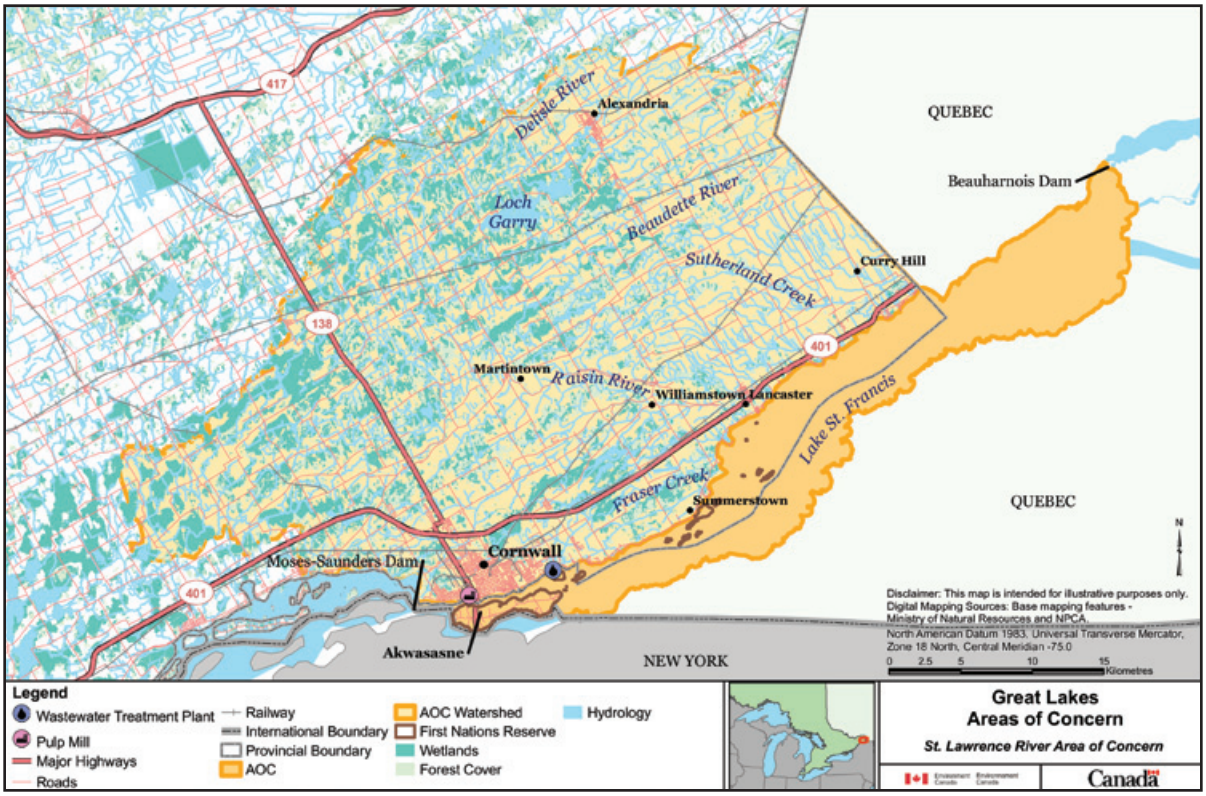
St. Lawrence River
Area of Concern
Canadian Section
Status of Beneficial Use Impairments
September 2010

The St. Lawrence River drains the Great Lakes and is among the largest rivers in the world. The Area of Concern includes a stretch of the St. Lawrence River approximately 80 km long, from the Moses-Saunders power dam (just upstream of Cornwall, Ontario) to the eastern outlet of Lake St. Francis, in Quebec. It is a complex jurisdictional area involving Canada, United States, Ontario, Quebec, New York State and Mohawks of Akwesasne interests. The Area of Concern's watershed, which includes tributaries of the St. Lawrence along this stretch, is mainly agricultural land and woodland. The largest urban area is the City of Cornwall, Ontario.

The Cornwall waterfront has been the location of industrial activities for more than 100 years. Although many of the contaminant sources have been eliminated, past discharges continue to impact the aquatic environment, as contaminated sediment and organisms transfer mercury and other metals to other components of the environment. Local contaminant sources include industrial and municipal discharges, and diffuse sources such as urban stormwater and agricultural runoff. Contaminants also enter the Area of Concern from upstream in the Great Lakes system via Lake Ontario and, finally, from air deposition. Land use practices, shipping and the extensive shoreline and water flow alterations that resulted from the construction of the St. Lawrence Seaway also have altered the natural features of the Area of Concern.



Ontario

Canada

PARTNERSHIPS IN ENVIRONMENTAL PROTECTION

The St. Lawrence 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 St. Lawrence 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 St. Lawrence River Area of Concern is shared jointly by both Canada and the United States. Remedial action plans have been developed and implemented independently in Ontario and New York State, in partnership with the respective local communities.

Environment Canada and the Ontario Ministry of the Environment coordinate the development and implementation of the remedial action plans to protect and restore these Areas of Concern in Canada. Since 1998, the St. Lawrence River Restoration Council has served as the implementation group for the St. Lawrence Remedial Action Plan. Partners in this cooperative effort include (in alphabetical order) the City of Cornwall, the Cornwall and District Environment Committee, the Cornwall Chamber of Commerce, Cornwall Chemicals Ltd., Domtar Inc., the Eastern Ontario Health Unit, Environment Canada, Fisheries and Oceans Canada, the Glengarry Federation of Agriculture, ICI Canada, the Mohawks of Akwesasne, the Ontario Ministry of the Environment, the Ontario Ministry of Natural Resources, Ontario Power Generation, the Raisin Region Conservation Authority, the Resources Stewardship Council Stormont, Dundas and Glengarry, the Rotary Club of Cornwall, the St. Lawrence River Institute of Environmental Sciences, the Township of North Glengarry, and Township of South Glengarry. Local industry and private landowners also have been involved extensively throughout the Remedial Action Plan process.

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***, summarizing the outcome of these efforts, was completed in 1992. The report identified 10 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 potential remedial actions to restore, protect and monitor environmental quality in the Area of Concern. The ***Stage 2 Remedial Action Plan Report***, which identified 64 recommended remedial actions, was completed in 1997. An update to the report, identifying those recommended actions still to be implemented, was completed in 2008.

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

All priority actions for delisting have been implemented. The ***Stage 3 Remedial Action Plan Report***, on the results of monitoring efforts to determine whether the environmental challenges have been addressed successfully through the remedial actions, is being prepared. However, as of September 2010, a decision on whether to delist the Canadian section of the St. Lawrence River Area of Concern has not been made.

PROGRESS ON ENVIRONMENTAL CHALLENGES

The federal and provincial governments and partners have made significant progress in addressing the environmental challenges in the Area of Concern, particularly in the areas of fish and wildlife habitat protection and restoration, reduction of runoff from rural non-point sources, and reduction of discharges from municipal and industrial sources. Their accomplishments include the Cornwall Pollution Control Plan, the decommissioning of the industrial sites on the river, the development of fisheries management plans for the river, tributaries and Lake St. Francis, many littoral zone and wetland restoration or habitat enhancement projects and the development and implementation of the Cornwall Sediment Management Strategy.

All priority actions for delisting have been implemented. In June, July and September 2010, the St. Lawrence River Restoration Council members have been consulting local groups on the subject of delisting the Area of Concern. However, as of September 2010, a decision on whether to delist the Canadian side of the St. Lawrence River Area of Concern has not been made.

Status of Beneficial Use Impairments

The tables below summarize, for each of the 10 beneficial use impairments for the St. Lawrence River 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

Eutrophication[1] or Undesirable Algae

Status: ***Impaired, in tributaries of the St. Lawrence River and Lake St. Francis nearshore*** (*Not impaired* in the St. Lawrence River main channel and in the Lake St. Francis offshore)

Levels of phosphorous in tributaries of the river and in the nearshore of Lake St. Francis have declined over time; they however remain above water quality guidelines, but are similar to other St. Lawrence River tributaries.

KEY ACTIONS	
COMPLETED	**REMAINING**
▪ Implemented environmental farm plans and tributary restoration program to reduce agricultural runoff; this work involved fencing to restrict cattle from watercourses, upgrades to milkhouse washwater facilities, manure storage facilities and rural septic systems; and tree planting along riverbanks ▪ Implemented the *Nutrient Management Act* that prescribes nutrient management planning requirements to reduce agricultural runoff ▪ Developed and implemented a pollution prevention and control plan for the City of Cornwall, reducing the number of combined sewers and combined sewer overflow events ▪ Put in place funding for upgrading the City of Cornwall's wastewater treatment plant, which will reduce nutrient loading to the St. Lawrence River ▪ Completed the Fly Creek Stormwater Pond Retrofit Plan to ensure treatment of municipal stormwater before discharging to the St. Lawrence River	▪ Continue to implement watershed management programs

[1] *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***

While some of the Remedial Action Plan delisting criteria for fish and wildlife habitat have been met, the targets for wetlands and forests likely are not achievable in either the short or long term, due to land use and development patterns.

KEY ACTIONS

COMPLETED	REMAINING
▪ Developed and adopted the Natural Heritage Strategy designed to protect and enhance terrestrial habitat ▪ Completed stream assessments for severely degraded streams ▪ Implemented a tributary restoration program to protect and restore fish and wildlife habitat; work involved fencing to restrict cattle from watercourses and tree planting along riverbanks ▪ Constructed nearshore fish spawning and nursery reefs along the Cornwall waterfront	▪ Continue to implement watershed management programs and Natural Heritage Strategy ▪ Continue to support Resource Stewardship Councils and certified forest owners to protect and restore habitat ▪ Implement fish habitat management plans

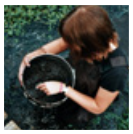
Restrictions on Fish and Wildlife Consumption

Status: ***Impaired, for fish consumtion***

Restricted consumption of Walleye, Yellow Perch and other species of fish is advised due to elevated levels of mercury. While mercury levels in fish have declined over time, it is expected that decades will be required to fully restore this beneficial use due to widespread, low-level mercury contamination in the sediments throughout the northern reaches of the Area of Concern and ongoing natural sources.

KEY ACTIONS

COMPLETED	REMAINING
▪ Eliminated all industrial discharges containing mercury ▪ Completed the Cornwall Sediment Strategy (2005), and established an administrative controls protocol to protect deeper sediments from disturbance by any future waterfront development ▪ Completed the mercury track-down initiative to identify fugitive sources of mercury ▪ Implemented federal and provincial legislation to regulate industrial discharges	▪ Continue to implement the Cornwall Sediment Strategy and administrative controls protocol ▪ Maintain monitoring of sport fish and the status of sediment quality ▪ Address fugitive sources of mercury if any are observed in future



Status – NOT IMPAIRED

Four environmental challenges have been designated as *not impaired*, following implementation of remedial actions.

Beach Closings

Status: ***Not Impaired***

Historically, there have been an excessive number of posted advisories that bacterial levels (*E. coli*) exceeded safe levels for swimming and other body contact recreational activities at several recreational areas within the Area of Concern. Since the 1980s, there have been substantial improvements in *E. coli* levels along the Cornwall waterfront and in Lake St. Francis. Data from the last few years indicate that water quality meets Beach Closings delisting criteria, though there still are several non-swimming areas where levels occasionally exceed provincial limits for the protection of human health.

KEY ACTIONS

COMPLETED	REMAINING
▪ Developed and implemented a pollution prevention and control plan for the City of Cornwall that reduced the number of combined sewers and combined sewer overflow events ▪ Implemented septic system re-inspection program to reduce runoffs from septic systems (2008) ▪ Implemented the Eastern Ontario Health Unit beach monitoring program	▪ Conduct additional sampling at sites where high bacterial levels occasionally occur, and apply remedial actions if required ▪ Continue to implement the Eastern Ontario Health Unit beach monitoring program

Degradation of Benthos[2]

Status: ***Not Impaired***

Benthic community structure, diversity and abundance along the Cornwall waterfront are no different than upstream or appropriate reference sites. Monitoring has confirmed no impairment of benthic community structure, no chronic or acute toxicity risk to benthos, and no risk of biomagnifications.[3]

KEY ACTIONS

COMPLETED	REMAINING
▪ Eliminated all industrial discharges along the Cornwall waterfront ▪ Completed the Cornwall Sediment Strategy (2005), and established an administrative controls protocol to protect deeper sediments from disturbance by any future waterfront development ▪ Implemented federal and provincial legislation to regulate industrial discharges	▪ Continue to implement the Cornwall Sediment Strategy and administrative controls protocol ▪ Maintain monitoring of sediment quality and benthic community

[2] *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.

[3] *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 Fish and Wildlife Populations

Status: ***Not Impaired***

KEY ACTIONS

COMPLETED	REMAINING
▪ Addressed recovery of Perch populations through implementation of the Lake St. Francis Fisheries Management Plan, reducing daily catch limits, and disallowing the sale of angler-caught Perch ▪ Restored fish populations through enhancement of fish habitat under the Cornwall littoral zone restoration ▪ Completed recovery plans for fish community and some individual species, including Walleye, Muskellunge and Sturgeon	▪ Continue to monitor fish community populations to ensure recovery is maintained ▪ Implement fish community and individual species recovery plans

Restrictions on Dredging Activities

Status: ***Not Impaired***

There is currently no navigational dredging which occurs in the Area of Concern along the Cornwall waterfront.

KEY ACTIONS

COMPLETED	REMAINING
▪ Completed the Cornwall Sediment Strategy (2005), and established an administrative controls protocol to protect deeper sediments from disturbance by any future waterfront development	▪ Continue to implement the Cornwall Sediment Strategy and administrative controls protocol ▪ Continue monitoring sediment quality

Three additional environmental challenges, thought to be possibly impaired, have been designated as *not impaired*, following further assessment.

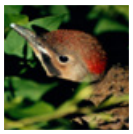
Bird (or Other Animal) Deformities or Reproduction Problems

Status: ***Not Impaired***

Assessments completed on Snapping Turtles, colonial waterbirds and Mink found no significant differences in contaminant levels, deformities or reproductive success compared to reference sites.

KEY ACTIONS

COMPLETED	REMAINING
▪ Implemented federal pulp and paper regulations and the provincial Municipal/ Industrial Strategy for Abatement (MISA) regulations in the mid-1990s, which led to process changes and upgrades to wastewater treatment at area pulp and paper mills ▪ Eliminated dioxins and furans in pulp mill discharges, following implementation of pulp and paper regulations	▪ No further action planned



Degradation of Phytoplankton and Zooplankton[4] Populations

Status: ***Not Impaired***

A 2005 study of phytoplankton and zooplankton communities within the Area of Concern found no impairment and no difference from upstream or downstream communities.

KEY ACTIONS	
COMPLETED	**REMAINING**
▪ Conducted phytoplankton and zooplankton study	▪ No further action planned

Fish Tumours or Other Deformities

Status: ***Not Impaired***

Studies of liver tumours in Brown Bullhead from the Area of Concern indicated that the tumour prevalence was not significantly different from that in reference locations outside the area.

KEY ACTIONS	
COMPLETED	**REMAINING**
▪ Conducted studies of liver tumours in Brown Bullhead	▪ No further action planned

[4] *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

Raisin Region Conservation Authority:
www.rrca.on.ca/view.php?id=39

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