



Detroit River Area of Concern

Canadian Section

Status of Beneficial Use Impairments

September 2010

The Detroit River is a major navigation corridor of the Great Lakes, extending 51 km from Lake St. Clair to Lake Erie. Its watershed, which covers about 2000 km² (200 000 ha) on both sides of the international boundary, is home to more than five million people. The major population centres in the area are the cities of Detroit, Michigan, one of the busiest ports in the Great Lakes, and Windsor, Ontario.

For decades, the watershed of the Detroit River Area of Concern has been subject to extensive industrial activity, agricultural practices and urban development. Nearly 100 communities rely on the river as a source of drinking water, and 76 industries and 10 municipalities discharge wastewater into the river or its tributaries. As a result of this extensive development, the Detroit River is the single largest source of contaminants released to Lake Erie. Combined sewer overflows, sanitary sewer overflows and municipal and industrial discharges are major sources of contaminants. Other sources of contaminants include stormwater runoff into tributaries in Michigan within the watershed and runoff and discharges from sites on both sides of the border upstream of the river.



PARTNERSHIPS IN ENVIRONMENTAL PROTECTION

The Detroit River was designated an Area of Concern in 1987 under the Canada–United States Great Lakes Water Quality Agreement. Areas of Concern are sites on the Great Lakes system where environmental quality is significantly degraded and beneficial uses are impaired. Currently, there are 9 such designated areas on the Canadian side of the Great Lakes, 25 in the United States, and 5 (including the Detroit River) that are shared by both countries. In each Area of Concern, government, community and industry partners are undertaking a coordinated effort to restore environmental quality and beneficial uses through a remedial action plan.

Remedial Action Plan Partners

Responsibility for the Detroit River Area of Concern is shared jointly by both Canada and the United States. In 1998, Environment Canada, the U.S. Environmental Protection Agency, the Ontario Ministry of the Environment and the Michigan Department of Environmental Quality (now the Department of Natural Resources and Environment) signed the Four Agency Letter of Commitment. The letter outlined agency roles and responsibilities during implementation of the remedial action plans for three binational Areas of Concern—the Detroit River, St. Clair River and St. Marys River.

Since 1998, the Detroit River Canadian Cleanup (DRCC) has served as the implementation group for the Canadian side of the Detroit River Area of Concern. The group, led by the Ontario Ministry of the Environment and Environment Canada, includes (in alphabetical order) representatives from the City of Windsor, the Essex County Stewardship Network, the Essex Region Conservation Authority, the Ontario Ministry of Natural Resources, the towns of Amherstburg and LaSalle, and the University of Windsor Great Lakes Institute for Environmental Research. Industry and several non-governmental organizations, including the Citizens Environment Alliance and the Essex County Field Naturalists Club, also have been involved in the implementation effort.

Remedial Action Plan Process

The Great Lakes Water Quality Agreement requires that remedial action plans be developed and implemented in three stages:

Stage 1: Identifying the Environmental Challenges

In Stage 1, the governments of Canada, Ontario, the United States and the State of Michigan, working with community stakeholders, undertook an extensive program of research and monitoring to assess environmental quality and identify the causes of degradation in the Area of Concern. The *Stage 1 Remedial Action Plan Report*, summarizing the outcome of these efforts, was completed in 1991. The report identified eight environmental challenges needing to be addressed and known as *beneficial use impairments* in the remedial action plan process.

Stage 2: Planning and Implementing Remedial Actions

In Stage 2, the governments of Canada and Ontario, working with the Detroit River Canadian Cleanup and community stakeholders, undertook a detailed consideration of potential remedial actions to restore, protect and monitor environmental quality in the Area of Concern. The draft binational *Stage 2 Remedial Action Plan Report*, which identified recommended remedial actions, was started in 1996, but never finalized and approved. The *Stage 2 Remedial Action Plan Report*, addressing only the Canadian side of the Area of Concern, was made available for public review and comment in late 2009. The report is to be finalized in 2010. The research required to develop these reports has provided evidence to re-designate the status of some of the beneficial uses. As a result, the *Detroit River Canadian Stage 2 Remedial Action Plan Report* proposes a total of 11 beneficial use impairments. Their current status is described below in **Progress on Environmental Challenges**.

Stage 3: Monitoring Actions and Delisting of the Area of Concern

The *Stage 3 Remedial Action Plan Report* and delisting of Detroit River as an Area of Concern will take place when monitoring confirms that the environmental challenges have been addressed successfully through the remedial actions. Completion of all priority actions is targeted for 2015. As of September 2010, there is no estimate of when the Detroit River will be delisted as an Area of Concern.



PROGRESS ON ENVIRONMENTAL CHALLENGES

The federal and provincial governments and partners have made significant progress in addressing environmental challenges in the Area of Concern. In addition to the specific actions summarized in the tables below, the partners have carried out a number of important actions that have addressed more than one environmental challenge. These cross-cutting initiatives have included implementing conservation tillage techniques on more than 15 000 ha of agricultural lands to reduce the runoff of nutrients, sediments and chemicals into local waterways; successful spawning of threatened or endangered fish species (Lake Sturgeon, Lake Whitefish, Walleye and Northern Madtom) through fish habitat creation at Fighting Island; and completing the final design of the City of Windsor's retention treatment basin, estimated at \$60 million, to reduce and treat combined sewer overflows and so reduce the discharge of pollutants into the Detroit River.

The major challenges remaining on the Canadian side include the construction of the City of Windsor's retention treatment basin (currently underway), which will eliminate 22 combined sewer overflows along the Windsor riverfront; the upgrade of the Amherstburg wastewater treatment plant (currently underway); and habitat restoration, with a focus on protecting and rehabilitating coastal wetlands, constructing fish spawning habitat, and carrying out shoreline naturalization projects. There also is a need for continued monitoring to track progress and better understand the causes of environmental degradation in the area. The *Stage 2 Remedial Action Plan Report* will guide future implementation, monitoring and public engagement efforts in the Canadian side of the Area of Concern.

Status of Beneficial Use Impairments

The tables below summarize, for each of the 11 beneficial use impairments in the Detroit River Area of Concern (Canadian section), their status as of September 2010; key actions taken by various partner agencies and organizations under the Remedial Action Plan; and future key actions planned by the partners as they work towards the full restoration of environmental quality and eventual delisting of the Area of Concern.

Status – IMPAIRED

Beach Closings

Status: *Impaired*

There are excessive posted advisories warning that bacterial levels (*E. coli*) exceed safe levels for swimming. In Ontario, provincial standards for *E. coli* were exceeded downstream of Little River, Turkey Creek and the Amherstburg wastewater treatment plant.

KEY ACTIONS

COMPLETED

- Reduced pollution from domestic sewage through \$110 million expansion and upgrade of the municipal wastewater treatment plant in Windsor
- Conducted beach monitoring at upstream and downstream beaches
- Conducted *E. coli* survey on both sides of the river (2008)

REMAINING

- Initiate monitoring of swimming areas within the Detroit River and compare to the beaches already being monitored upstream and downstream
- Complete the construction of the Windsor retention treatment basin, which will eliminate 22 combined sewer overflows along the Windsor waterfront
- Complete the upgrade of the Amherstburg wastewater treatment plant

Bird (or Other Animal) Deformities or Reproduction Problems

Status: *Impaired*

Although there has been a reduction in the severity of reproductive problems since the 1960s and 1970s, there is evidence that populations still are being affected to some degree. Bird or other animal deformities are not an issue.

KEY ACTIONS

COMPLETED

- Investigated impacts on reproductive viability of
 - Herring Gulls on Fighting Island
 - Black Crowned Night Herons in the Detroit River
 - Frog populations in Detroit River coastal wetlands
 - Snapping Turtles
- Conducted annual monitoring of Bald Eagle nesting
- Carried out remediation of contaminated sediments at Turkey Creek (Ontario)

REMAINING

- Complete frog population assessments in 2010
- Continue study to assess the reproductive viability of Black Crowned Night Herons

Degradation of Aesthetics

Status: *Impaired*

Aesthetics are impaired due to combined sewer overflows discharges, but these effects are not persistent. Numerous spills of various materials have been noted, but generally are more of an issue on the United States side of the Area of Concern.

KEY ACTIONS

COMPLETED

- Reduced pollution from domestic sewage through \$110 million expansion and upgrade of the municipal wastewater treatment plant in Windsor
- Conducted surveys of impacts on aesthetics (1999 and 2000)

REMAINING

- Conduct aesthetics survey on the Canadian side of the river in 2010
- Complete the construction of the Windsor retention treatment basin, which will eliminate 22 combined sewer overflows along the Windsor riverfront

Degradation of Benthos¹

Status: *Impaired*

Benthic communities are severely degraded along Michigan's Trenton Channel, but considerably better mid-river. Community structure along the Ontario shoreline is more balanced.

KEY ACTIONS

COMPLETED

- Conducted riverwide assessments of benthic invertebrate community (1991, 1999, 2004)

REMAINING

- Complete follow-up assessments of benthic invertebrate community

¹ *Benthos* and *benthic community* refer to the invertebrate organisms, such as worms, nymphs and insect larvae that dwell for all or part of their lives in the bottom sediments of lakes and rivers. Scientists often use the health and abundance of these organisms as indicators of contaminant toxicity and ecosystem health.



Degradation of Fish and Wildlife Populations

Status: *Impaired*

Impairment identified as a result of loss of coastal wetland habitat, shoreline hardening, loss of fish spawning habitat, and contaminants in sediments that are particularly toxic to young fish.

KEY ACTIONS

COMPLETED

- Implemented the provincial Municipal/Industrial Strategy for Abatement (MISA) regulations in the mid-1990s, which eliminated persistent toxic substances and addressed other problems associated with industrial discharges entering the Detroit River
- Implemented natural shoreline restoration projects to replace vertical sheet-pile walls and create habitat for fish and wildlife
- Created in-river fish spawning habitat at Fighting Island, Fort Malden, McKee Park and Riverfront Park; confirmed successful Lake Sturgeon spawning (2009)
- Undertook ongoing efforts to protect and rehabilitate coastal wetlands
- Conducted riverwide fish community assessment
- Undertook remediation of contaminated sediments at Turkey Creek (Ontario)

REMAINING

- Continue habitat restoration efforts in priority areas
- Continue monitoring of fish community to ensure recovery is maintained
- Complete revision of delisting criteria

Fish Tumours or Other Deformities

Status: *Impaired*

Original designation due to elevated incidence of liver tumours in Bullhead, Walleye, Bowfin, Redhorse, and White Sucker species; levels comparable to other highly industrialized areas of the Great Lakes.

KEY ACTIONS

COMPLETED

- Conducted several studies of the incidence of tumours in various species

REMAINING

- Update status of this environmental challenge following analysis of data from 2006 Brown Bullhead samples

Loss of Fish and Wildlife Habitat

Status: *Impaired*

Impairment due to the significant loss of coastal wetland habitat resulting from urban and industrial development along the shoreline of the Detroit River.

KEY ACTIONS

COMPLETED

- Undertook habitat restoration and non-point source remediation programs in the Area of Concern, beginning in the mid-1990s
- Implemented the provincial Municipal/Industrial Strategy for Abatement (MISA) regulations in the mid-1990s, which eliminated persistent toxic substances and addressed other problems associated with industrial discharges entering the Detroit River
- Implemented several large-scale natural shoreline protection projects in Windsor, LaSalle and Amherstburg
- Constructed Lake Sturgeon spawning habitat at Fighting Island
- Conducted assessments of coastal wetlands (2007, 2008)

REMAINING

- Continue to implement natural shoreline protection projects (e.g., Ranta Park, Brighton Beach) and in-river fish spawning habitat projects
- Determine how activities in the watershed affect the quality of the Detroit River

Restrictions on Dredging Activities

Status: *Impaired*

On a site-specific basis, dredged sediments may be subject to disposal restrictions because of contaminants.

KEY ACTIONS

COMPLETED

- Undertook remediation of contaminated sediments at Turkey Creek (Ontario)

REMAINING

- Review the status of this beneficial use impairment

Restrictions on Fish and Wildlife Consumption

Status: *Impaired*

Restricted consumption of fish is advised due to elevated levels of PCBs² and mercury in some fish species.

KEY ACTIONS

COMPLETED

- Confirmed that contaminated sediments in the lower United States reach of the river are the primary source of restrictions on consumption of fish and wildlife
- Undertook remediation of contaminated sediments at Turkey Creek (Ontario)
- Monitored sport fish and young-of-the-year fish
- Ensured findings on sediment contamination are better linked to fish consumption advisories

REMAINING

- Continue to monitor contaminants in sport fish in the Detroit River

² Polychlorinated biphenyls (PCBs) are synthetic chemicals that have wide industrial applications. The manufacturing and importing of PCBs were banned in North America in 1977. PCBs are very persistent (long-lasting) in the environment and can be transported over long distances.



Status – REQUIRES FURTHER ASSESSMENT

Degradation of Phytoplankton and Zooplankton³ Populations

<p>Status: <i>Requires further assessment</i></p> <p>Limited data available to analyze and address this environmental challenge.</p>	
KEY ACTIONS	
COMPLETED	REMAINING
<ul style="list-style-type: none"> Implemented the provincial Municipal/Industrial Strategy for Abatement (MISA) regulations in the mid-1990s, which eliminated persistent toxic substances and addressed other problems associated with industrial discharges entering the Detroit River Conducted study on Detroit River plankton in 2008 	<ul style="list-style-type: none"> Complete final assessment to determine status

Tainting of Fish and Wildlife Flavour

<p>Status: <i>Requires further assessment</i></p> <p>This environmental challenge requires further assessment, given that past studies are inconclusive.</p>	
KEY ACTIONS	
COMPLETED	REMAINING
<ul style="list-style-type: none"> No specific actions to date 	<ul style="list-style-type: none"> Conduct 2010 survey of anglers to provide more up-to-date comprehensive data and determine status

³ *Phytoplankton* and *zooplankton* are the collection of small or microscopic water-borne plant and animal organisms (respectively) that float or drift in great numbers, especially at or near the water's surface, and that serve as food for fish and other larger organisms.



FOR MORE INFORMATION

Environment Canada:

www.ec.gc.ca/raps-pas

Detroit River Canadian Cleanup:

www.detroitriver.ca

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