



# LAKE ONTARIO LAKEWIDE MANAGEMENT PLAN (LaMP)

## Annual Report 2012

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### What is the Lake Ontario LaMP?

The Lake Ontario Lakewide Management Plan (LaMP) is a binational plan to restore and protect the health of Lake Ontario by reducing chemical pollutants entering the lake and addressing the biological and physical factors impacting the lake. The LaMP's activities are coordinated by Canadian and U.S. federal, state and provincial government agencies.

The Lake Ontario LaMP includes ecosystem goals, objectives and indicators. Ecosystem objectives have been identified for aquatic communities, wildlife, human health and stewardship. The twelve indicators are designed to track progress towards achieving the ecosystem objectives.

### Overview

In 2011, the Lake Ontario LaMP participating agencies continued their efforts to restore and protect the lake's ecosystem through a number of actions and initiatives including: implementation of the Lake Ontario Binational Biodiversity Conservation Strategy; development of the next binational intensive study of the lake; and implementation of programs that promote the reduction of toxic chemicals and sediments impacting the nearshore.

This 2012 annual report focuses on the following key activities:

- Fisheries management plans are being updated,
- The Biodiversity Conservation Strategy is being implemented,
- A binational monitoring program for coastal wetlands is being developed.

In the upcoming year, the LaMP participating agencies will also continue to track new and emerging issues such as newly recognized chemicals of concern, invasive species, potential effects of climate change and water level regulation. ♦

#### *Canada-U.S. Great Lakes Water Quality Agreement (GLWQA) Amendments*

Negotiations to amend the 1987 GLWQA were launched in early 2010. The Governments of Canada and the United States held the final negotiation session in early 2012 and the amended GLWQA is now in the process of being finalized and approved. It is anticipated that the amended Agreement will be signed in 2012. ♦



Coastal wetland indicators have been chosen for Lake Ontario, and will be used to develop a new binational monitoring program for Lake Ontario wetlands. Credit: Environment Canada.

### Accomplishments

#### Updated Fish Community Objectives

In 2012, the fish community objectives (FCOs) for Lake Ontario (excluding the St. Lawrence River), were updated to provide more current targets for the management of the Lake Ontario fish community. These objectives guide management agencies, interest groups and the general public as they develop more specific fisheries, habitat, and watershed management plans. The new objectives are more relevant to modern fisheries management, and take into account: ecosystem changes, aquatic invasive species, changes in fish populations, and existing government policies and legislation. In addition, these objectives will contribute to other management planning initiatives such as Remedial Action Plans for Areas of Concern. FCOs for Lake Ontario were last published in 1991 and 1999, and are closely linked to the lake ecosystem objectives in the LaMP.

FCOs for the Lake Ontario fisheries are established by the Great Lakes Fishery Commission's (GLFC) Lake Ontario Committee. The committee is chaired by the New York State Department of Environmental Conservation (NYSDEC) and the Ontario Ministry of Natural Resources (OMNR), who are agencies responsible for fisheries management within Lake Ontario and active LaMP participants. For more information please visit the GLFC web site at [www.glfc.org](http://www.glfc.org).

#### Fisheries Assessment: Update on Lake Trout Populations

Recent assessments show that lake trout abundance has improved from low levels observed in the mid 2000s. That abundance is expected to remain at current levels because of stocking programs and sea lamprey control efforts. Naturally spawned one- and two-year-old lake trout have been found in assessment surveys, along with mature, naturally reproducing lake trout. In order to continue efforts towards the LaMP participants' objective of a self-sustaining lake trout population, annual lakewide lake trout assessments will continue in selected regions of Lake Ontario. This monitoring will be conducted by the U.S. Geological Service (USGS), NYSDEC, and OMNR.

#### Binational Collaboration Benefits Lake Ontario Fish

With funding from the U.S. National Fish and Wildlife Foundation (NFWF), the Credit River Anglers Association (CRAA) and OMNR collaborated to construct a fish ladder at the Norval dam, on the Credit River northwest of Toronto. The project received US\$60,000 from U.S. sources and CDN\$190,000 from Canadian sources. In addition the project was supported by the efforts of many volunteers and agency staff.

The Norval Dam was built in the 1830s and has been an obstruction to fish passage ever since. To remedy this, a fish ladder was built at the site in early 2011 and opened in June. Native Lake Ontario fish species now have direct access to over 39 miles (60 kilometres) of stream and 310 acres (125 hectares)

of upstream coldwater habitat in the middle and upper Credit River. This benefits many fish species, including: trout, Atlantic salmon, American eel, basses and minnows.

In its first season of operation, 20 species have successfully used the ladder, including adult Atlantic salmon (once extinct in Ontario), juvenile smallmouth bass and a juvenile American eel (an endangered species in Ontario). This project promotes progress towards FCOs.



A fisheries biologist releases a fish at the Norval fish ladder. Credit: Credit Valley Conservation.

#### Implementing the Biodiversity Conservation Strategy

The 2011 Lake Ontario Binational Biodiversity Conservation Strategy (BBCS) implementation report highlights a new focus on conserving and restoring the species and habitats of Lake Ontario.

The BBCS was completed in 2009 and it is now being implemented in both Canada and the United States. Progress is already being made. For example:

- **Research is underway on the restoration of native prey fish.** The GLFC is actively pursuing research and studies needed to re-introduce native deepwater ciscoes. Current research focuses on bloater chub. Restoration of native prey fish, including chubs, is an important step towards restoring naturally reproducing populations of lake trout and salmon.
- **Actions are underway to conserve American eel.** Recovery actions include banning fishing, improving eel ladders to encourage upstream migration of young eels at the Moses-Saunders Dam and transporting both young and mature eels around dams. American eels are one of the most unique fishes in the Great Lakes, and are listed as an endangered species in Ontario.
- **Coastal habitats are being protected and restored.** The U.S. Great Lakes Restoration Initiative is funding the restoration of agricultural land back to native sedge/grass meadow along West Creek, near Rochester, New York. Indicators are also being developed to monitor wetland health.
- **Atlantic salmon are starting to reproduce.** The NYSDEC has been stocking Atlantic salmon in Lake Ontario since 1983. In Ontario, the 'Bring Back the Salmon' initiative was launched in 2006 by the Ontario Federation of Anglers and Hunters and OMNR, along with more than 50 partners to help restore a self-sustaining Atlantic salmon population. (see <http://www.bringbackthesalmon.ca/>)





## Challenges

### *Restoring Deepwater Cisco Populations*

Until the mid 1950s, Lake Ontario was home to four deepwater cisco fish species which were the primary prey fish. All four species, including bloater chub, eventually disappeared from the lake and were replaced by non-native prey species. These non-native prey species contain an enzyme that has led to reproductive declines in key predator fish such as salmon and trout, leading to an overall negative impact on the aquatic food web.

The GLFC's Lake Ontario Committee is committed to re-establishing a self-sustaining population of deepwater ciscoes in Lake Ontario within the next 25 years. Lake Ontario LaMP participants are committed to restoring and enhancing self-sustaining diverse biological communities, including native prey fish species. Potential benefits include: improving reproduction of predator fish, increasing the diversity and resilience of the food web, and restoring its historical structure and function.

To explore the feasibility of re-introducing deepwater ciscoes to Lake Ontario, the NYSDEC, OMNR, USGS and U.S. Fish and Wildlife Service have been working to collect bloater chub eggs from the upper Great Lakes for culturing.

To address the unique challenges of collecting these eggs, 2012 efforts experimented with revised spawning techniques and successfully transferred approximately 300,000 eggs to newly dedicated quarantine facilities in Ontario and New York state. Plans call for continued culture experiments and eventual reintroduction of these important fish to Lake Ontario. ♦

## Next Steps

### *Building an Adaptive Management Approach to Conserve Coastal Wetlands*

Since 1960, water levels and flows of Lake Ontario and the St. Lawrence River have been regulated to allow for power generation, commercial navigation, and protection of coastal property. As a consequence, the natural pattern of water flows was altered, significantly reducing the natural variation of lake levels, as well as the seasonal occurrence and durations of levels that are essential for maintaining the biodiversity of coastal wetlands, beaches and dunes. Many of these areas are vital habitat for native fish and wildlife species.

The International Joint Commission (IJC) recognizes these problems and is developing a new plan for Lake Ontario that will restore more natural flows to benefit the environment, while considering other uses of the lake. The IJC and the Lake Ontario LaMP participants support the use of an adaptive management approach that would evaluate the new plan's

performance and possibly make changes based on environmental performance indicators. A final decision on a new plan is expected later this year.

One key requirement for the success of this approach is the establishment of an effective monitoring protocol. The Nature Conservancy and the Canadian Wildlife Service are working to develop a binational approach to coastal wetland monitoring to support the IJC's adaptive management monitoring needs. Field studies and aerial photography are being used to monitor meadow marsh cover and the extent of rare and sensitive plants and mammals. The protocol will allow the IJC to evaluate the effectiveness of a new regulation plan and measure potential benefits to Lake Ontario and St. Lawrence River coastal wetlands. ♦

## Niagara River Update

The Niagara River and its watersheds are located adjacent to and upstream of Lake Ontario. Historically, these areas, including the infamous Love Canal, have been polluted by human activities. Current remediation efforts are underway on both sides of the River in the U.S. and Canadian Areas of Concern. In addition, the binational Niagara River Toxics Management Plan (NRTMP) continues to monitor and report on contaminant levels in the Niagara River itself.

On the U.S. side, NYSDEC has begun a study to reassess loadings of priority toxic substances from legacy sources along the Niagara River, including significant public and industrial permitted point sources and remediated hazardous waste sites. The study will also assess water quality from primary tributaries to the Niagara River outside of the U.S. Area of Concern to determine the potential need for further source crackdown.

On the Canadian side, there are no further actions required under the Canadian Niagara River Remedial Action Plan (RAP) to identify or remediate contaminants in the Canadian AOC. The known point sources to the Niagara River were addressed in the early 1990s through other programs. All 14 areas of contaminated sediment in the Canadian AOC have now been assessed and management action has been taken. The Canadian RAP is entering its final phase and working toward delisting of the AOC. Future contaminant issues will be addressed through routine federal, provincial and municipal abatement and enforcement programs.



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## Advancing the Biodiversity Conservation Strategy

While knowledge and stewardship of Lake Ontario has improved in recent decades, there are still challenges to conserving and protecting the biodiversity of Lake Ontario. Ongoing implementation of the BBCS will help to address these challenges. The most significant problems facing Lake Ontario are new and evolving ecosystem conditions, such as: the arrival of invasive species, changes in nutrient cycling and the food web, and increasing temperatures. Today, Lake Ontario supports a multi-million dollar recreational fishery, but the long-term consequences of new and evolving ecosystem conditions to aquatic communities are unknown. In conjunction with routine fisheries assessments and monitoring, implementation of the BBCS will remain a high priority for Lake Ontario. 💧

## Lake Ontario Basin

Lake Ontario is the lowermost in the chain of Great Lakes that straddle the Canada/United States border, and is bordered by the Province of Ontario and New York State. Lake Ontario is the smallest of the Great Lakes, with a surface area of 18,960 km<sup>2</sup> (7,340 square miles), but it has the highest ratio of watershed area to lake surface area.



## Contact Information

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