

Annual Report

of the
**Great Lakes
Fishery
Commission**

2001



From the Chair
Bernie Hansen

New Vision for a New Millennium

Incredible as it may seem, before the 1990's, the Great Lakes Fishery Commission did not have a single set of guiding principles. While the commission still managed a well-established program that produced valuable research and embraced the ecosystem approach to management, we lacked a set of unified principles to guide our decisions, evaluate the success—or failure—of our efforts, and develop our future goals. By the late 1980's, commissioners perceived that a level of inconsistent decision-making was occurring within the commission. People did not know how or why decisions were made, and the commissioners had little to pass on to new commissioners to ensure program continuity.

In 1991, the commission adopted the *Strategic Vision for the Decade of the 1990's*. Since then, it has been the foundation of all commission decisions. The vision is organized into three interdependent statements of equal priority: Healthy Ecosystems, Integrated Management of Sea Lamprey, and Partnerships. The Strategic Vision has been our way to focus and invigorate activities, inform the public of our programs, and stay true to the needs of our valued Great Lakes fishery. Ten years later, as we begin a new millennium, the commission has evaluated the Strategic Vision and updated it to reflect new challenges and focus.

So, ten years after the vision for the 1990's, how did we do? Although we didn't reach all of the milestones, the commission has certainly changed course and moved in the direction identified in the vision. Some specific milestones are worth mentioning.

- One decade ago, we said that lake trout restoration would be a key indicator of native species rehabilitation. Today, lake trout stocking is no longer necessary in most areas of Lake Superior—a major victory for the fishery that reflects the efforts of many agencies in the Great Lakes region. The commission has a strong, renewed commitment for rehabilitation in Lake Michigan and Lake Huron, and has detected increasing levels of yearlings in Lake Ontario.
- Ten years ago we identified the need to establish policies preventing the unintentional introduction of exotic species in the Great Lakes. Today, despite public awareness of the problem and concerted efforts around the basin, new introductions continue.



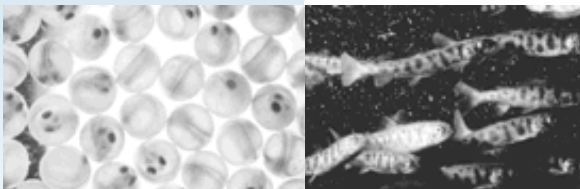


- In its original vision, the commission noted the need to reduce toxics in the Great Lakes to levels that do not impair the health of aquatic organisms. Today, these efforts have been successful in many instances thanks to a commitment to the *Great Lakes Water Quality Agreement*.
- Ten years ago we identified Fish Community Objectives and State of the Lake Reports as critical to the management of the Great Lakes fishery. Today, Fish Community Objectives have been produced for each lake—Lake Erie will be published this summer—and the Lake Committees, under the Joint Strategic Plan, are holding annual state of the lake conferences.
- In the first Strategic Vision, we pledged a renewed commitment to the Committee of Advisors and to communication with stakeholders. Today, advisors are extremely vocal and active and the Canadian Committee of Advisors has been expanded. In addition, the commission has heightened its commitment to communications.
- Finally, in the vision for the 1990's, we called for a 50 percent reduction in TFM use. Although the commission did not reach the 50 percent reduction goal, TFM use has been reduced by more than 30 percent, and new alternative control techniques, such as the sterile-male-release-technique and improved sea lamprey barriers, are now employed.

With a careful evaluation of the vision completed, the commission, in 1998, began to draft an update. After three years and several re-writes, the *Strategic Vision for the First Decade of the New Millennium* is complete! Thank you to those who reviewed and commented on the vision. Because of the input we received from many stakeholders, the revised vision is a far improved document.

Like the previous vision, the new vision again emphasizes the importance of the ecosystem approach to management. Milestones were updated from the original vision to reflect changes in the Great Lakes ecosystem over the past decade. The Healthy Ecosystems vision statement outlines how the commission can respond to uncertainties and changes in our evolving Great Lakes environment. The Sea Lamprey vision statement sets goals for sea lamprey control, as well as how we would like to conduct our program in the future. Finally, the Institutional and Stakeholder Partnerships vision statement focuses on relationships and processes required to achieve the ecosystem and sea lamprey vision statements and reasserts the commission's commitment to developing and strengthening research partnerships.

The Strategic Vision is a way to communicate our program to all stakeholders, and keeps us—the commissioners and secretariat—on a consistent course. The new vision contains both reachable and ambitious milestones. We are excited about where this vision will take us and look with anticipation to the future.



Lake trout eggs and fry.

Photos: American Fisheries Society

SEA LAMPREY CONTROL

Sea lamprey control continues to be an integral component of fishery management in the Great Lakes. The integrated sea lamprey control program is one of the commission's principal responsibilities as defined by the *Convention on Great Lakes Fisheries* and the *Strategic Vision for the First Decade of the New Millennium*. The commission collaborates with the Department of Fisheries and Oceans Canada and the U.S. Fish and Wildlife Service to control sea lamprey populations. With increasing partnerships, the commission is expanding its resources and expertise. The commission and its partners have, in the past decade, reduced the sea lamprey populations in the Great Lakes by 90%, thus beginning to fulfill the Fish Community Objectives developed by the lake committees.

In 2001, DFO and the USFWS collectively

- treated 72 tributaries with lampricides,
- surveyed 316 Great Lakes tributaries and 7 lentic areas to assess control effectiveness for future TFM treatments and to establish production capacity of streams, and
- operated assessment traps in 67 tributaries to capture and estimate the spawning-phase population in each of the lakes.

Continued evaluation of sea lamprey populations relative to fish community objectives is the foundation of sea lamprey management decisions made by the commission. In Lake Superior, sea lamprey-induced mortality in lake trout is estimated at 16% of the annual total. In Lake Michigan, the fish community objectives are being met despite the continued increase in lamprey wounding rates of lake trout in the northern part of the lake. Populations of parasitic lampreys remain high in Lake Huron due to continued production of transformers from the St. Marys River. In Lake Erie, abundance declined by 50% from 2000 levels. The objective for sea lampreys in Lake Ontario was nearly met in 2001, with wounding rates on lake trout at 3% compared to the target of 2%.

THE STERILE MALE RELEASE TECHNIQUE TASK FORCE continued to coordinate the implementation of the technique in the St. Marys River. The task force is working with the Assessment and Lampricide Control Task Forces and other researchers on stock recruitment variation. The task force is also assembling cost estimates for the control strategy in the St. Marys River in preparation of a formal review of the technique. The St. Marys River received 31,459 sterile males, which produced a 3.6:1 sterile:untreated male ratio. Combined trapping and sterile male release efforts resulted in an estimated 88% reduction in 2001.

THE BARRIER TASK FORCE continued coordination activities with the U.S. Army Corps of Engineers to implement ten barrier projects under Section 1135 of the Water Resources Development Act. The task force revised interim environmental policies and guidelines for the placement of sea lamprey barriers and began to formulate a basin-wide strategy for workplace and public safety in the barrier program.

THE ASSESSMENT TASK FORCE again utilized the empirical stream treatment-ranking model to rank and select streams for lampricide treatment in 2002. Transformer production predictions were made for all streams quantitatively assessed in 2001 as well as for all other streams treated in the last 3 years. The task force continued to redistribute trapping effort from small to large streams, estimate parasitic populations in Lake Huron, and assess the transformer production in Lake Superior. In the St. Marys River, the task force continued to evaluate larval lamprey populations and completed a spawner movement study in an effort to increase trap efficiency. A peer review of the larval program is scheduled for August 2002.

THE LAMPRICIDE CONTROL TASK FORCE continued to implement options for reducing lampricide use in individual treatments but concurrently coordinated an enhanced treatment program in all of the Great Lakes. The task force coordinated an ongoing treatment effectiveness study on 14 streams in the basin and continued to implement lake sturgeon treatment protocols in an ever-increasing number of streams.

Risk assessment projects focused on environmental risk management as related to regulatory agency permits for control actions and on coordination of issues related to lake sturgeon and other non-target organisms throughout the Great Lakes basin.



The sterile-male-release technique is an important part of the GLFC's alternative sea lamprey control strategy.
Photo: M. Gaden



Sea lamprey treatments remove larval lamprey from streams.
Photo: GLFC

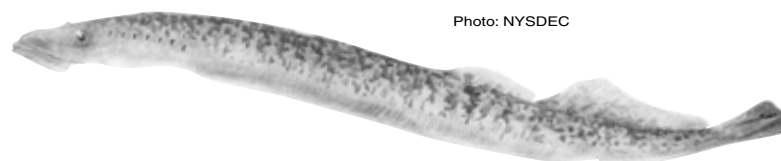


Photo: NYSDEC

FISHERY MANAGEMENT, RESEARCH, AND ENVIRONMENT

The GLFC is committed to the use of sound science for the conservation of biological diversity and the protection of the fishery. The commission strives for a healthy ecosystem by bridging policy and science with counsel from the Great Lakes Fishery Commission's Board of Technical Experts, Habitat Conservation Committee, Sea Lamprey Integration Committee, Lake Committees and their technical committees, the Law Enforcement Committee and the Great Lakes Fish Health Committee.

Based on recommendations from its boards, the commission, in 2001 approved research projects under the following categories:

Alternative Control

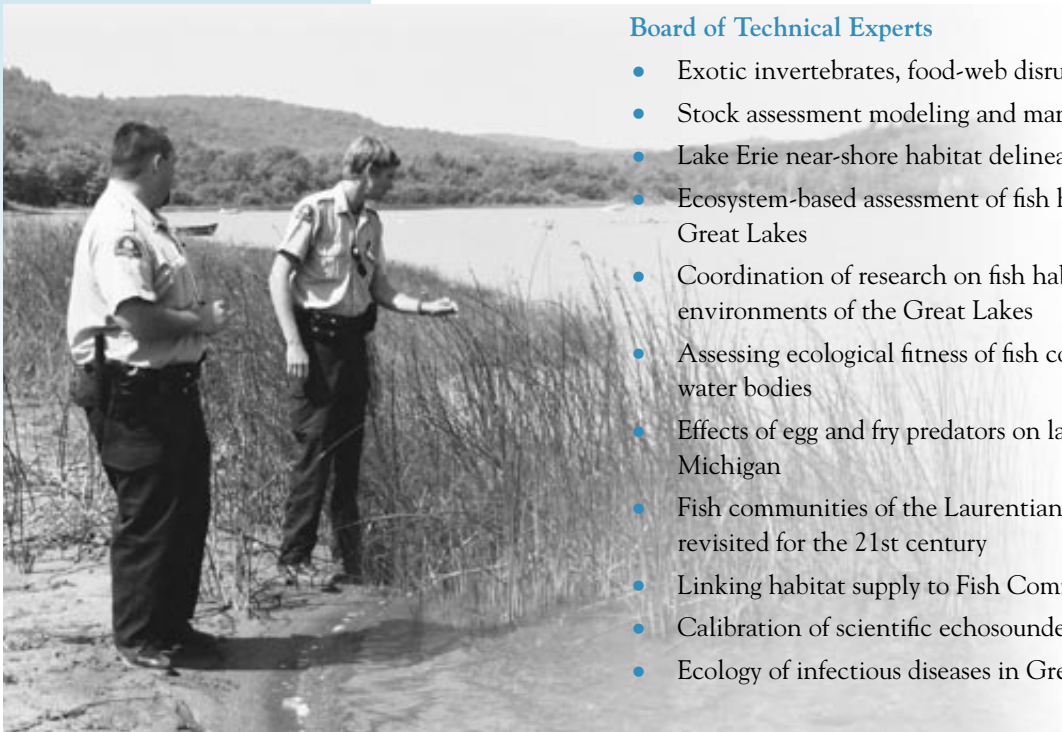
- The roles of sperm-activating proteins and the mechanism of protease-inhibitor(s) reaction for controlling fertilization in sea lamprey
- Compensatory mechanisms in Great Lakes sea lamprey populations
- Determining sources and chemical composition of lamprey larval pheromone and assessing the merit of measuring one of its principal components in river waters
- Population density and dynamics of lamprey populations in treated and untreated streams
- Regulation and manipulation of metamorphosis in sea lampreys
- Molecular cloning of lamprey enzyme (petromyzonol sulfotransferase) and enzymatic synthesis of lamprey pheromone (petromyzonol sulfate)
- Function, production and release of a sea lamprey male pheromone
- Fertility assessment in male and female lamprey
- The effects of larval pheromone on adult behavior
- Electro-reception in the sea lamprey
- Lamprey movement and population size in Lake Champlain and its tributaries

Board of Technical Experts

- Exotic invertebrates, food-web disruption, and lost fish production
- 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 in near-shore and tributary environments of the Great Lakes
- Assessing ecological fitness of fish communities of the world's large water bodies
- Effects of egg and fry predators on lake trout recruitment in Lake Michigan
- Fish communities of the Laurentian Great Lakes: the SCOL tradition revisited for the 21st century
- Linking habitat supply to Fish Community Objectives
- Calibration of scientific echosounders in the Great Lakes
- Ecology of infectious diseases in Great Lakes fishes

Officers from Ontario's Department of Fisheries and Oceans are charged with conserving and protecting fish habitat from being harmfully altered, disrupted, or destroyed as a result of conflicting and diversified interests.

Photo: H. Kirshman, N. Leonard



Other partnerships

- Great Lakes Fish Atlas
- Application of decision analyses to sea lamprey management
- Polygyny and polyandry as a means of optimizing sterile female releases
- Evaluation of the GLFC interim policy on barrier placement
- Constraints on growth of Lake Superior lake trout
- Wild production of chinook salmon in Lake Ontario from 1991-2000
- Great Lakes fisheries vessels: Status of the fleet and evaluation of assessment, research and management needs
- Effects of an electrical lamprey barrier on the migratory behavior of steelhead in the Pere Marquette River, Michigan
- Environmental assessment tool for private aquaculture in the Great Lakes Basin
- Sea lamprey larval parentage, adult reproductive success, and larval dispersal
- Fish health management of cool and warm water fishes
- A Great Lakes Coregonid-Diporeia Workshop
- Ecosystem-based assessment of fish habitat in coastal wetlands of the Great Lakes
- Review of procedures for estimating wild production of chinook salmon

In the new vision, the commission reiterates its dedication to the values and ideology of sound science and has reaffirmed its commitment for achieving sustainable fisheries in the Great Lakes basin. With its continued recognition of the interconnection between air, land and water and the welfare of its inhabitants, the commission continues to coordinate and develop management and research programs that incorporate all aspects of the ecosystem. The commission is also bridging various environmental agencies, fish management agencies, and non-agency stakeholders, in order to strengthen and broaden partnerships that will bring about a more efficient and effective result for our ecosystem.

In 2001, the commission undertook several initiatives in support of healthy Great Lakes ecosystems. For instance, the commission

- revised the terms of reference for the Board of Technical Experts and the Sea Lamprey Research Working Group, paying special attention to minimizing and balancing potential conflict of interest issues;
- enhanced its partnership with the Corps of Engineers by jointly sponsoring the development of a Fishery Restoration Support Plan. The support plan is the first stage of the implementation of section 506 of the *Water Resources Development Act of 2000*. This section created the Great Lakes Ecosystem and Restoration Program, which funds fishery restoration projects in the Great Lakes; and
- achieved the first milestone of the *Strategic Vision of the First Decade of the New Millennium* by approving guidelines for the use of discretionary funds for Canadian and U.S. advisor travel.



Small brook trout passing through sea lamprey barrier.
Photo: USFWS



Fish passage located in Pere Marquette, Michigan. Photo: USFWS



PARTNERSHIPS

Lake Committee Action Highlights of 2001

Successful management of the shared Great Lakes fishery occurs because of a strong commitment to lake committees, which were formed under the *Joint Strategic Plan for Management of Great Lakes Fisheries*. State, provincial and tribal fishery managers meet annually to develop common objectives for the lake, share scientific information, and allow agencies a place to make decisions on such things as stocking, harvest, law enforcement and environmental management. The following are highlights of 2001 Lake Committee actions (full summaries are on each lake committee's home page at www.glfc.org/lakecom.php).

THE LAKE SUPERIOR COMMITTEE approved its draft Fish Community Objectives and is currently seeking public comment for review. Committee discussion also addressed the issue of exotics' constraints on fish managers. The LSC adopted rehabilitation plans for coaster brook trout and walleye while continuing work on a sturgeon rehabilitation plan. The committee stressed to the U.S. Geological Survey the importance of spring assessment of Isle Royale lake trout.

THE LAKE MICHIGAN COMMITTEE directed that acoustics be incorporated into a lakewide assessment plan and approved the creation of an Acoustics Task Group. Additionally, strategies were discussed to avoid inadvertently exceeding stocking objectives of salmonids in Lake Michigan. In September 2001, the LMC will conduct a workshop beginning the process of revising the Lake Trout Rehabilitation Plan.

THE LAKE HURON COMMITTEE sponsored a workshop to focus on the condition of whitefish and the impact of diporeia decline in the lakes. The committee also supported a major initiative to identify bathythermal habitat of sea lamprey, chinook salmon, lake trout and whitefish and to learn where and when these species interact.

THE LAKE ERIE COMMITTEE established a percid management strategy for a three year period, authorizing a total allowable catch of 3.4 million walleye. The LEC agreed to conduct an independent external review of the Lake Erie yellow perch standard stock assessment modeling procedures. The yellow perch total allowable catch for 2001 was set at a total of 7.1 million lbs. in Lake Erie.

THE LAKE ONTARIO COMMITTEE agreed to develop a position statement on American eel management including: determining the roles of both the Department of Fisheries and Oceans and the U.S. Fish and Wildlife Service; ICES recommendations; and issues surrounding the eel ladder and turbine at the Moses-Saunders Dam. Members agreed to develop a bloater rehabilitation plan, which might include the need for hatcheries.

THE COUNCIL OF LAKE COMMITTEES announced a new environmental assessment tool for land-based aquaculture that will be distributed to stakeholders for review. The committee requested an additional Law Enforcement Committee term of reference directed at habitat protection. Further, the council supported a proposed independent review of the Great Lakes Science Center in 2002 that would be funded by the USGS with GLFC support. CLC also expressed concern regarding significant threats to fisheries posed by dredging operations due to low lake levels.

THE LAW ENFORCEMENT COMMITTEE revised its terms of reference and received approval from the CLC. Operation Kingfisher, the innovative cooperative law enforcement operations between Canadian and U.S. law enforcement agencies, continues to be successful with the joint citation of gillnet offenders in Canadian and Ohio waters.



Lake committee meetings are critical in the cooperative management of the Great Lakes fishery. Every year, biologists, lake managers, law enforcement agents, and sport and commercial fishers meet during lake committee meetings to discuss the latest information about the fishery. Photo: M. Gaden

THE GREAT LAKES FISH HEALTH COMMITTEE has been updating the fish disease model program, which includes revising the recommended responses to salmonine pathogens and disease. The committee was concerned with emerging warm water diseases. The committee's disease model program had success in a hatchery setting, but not in the wild. The decline in lipid availability to fish, due to declines in diporeia abundance, also raised concern within the committee.

THE COMMITTEE OF ADVISORS expressed concern about proposals to reverse existing bans on oil exploration in the Great Lakes, pointing out possible negative impacts on the environment and the fishery. The advisors also asked the commission to take a leadership role in coordinating research, information exchange and policy formulation regarding the negative effects of cormorants on fish, wildlife and habitat in the Great Lakes. The advisors expressed concern about the increase and spread of avian botulism. Advisors reported disparity in minimum size limits on lake trout between states and provinces. Advisors noted that sea lamprey populations are increasing in some areas of the Great Lakes and urged a re-examination of policies related to the use of TFM.

Budget

The commission received the following contributions from the governments of the United States and Canada (shown in U.S. dollars) for 2001:

	U.S.	CANADA	TOTAL
Sea Lamprey Management and Research	\$10,565,172	\$2,652,821	\$13,217,993
General Research, Committee and Scientific Support, and Administration	\$ 1,168,000	\$ 287,750	\$1,455,750
TOTAL	\$11,733,172	\$2,940,571	\$14,673,743

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. and Canadian trust funds received donations from AgrEvo, Kinetic Industries, the Michigan Steelhead and Salmon Fisherman's Association, the Ontario Commercial Fisheries Association, the Great Lakes Fishery Commission, Dick and Mary Reuss, Pam and Ed Makauskas, and Bert and Donna Atkinson.



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.

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- Joseph Day (U.S.)
- Bernie Hansen, Chair (U.S.)
- Ray Pierce (Can.)
- Roy Stein (U.S.)
- Peter Wallace (Can.)

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U.S. Department of State



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U.S. Geological Survey



U.S. Army Corps of Engineers

Awards and Honors

The Great Lakes Fishery Commission honored individuals who made outstanding contributions to the Great Lakes.



◀ The commission presented (R-L) Mark Holeý of the U.S. Fish and Wildlife Service, Tom Gorenflo of the Chippewa-Ottawa Resource Authority, and Kelley Smith of the Michigan Department of Natural Resources with the **Jack Christie/Ken Loftus Award for Distinguished Contributions to Healthy Great Lakes Ecosystems**. Their outstanding work helped achieve a historic fishery agreement between the Chippewa-Ottawa tribes signatory to the 1836 treaty, the State of Michigan, and the United States federal government. Also pictured: Chris Goddard, Executive Secretary.

➤ Ed Makauskas (left), chairman of the commission's Committee of Advisors, was presented with the **Buzz Besadny Award for Fostering Great Lakes Partnerships**. The award recognized Makauskas' dedicated work to advance the commission's sea lamprey control program and his overall passion for the health of the Great Lakes fishery. Also pictured: Commissioner Bernie Hansen.



◀ The commission presented Vic Gillman (left) of the Department of Fisheries and Oceans with the **Vernon Applegate Award for Outstanding Contributions to Sea Lamprey Control**. This award recognized Gillman for his many years of service to the sea lamprey control program and his dedication to cooperative fisheries management between the U.S. and Canada. Also pictured: Commissioner Bill Beamish.

The commission also used the 2001 annual meeting as an opportunity to honor Dr. Burton Ayles and Mr. David Dempsey who retired from the commission in 2001. Both men made instrumental and lasting contributions to the commission.



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