

THE NIAGARA RIVER MUSSEL BIOMONITORING PROGRAM: 1983- 2009



Mussels found in Great Lakes

The Ontario Ministry of the Environment has monitored the concentrations of contaminants in mussel (*Elliptio complanata*) tissue and bottom sediments at sites in the Niagara River since 1983. This monitoring program documents the improving water quality conditions in the Niagara River with respect to concentrations of organic contaminants, including chlorinated benzenes, pesticides, Mirex, and industrial chemicals. The length of the data set (26 years) and consistency of approach used over time have made the program an instrumental contributor to documenting the effectiveness of remedial actions to address sources of toxic chemicals to the Niagara River. Results from Canadian sites and 5 U.S. sites published in the Journal of Great Lakes Research show that remedial actions have reduced the magnitude of the contaminant inputs to the river. The data is supported by contaminant data generated by Ontario and the State of New York that shows decreasing trends for juvenile fish and sport fish, between the 1980s to the present. The mussel biomonitoring program will continue to be a critical component of the Niagara River Toxics Management Plan.

For further information: <http://www.npca.ca> or *Journal of Great Lakes Research* 37, 2011, p.213-225.

QUEEN’S ROYAL BEACH: NEW RESEARCH



Queen’s Royal Beach

There are three public swimming beaches within the Niagara River AOC. The Queen’s Royal Beach in Niagara-on-the-Lake, at the mouth of the Niagara River, is the only one where water quality problems result in frequent beach postings. It is one of the 26 beaches that Niagara Region Public Health routinely tests for bacterial contamination. At an all-day technical workshop held during the Great Lakes & St. Lawrence Cities Initiative 2011 Annual Meeting and Conference (June 15-17 in Niagara Falls, Ontario), Dr. Tom Edge (Environment Canada) reported that Queen’s Royal Beach has one of the highest levels of water quality impairment in the Niagara Region. Further work is underway to determine the source of the problem, and identify a solution.

For further information: <http://www.niagararegion.ca/living/water/beaches/default.aspx>

Beyond the Niagara River AOC’s Remedial Action Plan

The goal of RAPs is to restore degraded conditions in an Area of Concern to a comparable level with its surroundings. It is important to note that there are other programs in place that will continue to improve and protect water quality and fish and wildlife habitat once the work of a RAP is completed and an AOC has been delisted.

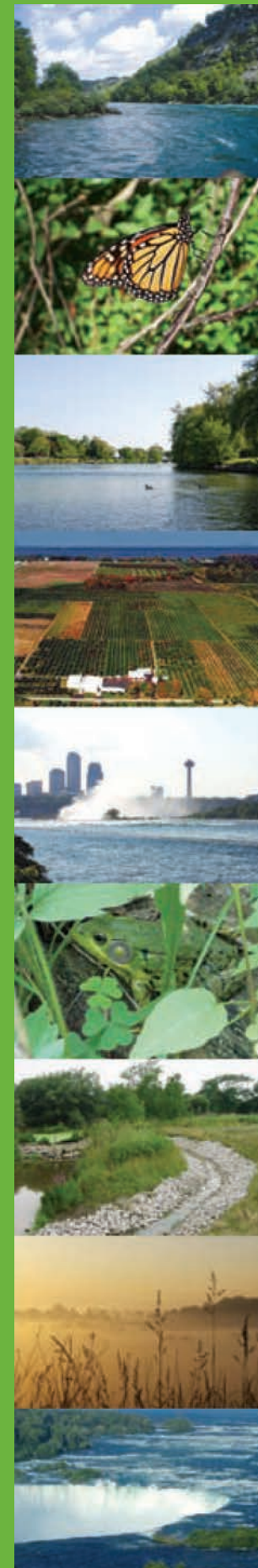
In Niagara these programs include:

- The Lake Ontario and Lake Erie Lakewide Management Plans
- The Niagara Natural Heritage System project
- Land use planning under the Provincial Policy Statement, Places to Grow, and Greenbelt Species at Risk legislation
- Habitat restoration programs supported by the Niagara Peninsula Conservation Authority, Niagara Restoration Council, Land Care Niagara, Ontario Power Generation, and other private, government, and community organizations

For further information on any of the topics in this newsletter contact:

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To obtain copies of the Niagara River (Ontario) RAP documents please visit: www.npca.ca/watershed-management/niagara-river-remedial-action-plan/



What is the Great Lakes Area of Concern?

There are a number of environmental hotspots around the Great Lakes as a result of historical pollution. Area of Concern (AOC) is the term used to identify those hotspots where the environment has been harmed to the point that it affects use and enjoyment of the water. In 1987, the government of Canada and the United States identified 43 of these Areas of Concern. Twelve are Canadian and five are shared between Canada and the United States.

Remedial Action Plans were developed and are being implemented to restore each of these AOCs. The plans follow a dynamic three stage process which includes the identification of environmental issues, also known as beneficial use impairments. There are 14 impairments which may be considered in each AOC. The beneficial use impairments identified in an AOC must be addressed before it can be delisted (i.e. removed from the list of AOCs). Three (as of 2010) of the Canadian AOCs have been delisted.

Niagara River Area of Concern

The 58 km long Niagara River is the major waterway linking Lake Erie and Lake Ontario. The river was designated an AOC on both the Canadian and American sides but these areas are being managed separately. The Niagara River (Ontario) AOC extends along the entire length of the Canadian side of the Niagara River (including Niagara Falls) and also includes the Welland River Watershed (which makes up 80% of its area).



Niagara River (Ontario) AOC Boundaries

Canada – Ontario Agreement Respecting the Great Lakes Basin (COA)

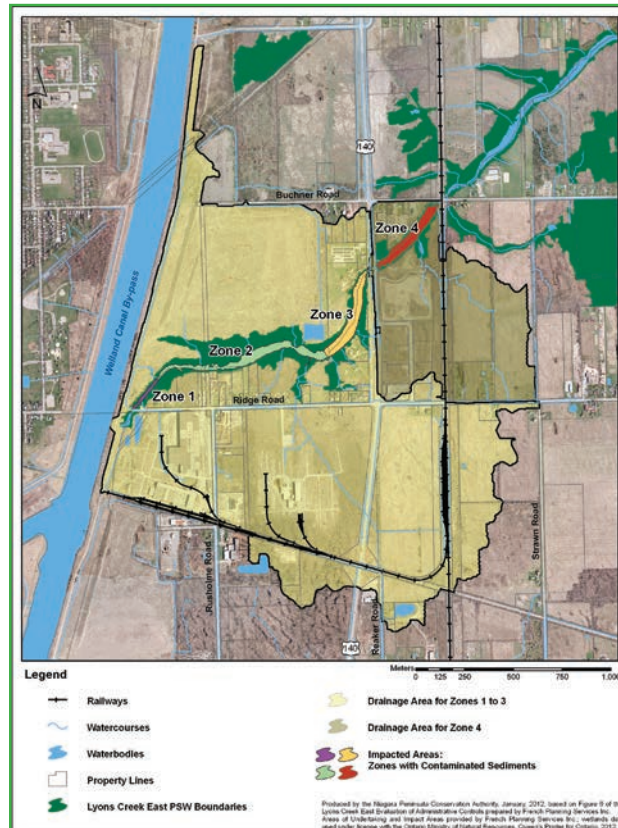
Since 1971 the Canadian Federal and Provincial governments have worked together on Great Lakes issues, co-ordinating their programs and activities. The roles and responsibilities of each government are outlined in the Canada-Ontario Agreement (COA) Respecting the Great Lakes Basin. Over the past forty years the COA has been updated several times. The current Canada-Ontario Agreement is in effect until June 2012 and builds on the actions taken through previous COA agreements.

The 2007-2010 COA Progress Report documents the research, implementation, monitoring and reporting deliverables, accomplishments, and challenges. Partnerships are key to its success. The list of COA partners is extensive and includes municipal governments, landowners, conservation authorities, Aboriginal peoples, industry, academia, non-governmental organizations, U.S. partners, and many other individuals across the Great Lakes Basin.

For further details: www.ec.gc.ca

Meeting Niagara River RAP Deliverables

LYONS CREEK EAST: MONITORED NATURAL RECOVERY OF CONTAMINATED SEDIMENTS



Historically, contaminated sediment was a significant factor contributing to the environmental problems in the Niagara River AOC, as it directly affects the water quality and beneficial uses. For example, sediment contamination can lead to fish consumption restrictions.

Lyons Creek East a tributary to the Welland River, which drains to the Niagara River. Lyons Creek East was identified in the Niagara River RAP process as an area with contaminated sediment issues, mainly polychlorinated biphenyl (PCB).

Extensive studies, assessments, and public engagement were undertaken in Lyons Creek East to address this issue. Based on community input and scientific studies, it was decided that a monitored natural recovery process was the most suitable approach to manage PCB contaminated sediment in Lyons Creek East. This approach

would ensure that the sediments were not disturbed in order to protect the species and habitat associated with this Provincially Significant Wetland area.

A unique environmental stewardship strategy is now in place for this stretch of Lyons Creek East and the surrounding drainage area, i.e. the section between the Welland Canal and the Buchner Street/ CN Railway Crossing in Welland. This approach allows for the natural process of fresh river sediment to cover the contaminated sediment. A monitoring program is being developed to periodically assess the natural recovery of the creek. Administrative Controls (Planning and Approval Framework) was established to prevent disturbance of the contaminated sediment by limiting activities that would be likely to disrupt the area.

Lyons Creek East is one of the sites in Ontario which is currently implementing a Monitored Natural Recovery Administrative Controls Protocol. The Niagara Peninsula Conservation Authority (NPCA) has agreed to act as the lead coordinating agency for this multi-stakeholder approach.

For further information: <http://www.npca.ca/planning-permits/lyons-creek-east/>

RESTORING AND PROTECTING FISH AND WILDLIFE HABITAT

Restoring and protecting fish and wildlife habitat, including unique habitats rarely found in other parts of the Great Lakes basin, has been a long standing priority of the Niagara River RAP.

The RAP Coordinating Team hosted a Fish and Wildlife Habitat Workshop in March 2011. The purpose of the workshop was to determine what issues remain and what actions need to be completed to address habitat issues associated with poor water quality in the AOC. The goal of RAPs is to restore degraded conditions in an AOC to a comparable level with its surroundings.

Representatives from local environmental agencies and organizations, including some from New York State were invited. Participants were engaged in a Geographic Information System (GIS) exercise, using data collected through the NPCA's Natural Areas Inventory. Landscape analyses for wetland, woodland, and riparian habitats were generated and compared to reference areas outside the AOC. The result of this analysis confirmed that habitat conditions outside of the AOC were comparable to that within the AOC. Habitat degradation and fragmentation is still an issue, but the situation in the AOC is not any worse than outside the AOC. Restoration work will continue through the various agencies and programs but the habitat work of the RAP is nearing completion.

WELLAND RIVER EUTROPHICATION STUDY - INVESTIGATING NUTRIENT ISSUES

Determining sources of nutrients causing eutrophication (high nutrients – low oxygen) in the Niagara River and its tributaries has been a priority of the RAP. In order to address this issue as it affects the Welland River, the NPCA coordinated the 3-year Welland River Eutrophication Study (2008-2010) in partnership with the City of Welland, Environment Canada (EC), Ontario Ministry of the Environment (MOE), Ontario Ministry of Natural Resources (MNR), and the Regional Municipality of Niagara (RMN).

The study involved extensive water quality monitoring to identify sources of nutrients and nutrient loads (amounts). It makes several observations and recommendations that will be considered in an effort to develop a nutrient/phosphorus reduction strategy for the Welland River watershed.

There are already projects and programs in place dealing with high nutrient levels in the Welland River watershed, including:

- The NPCA's Water Quality and Habitat Improvement Program, which supports the private landowner through cost share grants, to improve water quality. Typical projects include fencing to keep livestock out of creeks, manure storages to prevent runoff, windbreaks to prevent soil loss from fields, wetland restoration, and woodland restoration;
- Regional and municipal infrastructure capital programs that include ongoing sanitary/storm sewer separation in the City of Welland to reduce bypasses at the Water Pollution Control Plant;
- The City of Welland's new Official Plan incorporates RAP supported policies for urban stormwater runoff, reduction of combined sewer overflows, etc.