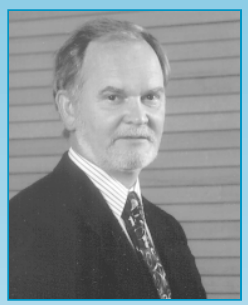
Annual Report of the Great Lakes Fishery Commission 2000



From the Chair

Burton Ayles

Great Lakes photo courtesy Veridian.

Reflecting on the Past, Embracing the Future

Major crossroads in history, like the beginning of a new millennium, often inspire people to reflect on the past and look foreword toward the future. The Great Lakes Fishery Commission indeed used this historic year as an opportunity to look at our work during the preceding decade and to consider our new *Strategic Vision for the First Decade of the New Millennium*.

The program of the 1990s began with the development and publication of the commission's *Strategic Vision for the Decade of the 1990s*, which has been the set of principles that guides our decision making process. The Vision is organized around three broad statements that outline goals for partnerships, sea lamprey control, and healthy ecosystems. The document guided us through the 1990s. As the 1990s are now past, and as we continue with our revision of the Vision, it is appropriate to reflect on how we did in fulfilling the vision of the 1990s and to discuss where the future vision is headed.

PARTNERSHIPS

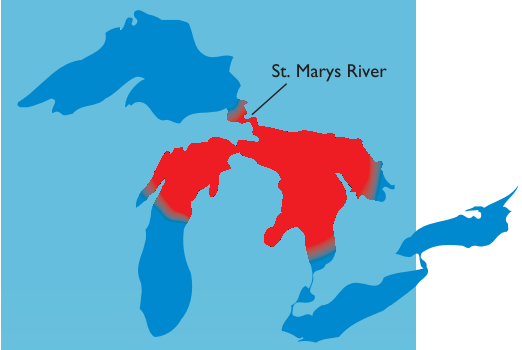
Partnerships, an important component of the vision, continued to grow during the 1990s. For instance, the 1990s brought

- heightened participation in the commission's advisor program,
- strong, continuing commitment to the *A Joint Strategic Plan for Management of Great Lakes Fisheries*—through the Lake Committee process—to facilitate coordinated, consensus-based fisheries management, and
- the creation of new partnerships including better interaction with the International Joint Commission through joint publications and regular meetings, with Michigan State University through the PERM program, and with the U.S. Army Corps of Engineers through greater cooperation in sea lamprey trap and barrier construction.

SEA LAMPREY

The sea lamprey control program continued to succeed throughout the 1990s. The goal under the Vision, of course, has been to keep lampreys suppressed to a level consistent with Fish Community Objectives. Certainly, in most areas of the Great Lakes, the commission and its agents have successfully reduced sea lamprey populations by 90%, allowing for rehabilitation, stocking, and the sustainability of a thriving sport and commercial fishery.

Without a doubt, however, the biggest challenge the program faced at the start of the 1990s was the terrible situation in the St. Marys River, where the river



The St. Marys River was a major sea lamprey producer until large-scale controls began in 1999.

produced more sea lampreys than all of the other Great Lakes combined, basically keeping fish populations in Lake Huron and northern Lake Michigan in a state of collapse. Last year, sea lamprey control on the river began on a large scale and the future of the affected areas looks extremely bright.

The 1990s also saw tremendous innovation in the sea lamprey control effort. The development of granular Bayluscide—by the scientists at the Upper Mississippi Science Center—allowed targeted application of lampricide without the use of TFM. The application of a large-scale sterile-male-release program will reduce sea lamprey spawning on the St. Marys River over the long run. And construction of sea lamprey traps will remove lampreys from the system before they have a chance to spawn. All of these elements were developed and applied during the 1990s and epitomize the forward-thinking, innovative nature of the program.

Remarkably, over the preceding ten years, the commission and its agents have made substantial progress on another component of the sea lamprey vision: that of lampricide reduction. Ten years ago, we set out—ambitiously—to reduce the use of TFM by 50% by the year 2000, due to escalating costs, belief that alternatives should be used if they exist, and our goal to create a more integrated pest management program. Although we fell short of that lampricide reduction goal, the amount we have reduced is still extraordinary. Today, the program uses about 35% less lampricide than it did at the start of the 1990s, saving us over $1.2 million a year while still allowing for the same level of sea lamprey control.

HEALTHY ECOSYSTEMS

One event of the 1990s particularly epitomizes the commission's vision for healthy ecosystems: restoration of lake trout in Lake Superior. At the start of the decade, after careful stocking and prudent harvest controls, lake trout populations in Lake Superior were in good shape, though it was still supported by stocking. By 1996, and continuing to this day, management agencies had declared a major victory in the management of the Lake Superior fishery: lake trout stocking would no longer take place in most of Lake Superior, because lake trout had reached a level of self-sustainability!

Thinking back to the late 1960s and early 1970s—when lake trout was driven to near extinction in all of the Great Lakes—today's decades-long achievement is monumental. The success in Lake Superior is testament to ingenuity, endurance, commitment, and foresight. More importantly, it proves to us that we can regain what we have lost as long as we adhere to science and sound management.

THE FUTURE

This year, at the start of a new decade, the future of the Great Lakes fishery looks bright.

Partnerships and cooperation are now "business as usual." No major uncontrolled populations of sea lampreys exist anywhere in the Great Lakes. Alternative controls have come of age and new research will take the program to a new plane. Most importantly, the health of the fishery is encouraging indeed.

As we formulate our new"*Strategic Vision for the First Decade of the Next Millennium*, we must remain conscious of where we have been and where we are going; where we have succeeded and where we have failed.

As I look back at the 1990s and as I reflect on my service as Chair of the commission, the thing that makes me most proud is our steadfast commitment to science. Our main strength in the Great Lakes region—indeed the very reason for our success—is the fact that science is behind our actions. In a world of uncertainty—and natural resource management is full of uncertainty—the one thing we know for sure is that science has brought us to where we are and will lead us boldly into the next millennium.

Sea Lamprey Control

Sea lamprey control remains a necessity in restoring and sustaining the fisheries of the Great Lakes, embedded in the *Convention on Great Lakes Fisheries* of 1955, and now buttressed by the Strategic Vision for the First Decade of the New Millennium. Forty-six years after the signing of the convention, sea lamprey control remains an enormous success story. In most regions of the Great Lakes, sea lamprey populations have been reduced by 90% or more, allowing for fulfillment of Fish Community Objectives developed by the Lake Committees as part of the *Joint Strategic Plan for Management of Great Lakes Fisheries*. Several agencies, such as the Department of Fisheries and Oceans (DFO), U.S. Fish and Wildlife Service (USFWS), the U.S. Army Corps of Engineers, the United States Geological Survey (USGS), the tribes, the province of Ontario, and the states are contributors of both resources and expertise to this program.

In 2000, the partner agencies for conducting the sea lamprey control program field work jointly:

- Conducted lampricide treatments in 63 tributaries of the Great Lakes;
- Sampled and surveyed 382 tributaries, inland lakes, and lentic areas to assess control effectiveness, plan future TFM treatments, and estimate production capacity of streams; and
- Operated assessment traps on 69 tributaries to estimate the spawning-phase population in each Great Lake.

Sea lamprey assessment. Photo: M. Gaden

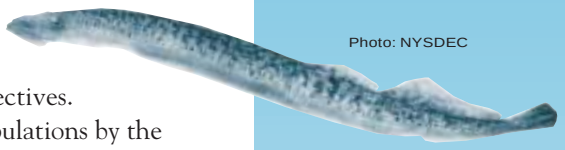


Photo: NYSDEC

The foundation for sea lamprey management decisions made by the commission remains sea lamprey control in support of Fish Community Objectives. In 2000, Lake Superior exceeded the target of 50% reduction of lamprey populations by the year 2000. The Lake Superior Committee is currently refining the Fish Community Goals and Objectives for Lakes Superior. In Lake Michigan, the fish community objective was met even with a long-term increase in abundance of spawning sea lamprey during the 1986-1998 period. Populations of parasitic sea lampreys remain significantly higher than the Fish Community Objective in Lake Huron, because of the continued high production of transformers from the St. Marys River. The lamprey management program met the Fish Community Objective in Lake Ontario, but did not for Lake Erie.

The commission's Strategic Vision calls for a 50% reduction in lampricide use by the year 2001 (compared to 1980's average use). In 2000, TFM use was 50% less than the average use for the decade of the 1980's, meeting the objective stated in the Vision. Although a portion of this large reduction may be attributable to low lake water levels, substantial strides have been achieved in lampricide use reductions throughout the Great Lakes.

In 2000, the Sterile Male Release Technique Task Force focused on a pilot study of density-dependent effects in seven Lake Superior streams, and conducted the fourth year of enhanced release of sterile male sea lampreys in the St. Marys River. The St. Marys River received 43,184 sterilized males which created a 3.3:1 sterile:untreated male ratio. The theoretical reduction of lamprey populations from trapping and sterile male release was estimated at 88% during 2000, resulting in a reduction of the estimated number of reproducing females from 8,406 to 1,010.

The St. Marys River Control Task Force completed all charges given by the Sea Lamprey Integration Committee (SLIC). The SLIC dissolved the task force, and any related responsibilities were assigned to the Assessment, Lampricide Control, and Sterile Male Release Technique Task Forces.

The Barrier Task Force coordinated with the U.S. Army Corps of Engineers to develop eight new barrier projects under Section 1135 of the Water Resources Development Act. The task force also was involved with workshops to develop fish passage and barrier research and the measurement of environmental criteria for barrier placement.

The Assessment Task Force continued to develop, with the secretariat, the Empirical Stream Treatment Ranking model to rank and select streams for lampricide treatment. For the first time, the model was used to predict potential transformer production from residual

Raceway designed to study response to sea lamprey pheromones. Photo: M. Gaden

populations. Preliminary rank lists for treatment during 2001 were prepared prior to the fall meeting of the St. Marys River. The task force cooperated in the long-term sterile male release, compensatory mechanisms, and the lampricide treatment effectiveness studies. The task force continued to implement recommendations of the adult assessment review by redistributing trapping effort from small to large streams, estimating the parasitic population in Lake Huron by marking and releasing parasitic lampreys into the lake, and estimating the transformer production in Lake Superior by marking and releasing transformers into select tributaries. The Task Force prepared a report on the use of granular Bayluscide as a survey tool in streams designated as Lake Sturgeon streams.

Fishery Management, Research, and Environment

The Great Lakes community relies on science as the foundation for it management activities. The goals of the *Convention on Great Lakes Fisheries*—which state in part that healthy Great Lakes fisheries depends on science—are supported by advice from the Great Lakes Fishery Commission's Board of Technical Experts, Fish Habitat Conservation Committee, 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 2000 approved research projects under the following categories:

Alternative Control

- Large Scale production of a larval sea lamprey pheromone (petromyzonal sulfate)
- Molecular synthesis of a larval sea lamprey pheromone (petromyzonal sulfate)
- Compensatory mechanisms in Great Lakes sea lamprey populations
- Population density and dynamics of sea lamprey populations in treated and untreated streams

New sea lamprey barriers like the electrical barrier on Michigan's Pere Marquette River are designed to block sea lamprey migration, trap sea lampreys, and pass desirable fish. Photo: E. Koon

- Collection of lamprey brains and pituitaries for purification of hormones
- Regulation and manipulation of metamorphosis in sea lampreys
- Using genetics to determine reproductive success of sea lamprey
- Function, production and release of a sea lamprey male pheromone
- Controlling fertilization in sea lamprey
- Elemental composition of statoliths of sea lamprey

Internal Research

- Determination of TFM treatment effectiveness
- Annual thermal habitat use by lake trout
- Long-term evaluation of sterile-male-release for control of sea lampreys in the Great Lakes

Board of Technical Experts

- Linking habitat supply to fish community objectives
- Fish communities of the Laurentian Great Lakes: the SCOL tradition revisited for the 21st century
- Bloater buoyancy basic biology

- Exotic invertebrates, food-web disruption, and lost fish production
- Enhancing stock assessment modeling and management of Great Lakes fisheries
- Lake Erie near-shore habitat delineation pilot initiative
- Ecosystem-based assessment of fish habitat in coastal wetlands of the Great Lakes
- Coordination of research on fish habitat and tributary environments of the Great Lakes
- Assessing ecological fitness of fish communities of the world's large water bodies

Integrated Management of Sea Lamprey Protocol

- Sterile-female-release
- Integration of sea lamprey functional response and lake trout assessment models for Lake Huron
- Sample proportions for mercury in larval sea lamprey
- Interim policy on barrier placement
- Fish passage/bypasses workshop

Other Partnerships

- Estimating forage fish consumption by predators in Lake Huron
- Environmental assessment tool for private aquaculture in the Great Lakes Basin
- Effects of an electric lamprey barrier on the migratory behavior of steelhead
- DNA-based markers for assessment of genetic population structure in yellow perch
- Temperature regime in Lake Erie
- Public input process for establishing fish community objectives for the St. Lawrence River
- Constraints on growth of Lake Superior lake trout
- Great Lakes Fish Atlas
- The status of American eel in the Lake Ontario/St. Lawrence River ecosystem

American eel (*Anguilla rostrata*). Average 24–40 inches.

- Biological invasions in the Laurentian Great Lakes: an analysis of ship vectors
- Predicting identity, spread, and impact of future nonindigenous species in the Great Lakes
- Great Lakes fisheries vessels: Status of the fleet and evaluation of assessment, research and management needs
- Wild production of chinook salmon in Lake Ontario from 1991-2000

The commission 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 2000, undertook several initiatives. For instance, the commission:

➤ established a Great Lakes Fish Habitat Conservation Committee (HabCom) to replace the recently dissolved Habitat Advisory Board. The new committee is designed to foster more agency involvement, more collaboration, and more interaction with other GLFC committees;

➤ extended the enormously successful Partnership for Ecosystem Research and Management (PERM) program to include the University of Guelph in Canada;

RUFFE

ROUND GOBY

ZEBRA MUSSELS

Invasive species such as ruffe, gobies, and zebra mussels threaten to disrupt the fragile Great Lakes ecosystem.

PHOTOS AND ILLUSTRATIONS: MINNESOTA SEA GRANT, DAVID JUDE, MICHIGAN SEA GRANT, GLERL

Congressman Pete Hoekstra (MI, right) and Congressman Jim Barcia (MI, middle) held a press conference in Washington, DC to focus on invasive species. Dr. Chris Goddard (left) of the Great Lakes Fishery Commission Secretariat spoke about the need to stop the flood of invasions The pressconference featured a European flounder found in the Great Lakes, presumably introduced through ballast water.

Photo: M. Gaden

- participated in a press conference with U.S. Representatives Pete Hoekstra and Jim Barcia about ballast water exchange and its impact on the Great Lakes. The commission also worked with the United States Coast Guard, the Smithsonian Institution, and the National Oceanic and Atmospheric Administration in a research meeting on the issue;
- supported funding, through the Coordination Activities Program, for projects about ballast effluent standards, the status of the Great Lakes fishery vessel fleet, contributions of wild chinook salmon to the standing stock of chinook salmon, and the status of the American eel;
- with input from cooperators, continued to revise the Strategic Vision. (This document is intended to be a guide for the efforts of the commission in its support of healthy ecosystems, partnerships, and sea lamprey control);

- promoted a bi-national research forum about ballast water exchange impacts on the Great Lakes. The commission also pledged to support future Great Lakes ballast initiatives;
- provided funding for publication of work highlighted at the Sea Lamprey International Symposium (SLIS) II. This conference was instrumental in sea lamprey information exchange among international experts;
- thanked the Law Enforcement Committee for its tremendous progress and outstanding efforts, especially with regard to Operation Kingfisher;
- supported a Lake Superior Fish Aging Workshop and a Great Lakes Fish Condition/Health Monitoring Methodologies Workshop.

In 2000, the comission convened the Sea Lamprey International Symposium to focus on the lastest information about sea lamprey control.

Photos: R. Bergstedt, G. Christie

Partnerships

Highlights of 2000 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 2000 Lake Committee actions. Detailed executive summaries are provided online (www.glfc.org/lakecom.htm) under the "publications and products" section of each lake committee.

THE LAKE SUPERIOR COMMITTEE reiterated its appreciation for and concern about the U.S. Geological Survey's (USGS) vessel program, upon which agencies depend for crucial information about prey species and the status of the lake.

THE LAKE MICHIGAN COMMITTEE agreed to expand the knowledge of the Lake Michigan yellow perch population and to develop tools for effective management of this fish population and to better understand recruitment failure. The committee recommended the development of a lakewide report on the status of fish research and management vessels. The committee discussed ways to work more closely with the Great Lakes Fish Health Committee on diseases in wild fish.

THE LAKE HURON COMMITTEE expressed concern about ageing management and research vessels. The committee stressed the importance of collectively deciding on assessment, research, and management needs, so that these needs can be addressed as vessels are replaced. The committee asked its technical committees to develop management and assessment recommendations for fish community objectives, lake trout rehabilitation guidelines, and coaster brook trout. The committee requested a plan for establishing a broodstock in the U.S. Fish & Wildlife Service hatcheries of Parry Sound lake trout, with minimal mortality on this remnant stock. The committee agreed to develop its environmental objectives through the Great Lakes Fish Habitat Conservation Committee, if established by the GLFC.

THE LAKE ERIE COMMITTEE remained concerned about the status of yellow perch and walleye and pledged in 2001 a coordinated long-term strategy for rebuilding stocks in Lake Erie. In addition to yellow perch and walleye, smallmouth bass will be studied. The committee released a statement on ballast water that supported efforts to control all biological components of ballast within the Great Lakes basin.

THE LAKE ONTARIO COMMITTEE agreed to study the need to preserve Lake Ontario and St. Lawrence River spawning stocks of American eel. The committee asked its technical committee to assess continuing validity and research needs associated with the lake trout rehabilitation plan. The committee encouraged the publication of research on bloaters. The committee reported that fish community objectives and a lake trout rehabilitation plan for Lake Ontario were in the editing process.

THE COUNCIL OF LAKE COMMITTEES worked to formalize the review process for proposing funds under the Fish and Wildlife Restoration Act. The council wrote to the director of the USGS to reiterate the importance of the research vessel program. The council urged all lake committee members to keep phosphorus loading in mind when discussing and reviewing Lakewide Management Plans and in discussions with environmental agencies. The CLC asked that principle investigators take into account input from state and provincial agencies in revising the Environmental Assessment Tool for Cage Aquaculture in the Great Lakes. The committee reviewed and re-endorsed its Procedure for Consultation and Introduction in the Great Lakes Basin, noting it did not need revision to accommodate the desired review of proposed strain introductions.

THE COUNCIL OF GREAT LAKES FISHERY AGENCIES considered various proposals and techniques for ending ballast water introductions. Potential release of organisms from these ships is not being addressed by current ballast management regimes. The U.S. Coast Guard needs political support to develop a meaningful standard for ballast water on a national, rather than a Great Lakes basis. The council encouraged agency action to protect wild fish from problems associated with aquaculture activities.

THE LAW ENFORCEMENT COMMITTEE developed and executed Operation Kingfisher, a new and innovative approach to cooperative law enforcement in the Great Lakes. The operation, which was carried out in Lake Erie in May, 2000, was the first-ever use of a Combined Enforcement Team, a special group of officers cooperating and pooling resources to carry out more effective law enforcement.

THE COMMITTEE OF ADVISORS (CANADIAN) expressed concern about declining water levels in the Great Lakes, noting that inefficient use of Great Lakes water could leave the region vulnerable to export based on demand from other regions. Canadian advisors urged the development of a basinwide water conservation strategy.

THE COMMITTEE OF ADVISORS (U.S.) expressed deep concern about the introduction of exotic species into the Great Lakes via ship ballast. They noted that some Great Lakes states (Michigan and New York) have legislation pending to regulate ship ballast that travels through that state's waters, although they noted that action by one state or province would be ineffective. Advisors recommended that basinwide environmentally protective standards for ballast discharge be developed. Once developed, advisors recommend that the shipping industry be allowed to decide for itself the best way to comply with the regulations.

For more details of these committee actions, visit their web pages at **www.glfc.org**

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.

Budget

The commission received the following contributions from the governments of the United States and Canada (shown in U.S. dollars) for 2000:

	U.S.	CANADA	TOTAL
Sea Lamprey Management and Research	$8,574,350	$4,290,467	$12,864,817
Administration and General Research	$887,150	$799,150	$1,686,300
TOTAL	**$9,461,500**	**$5,089,617**	**$14,551,117**

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

The commission's U.S. trust fund received donations from: The Coating Place, Clariant Fine Chemicals, the Great Lakes Fishery Trust, the United Nations University, Kinetic Industries, NBC Television, and Dick and Mary Reuss. Thank you fo · your contributions to the long-term health of the fishery!

Awards and Honors

The Great Lakes Fishery Commission established three new annual awards to recognize those who made particularly noteworthy contributions to the Great Lakes. The awards are:

- **The Jack Christie/Ken Loftus Award for Distinguished Contributions to Healthy Great Lakes Ecosystems.** This award recognizes those who made significant contributions to protecting or improving the Great Lakes environment. The commission presented the first Christie/Loftus award to **Dr. Ed Crossman** (top left) for his adherence to the highest principles of science in dedicated service to the long-term protection of the Great Lakes ecosystem.

- **The Buzz Besadny Award for Fostering Great Lakes Partnerships.** This award recognizes those who exemplified extraordinary commitment to building strong and lasting partnerships in Great Lakes resource management. The recipient of the Besadny award was **Mr. Dennis Hickey** (top right)—a Wisconsin commercial fisherman—for his outstanding personal contributions to the protection of the Great Lakes fishery and in recognition of the commercial fishing industry's many partnerships with management agencies.

- **The Vern Applegate Award for Outstanding Contributions to Sea Lamprey Control.** This award recognizes those who furthered the cause of sea lamprey control on the Great Lakes. The commission presented the Applegate award to **Mr. Mike Twohey** (bottom left) of the Fish and Wildlife Service for development and successful implementation of the innovative sterile-male-release-technique for sea lamprey control.

The commission also used the 2000 annual meeting as an opportunity to honor **Dr. David Balsillie** (bottom right), who retired from the commission in March, 2000.

U.S. Department of State | Department of Fisheries & Oceans Canada | U.S. Fish and Wildlife Service | U.S. Geological Survey | U.S. Army Corps of Engineers

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