

# ANNUAL REPORT 2008

*From the Chair*

**Mike Hansen**



## A Year of Innovation



The Great Lakes Fishery Commission has always been a science-based organization, striving to use the best information available to guide its policies and drive innovation.

Indeed, four of the commission's five major duties found in the *Convention on Great Lakes Fisheries* relate to research and the application of science to guide policy.

In 2008, the commission embarked on two major science-based initiatives: testing pheromones as a new sea lamprey control technique, and launching an experimental offensive on sea lampreys in Lake Erie with the hope of changing the way lampricides are used in the basin. Both initiatives could represent the future of the commission's program.

More than a decade ago, scientists hypothesized that pheromones – natural attractants that animals (including sea lamprey) use to communicate – could disrupt sea lamprey spawning. Seizing upon this possibility for a new control technique, the commission devoted considerable resources toward this pheromone research. The investments are paying off! In 2008, the commission and its partners carried out sea lamprey pheromone studies, including field trials in streams, that were the final step before incorporating pheromones into the control program. These trials suggest that pheromones can influence sea lamprey behavior, enhance trapping by serving as “bait”, lure sea lampreys into unsuitable spawning habitat, and lead to more effective control.

The commission also began a major new approach to lampricide application that could change the way sea lamprey

control is carried out. Currently, a subset of each lake's streams is treated for sea lampreys in a single year. Because sea lamprey larvae live in streams for three or four years before transforming into parasitic adults, streams do not need to be treated every year – one treatment removes several year classes, though some survive treatment.

Sea lamprey control agents, however, suggested a new approach. What would happen if *all* sea lamprey producing streams of a lake were treated two years in a row? The hypothesis was that back-to-back, intensive treatments would leave very few surviving sea lampreys and would drive populations down to nearly nothing. It might then take years for sea lamprey populations to recover, and sea lamprey would probably not return to all lamprey-producing streams. This lengthy “holiday” from sea lamprey predation would give fish a better chance to grow old enough to reproduce or be harvested.

Lake Erie – ideal because it has fewer sea lamprey-producing streams than any other Great Lake – was selected as the first place where the intensive back-to-back technique would be tested. In the spring of 2008, all nine of Lake Erie's known sea lamprey producing streams were treated with lampricide. In the fall of 2009, all streams will again be treated. If this treatment plan proves successful, it will be applied in other parts of the basin.

2008 was a banner year for the commission in innovation and science. The work conducted by the commission and its partners holds great promise for the future of the program and the Great Lakes fishery. ≈

PHOTO: T. LAWRENCE, GLFC



## Sea Lamprey Control



Pheromone studies are in the field-trial stage; here dye marks emitted pheromone from a trap on the Ocqueoc River in Northern Michigan. PHOTO: M. MORIARTY

To contribute to a healthy Great Lakes ecosystem, the commission and its partners – the Department of Fisheries and Oceans Canada and the U.S. Fish and Wildlife Service – annually conduct an integrated sea lamprey control program. This control program takes into account the ecological, economic, and social elements of Great Lakes fishery management, ensuring a comprehensive approach to restoration. The sea lamprey control program is based on the lake committees' Fish Community Objectives and is guided by the commission's *Strategic Vision for the First Decade of the New Millennium*. In 2008, the commission and its partners:

- conducted lampricide treatments on 100 tributaries;
- surveyed 338 Great Lakes tributaries and 55 lentic areas to assess control effectiveness and plan future TFM treatments; and
- operated assessment traps in 72 tributaries to estimate spawning-phase sea lamprey populations in each of the Great Lakes.

The 2008 season was successful with the implementation of major programmatic shifts. These shifts included:

- increasing sea lamprey control efforts through increased sea lamprey treatments;
- shifting resources from sea lamprey assessment to control;

- cross-training larval assessment and control staff, thereby sharing field staff resources;
- successfully delivering phase one of the Lake Erie watershed-scale treatment experiment;
- improving understanding of how sea lamprey pheromones work;
- developing a large-scale pheromone field trial to implement in 2009;
- successfully testing a new spray technology to deliver granular Bayluscide;
- registering the U.S. Fish and Wildlife Service as a TFM producer in Canada; and
- testing new traps for use in assessment and control.

Additionally, a new sea lamprey barrier strategy was established in 2008. This strategy ensures sea lampreys are blocked at all barrier sites; new structures provide cost-effective, alternative control to lampricides; and watershed approaches are improved to be compatible with pheromone-based methods, trapping, sterile-male-release, and lampricide treatments.



The USFWS and DFO conduct lampricide treatments (above) in streams throughout the basin. Determining the effectiveness of treatments is a major part of the program. Below is a larval sea lamprey captured during a stream treatment.

PHOTOS: T. LAWRENCE, GLFC



The complete report, *Integrated Management of Sea Lampreys in the Great Lakes 2008*, is available on the GLFC Annual Report home page, [www.glfcc.org/pubs\\_out/annualreports.php](http://www.glfcc.org/pubs_out/annualreports.php)



The Great Lakes Fishery Commission directs and supports a binational science program based on two broad priorities outlined in the Strategic Vision of the Great Lakes Fishery Commission: research in support of healthy Great Lakes ecosystems and research in support of sea lamprey control. Additionally, the commission directs and supports projects designed to transfer science to managers.

PHOTO: T. LAWRENCE, GLFC

## Science

Based on recommendations from the commission’s scientific and expert advisory bodies, the commission approved the following research projects in 2008:

### Fishery Research

- Comparative genetic and phenotypic analysis of lake trout morphotypes in representative North American lakes: Additional genetic analysis of Lake Superior lake trout morphotypes
- Improving decision-making in contentious Great Lakes fishery management
- Development of improved diagnostic methods for the herpes virus associated with epizootic epitheliotropic disease (EED) in lake trout (*Salvelinus namaycush*)
- Bio-physical forcing and walleye recruitment in western Lake Erie
- Are lake trout in an introduced population morphologically and genetically segregated by depth?
- A comparison of genetic diversity at the major histocompatibility complex in hatchery-produced and wild lake sturgeon

### Sea Lamprey Research

- An *in vitro* strategy for understanding the neural mechanisms underlying pheromone-activated movements in the sea lamprey
- A full-scale field test of the efficacy of the male mating pheromone compound 3-keto-petromyzonal-sulfate in trapping-for-control scenarios
- Real options analysis of Lake Ontario sterile sea lamprey transfers

- Movement pathways and behavior of sea lamprey around traps in the St. Marys River
- Improving the accuracy and precision of predictions of TFM-niclosamide concentrations for treatment of sea lamprey spawning tributaries
- Determination of preferred electrical barrier settings for blocking spawning-phase sea lamprey migrations
- Using a fishwheel to capture sea lampreys
- Determining pathways of migratory adult sea lampreys in large rivers using three-dimensional acoustic telemetry

### Science Transfer

- Detroit River-western Lake Erie indicator project
- Coordination workshops concerning lake trout age-1 mortality in the Great Lakes
- Great Lakes acoustics standard operating procedures



PHOTO: T. LAWRENCE, GLFC



PHOTO: B. GUNTHER

Ongoing studies help make sea lamprey control more effective, and lake studies allow fishery managers to understand ecosystem functions and food-web dynamics. A researcher (left) collects tissue, blood, and muscle in a sea lamprey study conducted at the Hammond Bay Biological Station. A scientist aboard research vessel Laurentian (above), assists with mid-lake assessments of zooplankton.

For more information about the commission’s science program, including research completion reports, visit: [www.glfc.org/research.php](http://www.glfc.org/research.php)

## Partnerships

The Great Lakes Fishery Commission works cooperatively with a variety of partners to fulfill the objectives of its program. The **Committee of Advisors** – established in Canada and the United States – proposes recommendations, programs, and activities related to the fishery. The **Council of Lake Committees** considers issues pertinent to the Great Lakes through its member agencies, serving as a forum for federal, state, provincial, and tribal agencies, while individual lake committees focus on lake-specific issues.

In 2008, the commission considered – through a resolution from the Committee of Advisors – the harm inflicted on the Great Lakes from the discharge of ballast from oceangoing vessels. The advisors called for meaningful legislation to address this issue. The resolution asked the commission to support a moratorium on the entrance of oceangoing vessels into the Great Lakes until effective methods of ballast water treatments are implemented.

The U.S. Committee of Advisors also advised the commission to urge the U.S. Fish and Wildlife Service, the Mississippi Flyway Council, the Council of Lake Committees, and other relevant agencies and organizations to work together in developing a plan for Great Lakes-wide cormorant control, aimed at minimizing the adverse impact of cormorants on the Great Lakes ecosystem.

Other partner actions in 2008:

- The **Lake Superior Committee** was pleased with the trend in sea lamprey abundance in Lake Superior and stressed that similar or greater control efforts must occur for the trend to be maintained. The committee focused on the status of endangered species in the lake, urging the listing of brook trout and shortjaw cisco, each of whose populations are threatened and under review.
- The development of a Lake Huron Lakewide Assessment Plan became a top priority of the **Lake Huron Technical Committee**. The purpose of the plan is to provide a coordinated sampling plan that is statistically rigorous, capturing as many elements of the fish community as reasonably possible. The final product should serve as a guide for agencies.

Cormorants have become a contentious issue within the Great Lakes because of the large quantities of fish they consume and their severe impact on terrestrial habitat. Many people worry that the explosion of the cormorant population is hurting the fishery. The commission and its partners are conducting studies on cormorant behavior and fish populations.

PHOTO: GLFC



- Under the **Lake Erie Committee**, the **Habitat Task Group** continued to: document habitat-related projects in the Lake Erie Basin; develop a strategy for Lake Erie GIS development and deployment; develop a compilation of fish habitat metrics; develop strategic research direction for Lake Erie's Environmental Objectives; and assist the **Coldwater Task Group** in determining additional lake trout spawning habitat in Lake Erie.
- The **Lake Michigan Committee** completed a draft of its Environmental Objectives. This draft will be circulated for comment by agencies and the public.
- The **Lake Ontario Committee** developed plans to share an automated mass marking trailer that New York purchased in early 2008. The committee expressed enthusiasm about the ability to mark all hatchery-reared chinook salmon stocked into the lake so that reliable estimates of natural reproduction can be made.
- The **Law Enforcement Committee** continued the evaluation and development of tracking technologies to monitor commercial fishing vessels and to manage daily catch reports and data. The development and implementation of electronic reporting follows the commercial fishing reform bill in the U.S. which increased penalties and established new technologies for reporting fisheries data by commercial fishers and fish wholesalers.

# Budget

The commission received the following contributions from the governments of the United States and Canada (shown in U.S. dollars) for 2008:

	U.S.	CANADA	TOTAL
Sea Lamprey Control and Research	\$14,653,700*	\$6,120,500	\$ 20,774,200
Research, Committee and Scientific Support, and Administration	\$ 2,128,000	\$1,979,600	\$ 4,107,600
<b>TOTAL</b>	<b>\$16,781,700</b>	<b>\$8,100,100</b>	<b>\$ 24,881,800</b>

\* Includes \$700,000 for Lake Champlain

The commission's U.S. and Canadian trust funds received donations from Northwest Indiana Steelheaders, Shamrock Productions, and members of the commission secretariat.

## 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.



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

## Awards and Honors

The Great Lakes Fishery Commission annually recognizes people who made exceptional efforts and important contributions to the protection of the Great Lakes. In 2008, the commission honored:

**Dr. Jan Ciborowski**, University of Windsor, Ontario, recipient of the Jack Christie/Ken Loftus Award for Distinguished Scientific Contributions Toward Understanding Healthy Great Lakes Ecosystems. Dr. Ciborowski was presented with the award for his innovative leadership in the Lake Erie Millennium Plan (a plan to define and understand Lake Erie's most pressing problems), and for his ongoing pursuits and projects in assessing indicators of ecological health in the Great Lakes coastal region.



PHOTO: D. ARCURI

**Mr. Russ Piper**, Ontario Federation of Anglers and Hunters (right), and **Dr. Jack Wingate** (below, right), Minnesota Department of Natural Resources (ret.), recipient of the Buzz Besadny Award for Fostering Great Lakes Partnerships. Piper was presented the award for helping the Ontario government bridge the ideological gap between sport fishers and commercial fishers and for leadership in land conservation practices that influence water quality and fish communities in Lake Erie. Wingate was presented his award by Commissioner Bill Taylor for developing, reviewing, and sponsoring state and tribal proposals under the Great Lakes Fish and Wildlife Restoration Act from 1998–2006.



PHOTO: OFAH



PHOTO: T. LAWRENCE, GLFC

The commission honored retired commissioner **Gerry Barnhart** (right) for his exceptional service to the commission and the Great Lakes. Barnhart was involved with the commission for more than two decades; his efforts helped in the formation of *A Joint Strategic Plan* and the lake committee process. Barnhart became commissioner and chair in 2002, leading the mid-decade review of the commission's strategic vision. Also pictured is commissioner Peter Wallace.



PHOTO: D. ARCURI, GLFC

### Also of note:

Commissioner **Bob Hecky** was named to Canada's highest academic honor, the Royal Society of Canada, for his world-renown work on African great lakes and northern reservoirs. The society wrote that Hecky's "research has led to the development of an excellent research laboratory in Uganda, and to the understanding of how climate, land-use and air quality have affected the great lakes of East Africa." **Jill (Finster) Wingfield**, Senior Communications and Policy Associate, was married in August of 2008. **Jo Darlington** and **Laura Klotz** joined the commission as the new program assistants. Two of the commission's research associates, **Dr. Mara Zimmerman** and **Dr. Nancy Leonard** accepted positions in the Northwest United States—Dr. Zimmerman is now with the Washington State Department of Fish and Wildlife, and Dr. Leonard is with the Northwest Power and Conservation Council, Portland, Oregon.

## Great Lakes Fishery Commission

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