

Annual Report

of the

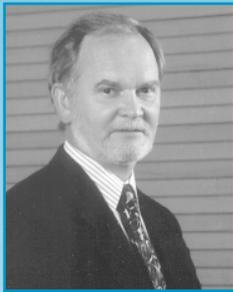
Great Lakes Fishery Commission

1999



Remembering a Champion for our Fishery

Buzz Besadny



From the Chair
Burton Ayles

In 1999, the Great Lakes community lost a stalwart champion for the fisheries resource: Buzz Besadny. He served for years as Wisconsin DNR's Secretary, earning him the nickname "Father Nature" by the grateful people of his state. After retirement from the DNR in 1990, to 1996, Buzz served as a commissioner and as chairman of the Great Lakes Fishery Commission. It is no exaggeration that Buzz inspired a generation of resource managers. He was a visionary, a solid backer of science-based management, and a statesman.

The year 1999 was successful in meeting many of the challenges the fishery faced and in fulfilling many of the promises we made in our Strategic Vision. As the following highlights from 1999 show, Buzz's fingerprints are all over much of this year's success.

- In 1999, the Great Lakes Fishery Commission began the process of updating its Strategic Vision for the Decade of the 1990s, a document that focuses the commission's thoughts, guides our decision-making, and communicates the program's goals. This year, the commission started a rigorous assessment of progress under the Strategic Vision and established a timetable for completion of the revised Strategic Vision. During the next two years, the commission plans to solicit input from stakeholders and agencies, circulate drafts of the vision, and publish it by the 2001 annual meeting. Buzz was active in drafting the commission's first strategic vision in 1990.
- Partnerships continued to improve in 1999, with the commission working more closely with the U.S. Army Corps of Engineers to build sea lamprey barriers, with Michigan State University to improve internal research, with the International Joint Commission to strengthen the dialogue between our two commissions, and with the state, provincial, and tribal agencies under the *Joint Strategic Plan for Management of Great Lakes Fisheries* to heighten cooperation among all the jurisdictions on the Great Lakes. These partnerships are the backbone of the commission's program and are critical to the successful science-based management of our natural resources.
- The Great Lakes Fishery Commission is proud to have significantly expanded the Canadian Committee of Advisors in 1999, thanks to the hard work of the Canadian Section of the commission—particularly Commissioners David Balsillie and Marie Tobin—and thanks to the input from existing Canadian Advisors Rob Graham and Terry Quinney. 



Sea lamprey control on the St. Marys River.
Photo: M. Gaden

The enlarged committee will expand the input we receive from stakeholders and, with the U.S. Committee of Advisors, will provide a truly cross-border stakeholder approach.

- ▶ Probably the biggest news of 1999 remains the large-scale treatment of the St. Marys River. Under the supervision of Terry Morse of the U.S. Fish and Wildlife Service and Larry Schleen of Fisheries and Oceans Canada, the commission treated nearly 2000 acres of the river with granular Bayluscide, a lampricide designed especially for use on the St. Marys River. This treatment, which was the culmination of years of planning, involved participation not only from the U.S. Fish and Wildlife Service and Fisheries and Oceans Canada, but also from the U.S. Geological Survey, the Chippewa-Ottawa Treaty Management Authority, and the Michigan Department of Natural Resources. A generous \$3 million donation from the State of Michigan and increased appropriations from the United States and Canada made this treatment possible.

The treatment of the St. Marys River is good news for Lake Huron and northern Lake Michigan, areas ravaged by sea lampreys from the St. Marys River. This year's treatment is projected to remove half of the larval sea lampreys in the river. Combined with the aggressive use of alternative control techniques (enhanced trapping and the release of sterilized male sea lampreys), we expect to reduce the spawning potential of the St. Marys River by 92%. We are confident that 1999 will go down in history as the year we knocked down the largest uncontrolled population of sea lampreys since the 1950s.

Clearly, 1999 was an active year for the Great Lakes Fishery Commission and its partners, and many of the initiatives we carried out, much of the planning we undertook, and much of the program success we achieved rests on the vision and dedication that Buzz provided to the Great Lakes community. The commission dedicates this annual report to Buzz Besadny.



Sea lamprey trap—an integral component of sea lamprey control. Photo: M. Gaden

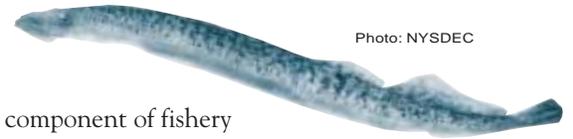


Photo: NYSDEC

Sea Lamprey Control

Sea lamprey control in the Great Lakes is a crucial component of fishery management. The integrated sea lamprey control program is the commission's principal responsibility as defined by the *Convention on Great Lakes Fisheries* and the *Strategic Vision for the Decade of the 1990s*. The commission collaborates with the Department of Fisheries and Oceans Canada and the U.S. Fish and Wildlife Service to control sea lamprey populations. The management agencies have reduced the sea lamprey populations in the Great Lakes by 90%, thus supporting *Fish Community Objectives* developed by the lake committees.

In 1999, lampricide treatments were conducted in 55 tributaries in the Great Lakes. Larval assessment crews surveyed 290 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 66 tributaries to estimate the spawning-phase population in each Great Lake.

Sea lamprey control continues to be the foundation of sea lamprey management decisions made by the commission. Objectives for sea lamprey populations have been established in the *Fish Community Objectives*. In 1999, sea lamprey abundance in Lake Superior was above the commission's target level. The estimated number of spawning-phase sea lampreys in 1999 was the highest since 1986. In Lake Michigan, spawning sea lampreys were relatively stable during 1986-1999, 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 fish community objective in Lake Huron due to the continued high production of sea lamprey from the St. Marys River. Integrated control measures implemented in the St. Marys River are predicted to significantly reduce the number of parasitic lamprey in Lake Huron.

The objectives for Lake Erie of wounding rates on lake trout of less than 5%, and assessment trap catches of lampreys less than 10% of treatment levels, are not currently being met (spawner catch in 1999 was equal to 25% of pre-treatment catch and lake trout of 533-633 mm suffered 15 wounds per 100 lake trout). The fish community objectives for sea lamprey management in Lake Ontario are currently close to being met.

In 1999, the St. Marys River Control Task Force coordinated the second year of lampricide treatment on the St. Marys River. A total of 4,249 kg (9347 pounds) of granular Bayluscide was applied to 759.8 ha (1877.5 acres) of the river in 1999, with a helicopter by a contracted pesticide application firm and agent boat crews. Personnel from both the Fish and Wildlife Service and the Department of Fisheries and Oceans Canada cooperated in the successful treatment. Combined with the 1998 treatment, at least 45% of the larval sea lamprey population has been removed. The St. Marys River Assessment Plan will continue to evolve, and a decision tree will be developed to determine future integrated control efforts in the river.

The Lampricide Control Task Force continued to implement options for reduced lampricide use, consistent with the commission's *Strategic Vision for the Decade of the 1990s*, which calls for a 50% reduction in the use of TFM by 2001. The task force completed a manual entitled, *Standard operating procedures for application of lampricides in the Great Lakes Fishery Commission integrated management of sea lamprey (Petromyzon marinus) control program*. The manual will facilitate cooperative control projects and cross-border control efforts.

The Sterile Male Release Technique Task Force focused on the fourth year of a four year assessment project in Lake Superior streams and the third year of enhanced release of sterile male sea lampreys in the St. Marys River as part of an integrated control program. The four-year study, which evaluated the success of the technique, had released lampreys during 1996-1998 in eight Lake Superior streams and is in the process of determining density-dependent effects within the larval population. The St. Marys River received 26,285 sterilized males which created a 4.7:1 sterile:untreated male ratio. The theoretical reduction from trapping and enhanced sterile male release was estimated at 92% during 1999, an increase from an average of 84% during 1997-1998. The sterilization facility continued to meet the demands of the program.

The commission is committed to reducing the use of lampricides through the implementation of alternative lamprey control techniques, which include barriers to impede sea lamprey migration. The Sea Lamprey Barrier Task Force completed the two year transition phase of the barrier program from a developmental process to a fully integrated and operational part of the sea lamprey control program by releasing the document *Sea Lamprey Barrier Life Cycle and Operational Protocols*. The task force also developed an interim environmental policy and guidelines document for the placement of sea lamprey barriers in Great Lakes tributaries. An experimental combination fixed-crest, gradient field electrical weir was completed and five existing barriers were modified to prevent sea lamprey migration. To date, 61 barriers have been constructed or modified on Great Lakes tributaries to hinder sea lamprey migration.

The Sea Lamprey Integration Committee established an Assessment Task Force in 1996 to optimize operations of the larval and adult assessment programs. In 1999, the task force continued to develop the Empirical Stream Treatment Ranking model to rank and select streams for lampricide treatment. They developed and implemented a sampling plan to assess pre- and post-treatment abundance of larval sea lampreys in the St. Marys River, and developed plans for assessing the efficacy of the integrated control measures on the St. Marys River. The task force continued to cooperate in the compensatory mechanisms study, and 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 population in Lake Superior by marking and releasing transformers into select tributaries.



Sterile-male-release-technique. Photo: M. Gaden



Fishery Management, Research, and Environment

The Hammond Bay Biological Station, home to US Geological Survey research, Michigan State University sea lamprey research (in cooperation with the Great Lakes Fishery Commission) and the sterilization facility.

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 1999 approved research projects under the following categories:

Alternative Control

- Large scale production of petromyzonol sulfate
- Potential use of steroids for sterilizing male sea lampreys
- Individual-based model of seasonal growth, seasonal blood consumption, and seasonal effects on hosts by parasitic-phase sea lampreys in the Great Lakes
- Function, identity, and potential application of a male sea lamprey pheromone in sea lamprey control
- Compensatory mechanisms in Great Lakes sea lamprey populations
- Reproductive functions of male sea lamprey in relation to potential targets for population control
- Determining chemical composition of the larval lamprey pheromone

Internal Research

- Classification of lentic habitat of sea lamprey larvae using a Roxann seabed device
- In situ determination of the annual thermal habitat use by lake trout
- Growth in juvenile sea lampreys of Atlantic and Great Lakes origins when held and fed in fresh water
- Long-term evaluation of the sterile-male-release-technique

Board of Technical Experts

- Examining the role of biodiversity in managing Great Lakes fishery resources
- Linking habitat supply to fish community objectives using a population dynamics approach
- Fish communities of the Laurentian Great Lakes: the SCOL tradition revisited for the 21st century
- Enhancing stock assessment modeling and management of Great Lakes Fisheries
- Great Lakes acoustics
- Bloater buoyancy basic biology

Integrated Management of Sea Lamprey Protocol

- The effects of low-head barriers on stream fish communities
- Sterile female releases
- Integration of sea lamprey functional response model and lake trout assessment models for Lake Huron
- Application of decision analyses to sea lamprey management

Other partnerships

- Estimating forage fish consumption by predators in Lake Huron
- Model management program for private aquaculture
- Review, update, and transfer of the SIMPLE model to the Lake Michigan Technical Committee
- Identification of Aquatic Biodiversity Investment areas (ABIAs) in the Great Lakes
- Effects of an electric lamprey barrier on the migratory behavior of steelhead
- Development of a lake-wide population model for Lake Superior
- DNA-based markers for assessment of genetic population structure in yellow perch



Low-head sea lamprey barrier.

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, the commission, in 1999, undertook several initiatives in support of healthy Great Lakes ecosystems. For instance, the commission:

- approved for discussion the Habitat Advisory Board’s *Declaration for the Conservation and Rehabilitation of Aquatic Habitat in the Great Lakes*. The declaration recognizes the importance of an ecosystem approach, through habitat rehabilitation, in successful fisheries management. Research priorities include the identification of: relationships between fish biodiversity and the quality, quantity, and location of fish habitat; threatened habitats whose loss will imperil fish biodiversity and productivity; methods for classification and inventory of aquatic habitats; and, mechanisms by which chemical pollutants affect fish biodiversity and productivity;
- in conjunction with the International Joint Commission, produced a report on biological pollution threats from private aquaculture.
- provided funding for the 10th annual Aquatic Nuisance Species Conference;
- joined with others in expressing concern about cormorants in the Great Lakes;
- supported funding, through the Coordination Activities Program, for research including: constraints on growth of Lake Superior lake trout; coordination of lower trophic level assessment on Lake Erie; and, an Interactive Environmental Assessment Tool for private aquaculture in the Great Lakes basin.

Partnerships

Celebrating 35 Years of Cooperation through Lake Committees and Marking the Expansion of the Canadian Committee of Advisors

Under *A Joint Strategic Plan for Management of Great Lakes Fisheries* 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 1999 Lake Committee actions.

THE LAKE SUPERIOR COMMITTEE continued with the development of Lake Superior Fish Community Objectives. The committee expressed concern about the Great Lakes Panel's Aquatic Nuisance Species Action Plan as over-reliant on control, while paying insufficient attention to prevention. The committee approved rehabilitation plans for brook trout, lake sturgeon, and walleye and forwarded the plans to the GLFC for publication.

THE LAKE MICHIGAN COMMITTEE began work on a comprehensive State of Lake Michigan report, to be presented during the 2000 lake committee meetings. The committee asked the Lake Michigan Technical Committee to discuss the pros and cons of continuing to stock lake trout for rehabilitation and pledged to work with the Lake Trout Task Group to revise the Lake Trout Rehabilitation Plan for Lake Michigan.

THE LAKE HURON COMMITTEE reported that its technical committee will focus on the sea lamprey management plan for Lake Huron, environmental objectives, and planning for the 2001 symposium and state of the lakes report. The committee continued with its multi-year plan for determining chinook salmon natural reproduction. The Lake Huron Technical committee held a workshop to develop the rationale for a stocking protocol addressing desired growth and mortality of chinook salmon and populations of alewives, and identifying triggers for management action. The committee supported the USGS's refurbishing of the research vessel *Sturgeon* for prey research. The committee expressed its support in principle for the Habitat Advisory Board's habitat declaration and expressed concern about the impact of dams on fish habitat.



The USGS RV *Sturgeon*, in need of renovation.
Photo: USGS

THE LAKE ERIE COMMITTEE approved its fish community objectives for release and publication by the GLFC and agreed to review (and revise if appropriate) the fish community objectives for Lake St. Clair. The committee asked its Walleye Task Group to evaluate the long-term effect of various management strategies on sustainability of walleye and to assist with a bioenergetics analysis of prey fish consumption by walleye. The committee asked its Yellow Perch Task Group to define a suitable, reliable recruitment indicator for determining the abundance of age-two fish entering the fishable population and to explore the potential for genetic research on yellow perch stocks in Lake Erie. The committee supported the Forage Task Group's work to coordinate forage assessment among the jurisdictions on Lake Erie and to use bioenergetics simulations to estimate consumption of smelt and other prey fish by predators in the central and eastern basins. The committee asked for a strategy for coordinated lower trophic level monitoring. The committee noted an increase in sea lamprey attack rates in Lake Erie and declining lake trout abundance. The committee stressed its concern over major changes in Lake Erie that appear to be driven by the lower end of the food chain, possibly linked to phosphorus abundance and nonindigenous species.

THE LAKE ONTARIO COMMITTEE continued to work on the Lake Ontario Fish Community Objectives, with the goal of publication in the near future. The committee supported efforts by New York and Ontario to reintroduce bloater chubs in Lake Ontario. The committee noted the considerable interest in cormorants and stressed that many ongoing studies are available (online at www.dec.state.ny.us).

THE COUNCIL OF LAKE COMMITTEES celebrated the 35th anniversary of Lake Committees and praised their work to heighten cooperation on the Great Lakes. The council wrote to members of the United States Congress in support of retrofitting the USGS's research vessel *Sturgeon* and requested the restoration of maintenance funds for Great Lakes research vessels. The council endorsed in principle the Habitat Advisory Board's draft Habitat Declaration and sought comments from the lake committees and the management agencies. The council stressed the importance of the Law Enforcement Committee and pledged to work more closely with that committee in order to better facilitate cooperative law enforcement on the Great Lakes.

THE LAW ENFORCEMENT COMMITTEE continued efforts and discussion on development of the committee's official Mission Statement.

An ongoing project to develop software for a freestanding computerized database for fishery related activities made significant progress, and a prototype version of the program was completed. Possible funding sources for future Great Lakes law enforcement related projects include the GLFC Coordination Activities Program and the Great Lakes Restoration Act.

Advisors

THE COMMITTEE OF ADVISORS (CANADA): The Canadian Section of the Great Lakes Fishery Commission formally expanded the Canadian Committee of Advisors, adding environmental, academic, aboriginal, and public-at-large representation to the committee, which already includes sport and commercial fishing interests. During the first meeting of the expanded committee, commissioners and advisors praised the heightened mutual commitment to communications and cooperation for better management of the Great Lakes fishery. Senior management officials of both the federal Department of Fisheries and Oceans and the Ontario Ministry of Natural Resources welcomed expansion of the committee.

THE COMMITTEE OF ADVISORS (U.S.): The U.S. advisors expressed continued concern about cormorants in the Great Lakes and their impact on fish communities. They also expressed concern about water diversion from the Great Lakes, Bacterial Kidney Disease, exotic species, and Great Lakes research.



Members of the expanded Canadian Committee of Advisors meet with GLFC Commissioners. L-R: Ted Cowan, Don Jackson, John Jackson, Terry Quinney, Commissioner Burton Ayles, Rob Graham, Commissioner David Balsillie, Commissioner Ray Pierce. Photo: M. Gaden

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.

COMMISSIONERS, 1999

- Burton Ayles, Chair (Can.)
- 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.)

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- Gavin Christie
- Marg Dochoda
- Randy Eshenroder
- Rik Evans
- Marc Gaden
- Chris Goddard
- Ann Krause
- Sean McFadden
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- Marc Gaden

ANNUAL REPORT CONTRIBUTING EDITORS

- Heather Glock
- Chris Grubb
- Steve King
- Gerald Klar
- Larry Schleen

Budget

The commission received the following contributions from the governments of the United States and Canada (shown in U.S. dollars) for 1999:

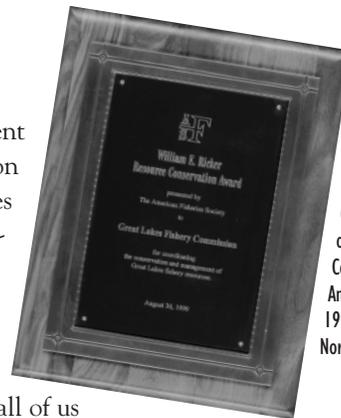
	U.S.	CANADA	TOTAL
Sea Lamprey Management and Research	\$7,384,128	\$3,949,552	\$11,333,680
Administration and General Research	\$785,200	\$700,200	\$1,486,400
TOTAL	\$8,170,328	\$4,649,752	\$12,820,080

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.

Awards and Honors

In 1999, the commission was the proud recipient of the William Ricker Resource Conservation Award, presented by the American Fisheries Society. The award was presented to the commission for facilitating cooperative fishery management on the Great Lakes under the *Joint Strategic Plan for Management of Great Lakes Fisheries*. We are proud that our peers at the American Fisheries Society have paid all of us in the Great Lakes region a high honor with this prestigious recognition.



Commissioner Roy Stein accepted the prestigious William Ricker Resource Conservation Award on behalf of the Great Lakes Fishery Commission during the American Fisheries Society's 1999 Annual Meeting in North Carolina.



During its annual meeting in Niagara-on-the-Lake, the Great Lakes Fishery Commission honored **Marie Tobin** of Fisheries and Oceans Canada for her service as Commissioner. Commissioner Tobin was recognized for her work to secure the commission's budget in Canada and to expand the Canadian Committee of Advisors.

The Department of Fisheries and Oceans Canada (DFO) used the Great Lakes Fishery Commission's annual meeting as an opportunity to honor **Larry Schleen** of DFO's Sea Lamprey Control Center for outstanding service to the department. The commission joined with Schleen's colleagues and friends in congratulating him on his achievements.

Commission Chair Burton Ayles presents former Commissioner Marie Tobin with a token of appreciation for her service on the commission.



U.S. Department of State



Department of Fisheries & Oceans Canada



U.S. Fish and Wildlife Service



U.S. Geological Survey Service



U.S. Army Corps of Engineers



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