



WHAT ARE THE CURRENT PRESSURES IMPACTING LAKE ONTARIO?

The current pressures impacting Lake Ontario include non-native invasive species, contamination, lake level regulation, habitat alteration, aquatic food web changes, and urbanization.

Pressures

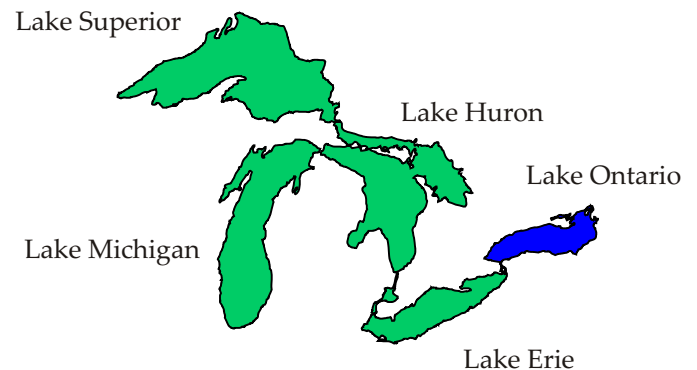
Non-native invasive species

Zebra and quagga mussels have irreversibly modified the physical, chemical, and biological integrity of Lake Ontario. The filtering activity of the mussels has reduced the amount of food available to other organisms, causing populations of native benthic organisms to decline and creating a ripple effect that has impacted the health of the fishery. These mussel colonies encrust many manmade features of the lake, as well as clump over soft substrates, altering the habitat for other organisms. Recently introduced non-native species include the round goby and the spiny and fishhook waterfleas. Round gobies eat zebra and quagga mussels and in turn are eaten by native and non-native fish species. Unfortunately, zebra and quagga mussels and the round goby are suspect in the growth and transfer of Type E botulism, which has now been detected at a few locations along the Lake Ontario shoreline.

Contaminants

As a result of actions taken by Canada and the United States to ban and control contaminants such as PCBs, DDT, mirex, dioxin/furans, mercury and dieldrin entering the Great Lakes, levels of contaminants in the Lake Ontario ecosystem have decreased significantly over the past 20 - 25 years. Despite this decline, levels of some contaminants detected in fish still exceed consumption guidelines for humans.

Contaminant levels in herring gull eggs have decreased dramatically; successful reproduction is occurring; and, bird populations have generally increased. Many fish and wildlife populations once on the verge of extinction have rebounded from the effects of contaminants. Key indicator species such as the bald eagle, river otter, and mink, are making a comeback in the Lake Ontario ecosystem. Aquatic



communities, however, are still under stress. It appears that the most significant sources of critical pollutants to Lake Ontario now arrive from upstream inputs and via atmospheric deposition.

Lake level regulation

Lake level regulation has had serious and lasting impacts on Lake Ontario's natural resources, including fish and wildlife, shoreline habitat and dune barrier systems, and numerous wetland complexes along the shore. Reductions in the area, quality, biodiversity, and functioning of Lake Ontario nearshore wetlands are some of the inadvertent consequences of artificial management of lake levels.

Habitat alteration

In addition to artificial lake level management and the proliferation of non-native species, the physical loss, modification, and destruction of habitats, through deforestation or the damming of tributaries are all threats to the success of fish and wildlife populations. Wetlands are particularly vulnerable to activities such as in-filling and dredging. It is estimated that about 50 percent of Lake Ontario's wetlands have been lost throughout the basin as a result of habitat alteration.

LAKE ONTARIO PRESSURES

Aquatic food web changes

The offshore lake ecosystem (greater than 15 meters deep) heavily relies on stocked salmon and trout to provide recreational fisheries and to control populations of non-native alewife and smelt. Chinook salmon, coho salmon, brown trout, and rainbow trout continue to support recreational fisheries and display variable rates of wild reproduction. The current salmon and trout complex remains reliant on alewife and smelt, and both of these preyfish species are in mixed or deteriorating states. In response, top predators, particularly Chinook salmon, are showing signs of reduced weight.

Other pressures on the Lake Ontario fishery include increasing competition for food by invasive species such as the round goby; consumption of fish by cormorants; thiamine deficiencies resulting in increased mortality of young fish; overfishing and continued reliance on stocking; and the presence of contaminants in many fish species including walleye and trout.

Urbanization

Land use and population growth, particularly low-density urban sprawl in the Golden Horseshoe (Toronto area), are impacting Lake Ontario and the stress is growing. By 2030, it is projected that an additional three million people will live in the Lake Ontario basin, with almost all of the growth concentrated at the western end of the Lake, in Ontario. Some consequences of urbanization include increases in the amount of impervious land area, stormwater runoff, and vehicular travel and transportation-related emissions.

Current Actions

To help meet Great Lakes Water Quality Agreement commitments, the governments of the United States and Canada agreed to develop and implement Lakewide Management Plans (LaMPs) for open lake waters and Remedial Action Plans (RAPs) for specific geographic Areas of Concern (AOCs). The Lake

Ontario LaMP works closely with the Great Lakes Fishery Commission to identify priority projects and develop appropriate aquatic habitat ecosystem objectives and indicators.

Actions Needed

To protect the Lake Ontario ecosystem the following actions are needed:

- Design communities that accommodate more people without rampant urban sprawl and destruction of habitats
- Prevent the introduction of non-native species
- Continue to monitor and control contaminants
- Inform lake level regulation managers of changes in fish and wildlife populations
- Monitor the subtle but important changes occurring in the Lake Ontario food web so that appropriate actions may be taken

To Learn More

For further information related to the state of Lake Ontario, refer to the *State of the Great Lakes 2005* report which, along with other Great Lakes references, can be accessed at www.epa.gov/glnpo/solec. The Lake Ontario Lakewide Management Plan 2004 can be accessed at www.epa.gov/glnpo/lakeont/2004update/.



Lake Ontario shoreline, Oswego, New York. Photo: U.S. EPA Great Lakes National Program Office.

