TORONTO & REGION Remedial Action Plan

UPDATE ON ACTIONS 2011-2012



For additional copies of this report please contact:

TORONTO AND REGION CONSERVATION AUTHORITY 5 Shoreham Drive, Toronto, Ontario, M3N 1S4

phone: 416-661-6600 fax: 416-661-6898

© 2012 Toronto and Region Conservation Authority, 5 Shoreham Drive, Downsview, ON M3N 1S4 All photography © Toronto and Region Conservation Authority unless otherwise specified

The Toronto and Region Remedial Action Plan is managed by representatives from Environment Canada, Ontario Ministry of the Environment, Ontario Ministry of Natural Resources and Toronto and Region Conservation Authority.

TABLE OF CONTENTS

- Background and Communications 2
 - Clean Waters 4
 - Sustainable Watersheds 5
 - Stewardship and Education 6
 - Habitat Creation 7
 - Fish and Wildlife 8

BACKGROUND AND COMMUNICATIONS

Toronto and Region is one of 39 locations on the Great Lakes which were identified as suffering from degraded environmental conditions. These locations are referred to as Areas of Concern, and each Area of Concern is required to implement a Remedial Action Plan to address environmental issues.

The Toronto and Region Area of Concern consists of six watersheds encompassing 2000 km² of land and 43 km of waterfront, and its Remedial Action Plan (RAP) is currently in the implementation stage. During implementation, remedial actions are undertaken and environmental progress is measured. The *Toronto and Region Remedial Action Plan: Update on Actions 2011-2012* reports on research and implementation projects that, as of 2011-2012, joined the roster of programs and projects that receive RAP support.

Descriptions of ongoing or recently completed projects that were in receipt of RAP support can be found in the documents *Toronto and Region Remedial Action Plan: Update on Actions 2007-2010* and *Toronto & Region Remedial Action Plan: Update on Actions 2010-2011.* Projects outlined in these documents that receive RAP support in 2011-2012 include:

- Lake Ontario Evenings
- Developing Best Practices for the Application of Salt to Parking Lots
- Sustainable Neighbourhood Retrofit Action Plan Program Evaluation
- Stewardship and Outreach Programming
- Habitat Creation Projects
- Fisheries Research Projects

Beneficial Use Impairment Reports

A "Beneficial Use Impairment" is a term that describes the environmental issues around which the Remedial Action Plan is structured. Beneficial Uses are human or ecological uses or qualities of the ecosystem, and these uses are considered "Impaired" when the Beneficial Use has been lost or damaged as the result of poor environmental quality.

In 2011-2012, the Toronto and Region RAP completed the evaluation of two Beneficial Uses previously deemed to require further assessment. The results of research assessing the Beneficial Use Impairments *Fish Tumours or Other Deformities* and *Bird or Animal Deformities or Reproductive Problems*, released this year, identified that neither of these issues were problematic within the Toronto and Region Area of Concern. Following a period of public review and comment, the assessment reports were submitted to the federal and provincial governments for final review and approval in December 2011.

Remaining Beneficial Use Impairments in the Toronto and Region Area of Concern:

- Restrictions on fish and wildlife consumption
- *Degradation of fish and wildlife populations*
- Degradation of benthos
- *Restrictions on dredging activities*
- Eutrophication or undesirable algae
- Beach closings
- Degradation of aesthetics
- Loss of fish and wildlife habitat

Remaining Beneficial Use Impairments that Require Further Assessment:

• Degradation of phyto- and zooplankton populations

RAP Technical Review and Update

On April 20, 2011, the Toronto and Region Remedial Action Plan held a public open-house and workshop to launch the Technical Review and Update of the criteria used to assess the status of the remaining Beneficial Use Impairments.

The objectives of the Technical Review and Update are threefold:

Objective 1:

Align the Toronto and Region Remedial Action Plan with other Canadian Remedial Action Plans by delineating the Area of Concern delisting criteria on a Beneficial Use Impairment-by-Beneficial Use Impairment basis;

Objective 2:

Undertake a technical review and update the criteria used to evaluate the status of Beneficial Use Impairments, and ultimately re-designate the status of a Beneficial Use from "Impaired" to "Not-Impaired"; and

Objective 3:

Apply a transparent, science-based framework to Beneficial Use Impairment evaluation and re-designation.

Lake Ontario Evenings

Since its 2009 launch, the Lake Ontario Evening Speaker Series has been a resounding success. These events have brought together diverse, standing-room only crowds to learn from, and share ideas with, the individuals and organizations working at the forefront of environmental challenges in Toronto and Region, Lake Ontario, and the Great Lakes as a whole.

The Lake Ontario Evenings event themes have included:

- Great Lakes Water Diversions (2009)
- Biodiversity (2010)
- The Lake Ontario Nearshore (2010)
- Environmental Contaminants (2010)
- Geology, Landscape, and Water (2011)
- Beach Water Quality (2011)
- Toronto Fish and Fish Habitat (2011)
- Drinking Water Source Protection (2012)

The Remedial Action Plan team has committed to continuing the Lake Ontario Evening Speaker Series through 2012-2013. Keep an eye on the Remedial Action Plan website for event listings and details.

www.torontorap.ca



CLEAN WATERS

Developing Best Practices for the Application of Salt to Parking Lots

Approximately 130,000 to 150,000 tonnes of road salts are applied in Toronto every year and concentrations of chloride, the primary constituent of road salts, have been steadily increasing in Toronto and Region watersheds. Currently, chloride concentrations in all of the Area of Concern watersheds regularly exceed guidelines for the protection of aquatic life throughout the winter and spring.

Past efforts to address the environmental impacts of road salts have focused primarily on roadway maintenance. Little attention, however, has previously been given to parking lots and sidewalks which collectively account for between 20 and 30% of all salt applied. This project will develop a better understanding of the conditions that influence the effectiveness of various commonly used deicing and anti-icing treatments for parking lots and sidewalks, and will develop guidelines for the selection of optimum materials, application rates and techniques.

Soil Quality and Depth Guideline

Healthy soil provides important stormwater management functions including efficient water infiltration and storage, adsorption of contaminants and excess nutrients, filtration of sediments, biological decomposition of contaminants, and moderation of peak stream flows and temperatures. These functions are largely lost through the land development process during which native soils, trees and vegetation are stripped away, subsoils are compacted and only a minimal depth of topsoil is replaced. This project involves the development of guidelines that includes post-construction soil management recommended practices and minimum post-construction soil standards. These guidelines will help development proponents, landscape designers, contractors and approval agencies better understand the intrinsic link between post-construction soil quality and environmental health and the benefits of best management practices and the most efficient ways of implementing them. In turn, healthier soils will increase the capacity of pervious landscaped areas to intercept, absorb, and cleanse urban runoff thereby contributing to the health of receiving waters.

Improving the Process for Inspecting and Servicing Hydrodynamic Separators

Hydrodynamic separators (HDS) are intended to remove sediment and screen debris, and separate hydrocarbons from stormwater for small drainage areas. Survey data of existing HDSs in other jurisdictions suggests that the vast majority are not providing adequate treatment or pretreatment of runoff because they have not been regularly cleaned out. This lack of maintenance allows dirty stormwater to bypass the systems resulting in significant adverse effects on receiving water quality and aquatic life.

This project will help identify and test a process by which the maintenance of existing and new HDS on private property can be undertaken and enforced. Recommendations from the pilot are also expected to yield important lessons for maintenance of other types of stormwater infrastructure on private property.

SUSTAINABLE WATERSHEDS

Sustainable Neighbourhood Retrofit Action Plan (SNAP) Program Evaluation

In 2010, three pilot Sustainable Neighbourhood Retrofit Action Plan projects were launched in the Greater Toronto Area. Sustainable Neighbourhood Retrofit Action Plans (SNAPs) help established communities to achieve environmental improvement and prepare for climate change by bringing together residents, businesses, community groups, and government agencies to develop a sciencebased action plan specific to the needs of a given community.

Each of the pilot SNAPs has a broad scope that includes stormwater management and water quality improvement, natural heritage and habitat improvement, water and energy conservation, greening of buildings, and other complementary socioeconomic themes. Projects within the SNAP provide opportunities to showcase innovative science and engineering solutions to environmental challenges (e.g., lot level stormwater controls) as well as to also engage local residents and businesses through school and neighbourhood events such as environment fairs, homeowners' workshops, tree plantings, and lot level stormwater demonstration projects.

The SNAP Program Evaluation Project reviewed the three pilot SNAPs to further refine the design and delivery of the SNAP Program as well as to determine SNAP transferability to other neighbourhoods within and beyond the Greater Toronto Area.

Developing Stormwater Water Balance Criteria for the Protection of Natural Features in an Urban Setting

This project provides the scientific support required for the refinement of guidelines outlining water balance criteria and monitoring methodologies to ensure the long-term protection of natural features (wetlands, woodlands and watercourses) through the urban development process.

Wetlands, woodlands and watercourses are integral components of the watersheds of the Toronto region and are often negatively affected by urban development. Impacts to these natural features can be linked to changes in hydrology including changes in water quantity, quality, volume, duration, frequency, and timing of flow.

This project conducted research to gather scientific information to support the refinements of guidelines outlining water balance criteria and monitoring methodologies. This research will advance knowledge and understanding of hydrological requirements of natural features to protect their long-term ecological health during urban development.

In future years this project will continue to collect information with the end goal being a measure of the efficacy of measures implemented to mitigate the effects of urban development on studied wetlands.

5

STEWARDSHIP AND EDUCATION

Aquatic Plants Program

Students propagate aquatic plants in the classroom and engage in aquatic plantings at various designated community wetland rehabilitation sites across the GTA, with sites in the City of Toronto, Peel Region, and York Region. The program expands each year through the addition of new wetland restoration sites across all regions and planting and educational activities about terrestrial pollinator plants.

The Aquatic Plants Program promotes a culture of conservation in addition to meeting various Remedial Action Plan objectives as well as supporting and implementing Toronto and Region Conservation watershed plan targets for wetland enhancement, Natural Heritage Strategy and regional biodiversity. The program educates students about a wetland's ability to store and filter water, erosion abatement, habitat creation, and lowering of nutrients and pollutants (silt, heavy metals) in the water through phytoremediation and the important roles that pollinators and pollinating plants play in terrestrial ecosystems.

Caledon Headwaters Rehabilitation Initiative

The goals of the Caledon Headwaters Rehabilitation Initiative are to protect and rehabilitate fisheries habitat within the many headwater tributaries of the Town of Caledon through in-stream habitat enhancement, mitigation of barriers to fish passage, riparian regeneration, fisheries monitoring, and Atlantic Salmon restoration. An additional objective of this initiative is to increase communication amongst individuals and organizations involved in conserving aquatic environments in Ontario and act as a catalyst to empower communities in conserving their local environment through partnership building and the provision of resources.

In 2011, 180m of Coffey Creek was restored through the installation of structures that provide overhead cover for fish and habitat for other species while deflecting stormflows away from vulnerable stream banks. At Boye Creek and Centreville Creek volunteers, under expert guidance, undertook invasive species removal. Flowering heads of purple loosestrife was removed to prevent further spread of the seed, Japanese knotwood was cut at its base multiple times during the season (this work will continue in future years until re-sprouting stops)and small strands of Phragmities were dug out by hand.

Yellow Fish Road

This project is a hands-on educational program focused on community and youth groups delivering a water quality message about non-point source pollution. This program examines the different types of contaminants that enter our rivers and lakes (without treatment) via the storm drains and gives the participants an opportunity to help raise community awareness of this issue. Actions that home owners can take to mitigate this problem are discussed with participants through the use of educational tools and an interactive presentation. The causes of non-point source pollution are shared with local residents through the distribution of an educational fish shaped leaflet and the marking of neighbourhood storm drains.

Youth and Community Greening of the Rouge River Watershed

This project in the Rouge River watershed restores former agricultural lands by planting 29ha of forest, wetland and meadow plants in Rouge Park. The project focuses on reforestation with native vegetation and the creation of wildlife habitat including log piles, raptor posts, bird boxes and vernal pools. In additional 850m of riparian vegetation is being planted along the Rouge River and Petticoat Creek to support fish habitat. The project is accomplished with the help of the community and 2500 students from the Toronto District School Board.

HABITAT CREATION

Toronto Island Wetland Implementation

This project created 0.5ha of wetland on the Toronto Islands as part of a multi-year initiative to create 1.5ha of priority wetland habitat toward a delisting target of creating 75ha of wetland habitat to help offset the historic loss of approximately 500ha of wetland from Ashbridges Bay. The new 0.5ha wetland includes sheltered embayments to encourage aquatic plant growth which creates spawning, nursery, and feeding habitat for Northern Pike and Largemouth Bass, and Northern Pike spawning channels.

This project is the first stage in creating a sustainable "fish habitat bank", a model which we anticipate will allow habitat creation and restoration projects to continue in perpetuity.

FISH AND WILDLIFE

Toronto Harbour Fish Assessment

The Toronto Harbour Fish Assessment project examines the year-round habitat needs of 90 tagged native and nonnative fish as they live, feed, reproduce, and overwinter in Toronto Harbour. The first full year of fish movement data was collected and analyzed in 2011-2012. The results of this study will help ensure that future restoration efforts create habitats that favour native fish populations. The information gathered in this study will also allow researchers to determine how often, and by what types of fish, recently created habitat (such as a recently completed wetland in Tommy Thompson Park) is used.

This study is still ongoing; the results obtained in 2011-2012, however, have confirmed the effectiveness of measures taken to ensure that newly created wetland habitats preferentially benefit desirable, native fish species. The Toronto Harbour Fish Assessment project has also demonstrated how science supported by the RAP can be shared and made relevant to a wide variety of audiences. In 2011-2012 project information and results were showcased to politicians, presented to academic audiences at research conferences, highlighted at a Lake Ontario Evenings event, and developed into a Watershed on Wheels learning module for local high school students.

Offshore Hydroacoutisic Estimation of Lake Ontario's Alewife Population

Alewife is important prey for salmon, trout, and warm water predators such as Walleye in Toronto and the region. Ontario Ministry of Natural Resources and the New York State Department of Environmental Conservation cooperate in a joint program using hydroacoustics (sonar) to monitor forage fish in Lake Ontario. The surveys, conducted annually, typically cover the waters in both jurisdictions in a series of north-south transects, collecting continuous hydroacoustic data. Periodic midwater trawls and temperature profile measurements are conducted to provide information needed to interpret the hydroacoustic data in order to obtain population estimates of Alewife. The estimate of yearling and older Alewife in Lake Ontario in 2011 was 185 million fish. This is a 38% increase from 2009 and slightly above the previous 5-year average. Sound management decisions regarding predator-prey balance require continued monitoring of prey fish populations.

Lake Ontario Atlantic Salmon Reintroduction Program

Through the Classroom Hatchery Program, Herb Campbell and Macville public schools within Peel Region helped out with raising Atlantic Salmon fry for stocking in the Humber River. Each classroom received 100 eyed eggs and raised them to free swimming fry in an aquarium. Students released their fry in May and June.

Ontario Streams, with guidance from the Ministry of Natural Resources, designed and implemented an Atlantic Salmon eyed-egg in-stream incubation experiment in several areas of the upper Humber River. Incubation Tubes, developed by Ontario Streams and the MNR, were tested at several sites. Follow-up monitoring involving visual inspections in the winter/spring; opening of the tubes in May to tally the fry; and electrofishing surveys in August were all conducted. In addition, the Islington Sportsmen's Club raised 40,000 eyed-eggs at their volunteer hatchery in Caledon. The resulting 26,000 fry were stocked at 2 sites in the upper Humber watershed, one of which was located within the Town of Caledon.

In addition to the above stocking activities, Ontario Streams recruited volunteers to assist with the MNR's stocking of hatchery raised Atlantic Salmon at multiple sites in May 2011. Approximately 100,000 advanced fry were released at 6 sites in Caledon. Fry were also raised by MNR's Normandale Fish Culture Station and by Sir Sanford Fleming College. Toronto and Region Conservation, Ontario Federation of Anglers and Hunters and Ontario Streams undertook several projects to improve Atlantic Salmon habitat in the Humber River. Projects included stream bank stabilization, tree planting, debris removal and livestock fencing.

www.torontorap.ca