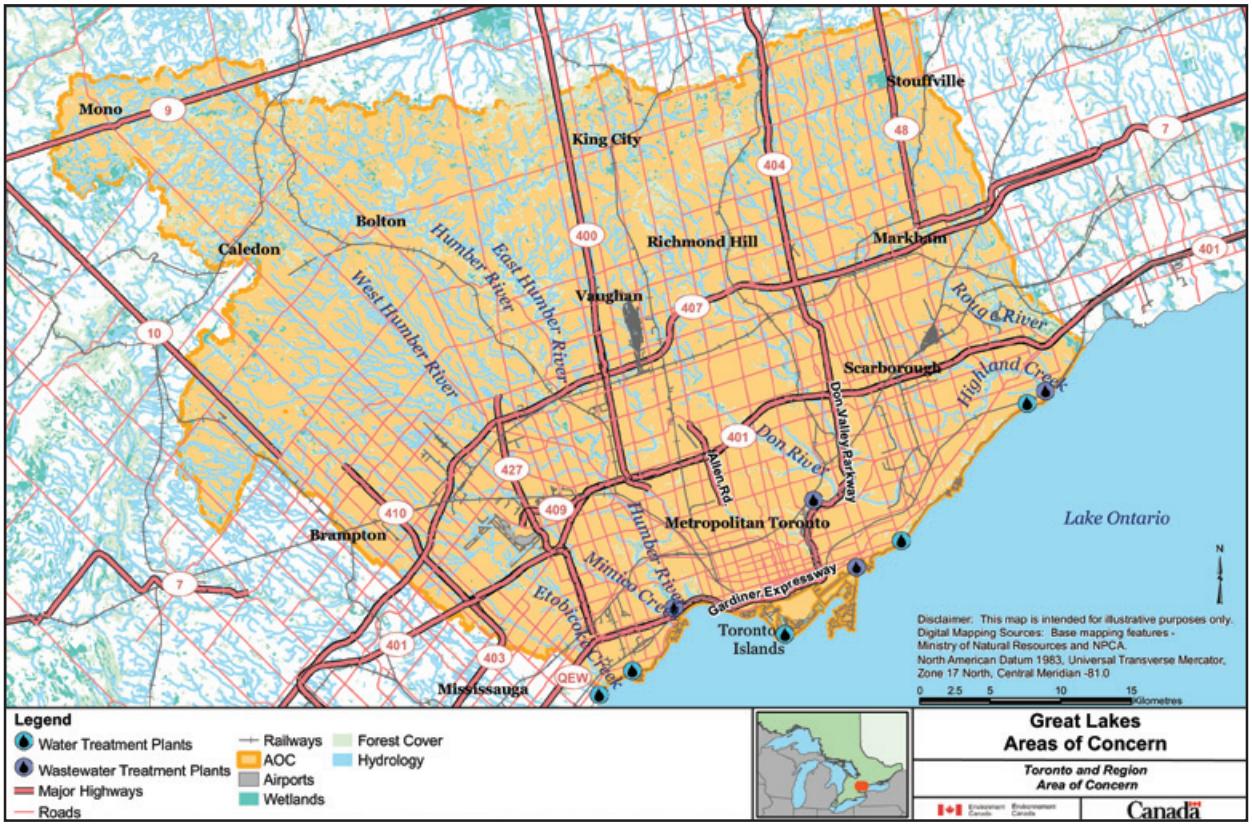
Toronto and Region
Area of Concern
Status of Beneficial Use Impairments
September 2010

The Toronto and Region Area of Concern extends along the northern shoreline of Lake Ontario from the Rouge River in the east to Etobicoke Creek in the west. The 2000 km^2 (200 000 ha) area includes the Toronto waterfront and 6 watersheds: Etobicoke Creek, Mimico Creek, Humber River, Don River, Highland Creek and Rouge River. The drainage basin of these watersheds makes the Area of Concern a study in contrasts: more than 40% of the area is still rural and contains one of the world's largest natural parks in an urban/agricultural setting; at the same time, more than three million people live in the Area of Concern and the City of Toronto is in the centre of the most densely urbanized area in Canada.

The Toronto and Region Area of Concern has long faced complex environmental challenges. Several centuries of agriculture and urban development have dramatically reshaped the natural environment. Wetlands have been infilled, forests and riverbank vegetation removed, creeks buried or channelized, shorelines hardened, and dams and weirs built that obstruct fish migration in the rivers. Currently, contaminants associated with rapid stormwater runoff and melting snow from the area's six watersheds create serious impacts in the rivers and streams as well as at the waterfront itself. Overflows of stormwater mixed with raw sewage are a serious problem in the lower portions of the Don and Humber Rivers and directly along the waterfront following heavy rains. Spills, road runoff, and chemical inputs to sewers from industries and residences further contribute to a degraded aquatic environment. Downstream of the other four Great Lakes and the Niagara River, the Toronto waterfront is also affected by many sources of water-borne contaminants in the Great Lakes system.



Ontario

Canada

PARTNERSHIPS IN ENVIRONMENTAL PROTECTION

Toronto and Region 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 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 beneficial uses through a remedial action plan.

Remedial Action Plan Partners

Environment Canada, the Ontario Ministry of the Environment and the Ontario Ministry of Natural Resources coordinate the development and implementation of the Toronto and Region Remedial Action Plans to protect and restore this Area of Concern. Since 2002, the Toronto and Region Conservation Authority has coordinated implementation of the Toronto and Region Remedial Action Plan, under agreements with Environment Canada and the Ontario Ministry of the Environment.

One of the guiding principles of the Toronto and Region Remedial Action Plan process is that "*we all have a role to play in restoring our watersheds and waterfront to health.*" As a result, while the management of the process is the responsibility of the three government agencies and the Conservation Authority, implementation and restoration activities are being carried out by federal and provincial government agencies, the Conservation Authority, municipalities within the Area of Concern, watershed alliances and councils, industries, non-governmental organizations and individual farmers, landowners and residents.

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 and Ontario, 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 – Environmental Conditions and Problem Definition***, summarizing the outcome of these efforts, was completed in 1989. The report identified 11 environmental challenges needing to be addressed and known as *beneficial use impairments* in the Remedial Action Plan process. Their current status is described below in **Progress on Environmental Challenges**.

Stage 2: Planning and Implementing Remedial Actions

In Stage 2, the governments of Canada and Ontario, working with community stakeholders, undertook a detailed review of several potential remedial actions to restore, protect and monitor environmental quality in the Area of Concern. The ***Stage 2 Remedial Action Plan Report – Clean Waters, Clear Choices***, which identified 53 recommended remedial actions, was completed in 1994. Progress reports were issued in 2001 (*Clean Waters, Healthy Habitats*) and in 2007 (*Moving Forward*).

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

Remedial Action Plan partners are reviewing restoration targets for the Area of Concern. The ***Stage 3 Remedial Action Plan Report*** will be prepared and delisting of the Toronto and Region as an Area of Concern will take place when monitoring confirms that the environmental challenges have been addressed successfully through the remedial actions. The year 2020 has been proposed as the target date for delisting the Toronto and Region 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. These challenges are linked to both historical factors and new and ongoing pressures from urban development around Canada's largest city. Addressing Toronto's environmental challenges is expected to be a decades-long undertaking. For example, the Wet Weather Flow Management Master Plan, a 25-year effort approved by the City of Toronto in 2003, aims to reduce and ultimately eliminate the adverse effects from runoff during rain and snow events on streams, rivers and the waterfront. The Plan focuses on public education and outreach, municipal operations, waterfront shoreline management, stream restoration and environmental monitoring. Also, the City of Toronto is considering a 100-year plan for the control of water pollution sources.

Coordinating the efforts of the many partner agencies and organizations will continue to be a critical element in the success of the Remedial Action Plan, particularly as the need increases for integrated monitoring to measure progress towards restoration of environmental quality.

Status of Beneficial Use Impairments

The tables below summarize, for each of the 11 beneficial use impairments in the Toronto and Region Area of Concern, 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 occasional posted advisories that bacterial levels (*E. coli*) exceed safe levels for swimming and other body contact recreational activities at several City of Toronto beaches.

KEY ACTIONS

COMPLETED	REMAINING
▪ Gained better understanding of the various sources of bacteria on beaches through microbial source tracking ▪ Launched several important wet weather flow projects to improve beach water quality, including the Bonar Creek Stormwater Quantity and Quality Treatment Pond and combined sewer overflow and/or storm sewer control studies for the eastern beaches, Scarborough and Coatsworth Cut ▪ Improved water quality at Toronto beaches through wastewater infrastructure improvements, such as construction of the Western and Eastern Beaches Stormwater Detention Facilities, to capture and treat stormwater and combined sewer overflows ▪ Initiated ongoing programs to educate residents on the implications to water quality of feeding birds on the beaches ▪ Launched a highly successful pilot project to use herding dogs to help control waterfowl presence on the swimming beaches ▪ Began implementation of the City of Toronto Beaches Plan, a key to maintaining and improving conditions at city beaches (2009); in 2009, 7 of 11 Toronto beaches achieved the international Blue Flag designation status	▪ Maintain efforts in the rural areas to implement best management practices through Environmental Farm Plans and the Rural Clean Water Program ▪ Continue wet weather flow projects and dry weather flow reduction measures, such as the track down and correction of illegal sewer cross-connections ▪ Implement the Don and Waterfront Trunk Interceptor Capacity and Combined Sewer Overflow Control and Treatment Strategy ▪ Continue implementation of the City of Toronto Beaches Plan

Degradation of Aesthetics

Status: ***Impaired***

Anecdotal evidence suggests that algal growth continues to be a problem, especially along the western shoreline.

KEY ACTIONS

COMPLETED	REMAINING
▪ Launched a range of initiatives focusing on cleaning up beaches and shorelines, including public education on littering and the annual Great Canadian Shoreline Cleanup along Toronto's waterfront and watershed shorelines	▪ Address and monitor bacterial issues along the waterfront through the Blue Flag Beaches program ▪ Continue implementation of the City of Toronto Beaches Plan ▪ Undertake a comprehensive assessment of this environmental challenge and develop a delisting target

Degradation of Benthos[1]

Status: ***Impaired***

Impairment of benthic communities varies in the watersheds, with Highland Creek showing the most impairment and the Rouge and Humber Rivers the least. Along the waterfront, impairment of benthic communities is still seen in areas enriched with nutrients, generally at the outlets of storm sewers and combined sewer overflows in the Keating Channel and in Ashbridge's Bay.

KEY ACTIONS

COMPLETED	REMAINING
▪ Undertook long-term monitoring of the sediment and benthos to obtain data on trends ▪ Conducted benthos study of the Toronto Inner Harbour that observed no acute toxicity at any site as well as a significant decline in the density of pollution-tolerant benthos ▪ Initiated implementation of the Wet Weather Flow Management Master Plan, which is contributing to the restoration of the benthic community along the waterfront	▪ Maintain implementation of the Wet Weather Flow Management Master Plan ▪ Maintain operation of the Regional Watershed Monitoring Network to obtain better long-term data on trends

[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***

Fish and wildlife populations are impaired by past wetland and habitat loss and the effects of rapid and continued urbanization.

KEY ACTIONS

COMPLETED	REMAINING
▪ Completed a range of stream restoration, wetland creation and fish barrier mitigation projects to address the needs of fish and wildlife populations ▪ Created or restored more than 40 ha of coastal wetlands in the last 10 years, including at Tommy Thompson Park, Mimico Waterfront Park, Spadina Quay, Rouge Marshes and the mouth of Highland Creek as part of the Toronto Waterfront Aquatic Habitat Restoration Strategy ▪ Worked with conservation partners and landowners to plant an average of 165 000 trees and shrubs a year ▪ Strengthened reforestation efforts to include restoring riverbank vegetation in stream and river valleys ▪ Developed the Terrestrial Natural Heritage System Strategy and a series of watershed-based fisheries management plans and habitat improvement plans to provide long-term blueprints to guide future improvements in fish and wildlife habitats ▪ Updated the watershed plans for the Rouge and Humber River ▪ Completed recovery strategies for Redside Dace, Peregrine Falcon and Jefferson Salamander	▪ Maintain work on restoration and protection of priority habitats and species, under the Toronto Waterfront Aquatic Habitat Restoration Strategy, the Terrestrial Natural Heritage System Strategy, species recovery strategies and the fisheries management plans ▪ Reintroduce Atlantic Salmon in the Humber River

Eutrophication[2] or Undesirable Algae

Status: ***Impaired***

While levels of phosphorus along the waterfront frequently meet provincial guides, levels of phosphorus in the watershed frequently exceed provincial guidelines. Algal growth continues to be a problem along the western part of the waterfront.

KEY ACTIONS

COMPLETED	REMAINING
▪ Decreased phosphorous loading into waterways through improvements to the stormwater infrastructure, including targeted combined sewer separation projects; installation of new infrastructure; evaluation and demonstration of sustainable technologies; and ensuring best management practices on construction sites ▪ Addressed concerns about eutrophication through wet weather flow projects and dry weather flow reduction measures	▪ Maintain efforts in the rural areas to implement best management practices through Environmental Farm Plans and the Rural Clean Water Program ▪ Continue wet weather flow projects and dry weather flow reduction measures ▪ Ensure stormwater management facilities in the upper reaches of the watersheds are operating properly ▪ Implement low impact development guidelines at new development sites ▪ Implement the Don and Waterfront Trunk Interceptor Capacity and Combined Sewer Overflow Control and Treatment Strategy

[2] *Eutrophication* (or *eutrophic conditions*) is the process by which lakes and other water bodies are enriched by nutrients (usually phosphorus and nitrogen), which leads to excessive plant growth and oxygen depletion.

Loss of Fish and Wildlife Habitat

Status: ***Impaired***

Loss and degradation of diverse fish and wildlife habitats throughout the Area of Concern over many years have been identified as leading causes of widespread losses in species abundance and diversity. Loss of habitat along rivers continues due to urbanization, particularly in headwater or intermittent streams. Fragmentation and isolation of existing or newly created habitats is of concern. Gains from habitat restoration and creation projects tend to be offset by the effects of continued and rapid urbanization.

KEY ACTIONS

COMPLETED	REMAINING
▪ Completed a range of projects to address fish and wildlife habitat loss, including stream restoration, wetland restoration and creation, and fish barrier mitigation projects ▪ Strengthened watershed regulations to protect floodplains and wetlands from development ▪ Created Rouge Park, the largest urban natural environment park in the country ▪ Removed or modified critical barriers along waterways to permit fish passage in the Area of Concern, allowing lake fish such as Rainbow Trout to migrate ▪ Created and improved fish and wildlife habitat as part of the revitalization of the Toronto waterfront, including the Port Union and Mimico shoreline projects, the Western Beaches Watercourse Facility, HTO Park, Harbourfront Promenade, wavedecks at Spadina, Rees and Simcoe slips, wetlands at Bluffer's Park and shoreline restoration and carp barriers at Ontario Place ▪ Constructed a 7.7–ha coastal marsh in Tommy Thompson Park, the largest constructed wetland in the Greater Toronto waterfront area (2003)	▪ Continue work on protecting and restoring priority habitat, through the Terrestrial Natural Heritage System Strategy, the fisheries management plans and the Toronto Waterfront Aquatic Habitat Restoration Strategy ▪ Support efforts of municipalities to implement progressive planning techniques that will allow for low-impact development

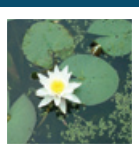
Restrictions on Dredging Activities

Status: ***Impaired***

While contaminant levels have generally improved in sediments near the surface, they still exceed provincial chemical water quality guidelines for open water disposal.

KEY ACTIONS

COMPLETED	REMAINING
▪ Sampled navigational dredging for contaminant levels to determine whether the materials can be used in restoration projects along the waterfront; in the past, all dredged material would be disposed of in the confined disposal cells at Tommy Thompson Park; more recently, however, some dredged material has met lakefill quality guidelines and has been used in restoration projects along the waterfront (for example, dredged material from the Coatsworth Cut was used in the creation of wetlands within the embayments at Tommy Thompson Park) ▪ Continued to deposit dredged material coming out of the Keating Channel in the confined disposal cells at Tommy Thompson Park, though there have been overall improvements in the quality of that material ▪ Reduced the amount of contaminants discharged into the sewer systems and ultimately into Lake Ontario through new, more stringent sewer use bylaws in various municipal jurisdictions ▪ Provided training and educational materials on erosion and sediment control practices	▪ Maintain sampling of dredging material to ensure appropriate end disposal or use ▪ Ensure compliance with sediment and erosion control guidelines, such as The Erosion and Sediment Control Guideline for Urban Construction, to reduce sedimentation of the rivers and river mouths



Restrictions on Fish and Wildlife Consumption

Status: ***Impaired***

PCBs,[3] dioxins and furans are the major cause of consumption restrictions throughout Lake Ontario. Consumption advisories for fish in the Area of Concern persist. Generally, the larger sizes of fish and top predators are of more concern due to the biomagnification[4] of toxics. Contaminant levels in local fish species, such as Northern Pike found in the Inner Harbour, are improving significantly, while salmonid fish species such as Lake Trout and Chinook Salmon, which can feed over wide geographic areas outside the Area of Concern, tend to accumulate higher concentrations of PCBs and mercury.

KEY ACTIONS

COMPLETED	REMAINING
▪ Reduced contaminant loadings through components of the Wet Weather Flow Management Master Plan such as source control measures (for example, rainwater "harvesting" and tree planting) and end-of-pipe facilities ▪ Reduced the amount of contaminants discharged into the sewer systems and ultimately into Lake Ontario, through new sewer use bylaws in various municipal jurisdictions in the Area of Concern ▪ Identified an ongoing source of PCBs into Etobicoke Creek; responsible parties are currently taking steps to further define the sources	▪ Undertake further assessment to determine whether consumption advisories are linked to lakewide conditions rather than conditions within the immediate region or Area of Concern ▪ Determine sources and distribution of PCBs in Etobicoke Creek and develop appropriate management option ▪ Continue implementation of the Wet Weather Flow Management Master Plan

Status – REQUIRES FURTHER ASSESSMENT

Bird (or Other Animal) Deformities or Reproduction Problems

Status: ***Requires further assessment***

Studies in 2004 suggested that reproductive effects and deformities in colonial waterbirds due to contaminants are not an impaired use in the Area of Concern; these findings still need to be peer-reviewed.

KEY ACTIONS

COMPLETED	REMAINING
▪ Conducted studies on the effect of contaminants on colonial waterbirds in the Area of Concern (2004)	▪ Complete documentation for reporting this environmental challenge as *not impaired*

[3] *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.

[4] *Biomagnification* is the increasing concentration of a substance, such as a toxic chemical, in the tissues of organisms at successively higher levels in a food chain. As a result, organisms at the top of the food chain generally suffer greater harm from a persistent pollutant than those at lower levels.

Degradation of Phytoplankton and Zooplankton[5] Populations

Status: ***Requires further assessment***

Lakewide factors, physical factors and local pollution sources influence the health of phytoplankton and zooplankton communities; however, there is insufficient information to determine the relative significance of local sources.

KEY ACTIONS	
COMPLETED	**REMAINING**
▪ No specific actions to date	▪ Undertake an assessment of this environmental challenge and develop a delisting target

Status – NOT IMPAIRED

One environmental challenge has been designated as *not impaired*, following implementation of remedial actions.

Fish Tumours or Other Deformities

Status: *Not* ***Impaired***

Studies carried out in 2003, 2004 and 2006 along with historical evidence and data, identified that liver tumours are not impaired in the Area of Concern.

KEY ACTIONS	
COMPLETED	**REMAINING**
▪ Completed documentation in 2010 for reporting this environmental challenge as *not impaired*	▪ No further action required

[5] *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

Toronto and Region Remedial Action Plan:
www.torontorap.ca

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