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Welcome to **ACTION**. This newsletter features reports on community-based partnership projects that receive support from the Government of Canada's Great Lakes Sustainability Fund to clean up and restore Areas of Concern.

The Government of Canada is helping to restore water quality and environmental health in Canadian communities and to meet international commitments in the Canada–U.S. Great Lakes Water Quality Agreement of 2012.

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ACTION:

UPDATE ON GREAT LAKES AREAS OF CONCERN



Areas of Concern: These are hotspots where beneficial uses of the aquatic ecosystem are impaired. Of the 36 remaining Great Lakes Areas of Concern, 9 are in Canada and another 5 are shared with the United States.

Remedial Action Plans: Developed for each Area of Concern, these plans identify the challenges and priority actions needed to address them. Undertaking environmental restoration requires a large amount of scientific and technical expertise, local knowledge, and hard work. The governments of Canada and Ontario work together with local governments, Aboriginal communities, conservation authorities, industry, local citizens and other partners to develop and implement the plans.

For more information, please visit:
www.ec.gc.ca/raps

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WHAT IS THE GREAT LAKES SUSTAINABILITY FUND?

The Government of Canada established the Great Lakes Sustainability Fund (GLSF) to help restore water quality and ecosystem health in Canadian Areas of Concern (AOCs). GLSF projects are funded and implemented in partnership with other agencies, industry and local community stakeholders to advance the Remedial Action Plans that have been established in all of Canada's remaining AOCs.

Through the GLSF, Environment Canada provides technical and financial support (up to one third of the total cost) to projects that focus on implementing remedial actions in three priority areas:

- **fish and wildlife habitat rehabilitation and stewardship;**
- **contaminated sediment assessment and remediation; and**
- **innovative approaches to improving municipal wastewater effluent quality.**

Emphasis is placed on meeting the goals that are set under the Canada–Ontario Agreement on Great Lakes Water Quality and Ecosystem Health, 2014 and commitments under the 2012 Great Lakes Water Quality Agreement between Canada and the United States.

If you have an idea for a restoration project in an AOC or would like more information about the GLSF, please visit www.ec.gc.ca/raps-pas or contact the GLSF team at glsf@ec.gc.ca.



THUNDER BAY AREA OF CONCERN

Tracking the Seasonal Movements of Walleye: Kaministiquia River, Thunder Bay

2010–2011 to 2012–2013

Funding: \$120,000 over three years, including \$40,000 provided by the Great Lakes Sustainability Fund

Partners in the project are the Ontario Ministry of Natural Resources and Forestry, and Ontario Power Generation.

A project supported by the Great Lakes Sustainability Fund is using innovative technology to gain insight into the seasonal movement patterns of walleye, an important sportfish, to determine if they are affected by effluent from a large pulp and paper mill on the Thunder Bay waterfront.

The Thunder Bay Area of Concern extends about 28 kilometres along the shoreline of Lake Superior and up to 9 kilometres offshore from the City of Thunder Bay. The Area of Concern's watershed is drained by the Kaministiquia River system and a number of smaller rivers and creeks. The area supports both commercial and sport fisheries. Thunder Bay is one of Canada's largest freshwater shipping ports, and it is the largest community on Lake Superior. Environmental concerns in the Area of Concern have focused on the water quality impacts of industrial and urban development along the Thunder Bay waterfront and adjoining tributaries. Over the years, industrialization, dredging, waste disposal, channelization and the release of pollutants have eliminated quality fish and bird habitat along the waterfront. While improved effluent treatment and changes in industrial processes have significantly reduced impacts in recent years, environmental challenges remain.

The project set out to document the location and movement patterns of adult walleye within the Kaministiquia River through different seasons. Using transmitters implanted into more than 20 walleye, investigators were able to track the fish movements through sound wave signals. The data provided key information on the fish population's critical habitats and migration routes. The data will enable project partners to determine whether treatment improvements at the mill have reduced barriers to fish migration.

Preliminary analysis suggests that the walleye frequently moved through areas where effluent is discharged from the mill. A period of reduced movement was observed during the spawning season and the month of August. However, both of these periods of reduced movement are a reflection of natural patterns related to habitat use, rather than avoiding discharged effluent. These findings suggest that the occasional barriers to fish movement that formerly existed due to pulp mill effluent discharge are no longer a factor for walleye in Thunder Bay.

Photo: © Environment Canada



For more information on the Thunder Bay Area of Concern, please visit:
<http://infosuperior.com/thunder-bay>

DETROIT RIVER AREA OF CONCERN

Creating and Restoring Fish and Wildlife Habitat: Detroit River and Its Tributaries

2012–2013 Funding:

\$274,500 total, including \$90,000
provided by the Great Lakes
Sustainability Fund

Partners in the project are
the Essex Region Conservation
Authority, landowners and Ontario
Power Generation.

For more information on the Detroit
River Area of Concern, please visit:
www.detroitriver.ca



Photo: © Environment Canada

More than three hectares of wildlife habitat created at the Windsor Airport Lands are supporting the recovery of wildlife in the Detroit Area of Concern, under a project supported by the Great Lakes Sustainability Fund. The newly created habitat now connects two provincially significant wetlands, establishing a wildlife corridor that will support biodiversity. Fish and wildlife populations in the Area of Concern have declined as a result of habitat loss due to historical industrialization and ongoing urban and agricultural development.

This project supports the Essex Region Conservation Authority's Biodiversity Conservation Strategy, which helps to identify opportunities to restore and create priority habitat in watersheds of the Detroit River. These watersheds include the Little River, Turkey Creek and the Canard River. Project partners work with landowners to support the creation of wetlands, forests and shoreline habitat that will then increase biodiversity.

In 2012, more than 12 hectares of Carolinian forest and wetland habitat were created at 6 locations in the area: 3 in Amherstburg and 1 each in Windsor, Essex and Kingsville. Carolinian habitat is a unique ecosystem zone that supports a great diversity of habitat and species, found in Canada only in southwestern Ontario. Follow-up surveys are helping to assess the extent to which the new habitat is attracting fish and wildlife, as well as to measure the effectiveness of various public outreach activities.

ST. CLAIR RIVER AREA OF CONCERN

Converting Farmland to Habitat in a Rare Canadian Ecosystem: Bowens Creek

2012–2013 Funding:

\$1,716,045 total, including \$46,000
provided by the Great Lakes
Sustainability Fund

Partners in the project are Lambton
County, Ducks Unlimited Canada, the
RBC Foundation, the St. Clair Region
Conservation Authority, Trees Ontario,
Shell Fueling Change and Friends
of the St. Clair River.

Former farmland near the St. Clair River is being converted back to wetlands and forest to support fish and wildlife in a rare Canadian ecosystem, with the support of the Great Lakes Sustainability Fund.

The St. Clair River Area of Concern covers about 335 000 hectares on both sides of the Canada–U.S. border, including the river, its delta channels and its immediate drainage basin. The wetlands and shallow open waters of the lower St. Clair River and Lake St. Clair provide important habitat for many fish and wildlife species and are considered some of the most important wetland areas in the Great Lakes basin. For many years, the river has been subject to industrial activity and agricultural development in its drainage basin, which have led to a loss of fish and wildlife habitats and populations.

The Bowens Creek Habitat Enhancement Project is located on public lands owned by the County of Lambton in St. Clair Township, within a kilometre of the St. Clair River. Historically, the area was a wetland but was drained many years ago and used for agricultural purposes.

The property is in a Carolinian Canada site, a rare ecosystem type in Canada, similar in its diverse flora and fauna to regions in the southeastern United States. The area's wet prairie and mature deciduous forest provide habitat for more than 15 locally rare Carolinian flora and fauna, including the Riddell's Goldenrod, the Shumard Oak, the Hooded Warbler, the Climbing Prairie Rose and several reptile species. As well, the project site is located where the Atlantic and Mississippi waterfowl migration corridors merge, and it provides excellent resting and feeding habitat for migrating waterfowl.

The project started in 2011, with about 20 hectares of agricultural land pulled out of production to help establish about 8 hectares of restored wetlands. Within months, hundreds of waterfowl were using the site. Over the next 3 years, project partners plan to create about 50 hectares of wetlands and forest habitat for wildlife, using native trees, shrubs and tall prairie grasses.

Photo: © Environment Canada

For more information on the
St. Clair River Area of Concern,
please visit: www.friendsofstclair.ca/
www/index.html





Photo: © Environment Canada

NIAGARA RIVER AREA OF CONCERN

Reducing Runoff to Improve Water Quality and Protect Habitat: Welland River

2012–2013 Funding:

\$835,369 total, including \$245,000 provided by the Great Lakes Sustainability Fund

Partners in the project are private landowners, the Niagara Peninsula Conservation Authority, the Regional Municipality of Niagara, the Ontario Ministry of the Environment and Climate Change, the Ontario Ministry of Natural Resources and Forestry, the Ontario Ministry of Agriculture, Food and Rural Affairs, the Agricultural Producers Group, Landcare Niagara, Ducks Unlimited Canada, Ontario Power Generation, and the Association of Canadian Educators.

The Water Quality and Habitat Improvement Project, part of the Niagara Peninsula Conservation Authority's ongoing watershed stewardship program, is seeking to reduce runoff of phosphorus, sediments and manure from a range of agricultural operations. These discharges contribute to declines in water quality and fish and wildlife habitat in the Niagara River Area of Concern. Most of the runoff from rural areas is concentrated in the Welland River watershed, which makes up about 80% of the Canadian Section of the Niagara River Area of Concern.

In 2012, 14 initiatives were undertaken on 11 properties in the watershed. Working with owners committed to improving the environmental impact of their operations, project partners targeted 3 creeks that have been identified as high priorities for reducing phosphorus runoff. Initiatives included:

- planting trees and other vegetation along nearly one kilometre of creek banks to act as a buffer for runoff;
- restoring about four hectares of small wetlands; and
- helping to build two manure waste storage facilities to enclose the manure and prevent it from entering the creeks during heavy rains.

Project partners also engaged owners of two greenhouses and worked with them to introduce wastewater diversion and water conservation projects within their greenhouse operations. These efforts will help reduce runoff of fertilizer-based phosphorus.

Finally, ongoing monitoring of the water quality of the Welland River and other tributaries entering the Niagara River is allowing project partners to measure progress and target future priority areas for reducing runoff.

For more information on the Niagara River Area of Concern, please visit:
www.npca.ca/watershed-management/niagara-river-remedial-action-plan

HAMILTON HARBOUR AREA OF CONCERN

Restoring One of Canada's Biologically Richest Locations: Cootes Paradise Marsh

2012–2013 Funding:

\$2,279,981 total, including \$125,000 provided by the Great Lakes Sustainability Fund

Partners in the project are the Ontario Ministry of the Environment and Climate Change, the Royal Botanical Gardens, ArcelorMittal Dofasco, the R. Howard Webster Foundation, the Hamilton Harbour Remedial Action Plan Office, the Bay Area Restoration Council, the City of Hamilton, the City of Burlington, and private donors.

For more information on the Hamilton Harbour Area of Concern, please visit:
www.hamiltonharbour.ca/rap

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Canada's largest botanical garden is undertaking an ambitious long-term effort to restore its once biologically rich wetlands and shoreline habitats, thanks in part to support from the Great Lakes Sustainability Fund.

The Royal Botanical Gardens is internationally known for its display gardens. It also has extensive marshlands in the 250-hectare Cootes Paradise marsh—one of the most biologically diverse locations in Canada—and lower Grindstone Creek, which flow into Hamilton Harbour in western Lake Ontario. Historically, these marshlands were prime fish nurseries and migratory bird staging areas in western Lake Ontario. By 1980, however, these sanctuaries had completely collapsed, largely devoid of plants and no longer capable of serving as productive habitat for fish and bird species. Key factors in this decline included poor water quality due to the inflow of excessive nutrients and sediments; excessive algae growth resulting from runoffs of fertilizers and urban wastewater; the impacts of non-native fish species, particularly the common carp; and fluctuations of water levels from Lake Ontario water-level controls.

Project Paradise was launched in 1993 as a component of the Hamilton Harbour Remedial Action Plan to address all of these factors, with the long-term goal of having habitats naturally regenerate and become self-sustaining. The initiative includes a wide variety of conservation projects, but the overall success of the project depends on significantly reducing the presence of carp in the wetlands. First introduced into the region in the late 1800s in fish hatcheries, carp had, by the 1930s, become by far the dominant species throughout the Botanical Gardens marshlands. The bottom-feeding and spawning actions of carp can uproot and crush aquatic plants and reduce water quality.

Carp barriers are typically a set of vertical bars about 12.5 cm apart that restrict the species from entering an area while allowing other species to pass through. They have been established at several locations in the wetlands complex. The Cootes Paradise fishway is the first two-way fishway/carp barrier structure on the Great Lakes and an important site for public education and outreach efforts.

At the same time, native plant species, including cattails, waterlilies and wild rice, have been planted as part of the restoration efforts. Turtle nesting habitat has been re-established in one bay by removing woody invasive species that were shading the site and by mixing up hardened soil to make nesting easier for the turtles. And for all of its long-term focus, the project has had some exciting immediate results, too: in March 2013, a pair of Bald Eagles that had arrived in 2008 successfully hatched young, the first time in more than 50 years that eaglets have hatched on the Canadian shoreline of Lake Ontario.

Photo: © Environment Canada

