



Keeping the GREAT LAKES Great

Success Stories from the Shoreline

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Top: Lake Huron near Goderich
Credit: Ontario Ministry of the Environment

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THE GREAT LAKES: A Resource Worth Protecting

Our greatest resource

One of North America's greatest natural resources is the largest freshwater ecosystem in the world. Spanning more than 244 000 square kilometres, it fuels our economy, shapes our lifestyles and recreational pastimes, and provides millions of people with drinking water. That resource is the Great Lakes—Michigan, Superior, Huron, Erie and Ontario and the rivers that connect them—the St. Mary's, St. Clair, Detroit, Niagara and upper St. Lawrence.

Valuable and vulnerable

The Great Lakes are a valuable asset to Canadians, providing water for consumption, transportation, power and recreation. In spite of their size, the Great Lakes are vulnerable, facing pressures from climate change, new chemicals, urban development, invasive species and other threats. Protecting this delicate ecosystem will ensure that it continues to provide for the people of the region and all living things in the Great Lakes.

We can all play a role in protecting the Great Lakes. Every action we take to reduce waste, and consumption of water and energy, will benefit the lakes for years to come.

Canada and the United States and their partners have a long history of working together to protect the lakes, including the signing of the

Canada–United States Great Lakes Water Quality Agreement (GLWQA) in 1972. In 1971, the Canada–Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) was signed by the governments of Canada and Ontario. Since then, COA has been renewed six times, most recently in 2007.

Canada and Ontario work together to maintain a healthy, prosperous Great Lakes ecosystem both now and for the future. Scientists and other experts from eight federal departments/agencies and three provincial ministries with expertise in environment, natural resources and agriculture are working together under the Canada–Ontario Agreement. The expertise of our collective Great Lakes team is as varied as the environmental challenges faced by the lakes themselves.

The 2007 COA sets out specific goals, results and commitments for Great Lakes environmental protection. Key COA priority areas are: cleaning up the hotspots, reducing harmful pollution, and dealing with lakewide environmental issues. More than 800 Great Lakes projects are being conducted in support of COA commitments. The federal and provincial governments, with support from partners, are delivering on these commitments. This newsletter provides a sample of just some of the projects that Canada and Ontario are working on to protect the Great Lakes as part of their commitments

Aussi disponible en français



Ontario

Canada

- Eighty-seven percent of Ontarians live within the watersheds of the Great Lakes and St. Lawrence River.
- More than 70 percent of Ontarians get their drinking water directly from the lakes.
- More than 80 percent of the power generated in this province depends, in some way, on the Great Lakes.
- 95 percent of Ontario's farm cash receipts come from the Great Lakes region.
- More than \$7 billion annually is injected into Ontario's economy from Great Lakes fishing and shipping.

to the Canada–Ontario Agreement Respecting the Great Lakes Basin Ecosystem. For more information about COA, please see progress reports at: www.on.ec.gc.ca/coa.

Cleaning up the hotspots

There are a number of environmental hotspots around the Great Lakes resulting from historical pollution and habitat loss. "Area of Concern" (AOC) is the term used to identify each of the hotspots where the environment has been harmed to the point that it affects use and enjoyment of that area of the lake or may be affecting the health of the lake. Consequences may include beach closings, loss of fish and wildlife habitat, and restrictions

on fish. In the mid-1980s, under the Canada–United States Great Lakes Water Quality Agreement, Canada and the U.S. identified 43 AOCs around the Great Lakes. Three Canadian AOCs, Severn Sound, Collingwood and Wheatley Harbour, have been delisted. One AOC in the U.S. has also been delisted. Of the remaining 39 areas, 9 are in Canada, 25 in the U.S., and the remaining 5 are shared by both countries.

Under the Canada–Ontario Agreement, the governments work together with conservation authorities, municipalities, Aboriginal communities, environmental groups, industry and others to develop and implement plans to restore and protect these AOCs. For more information on AOCs, visit: www.ec.gc.ca/raps-pas.



Lake Ontario near Toronto Island

CANADA AND ONTARIO RE-AFFIRM THEIR COMMITMENT TO GREAT LAKES

Canada and Ontario have extended the 2007 Canada–Ontario Agreement (COA) by one year to March 31, 2011. This one-year extension allows Canada and Ontario to continue their important work to protect and restore the Great Lakes while the governments of Canada and the United States negotiate amendments to the Great Lakes Water Quality Agreement (GLWQA). Once amendments are negotiated to the GLWQA, Canada and Ontario will have the foundation for future discussions on priorities for a new COA.

Credit: Gary J. McGuffin

GREAT LAKES PARTNERS

Partnership is the key to Great Lakes protection. Several federal and provincial government ministries and departments work together to restore and protect the Great Lakes under the Canada–Ontario Agreement.

The broader Great Lakes community is also involved. Municipalities, conservation authorities, Aboriginal communities and organizations, non-governmental organizations, academic institutions, industry, farmers, and others all work together to help clean up and protect the Great Lakes.

GREAT LAKES TO BENEFIT FROM \$529.2 MILLION IN SEWAGE TREATMENT PLANT UPGRADES

Nine projects located near the Great Lakes will benefit from up to \$529.2 million in federal and provincial funding allocated to help improve wastewater treatment in Ontario. In 2009 and 2010, the governments jointly announced funding for projects to help improve wastewater treatment in the communities of Nipigon, Red Rock, Cornwall, Halton Region, Owen Sound, South Dundas, the York and Durham Regions, Kirkland Lake, and Hamilton.

Projects located within the communities of Nipigon, Red Rock, Cornwall, South Dundas and Owen Sound will involve upgrades to primary sewage treatment facilities. Currently, these facilities discharge high levels of organic materials and nutrients directly to the Great Lakes and St. Lawrence River Basin. The funding committed by the provincial and federal governments will allow for upgrades to these sewage treatment plants from primary to secondary levels of treatment, resulting in improved quality of treated wastewater discharged into the environment.

- Since Budget 2009, Infrastructure Canada has committed more than \$9.5 billion towards over 6000 infrastructure projects across Canada. Year 2 of Canada's Economic Action Plan will deliver \$7.7 billion in infrastructure stimulus funding to create jobs.
- Ontario has committed more than \$653 million to wastewater infrastructure upgrades in the Great Lakes Basin since March 2007.
- Through the 2009 Ontario Budget—Confronting the Challenge: Building Our Economic Future—the province is investing \$32.5 billion in infrastructure projects over the next two years, including a \$5 billion contribution from the federal government that will support more than 300 000 jobs and strengthen Ontario's economy.

Primary treatment plants only remove easy-to-settle solids. This type of treatment removes limited amounts of organic matter, nutrients and metals found in sewage. Wastewater discharged from primary treatment plants can cause poor water quality, which in turn may reduce or destroy fish habitat and cause an increase in algae growth.

Secondary treatment of wastewater can remove up to 90 percent of organic material, some metals and solids. Secondary treatment plants remove organic materials and nutrients from wastewater from homes, industries and businesses.

Upgrades to these sewage treatment plants will help reduce municipal wastewater pollution in the Great Lakes. As a result of the funding and the upgrades, there will be no more primary sewage treatment plants discharging to any water body in Ontario.

Sewage treatment plant upgrades at Nipigon, Red Rock, Cornwall and Hamilton will bring three Great Lakes hotspots one step closer to being restored.

To learn more about Canada's Economic Action Plan, visit:
www.actionplan.gc.ca.

Learn how Canada is investing in Ontario infrastructure and how Ontario is helping to build and revitalize infrastructure across the province at:
www.buildingcanada-chantierscanada.gc.ca/regions/on/on-eng.html



Clearing and grubbing Turkey Creek



Turkey Creek restored

Credit: Essex Region Conservation Authority

DETROIT RIVER AREA OF CONCERN: SEDIMENT REMEDIATION IN TURKEY CREEK

The City of Windsor's Turkey Creek is one step closer to environmental recovery. The governments of Canada, Ontario and Windsor, together with the Essex Region Conservation Authority and local industry collectively contributed

\$1.2 million to clean up contaminated sediment in Turkey Creek.

The sediment and bank soil in this area were contaminated with heavy metals, including polychlorinated biphenyls (PCBs) which are of particular concern since they accumulate in fish.

From August to November 2008, about 1000 cubic metres of contaminated sediment and soil was excavated and taken to an approved non-hazardous solid waste disposal site.

Following excavation, the area was graded and loose rock installed to prevent erosion. Further measures include shrub and tree planting. Fish sampling will be conducted to evaluate success of the project in removing contaminants from the food chain.

Turkey Creek is part of the Detroit River Area of Concern (see www.ec.gc.ca/raps-pas for more information).



Eastern shore of Jackfish Bay, Lake Superior, near the old town of Jackfish

Credit: Environment Canada

LAKE SUPERIOR: JACKFISH BAY, AREA ON THE MEND

There was a time in the early 1980s when fish in the Jackfish Bay ecosystem were dying. Water quality in this area on the north shore of Lake Superior was severely impaired as a result of direct discharges from a pulp and paper mill in nearby Terrace Bay. The mill had been operating since the 1940s, when there were no environmental controls.

The Bay was designated an Area of Concern in 1987 because of



The Terrace Bay pulp mill, west of the Jackfish Bay Area of Concern, September 2008

Credit: Environment Canada

the negative impacts that mill effluent was having on fish, fish habitat, sediment and aesthetics. Blackbird Creek, which is visible from the Trans-Canada Highway, was often noted for its brown, foamy appearance and odour.

In the 1990s, the provincial and federal governments passed environmental legislation that set new limits for pulp and paper mill effluent. Today, mill effluent must meet strict requirements and cannot be lethal to fish and aquatic insects. As a consequence, the waters of Jackfish Bay are no longer toxic to fish, and the health of the local fish population has improved.

With the major concerns addressed, the federal and provincial governments, along with community partners, are looking at recognizing Jackfish Bay as an Area in Recovery. This would mean that all priority remedial actions in this Great Lakes hotspot are complete, but the environment needs more time to recover.

Over the past year, Lakehead University has reviewed more than 20 years of monitoring data

collected by government scientists. The university is working with the community through the Public Area in Recovery Review Committee to prepare a status report and identify long-term monitoring needs.

Pending recommendations from this committee and comments from the International Joint Commission, the area will be recognized as an Area in Recovery and a long-term monitoring plan will be implemented. For more information, visit: www.ecosuperior.org.

WHAT IS THE INTERNATIONAL JOINT COMMISSION?

The International Joint Commission (IJC) is the binational organization responsible for evaluating and advising governments on the implementation of the Great Lakes Water Quality Agreement.

The IJC was established by the United States and Canada under the Boundary Waters Treaty of 1909.



Reducing harmful pollutants

Reducing harmful pollutants, including PCBs, dioxins and mercury, and preventing them from getting into the Great Lakes environment is a key priority under the Canada–Ontario Agreement. Not only are the governments dealing with legacy pollutants released by past practices into the water and sediment of the lakes, they are also taking action to reduce the amount of new pollutants going into the lakes. The governments are also working to better understand the effects of chemical pollutants on human health and are working with health units, doctors and other medical professionals to share information.

LET'S TALK TOXICS – FEDERAL AND PROVINCIAL EFFORTS TO ADDRESS TOXICS IN THE GREAT LAKES BASIN

Chemical pollution has been a significant environmental problem in the Great Lakes since the birth of industry in North America. Canada and Ontario have worked cooperatively to reduce pollution of our water, air and land, and continue to develop or enhance programs to assess and manage chemicals that are used by industry and Canadians in our daily lives.

Through the federal Chemicals Management Plan (CMP), the federal government is working to assess priority chemicals for potential risks to human health and the environment. These priorities were identified from a review of over 23 000 substances in commercial use in Canada.

Additionally, under the New Substance Notification regulation, the federal government screens hundreds of new substances introduced to the Canadian marketplace every year to ensure that they are managed effectively to protect the environment.

Canada is committed to working with industry to ensure the country has both a healthy environment and a healthy economy, and has taken action to prevent pollution at its source. By taking action through the CMP, such as banning or limiting bisphenol A in consumer products, and by introducing regulations on specific industries such as metal mining and pulp and paper that reduce the toxicity of their effluents, the federal government is contributing to the efforts to restore and protect the Great Lakes. For more information on the CMP, go to: www.chemicalsubstanceschimiques.gc.ca/index-eng.php.

The Ontario government is also committed to addressing chemical pollution in a way that will ultimately benefit human health and the environment, including the Great Lakes. The province is moving beyond “end of pipe” controls on industrial emissions and focusing on reducing the amount of toxic substances used by facilities. Ontario’s Toxics Reduction Strategy proposes to reduce the province’s reliance on toxic chemicals in manufacturing and mineral processing and thereby to protect the environment through toxics reduction.

This shift in policy includes framework legislation. The *Toxics Reduction Act, 2009*, which received Royal Assent on June 5, 2009, will require facilities in Ontario to conduct materials accounting of prescribed toxic substances at their facilities and develop a plan to reduce their use of toxics.

This new approach complements existing emissions regulations and will not only benefit the environment, but will also encourage new ways of doing business, and will better position businesses in Ontario for the green economy. For more information: ontario.ca/toxicsreduction.



OPERATION CLEAN SWEEP

Ontario farmers are helping protect the Great Lakes by turning in used livestock sharps (needles, syringes and scalpel blades) and unwanted livestock medicines through a unique two-year collection program. A North American first, the program is funded through the Ontario government as part of an initiative to protect water quality in the Great Lakes Basin.

The program began with a three-day pilot project in November 2008. Six different sites in southwestern and eastern Ontario served as collection depots, allowing farmers to drop off these products safely and free of charge.

The program was expanded across Ontario in 2009 to run concurrently with a pesticide collection campaign that has been going for several years. Pesticide collection programs have been run in Canada by CropLife Canada since 1998 under the CleanFARMS™ banner.

The project is coordinated by AGCare and its partners, the Ontario Farm Animal Council, the Canadian Animal Health Institute, the Ontario Veterinary Medical Association, the Ontario Agri Business Association, CropLife Canada and the Ontario Ministry of Agriculture, Food and Rural Affairs. For more information, visit: www.ofac.org or www.agcare.org.

Operation Clean Sweep is a North American first.



Credit: Ontario Ministry of Agriculture, Food and Rural Affairs

ONTARIO PESTICIDE USE SURVEY SHOWS FARMERS' PROGRESS

A survey that takes the pulse of pesticide use on Ontario's farmland has recorded a dramatic 52 percent reduction over the past 20 years.

The Ontario Ministry of Agriculture, Food and Rural Affairs has conducted the survey with growers every five years since 1973. Under the 2007 Canada–Ontario Agreement, the Ontario Pesticide Education Program at the University of Guelph Ridgetown Campus again facilitated the survey of pesticide use by farmers. Ontario is one of the few provinces in Canada that collects this information. The ministry uses information generated from the survey to support research projects geared toward pesticide reduction and integrated pest management (IPM). IPM is an ecological approach to reducing pesticide use while managing pest populations at an acceptable level. This work will ultimately benefit Ontario growers as well as the Great Lakes Basin.

CHILDREN'S ENVIRONMENTAL HEALTH WORKSHOPS

Understanding the link between the environment and the health, development and well-being of children from conception through adolescence was the focus of a series of environmental health workshops held across Ontario in 2009.

The Canadian Institute of Child Health, in an initiative supported by the Ontario Ministry of the Environment, delivered five professional training workshops for physicians and health professionals on children's health and the environment. These one-day workshops, open to all health professionals, looked at a range of topics, including:

- the special vulnerabilities of children to environmental contaminants;
- health effects of indoor and outdoor air;
- water-related diseases in children;
- cancer and non-cancer effects of pesticides; and
- health effects of climate change.

The workshops were intended to help the Ontario medical community recognize and respond to environmental health issues in children. Fourteen physicians and health professionals with expertise in different areas of environmental health contributed to the development of workshop materials.

The first workshop was held in Thunder Bay in February 2009, with additional sessions across Ontario in the spring of 2009 in Hamilton, Kingston, Toronto and Windsor.

THE GREAT LAKES PUBLIC HEALTH NETWORK

Canada and Ontario are committed to establishing a public health network in the Great Lakes Basin to facilitate information sharing on environmental health issues between federal and provincial governments and Ontario public health units.

Health Canada and the Ontario Ministry of Health and Long-term Care worked closely on a grassroots development process involving all Ontario public health units and Medical Officers of Health.

Officially launched in November 2005, the Great Lakes Public Health Network (GLPHN) now boasts membership from all 37 public health units, as well as key federal departments and provincial ministries.

To date, the GLPHN has tackled environmental health issues ranging from fish consumption and beach closings to air pollution and climate change. Regular teleconference calls feature the latest peer-reviewed science and provide an opportunity to share best practices. In 2008, the GLPHN hosted its first workshop for public health professionals on perceptions of risk, followed by a second in 2009 on risk assessment.

Future plans for the network include additional workshops and interactive web-based seminars, or "webinars." Perhaps more exciting though, is the realization of a long-term goal to link the GLPHN with its U.S. counterpart, the Great Lakes Human Health Network, thus expanding our forum to include all the Great Lakes states and their agencies. This new forum will be known as the Environmental Public Health Network.

Dealing with lakewide issues

Along with chemical and area-specific environmental challenges, Canada and Ontario also deal with problems found across the lakes, like invasive species and habitat destruction. Under the Canada–Ontario Agreement, scientists use an ecosystem approach in dealing with these issues, meaning that they consider all aspects of the Great Lakes environment and how they are connected.

Federal, state and provincial agencies in Canada and the U.S. work together with conservation authorities, municipalities, environmental groups and others to develop plans to restore and protect each lake.

GREAT LAKES INVADERS

The health of the Great Lakes ecosystem is under threat, and the culprits are non-native fish, plants and tiny water-borne organisms.

These creatures can cause ecosystem changes by out-competing native organisms for food and habitat space. The end result is the decline of the health and abundance of native plants, fishes and invertebrates, which may in turn impact the recreational commercial fisheries, tourism and overall quality of life for people living in the Great Lakes Basin.

When it comes to dealing with aquatic invasive species, prevention is the best approach. In Canada, regulations in effect since 2006 help prevent infiltration of aquatic invasive species from the most significant source in the Great Lakes—ships' ballast water.

Vessels without full cargo shipments use ballast water for stabilization. The threat to the lakes can happen if aquatic invasive species from foreign ports survive the long-distance transport and are then discharged into local waters. Ballast water is assumed to be responsible for 55–65 percent of recorded aquatic invasions in the Great Lakes since the opening of the St. Lawrence

Seaway in 1959. Transoceanic vessels from foreign ports discharge approximately 600 000 tonnes of ballast water into the Great Lakes each year.

After consultation with industry, U.S. counterparts and environmental groups, Canada passed legislation to control the spread of aquatic invasive species coming from the ballast water of transoceanic ships. As of 2006, all vessels entering waters under Canadian jurisdiction from outside Canada's Exclusive Economic Zone must exchange the contents of their ballast tanks while at sea, thereby taking on salt water, which is toxic to organisms that could thrive if released into the Great Lakes. All ships entering the Great Lakes are inspected by a joint enforcement team of inspectors from Transport Canada, the United States Coast Guard, and the Canadian and U.S. Seaway authorities, to ensure compliance.



Credit: Fisheries and Oceans Canada

Dr. Nazmul Haq, a sample preparation technician with Fisheries and Oceans Canada in Burlington, Ontario, demonstrates the features of the FlowCAM®. This new technology will facilitate the identification and count of phytoplankton and zooplankton in ballast water. The specialized equipment can classify different organisms according to various parameters in rapid time—quite the challenge when the size of the organisms is being measured in microns (one-millionth of a metre).

NEW TECHNOLOGIES UNDER THE MICROSCOPE

Traditional methods for sampling and analyzing ballast water are difficult and extremely time consuming. Transport Canada and Fisheries and Oceans Canada are working together to test new technologies for automated assessment of microscopic organisms in ballast water.

The high-tech equipment includes a high-resolution laser optical plankton counter and a FlowCAM, a specialized microscope with an automatic digital camera. Sarah Bailey, Research Scientist with Fisheries and Oceans Canada, is leading the team which will develop standard methods for this equipment. This research will allow Canada to quickly confirm that ballast water has been treated before discharge, resulting in increased protection of the Great Lakes ecosystem.



Becky Cudmore, Manager of the Centre of Expertise for Aquatic Risk Assessment at Fisheries and Oceans Canada, poses with Grass Carp, a species of Asian Carp.

Credit: Fisheries and Oceans Canada

MANAGING AQUATIC INVASIVE SPECIES IN THE GREAT LAKES

Aquatic invasive species have already been responsible for significant devastation of some native fish species and fisheries in Canada. Annually, the problem is responsible for billions of dollars in lost revenue and control measures. Two examples relating to the Great Lakes:

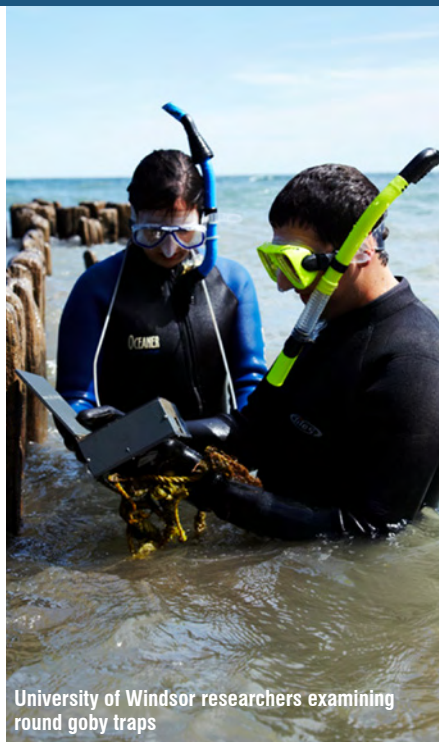
- Canada has played a significant role in the successful management of invasive sea lampreys in the Great Lakes, without which populations of lake trout and other native fish species would have been destroyed. This ongoing program is administered by the Great Lakes Fishery Commission, which was established by the federal governments of Canada and the United States in 1955, and is crucial in protecting a fishery worth an estimated \$7 billion. For more information, visit: www.glfc.org.
- Asian carp have aggressively infested several U.S. waterways. Migration of Asian carp from the Mississippi River Basin into the Great Lakes would constitute a significant long-term threat to the Great Lakes ecosystem. There are concerns that Asian carp will enter the Great Lakes through the Chicago Sanitary and Ship Canal (CSSC). Fisheries and Oceans Canada recently participated in a very direct and practical way in the control activities in the CSSC in the vicinity of the electrical barriers, from November 30–December 5, 2009. Fisheries and Oceans Canada led an 18-member fully equipped team that provided on-the-ground technical expertise that assisted in the efforts to prevent Asian carp from passing through the canal during the deactivation of an electrical barrier for maintenance work.

LURING THE ALLURING ROUND GOBY

Round Gobies looking for mates should start thinking about doing some background checks before they accept any invitations. Their next partner could be a researcher with a trap.

Researchers with the University of Windsor's biological sciences department are having a close look at the mating signals of the Round Goby, a small, prolific aquatic invader that feeds hungrily on the eggs and fry of many native Great Lakes fish species. Researchers hope that by understanding the process and patterns of attraction in the Round Goby, they can develop a way to lure and trap this fish, to prevent it from further invasion of the Great Lakes Basin streams and rivers.

But how does the male Round Goby attract the female? The team at the University of Windsor is looking at the chemical attraction that occurs in the mating process. The researchers believe that to attract females, the males secrete pheromones (chemical compounds), a sort of smell, into the water. In addition



University of Windsor researchers examining round goby traps

Credit: MNR-2007 COA/Jason Mortlock

to smell, researchers have also discovered that male gobies let out a series of "grunt-like" sounds to attract their mates.

With this information in hand, researchers believe they have the foundation for developing Round Goby traps that could be used to limit the spread of this fish up rivers and streams. This research will help Great Lakes managers develop future strategies for controlling this invasive fish. Female Round Gobies

beware: that alluring smell and seductive grunt may not be what you think it is.

The University of Windsor research team is working in partnership with the National Science and Engineering Research Council, the Canadian Aquatic Invasive Species Network and the Ontario Ministry of Natural Resources.

GETTING TO THE BOTTOM OF STINKY BEACHES

If you love your local beach but you've noticed that it's not always safe or pleasant to swim there because of the algae and odour, you're probably wondering what's going on. And you're not alone.

Scientists on both sides of the border are working together to



Lake Ontario, 2007

Credit: Ontario Ministry of the Environment

understand the unique environmental challenges of the nearshore zone of the Great Lakes and are focusing their efforts this year and next on Lake Ontario and Lake Erie. This area, within 5–10 kilometres of shore, is going through significant ecological changes as a result of invasive species like zebra and quagga mussels.

The result seems to be a dramatic increase in algal blooms and shore-fouling and a decline in the quality of water. All of these things can lead to an unpleasant beach experience in some areas due to the presence of rotting, unsightly and stinking algae.

Canada and Ontario, together with local governments, farmers

and other landowners are taking action to reduce nutrient discharges to the Great Lakes which are responsible for excess algae growth.

However, scientists need to understand what is going on before lake managers can make decisions about further measures to deal with these problems. That is why the Ontario Ministry of the Environment, Environment Canada, the U.S. government and academic partners on both sides of the border conducted binational collaborative research and monitoring of Lake Ontario in 2008.

The study looked at the sources and movement of nutrients in the

nearshore area and the effects they are having on water quality, as well as looking at the role of quagga and zebra mussels in that process. Intensive field studies in 2008 were conducted in four areas on the Canadian side of the lake, and at three areas on the U.S. side.

The Lake Ontario study is a collaboration between the Ontario Ministry of the Environment, Environment Canada, Toronto Region Conservation Authority (assisted by other Lake Ontario conservation authorities), City of Toronto and University of Waterloo. These parties participated in the study design and field studies in the Canadian portion of the study.

HUMANITY FOR HABITAT – BUILDING BIODIVERSITY IN THE GREAT LAKES

Habitat destruction and aquatic invasive species have taken a toll on some of our native Great Lakes fish species. The good news is that the Ontario Ministry of Natural Resources is working together with many people and organizations to do something about it. Here is a sample of the more than 30 rehabilitation projects currently on the go:

- In the eastern basin of Lake Ontario and along the St. Lawrence River, many levels of government, hydro generation companies and members of commercial fisheries associations are releasing young American Eels caught in the Atlantic Ocean to increase what used to be a thriving population.
- Around Toronto, more than 50 partners are working together to rejuvenate habitat and stock for more than one million young Atlantic Salmon. The goal? To help Ontario's only native salmon make a comeback in three prime coldwater tributaries of Lake Ontario.
- At the west end of Lake Erie, the U.S., Canadian and Ontario governments pooled funding to build a 150-metre-long artificial spawning bed off the shoreline near Windsor to help the Lake Sturgeon return to the Detroit River.
- In Lake Huron's Moon River near Parry Sound, 1100 tonnes of rock make up 1500 square metres of new spawning habitat for Walleye and Lake Sturgeon. Researchers are also assessing the condition of existing Walleye spawning beds at various locations from Parry Sound to Severn Sound.
- In Lake Superior, the Ontario Ministry of Natural Resources and partners radio-tagged more than 1000 Brook Trout, Walleye and Lake Sturgeon to study fish movement, the condition of spawning beds and the health of native fish populations in a variety of tributaries. The ministry is also studying adult Lake Sturgeon in a Thunder Bay tributary to determine how sturgeon respond to changes in water flow rates.

Rehabilitation projects like these help to protect the biological diversity of the Great Lakes Basin Ecosystem. In turn, biological diversity means basin residents can continue to rely on the lakes for their livelihoods and for the cultural and recreational benefits the lakes have to offer.



American Eel

Credit: Ontario Ministry of Natural Resources

MANITOULIN – A FISHERIES REHABILITATION ISLAND

Located in northern Lake Huron, Manitoulin, the world's largest freshwater island, has rediscovered the value of its coldwater streams, thanks to a partnership between private landowners and fisheries experts. The partnership, called Manitoulin Streams, is the largest community and landowner-supported fisheries restoration demonstration project ever conducted in northern Ontario.

Since 2003, Manitoulin Streams has helped complete 21 large-scale, in-stream and riverbank rehabilitation projects, primarily on private land.

In the past two years alone, workers have planted 3600 trees to create vegetative buffers along nearly 50 000 square metres of stream bank.

They have fenced 2000 metres of river bank to prevent cattle from crumbling stream banks and contaminating water.

Within streams, workers have placed boulders and spawning gravel, constructed islands and pools, and built almost 600 water flow control structures to create 3300 square metres of fish habitat.

The changes to Manitoulin Island's coldwater stream habitats have been dramatic. Six years ago, researchers were cataloguing eroded banks, degraded spawning areas and stretches of riverbank that needed vegetation. Today—and many restoration projects later—students from nearby colleges and universities are studying this area as a success story.

Manitoulin's coldwater streams and waterways are ideal spawning sites for Chinook and Coho Salmon and Rainbow Trout. On the island's south shore alone, 64 kilometres of streams are accessible by salmon and trout that migrate up from Lake Huron to spawn.

Manitoulin Streams is a good example of how partnership works to protect the Great Lakes ecosystem—one reason why the program was given an award by the Canada-U.S. State of the (Great) Lakes Ecosystem Conference in 2008.

For more information, visit:
www.manitoulinstreams.com.

TORONTO WATERFRONT: NOT JUST PRIME REAL ESTATE FOR PEOPLE

More than 2500 square metres of new habitat along the Toronto waterfront was built in 2008 by Waterfront Toronto, a corporation committed to revitalizing Toronto's waterfront. Canada, Ontario and the City of Toronto jointly announced

their support for the creation of Waterfront Toronto (formerly Toronto Waterfront Revitalization Corporation) to oversee and lead waterfront renewal in the spring of 2007.

The new habitat, located at Spadina Head of Slip, includes the installation of concrete and river stone shoals, embankments around the perimeter of the slip, tree log and root habitat structures, and boulder clusters.

The end result is a safe and healthy habitat for Lake Ontario's fish. Similar installations elsewhere have resulted in increased populations of native fish species, including Northern Pike.

In 1985, Toronto's waterfront was identified as an Area of Concern as a result of poor water quality, contaminated sediments, loss of fish and wildlife species and their habitat, contamination in fish, and beach closures due to pollution. These environmental impacts were caused by historic industrialization and ongoing urbanization, essentially 200 years of environmental degradation.



Rootwad habitat feature being placed in Spadina Slip

Credit: Toronto and Region Conservation Authority

Aquatic Habitat Toronto's (AHT) implementation of the Toronto Waterfront Aquatic Habitat Restoration Strategy is integral to achieving Remedial Action Plan objectives and delisting Toronto as an Area of Concern.

Membership of AHT includes representatives from Fisheries and Oceans Canada, the Ontario Ministry of Natural Resources, Toronto and Region Conservation, and Waterfront Toronto, with key participants from Environment Canada and the Canadian Environmental Assessment Agency, working in consultation with the City of Toronto.

In 2008 AHT received an Award of Excellence for outstanding achievements at the 2008 Public Sector Quality Fair. The award acknowledges the group's collaborative approach to restoring the aquatic ecology of the Toronto Waterfront. For more information, visit: www.aquatichabitat.ca.

LAKE HURON-GEORGIAN BAY'S YOUTH AMBASSADORS AT LARGE

A weekend Youth Summit organized by Canada and Ontario in September 2009 (the third since 2007) inspired a group of grade 11 and 12 students to become Youth Ambassadors in the Lake Huron and Georgian Bay watershed.

The goal of the summit was to foster a community-based approach to restoring and protecting the lands and waters of the Lake Huron-Georgian Bay watershed through education, awareness and commitment.

The 30 grade 11 and 12 students who attended the summits learned about water quality, fish and wildlife resources, and the importance of local community action in the Lake Huron-Georgian Bay watershed. Students were armed with materials to help them become environmental ambassadors in their own communities.

Following the summit, local mentors provided guidance to students as

they prepare to make presentations to organizations and groups, including their local municipal councils.

The 2007 Youth Ambassadors wrote newspaper articles, led clean-up events, made presentations to local municipal councils and schools, and hosted five water festivals around the basin.

The summits are organized in support of the Lake Huron Binational Partnership, by Environment Canada in collaboration with the Ontario Ministries of the Environment, Natural Resources, and Agriculture, Food and Rural Affairs. The Lake Huron-Georgian Bay Youth Summit was held in the Huron County area in September 2009.

For more information on the Youth Summit/Youth Ambassadors Program and the Lake Huron-Georgian Bay Watershed Framework for Community Action, visit: www.lakehuroncommunityaction.ca.



High school students build a fence along the road in Killbear Provincial Park to prevent snakes from crossing the road (Youth Summit, October 2008)

Credit: Ontario Ministry of Natural Resources

FOR MORE INFORMATION ON COA/GREAT LAKES

Environment Canada:
www.ec.gc.ca/grandslacs-greatlakes

Department of Fisheries and Oceans:
www.dfo-mpo.gc.ca/regions/central/science/greatlakes-grandslacs/ndex-eng.htm

Ontario Ministry of the Environment:
ontario.ca/healthygreatlakes

Ontario Ministry of Natural Resources:
ontario.ca/greatlakes

Ontario Ministry of Agriculture, Food and Rural Affairs:
www.omafra.gov.on.ca/english/environment/facts/oglp_sum.htm

Health Canada:
www.hc-sc.gc.ca

Natural Resources Canada:
www.nrcan-rncan.gc.ca

Transport Canada:
www.tc.gc.ca

Agriculture and Agri-Food Canada:
www.agr.gc.ca

Parks Canada Agency:
www.pc.gc.ca



Near the tip of Long Point, along the north side of Lake Erie

Credit: Scott Gillingwater