LAKE ONTARIO • LAKEWIDE MANAGEMENT PLAN

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Lake Ontario LaMP 2002

BIENNIAL REPORT

HIGHLIGHTS

APRIL 2002

What is the Lake Ontario LaMP?

The Lake Ontario Lakewide Management Plan (LaMP) is a binational framework for coordinating environmental efforts on Lake Ontario, as called for under the U.S. - Canada Great Lakes Water Quality Agreement. The main purpose of the LaMP is to reduce the amount of contaminants entering the lake and address causes of lakewide problems. The LaMP is led by the "Four Parties": Environment Canada, United States Environmental Protection Agency, Ontario Ministry of the Environment and New York State Department of Environmental Conservation.

The Lake Ontario LaMP Stage 1 Report published in 1998 identified four lakewide problems, known as beneficial use impairments:

- Restrictions on fish and wildlife consumption
- Bird or animal deformities or reproductive problems
- Degradation of wildlife populations
- Loss of fish and wildlife habitat

The LaMP Stage 1 Report determined that the first three impairments are caused by elevated levels of polychlorinated biphenyls (PCBs), DDT, mirex, dioxins/furans and mercury in the ecosystem. These chemicals are all designated as critical pollutants by the LaMP and are the focus of source trackdown and pollution prevention activities.

The impairment, loss of fish and wildlife habitat, is caused by a combination of factors such as exotic species, land use changes and lake level controls.

The restoration of these beneficial uses will require coordinated binational actions.

Map Credit: Environment Canada

Lake Ontario LaMP 2002 Report

The Lake Ontario LaMP 2002 Report provides a summary of actions taken and progress made by the LaMP since the Stage 1 Report was released. This report describes the development and adoption of ecosystem indicators for monitoring progress in restoration, provides an assessment of the status of beneficial use impairments, and updates information on levels of critical pollutants. It also summarizes new agency efforts to identify and control sources of critical pollutants impacting the lake.

What are the Goals of the LaMP?

The ecosystem objectives for Lake Ontario are:

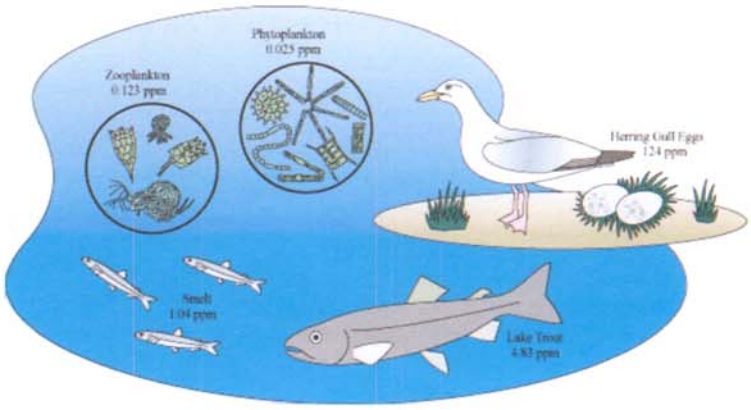
- Diverse, healthy aquatic communities
- Diverse, healthy wildlife communities
- Protection of human health
- Sufficient quality habitat
- Responsible stewardship

How Does the LaMP Measure Progress?

Measurement tools called ecosystem indicators are used to track the progress in restoring the Lake Ontario ecosystem. Eleven specific ecosystem indicators have been adopted to represent overall ecosystem health. These indicators provide an accurate picture of ecosystem health across the food web and are already part of ongoing long-term U.S. and Canadian monitoring programs. The status of these indicators will be highlighted in future reports.

Photo Credit: Environment Canada

Water quality is monitored to ensure that nutrient levels are sufficient to support aquatic life and are not causing unsightly algal blooms.



It is necessary to monitor cross sections of the food chain to understand the impacts of chemical, physical and biological changes occurring in the lake. Even low concentrations of pollutants in water can bioaccumulate through the food web to reach levels of concern in fish consumed by humans and wildlife.

Source: The Great Lakes Atlas - An Environmental Atlas & Resource Book, 3rd Edition.

Three categories of ecosystem indicators have been selected for Lake Ontario:

Critical pollutant indicators that measure concentrations of critical pollutants in water, young-of-the-year fish, herring gull eggs and lake trout for comparison against existing guidelines.

Lower foodweb indicators that track the status of nutrients, phytoplankton, zooplankton, and prey fish. These indicators reflect the ability of the ecosystem to support higher level organisms such as lake trout and waterbirds.

Upper foodweb indicators that monitor the health of herring gulls, lake trout, bald eagles, mink and otter populations. These top predators are dependent on quality habitat and sufficient populations of prey, free of problematic contaminant levels.

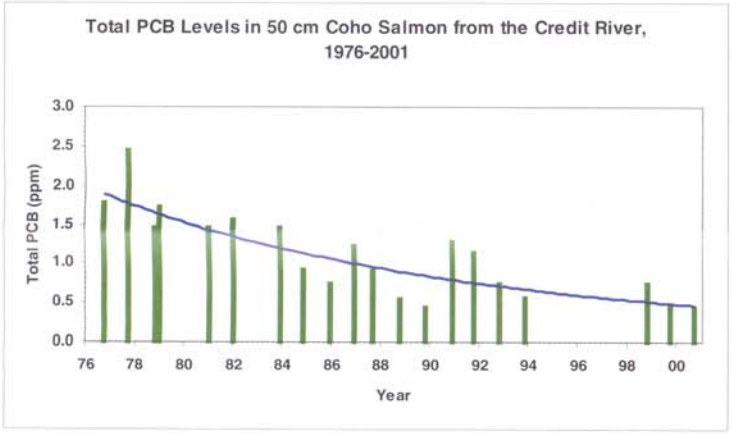
Photo Credit: Dennis Money

The otter is an animal that consumes fish and other aquatic animals. It has been chosen as a critical indicator species for the Lake Ontario ecosystem..

Results Show Continued Improvements

Recent findings presented in the *Lake Ontario LaMP 2002 Report* indicate that the management of critical pollutants has been effective in reducing their presence in the ecosystem, and that fish and wildlife have responded positively to this improvement.

Overall, fish tissue has shown a significant reduction in critical pollutant levels since the 1970's. Levels of critical pollutants in Lake Ontario coho salmon have been decreasing steadily. Total PCB concentrations have gone down by 2/3 and the concentration of mirex has decreased by 1/2. It is hoped that these trends will continue as source trackdown and remedial actions further reduce the amount of critical pollutants entering the Lake Ontario ecosystem.



Long term monitoring of coho salmon from Lake Ontario illustrate a steady reduction in PCB levels over time.

Populations of fish-eating waterbirds in Lake Ontario have recovered and are reproducing normally. Caspian terns, common terns, gulls and cormorants have all benefitted from the reduction in pollutants. Several key indicator species such as the bald eagle, lake trout, river otter and mink are also making a comeback in the Lake Ontario ecosystem.

Photo Credit: Don Simonelli

Caspian tern numbers on Lake Ontario are increasing.

Although bald eagles have been successfully nesting in the Lake Ontario basin since the 1980s, they are finally nesting on the shores of Lake Ontario after a forty-year absence. Two shoreline nests have been established. The success of these eagle nests suggests that contaminants are no longer a significant barrier to the recovery of bald eagles on the Lake Ontario shoreline.

The Return of Lake Trout

Early 1900s - Native lake trout populations eliminated due to overfishing, habitat loss and sea lamprey impacts.

1960s - Stocking of lake trout begins to restore top-level predator fish to the food web with a goal of reestablishing naturally reproducing populations.

1990s - First signs of naturally reproduced lake trout.

2000s - Natural reproduction is expected to increase as more naturally spawned fish reach reproductive age.

Photo Credit: Fisheries and Oceans Canada

Reducing Critical Pollutants

The Four Parties have developed and agreed to a cooperative binational approach for reducing critical pollutants to the lake. This approach encompasses the reduction of critical pollutants through regulatory programs and partnerships with local government, industries and individuals. Using this approach, sources of critical pollutants are identified through trackdown activities, as well as assessed and addressed using regulatory or voluntary actions.

Canadian Tributary Source Trackdown

Environment Canada and the Ontario Ministry of the Environment are working together to identify the sources of PCBs and other critical pollutants in large streams and rivers that flow into Lake Ontario. Concentrations of PCBs in water, sediment and fish are measured at various locations along rivers or streams entering Lake Ontario in order to determine where the critical pollutants are coming from and how to address them. A pilot source trackdown project has begun on three priority watersheds and data are currently being analyzed. The information gained from these activities will help focus remediation and pollution prevention efforts that will ultimately reduce the amount of critical pollutants entering the lake.

U.S. Contaminant Trackdown Activities

The United States Environmental Protection Agency and the New York State Department of Environmental Conservation are working together to locate and address sources of critical pollutants. Water, sediment and fish are collected at strategic locations to identify where and how critical pollutants are entering streams and rivers.

Photo Credit: USEPA

Trackdown sampling involves sampling water in local sewer systems for contaminants such as PCBs.

Photo Credit: Ontario Ministry of the Environment

Tracking down pollutants in rivers and streams is an important component of the Lake Ontario research.

Trackdown sampling results have also helped develop a good picture of the location and extent of critical pollutant sources and problems in the watersheds of the U.S. portion of the basin. These efforts have helped sewage treatment plants qualify for New York State funding to upgrade their treatment systems, thereby reducing critical pollutant inputs to the lake. The agencies will continue to support critical pollutant trackdown activities as well as to promote pesticide and household hazardous waste collections.

Related Programs

Restoring beneficial uses in Lake Ontario will also depend on the success of other Great Lakes programs, such as the Great Lakes Binational Toxics Strategy. The Canada – Ontario Agreement and the U.S. Great Lakes Toxics Strategy also include commitments that address persistent toxic substances in Lake Ontario. It is only through coordinated and focused initiatives such as these that the effects of critical pollutants can be effectively reduced and beneficial uses can be restored.

Sources & Loadings Update

The *Lake Ontario LaMP 2002 Report* provides estimates of the amount of each of the 6 critical pollutants that enter and exit the Lake Ontario ecosystem. These estimates will be used to help guide future trackdown and control activities. As Lake Ontario is the last in the chain of the Great Lakes, most of the critical pollutant loadings come from outside the basin.

Challenges Ahead

Although progress to date has been significant, further reductions of critical pollutant loadings are needed in order to meet the LaMP ecosystem objectives.

The LaMP recently completed an assessment of bottom-dwelling organisms (benthos) and microscopic aquatic plants (phytoplankton). This assessment concluded that benthos and nearshore phytoplankton populations are degraded due to zebra mussel-related impacts. The LaMP will promote the prevention of future introductions of exotic species by raising awareness of the problem and the need to take action.

Photo Credit: Centre for Great Lakes & Aquatic Sciences

Zebra mussels are causing serious lakewide problems in the Lake Ontario ecosystem.

Efforts to preserve and restore fish and wildlife habitat have shown mixed results. Programs to control runoff and erosion, protect stream banks and improve agricultural tillage practices have been successful, where they have been implemented. However, urban and agricultural development, land use practices and lake-level controls still threaten habitat. Opportunities to protect and restore important habitats are being explored by the LaMP in addition to continuing support of ongoing habitat protection efforts.

Photo Credit: Bay Area Restoration Council.

More efforts to create, preserve and restore fish and wildlife habitat are needed in the Lake Ontario basin.

Public Involvement

Public involvement is an important component of the LaMP. Annual public meetings, newsletters, reports, presentations, displays and website updates increase public understanding and awareness of the LaMP and its goals. For more information on how to get involved, see the contact details provided at the end of this brochure.

Photo Credit: Ontario Ministry of the Environment

Giving presentations about the Lake Ontario LaMP is just one of the important aspects of public involvement.

Next Steps

Future efforts will continue to focus on the restoration of impaired beneficial uses. Contaminant trackdown activities will continue to provide a better understanding of critical pollutant sources. The information gained from these activities will help focus remediation and pollution prevention efforts that ultimately will reduce the amount of critical pollutants in the lake.

Coordination of binational monitoring efforts, particularly those related to the LaMP's ecosystem indicators, will be a special area of emphasis. The status of the eleven ecosystem indicators will be highlighted in upcoming reports and presentations.

The LaMP will work to strengthen partnerships, keep stakeholders informed and encourage greater public involvement and participation in the restoration of the Lake Ontario ecosystem.

Lake Ontario LaMP 2002

The Lake Ontario LaMP 2002 Report provides a summary of actions taken and progress made by the LaMP. Highlights of the Report include:

- The LaMP has adopted ecosystem indicators to track progress
- Fish and wildlife populations have improved
- Populations of benthos and phytoplankton are degraded due to zebra mussels
- Levels of critical pollutants in fish and wildlife continue to decline
- Sources of critical pollutants in the Lake Ontario basin are being addressed

In addition, the report provides an update of public involvement activities and outlines next steps.

Photo Credit: Environment Canada

Photo Credit: Environment Canada

For More Information

Check out the *Lake Ontario LaMP 2002 Report* on the Internet at www.on.gc.ca/glimr/lakes/ontario/ or www.epa.gov/lakeont/

To obtain a copy of the report, or for other information, contact:

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