

FORUM

FOR STEWARDSHIP AND SUSTAINED BENEFITS

Great Lakes
Fishery
Commission

Connecting Channels, Crossroads, and Fish Biodiversity

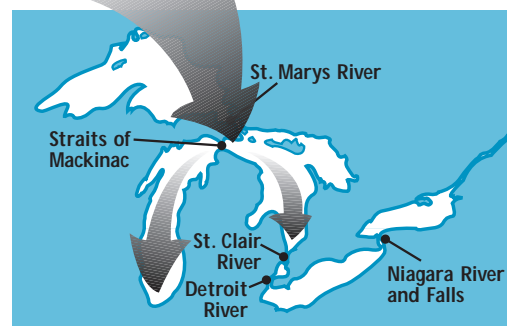
By Randy Eshenroder

"Strategically located, Lake Huron is a biological crossroads that links the diversity stored in Lake Superior to the other lakes."

THE HISTORICAL DIVERSITY of fishes in each Great Lake was largely determined by each lake's position in the chain and where lakes drained during deglaciation. As the Laurentian Glacier retreated and relieved the land of the tremendous weight of ice, the land rebounded causing the lakes to drain first into one river and then into another until the present drainage pattern was established about 4,000 years ago.

These past connections and drainages provided an opportunity for species existing in different river systems to enter and colonize the Great Lakes. For instance, the Atlantic salmon probably entered Lake Ontario shortly after glacial retreat when the Atlantic Ocean intruded into the lake's present basin, and paddlefish entered Lake Michigan when it naturally drained to the Mississippi River. Once a lake was colonized, a species could spread via the connecting channels to the other lakes, except that Niagara Falls presented an upstream barrier to fish inhabiting Lake Ontario.

By the time of European Contact, the diversity of fishes within each lake was well established and the connecting channels were no longer important as colonization routes. Well before Contact, new species or forms had also developed within the lakes, further contributing



to the historical diversity. Beginning in the 1800s, however, introductions of non-native species, overfishing, and habitat destruction resulted in extirpations and extinctions of native fishes. Once again, the connecting channels became important corridors for colonization because some of the lakes, especially Lake Superior, retained species that were lost in one or more of the other lakes.

In fact, no species of lake-dwelling fish was lost from Lake Superior. This lake is a storehouse of diversity that can be supplied back to the other lakes via the connecting channels. This natural process involves reestablishment first in Lake Huron because it receives the outfall from Lake Superior. Once established in Lake Huron, populations can spread westward to Lake Michigan

CHANNELS CONTINUED ON NEXT PAGE 

Calendar

Lake Committee Meetings
March 18-27 Ann Arbor, MI
Kingston, ON

Sea Grant Ruffe Symposium
March 21-23 Ann Arbor, MI

GLFC Annual Meeting
June 10, 11 Ottawa, ON

Recent Publications

A Lake Trout Restoration Plan for Lake Superior. 1996. M.J. Hansen, ed. 34 p.

Fact Sheet Series:

1. GLFC History
2. GL Fishery Research
3. Sea Lamprey: A Great Lakes Invader
4. TFM and Sea Lamprey Control
5. Sea Lamprey Barriers
6. Sterile-Male-Release-Technique
7. Sea Lamprey Assessment
8. GLFC Online

WINTER 1996

2 GLFC Honors
Buzz Besadry Upon
His Retirement
by Gail Beggs

3 NISA Passed!
by Allegra Cangelosi

4 Successful Sea Lamprey
Control Continues While
TFM Use Declines
*by Terry Morse
and Larry Schleen*

5 International Symposia
Help Scientists and
Resource Managers
Conceptualize Ecosystem
by Marc Gaden

6-7 Anniversary
Celebration Highlights
Forty Years of Success
by Gordon Zuverink

8 GLFC, Lake Committees
on the World Wide Web

SPECIAL INSERT:

1995 Annual Report of
the Great Lakes Fishery Commission

From the Chair...

Gail Beggs

GLFC Chair Gail Beggs presents former commissioner Buzz Besadny with a special award marking his dedicated service to the Great Lakes Fishery Commission. Buzz's appointment as commissioner ended in early 1996.



Photo: Marc Gaden

GLFC Honors Buzz Besadny Upon His Retirement

Besadny Characterizes Pragmatic Resource Management

During the Great Lakes Fishery Commission's recent annual meeting in Milwaukee, I had the pleasure to present former commissioner Buzz Besadny with a special award marking his many years of service to the Great Lakes and to thank him for his dedication to the fishery as GLFC commissioner. Buzz's appointment as commissioner ended in early 1996. Officials from state, federal, provincial, and tribal agencies, along with the public, joined me in this tribute to one of the Great Lakes' most dedicated resource managers.

Even before he was appointed to the Great Lakes Fishery Commission in 1990, Buzz had a long and distinguished career working for the benefit of the Great Lakes

resources. Beginning in 1952, Buzz served the Wisconsin Department of Natural Resources in various management positions, and in 1980, he assumed the highest position within the Department: that of Secretary. As Secretary, Buzz headed a multi-divided department with responsibility for administering traditional conservation programs including wildlife, forestry, parks and recreation, water resources management, and, of course, fisheries. He filled the position with distinction for 13 years and retired from the Department in 1993.

Buzz was actively involved with the Great Lakes Fishery Commission during his tenure with the Wisconsin DNR. He twice chaired the Committee of the Whole—

made up of the administrators, directors, and ministers of the agencies responsible for the welfare of the Great Lakes fisheries—and led in the development of the Joint Strategic Plan for Management of Great Lakes Fisheries (SGLFMP), the cornerstone plan by which Great Lakes fisheries are managed cooperatively.

As Commissioner, Buzz was an outspoken advocate for the fishery. He was tireless in communicating the success of the program to the Governments of the United States and Canada and he did not hesitate to stress the need to maintain adequate funding for the fishery.

Most striking and admirable about Buzz's management style was his genuine concern for the resource—a concern that prevailed above everything else. Throughout his career, Buzz remained deeply committed to science, he was pragmatic and fair in his decisions, he listened to both sides of issues in all instances, he was always above-board and frank, and he was extremely personable. Buzz serves as a role model for many resource managers in the Great Lakes region.

Buzz's energy, depth of knowledge, dedication, and sincere respect for the Great Lakes helped drive the commission. Not surprisingly, Buzz continues to keep in close contact with the commission and the secretariat. I know I speak for the other commissioners when I say that his presence and expertise were of great benefit to the health and long-term perpetuation of the Great Lakes fishery, and we wish him all the best in his retirement. ≈

CHANNELS CONTINUED FROM COVER

and southward to Lakes Erie and Ontario. Strategically located, Lake Huron is a biological crossroads that links the diversity stored in Lake Superior to the other lakes.

Replenishment by lake-to-lake spreading is especially important for ciscoes, a closely related group of mostly endemic species that were once the most abundant fishes in all of the Great Lakes. The ciscoes experienced the most profound depletion of any group of Great Lakes fishes. Only four of the original seven species survive including all four of the species that existed in Lake Superior. Each of the other lakes is missing two or more of the surviving species. Ciscoes should readily spread from Lakes Superior and Huron to the other

lakes because their recently hatched fry live in surface waters which feed the connecting channels.

But ciscoes are not proliferating in Lake Huron, the crossroads lake. The same life-history characteristic, surface-water-living fry, that makes entrainment to the other lakes possible also makes them vulnerable to predation by alewives. The alewife, like the sea lamprey, gained access to the Great Lakes from the Atlantic Ocean via canals. When abundant, alewives suppress the reproduction of ciscoes and other native species by feeding on their fry. Alewives are abundant in Lake Huron.

The problem in Lake Huron is too few predatory fish, a condition intensified by a large infestation of parasitic sea lampreys

originating from the St. Marys River. Fish hatcheries cannot produce enough salmon and trout to suppress alewives, especially when sea lampreys are, in turn, suppressing them. Natural reproduction of lake trout, the native predator, is inhibited because sea lampreys are most abundant in the northern waters of the lake where the best lake trout spawning habitat occurs. Compounding the problem, alewives are suspected of preying on lake trout fry in Lake Huron as they have been found to do in Lake Ontario.

If Lake Huron is to function as an ecological crossroads, it needs a population of salmon and trout large enough to suppress alewives. The first priority must be to control the sea lamprey in the St. Marys River.

NISA Passed!

Reauthorization of Key Aquatic Nuisance Species Legislation Adds Layer of Protection to the Fishery

by Allegra Cangelosi



Allegra Cangelosi is a Senior Policy Analyst at the Northeast-Midwest Institute and the Director of the bipartisan House and Senate Great Lakes Task Forces. She explained the importance of NISA to participants at the Great Lakes Fishery Commission's 1996 Annual Meeting. Photo: Marc Gaden

JUST MINUTES before adjourning for the national elections, Congress acted to reauthorize and expand the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990. The new legislation, entitled the National Invasive Species Act of 1996, assures continuation of Great Lakes ballast management requirements, and establishes a national ballast management program.

The National Invasive Species Act of 1996 was introduced in the Senate (S. 1660), by Senator John Glenn, and in the House of Representatives (H.R. 3217), by Congressman Steve LaTourette, on March 29, 1996. Introduction of the bill followed a National Forum on Nonindigenous Species Invasions of U.S. Marine and Fresh Waters held in the US Capitol (proceedings available through the Northeast-Midwest Institute), and a lengthy process of consensus-building among key stakeholders. Both these early efforts paid

off as the bill attracted solid bipartisan support throughout the Great Lakes and other coastal regions.

The legislation establishes a national ballast management program which will be mandatory after three years if industry shows a poor track record of compliance under a voluntary system. The successful Great Lakes program remains mandatory. Specific provisions of the legislation which especially benefit the Great Lakes environment include:

- Reauthorization of the mandatory Great Lakes ballast management program.
- Changes in wording of Great Lakes program to assure that the program encompasses all vessels with ballast tanks rather than vessels which carry ballast water. This expansion allows the Coast Guard to issue guidelines for vessels in a fully loaded condition (NOBOB) once prevention techniques are identified and developed applicable to these vessels (such as flow-through bottom flushing).

This river is large and control will be costly, but it is justified by the compelling need to reestablish the ecological connections between the lakes. Plans for control will be firmed-up early in 1997.

The second priority should be to maximize the population of predatory fish until alewives are reduced to a benign level. Harvest of lake trout will need to be tightly restricted to maximize their spawning potential and predatory impact on alewives. An adequate abundance of predators cannot be reached without a contribution of naturally reproduced lake trout. The fisheries for trout and salmon can continue to target spawning-run salmon which in that phase of their life cycle have completed feeding.

The twin goals of restoring naturally

reproducing lake trout and of suppressing alewives to levels consistent with recovery of ciscoes have been formally agreed upon by Lake Huron fishery management agencies. These goals will not be met without considerable public support. Culture and planting of ciscoes, an alternative approach, is being discussed and should be attempted, but to be successful it too requires suppression of alewives. The concept of Lake Huron as an ecological crossroads is new and needs to be communicated. The sooner that Lake Huron and the other lakes can be restored to ecological health, the less likely another irreparable loss like the recent extinction of the shortnose cisco. ≈ Randy Eshenroder is the Great Lakes Fishery Commission's Senior Scientist.

- Authorization of a national ballast management program to help keep out of other coastal regions alien organisms which could spread to the Great Lakes.
- Authorization of a Ballast Technology Development Program, which brings many more resources to the search for technological and management practice tools to replace ballast exchange. This program is especially important for the Great Lakes where ballast exchange falls short in preventing species transfers by intrasystem ship movements and NOBOB vessels.
- Continuation of the State Management Plans program and expansion of it to include an aquatic plants program.
- Authorization of funding for research and development of a dispersal barrier for the Chicago Ship and Sanitary Canal.
- Voluntary national guidelines for recreational vessels to help prevent the spread of alien species into inland takes of the region.
- Continuation of Great Lakes-targeted research on invasive species impacts through the GLERL laboratory.

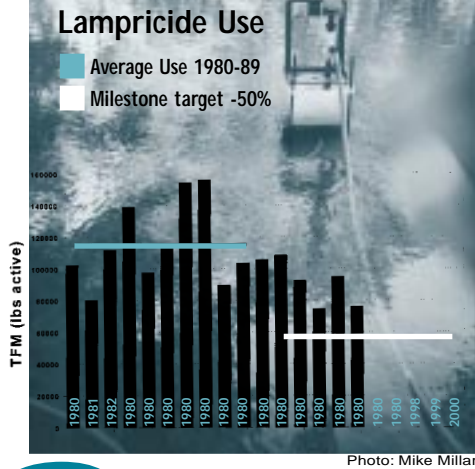
Passage of the National Invasive Species Act of 1996 is a real achievement for the Great Lakes region which led the national effort. The bill became law only because of the willingness of so many in the Great Lakes community to take an active role in promoting this program to protect the environment. Each action taken to support the legislation from every corner turned out to be critical to the success of the bill.

However, the work continues. The Great Lakes region has the opportunity to be equally integral in addressing future exotic species challenges. Specifically, the Great Lakes region should continue its leadership in aquatic nuisance species prevention and management through promoting effective implementation of the bill's programs. In addition, as technology challenges supercede policy needs in limiting effective prevention of ballast-mediated introductions of exotic species, the region should remain in the forefront of pioneering the development of better ballast management technologies and practices. Finally, as Congress turns its attention to policy to address planned introductions of exotic species and terrestrial invasions, the region can provide important experience in interstate policy solutions. ≈

Successful Sea Lamprey Control Continues While TFM Use Declines

Commission Envisions Reducing TFM Use 50% by the Year 2001

by Terry Morse and Larry Schleen



SEA LAMPREY CONTROL in the Great Lakes has been an extraordinary success. Indeed, sea lamprey populations in most areas of the lakes have been reduced by 90% from their historic high of the 1940s and 1950s. This successful control program has allowed the resurgence of top predators such as lake trout and salmon, has helped subdue smaller, problematic exotic species such as alewives, and has allowed management agencies to stock fish and implement other restoration activities with confidence, knowing that their fish will likely survive to reproduce or to be caught by humans. Forty years ago, when the fishery was very much in peril—and before we had a viable sea lamprey control mechanism—the successes we see today were only a dream.

Prior to the discovery of a safe and effective lamprey control tool, fishery managers were forced to rely on mechanical and electrical barriers to stop lampreys from spawning. These barriers were largely ineffective. Fishery managers came to realize very quickly that the key to lamprey control was to kill larval lampreys in their nursery streams before they transformed into parasitic adults.

TFM: a safe and effective tool

To that end, during the 1950s, under the direction of the U.S. Fish and Wildlife Service, scientists tested almost 6,000 compounds to identify one which would kill sea lamprey larvae while having minimal effect on other species. Through this research, scientists, in 1958, discovered that TFM (3-trifluoromethyl-4-nitrophenol) was selectively effective in controlling sea

lampreys without significantly impacting other species. Since its discovery as an effective sea lamprey control tool, the Great Lakes Fishery Commission and its agents have used TFM to suppress populations of sea lampreys in the Great Lakes. Exhaustive laboratory tests—more than 40 years' worth—show that at the dose needed to kill sea lampreys, TFM is nontoxic or has minimal effects on aquatic plants, fish, and other aquatic organisms. Studies also have shown TFM to be nontoxic to humans and other mammals. TFM has met or surpassed all EPA criteria for application in Great Lakes streams.

TFM reduction is a goal

Despite the success of TFM, the Great Lakes Fishery Commission and its agents decided five years ago to reduce reliance on the lampricide by 50% by the year 2001. Lampricides are costly (the price of TFM has tripled since 1986!) and the commission is sensitive to societal concerns about the use of chemicals—even safe and proven lampricides—in the Great Lakes.

The good news is, the commission and its agents believe that optimal levels of sea lamprey control can be maintained with less TFM. The plan is to cut back the amount of TFM: by reducing concentrations to the minimum needed; by using single treatments on large rivers historically treated in sections; by not boosting the concentration in lower reaches of rivers where larvae are not abundant; and by investing in alternative sea lamprey control methods like lamprey traps, barriers and sterile-male-release.

Already, the commission is about halfway to reaching the 50% lampricide reduction goal. The initial savings of TFM were largely achieved by tailoring stream treatments to the pH cycle of the water and by constructing lamprey barriers. In 1997,

additional TFM savings will be achieved by consolidating a large lamprey treatment, the Rifle River (Lake Huron tributary), which, historically, was treated in segments. During the treatment of the Rifle River, agents will also reduce the concentration of TFM applied to the lower river. Collectively these efforts may result in using 40% less TFM than was used in the previous treatment in 1993. This would represent an additional savings of about 5% of the total basin-wide use of TFM projected for the 1997 field season.

The commission also remains committed to non-lampricide control methods. Over the years, it has devoted increasing percentages of the sea lamprey control budget to alternative controls. In 1996, the commission applied approximately 25% of the budget to alternative controls; in 1997, the goal is to commit about 30%. These funds are used to improve sea lamprey barriers, to support research, and to implement the experimental sterile-male-release technique.

Today's approach to lamprey control

The modern idea of less TFM, of more efficiencies, and of continued investment into alternative control methods has been embraced by the commission and its agents. This approach to lamprey control is friendly to the ecosystem, makes economic sense, and allows the commission and its agents to build on its successful record of sea lamprey control in the Great Lakes. ≈

Terry Morse supervises the USFWS lamprey control unit, currently serves as Chairman of the Lampricide Control Task Force, and is a member of the Lake Huron Technical Committee.

Larry Schleen supervises the Canadian DFO lamprey control unit, currently serves as Chairman of the St. Marys River Task Force, and is a member of the Lampricide Control Task Force.

International Research Symposia Help Scientists and Resource Managers Conceptualize Ecosystem

HabCARES and RESTORE Continue Tradition of Sound Science

by Marc Gaden

The GREAT LAKES FISHERY COMMISSION may be best known for sea lamprey control, but it also has a responsibility to formulate and implement joint U.S.-Canadian research. The goal of commission research is to determine what measures are needed and best adapted for making possible the maximum sustained productivity of any Great Lakes fish stock of common concern to the two nations.

To accomplish its goal, the commission has emphasized symposia as a means for reporting and interpreting research findings. Symposium, translated literally from Greek, means “to drink together.” Indeed, symposia were originally social gatherings at which people exchanged ideas freely. The tradition of the free exchange of ideas remains paramount for symposia held today.

Symposia are different from stand-alone research in that they bring together groups of scientists to focus on the most recent information about specific topics or problems. A symposium has a common theme, which allows scientists to look at many angles of an issue at once and to approach a problem in a holistic manner. The idea is to identify generalities and major inferences from many different studies.

Symposia also help scientists think about the resource in new and futuristic ways. For instance, symposia allow for more speculation than is generally allowed in stand-alone research papers. Because symposia generate theoretical papers that would not be published normally, symposia are important forums to offer new ideas. Papers from symposia are usually published *en masse* in respected scientific journals.

“International symposia help scientists and resource managers conceptualize very complex systems and conditions,” said Dr. John Kelso, a Department of Fisheries and Oceans (DFO) scientist who recently organized a symposium. “If actions and

approaches are applied with good scientific method and thoughtful biological and ecosystem assessment, future conservation and repair actions will benefit.”

Because it has a long-standing charge from both Canada and the U.S. to foster research, the commission has been in a unique position to advance holistic science. In fact, the commission is the only institution on the Great Lakes with a binational mandate to undertake and coordinate fisheries research. Governmental and non-governmental agencies, from both the United States and Canada, look to the commission as a place where they can participate in the shaping and application of research.

The commission has sponsored and co-sponsored many symposia over the years. Each symposium ended with concepts and recommendations for improving fishery management in the Great Lakes. For example, Chuck Krueger, Mike Jones, and Bill Taylor, contributing to the recent

RESTORE symposium, proposed management strategies to achieve lake trout restoration goals and to apply what we know about lake trout restoration to the restoration efforts of other species. RESTORE strategies include conserving remaining native populations in Lake Superior, introducing genetically diverse lake trout to the lower four Great Lakes, control of sea lampreys in the St. Marys River, reintroduction of native forage fish, establishment of lake trout at offshore spawning areas, and constructing artificial spawning shoals.

HabCARES, another recent symposium, was an attempt to better understand the linkages between habitat, fish yield, and structure of aquatic and wetland communities and to provide recommendations for resource managers to effectively conserve, restore, and enhance aquatic habitats. A manual entitled “Methods of Modifying Habitat to Benefit the Great Lakes Ecosystem” was a spin-off of HabCARES, promoted by the commission’s Habitat Advisory Board and its chairman Doug Dodge. Edited by John Kelso and John Hartig, it described 47 ways of modifying habitat to benefit the Great Lakes. Hartig explains that “the methods described in the manual reflect the diversity in habitat modification and conservation techniques used in the Great Lakes basin.”

The advancement of science in the Great Lakes is vital to proper resource management. International symposia that truly epitomize the ecosystem approach will continue to serve as an important means for scientists to focus on the most vital problems. ≈

GLFC-Supported Symposia

- Salmonid Communities in Oligotrophic Lakes (SCOL), 1971;
- Percid International Symposium (PERCIS), 1976;
- Sea Lamprey International Symposium (SLIS), 1979;
- Stock Concept Symposium (STOCS), 1980;
- Assessment and Prediction of Yield International Symposium (ASPY), 1985;
- Socio-Economic Assessment of Fishery Resources, 1985;
- Large River Symposium (LARS), 1987;
- Lake Trout Restoration in the Laurentian Great Lakes (RESTORE), 1994; and
- Habitat Conservation and Restoration Strategies (HabCARES), 1994.



Anniversary Celebration Highlights 40 Years of Success



Over 1000 school students and over 500 of the general public, visited the Sea Lamprey Control Centre—located in Sault Ste. Marie, Ontario—during the four-day anniversary celebration. Vermont Johnson (left) and Dick Reuss were two of the several GLFC advisors who attended.

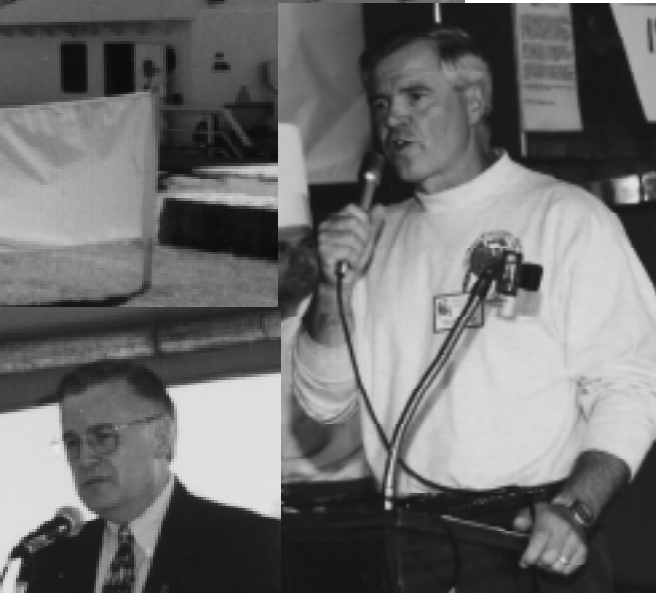


Dignitaries from the United States and Canada (above right) were on hand to celebrate the success of the lamprey control program and to unveil a commemorative plaque (above). From left to right, the dignitaries included Soo Mayor Stephen Butland; the Hon. Fernand Robichaud, MP; the Hon. Ron Irwin, Minister DIAND; Paul Steckle, MP; and the Hon. Walter North, Michigan Senate. Not pictured: Joe Comuzzi, MP.



At left: A toast by Mayor Butland's Celebrity Panel. From left to right: Mayor Stephen Butland, GLFC Commissioner Burton Ayles, former GLFC Executive Secretary Carlos Fetterolf, GLFC Commissioner Gail Beggs, and Joan Guilfoyle of the Fish and Wildlife Service.

Department of Fisheries and Oceans staff set up a simulated river to demonstrate methods of sea lamprey control to the students who visited the Sea Lamprey Control Centre.



Above: Vic Gillman, Chairman of the Anniversary Committee, welcomes guests to the fish boil.

At left: Tom Baldini, Co-Chairman of the International Joint Commission, stresses the benefits of binational cooperation.



Photos: Carmen Pajak, Marc Gaden, and Tina Berry

On the 19th and 20th of September, the Province of Ontario and the City of Sault Ste. Marie, Ontario, extended a fabulous welcome to the visitors and participants of the Great Lakes Fishery Commission's 40th Anniversary Celebration. The event also marked the 30th anniversary of the Canadian Department of Fisheries and Oceans' Sea Lamprey Control Centre.

By Gordon Zuverink

IT WAS INDEED AN HONOR for my wife and me to attend the anniversary celebration. Mr. and Mrs. Dick Reuss from Illinois, Mr. and Mrs. Vermont Johnson from Wisconsin, and Dr. Terry Quinney from Ontario were also in attendance, representing the GLFC Advisory Committee.

Vic Gillman and his committee are to be commended for the intricate detail and the care and effort that went into this gala event. The occasion was impressive enough to warrant the participation of five members of the Canadian Parliament, U.S. legislators, government and non-government officials from both countries, and hundreds of local students.

I had been to the Soo several times before, but I had never had the opportunity to visit the Sea Lamprey Control Centre, which was open to the public for tours. The displays—including working models of barriers and a simulated stream demonstrating TFM application—were most informing and educational. The Friday luncheon cruise, featuring a tour through the locks, was a first for us.

The Canadian Bushplane Heritage Centre was the location for Jim Tibbles' famous "fish boil," hosted by the City of Sault Ste. Marie, Ontario. The event featured Soo Mayor Stephen Butland's "Celebrity Sea Lamprey Cook-Off," where several of the area's noted chefs prepared lamprey dishes. The platters provided a very tasteful appearance but I don't believe they created an international demand for sea lamprey recipes.

The highlight of the entire celebration was the Friday evening dinner and dance. Jim Tibbles' recollections of the early years of the sea lamprey control effort were entertaining and enlightening. Carlos Fetterolf recalled the middle years, of which we were familiar, and Chris Goddard brought us up to date with where the program is today and where we will go in the future.

Since my appointment as an Advisor to the GLFC in 1980, I have witnessed the ebb and flow of public and political sentiment and involvement in the charge of the GLFC. It has been difficult to keep the attention of those that control the purse strings. The Great Lakes fishery resource never seems to get top billing in spite of its major contribution to the economies of both the U.S. and Canada.

The Advisory Committee has accepted the challenge to improve this image as it relates to the general public and our politicians. The anniversary that we marked in September proves not only that we have the commitment to long-term protection of the fishery, but also, that we have the tools and the technology to do the job. That success is truly worth celebrating. ≈

Gordon Zuverink is a GLFC Advisor from the State of Michigan, representing the Public-at-Large. He currently serves as Chair of the U.S. Advisory Committee.

