



# LAKE ONTARIO LAKEWIDE ACTION AND MANAGEMENT PLAN

## 2017 Annual Report

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### What is the Lake Ontario LAMP?

Under the Great Lakes Water Quality Agreement (GLWQA), the governments of Canada and the United States have committed to restore and maintain the physical, biological, and chemical integrity of the waters of the Great Lakes.

The Lake Ontario Lakewide Action and Management Plan (LAMP) is a binational action plan for restoring and protecting the Lake Ontario ecosystem. The LAMP is developed and implemented by the Lake Ontario Partnership, which is led by the U.S. Environmental Protection Agency (U.S. EPA) and Environment and Climate Change Canada (ECCC). The Partnership facilitates information sharing, sets priorities, and assists in coordinating binational environmental protection and restoration activities. The next Lake Ontario LAMP is now planned for release in 2018; in the interim, the Lake Ontario Partnership will be assessing the state of the lake, measuring progress against existing LAMP goals and objectives, and promoting management actions to address identified issues.

This 2017 annual report highlights accomplishments and progress in achieving LAMP goals during the past year and identifies LAMP-related activities including outreach, monitoring, and protection and restoration actions.

### Overview

Over the past year, the Lake Ontario Partnership agencies have been working cooperatively to protect and restore the lake’s water quality and ecosystem health through a range of actions and programs. These actions include implementing the *Binational Biodiversity Conservation Strategy* (BBCS), planning for the 2018 binational *Cooperative Science and Monitoring Initiative* (CSMI) field year, restoring fish and wildlife species and habitat, improving coastal wetland and nearshore ecosystems, assessing and managing nutrients, and undertaking outreach and engagement activities. The Lake Ontario LAMP’s geographic scope has been expanded to include the Niagara and St. Lawrence Rivers as required under the new GLWQA.

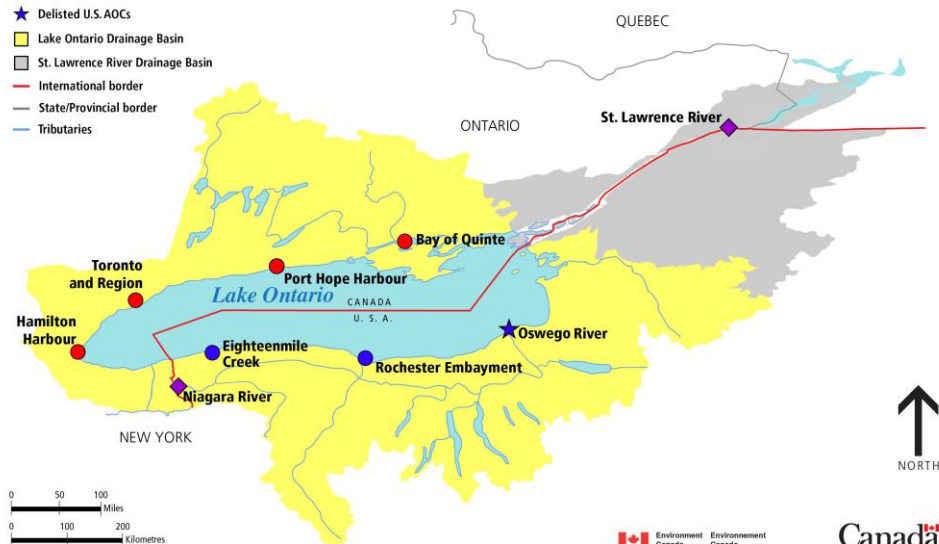
The 2017 annual report summarizes the following information:

- accomplishments in restoring habitat and species in the St. Lawrence River, coastal wetland restoration, and outreach and engagement;
- challenges for nutrient reduction initiatives and the lake fisheries;
- update on Niagara and St. Lawrence River monitoring efforts; and
- next steps for advancing science priorities and on-the-ground actions.

### Lake Ontario Drainage Basin

#### Legend

- Canadian Areas of Concern (AOCs)
- ◆ Binational AOCs
- U.S. AOCs
- ★ Delisted U.S. AOCs
- Lake Ontario Drainage Basin
- St. Lawrence River Drainage Basin
- International border
- State/Provincial border
- Tributaries





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### Accomplishments

#### *Hogansburg Dam Removal and Native Mussel Rescue*

In the summer of 2016, the Saint Regis Mohawk Tribe (SRMT) oversaw the removal of the Hogansburg Dam, a 281-foot dam near the mouth of the St. Regis River, a tributary to the St. Lawrence River. This project marked the first removal of a federally-licensed dam by a U.S. Tribe, as well as the first removal of a hydropower dam in New York State. The removal opened 274 river and stream miles (441 kilometers) of migration routes to upstream spawning and nursery habitat benefiting walleye, muskellunge, Atlantic salmon, lake sturgeon, American eel, and others. The project supports the LAMP's BBCS goals of improving hydraulic connectivity to the Great Lakes' ecosystem to benefit native fish.

SRMT also rescued nearshore native freshwater mussels in the area above the dam that would have died following the dewatering associated with the dam removal. Surveys found 11 native mussel species present within the project area, 4 of which are considered New York State Species of Greatest Conservation Need (NYS SGCN). In total, 66,539 mussels were relocated, including 6,550 which were assumed to be NYS SGCN. Preventing mussel mortality was important in this river system since the population remains unimpacted by invasive mussel species, and because the mussels have an important ecological function that contributes to water quality.



Rescued St. Regis River native mussels being relocated upstream in advance of the removal of the Hogansburg Dam. Credit: SRMT Environment Division

#### *Lake Ontario Coastal Wetlands*

The Lake Ontario Partnership and the International Joint Commission's (IJC's) Great Lakes Adaptive Management Committee (GLAM) have a common interest in a unique assemblage of native coastal wetland plants known as meadow marsh. Meadow marsh is the single most important indicator of coastal wetlands health providing valuable habitat to a wide range of organisms. Healthy meadow marsh communities require periodic (i.e., once in a decade), low spring water levels to expose meadow marsh plant seeds to air, which allows them to germinate. The natural cycle of periodic low water levels was halted in 1958 with the construction of hydroelectric dams on the St. Lawrence River which stabilized water levels. This started a steady decline in meadow marsh and allowed cattails to dominate wetlands, greatly reducing biodiversity.

In 2016, the IJC adjusted the current water level management system for Lake Ontario and upper St. Lawrence River to more closely mimic natural water level fluctuations. Restoring more natural patterns of water level fluctuations is also a major LAMP BBCS objective. Meadow marsh communities should slowly respond to these changes and begin to recover.

#### **Outreach and Engagement in Urban Regions**

The western end of Lake Ontario is one of the most populated and rapidly growing urban areas in Canada. In September 2016 a two-day [Toronto Region Conservation Authority](#) workshop was held for resource managers, stakeholders and NGOs to gauge interest in the lake, discuss the merits of working together and to make the connections between actions on the land and the health of the lake. The response was overwhelming. Interest and momentum was secured through peer-to-peer engagement and promotion. The workshop was an important stepping stone and there is a great opportunity to build upon the momentum.

The Genesee River flows through Rochester and carries a significant load of nutrients and sediment due to a combination of highly erodible soils and intensive agriculture. Options to address these issues were explored at the 3<sup>rd</sup> Annual Genesee River Basin Summit by the Genesee RiverWatch in May 2016. The theme was "*Streambank Erosion, Sediment Loss, and Sediment.*" Presentations were provided by state, regional and local experts. A subsequent summit was held in June 2017 at the Rochester Institute of Technology. The summits are open to the public.





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### *St. Lawrence River Shoreline Cleanups*

Between June and September 2016 the upper St. Lawrence River Protection Network (comprising over 50 river organizations and individuals), the St. Lawrence River Institute of Environmental Sciences, the Mohawk Council of Akwesasne Environmental Program, the Cornwall Lunger Club, Seaway Valley Divers, Raisin Region Conservation Authority, City of Cornwall, and other community volunteers undertook a series of 5 in-river and shoreline clean-ups in and along the upper St. Lawrence River at Cornwall and Akwesasne. Discarded debris in the water and along shorelines was posing harm to fish, wildlife, and human health. In Akwesasne, for example, children had been seriously injured on metal debris while swimming. The clean-ups removed well over 12 tons of debris from the river. Over 400 Cornwall and Akwesasne community volunteers of all ages came together with a common purpose and vision: to tackle the rubbish in the river.

The short documentary film, "A Great River Runs Through Us," highlights the project's impact on Cornwall and Akwesasne communities. This film is now travelling to schools and community events with volunteer facilitators to highlight the importance of stewardship and protection of fresh water.

Plans are underway to continue the clean-up project in 2017.



Akwesasne Boys and Girls Club gather to celebrate taking 2 tons of garbage out of Snye Marsh. Credit: St. Lawrence River Institute of Environmental Sciences

### *Promoting Environmental Partnerships*

The newly created Lake Ontario Outreach and Engagement (O&E) Subcommittee aims to increase public understanding and awareness of lakewide priorities and actions to protect and restore Lake Ontario's ecosystem. The committee, co-chaired by ECCC and the U.S. EPA, includes cross-border federal agencies, state, and provincial governments. The committee

comprises a multifaceted group of partners who have outreach, engagement, and communication and consultation experience.

The O&E Subcommittee will provide information on 1) opportunities for meaningful stakeholder and public consultation, and 2) ideas for promoting environmental awareness around Lake Ontario. The O&E Subcommittee aims to build partnerships with others working to preserve and protect Lake Ontario.

## Addressing Challenges

### *Monitoring Atlantic Salmon Restoration*

Restoration of Atlantic Salmon in Lake Ontario and key tributaries is a goal identified in the LAMP's BBSC and Great Lakes Fishery Commission's Lake Ontario Fish Community Objectives. In addition to Atlantic Salmon, Lake Ontario tributaries also provide spawning habitat to other migratory fish including Chinook Salmon, Coho Salmon, Rainbow Trout and Brown Trout. Monitoring migrating adult Atlantic Salmon is an important indicator of restoration progress but it is complicated by migration of large numbers of these other salmon and trout species that spawn at similar times. To address this challenge, the Ontario Ministry of Natural Resources and Forestry (OMNRF), partner organizations and volunteer groups installed and tested a new multi-sensor fish counter at a fishway in the Ganaraska River (along the north-east shore of Lake Ontario) in 2016. The system automatically counts and records both an infrared silhouette image and short high resolution video for each passing fish; this allows researchers to identify species, sex, size and fin clips of fish ascending/descending the river, to help reveal how many adult Atlantic Salmon return to the tributaries to spawn.



An image of a migrating Rainbow Trout captured from hi resolution video taken by the Ganaraska River's new multi-sensor fish counter. Credit: Ontario MNRF



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### Lake Ontario Cooperative Science and Monitoring Initiative 2018

GLWQA nutrient research and control activities have been focused on Lake Erie but will soon include Lake Ontario. Eutrophication is not an issue for Lake Ontario's offshore waters. Offshore nutrient concentrations have declined to the point where there is some concern for the long-term viability of desirable fisheries. However, the apparent resurgence of nearshore nuisance algae problems is a concern for some coastal communities. Likely sources of nutrients driving these problems are the Niagara River and rapidly growing urban areas along the western shore. The lack of long-term information on nuisance algae trends, such as *Cladophora*, presents challenges to managers seeking to identify specific objectives for Lake Ontario basin nutrient reduction initiatives. Lake Ontario's 2018 Cooperative Science and Monitoring Initiative (CSMI) year will work to improve our understanding of these issues and support the development of future water quality and natural resource management strategies. In addition to nutrient related science, the Lake Ontario CSMI will support the maintenance of valuable long-term water quality, food web, coastal wetland and contaminant data sets for the lake and its connecting river systems.

### Lake Ontario LAMP: 2018-2022

The Lake Ontario **Lakewide Action and Management Plan (LAMP)** is a binational ecosystem-based strategy to restore and protect the water quality of Lake Ontario and its connecting river systems, the Niagara and upper St. Lawrence Rivers using an integrated management approach that recognizes the interaction of human and natural influences on Lake Ontario habitats, species, and physical processes. It is intended to guide and support the work of natural resource managers, decision-makers, Lake Ontario partners and the public. **Lake Ecosystem Objectives (LEOs)** are used to assess status and trends in water quality and lake ecosystem health, and to support the General Objectives of the GLWQA.

In addition, an update on the **Lake Ontario Binational Biodiversity Conservation Strategy (BBCS)** Implementation will also be included in the 2018 LAMP, with recommendations for action over the next 5 years. To date, approximately 300 projects have been completed in priority action sites, which amount to over \$90 million in funding support, not counting many other efforts within New York and Ontario performed by government agencies, non-government organizations, and others that directly or indirectly support the BBCS priorities.

### Niagara & St. Lawrence Rivers Update

Precise measurements of the amount of water flowing through Lake Ontario's connecting rivers are essential to calculating the amount of nutrients, sediment, and contaminants entering and leaving the lake. A cooperative U.S. Geological Survey and U.S. Army Corps of Engineers effort is establishing state-of-the-art flow measurement stations on the lower Niagara River and the upper St. Lawrence River. The new stations use Acoustic Doppler Velocity Meters (ADVMs), hydroacoustic current meters very similar to sonar, which measure water current velocities using the Doppler effect of sound waves scattered back from particles within the water column. The ADVM sites are strategically located on the lower Niagara River just before entering Lake Ontario and on the upstream St. Lawrence River, just downstream from Wolfe Island where the river constricts into one channel. The increased accuracy of these flow meters will benefit a range of binational efforts dealing with water quality and quantity.

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