



St. Clair River Area of Concern
Canadian Remedial Action Plan
Implementation Committee

Work Plan 2007-2010 Report of Accomplishments



Photo courtesy of Julie Fisher, Sarnia, Ontario



St. Clair River winter sunset photo courtesy of Steve Pondo, Marine City, Michigan

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St. Clair River Area of Concern

Canadian Remedial Action Plan Implementation Committee

Work Plan 2007-2010 Report of Accomplishments

FOREWORD

The mandate of the Canadian Remedial Action Plan Implementation Committee (CRIC) is to restore Beneficial Use Impairments (BUIs) identified in the 1992 Stage 1 Remedial Action Plan (RAP) for the Canadian jurisdiction of the St. Clair River. The primary responsibility of the committee is to coordinate the implementation of remedial activities to restore BUIs to the status of delisting criteria defined for each impairment.

In 2007, the committee developed a work plan that expanded on the 1995 St. Clair River Stage 2 – Recommendation Plan outlining outstanding priority actions required to achieve the re-designation of BUIs. Four subcommittees were formed and provided recommendations relating to 1) Point Sources, 2) Sediments, 3) Habitat and Non-Point Sources (NPS), and 4) Monitoring and Research. In addition, a section was included summarizing activities needed to enhance Public Outreach and Education.

This document serves to report on the accomplishments related to the 2007-2010 Work Plan. Its purpose is to provide an overview of the recommendations identified in 2007, the current status of priority actions, highlight achievements over the three year period, and identify what actions are still outstanding.

The following list acknowledges the partners and agencies that, without their contributions, progress on the 2007-2010 priority actions would not have been accomplished.

Aamjiwnaang First Nation
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Canadian Wildlife Service
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City of Sarnia
Environment Canada
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Municipality of Chatham-Kent
Ontario Ministry of Agriculture, Food
and Rural Affairs
Ontario Ministry of Environment
Ontario Ministry of Transportation
Rural Lambton Stewardship Network
Sarnia-Lambton Environmental Association
St. Clair Region Conservation Authority
St. Clair Township
Walpole Island First Nation



St. Clair River photo courtesy of Emer Dudley, Wallaceburg, Ontario

INTRODUCTION

In 1985, the International Joint Commission (IJC) identified the St. Clair River as an Area of Concern (AOC) in the Great Lakes Basin as it did not meet the objectives of the Great Lakes Water Quality Agreement signed in 1972 by the Canadian and United States governments. As a result of degraded chemical, physical and biological integrity, impairments to beneficial uses were identified, attributed primarily to elevated contaminant concentrations in the water, biota and sediments of the St. Clair River, and the loss of aquatic and coastal habitats. These observations led to the formation of a Binational RAP Committee in 1987, consisting of federal, and provincial and state representatives from Michigan and Ontario. The committee's key responsibility was to develop a Remedial Action Plan (RAP) to improve the environmental conditions in the St. Clair River.

The Stage 1 RAP report was published in 1992. It described the environmental conditions of the St. Clair River and identified the status of Beneficial Use Impairments (BUIs) based on criteria developed by the IJC. Of the 14 beneficial uses outlined by the IJC, eight were "Impaired" and four were classified under "Requires Further Assessment" based on 1985-1986 surveys of water, biota and sediment, and data up to 1990. The follow-up Stage 2 RAP report and the St. Clair River Stage 2 – Recommendation Plan were completed in 1995. Both introduced a framework for restoring the environmental integrity of the St. Clair River with the Recommendation Plan outlining 45 actions and issues required to fulfil BUI delisting criteria and lead to the "Not Impaired" BUI re-designation. Once all BUIs are re-designated to "Not Impaired" status, a recommendation to the IJC can be made supporting the move to "delist" the St. Clair River as an AOC.

The 2007-2010 Work Plan produced by the Canadian Remedial Action Plan Implementation Committee (CRIC) was a continuation from the 1995 St. Clair River Stage 2 – Recommendation Plan, and proposed actions that would further advance the rehabilitation of BUIs continuing to have "Impaired" or "Requires Further Assessment" statuses. Four subcommittees (Point Source, Sediments, Habitat and NPS, and Monitoring and Research) were established representing key areas that required further actions and recommendations. In addition, all subcommittees participated in developing a work plan related to Public Outreach and Education.

The following report will provide an update on the advancements and progress made in implementing the priority actions outlined in the 2007-2010 Work Plan and highlight significant achievements and milestones. In total, 114 activities were recommended by the work plan subcommittees and by the end of 2010, 85% had been completed or initiated (48% and 37%, respectively). Subsequent to this update will be the development of a 2012-2017 Work Plan, addressing the remaining actions needed to rehabilitate and "delist" the St. Clair River as an AOC.

REPORT ORGANIZATION

This report is organized into five sections corresponding to those presented in the 2007-2010 Work Plan (Point Source, Sediments, Habitat and NPS, Monitoring and Research, and Public Outreach and Education). Each section includes an overview of the recommendations and priority actions proposed in 2007 and the status of these actions current to the end of 2010. The definitions used in this report for the 2010 action statuses are:

Completed – The priority action outlined in the 2007-2010 Work Plan was accomplished.

Completed and Ongoing – The priority action outlined in the 2007-2010 Work Plan was accomplished; however, continued monitoring and/or actions will continue for a period of time beyond 2010.

In Progress – The priority action outlined in the 2007-2010 Work Plan was initiated but not accomplished and is moving toward completion.

Not Completed – The priority action outlined in the 2007-2010 Work Plan was not accomplished.

In addition, an addendum has been included in this report to provide an overview of the priority action progression and achievements that occurred in 2011.

Section 1 – Point Source Work Plan

Summary of Accomplishments

The 2007-2010 Work Plan Point Source Subcommittee provided four recommendations to promote the advancement of re-designating impaired St. Clair River BUIs impacted by point source pollution. Under these recommendations, 20 priority actions were listed. As of 2010, 16 actions were accomplished with others nearing completion.

Several industries situated along the St. Clair River shoreline were decommissioned. As a result, MISA loadings consistently decreased. In 2008, Spill Prevention and Contingency legislation was introduced outlining measures to reduce spill frequency and compliance criteria for the industrial sector. Monitoring programs continue to track industrial discharge entering the river, ensuring the effective identification of issues arising from point sources in the watershed.

Reductions were observed in the number of discharge exceedances and bypasses occurring at local WPCPs between 2007 and 2010. Beach monitoring programs were initiated in 2009 and 2010 at eight locations along the St. Clair River and on Walpole Island, providing weekly bacterial data, adding to those collected by local Health Units.

Two CSOs were eliminated in the City of Sarnia, with work currently being conducted to separate combined infrastructure in the Sanitary Drainage Area. The increased volume of sewage to WPCPs has resulted in the mitigation of CSOs in the Sarnia area.

INTRODUCTION

Many issues stemming from the direct discharge of contaminants by Point Sources located along the St. Clair River were identified in the 1995 St. Clair River Stage 2 – Recommendation Plan. Specifically, inputs from industry, municipal WPCPs, municipal CSOs, and the Cole Drain resulted in the proposal of 16 priority actions in the 1995 Recommendation Plan.

The review conducted by the Point Source Subcommittee in 2007 recognized the successful completion of many priority actions listed in 1995. Upon further discussion and consideration, however, the Subcommittee identified other actions they considered to be ongoing or in need of additional attention. As a result, four recommendations were proposed in the 2007-2010 Work Plan. Programs developed to address the recommendations were established and included continued monitoring of decommissioned industrial facilities, the elimination of CSOs (particularly in the City of Sarnia) and increased bacteriological sampling at beaches along the St. Clair River shoreline.



Beach photo courtesy of Tonya Wirgau, Algonac, Michigan

RECOMMENDATIONS

#1.1 RECOMMENDATION

Track monitoring of decommissioned and decommissioning of industrial facilities and landfills in the St. Clair River (e.g., Dow Canada, Chinook) and continue to examine and mitigate any existing or potential future environmental impacts due to residual contaminant sources on St. Clair River beneficial uses.

RESPONSIBLE ORGANIZATIONS

- OMOE
- EC

ACTION 1

Maintain and review Point Source regulatory monitoring (Municipal Industrial Strategy for Abatement (MISA), Certificate of Approval (C of A)) to ensure timely reporting and information dissemination on environmental concerns.

STATUS

Completed and Ongoing

Systems and processes are in place to provide for effective sustainment of this ongoing need. There are no other time-bounded steps that need to be taken relative to this recommendation to enable delisting of the AOC.

The rationale for this conclusion is summarized below:

The OMOE has policies and systems in place to track industrial sewage discharge exceedances and the decommissioning of MISA outfalls every year. There is a public Environmental Compliance Report (ECR) that details exceedances across the province (available online) since 2005. The OMOE also inspects facilities and landfills locally every three to four years to ensure they are complying with Environmental Compliance Approvals (ECAs; formerly C of As) and MISA legislation. Overall, MISA loading trends for the St. Clair River have been steadily decreasing (Figure 1.1). Landfills are tracked locally through inspections and yearly reports submitted by regulated companies and reviewed by surface and groundwater specialists. Any issues identified through reports or inspections are followed up locally with abatement staff.

Details are provided on some of the major changes:

Dow Chemical LaSalle Road landfills – The MISA sampling point was decommissioned for both landfills in 2010.

Dow Chemical Vidal Street – All manufacturing has been shut down at the site; the process sewage flows have ceased and the plant site has been completely decommissioned. Since the site has been sold, the original MEWS designation is no longer applicable. No new processing plant has been established on the former Dow Chemical Canada Ltd. St. Clair River plant site.

Lanxess – Lanxess provides treatment for the waste streams of seven other companies in the area with their biox treatment unit. The biox treatment unit utilizes microbes to enhance biological oxidation and aeration to treat process water. One of their MISA points was decommissioned due to unit shutdown. There are also cooling water discharge points (three in total with one currently active).

Praxair Mooretown – The company has permanently closed this site and District granted the company to eliminate the MISA point.

Chinook – Chinook shut down in 2007 and was decommissioned.

Welland Chemical – Although the on-site wastewater lagoons have not been permanently discharged, there is no longer a MISA discharge point.

Royal Polymers – This facility was closed in 2009 and no longer discharges to the St. Clair River.

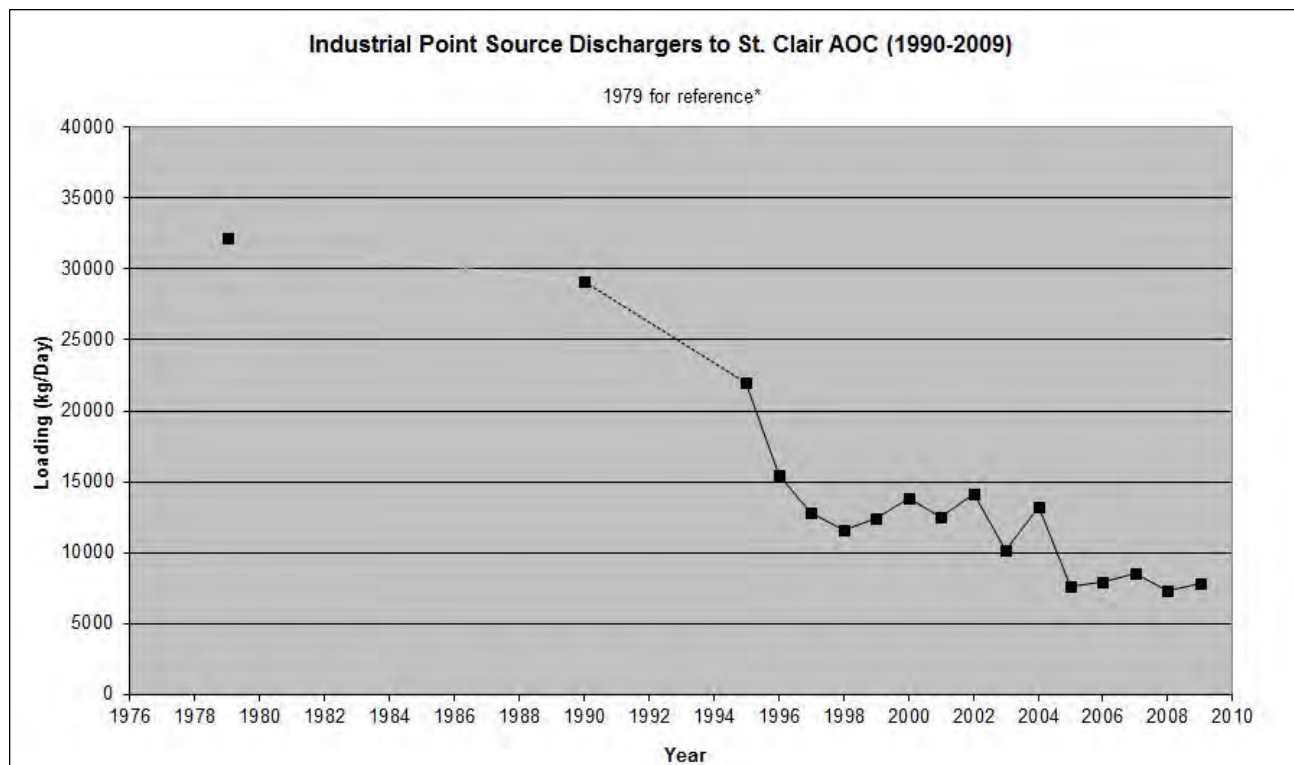


Figure 1.1: Chemical loadings of 19 parameters (suspended solids, solvent extractables, biological oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon (TOC), ammonia, phenolics, phosphorus, copper, chromium, iron, lead, nickel, zinc, chlorides, fluoride, arsenic, cyanide, and sulphates) between 1990 and 2009 for 17 facilities with point source discharges in the St. Clair River Area of Concern (AOC; OMOE, 2012).

ACTION 2 Maintain and review corridor/river monitoring programs and ensure timely delivery of results for synthesis and BUI assessments.

STATUS *Completed and Ongoing*

Systems and processes are in place to provide for effective sustainment of this ongoing need. There are no other time-bounded steps that need to be taken relative to this recommendation to enable delisting of the AOC.

The rationale for this conclusion is summarized below:

Sportfish Contaminant Monitoring Program – Staff from the OMNR and OMOE collect fish, which are then analyzed for a variety of substances, including mercury (Hg), PCBs, mirex, DDT, and dioxins. The results are used to develop the advisory tables, which give size-specific consumption advice for each species tested from each location. The guide is published every other year. Within the St. Clair River, sampling of a variety of fish species occurs in three sections: upper, middle, and lower.

Environment Canada Head and Mouth Surveys – Two permanent monitoring stations were established in 1987: one at Point Edward and one at Port Lambton, corresponding to the head and mouth of the river, respectively. Biweekly water and suspended sediment samples have been collected at these two sites since April 1987. The samples are analyzed for a variety of chemical parameters including nutrients, major ions, trace metals, and organic contaminants. The results from 1987 to 1999 were published by EC in 2001 (Chan *et al.*, 2001).

Monitoring of Industrial Discharge Results under MISA and ECAs (formerly C of As) – The MISA program began in the late 1980s with an assessment of direct wastewater dischargers in nine industrial sectors. This resulted in the enactment of regulations in the early 1990s requiring designated large facilities to meet discharge limits and to report the load discharged for regulated substances since that time.

The Provincial Water Quality Monitoring Network (PWQMN) – The PWQMN started in 1964 to collect surface water quality information from rivers and streams at strategic locations throughout Ontario. The purpose of the program is to document long-term ambient water quality trends; to determine the general location and causes of water quality problems; and to measure the effectiveness of broad pollution control and watershed management programs including watershed-based source protection planning and nutrient management.

SLEA Monitoring Program – A fully automated monitoring station is located at Courtright. It was established in 1987 and analyzes samples of river water on an hourly basis. Twenty chemical compounds are tracked; these are associated with the refining of petroleum and the manufacturing of chemicals. In 2008, more than 8,700 samples from the St. Clair River were collected and analyzed, under the SLEA's continuous water quality monitoring program.



Fishing photo courtesy of Peter DeBurger, Port Lambton, Ontario.

#1.2 RECOMMENDATION

Ensure that Water Pollution Control Plants (WPCPs) continue to meet current regulations and do not negatively affect beneficial uses.

RESPONSIBLE ORGANIZATIONS

- MOE
- Municipalities
- WIFN
- EC
- AANDC

ACTION 1

Cities of Sarnia and Wallaceburg, villages of Point Edward, Corunna and Courtright, and towns of Sombra and Port Lambton must continue to operate their WPCPs and lagoons in order to meet discharge criteria as identified in their C of A.

STATUS

Completed

Systems and processes are in place to provide for effective sustainment of this ongoing need. There are no other time-bounded steps that need to be taken relative to this recommendation to enable delisting of the AOC.

The rationale for this conclusion is summarized below:

Compliance with ECA (formerly C of A) – This is a legislated requirement that the OMOE monitors continuously. It releases Environmental Compliance Reports (ECR) to the public every year, which provide information about contaminant discharges to water that exceed limits found in legislation, environmental approvals, orders, and/or policies/guidelines. Generally, the facilities report non-compliance to the ministry. The ministry, through inspections, may also identify non-compliance. The ministry reviews all recorded incidents of limit exceedances and ensures that appropriate action is taken. The range of abatement and enforcement responses include: education, amendments to approvals, issuing orders, tickets and/or environmental penalties, prosecution and up to and including suspension of certificates.

The ECRs are available online at:

www.ene.gov.on.ca/environment/en/industry/compliance_and_enforcement/environmental_compliance_reports/index.htm.

Point Edward – The plant operates as an extended aeration plant with continuous phosphorus (P) removal, ultraviolet disinfection, and a treated effluent discharge to the St. Clair River. There has been full compliance with all of the applicable limits imposed by the C of A.

Corunna – The C of A was issued on April 22, 2009, which approved the replacement of the Corunna WPCP with a sanitary pumping station to convey sewage from the community of Corunna to the Courtright WPCP. It was last inspected in 2009, during which no recent bypasses were experienced. Some exceedances were noted in 2009, 2008, and 2005, and were reported in the ECR.

Courtright – The C of A was issued March 4, 2009, approving the expansion of the Courtright STP for treatment of sewage from the Township of St. Clair. No recent bypasses were reported in the last inspection in 2009. Some exceedances were noted on ECR for 2009. Effluent limits have not changed in the C of A.

Sarnia – There is a multi-year sewer separation project in progress to address bypasses. There have been exceedances reported in the 2005 to 2010 ECR report. There continues to be regular bypasses of combined storm/sewer during rain events, although volume has been reduced by 50% from previous years.

Sombra – These lagoons were last inspected in 2008 and no bypasses were reported.

Port Lambton – These lagoons were inspected in 2008. No issues were identified.

CF Industries (formerly Terra Industries Inc.) – This company operates a WPCP. The final discharge is combined with their MISA effluent. Some issues reported related to exceedances and ammonia (NH₃) ingress (the presence of NH₃ in effluent originating from outside their treated process water). A Provincial Officer's Order and Abatement Plan are in place to address the exceedances.

ACTION 2 Assess the need for disinfection at Port Lambton and Sombra lagoons if Beach Closings for bacteria are still occurring once all other sources are remediated.

STATUS *In Progress*

The Port Lambton and Sombra lagoons were inspected in 2008. No bypasses were reported and exceedances were found at Sombra in 2005.

A review on the status of beach closings BUI is currently underway. If it is determined that there are further bacterial issues/beach closings, further action will be considered.

St. Clair River Beach Monitoring Program – Official beaches identified by the municipality and monitored by local Health Departments include Mitchell's Bay (sampled by the Chatham-Kent Health Unit (CKHU) and is located downstream of the Port Lambton and Sombra lagoons.

In 2004, the Lambton County Community Health Services Department (LCCHSD) and the OMOE undertook additional sampling at sites along the St. Clair River from Sarnia to the delta, between June and August. The sites located downstream of Sombra included Cathcart, Branton Cundick, Regan and Brander Parks (this does not include the delta).

In 2009, a beach monitoring program was initiated by the OMOE and the SCRCA. Single samples were collected on a weekly basis between June and September at the following locations south of Sombra and the Port Lambton lagoons: Cathcart Park, Branton Cundick Park, Regan Park, and the outlet of Marshy Creek. This program was also continued between June and September of 2010.

WIFN also monitors *E. coli* at beaches and other heavily used recreational areas on the island. Data sharing agreements are in development.



E. coli and water sampling along St. Clair River beaches and park areas

ACTION 3 Develop a Master Plan for sewage treatment for the City of Sarnia, which includes plant optimization, elimination of bypasses, and CSOs.

STATUS *In Progress*

The City of Sarnia owns and operates two Wastewater Treatment Plants: one located in the City proper and a second located in the hamlet of Bright's Grove. The wastewater collection system servicing the City's WPCP facility includes approximately 302 km of gravity sewer, 51 Sewage Pumping Stations (SPSs), and approximately 39 km of forcemain. The Bright's Grove WWTP is serviced by approximately 26 km of gravity sewers, 4 SPSs, and 2.5 km of forcemain.

In 2009, the City undertook an assessment of the reserve capacity of each Wastewater Treatment Facility. The resulting report (Triton Engineering Services Limited, 2009) concluded that limited uncommitted reserve capacity existed at both facilities. The report recommended that the City undertake a detailed hydraulic assessment of the wastewater collection systems serving the City's treatment facilities and to include the following:

- 1) Identify trunk sewer service areas;
- 2) Initiate a sanitary flow monitoring program to permit the City to identify hydraulically-deficient trunk sewers and high Infiltration/Inflow;
- 3) Develop a hydraulic model of the collection system, to identify trunk systems that are hydraulically-deficient and assess the impact of future development; and
- 4) Develop a Wastewater Collection Systems Master Plan.

The Master Plan will provide direction to the long-term management and operation of wastewater infrastructure specific to:

- i) Providing input to the City's long-term capital planning;
- ii) Identifying wastewater infrastructure projects to be incorporated into the City's Development Charges Bylaw; and
- iii) Assist in long-term planning.

ACTION 4 Determine the wastewater treatment practices on Walpole Island and assess if there are any impacts to St. Clair River beneficial uses and identify work plan additions to support delisting.

STATUS *Completed*

WIFN does have a communal sewer system. The majority of WIFN residents are linked to individual septic systems. Reports of problems with septic systems in the community are likely caused by high groundwater levels, the age of the systems, and periodic flooding. WIFN is assessing impacts by reviewing *E. coli* data from their beach monitoring program. A new work plan may include examining bacteria levels within the Walpole Island Dredge Cut, which receives surface water drainage during the summer. There are two wastewater collection systems with aeration treatment units serving the Sports Complex and a residential subdivision.

WIFN has been unsuccessful in applying for funding to support building a wastewater treatment plant.

ACTION 5 Maintain and review WPCP regulatory monitoring (C of A) to ensure that recommendation is achieved.

STATUS *Completed*

Systems and processes are in place to provide for effective sustainment of this ongoing need. There are no other time-bounded steps that need to be taken relative to this recommendation to enable delisting of the AOC.

Refer to the first action under this recommendation for details supporting this conclusion.

ACTION 6 Maintain and review corridor/river monitoring programs and ensure timely delivery of results for use in BUI assessments.

STATUS *Completed and Ongoing*

Refer to the status of Action 2 under #1.1 Recommendation.



Courtright Pollution Control Plant

#1.3 RECOMMENDATION

Complete programs to eliminate combined sewer overflows (CSOs).

RESPONSIBLE ORGANIZATIONS

- MOE
- Municipalities
- WIFN
- EC
- AANDC

ACTION 1 Eliminate Exmouth Street CSO in the City of Sarnia.

STATUS *Completed*

Work was undertaken in 2009.

The sewage from the separated area (Area 4) now discharges into a separated sanitary sewer on Exmouth Street. The Exmouth CSOs to the St. Clair River have been completely eliminated. This project cost \$9 million. The federal and provincial governments provided \$6 million. Monitoring by the County of Lambton Health Services Department has shown a noted improvement in the water quality within Centennial Bay since completion of this project.

ACTION 2 Eliminate Christina Street CSO in the City of Sarnia.

STATUS *Completed*

Work was completed on the Christina Street separation in 2009 and cost \$5.25 million, which was split three ways between the City and the federal and provincial governments.

ACTION 3 Completely separate cross connections within the City of Sarnia Sanitary Drainage Area 1.

STATUS *In Progress*

Most of the combined sewers are located in the core areas of the City (Area 1), which includes the Cromwell and Devine main CSOs. Within this area, about 32 km of combined sewers exist and of that, eight km have been separated over the past five years (2006 to 2010).

Sarnia has/had three combined sewers (Exmouth/Cromwell and Devine) that flow directly into the St. Clair River. The total length of the sewers is approximately 37 km. That has been reduced to 25 km. Remaining work to separate sewers, and rebuild streets and the water system is estimated to cost between \$130 and \$150 million. Sarnia continues to work on these projects, but it is estimated it will take 15 to 20 years to complete at present levels of funding.

The table below (Table 1.1) represents total capital funds spent as part of the sewer separation work since 2006.

Table 1.1: The total capital funds provided as part of the sewer separation work in Sarnia, Ontario, since 2006.

	TOTAL FUNDING	CITY OF SARNIA PORTION	FEDERAL / PROVINCIAL PORTION
COMRIF	\$9,000,000	\$3,000,000	\$6,000,000
MIII	\$5,250,000		\$5,250,000
CSIF	\$34,970,000	\$11,660,000	\$23,310,000
ISF	\$11,700,000	\$3,900,000	\$7,800,000
TOTAL	\$60,920,000	\$18,560,000	\$42,360,000

ACTION 4 Complete City of Sarnia East Street sanitary interceptor sewer to divert sewage from Drainage Areas 2 & 4 to WPCP.

STATUS *In Progress*

The sewage from the separated areas (Area 2) is being diverted to a new pump station on Devine Street-City's Works Yard and being pumped to a WPCP directly via a forcemain. This has mitigated CSOs at Devine Street and Cromwell Street. The City received approximately \$35 million to undertake this project through provincial and federal funds. The project is to be completed in 2012.

ACTION 5 Determine the effectiveness of the Devine Street CSO holding tank in the City of Sarnia at full capacity.

STATUS *Completed*

The City of Sarnia reported no overflows from this tank for 2011. As the sewer separations continue, the flows to this tank will be reduced. The tank buffers flow during storm events, which are pumped to the WPCP for treatment under lower flow conditions.

Sewer separation in the Devine Street Drainage areas (approximately seven km) is expected to be completed within five years.

ACTION 6 Determine whether there are CSO discharges from Walpole Island First Nation impacting on the river beneficial uses and identify work plan additions to support delisting.

STATUS *Completed*

There are no CSO concerns in WIFN.

ACTION 7 Determine whether there are CSO discharges from Aamjiwnaang First Nation impacting on the river beneficial uses and identify work plan additions to support delisting.

STATUS *Completed*

No CSOs were reported in the AFN territories. The community is connected to the Sarnia municipal sewage system.

ACTION 8 Determine whether there are sanitary/stormwater sewer cross connections in Point Edward and identify work plan additions to support delisting.

STATUS *Completed*

The Point Edward plant does not have combined sanitary/stormwater sewer cross connections.

ACTION 9 Maintain and review corridor/river monitoring programs and ensure timely delivery of results for synthesis and BUI.

STATUS *Completed and Ongoing*

Refer to the status of Action 2 under #1.1 Recommendation.



Devine Street Reconstruction

#1.4 RECOMMENDATION

Continue to work closely with industries to improve spill prevention to the St. Clair River.

RESPONSIBLE ORGANIZATIONS

- MOE
- Industries
- SLEA

ACTION 1

Assess extent to which regulatory changes made in 2005-2007 have addressed IPAT recommendations and identify which remaining recommendations will be implemented.

Editorial Note:

IPAT report is available online at: http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079095.pdf.

STATUS

Completed

In May of 2005, the Government of Ontario passed the Environmental Enforcement Statute Law Amendment Act, also known as "Bill 133." The objective, as stated by the Minister, was to reduce the number of spills in Ontario by "encouraging companies to do more to prevent spills and to ensure fast, effective cleanup when mishaps do occur."

Changes introduced by the bill included:

- Increasing the onus on corporate officers for prevention of spills;
- Lowering the thresholds for spill reporting;
- Allowing for regulations to strengthen spill reporting requirements, requiring establishment of spill prevention and contingency plans, and to establish a system for imposing environmental penalties when spills have occurred;
- Increased fines; and
- That due diligence will not reduce the liability of industries that have a spill.

The related Spill Prevention and Contingency legislation – Reg. 224 came into effect on September 1, 2008. It required that a spill prevention and contingency plan is developed and implemented for each regulated plant.

The Environmental Penalties portion of Bill 133 was embodied in Reg. 222, which was passed into law in 2007.

In 2010, the ministry issued 33 environmental penalty orders that addressed 74 violations. The value of these 33 orders was \$430,112.90. Six of those penalties were in the Sarnia area for a total of \$140,780.75.

In addition to regulatory initiatives, industrial facilities have addressed, on their own initiative, aspects of IPAT recommendations through capital investment to upgrade industrial stormwater retention ponds, spill detection, and diversion, to contain wastewater on site and optimization of wastewater treatment.

ACTION 2 Continue to work with industry to develop closed-loop cooling water systems, cooling water towers, or monitor and divert systems.

STATUS *Completed and Ongoing*

The Sarnia District Office has verified that all regulated facilities have completed Spill Prevention and Contingency Plans. In addition, they regularly inspect those facilities that are required to have a plan to confirm they continue to have these plans in place.

Project plans for the development of closed-loop cooling water systems, cooling water towers, or monitor and divert systems are submitted to the OMOE Approvals Branch when amendments to their Environmental Compliance Approval, or a new approval, are required. Environmental officers assigned to the specific facility will have a chance to review and comment on the application.

ACTION 3 Continue MISA and C of A monitoring and improve MOE data reporting to AOC lead agencies for use in assessing BUI status.

STATUS *Completed*

The capturing of this data is ongoing. Communications of this data has improved with the appointment of OMOE District office staff to the CRIC, which allows improved access of this information for reporting. Results of this improved communication can be found in a number of action reports found in early parts of this section.



Industry along the St. Clair River

Project Highlights

Exmouth Street and Christina Street Combined Sewer Overflow (CSO) Elimination

The separation of the combined sewers at both Exmouth Street and Christina Street in Sarnia, Ontario, highlights the commitment AOC partners have in eliminating CSOs into the St. Clair River. The 2009 completion of the sewer separation followed multiple reports that untreated sewage and stormwater discharge were entering the river during heavy rainfall events because of aging and outdated infrastructure. Since the elimination of the Exmouth and Christina Street CSOs, the County of Lambton Health Services Department has seen marked improvements in water quality, particularly in Sarnia Bay where average summer *E. coli* levels have decreased from 1028 cfu/100 mL in 2007 to 195 cfu/100 mL in 2010 (Paul Buttery, personal communication, 2012). Although the complete elimination of CSOs in the City of Sarnia is not expected to be complete for another 15 years and at an estimated cost of \$150 million, the progress made to date is encouraging. Continued separation of combined sewers will contribute to the “delisting” of the St. Clair River AOC and provide healthier waters for the residents and visitors of the region.

Spill Prevention and Contingency Plans

The number of spills reported in the Great Lakes Basin has decreased since the 1990s; however, concerns with the risk these incidents pose to the quality of drinking water continue. In the St. Clair River, the input of contaminants (e.g., chemicals, oil, hydrocarbons, wastes) as a result of spills primarily originate from onshore industry (IJC, 2006). The implementation of the Spill Prevention and Contingency Plans legislation (Regulation 224) in 2008 has led to advancements in preventing the release of contaminants as a result of spills. Industries have invested millions of dollars in upgrading and maintaining equipment and have incorporated spill prevention systems into their facilities (e.g., water-hold and treat systems, Imperial Oil, Sarnia, Ontario). Furthermore, a continuous water quality monitoring station (administered by SLEA) south of Courtright serves to challenge and motivate industry to meet their “no spills” objective. Twenty



Sarnia Bay Marina

target chemicals have been identified by the organization and if detected, an alarm is sent to the OMOE. Since its implementation, only one plant upset has led to the precautionary closing of a drinking water intake along the St. Clair River. It was later determined that the discharge that led to the notification would not have posed a risk to the source of drinking water. This event highlights the precautionary nature of water treatment plant notification and closure procedures on the St. Clair River.

Section 2 – Sediment Work Plan

Summary of Accomplishments

With the 2004 removal of contaminated sediments by Dow Chemical Canada from Zone 1 in the St. Clair River, the primary task of the Sediment Subcommittee focused on how to address the remaining sediment contamination sites in Zones 2 and 3. Seven priority actions were identified falling under one recommendation.

Between 2007 and 2010, four priority actions were completed. In 2007, a Technical Steering Committee was established with representatives from EC, the OMOE, the SCRCA, SLEA, WIFN and the AFN. The committee's key responsibilities included undertaking an assessment of the sediments to determine the ecological impacts of the Contaminants of Concern (COCs), and identifying options to successfully manage these remaining sites.

In 2008, the Sediment Technical Committee, through the SCRCA, hired ENVIRON to undertake an assessment of these sediments using the COA Sediment Decision-Making Framework. This report was provided to the Technical Team in March 2009 and identified that, while there was no impairment to the benthic communities and sediment toxicity, there was a risk of biomagnification to fish requiring the development of management options for these contaminated sediments.

In November 2009, ENVIRON was hired to undertake the development of Sediment Management Options (SMOs) for these contaminated zones. The options being looked at for each area are sediment removal, isolation capping, and monitored natural recovery. Further studies (geotechnical, geophysical and geochemical) were identified in the draft stage of the report to better refine costs for each of these options. These studies and the completion of the SMOs report are anticipated by June 2012.

INTRODUCTION

The 2004 removal of 13,370 m³ of contaminated sediment in Zone 1 of the St. Clair River by Dow Chemical Canada proved to be an important step in moving towards re-designating impaired BUIs. Currently, two zones of contaminated sediments remain (Figure 2.1), which were the primary focus of the Sediment Subcommittee in their review of the 1995 Stage 2 – Recommendation Plan.

The Sediment Subcommittee provided one recommendation together with seven priority actions that would establish measures and options available for the remediation of the contaminated sediments in Zones 2 and 3 (now identified by three Areas of Interest (AOI): A, B and C; Figure 2.2).



2011 sediment core sampling conducted by Pollutech EnviroQuatics Limited



Figure 2.1: Contaminated sediment priority zones in the St. Clair River (Hayman, 2009).

RECOMMENDATIONS

#2.1 RECOMMENDATION

Undertake an assessment of contaminated sediments in the St. Clair River and determine actions.

RESPONSIBLE ORGANIZATIONS

- MOE
- EC

ACTION 1 Establish a Technical Steering Committee.

STATUS *Completed*

As the first step in addressing the remaining contaminated sediments within the St. Clair River, a Sediment Technical Committee was established in 2007, along with a Terms of Reference. The St. Clair River Technical Team assesses the ecological impact of the Contaminants of Concern (COCs) in a defined sediment study area of the St. Clair River. The Technical Team determines if the sediment COCs are primarily from historical contamination which, if not remediated, could result in an unacceptable ecological risk. The Technical Team assumes that local ongoing sources have been/are being managed by the appropriate agency. Where remedial action is required, the Technical Team assesses sediment management options and recommends a preferred option as a basis for the development of a sediment management strategy to meet both short- and long-term goals. The Technical Team is involved in risk assessment but not risk management.

The membership consists of representatives from partnership agencies as follows: EC (co-chair), OMOE (co-chair), SCRCA, SLEA, WIFN and AFN.

ACTION 2 Hire a Project Manager to facilitate the decision-making process for contaminated sediments in Zones 2 and 3 (if required).

STATUS *Completed*

Management of the process through the Sediment Technical Committee is being handled by EC and the OMOE as co-chair on the technical committee. Specific project management for letting out contracts for the undertaking of the assessment, sediment management options, and any additional studies required has been handled to date through the SCRCA.

ACTION 3 Identify and address sediment chemistry, biological and other data gaps for Zones 2 and 3.

STATUS *Completed*

A great deal of data supporting efforts to assess the contaminated sediments within the remaining area of interest had been identified for use. Before the assessment could be completed, a geo-referenced database of all relevant data and needs was developed (Phase 1), along with the mapping of the stations and the COCs priority areas. The geo-referenced database constructed by the OMOE GIS staff combined the St. Clair River data to be used in the

Canadian Ontario Agreement (COA) Framework (assessment). Maps of mercury (Hg) distribution provided highlights of sites needing management.

The population of the database used 2001 to 2006 data, as it was the most relevant for assessing current status.

ACTION 4 Use the COA “Assessment Framework” on St. Clair River sediment to determine the need for contaminant sediment management strategies.

STATUS *Completed*

The St. Clair River Technical Team hired the consulting firm ENVIRON in July 2008 to undertake a risk assessment to wildlife and fish from elevated concentrations of mercury (Hg) and octachlorostyrene in sediments, within Zones 2 and 3 of the St. Clair River. This study was completed at the end of March 2009.

The study applied the *COA Decision-Making Framework for the Assessment of Great Lakes Contaminated Sediments*, which uses an ecosystem approach in the assessment of sediment and identifies potential effects on sediment-dwelling and aquatic organisms, along with the potential for biomagnification in higher species levels.

The COA Framework uses four lines of evidence to determine impairment; these include sediment chemistry, sediment toxicity, benthic community alteration, and biomagnification potential. Sediment management is based on the evaluation of these Lines of Evidence. The COA Framework provides a mechanism for identifying contaminated sediments of greatest concern.

i) Risk from Biomagnification

Risk from biomagnification was evaluated by: 1) selecting ecological receptors of interest (ROIs); 2) calculating target concentrations of mercury (Hg) and octachlorostyrene in aquatic organisms that are protective of each ROI; and 3) comparing current chemical concentrations in aquatic organisms to the target concentrations that are protective of each ROI.

ii) Sediment Chemistry

The sediment chemistry Line of Evidence involves comparing surface sediment chemistry data to Provincial Sediment Quality Guidelines (PSQGs) and reference conditions. The objective of this is to determine whether: 1) chemicals are present in surface sediment at concentrations greater than conservative screening levels; and/or 2) chemicals present in surface sediment could biomagnify and affect the health of biological communities at higher species levels, such as herring gulls, double crested cormorants, and raccoons.

iii) Benthic Invertebrate Community Alteration

The objective of the benthos alteration Line of Evidence is to determine whether the benthic community structure in the study area differs significantly from benthic community structure at appropriate reference sites.

iv) Sediment Toxicity

The objective of the sediment toxicity Line of Evidence was to determine whether survival, growth, and/or reproduction of sediment-associated invertebrates and minnows are impaired in the St. Clair River study area.

Based on the assessment using the *COA Decision-Making Framework for the Assessment of Great Lakes Contaminated Sediments*, there was no impairment based on the benthos alteration and sediment toxicity Lines of Evidence; however, there was indication of impairment based on the biomagnification Line of Evidence, which, based on the framework document, requires further assessment.

Zones for sediment management were prioritized based on risk to fish (Figure 2.2), the one ROI for which significant risk from biomagnification was predicted. The species looked at include yellow perch (*Perca flavescens*), white sucker (*Catostomus commersonii*), carp (family *Cyprinidae*), freshwater drum (*Aplodinotus grunniens*), brown bullhead (*Ameiurus nebulosus*), largemouth bass (*Micropterus salmoides*), rock bass (*Ambloplites rupestris*), walleye (*Sander vitreus*), redhorse sucker (*Moxostoma carinatum*) and northern pike (*Esox Lucius*).

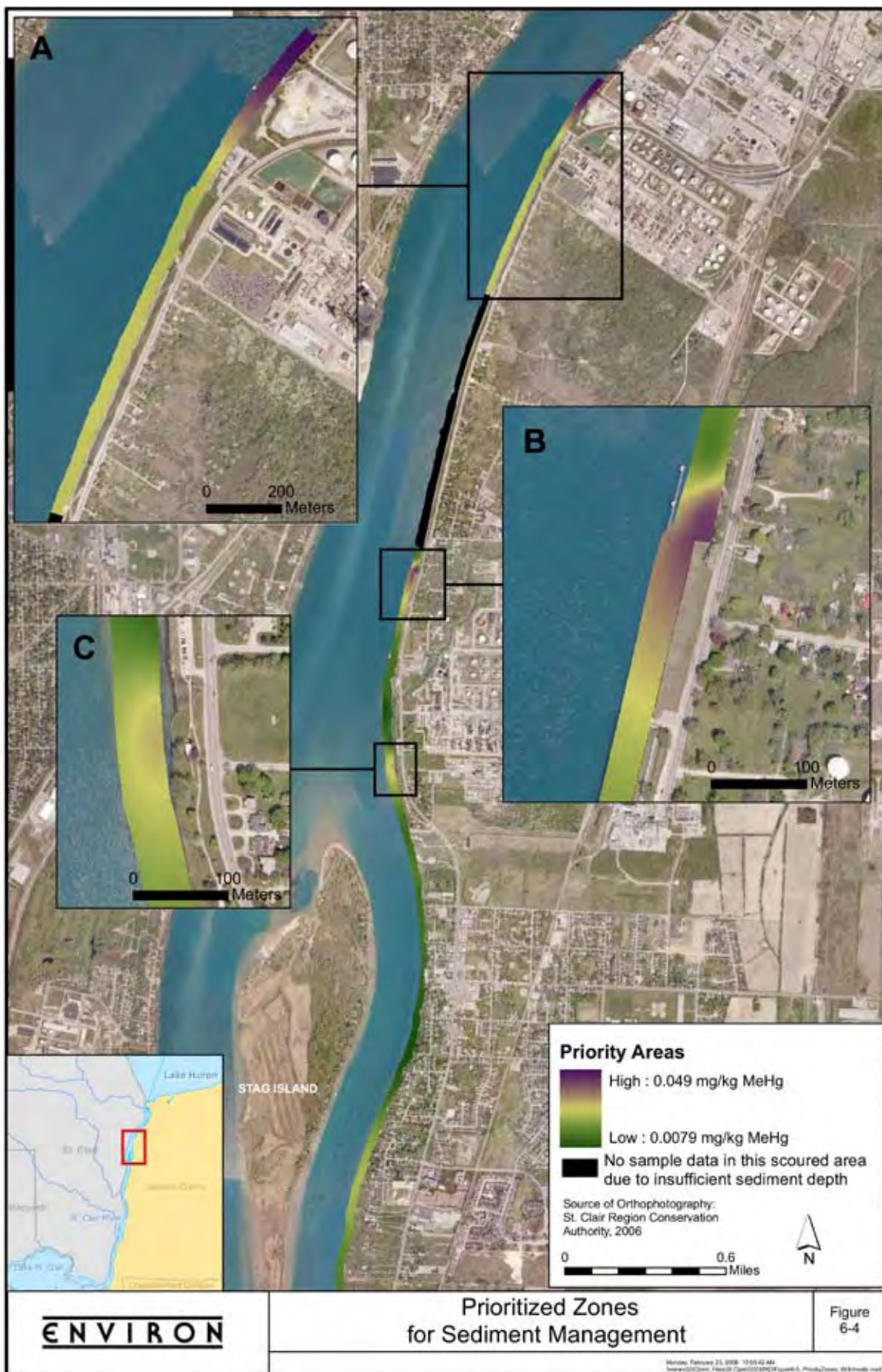


Figure 2.2: Prioritized sediment management zones based on risk to fish (ENVIRON International Corporation, 2009).

-
- ACTION 5** Develop sediment management options and select preferred option for Zones 2 and 3.
a) Conduct a “Public, First Nations and Stakeholder Consultation” to seek consensus.

STATUS *In Progress*

A contract for developing Sediment Management Options (SMOs) was issued in November 2009 to ENVIRON Consultants. Options being reviewed include:

- Priority Area 1a: 1) Dredging with thin layer capping of residuals; 2) Isolation capping; 3) Monitor natural recovery
- Priority Area 1b: 1) Isolation capping; 2) Thin layer capping; 3) Monitor natural recovery
- Priority Area 2: 1) Dredging with thin layer capping of residuals; 2) Isolation capping; 3) Monitor natural recovery
- Priority Area 3: 1) Dredging with thin layer capping of residuals; 2) Isolation capping with institutional controls; 3) Monitor natural recovery

A draft SMO report was completed in February 2010, at which time it was identified that further data were required in order to better identify option costs. These studies include: 1) geophysical, which was completed in the fall of 2010, and 2) geotechnical and geochemical, which will be completed at a later date.

Once these data have been collected, they will be incorporated into the draft SMO report and then finalized for public consultation.

This will then lead to selection of the preferred remedial measure in each priority area.

-
- ACTION 6** If sediment removal is necessary, the following steps are required for implementation:
a) Develop engineering design
b) Secure funding
c) Undertake an Environmental Assessment (EA)
d) Implement the sediment remediation strategy
e) Environmental monitoring
f) Public and agency communications

STATUS *Not Completed*

This action will be completed once the geochemical and geotechnical surveys are completed and only if removal is the necessary and/or decided SMO for remediating the contaminated sediments from the St. Clair River.

-
- ACTION 7** Evaluate the effectiveness of remediation on beneficial uses.

STATUS *Not Completed*

The evaluation of the effectiveness of the SMOs on re-designating the St. Clair River BUIs will be assessed once all remediation activities are complete.

Project Highlights

The COA Decision-Making Framework for the Assessment of Great Lakes Contaminated Sediments

The *COA Decision-Making Framework for the Assessment of Great Lakes Contaminated Sediments* was utilized by ENVIRON International Corporation to assess the need for management of contaminated sediments in the St. Clair River AOC. The COA Framework uses an ecosystem approach to sediment assessment to evaluate potential effects on sediment-dwelling and aquatic organisms, as well as potential for contaminants to biomagnify (transfer) in the food chain, in order to form a rational basis for making sediment management decisions. Four lines of evidence (LOEs) were evaluated and included: 1) risk from biomagnification of mercury (Hg) and octachlorostyrene; 2) sediment chemistry; 3) benthic invertebrate community structure; and 4) sediment toxicity. Based on this evaluation, the management of the contaminated sediments was recommended for the Area of Interest in the St. Clair River based on the risk of adverse effects to fish resulting from the biomagnification of Hg. To measure risk of adverse effects to fish from Hg accumulation, a toxicity reference value (TRV) of 0.2 mg Hg/kg was established by reviewing published literature. Comparing this threshold to measured tissue concentrations in St. Clair River fish found that young of the year tissue concentrations were consistently below the TRV (negligible risk; <20% exceeding TRV), while in some areas up to 31% of adult fish had Hg tissue concentrations greater than the TRV (intermediate risk; 21%-50% exceeding TRV). Species-specific results indicated that Hg bioaccumulation posed the greatest risk to redhorse sucker and northern pike followed by brown bullhead, carp, freshwater drum, large-mouth bass, rock bass and walleye. Results from these studies led to the identification of two zones where Sediment Management Option (SMO) development should be initiated due to risks to Hg bioaccumulation in fish. These zones are located just north and south of an area impacted by extensive sediment scouring (Figure 2.2; areas with purple shading; ENVIRON International Corporation, 2009).

Sediment Management Options for the St. Clair River Area of Concern

In November 2009, ENVIRON was hired to develop Sediment Management Options (SMOs) for the two remaining contaminated zones. A draft report was prepared in February 2010 recommending further studies (geotechnical, geophysical and geochemical) be undertaken to improve cost estimates for implementing management options. Based on the recommendation, the SCRC hired a firm to complete a detailed geophysical study of the bottom of the river to locate all potential objects on the bottom of the river that could impede remediation works. Field work was completed for that study in 2010 and a report was scheduled to be completed in 2011. The two additional studies were scheduled to take place in 2011 and the progress related to the studies is reported in the 2011 addendum found at the end of this report.

Section 3 – Habitat & Non-Point Source (NPS) Work Plan

Summary of Accomplishments

The 2007-2010 Work Plan itemized 38 activities for the Habitat and NPS Subcommittee to undertake. These activities were captured under six broad “recommendations,” which ranged from wetland creation to promoting the protection, preservation, and rehabilitation of the natural heritage features of the St. Clair River AOC.

During the past four years, over one third of the activities have been completed with several more nearing completion. The collective efforts of the Subcommittee partners have resulted in over 90 individual wetland, tall grass prairie, and tree planting projects, which have created or enhanced 250 ha of wildlife habitat within the AOC (Figure 3.2). Of the 250 ha of wildlife habitat, 42 ha are wetland and the remaining are forest, prairie, or a combination of the two. During the same timeframe, approximately 27 km of new or enhanced riparian habitat were created within priority tributaries of the AOC. Along Highway 40, 28 ha of native vegetation have been established, contributing to the ‘prairie passage,’ which provides a north-south wildlife corridor connecting three regionally significant wildlife anchor areas: WIFN wetlands, the Bickford Oak Woods, and the AFN forest. Partnerships with industries have resulted in the completion of several habitat restoration and enhancement projects, which have contributed towards improving the biological connectivity between the St. Clair River and the north branch of the Sydenham River. Since 2006, shoreline restoration has been completed at Guthrie and Mission Parks, as well as private properties located along the St. Clair River. These shoreline restoration projects have improved fish habitat and the aesthetics of the shore. Aquatic wildlife monitoring of the shoreline by the CA has been undertaken, revealing large schools of minnows and basking turtles. Increased access to the river by small mammals to hunt and drink has also been a benefit of the shoreline restoration projects (Figure 3.3).

In 2010, the Subcommittee started to digitize and map all of the habitat restoration projects from 2000-2010. The result will be of tremendous value as it will provide a visual picture of the collective habitat restoration efforts and will facilitate reporting, planning, and prioritizing of future habitat restoration projects within the AOC.

INTRODUCTION

The historical loss of fish and wildlife habitat along the St. Clair River, as a result of human activities, led to its identification as a BUI in the AOC. The 1995 St. Clair River RAP Stage 2 – Recommendation Plan also identified environmental problems associated with NPS pollution originating primarily from urban and rural storm runoff, leachate from waste facilities, malfunctioning septic systems, and hazardous household wastes.

In their assessment of the progress made since 1995, the Habitat and NPS Subcommittee identified areas in addition to those previously outlined that should be given priority in rehabilitation. Their resulting work plan focused on the remediation of aquatic habitat and water quality. An updated list of Habitat and NPS Rehabilitation Priority sites was developed and included:

- Coastal wetlands with direct hydrological connection to the St. Clair River and delta;
- Shoreline softening of the St. Clair River and riverine habitat rehabilitation;
- Other wetlands in Area 1A providing aquatic habitat;
- Riparian buffers along the St. Clair River;
- Riparian buffers in the tributaries of Area 1A; and
- Other rehabilitation work, which address improved water quality conditions and fish and aquatic wildlife habitat in Areas 1A and 1B (Figure 3.1).

The Habitat and NPS Subcommittee identified 34 priority actions falling under six recommendations in the 2007-2010 Work Plan.



Walpole Island soft shoreline

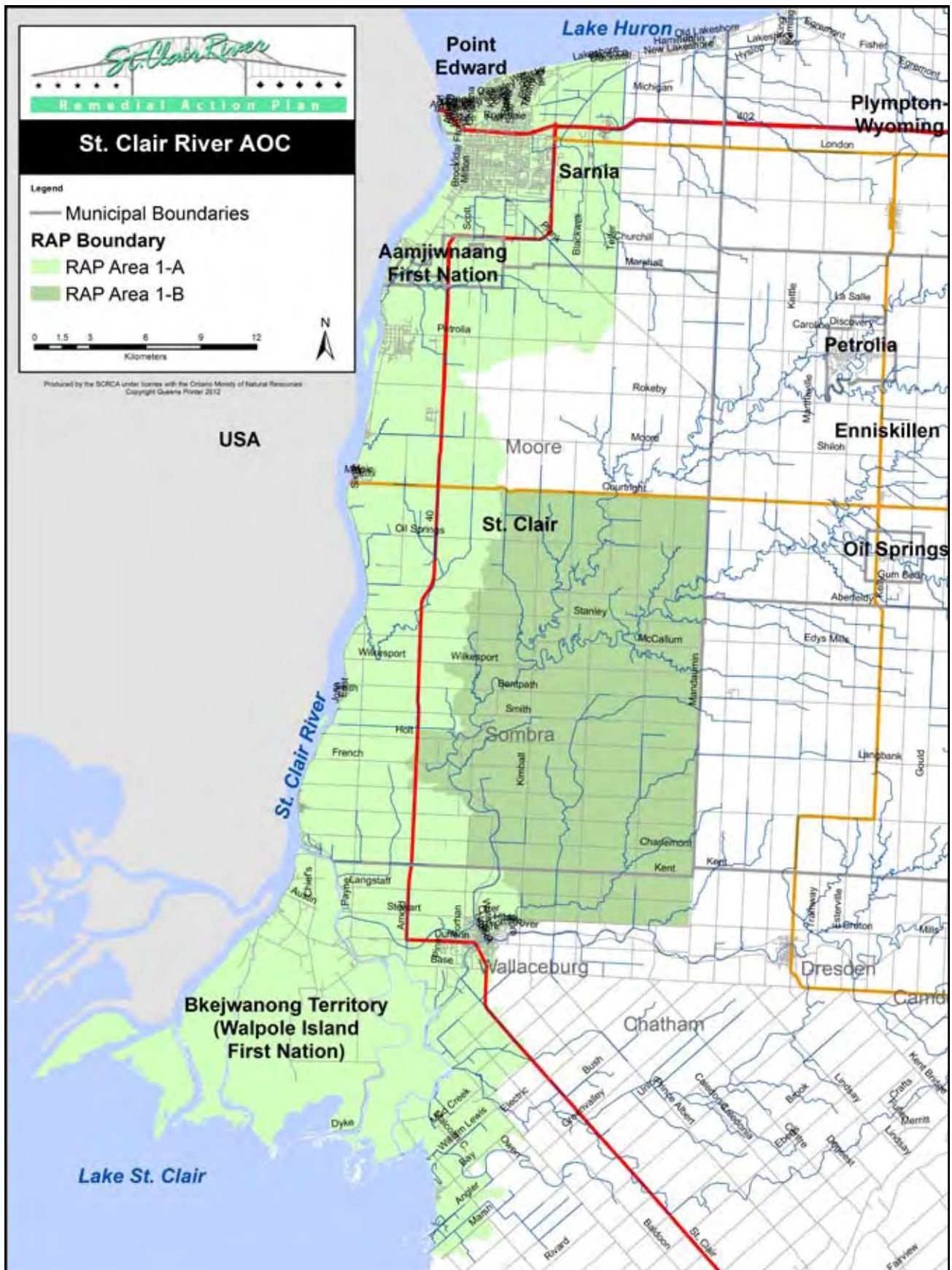


Figure 3.1: Map of the St. Clair River Area of Concern (AOC), including Area 1A and 1B boundaries (EC, 2010).

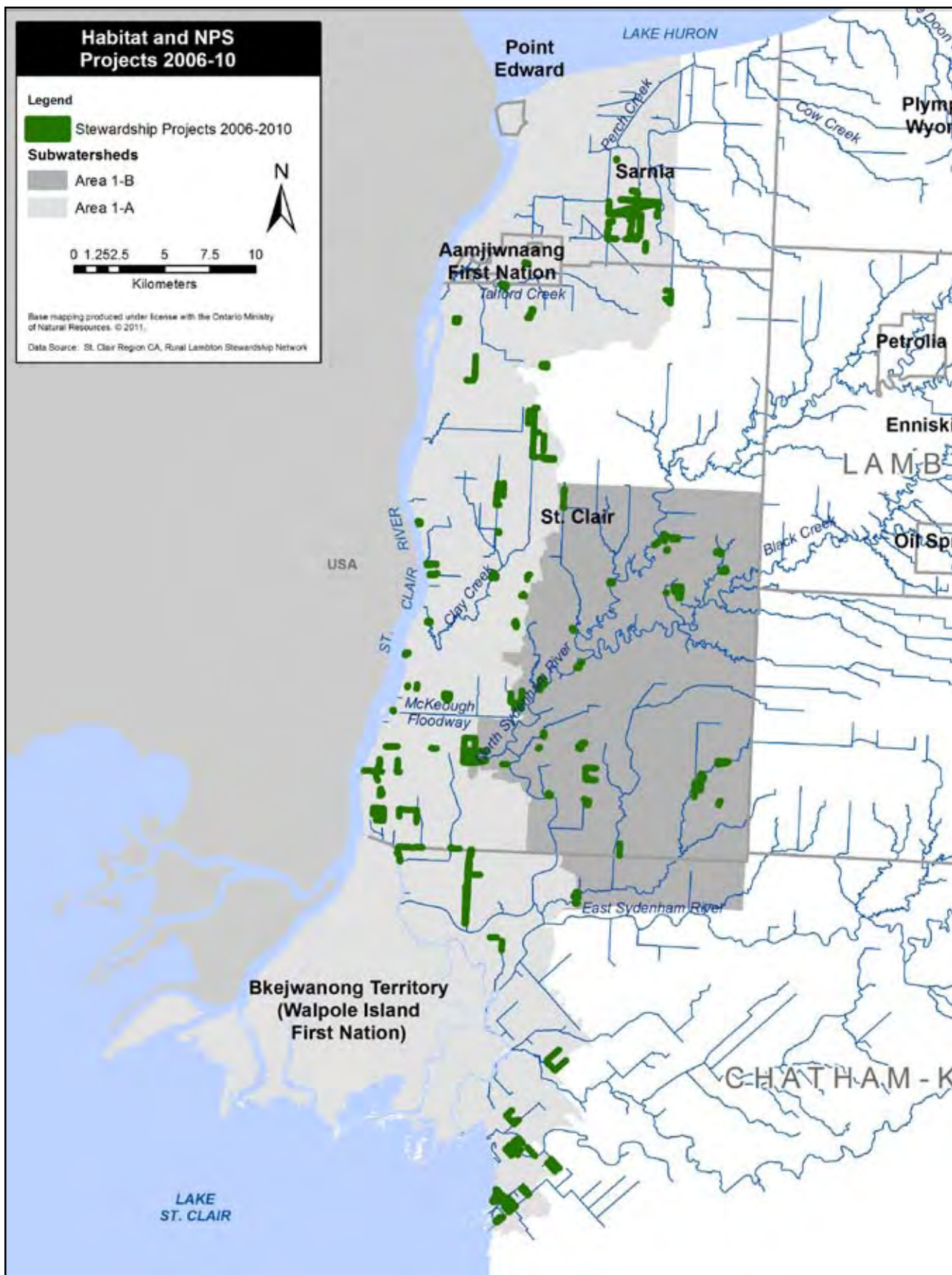


Figure 3.2: Map of the Habitat and Non-Point Source (NPS) completed projects in the St. Clair River Area of Concern between 2006-2010.

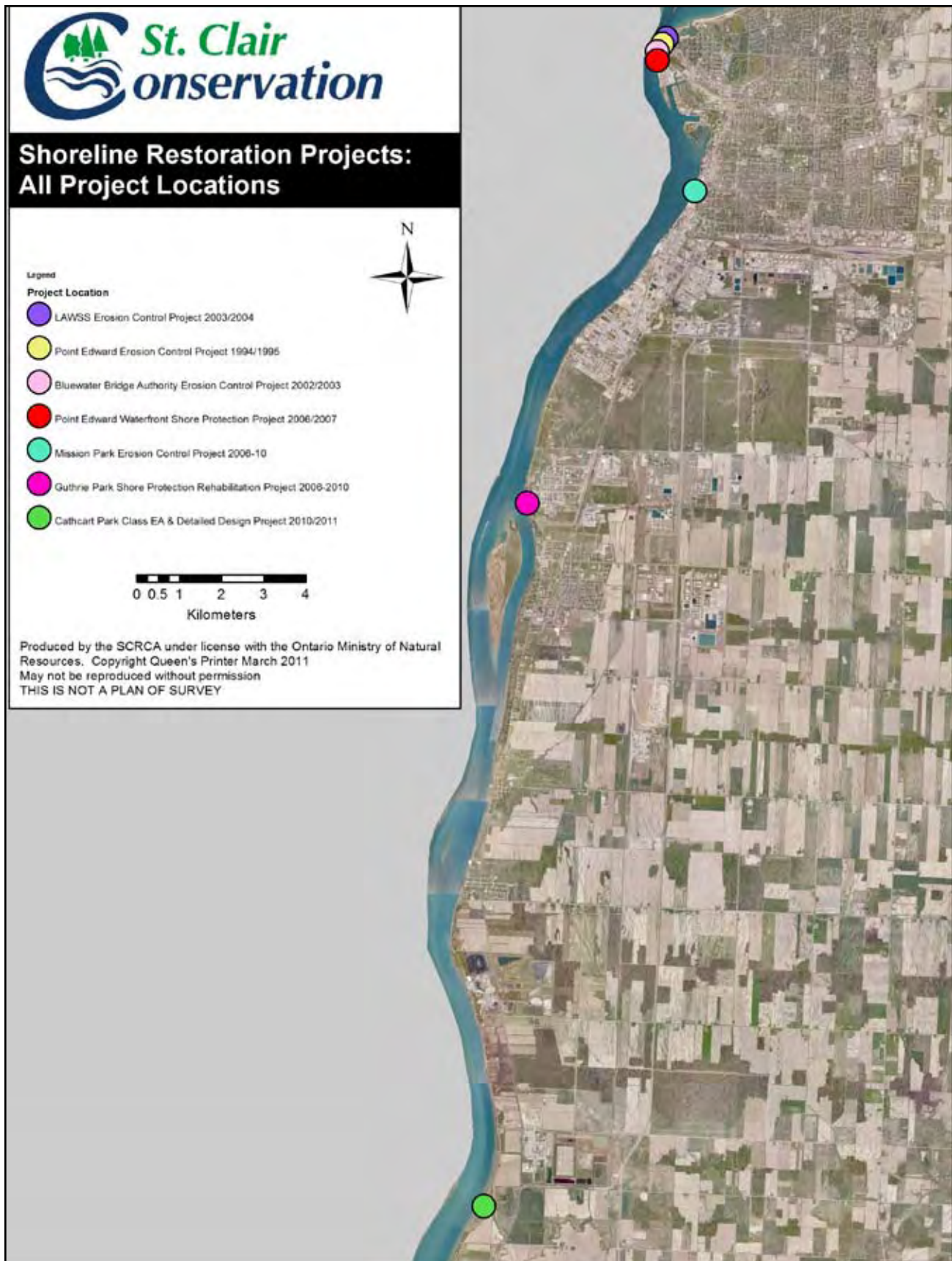


Figure 3.3: Map of all completed shoreline restoration projects conducted in the St. Clair River Area of Concern (AOC).

RECOMMENDATIONS

#3.1 RECOMMENDATION

In addition to the delisting criterion pertaining to Chenal Ecarte wetland creation, broaden the scope of wetland habitat projects to include creation, rehabilitation, acquisition, and maintenance within Walpole Island First Nation delta and headwaters of AOC creeks (as per the Updated Habitat and NPS Rehabilitation Priority Sites).

RESPONSIBLE ORGANIZATIONS

- WIFN
- SCRCA
- Lambton County
- Municipality of Chatham-Kent
- OMNR
- EC
- DFO

ACTION 1 Make use of the 2006 GIS database created by Aylmer District OMNR to locate potential wetland habitat project sites.

STATUS *Completed*

In 2006, the OMNR identified 20 potential wetland habitat project sites within the St. Clair River AOC. Of the 20 potential sites, six sites have had projects completed and two sites have had ongoing restoration work. The remaining sites were reviewed by the Subcommittee for feasibility and many remain as possible sites along with new sites suggested by the Subcommittee partners.

ACTION 2 Create an inventory of prioritized wetland project sites by following the “2007 Updated Habitat and NPS Rehabilitation Priority Sites” presented in the Introduction.

STATUS *In Progress*

As indicated above, the Subcommittee has created a draft list of potential wetland habitat rehabilitation/enhancement sites within the AOC; however, the sites need to be prioritized using the specific site-selection criteria developed in 2007. Once completed, this list will guide future restoration efforts and be a key component of the long-term habitat management plan for the AOC.

ACTION 3 Establish wetland goals and objectives for the AOC and develop numerical (or qualitative) wetland delisting criteria (targets). Track progress towards wetland targets.

STATUS *Completed*

In 2010, the Subcommittee reviewed the 1995 delisting criteria along with revisions proposed in 2006. Using the proposed revisions from 2006 as a foundation, two wetland goals have been established and include a qualitative (wetland quality) and quantitative (percentage of wetland coverage and number of hectares enhanced/restored/created) component. The two proposed delisting criteria are:

- that wetland coverage within the major subwatersheds of Area 1A be 6-10%, or restored to the extent possible relative to the original percent coverage of wetlands; and
- that 155 ha (383 acres) of wetland habitat be rehabilitated, created, or protected within the Chenal Ecarte, WIFN delta, or on the eastern shore of Lake St. Clair, as these were areas where significant wetland loss and alteration occurred.

Of the 11 watersheds within Area 1A of the AOC, the “major” subwatersheds are considered to be Talford, Baby, Bowens, Marshy, and Clay Creeks. Currently, only Bowens Creek meets the wetland coverage criteria and at 4.5%, Clay Creek has the second highest wetland coverage.

Over the past four years, of the 90 individual projects undertaken within the AOC, over half were wetland restoration/creation projects that occurred on approximately 25 different properties including private, municipal, and industrial. For example, in partnership with the St. Clair Township, a 2.2 ha (5 acres) wetland and pike spawning habitat within Branton Cundick Park was developed. Two wetland projects on private lands along the eastern shore of Lake St. Clair were also completed, resulting in over 20 ha (49 acres) of wetland habitat; one of which was a 6.5 ha (16 acres) wetland created through a long-term conservation agreement with DU and the landowner. This wetland is home to several rare species of birds and reptiles. In 2009, the Walpole Island Land Trust (WILT) secured a 10-year lease agreement for the Swan Lake marsh, during which time the marsh will be protected and enhanced by the WILT. The diversity and number of partnerships created in the AOC have made a positive contribution towards creating/enhancing and protecting wildlife habitat.

To track these habitat restoration efforts, the SCRCa will digitize and map all of the projects completed by the Subcommittee partners. At the close of 2010, the SCRCa had successfully started digitizing habitat project data from 2000-2010.

ACTION 4 Identify and engage landowners, seek funding, and implement coastal wetland habitat projects within the AOC to maintain and improve the integrity and hydrological connectivity of coastal wetlands for fish spawning, nursery and feeding areas, and aquatic wildlife.

STATUS *In Progress*

From 2006-2010, numerous landowners have been directly involved and supported the implementation of 90 wetland habitat projects within the AOC. As mentioned above, two projects were located within the immediate vicinity of Lake St. Clair.

WIFN initiated a multi-year study to assess the ecological feasibility of restoring a 14 km “dredge cut” that currently meanders through the community. This project could improve the integrity and hydrological connectivity of wetlands within the community with those along the coast of the St. Clair River and Lake St. Clair. Two years of field study have been completed; however, additional studies and modelling are needed to assess the risks and benefits of this project. The Chief and Council will be establishing a subcommittee to facilitate community involvement and future planning of the project.

Coastal wetland projects are a priority for the AOC and take a great deal of planning and approvals for successful implementation. As a result, the Subcommittee will undertake a strategic planning exercise to identify priority project sites and engage local landowners.

ACTION 5 Assess the quality of coastal wetland habitat in the Chenal Ecarte and WIFN delta by collecting data on water quality, aquatic macroinvertebrates, amphibians (if possible), marsh birds, and submerged aquatic vegetation (for more detail see Section 4 – Research and Monitoring).

STATUS *In Progress*

In 2008, EC conducted wetland assessments on 10 individual wetlands, several within the Bear Creek NWA, as well as several outside the AOC on Lake St. Clair. Using protocols and reporting methods recommended by the Great Lakes Coastal Wetlands Consortium (GLCWC) Monitoring Plan (2008), data were collected for water quality, submerged aquatic vegetation, and aquatic macroinvertebrates in 2006 and 2007, and marsh breeding birds during 2007. Results indicated that coastal wetlands in the St. Clair River AOC were comparable to three reference non-AOC wetlands on Lake St. Clair. Water Quality Index Scores were ranked as “Moderately Degraded,” and Indices of Biotic Integrity (IBI) for submerged aquatic vegetation and aquatic macroinvertebrates ranked “Very Good,” and were not statistically different than non-AOC Lake St. Clair reference sites. IBI scores for marsh breeding birds were on average statistically lower in coastal wetlands in the St. Clair River AOC compared to reference sites. Overall, however, the AOC sites still ranked “Very Good.”

Wetland assessments within WIFN have not yet been conducted as WIFN intends to do these assessments independently and in the near future.

ACTION 5a Examine options, risks, and benefits of improving fish access to impounded wetlands (i.e., possible impact on species at risk (SAR), waterfowl production, etc.).

STATUS *In Progress*

As mentioned above, the dredge cut feasibility study will provide baseline data to help examine options/risks and benefits of restoring impounded areas within the dredge cut. The WILT is also planning to use Swan Lake marsh as a potential ‘test site’ to explore options to improve fish access to impounded wetlands.

ACTION 5b Work with Walpole Island Heritage Centre regarding aquatic habitat needs to meet fish and wildlife goals and develop a list of project sites in the First Nation delta.

STATUS *In Progress*

EC works collaboratively with the Walpole Island Heritage Centre through various programs. AOC-related issues are addressed through an annual agreement. These funding agreements have largely facilitated wildlife research projects, community engagement, and participation in RAP-related meetings. Funding has also been made available through the GLSF and two years of successful applications have resulted in the completion of field work to provide baseline data on the dredge cut that will ultimately be included in a feasibility study for its restoration.



Walpole Island Delta

In 2010, Walpole Island Heritage Centre completed a list of potential habitat restoration sites within the community. One site is Swan Lake marsh. The dredge cut restoration and the Swan Lake marsh restoration are significant potential projects and would directly contribute towards enhancing wetland habitat within the delta; this part of the AOC lost significant habitat through alteration and dyking.

ACTION 5c Examine ways to control and prevent *Phragmites* invasion; monitor high-quality and susceptible wetlands, select demonstration areas for control, and plan steps for controlling established *Phragmites*. Share experiences and transfer knowledge.

STATUS *Completed*

Phragmites are pervasive throughout the delta and Lake St. Clair. In 2010, the OMNR undertook experiments at Rondeau Provincial Park, and published and distributed “Best Management Practices” for *Phragmites* later that year. Regulations prevent the use of pesticides over water, limiting its use along heavily infested coastal wetlands and other wetland areas. Within the AOC, the RLSN has extensive experience in site preparation, including the eradication of *Phragmites*. Projects they were directly involved with include the Bear Creek NWA wetland, Bay Lodge coastal wetland site, Otter Creek (Peers Wetland), and along Hwy 40. The results have been positive; however, ongoing maintenance of sites is required and is labour intensive and costly.

WIFN community members are concerned about the impact of pesticide use within the community, so they are seeking alternative prevention and control measures.

ACTION 5d Prepare wetland quality report with management recommendations once assessments have been completed.

STATUS *Completed and Ongoing*

A wetland assessment report for AOC wetlands was published by Environment Canada (Canadian Wildlife Service) in 2008. The purpose of the wetland assessment was to assess the quality of coastal wetland habitat in the St. Clair River AOC using protocols and reporting methods recommended by the GLCWC Monitoring Plan (2008). The GLCWC consists of scientific and policy experts from key U.S. and Canadian federal agencies, state and provincial agencies, non-governmental organizations, and other interest groups with responsibility for coastal wetlands monitoring. The Consortium designed standard protocols to assess the status of coastal wetlands within the Great Lakes. Wetland assessments are accomplished through the examination of wetland health “indicators,” including vegetation coverage, diversity and abundance of amphibians, marsh birds, and aquatic vegetation.

In 2006 and 2007, data were collected for water quality, submerged aquatic vegetation, aquatic macroinvertebrates, and marsh breeding birds. Results indicated that coastal wetlands in the St. Clair River AOC are comparable to three reference non-AOC wetlands on Lake St. Clair. Water Quality Index Scores were ranked as “Moderately Degraded” and IBI for submerged aquatic vegetation and aquatic macroinvertebrates ranked “Very Good” and were not statistically different than non-AOC Lake St. Clair reference sites. IBIs for marsh breeding birds were on average statistically lower in coastal wetlands in the St. Clair River AOC compared to reference sites; however, overall, these sites still ranked “Very Good.” The report also made a few recommendations to enhance water quality and wildlife habitat. Subsequent wetland assessments are scheduled for 2011.



Dow Wetlands

Wetland assessments within WIFN have not been conducted by EC as WIFN intends to undertake this task in the near future.

#3.2 RECOMMENDATION

Integrate shoreline erosion control approaches and shoreline development (or redevelopment) projects with environmentally-friendly habitat approaches (e.g., shoreline softening, buffer strips, and spawning channels) that take nearshore aquatic habitats and hydraulic impacts into account.

RESPONSIBLE ORGANIZATIONS

- EC
- DFO
- SCRCA
- MNR
- Lambton County and Municipalities
- Municipality of Chatham-Kent
- Industries

ACTION 1 Develop an Integrated Shoreline Management Plan for the St. Clair River.

STATUS *Not Completed*

In 2006, the SCRCA inventoried and mapped existing shoreline structures and conditions on public and private lands along the river's shoreline. The results were compiled into a report in 2007 entitled *St. Clair River Restoration Assessment Project Report*, authored by J. Nodwell, S. Kyba, and M. Loewen. This information will help create an integrated shoreline management plan for the St. Clair River.

ACTION 2 Use GIS to inventory/map existing shoreline hardening structures on public and private lands, and assess condition, habitat features, sediment profile and contaminants, plant, fish, and wildlife communities at each site.

STATUS *Completed*

As per above, a detailed shoreline inventory report of the St. Clair River shoreline conditions, including shoreline erosion measures, was completed. This information was stored in a geo-database and was used in conjunction with GIS software, historical digital shoreline photography, and contours to catalogue conditions of the shoreline and outline areas where shoreline works were needed. Supplementary data, such as fisheries data, bathymetry data, and water quality data will be added to the database to provide for additional mapping and to make the database more useful in the long-term as a planning and project-tracking tool.

In October 2010, fish surveys were conducted at several shoreline softening projects at various stages of construction to obtain a better understanding of the number and types of species of fish that inhabit these areas; document the changes as shoreline softening structures are built; and provide baseline data for future projects. The surveys were conducted by the DFO using different sampling methods to obtain an appropriate cross section. A spotted sucker (*Minytrema melanops*), considered Special Concern federally and Threatened provincially, was sampled at Cathcart Park. A formal report on the DFO survey is expected in 2011.

In addition to mapping the shoreline, contaminated sediment 'areas of interest' have also been mapped within the AOC, which enhances decision-making and prioritization of shoreline restoration projects. DFO has incorporated this information into their fish habitat suitability model for the AOC.

ACTION 3 Establish quantitative and/or qualitative shoreline rehabilitation targets, including cost benefits and environmental analysis. Candidate sites include, but are not limited to: CN Lands on Sarnia Bay, Guthrie Park, Courtright Waterfront Park, Willow Park, Cathcart Park, Marshy Creek Park, Stag Island, and Walpole Island Delta. Develop engineering plans for candidate sites on public lands, which incorporate shoreline softening techniques that replace degraded structures.

STATUS *Completed*

In 2010, as part of the proposed revisions to the habitat and NPS delisting targets, the Subcommittee suggested that nearshore and shoreline fish habitat be enhanced at 6-12 priority sites along the St. Clair River. There have been seven shoreline restoration projects completed to date, with Guthrie and Mission Parks completed from 2007-2010 (Figure 3.4 and 3.5), along with several completed on private lands, as well.

SCRCA has completed a matrix for 27 public land sites and 24 private land sites, along with a map identifying each site. This matrix is used to prioritize sites.



Mission Park



Point Edward



Guthrie Park



Figure 3.4: Map of Mission Park shoreline restoration projects conducted in the St. Clair River Area of Concern (AOC).

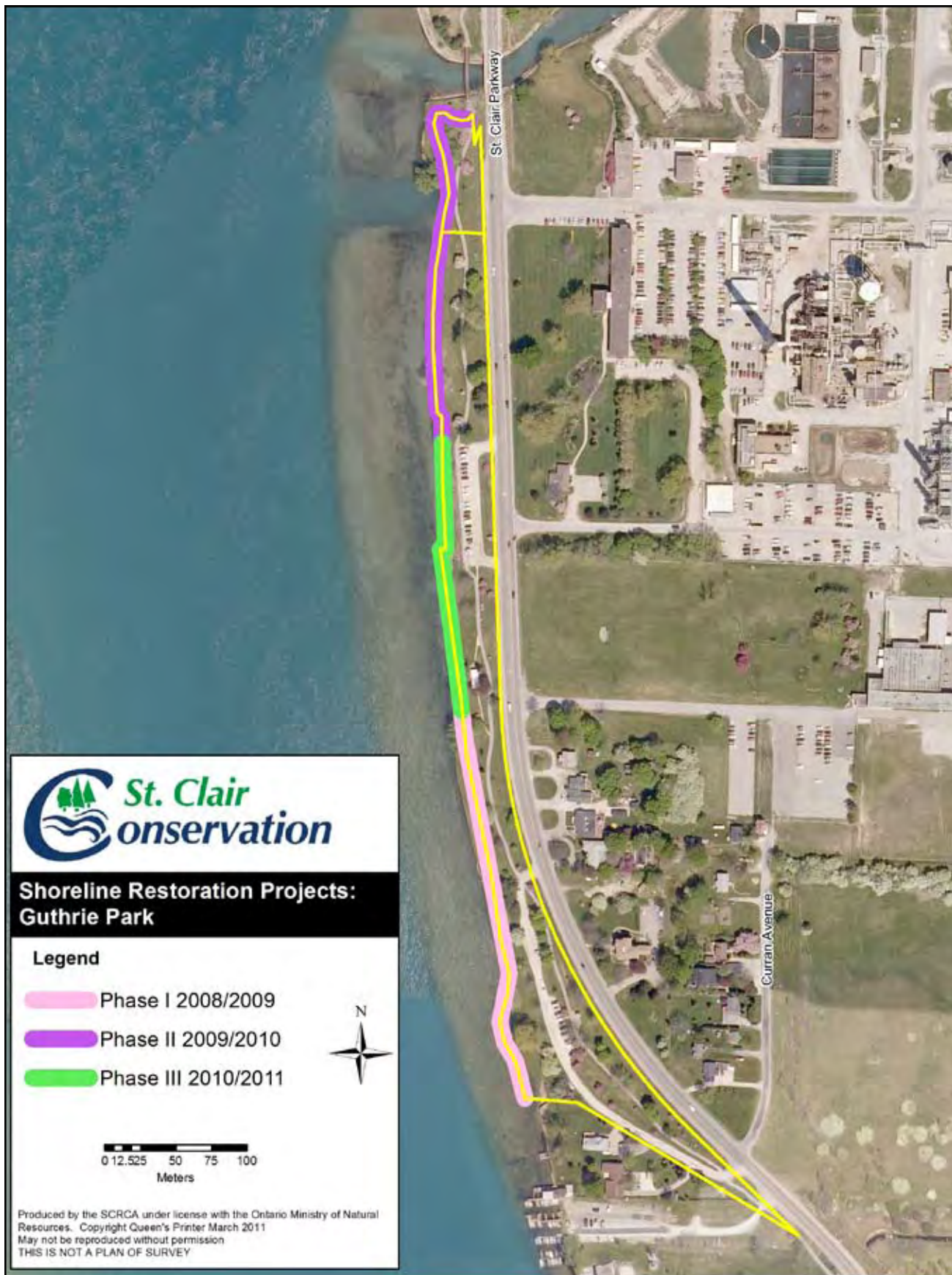


Figure 3.5: Map of Guthrie Park shoreline restoration projects conducted in the St. Clair River Area of Concern (AOC).

ACTION 4 At sites where softening has occurred, rehabilitate littoral habitat by installing reef structures, submerged rock clusters/shoals, cobbles or fish mix, and coves to improve the quality of littoral fish habitat. Establish native grasses, and shrub and tree plantings at candidate sites behind the shoreline structure.

STATUS *Completed*

To date, it has not been possible for shoreline projects to incorporate shoals, rock clusters, or coves. There was an opportunity to consider a reef off the shore of Guthrie Park; however, due to the presence of contaminated sediment, implementation was not feasible. The planning is underway for shoreline restoration at Cathcart Park and this project may provide an opportunity to create an offshore fish habitat structure pending approval to do so.

To further naturalize the shoreline and enhance the wildlife value, habitat pods at Guthrie and Mission Parks were incorporated into the shoreline design and have been planted with a variety of native vegetation, which provide shelter, food, and resting opportunities for birds and other wildlife. The habitat pods include many different types of vegetation, such as silky dogwood (*Cornus amomum*), hairy beardtongue (*Penstemon hirsutus*), and brown-eyed susan (*Rudbeckia triloba*). In addition, a diverse, Dutch wet meadow seed mix was applied to the site, which included, among others, woolgrass (*Scirpus cyperinus*), Canada bluejoint (*Calamagrostis canadensis*), and blue vervain (*Verbenaceae* sp.).



Guthrie Park shoreline protection project with habitat pods

The DFO is collecting data to create a fish habitat suitability model for the Huron-Erie Corridor. When completed, it will strengthen and support the design of shoreline and nearshore fish habitat enhancement projects. It will also facilitate prioritizing shoreline restoration projects.

ACTION 5 Assess the extent of shoreline projects completed elsewhere within the AOC (e.g., SCRCA projects, Chatham-Kent work at MacDonald Park) for reporting purposes.

STATUS *Not Completed*

This activity is a priority for the Subcommittee.

ACTION 6 Identifying potential opportunities for increasing river flow capacity as credits for infill projects.

STATUS *Not Completed*

This activity was a result of a “flow velocity” report, which deemed no net infill within the river. The Subcommittee did not have the capacity to undertake this activity.

#3.3 RECOMMENDATION

Establish and implement a riparian habitat and buffering program for the St. Clair River AOC (as per the *Updated Habitat and NPS Rehabilitation Priority Sites*).

RESPONSIBLE ORGANIZATIONS

- EC
- MNR
- DFO
- OMAFRA
- WIHC

ACTION 1 Systematically identify public, private, and industrial land use and ownership adjacent to tributaries flowing directly into the St. Clair River, and prepare a land use inventory, including zoning status (as per the *Updated Habitat and NPS Rehabilitation Priority Sites*).

STATUS *Not Completed*

This is a high priority for the Subcommittee as this will facilitate prioritizing, planning, and implementing riparian enhancement habitat projects within the AOC.

Prior to completing this activity, there is a need to update the riparian section of the 2006 Natural Heritage Strategy (NHS) Report by using the high resolution 2010 air photographs. Upon completion of the analysis, a strategic plan can be created to systematically identify priority properties adjacent to tributaries flowing directly into the St. Clair River. In 2010, EC initiated a project to classify land use within the Huron-Erie Corridor. The results of this Ecological Land Classification (ELC) project will provide land use information that will help with the completion of this action.

ACTION 2 Undertake a proactive landowner contact program starting in Area 1A to increase the number of landowners involved in tributary buffering within the AOC boundaries.

STATUS *In Progress*

From 2007-2010, 37 projects with a riparian component were undertaken in the AOC, resulting in 28 km or 137 ha (339 acres) of new/enhanced riparian habitat. Projects were largely undertaken on private lands. Community outreach and education encouraged landowners to participate in creating riparian habitat. As per above, a proactive landowner engagement strategy will be developed once priority areas have been revealed. Future efforts and resources can then be directed accordingly.

ACTION 3 Identify riparian buffer priorities and targets for each tributary based on landowner cooperation and habitat value.

STATUS *In Progress*

As per above, riparian coverage within the AOC is currently being assessed and a strategic plan will be created to guide and focus restoration efforts. Creation/enhancement of riparian habitat can only be achieved with landowner cooperation, so targets for each tributary will be proposed accordingly.

ACTION 4 Rehabilitate a minimum of 20 km/year of riparian habitat by establishing vegetative buffer strips, planting appropriate native vegetation, undertaking stream bank stabilization activities, and/or restricting livestock access to riparian areas adjacent to tributaries in Area 1A to a minimum of 3-5 metres.

STATUS *In Progress*

Over four years, 37 projects have resulted in 28 km or 137 ha (339 acres) of new or restored riparian habitat within the priority tributaries of the AOC. The resolution of the 2010 aerial and satellite images will provide more accurate information on available riparian habitat and facilitate the development of a strategic plan for the AOC to meet the proposed 2010 target.

In 2010, the Subcommittee proposed that 50% of the length of tributaries in Area 1A of the AOC be buffered by a minimum width of five metres of vegetation with the provision that riparian buffer coverage be assessed using the 2010 air photos and feasibility of this target be discerned.

ACTION 5 Track habitat and riparian buffer projects and provide annual reports on the status towards meeting targets. Include information such as: uptake on Environmental Farm Plans; uptake on landowner funding programs; SCRCA and RLSN annual project reports.

STATUS *In Progress*

Tracking of habitat and riparian buffer projects is ongoing by the individual partner organizations. Partner agencies who received funds from the GLSF are required to provide EC with a year-end report. In 2010, the Subcommittee started to digitize all habitat and riparian projects within the AOC. This will facilitate reporting and future project planning and prioritizing.



Guthrie Park shoreline protection project with vegetated habitat pods providing habitat for wildlife

#3.4 RECOMMENDATION

Improve the biological connectivity within the AOC with a focus on Area 1A.

RESPONSIBLE ORGANIZATIONS

- SCRCA
- MTO
- OMNR
- EC
- DFO

ACTION 1

Link the Walpole Island First Nation habitats with the McKeough Floodway, headwaters of the St. Clair River tributaries, Bickford Oak Woods, and Aamjiwnaang First Nation forest tract through:

- Planting riparian buffers consisting of rows of native grasses, tallgrass prairie, savannah, and native shrubs adjacent to agricultural drains and roadsides along Highway 40;
- Incorporating wetland creation wherever conditions are favourable.

STATUS

In Progress

Approximately 69 ha (170 acres) of native vegetation have been established along the Highway 40 Prairie Passage. This creates a north/south wildlife corridor that connects three regionally significant wildlife anchor areas: WIFN delta, Bickford Oak Woods, and AFN forest.

Through the completion of several habitat restoration projects on industrial and private lands, an east/west corridor from the St. Clair River to the north branch of the Sydenham River has also been created. Project properties include Terra Nitrogen, Envirofresh, Moore Wildlife Management Area, Smith Line, McKellar Tract, Bickford Oak Woods, and ICI. Plans to compare current aerial photos of these sites will be undertaken by SCRCA to track progress and identify potential opportunities.

ACTION 2

Examine other linkages proposed in the Lambton County Natural Heritage Strategy (NHS; e.g., Clay Creek to the North Sydenham River), and investigate and develop actions for additional opportunities on Walpole Island First Nation.

STATUS

Not Completed

It is a priority for the Subcommittee to identify additional opportunities to enhance natural corridors within the AOC. WIFN is a member of the Subcommittee and through the Walpole Island Heritage and Land Trust, new habitat restoration opportunities and/or projects will be shared with the Subcommittee.

ACTION 3

Establish signs on Hwy 40 to educate the public on the benefit of biological corridors through riparian buffering.

STATUS

Completed

Signs have been erected along the highway promoting the Prairie Passage and project sponsors.

#3.5 RECOMMENDATION

Address and complete all Rural Non-Point Source Pollution and Urban Non-Point Source Pollution “Priority Actions” and track progress impacting on beneficial uses (as per the *Updated Habitat and NPS Rehabilitation Priority Sites*).

RESPONSIBLE ORGANIZATIONS

- MOE
- OMAFRA
- EC
- DFO
- Municipalities
- Developers
- CCG
- SCRCA
- MNR
- Agriculture Canada

ACTION 1 Continue to provide funding support, technical advice and outreach materials, and assist landowners to access funding as part of ongoing NPS and stewardship programs within AOC (*Updated Habitat and NPS Rehabilitation Priority Sites*).

STATUS *Completed*

The RLSN has provided extensive funding support, technical advice, and outreach materials to landowners interested in land stewardship. RLSN has participated in numerous public events including: John Deere Days in Petrolia, Big Buck Day in Brigden, and a Tallgrass Ontario general business meeting. RLSN provided technical advice and outreach materials at the following events: Rural Game Protective Association Dinner, Agriculture in the Classroom Gala Dinner, Lake Erie COA Day and SW Zone Stewardship Conference, and the Aylmer District Staff Day. RLSN also delivered several presentations within Lambton County to: Nova Chemicals, Ontario Power Generation, Terra Nitrogen, Envirofresh Green house, First Solar, MTO, Sunset Acres Committee, Carolinian Canada Workshop, Aylmer District MNR leadership team, and Tallgrass Ontario.

ACTION 2 Develop appropriate Watershed/Subwatershed Management Plans to identify priority NPS sites in the AOC (*Updated Habitat and NPS Rehabilitation Priority Sites*). Consult with St. Clair Region CA, examine MDEQ Plan, and use existing reports (e.g., wetlands, riparian buffer, land use, land ownership), and, as a foundation for a SCR-AOC, Subwatershed Management Plan.

STATUS *Completed*

In 2009, a Watershed Management Plan entitled the *St. Clair River Watershed Plan* was drafted for Area 1A of the AOC (Hayman, 2009). This report characterized the watersheds, identified the challenges with each, and summarized works completed to date.

ACTION 3 Link (integrate) urban/rural stormwater control through subwatershed plans.

STATUS *Not Completed*

Integrating urban/rural stormwater management projects with subwatershed plans was felt to be beyond the capacity of the Subcommittee.

ACTION 4 Support implementation of rural stormwater projects, e.g., oxbow management.

STATUS *In Progress*

A landowner experiment was completed by arranging all tiles to feed into a main tile drain, where oxbow was installed for water control. This prevented runoff by holding back water to promote wet areas and attract waterfowl. There were a few seasonally restricted tile drainage pilot programs within the AOC, but not an official program. This program is landowner-driven and success-based, working especially well if the property is flat, and can be done for habitat reasons. It is promoted by FOSCR.

ACTION 5 Identify problems relating to domestic sanitary sources and ensure proper maintenance and repair.

STATUS *Completed*

GLSF funding was provided to help identify and remediate septic-related issues.

ACTION 6 Investigate private septic systems within smaller communities and other homes along the St. Clair River, including the delta within the AOC, to ensure that they are not causing negative effects on water quality of the St. Clair River.

STATUS *In Progress*

A septic system inspection program was not implemented within the small communities/homes along the St. Clair River; however, Walpole Island did complete septic system inspections. Monitoring for elevated levels of bacteria is conducted at community beaches. Analysis of the beach monitoring program results will help identify whether there are faulty septic systems. The Walpole Island Natural Heritage Committee will work with the Health Unit to assemble the beach monitoring results from 2005-2010.

Elevated levels of nutrients/bacteria in dredge cut were revealed during field work and WIFN will be looking into this issue further.

ACTION 7 Support the implementation to mitigate septic system-related problems within smaller communities and other homes along the river within the AOC, e.g., Froomfield and Wilkesport.

STATUS *In Progress*

Froomfield is awaiting approval to extend municipal services to the 40 homes. Homes along Snye River remain on septic.

Direction from the CRIC is needed by the Subcommittee to determine whether this activity will continue under the next work plan.

ACTION 8 Mandate ongoing maintenance of private sewage disposal systems.

STATUS *Not Completed*

Mandating ongoing maintenance of private sewage disposal systems is beyond the capacity of the Subcommittee.

ACTION 9 Obtain a GIS tile drain layer and identify tile drain outlet locations. Investigate options to improve water quality at selected pilot sites.

STATUS *Completed*

The SCRC has obtained a GIS tile drain layer from the OMNR and drain outlet locations have been identified. Where appropriate, these sites may be suitable for wetland creation. Drain habitat enhancement is also being explored with a pilot project scheduled for 2011.

ACTION 10 Track NPS projects and provide annual reports on the status to key stakeholders.

STATUS *Completed*

RLSN undertakes NPS projects and provides annual reports to EC as part of their contractual agreement under GLSF. RLSN also reports their activities to their Board.

#3.6 RECOMMENDATION

Promote the protection, preservation, and rehabilitation of the natural heritage features of the St. Clair River AOC by encouraging Lambton County and municipalities, and the Municipality of Chatham-Kent to incorporate wording into their Official Plans such that the St. Clair River Area of Concern is recognized as a priority area in need of water quality protection, and fish/wildlife habitat conservation and protection.

RESPONSIBLE ORGANIZATIONS

- EC
- OMNR
- OMOE
- DFO
- Municipalities
- WIFN
- AFN
- Industries

ACTION 1 Encourage Lambton County and municipalities, and the Municipality of Chatham-Kent to strengthen “Natural Heritage Policies” for the AOC when amending their Official Plans (OPs), to provide greater protection to water quality, and fish and wildlife habitat.

STATUS *In Progress*

The Lambton Natural Heritage Study, under development since 2007, has developed criteria for a Lambton County natural heritage system, including recognition that all natural heritage features and areas with a minimum size of 0.5 ha (approximately 1 acre) that are located within 50 m of surface water features (including interior and coastal watercourses) are significant, and provide significant natural heritage corridors and linkages.

Chatham-Kent OP (adopted Dec. 2008) includes, as one of its six Strategic Directions for the Community Strategic Plan, “Sustaining and enhancing our environmental assets.”

The Natural Heritage section of the OP, “Enhancing our Natural Surroundings,” recognizes that “The natural heritage system is supported by groundwater protection mapping and policies, as well as policies for stormwater management, parks and recreation, and environmentally sound infrastructure servicing.”

ACTION 2 As information becomes available, provide planners with the necessary science and documentation on significant habitats in the AOC to facilitate their efforts to protect natural heritage features.

STATUS *In Progress*

OMNR provides provincially-significant wetland evaluation information to CAs and municipal planners, and identifies significant habitat of provincially Endangered or Threatened species. The habitat of aquatic SARs in the AOC is provided by DFO.

ACTION 3 Ensure that GIS-spatial analysis is shared with county, municipalities, conservation authority, government agencies, First Nations, and other groups.

STATUS *In Progress*

The OMNR is responsible for the provision of natural resources information. The provision of information is provided on an annual basis to the county, municipalities, CAs, and other government agencies.

ACTION 4 Encourage RAP partners to utilize completed reports (e.g., St. Clair River NHS, Binational Habitat Management Plan, MNR Candidate Sites, Wetland Mapping) to guide habitat rehabilitation and protection.

STATUS *Completed*

Subcommittee members have been encouraged to use completed reports to guide habitat restoration activities. As mentioned previously, the Subcommittee has reviewed the OMNR candidate sites list and NHS report of 2006, and both require updating to provide the Subcommittee with the most current information. These are priorities for the Subcommittee.

ACTION 5 Encourage efforts to protect and/or acquire significant natural spaces.

STATUS *In Progress*

In 2008, WIFN established the first aboriginal land trust to be registered as an incorporated charity in Canada. The WILT is a grassroots organization that aims to conserve land in the WIFN/Bkejwanong Territory (Bkejwanong is the Anishnaabe name meaning *where the waters divide*). In addition to conserving land, the WILT aims to maintain and reconnect the community's cultural ties to the land. One important project that the Land Trust is working on with community partners is to conserve and restore a 69 ha (170 acres) marsh on Walpole Island with support from DU, Wildlife Habitat Canada (WHC), FOSCR, and the WIFN. Funds raised for this pilot project will support ecological restoration, invasive species control, research, and education initiatives.



Walpole Island marsh

Project Highlights

Guthrie Park and Mission Park Shoreline Restoration

The shoreline restoration projects at Guthrie and Mission Parks removed failing sheet pile wall and replaced it with large armour stone that was ‘stepped’ down into the water, providing hiding and resting places for fish (Figure 3.6 and Figure 3.7). The native vegetation planted along the shoreline and within the habitat pods have also provided shelter and food to birds and insects. Small mammals, such as muskrats, are taking advantage of easier access to the river for water and hunting. The completion of these projects resulted in approximately 1 km of naturalized shoreline, combined. These projects serve to demonstrate to local landowners and industry the environmental benefits of shoreline restoration.



Figure 3.6: The Guthrie Park shoreline prior to restoration (left) and after restoration was completed (right).



Figure 3.7: Mission Park shoreline prior to restoration (left) and after restoration was completed (right).

Project Highlights

Branton Cundick Park

The RLSN, in consultation with DFO, the OMNR, and DU, created 2.2 ha (5 acres) of fish and wildlife habitat at Branton Cundick Park (Figure 3.8c), creating coastal wetland habitat with direct hydrological connection to the St. Clair River. Source waters from adjacent areas were channelled through the park towards the outflow at the St. Clair River. Sediment had built up in the outflow area, between the road culvert and the river. The removal of sediment (Figure 3.8a) at the outflow allowed a connection from the St. Clair River to newly excavated wetland areas (Figure 3.8b).



a)



b)



c)

Figure 3.8: Coastal wetland habitat created at Branton Cundick Park in the St. Clair River Area of Concern (AOC). Sediment was required to be removed from the channel (a) before a hydrological connection with the St. Clair River could be established (b). The 2.2 ha wetland provides spawning habitat for Northern Pike (c).

Project Highlights

Smith Line Restoration

This project resulted from the initiative of two landowners who collaborated to create a small wetland on their property. Small, shallow ponds were created to improve wildlife habitat in the St. Clair watershed. Minor excavations removed fill from low lying areas creating ponds that enhance the wetland capacity for holding water on the landscape for longer periods of time, filtering sediments, nutrients, and pesticides before they enter the river. The adjacent areas around the wetlands were seeded with native tallgrass prairie, trees, and shrubs. By creating wetland, grassland, and forest habitat, the landowner is supporting Source Water Protection, increasing wildlife habitat, and promoting the recovery of local SARs. The total size of the restoration area is approximately 8.1 ha (20 acres), with multiple partners contributing to make it a success.



Figure 3.9: The Smith Line Restoration project sign acknowledging the funding sources and partners. The project consisted of creating wetland habitat on two private properties in the St. Clair River Area of Concern (AOC).

Project Highlights

Gerald Lozon Wetland Creation

This 5.3 ha (13 acre) project site, located at the southernmost tip of the St. Clair River AOC, aligns with existing coastal marshes along the east shore of Lake St. Clair and will add to the staging habitat available for mallards (*Anas platyhynchos*), wood ducks (*Aix sponsa*), and other dabblers.



a)



b)



c)

Figure 3.10: The project location (a), excavation (b), and completed habitat (c) for the Gerald Lozon Wetland Creation project in the St. Clair River Area of Concern (AOC).

Project Highlights

Terra Nitrogen Habitat Creation

The Terra Property is located in St. Clair Township, Lambton County, at the corner of the St. Clair Parkway and Bickford Line. This project created approximately 20 ha (50 acres) of wildlife habitat by converting agricultural land into several small wetland impoundments and planting native warm season grasses and forested shelter strips. The wetlands were created by installing a series of four small water control structures in low valley areas in the agricultural field portion of the property. In addition, a fifth wetland area was created along the shallow creek bed that lies adjacent to the west edge of the field. This particular impoundment creates a shallow area for shorebirds and ducks. Prior to the completion of this project, the SCRCA planted 3300 trees and shrubs on the site, covering approximately 2 ha (5 acres), plus a hedge row that acts as a visual buffer between the wildlife area and the neighbouring Air Liquide plant. The remainder of the property was restored as an upland tallgrass prairie site.

First Solar Habitat Enhancement

First Solar Farms purchased approximately 485 ha (1200 acres) of land and built the largest solar electrical energy farm in the world, located within the St. Clair River AOC. First Solar Farms partnered with RLSN to restore approximately 69 ha (170 acres) of native tallgrass prairie along all access corridors. It is the northern anchor point on the Highway 40 Prairie Passage, which extends 38 km from Sarnia to Wallaceburg. The project has also created 3 km of riparian buffer along Perch and Porter Creeks, which flow through the entire property. An additional 8 km of riparian were also restored with native tallgrass prairie around the entire property. Tallgrass prairie buffers are twice as effective as traditional cool season grass buffers in filtering and trapping NPS pollution and are far superior from a natural heritage perspective. Located within the chemical valley, First Solar Farms acts as a demonstration project to help educate, motivate, and challenge other industries to reduce NPS pollution and improve water quality by planting native prairie cover along watercourses and in their access corridors.

Klompstra Habitat Creation

This project is located on privately owned property at 804 White Line, Sombra, Ontario. Four wetlands, with a total area of 0.8 ha (2 acres), have been created by excavating shallow ponds that hold back water for longer amounts of time on the landscape. The surrounding 5.3 ha (13 acres) have been planted with tallgrass prairie along with 4050 trees and shrubs.

Project Highlights

Port Lambton Lagoons Habitat Restoration

The RLSN and the St. Clair Township restored these 6.2 ha (15 acres) with native vegetation to provide an important riparian buffer for the adjacent Marshy Creek. The property is located within a kilometre of the St. Clair River. This agricultural land was planted with tallgrass prairie, trees, and shrubs. A food plot was also created for wildlife. This area, due to its location, acts as a demonstration and education area for the public to increase the awareness of the importance of protecting and enhancing fish and aquatic habitat, as part of the St. Clair River Trail.



a)



b)

Figure 3.11: The Port Lambton Lagoons Habitat Restoration pre-restoration (a) and post-restoration (b).

Project Highlights

The Bickford Oak Woods Restoration

Bickford Oak Woods is one of the largest and most unique inland forests in Canada's Carolinian Zone. Located 25 km south of Sarnia and 6 km from the St. Clair River, this 308 ha (762 acre) property is comprised of diverse habitats, such as mixed oak forest, spring pools, swamp-thickets, and marsh lands. The Bickford Oak Woods is one of the largest contiguous forested ecosystems in Lambton and one of the only forests linked to the St. Clair River, so it is an important wildlife habitat to common species such as white-tailed deer (*Odocoileus virginianus*) and wild turkeys (*Meleagris gallopavo*), as well as to species that are rare in Ontario, such as the tufted titmouse (*Baeolophus bicolor*) and several bird species, including the cerulean warbler (*Dendroica cerulea*), which is listed as a Special Concern, nationally. The Bickford Oak Woods is designated as a Regional Life Science Area of Natural and Scientific Interest (ANSI) and is recommended as a Provincial ANSI. The property offers a unique opportunity for the surrounding community to discover nature.

The RLSN, in partnership with the GLSF, the Ontario Great Lakes Renewal Foundation, the OMNR, SCRCA, and Ontario Power Generation, have restored retired agricultural land around the Bickford Oak Woods. This has been achieved by planting 5.7 ha (14 acres) of tallgrass prairie, 1.6 ha (4 acres) of trees and shrubs, and creating 0.75 km of riparian buffer areas along the creek.

Walpole Island Land Trust (WILT) Habitat Protection

In 2008, WIFN established the first Aboriginal land trust to be registered as an incorporated charity in Canada. The WILT is a grassroots organization that aims to conserve land in the WIFN/Bkejwanong Territory. In addition to conserving land, the WILT aims to maintain and reconnect the community's cultural ties to the land, thereby ensuring community investment in the natural beauty that is found within Bkejwanong. A significant success of the Land Trust was the successful negotiation of a ten-year lease agreement for a 69 ha (171 acre) marsh on Walpole Island. The Land Trust has fundraised to undertake ecological studies so that long-term restoration planning can be undertaken and benefits of a healthy marsh can be shared with the community and future generations.

Plain Restoration Project

Located within the AFN, within the head waters of Talford Creek, the "Plain Restoration Project" resulted in the creation of 0.8 ha (2 acres) of wetlands by excavating existing low lying areas to create several small, shallow ponds for waterfowl and other aquatic wildlife. The area adjacent to the wetlands was seeded with native grasses and forbs. A total of 8 ha (20 acres) were enhanced around the newly created wetlands, providing habitat for local wildlife, while also providing a buffer along a small waterway that flows into Talford Creek. This project has been enjoyed by the entire community.

Section 4 – Monitoring and Research Work Plan

Summary of Accomplishments

In developing the 2007-2010 Work Plan, the Research and Monitoring Subcommittee identified 43 actions required to meet the monitoring needs of the 12 BUIs which were either “Impaired” or “Requires Further Assessment.” Progress on these 43 actions has provided a better understanding of the status of the BUIs. It is anticipated that several of these BUIs can be re-designated to “Not Impaired” in 2012. It is now clearer where efforts should be directed to guide and assess future RAP implementation actions.

The tainting of fish and wildlife flavour BUI was recommended for re-designation to “Not Impaired,” based on extensive surveys of river users. Substantial progress on ensuring safe drinking water has been made since the onset of the RAP through strengthened provincial regulations related to spills, and source water protection. Local water supply agencies have indicated no issues with taste and odour. Ongoing monitoring of industrial spills to the St. Clair River indicate that substantial decreases have occurred since 1988. Furthermore, impairments due to additional costs for water treatment of industrial or agricultural use no longer exist. Many river users now believe the appearance of the river has improved with 63% rating the St. Clair River aesthetics as “Good” or “Excellent” based on a river-wide survey conducted between 2007 and 2010. Monitoring of bacterial (*E. coli*) levels along shoreline beaches and parks generally shows these areas to be safe for recreational use during dry weather. Habitat projects, such as shoreline softening, are attracting species including the eastern spiny softshell turtle. Tracking of habitat projects continue to determine the progress towards delisting targets for quantity of wetlands and riparian cover, as well as the tracking of fish and wildlife populations in the AOC. Extensive assessment of the presence of fish tumours in shorthead redhorse suckers was completed, and the data indicate that no tumours were observed.

Monitoring of contaminated sediment in the most heavily impacted region of the St. Clair River revealed a general decrease in organic contaminants that resulted, in part, to the AOC designation. Indeed, fish tissue concentration of spottail shiners in the river showed a decline in these organic chemicals. Long-term monitoring data assessing remedial efforts to date (at Dow Chemical) have shown that the risk of contaminant bioaccumulation (particularly mercury) in fish and bottom-dwelling organisms has been reduced.

INTRODUCTION

The rehabilitation and re-designation of BUIs is the fundamental objective of the restoration and remedial actions occurring in the St. Clair River AOC. Only the re-designation of BUIs to “Not Impaired” will lead to delisting the St. Clair River as an AOC.

Because of the continued exceedance of yardstick values, along with the existence of information gaps, the 2007 Research and Monitoring Subcommittee reviewed each BUI and determined its current status. In addition, the Subcommittee established research and monitoring actions that would lead to the re-designation of BUIs. In total, 43 priority actions were provided.

In 2010, the CRIC reviewed the delisting criteria for each BUI and made revisions as necessary. Although not finalized, the most recent draft form of the delisting criteria is presented for each BUI with an “Impaired” or “Requiring Further Assessment” status.



Eastern spiny softshell turtle

BENEFICIAL USES DESIGNATED AS “IMPAIRED”:

1. RESTRICTIONS ON FISH AND WILDLIFE CONSUMPTION

- Restrictions on fish consumption – Impaired
- Consumption of wildlife – Requires Further Assessment

REVISED DELISTING CRITERIA (2010)

This BUI will be considered restored when fish consumption advisories in indicator fishes (e.g., walleye, brown bullhead, and smallmouth bass) in the AOC are the same or less restrictive than the associated Great Lake or appropriate reference site and when the general guidance for the consumption of indicator wildlife (e.g., snapping turtles, geese) are no different than the non-AOC sites in the Great Lakes.

RESPONSIBLE ORGANIZATIONS

- MOE
- MNR
- EC (Fish Contaminants Monitoring Program)

ACTION 1 Determine the relative role of out of basin sources (i.e., atmospheric contaminants), local ongoing sources, and local sources from historical sediment contamination.

STATUS *In Progress*

Out of basin sources of contaminants are Lake Huron, and atmospheric deposition. Historically, the contaminants of concern for the St. Clair River were a wide suite of organic contaminants associated with the industries along the river. By 2007, only octachlorostyrene (OCS), hexachlorobenzene (HCB), hexachlorobutadiene (HCBd), and mercury (Hg) were considered to be COCs for the RAP, as substantial reductions in the other chemicals were made. From 1990 to 2008, the OMOE and EC conducted extensive sampling of the sediments for Zones 2 and 3 (the 9 km stretch of the St. Clair shoreline that is currently the focus of the contaminated sediment project described in the Point Source Section). Results of this sampling effort are provided in a Journal of Great Lakes Research paper by Richman and Milani (2010). The main conclusions are that concentrations of OCS, HCB and HCBd are low at most stations, indicating that sediment quality has improved since 2001 (due to removal of inputs and post-sediment remediation projects at the Cole Drain, and Dow Chemical in 2002-2004). Mercury concentrations, however, were greater than Provincial Sediment Quality Guidelines (PSQG) and ranged as high as 41 µg/g in the surficial 0-5 cm sediment. Minimal change was observed in mercury in the sediments over the last 18 years. The authors were uncertain as to why concentrations of mercury in the surface sediment were not decreasing similar to the other COCs.

Data from sediment traps deployed in 2006-2009 indicated that concentrations of COCs were trending downward since the remediation effort at the Dow Chemical site (Richman & Milani, 2010). There was a significant ($p \leq 0.02$) decrease in concentrations of Hg, HCBd, and OCS for suspended solids in 2006-2009 (post-remediation), compared to 2001 (pre-remediation). Contaminant down-flux rates have also decreased since remediation. Data for HCB were more variable than the other COCs. While 2006-2009 suspended sediment COC concentrations have remained consistently lower than 2001, further improvements in suspended sediment quality would likely require additional remedial actions. Bottom sediment data for HCB, OCS, and HCBd collected in 2006 and 2008 have shown a downward trend when compared to concentrations reported for 1990-2001, but Hg has not. It is unclear why relatively lower Hg concentrations in suspended solids have not resulted in lower concentrations in bottom sediment.

As cited by Richman and Milani (2010) and documented by others (Gewurtz *et al.*, 2010), fish tissue concentrations of mercury from the lower St. Clair River have declined since 1978, but have remained stable since the mid-1980s.

The OMOE/EC sampling program also examined mercury in fish tissue. The measured mercury in the benthic organisms, particularly chironomids, was used to estimate the biomagnification potential of the organic form of mercury, methylmercury, in walleye. This information provided insight into the extent of fish consumption restrictions for the various contaminated sediment zones, and was checked against the OMOE Sportfish Contaminant Monitoring Program. Greatest concern was observed for Zone 2, where there was predicted to be a total restriction for both the sensitive and general populations.

There are ongoing projects to quantify atmospheric deposition of mercury, but these studies and modelling are aimed at non site-specific deposition to the Great Lakes region, rather than specific connecting channels (EC/USEPA, 2005; Gbor *et al.*, 2007).

However, atmospheric deposition is not likely to be a significant source relative to the contaminated sediments for determining remedial actions at this time. Likewise, Lake Huron is not a significant source of contaminants, as reflected in the sampling programs conducted by EC (Jia *et al.*, 2010) and OMOE. For example, the concentration of mercury in suspended sediments collected at Lake Huron ranged from 0.058 to 0.063 µg/g dry sediment compared to 0.322 to 0.465 µg/g dry sediment from downstream St. Clair River samples. Other point sources (e.g., storm sewers) of mercury discharges within the AOC are considered unlikely or not as significant at this time.

ACTION 2 Work with MOE and MNR to develop consistent, long-term, corridor-wide collections of sportfish species from the upper, middle, and lower St. Clair River to track spatial and temporal contaminants trends. Fish sampling in the upper, middle, and lower St. Clair River should be conducted every four years at the very least.

STATUS *Completed and Ongoing*

Based on monitoring data from the provincial Sportfish Contaminant Monitoring Program mentioned in the Point Source Section of this report, Gewurtz *et al.* (2010) published the paper, "Temporal and Spatial Trends of Organochlorines and Mercury in Fishes from the St. Clair River/Lake St. Clair Corridor," in the Journal of Great Lakes Research. In this corridor, sharp declines in concentrations of PCBs, mercury, and other COCs occurred during the 1980s and 1990s, due to plant closure and remediation efforts, as mentioned in the Point Source Section and previous reports (MOE/MDEQ, 1995).

Collection of sportfish samples from the St. Clair River is challenging compared to Lake St. Clair. Further, movement of large-bodied sportfish in and out of the river complicate the temporal trend analysis. Available monitoring data for common carp, walleye, and yellow perch from the river suggested some declines; however, statistical significance of the findings was low due to small sample size. A better fish monitoring dataset for the downstream Lake St. Clair showed significant declines in major contaminant levels. Young-of-the-year fish (spottail shiner (*Notropis hudsonius*)) measurements were used to assess spatial trends in the corridor, because these fish have small home ranges (less than 1 km) and thus can provide more site-specific contaminant information compared with sportfish. Fish caught in the vicinity of the Lambton Generating Station showed significant decreases in PCB, OCS, and HCB during the 1980s and 1990s. Mercury showed an increasing trend; however, measurements were collected after 1990. Spatial trends in the data for mercury, PCB, OCS, HCB, and DDT in fish going downstream (i.e., Lake Huron, five sites along the St. Clair River, and five sites on Lake St. Clair, including St. Clair cutoff and Mitchell's Bay, which are in the AOC) show fish in the AOC having higher concentrations. The concentrations exceeded the levels protective for wildlife that consume fish more frequently. Exceedances for wildlife protection for mercury occurred at Suncor, Talford Creek, Stag Island, and Lambton Generating Station. The DDT exceedances in the AOC were similar to Lake St. Clair, but higher than Lake Huron.

Mercury and PCBs are the only chemicals that present issues for fish consumption by humans, depending on the population being considered (sensitive, general) and fish type and size. No other chemicals evaluated (OCS, HCB, total DDT) present an issue for fish consumption by humans. Concentration of mercury and PCBs for walleye, yellow

perch, and common carp were presented for Lake Huron, St. Clair River, and Lake St. Clair for different size fish and against consumption advisory levels for different populations. Smaller sizes of the fishes do not exceed fish consumption guidelines; however, restrictions are advised in consuming larger sizes of these fishes.

The work by Richman and Milani (2010) suggests that the remaining contaminated sediment will continue to be a source of contaminants to fish and the advisories.

ACTION 3 Conduct additional monitoring studies to determine the extent to which contaminant exposure and uptake occurs in mergansers, over-wintering waterfowl, and other game species, to address the BUI's "consumption of wildlife."

STATUS *In Progress*

In 2010, contaminant analysis on 23 resident waterfowl livers (20 from areas along the river and three collected from within WIFN) was completed.

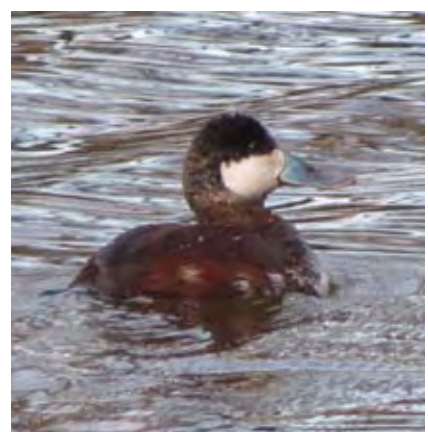
ACTION 4 Review and revise delisting criteria.

STATUS *In Progress*

The BUI was assessed and reviewed, and the revised delisting criteria were drafted in 2010. The revised delisting criteria require approval by the CRIC prior to finalization.



Photo courtesy of Sharon Nethercott, Sarnia, Ontario



Ruddy Duck on the St. Clair River

2. DEGRADATION OF BENTHOS

- Dynamics of Benthic Populations/Communities – Impaired
- Body Burdens of Benthic Organisms – Impaired

REVISED DELISTING CRITERIA (2010)

This BUI will be considered restored when the benthic community structure, diversity, and abundance are not significantly different to suitable, un-impacted reference sites within the AOC of comparable physical (sediment, grain size, water velocity) and chemical characteristics; and when benthic invertebrates tissue contaminant concentrations (body burdens) are comparable to suitable, un-impacted reference sites within the AOC, or when all remedial options, recommended to address the areas of interest for contaminated sediment, have been completed and follow-up monitoring confirms their effectiveness.

RESPONSIBLE ORGANIZATIONS

- EC
- NWRI
- MOE

ACTION 1 Complete a clear and concise synthesis of existing information to document existing conditions and trends on benthic communities and body burdens.

STATUS *Completed*

In the review of delisting criteria (CRIC Delisting Workgroup, 2010, unpublished) for the St. Clair River RAP, a synopsis of all benthic monitoring work on the river since 1990 is provided. The information was based on a detailed draft report prepared by EC (Mayne, 2008). Report highlights are as follows: surveys conducted between 1968 and 1977 found that the benthic community along the Michigan shore was well-balanced (e.g., well represented by pollution-intolerant, facultative, and tolerant organisms, and was essentially unaltered spatially (OMOE/MDEQ, 1991)). However, along the Ontario shoreline, the opposite was true. In 1968, sediment impairment was documented based on impaired benthic communities along the Ontario shoreline from the City of Sarnia to below Chenal Ecarte (OMOE, 1979), as a result of contaminated sediment due to industrial and municipal point sources on the Ontario side of the river (OMOE/MDEQ 1995).

By 1977, the impaired benthic community zone was reduced to approximately 20 km. When the St. Clair River was designated as an AOC in 1985, the sediment of the river was severely degraded as a result of nutrient loading and elevated levels of metals and organic compounds including Hg, polycyclic aromatic hydrocarbons (PAHs), PCBs, OCS, and HCB.

In 1990, a benthic invertebrate survey of the river identified four “environmental quality zones” based on benthic community structure and sediment chemistry (Pope, 1993). The river was classified into one of four zones: unimpaired, intermediate (slightly impaired), impaired, and degraded. The degraded zone was restricted to three areas along the St. Clair River: (1) downstream of Sarnia, (2) downstream of Suncor, and (3) near Corunna. Bioassay results from sediment samples collected in the degraded zone ranged from “very highly toxic” to “moderately toxic.”

In 1996, chlorinated hydrocarbons were removed from a small area immediately downstream of the Cole Drain and between 2002 and 2004, 13,370 m³ of contaminated sediment within Zone 1 were remediated.

In 2004 and 2005, the Great Lakes Institute for Environmental Research (GLIER, 2006) collected sediment samples for chemical analysis and benthic macroinvertebrate samples from the St. Clair River Delta. Although oligochaetes were present at all ten locations in numbers indicating moderate organic enrichment, the richness and identity of benthic taxa suggested good environmental quality of benthic habitats at the Walpole Delta sample sites (GLIER, 2006).

In 2007, the CRIC identified the need to apply the *COA Decision-Making Framework for Assessment of Great Lakes Contaminated Sediment* (EC & OMOE, 2008) to the remaining degraded areas of the river in Zones 2 and 3.

The *COA Sediment Framework* uses an ecosystem approach to sediment assessment to evaluate potential effects on sediment-dwelling and aquatic organisms using four lines of evidence (LOEs) and knowledge of sediment stability to assess contaminated sediment and associated effects in AOCs. ENVIRON Consultants (2009) produced a report detailing the application of the *COA Decision-Making Framework for Assessment of Great Lakes Contaminated Sediment* (EC & OMOE, 2008) to the remaining degraded areas of the river in Zones 2 and 3. The report results are based, in part, on extensive sediment and benthic assessment work conducted by EC and the OMOE (Biberhofer *et al.*, 2007; Milani *et al.*, 2007; Richman, 2008a; Richman, 2008b) from 2007 to 2008, as well as SLEA sampling work completed in 2005 and 2006 (Houtby & Moran, 2006).

ACTION 2 Identify information gaps in order to review existing delisting criteria, develop management plans, and recommend additional remedial options for contaminated sediments (i.e., Integrate findings of the Benthic Assessment of Sediment (*Beast*), National Water Research Institute, Sarnia-Lambton Environmental Association, Great Lakes Institute of Environmental Research (GLIER)).

STATUS *Completed*

The report, submitted to the SCRC by ENVIRON International Ltd. (2009), identified information gaps that would affect how to best manage the contaminated sediment in the St. Clair River. The report recommended three additional studies be conducted (geophysical, geotechnical, and geochemical) in order to develop SMOs that would effectively remediate sediment contamination. The geophysical study of the contaminated sediments was initiated in 2010.

Refer to the Sediment Work Plan (Section 2) for more information.

ACTION 3 Determine the need to continue the comprehensive (MOE) benthic community assessment for the entire St. Clair River and delta to determine overall benthic community health as was completed in 1957, 1968, 1977, 1985, 1990, 1994, and 1996.

STATUS *Not Completed*

As of 2010, no decision was made as to whether to conduct a comprehensive benthic community assessment. Given the focus on the work in Zones 2 and 3, it seems logical to defer this decision.

ACTION 4 Establish a technical committee to examine existing data and the need for additional studies.

STATUS *Completed*

The technical committee was established and consists of EC, OMOE, and SLEA. Additional studies have been undertaken by the OMOE, EC (i.e., Biberhofer *et al.*, 2007; Milani *et al.*, 2007), and ENVIRON (2009) through the study of impacts of contaminated sediments.

ACTION 5 Review and revise delisting criteria.

STATUS *In Progress*

The BUI was assessed and reviewed, and the revised delisting criteria were drafted in 2010. The revised delisting criteria require approval by the CRIC prior to finalization.



Fish sampling in the St. Clair River

3. RESTRICTION ON DREDGING ACTIVITIES

REVISED DELISTING CRITERIA (2010) This BUI will be considered restored when there is no limitation on the disposal of dredging spoils from routine dredging in the St. Clair River.

RESPONSIBLE ORGANIZATIONS • EC
• MOE
• DOT

ACTION 1 Collect and synthesize sediment contaminant data for the St. Clair River, such as:

- PWGSC for each dredging event in the St. Clair River AOC;
- Consult with GLIER and synthesize results from Drouillard, Hafner, and Ciborowski contaminant results for the St. Clair River, St. Clair River Delta, Lake St. Clair, and the Detroit River (Huron Erie Corridor);
- MOE and EC sediment core results; and
- SLEA sediment results.

STATUS *In Progress*

In the review of delisting criteria (CRIC Delisting Working Group, 2010) for the St. Clair River RAP, a synopsis of all benthic monitoring work on the River since 1990 is provided. The information was based on a detailed draft report prepared by EC (Mayne, 2008). The BUI status remains impaired. Exceedances of sediment yardstick values were recorded in the Southeast Bend Cutoff Channel for manganese (Mn), mercury (Hg), HCB, total PCBs, Total Kjeldahl Nitrogen (TKN), and total phosphorus (P). However, exceedances were less than 5% of samples collected and values were only slightly above yardstick.

ACTION 2 Review and revise delisting criteria.

STATUS *In Progress*

The review of the delisting criteria proposes that the status of this BUI will be based on an evaluation of whether there is “no limitation” on the disposal of dredging spoils. Limitations on the open water disposal of dredged materials, due to contaminants in the sediment, result in increased disposal costs. This is consistent with the generic delisting criterion developed for this BUI by the IJC in 1989, which states that restrictions on dredging activities are implemented when contaminants exceed standards, criteria, or guidelines, such that there are added costs associated with dredging or disposal activities (Krantzberg & Montgomery, 2007). The revised delisting criteria were drafted in 2010 and require approval by the CRIC prior to finalization.

ACTION 3 Identify the disposal outcome from dredging events based on sediment chemistry analysis and compare with delisting criteria.

STATUS *In Progress*

The PSQG established for the protection of aquatic life (Persaud *et al.* 1993), will serve as the standard for the evaluation of this BUI. Both PWGSC and OMOE base their evaluations of dredged material on the PSQG Lowest Effects Level (LEL). Chemical analysis is conducted on the material to be dredged and the analytical results are compared to the PSQG-LEL. If there are exceedances of the LEL, then open water disposal of the dredged sediment is not allowed. In this manner, the RAP can determine whether the costs of dredging in a navigational channel will rise due to the need for some form of confined disposal, thereby constituting impairment.



Large lake freighter travelling on the St. Clair River

4. RESTRICTIONS ON DRINKING WATER CONSUMPTION, OR TASTE OR ODOUR PROBLEMS

- Consumption – Impaired
- Taste or Odour Problems – Impaired

REVISED DELISTING CRITERIA (2010)

This BUI will be considered restored when there are no treatment plant shutdowns due to exceedances of drinking water guidelines over a two-year period.

RESPONSIBLE ORGANIZATIONS

- EC
- MOE
- SLEA
- Municipalities

ACTION 1 Continue to monitor spills to the St. Clair River.

STATUS *Completed and Ongoing*

Spills are monitored by OMOE Spills Action Centre. In 2010, Ryerson University prepared a report providing information on spills to the St. Clair River and water treatment plant shutdown records (Li & Cheng, 2010). Water treatment plant shutdown information was obtained from the provincial Spills Action Centre for 1988 to 2007, and from the SLEA for 1988 to 2005. The water treatment plant shutdowns were not identified as being mandatory or precautionary/ voluntary. Spills in the St. Clair River decreased from over 100 spills to below 20 spills from 1988 to 1999, and increased again to 40 spills in 2007. Reasons for spills were also identified. There was an attempt made to quantify the risk of a spill causing a water treatment plant shutdown; however, the time period of spill records was too short to make this approach valid.

ACTION 2 Review and, if necessary, revise the delisting criteria for “restrictions on drinking water consumption or taste and odour problems.”

STATUS *In Progress*

The “restrictions on drinking water consumption or taste and odour problems” BUI was designated as “Impaired” due to the mandated closures of water intakes along the St. Clair River as a result of industrial and municipal spills. In the review of delisting criteria (CRIC Delisting Working Group, 2010) for the St. Clair River RAP, a synopsis of actions related to this BUI is presented.

Highlights include:

- There is no evidence of problems with disease-causing organisms or toxic substances in drinking water from the Lambton Area Water Supply System (LAWSS).
- The Water Quality Report (2003; first quarter) from the Township of St. Clair LAWSS, which provides drinking water to Sarnia, the Township of St. Clair, the Town of Plymouth-Wyoming, the Village of Point Edward, the Township of Warwick, and the Municipality of Lambton Shores reported that the test results from the water confirm that the water met all health-related Ontario Drinking Water Standards (Township of St. Clair, 2012).

- As of 2010, there were few taste and odour complaints to the LAWSS and only one on Walpole Island (CRIC Delisting Working Group, 2010). Both drinking water treatment systems have installed processes to control taste and odour (powdered activated carbon for LAWSS, and granular activated carbon at WIFN).

Regulatory initiatives have also significantly strengthened drinking water protection relative to the time of the Stage 1 and Stage 2 reports. Bill 133 – Environmental Enforcement Statute Law Amendment Act – was passed by the Ontario Legislature on June 9, 2005. This amendment strengthened spill reporting requirements and introduced Environmental Penalties as an additional abatement tool. The Spill Prevention and Contingency Plans regulation (O. Reg. 114/07) codified expectations for major industrial sources with respect to proactive incident prevention. Finally, under the Clean Water Act of 2006, Source Water Protection for drinking water has been significantly strengthened. Currently, notification protocols are in place to provide adequate warning to down river water users within a two-hour time of travel consistent with Source Water Protection policies. All of these initiatives will serve to build on the much improved spill prevention execution evident in recent industry performance.

The revised delisting criteria were drafted in 2010. The proposed criteria require approval by CRIC prior to finalization.

ACTION 3 Identify the need for improvement to current monitoring programs.

STATUS *In Progress*

Monitoring exists through the SLEA station that captures volatile organics emissions, and is also a useful detection device for spills. A thorough review of current monitoring programs and spill contingency planning is still warranted, as indicated in the review of delisting criteria (CRIC Delisting Working Group, 2010) for the St. Clair River RAP.



Courtright water monitoring station photo courtesy of the Sarnia-Lambton Environmental Association (SLEA)

5. BEACH CLOSINGS

REVISED DELISTING CRITERIA (2010)

This BUI will be considered restored when less than 20% of the geometric means of water samples collected over the swimming season, at identified beaches within the St. Clair River AOC, exceed the Provincial Water Quality Objectives (PWQO) for *E. coli*, or is similar to a suitable non-AOC reference site, when assessed over a period of at least three to five years.

RESPONSIBLE ORGANIZATIONS

- Local Health Units
- MOE
- EC

ACTION 1 Obtain water quality monitoring data from the Public Health Unit (bacteria levels in beaches and day-use parks) and MOE – Provincial Water Quality Monitoring Network data for stations within the AOC and St. Clair Watershed.

STATUS *Completed and Ongoing*

Water quality monitoring is conducted in the St. Clair River at three locations identified by the municipality and sampled by local Health Departments. Three beaches are assessed and include:

- Canatara Park – LCCHSD
- Sarnia Centennial Park – LCCHSD
- Mitchell's Bay – CKHU

Additionally, in 2004, the LCCHSD and the OMOE conducted further sampling between June and August along the St. Clair River stretching from Sarnia to the delta. Sample sites included downstream of Cromwell Street in Sarnia, the Chippewa ramp, Guthrie Park, Mooretown Centennial Park, and the outlets of Talford Creek, Baby Creek, Bowen Creek, and Clay Creek. Cathcart, Branton Cundick, Regan, and Brander parks were also sampled.

The OMOE and SCRCA also initiated a beach monitoring program in 2009, whereby weekly single samples were collected and analyzed from the Bluewater Bridge, Guthrie Park, Mooretown boat launch, Courtright Waterfront Park, Cathcart Park, Branton Cundick Park, Regan Park, and the outlet of Marshy Creek. The program continued between June and September of 2010. Results indicated that *E. coli* levels only exceeded the Ontario safe swimming standard (100 cfu/100 mL) at one location (Regan Park; Carroll, 2011).

ACTION 2 Obtain routine beach surveillance data from Lambton County and Chatham-Kent Community Health Services Departments.

STATUS *Completed*

Received reports from the Regional Health Unit in 2009 and 2010. The OMOE and SCRCA conducted beach surveillance for *E. coli* at various sites along the St. Clair River in 2009 and 2010, as well.

ACTION 3 Evaluate the source(s) of bacterial contamination of beaches.

STATUS *Not Completed*

This action was deferred pending assessment of studies going beyond 2010.

ACTION 4 Evaluate the performance of municipality infrastructure upgrades on sewage treatment plants, stormwater treatment, and combined sewer overflows and facility optimization.

STATUS *In Progress*

Sampling in 2010 by the LCCHSD identified reduced bacterial counts at Centennial Park beach related to CSO improvements. Further studies have been deferred pending identification of the need for this work, given that municipalities provide compliance reports.

ACTION 5 Conduct river-wide screening in 2008 and compare with results from 2004.

STATUS *In Progress*

Bacteria data have been compared between 2010 and 2009. A comparison to 2004 data is outstanding.

ACTION 6 Work closely with Walpole Island First Nation to determine if there are beach closings at local beaches.

STATUS *In Progress*

WIFN also monitors *E. coli* at beaches and other heavily used recreational areas on the island. Results from this monitoring program will be provided in 2011.

ACTION 7 Assess beneficial use impairment and review delisting criteria.

STATUS *In Progress*

The BUI was assessed and reviewed, and the revised delisting criteria were drafted in 2010. The revised delisting criteria require approval by the CRIC prior to finalization.

ACTION 8 Support the Lambton County Public Health Unit to conduct a St. Clair River-wide sampling “to determine if the AOC creeks that enter into the river have a significant impact upon the presence and concentrations of *Escherichia coli*.”

STATUS *Not Completed*

This action was deferred pending completion of the study of bacterial levels at St. Clair River beaches. It is expected to commence in 2011.



Beach area along the St. Clair River, photo courtesy of Chris Durand, London, Ontario

6. DEGRADATION OF AESTHETICS

REVISED DELISTING CRITERIA (2010)

This BUI will be considered restored when the waters are devoid of anthropogenic substances at levels that produce a persistent objectionable deposit and/or odour.

RESPONSIBLE ORGANIZATIONS

- EC
- OMOE
- OMNR
- Health Units
- Municipalities
- WIFN
- AFN

ACTION 1

Develop an appropriate methodology (i.e., questionnaire, contact MOE district office, Health Units, municipalities, and the MNR to determine if there have been recent complaints) to evaluate degradation of aesthetics in the St. Clair River AOC. (Cost to produce questionnaires is estimated at \$1,000.00 and a survey of River users is expected in 2007.)

STATUS

Completed

In 2007 and again in 2010, a river-wide survey of aesthetics was conducted. Additional surveys are contemplated for future years through the OMOE/Health Unit/CA beach monitoring initiative.

ACTION 2

Include all partners (U.S., Canadian, First Nations) in the development of a study and the decision BUI status.

STATUS

Completed

In 2007, aesthetics surveys were handed out at the annual Sarnia Fishing Derby, an event that attracts approximately 1000 people from both Canada and the United States. In addition, the questionnaires were made available through the FOSCR website and distributed to local businesses and to the community members of the Aamjiwnaang and Walpole Island First Nations. In total, 184 surveys were returned with Canadians representing the majority of respondents (80%), followed by members of the First Nation communities (12%; 1% AFN and 11% WIFN) and Americans (8%).

Due to concerns that the AFN community was not well-represented in the 2007 survey, the questionnaire was re-distributed to the community in 2008. A revised questionnaire was distributed to WIFN in 2010.

The results of these surveys indicate that the majority of the people questioned felt that the appearance of the St. Clair River had improved with many (63%) rating the appearance of the river as "Good" or "Excellent."

7. ADDED COSTS TO AGRICULTURE OR INDUSTRY

REVISED DELISTING CRITERIA (2010)

This BUI will be considered restored when there are no significant additional costs required to use raw St. Clair River water for agricultural and industrial purposes.

RESPONSIBLE ORGANIZATIONS

- EC
- MOE

ACTION 1 Collect spills data from MOE and review for mandated shutdowns.

STATUS *Not Completed*

This action was deferred. It is anticipated that this work will be started in 2011.

ACTION 2 Review and revise existing delisting criteria.

STATUS *In Progress*

In the review of delisting criteria (CRIC Delisting Working Group, 2010) for the St. Clair River RAP, a synopsis of actions related to this BUI is presented. Users surveyed to date did not incur any added costs. These users included companies that use St. Clair River water for cooling and firefighting, and one golf course operator who used raw river water for irrigation.

The revised delisting criteria were drafted in 2010 and require approval by the CRIC prior to finalization.



View of the Darcy McKeough floodway and surrounding agricultural lands along the St. Clair River

8. LOSS OF FISH AND WILDLIFE HABITAT

REVISED DELISTING CRITERIA (2010)

The Fish and Wildlife Habitat BUI in the Ontario portion of the St. Clair River AOC will no longer be considered impaired when:

1. Administrative and legislative mechanisms are in place to protect locally recognized significant/unique wetland and terrestrial habitat from destruction or degradation.
2. Wetland coverage within the major subwatersheds is 6-10% or is restored to the extent possible to the original percentage of wetlands, and 155 ha (383 acres) of wetland habitat is rehabilitated, created, and protected within the Chenal Ecarte, Walpole Island First Nation delta or eastern shore of Lake St. Clair.
3. Habitat connectivity between the St. Clair River and Sydenham River and between Walpole Island First Nation, Bickford Oak Woods, and the Aamjiwnaang forest has been improved using landscape ecology principles.
4. 50% tributary lengths in Area 1A (Talford, Baby, Bowens, Clay, Whitebread/Marshy, Running, and Maxwell/Bear/Rankin Creeks) are buffered by a minimum width of 5 m of native vegetation to improve fish habitat (Qualitative target subject to feasibility study).
5. Nearshore and shoreline fish habitat have been enhanced at 6-12 priority sites along the St. Clair River to demonstrate the ecological benefits of integrating shoreline protection with fish habitat enhancement measures.
6. Wetland habitat quality of representative wetland sites achieves an integrated ranking of "Good" or better based on the IBI scores for water quality, submerged aquatic vegetation, aquatic invertebrates, fish, and birds or, when the quality of the wetlands in the AOC is shown to be comparable to reference wetlands outside the AOC.
7. A long-term *Habitat Management Plan* for both Michigan and Ontario, including an assessment of needs (GAP Analysis) relating to wildlife diversity and integrity, is completed to ensure continued habitat restoration and protection beyond RAP delisting.

RESPONSIBLE ORGANIZATIONS

- EC
- OMNR
- WIFN
- SCRCA
- RLSN

ACTION 1 A St. Clair River shoreline survey for rehabilitation and design of restorative works report.

STATUS *Completed*

A shore protection assessment was completed for all remaining shoreline properties on the Canadian side of the AOC. Potential opportunities for habitat restoration/enhancement were documented. The report was completed in 2007 and is publicly available through the CA web site (www.scrca.on.ca).

ACTION 2 Pre- and post-monitoring of fish abundance and diversity in areas designated for shoreline softening projects to assess the success of aquatic habitat rehabilitation.

STATUS *In Progress*

In 2009, the Biological Technician from the SCRCa conducted weekly post-restoration observations along the shorelines of Guthrie Park and Mission Park during July, August, and September. Observations of large schools of minnows were common and in August, an eastern spiny softshell turtle (*Apalone spinifera*) was seen basking on a log at Guthrie Park.

In October 2010, SCRCa and the DFO conducted fish sampling at Guthrie Park and Mission Park, as well as Cathcart Park. A full report on the fish surveys is expected from the DFO in early 2011. Pre-construction preliminary surveys at Cathcart Park indicate that spotted sucker (*Minytrema melanops*), northern madtom (*Noturus stigmosus*), and channel darter (*Percini copelandi*) are utilizing the shoreline.

ACTION 3 Complete a GIS analysis of existing 2006 data to determine tributary lengths, amount of existing riparian habitat, land use, and land ownership in order to establish targets.

STATUS *Completed*

Targets have been established. The OMNR completed a NHS for the AOC in 2006, which provided baseline data on wetland, forest, and riparian habitat. This information was used to propose restoration targets within the AOC.

ACTION 4 Continue benthic monitoring and fish habitat assessments in the tributaries flowing directly into the St. Clair River following major rehabilitation pilot projects to measure ecological benefits.

STATUS *Completed and Ongoing*

The SCRCa has regularly monitored benthic health in the AOC watershed since 1999 (results available online at www.scrca.on.ca/Reportcards.htm). The sites monitored include: Clay Creek, Baby Creek, Talford Creek, and Bowens Creek. According to the most recent St. Clair River Watershed Plan (Hayman, 2009), based on six years of monitoring

data, benthic communities in the St. Clair River tributaries continue to be degraded, with impacted communities located in Talford Creek and the St. Clair River itself attributed primarily to the contamination of sediments.

ACTION 5 As identified in Recommendation 3.4, work with Walpole Island Heritage Centre to develop a list identifying priority coastal wetland sites of WIFN for CWS wetland habitat quality assessments (i.e., water quality, macroinvertebrates, submerged aquatic vegetation, and marsh birds).

STATUS *Not Completed*

This action was deferred pending future discussions with WIFN and also upon updated assessment of the BUI.

ACTION 6 Complete wetland assessments and obtain results from WIFN/CWS and WIFN/Bird Studies Canada wetland assessments in order to determine their biological integrity and functionality.

STATUS *In Progress*

AOC wetlands (with the exception of wetlands within WIFN) have been assessed in 2008 and the overall condition of the biotic community of the assessed wetlands was ranked as "Good" to "Very Good." The water quality index results indicated that the AOC coastal wetlands were "Moderately Degraded," but similar to non-AOC Lake St. Clair wetland sites. Wetland assessments are planned for 2011.

ACTION 7 Walpole Island Heritage Centre to identify and develop habitat and community project proposals that will contribute to restoring BUIs for habitat/shoreline remediation, i.e., wetland rehabilitation plan.

STATUS *Completed*

For two years, the WIHC received funding through the GLSF to undertake the necessary studies to help assess feasibility of restoring 14 km of fish habitat in the dredge-cut. Baseline data on the hydrological, biological, and chemical components of the dredge-cut were collected and analyzed. No major issues with respect to contaminants were found, but nutrient levels were elevated. A Dredge-cut Restoration Group will be established with a mandate to undertake key tasks including the development of a restoration strategy. The WILT successfully secured a 10 year conservation leasing agreement with WIFN. The long-term plan of the WILT is to restore the Swan Lake marsh and improve the aquatic habitat for wildlife conservation. WIHC also provided a list of potential candidate sites for habitat restoration.

BENEFICIAL USES DESIGNATED AS “REQUIRING FURTHER ASSESSMENT”:

1. TAINING OF FISH AND WILDLIFE FLAVOUR

RESPONSIBLE ORGANIZATIONS

- EC
- OMNR
- OMOE

ACTION 1 Develop a methodology (e.g., questionnaire, fish tasting panel) to evaluate fish tainting in the St. Clair River AOC.

STATUS *Completed*

A questionnaire was developed and used for a survey of WIFN community in 2010.

ACTION 2 Include all partners (U.S., Canadian, and First Nations) and use information gathered to assess the status of the BUI based on study results.

STATUS *Completed*

In 2009/2010, additional community consultation was undertaken by WIFN. Results from over 100 respondents will be incorporated into the draft BUI assessment maintaining the initial recommendation that this BUI be re-designated from “Requiring Further Assessment” (RFA) to “Not Impaired” (NI).



Fishing photo courtesy of Jennifer Jowett, Port Huron, Michigan

2. DEGRADED FISH AND WILDLIFE POPULATIONS

- Dynamics of Fish Populations – Not Impaired
- Body Burdens of Fish – Requiring Further Assessment
- Dynamics of Wildlife Populations – Requiring Further Assessment
- Body Burdens of Wildlife – Requiring Further Assessment

RESPONSIBLE ORGANIZATIONS

- EC
- OMNR
- OMOE

ACTION 1 Determine the relative role of out of basin contaminant sources (i.e., atmospheric contaminants), local ongoing sources from historical sediment contamination (same action as identified for BUI Restrictions on Fish and Wildlife Consumption).

STATUS *In Progress*

Refer to Action 1 under the Restrictions on Fish and Wildlife Consumption BUI. In addition, this action is pending review of whether data exist to determine threshold contaminant levels that cause population effects.

ACTION 2 Conduct additional monitoring studies to determine the extent to which contaminant exposure and uptake occur in mergansers, over-wintering waterfowl, and other game species to address the BUI “consumption of wildlife” (same action as identified for BUI Restrictions on Fish and Wildlife Consumption).

STATUS *In Progress*

Refer to Action 3 under the Restrictions on Fish and Wildlife Consumption BUI.

ACTION 3 Evaluate aquatic wildlife population dynamics in the AOC, including Walpole Island First Nation, through wetland evaluations.

STATUS *In Progress*

In 2010, a contract was let to analyze five long-term wildlife datasets to assess the status and trends of wildlife populations within the AOC. The report is scheduled for completion in 2011.

ACTION 4 Work with existing Species at Risk programs (i.e., Canadian Wildlife Service, Department of Fisheries and Oceans, and Walpole Island Heritage Centre) and synthesize information to comprehensively wildlife-related BUIs.

STATUS *Not Completed*

This project has been deferred to a later date.



Benthic invertebrate sampling

3. FISH TUMOURS AND OTHER DEFORMITIES

RESPONSIBLE ORGANIZATIONS

- EC
- OMNR
- OMOE

ACTION 1 Await a report on the 2006 fish collection and liver evaluation from EC-NWRI and undertake a comprehensive review on the current status. Integrate previous studies with the 2006 results to determine if this BUI is impaired or not impaired. (A complete liver tumour assessment completed by Environment Canada's National Water Research Institute is anticipated by the end of 2007.)

STATUS *Completed*

From 2001 to 2006, EC conducted a comprehensive survey of fish in Canadian Great Lakes AOCs that had this BUI designation. The EC survey was scientifically consistent with the IJC guidance for the delisting criteria for this BUI and current understanding of the science of fish tumours. The St. Clair River AOC survey was compiled in a report titled "Data Analysis and Fish Tumour BUI Assessment for Lake Superior and the St. Clair River AOCs" by Paul C. Baumann, PhD, in March, 2010.

The report documents the history and evolution of the science of fish tumours in the Great Lakes AOCs, sampling methodology, sampling sites, analytical methods, data analysis including statistical treatment, results, discussion, and conclusions. The report concluded that the status of this BUI can now be considered "Not Impaired" and that no further monitoring specifically for tumours was needed. Feedback from St. Clair River RAP agencies and First Nations was obtained and will be considered to determine next steps.



Minnow photo courtesy of Joan Hettinger, East China, Michigan

4. BIRD OR ANIMAL DEFORMITIES OR OTHER REPRODUCTIVE PROBLEMS

RESPONSIBLE ORGANIZATIONS • EC

ACTION 1 Integrate previous studies on birds, reptiles, and mammals with the 2006/2007 amphibian results.

STATUS *In Progress*

From 2006 to 2008, field studies were conducted on birds, reptiles, mammals, and amphibians. In 2006 and 2007, deformity rates in froglets on WIFN were measured to help assess the status of this BUI within the St. Clair River AOC. The results were quite variable for the two years, so a third year of deformity data for amphibians was suggested for 2011.

ACTION 2 Complete a comprehensive assessment of invertebrate classes to determine the status of this BUI (i.e., Impaired, Not Impaired, and Requires Further Study on a site-specific basis).

STATUS *Not Completed*

Upon review, it was concluded that this action relates most appropriately to the assessment of benthic macroinvertebrate studies and will be addressed in the degradation of benthos BUI.



Studies were conducted between 2006 and 2007, and again in 2011 on deformity rates in frogs on Walpole Island. This information will be used to assess the status of the "Bird or Animal Deformities or Other Reproductive Problems" BUI within the St. Clair River AOC

Project Highlights

2010 Revised Delisting Criteria

In the spring of 2010, a review of the delisting criteria for each “Impaired” BUI was initiated by a subcommittee of the CRIC for the St. Clair River AOC. The original criteria were established in 1995, at the time that the RAP was developed. A review was proposed to determine if the criteria needed updating in response to environmental, legislative, and scientific changes that occurred since their development. The purpose of the review was to assess all of the delisting criteria to ensure they were current, achievable, and measurable in the present environment. The review followed recent revisions to delisting criteria in other jurisdictions (MDEQ, 2008) and AOCs such as the Detroit and St. Mary’s rivers. A working group was established by CRIC with representatives from federal and provincial governments, First Nations, industry, and public organizations. By the end of 2010, a draft report was complete outlining the proposed delisting criteria and the rationale for any changes. In addition, the document included recommended actions that should be considered in the next RAP Work Plan to meet delisting criteria and result in the re-designation of “Impaired” BUIs. The draft report was approved by CRIC and distributed to BPAC for their consideration. A plan was developed to conduct consultation in 2011 with community members of the Aamjiwnaang and Walpole Island First Nations. Upon completion of the consultation process, the final revised delisting criteria document will be submitted to the Four Agency Management Committee and the Canadian/Ontario Agreement Annex Implementation Committee for their consideration. Ultimately, they will be used in determining if the St. Clair River AOC should be recommended for “delisting.”



The Bluewater Bridge connecting Sarnia, Ontario to Port Huron, Michigan

Section 5 – Public Outreach and Education Work Plan

Summary of Accomplishments

OMOE, EC, SCRCA, and Friends of the St. Clair River (FOSCR) have all worked cooperatively to reach out to the public and offer educational opportunities about the St. Clair River AOC and environmental science in general. OMOE provided funding to FOSCR to support outreach and education activities. They host a very successful website, which allows access to all significant BPAC and RAP-related documents and reports. They held a popular photo contest in 2006 that resulted in the posting of hundreds of photos related to the river, which in turn attracts thousands of additional “hits” per year to their website.

FOSCR, in cooperation with the SCRCA’s education program, produced an extremely well-received RAP education series that features a “RAP” video, locally produced by youth in the area. It proved to be an excellent tool for engaging the younger generation.

FOSCR supported BPAC events, AOC signage, and local rehabilitation demonstration sites.

The SCRCA, in addition to the RAP education program, developed and hosts a St. Clair River AOC website that includes a section on the sediment management. The SCRCA has provided communications support for a number of initiatives including open houses, announcements, and special events.

INTRODUCTION

The 2007-2010 Work Plan recognized the importance of public outreach and education to engage and involve the local community in the St. Clair River rehabilitation. Through the collaboration of all the Subcommittees, one recommendation was presented with priority actions focused on continuing education and outreach programs in the St. Clair River AOC.



Posters and displays at the Aamjiwnaang First Nation Pow Wow

RECOMMENDATIONS

#5.1 RECOMMENDATION

Continue to develop and implement education and communication programs to deal with significant actions for RAP Implementation.

RESPONSIBLE ORGANIZATIONS

- CRIC
- OMOE
- EC
- DFO
- CCG

ACTION 1

Support the BPAC in their efforts to enhance local coordination of present and future public outreach projects (e.g., Photo Contest and Promotions, Advertising Campaign, News Releases, Power Point Presentations, Portable Display, Report Card, Fact Sheet).

STATUS

Completed and Ongoing

Education:

- Through the support from a number of partners, the SCRCa provided in-class education programs at local schools with messaging that supports the work of BPAC, including: the St. Clair River RAP program that included the use of a locally produced "RAP" video (910 students from 2009-2010); and River Bottom Critters (10,512 students from 2007-2010 – supported by SLEA).

Tours and Events:

- Three boat tours were held highlighting issues related to the AOC (SCRCa partners tour, Ontario Nature Conference tour, BPAC US Workshop and Cruise)
- Sarnia Point Lands Public Event / Education Series in Sarnia, Ontario (2010)
- Earth Voyager, Sarnia, Ontario
- Open House at AFN (2009)
- Open House at St. Clair Township (2009)
- BPAC meetings hosted five times per year with minutes posted on the FOSCR website

Websites and Publications:

- FOSCR website maintenance
- FOSCR E-News bulletins
- SCRCa developed and hosts a St. Clair River AOC website, including a section on sediment management
- St. Clair River AOC section in SCRCa Annual Report (posted on website and distributed to SCRCa partners)
- Subwatershed Report Card completed by SCRCa in 2008 – reports on forest and water quality parameters for the St. Clair River subwatershed (posted on SCRCa website and distributed at events and meetings)

Signage and Demonstration Projects:

- Interpretive signage placed along the St. Clair River
- Demonstration projects of completed Habitat and shoreline rehabilitation projects – Guthrie Park, St. Clair Township (shoreline revitalization); Dow Wetlands, St. Clair Township (tree planting); Mission Park, Sarnia (shoreline revitalization); Bowens Creek, St. Clair Township (tree planting); Enbridge Property.

ACTION 2 Develop outreach/education materials to promote the rehabilitation of nearshore aquatic habitat and shoreline softening, such as shoreline tabloid, website, presentation, demonstration day.

STATUS *Completed and Ongoing*

The SCRCA has rehabilitated 700 metres of deteriorating metal sea wall at Guthrie Park with new armour stone blocks providing improved habitat for fish and wildlife. It serves to demonstrate to private landowners what can be accomplished. A watershed model was purchased by FOSCR for the SCRCA education program. The model helps children understand ecological concepts and what they can do to restore the environment.

ACTION 3 Recognize the need for and provide funding support for RAP coordination.

STATUS *Completed and Ongoing*

Both the federal and provincial agencies supported a part-time RAP Coordinator during 2007-2008. In fiscal year 2008-2009, funding was increased to support a full-time position, which was filled in February 2009. The full-time coordinator was able to expand outreach activities throughout the AOC.

ACTION 4 Continue to provide support to the Friends of the St. Clair River (Canada) for information development and BPAC outreach projects.

STATUS *Completed*

The OMOE provided financial support to FOSCR for three fiscal years of the work planning period. FOSCR has undertaken several outreach and education projects and initiatives.

ACTION 5 Develop educational materials to inform the public on correct direct discharges of untreated grey water from boats.

STATUS *Not Completed*

This priority action will be included in the 2012-2017 work plan with a development proposal to complete it in 2012.

ACTION 6 Celebrate successes and milestones via site visits for public and agency trips to implementation sites.

STATUS *Completed and Ongoing*

Tours and openings were held, including: source water protection bus tours; the Conservation Authority's annual bus tours; Ducks Unlimited (DU) site openings and tours; RLSN project tours; and Conservation Authority opening celebrations.

Project Highlights

Friends of the St. Clair River (FOSCR) E-Newsletter

Thanks to funding provided by the OMOE, FOSCR launched an E-newsletter in July 2009 (Figure 5.1). The E-newsletter is aimed to inform and educate interested parties on the St. Clair River AOC and highlight the latest developments and achievements in both Canada and the United States. The public can add their name to the distribution list through the FOSCR website (www.friendsofstclair.ca). The E-newsletter is sent out approximately every two months and provides updates on AOC-related topics, including contaminated sediments, habitat projects, funding applications, shoreline restoration, Species at Risk, invasive species, BUI status, and the progress made in other Great Lakes Basin AOCs (Figure 5.2). In addition, the E-newsletter provides information on events such as open houses and workshops, and on everyday changes residents can adapt to help support the delisting of the St. Clair River AOC. The environmental initiatives of local community groups are also highlighted. By the end of 2010, approximately 600 people were on the E-newsletter distribution list.



Figure 5.1: The E-Newsletter launched by the Friends of the St. Clair River (FOSCR) in July 2009. The newsletter is funded by the Ontario Ministry of Environment (FOSCR, 2009).



Figure 5.2: Shoreline erosion and habitat project highlighted in the May 2010 E-Newsletter produced by the Friends of the St. Clair River (FOSCR, 2010).

Project Highlights

Sarnia Point Lands Project

With the contributions of the OMOE, Lambton Wildlife Inc., SCRCA, Sarnia Urban Wildlife (SUW), Sarnia Young Naturalists (SYN), Sarnia Bay Marina, and the City of Sarnia, FOSCR displayed educational signs along the last undeveloped piece of property along the Sarnia waterfront (Figure 5.3). A \$10,000 grant was provided to the group by the South Western Ontario Development Program (SWODP), FedDev Ontario, the Sarnia-Lambton Business Development Corporation, and the Government of Canada through Canada's Economic Action Plan. The signs focus on the importance of the St. Clair River, a key component of the Huron-Erie Corridor between Lake Huron and Lake Erie. They provide the public with information on the significance that urban natural areas, such as the Sarnia Point Lands, have in providing habitat for local flora and fauna. The challenges BPAC and the government have in delisting the St. Clair River as an AOC were also highlighted. The unveiling of the signs was also accompanied by events such as evening nature walks put on by the SYN, SCRCA, and SUW. The events were very well-attended and received by the surrounding communities.



Figure 5.3: Members of Friends of the St. Clair River (FOSCR) and local residents attend the unveiling of educational signs along the Sarnia Point Lands on the St. Clair River (left: FOSCR, 2010). Other signage has since been erected at other parks along the shoreline (right).

List of Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada
AFN	Aamjiwnaang First Nation
ANSI	Area of Natural and Scientific Interest
AOC	Area of Concern
AOI	Area of Interest
BEAST	Benthic Assessment of Sediment
BOD5	Biological Oxygen Demand
BPAC	Binational Public Advisory Council
BUI	Beneficial Use Impairment
CA	Conservation Authority
CCG	Canadian Coast Guard
CKHU	Chatham-Kent Health Unit
COA	Canada – Ontario Agreement
COC	Contaminant of Concern
COD	Chemical Oxygen Demand
C of A	Certificate of Approval
CRIC	Canadian Remedial Action Plan Implementation Committee
CSO	Combined Sewer Overflow
CWS	Canadian Wildlife Service
DDT	Dichlorodiphenyltrichloroethane
DFO	Department of Fisheries and Oceans
DOT	Department of Transportation Canada
DU	Ducks Unlimited
EA	Environmental Assessment
EC	Environment Canada
ECA	Environmental Compliance Approval
ECR	Environmental Compliance Report
ELC	Ecological Land Classification
FOSCR	Friends of the St. Clair River
GLCWC	Great Lakes Coastal Wetland Consortium
GLIER	Great Lakes Institute for Environmental Research
GLSF	Great Lakes Sustainability Fund
GLWQA	Great Lakes Water Quality Agreement
HCB	Hexachlorobenzene
HCBD	Hexachlorobutadiene
Hg	Mercury
IBI	Indices for Biotic Integrity
IJC	International Joint Commission
IPAT	Industrial Pollution Action Team
LAWSS	Lambton Area Water Supply System
LCCHSD	Lambton County Community Health Department
LEL	Lowest Effects Level

LOE	Line of Evidence
MDEQ	Michigan Department of Environmental Quality
MEWS	Ministry of the Environment Wastewater System
MISA	Municipal Industrial Strategy for Abatement
Mn	Manganese
MOHLTC	Ontario Ministry of Health and Long-term Care
NH ₃	Ammonia
NHS	National Heritage Strategy
NI	Not Impaired
NPS	Non-Point Source
NWA	National Wildlife Area
NWRI	National Water Research Institute
OCS	Octachlorostyrene
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs
OMNR	Ontario Ministry of Natural Resources
OMOE	Ontario Ministry of Environment
OP	Official Plans
P	Phosphorus
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PSQG	Provincial Sediment Quality Guidelines
PWGSC	Public Works and Government Services Canada
PWQMN	Provincial Water Quality Monitoring Network
PWQO	Provincial Water Quality Objectives
RAP	Remedial Action Plan
RFA	Requiring Further Assessment
RLSN	Rural Lambton Stewardship Network
ROI	Receptor of Interest
SAR	Species at Risk
SCRCA	St. Clair Region Conservation Authority
SLEA	Sarnia-Lambton Environmental Association
SMO	Sediment Management Option
SPS	Sewage Pumping Stations
SUW	Sarnia Urban Wildlife
SWODP	South Western Ontario Development Program
SYN	Sarnia Young Naturalists
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency
WHC	Wildlife Habitat Canada
WIFN	Walpole Island First Nation
WIHC	Walpole Island Heritage Centre
WILT	Walpole Island Land Trust
WPCP	Water Pollution Control Plant

Glossary

Area of Concern (AOC) – Geographic locations recognized by the International Joint Commission (IJC) where water, sediment, and fish quality are degraded, and the objectives of the Great Lakes Water Quality Agreement (GLWQA) of local environmental standards are not being achieved.

Beneficial Use Impairment (BUI) – A change in the chemical, physical or biological integrity of a Great Lakes System sufficient to cause any of the 14 use impairments.

Combined Sewer Overflow (CSO) – Combined storm and sanitary sewer systems.

Delist – The removal of an Area of Concern (AOC) from the list of AOCs achieved only when the criteria for the restoration of beneficial uses as defined by the Remedial Action Plan (RAP) are met and agreed upon by agencies and the local community.

Environmental Remediation – The removal of pollution or contaminants from environmental media, such as soil, groundwater, sediment or surface water, for the general protection of human health and the environment.

Great Lakes Water Quality Agreement (GLWQA) – A joint agreement between Canada and the United States, which commits the two countries to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin ecosystem (from Article 2 of the 1978 GLWQA). Originally signed in 1972, the Agreement was amended in 1978 and 1987.

Habitat – An ecological or environmental area that is inhabited by a particular species of animal, plant or other type of organism.

International Joint Commission (IJC) – A binational organization established in 1909 by the Boundary Waters Treaty. Through the IJC, Canada and the United States cooperatively resolve problems along their common border, including water and air pollution, lake levels, power generation, and other issues of mutual concern.

Non-Point Source (NPS) – Source of pollution in which pollutants are discharged over a widespread area from a number of small inputs rather than from distinct, identifiable sources.

Point Source – A source of pollution that is distinct and identifiable, such as an outfall pipe from an industrial plant.

Remedial Action Plan (RAP) – A document drafted with the purpose of restoring and protecting beneficial uses in the Areas of Concern (AOCs) within the Great Lakes Basin.

Sediment – The fines or soils on the bottom of the river or lake.

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St. Clair River shoreline

2011 Addendum

The next Work Plan to be developed for the St. Clair River Area of Concern (AOC) is anticipated to cover the years 2012 to 2017. The following Addendum describes those activities occurring in 2011 that expand on the priority actions introduced in the 2007-2010 Work Plan. The following update is presented in the same format as the body of the Work Plan 2007-2010 Report of Accomplishments.

Section 1 – Point Source Work Plan

#1.1 RECOMMENDATION Track monitoring of decommissioned and decommissioning of industrial facilities and landfills in the St. Clair River (e.g., Dow Canada, Chinook) and continue to examine and mitigate any existing or potential future environmental impacts due to residual contaminant sources on St. Clair River beneficial uses.

ACTION 1 Maintain and review point source regulatory monitoring (Municipal Industrial Strategy for Abatement (MISA), Certificate of Approval (C of A)) to ensure timely reporting and information dissemination on environmental concerns.

STATUS *Completed and Ongoing*

In addition to the decommissioned MISA outfalls listed between 2007 and 2010, Fibrex Insulation Incorporated closed their Sarnia facility in 2011. Their process water was rerouted to the Lanxess biox treatment unit.

#1.2 RECOMMENDATION Ensure that Water Pollution Control Plants (WPCPs) continue to meet current regulations and do not negatively affect beneficial uses.

ACTION 2 Assess the need for disinfection at Port Lambton and Sombra lagoons if Beach Closings for bacteria are still occurring once all other sources are remediated.

STATUS *In Progress*

A monitoring program initiated in 2009 by the OMOE and the SCRCA and then continued in 2010 was expanded during the 2011 monitoring season with the assistance of the County of Lambton's Community Health Department (LCCHSD).

During the beach posting BUI discussions, several sites along the St. Clair River were identified where recreational water use occurs but is not considered an official beach, as defined by the Ministry of Health and Long Term Care (MOHLTC) 2008 Beach Management Protocol and are therefore not sampled during the swimming season by LCCHSD.

In order to undertake a thorough analysis of potential bacteriological issues along the St. Clair River, a project was proposed in which samples were taken by LCCHSD and sent to an identified lab for analysis. Costs for analysis and couriering of samples were provided through the support of the OMOE and the SCRCA. This sampling is a separate project from the regular beach sampling currently done by LCCHSD.

A total of 22 samples were collected weekly between June and September for *E.coli* analysis. It is anticipated that this sampling will continue over a three-year period (2010-2012). The sites sampled included: Bluewater Bridge, Aamjiwnaang Dock, Corunna Dock, Mooretown Dock, Courtright Dock, Seager Park, Terra Beach, Branton Cundick Park, and Port Lambton Dock. Monitoring was also continued on Walpole Island and by Chatham-Kent at Mitchell's Bay.

ACTION 3 Develop a Master Plan for sewage treatment for the City of Sarnia, which includes plan optimization, elimination of by-passes, and CSOs.

STATUS *In Progress*

The City of Sarnia began a sewage master plan in early 2011 which included an assessment of its sanitary sewer system. The project cost \$600,000 and was totally funded by the city. The purpose of the assessment was to determine the existing capacity of the sewage treatment plant and future plant capacity needed to address additional flows generated from the separation of combined sewers and population growth.

The plan will provide the City with tools for long-term management and operation of wastewater infrastructure by:

1. Identifying servicing policies (a strategic document to assist in overall planning for a period of 20 years);
2. Identifying key infrastructure projects (determine priorities and provide for first steps of projects as the Master Plan is intended to cover Phases 1 and 2 of the MEA Class EA process);
3. Identifying key study projects (this project is part of an ongoing infrastructure management process); and
4. Identifying operational changes (if possible).

The plan is expected to be finalized in August 2012 after the completion of a public information meeting for review and input and presentation to Sarnia Council.

#1.3 RECOMMENDATION Complete programs to eliminate combined sewer overflows (CSOs).

ACTION 3 Completely separate cross connections within the City of Sarnia Sanitary Drainage Area.

STATUS *In Progress*

A \$6.7 million project was initiated to separate storm and sanitary sewers along a nine-block stretch of East Street between London Road and Ross Avenue. This represents the final phase of the East Street reconstruction project between Exmouth and Campbell Streets at a total cost of \$35 million.

Sewer diversion work on East Street was carried out and completed on the East Street Project from Wellington Street to George Street. The work included installation of a new deep sanitary sewer, diversion of pump station flows from east of East Street to the new interceptor sanitary sewer, watermains, and road reconstruction.

The sewage from the separated areas east of East Street is being diverted to a new pump station on Devine Street – City's Works Yard and being pumped to a Waste Pollution Control Centre directly via a forcemain. This has mitigated combined sewer overflows at Devine Street and Cromwell Street.

An additional \$2.5 million project was undertaken on Devine Street between Margaret Street and Proctor Street. The work included the installation of a new deep sanitary sewer, future storm sewer, watermains, and road reconstruction. This project was also part of the East Street Sewer Separation Project.

Project Highlights

Courtright and Corunna WPCP Upgrades

Construction began in 2011 on the WPCP upgrades in Corunna and Courtright. The upgrades involved replacing the Corunna WPCP with a pumping station to redirect sewage from the community of Corunna to the Courtright WPCP. The upgrades to the Courtright WPCP cost over \$28 million dollars and, although the plant was up and operating in 2011, construction will not be completed until 2012. This project has contributed significantly to the decreased water pollution in the St. Clair River.

Section 2 – Sediment Work Plan

#2.1 RECOMMENDATION Undertake an assessment of contaminated sediments in the St. Clair River and determine actions.

ACTION 5 Develop sediment management options and select preferred option for Zones 2 and 3.
a) Conduct a “Public, First Nations and Stakeholder Consultation” to seek consensus.

STATUS *In Progress*

As identified by ENVIRON in their draft SMO report, the required geophysical and geochemical studies of contaminated sediment in the St. Clair River were initiated by Pollutech EnviroQuatics Ltd. in 2011. All field work was completed in the Fall, with the final report expected by June 2012. The objectives of these studies were to delineate the depth and areal distribution of mercury contamination and to determine the extent to which native sediment can support a stable capping remedy. Results will allow ENVIRON to determine the effectiveness, cost, and feasibility of capping; natural recovery; and dredging as options to remediate the contaminated sediment.

Through the St. Clair River Contaminated Sediment Communications Team, co-chaired by the OMOE and EC, a draft Consultation Framework Strategy was developed. This framework will be used as the core plan for undertaking the public, First Nations, and stakeholder consultations and engagement once the management options have been determined.

Section 3 – Habitat and Non-Point Source (NPS) Work Plan

#3.1 RECOMMENDATION In addition to the delisting criterion pertaining to Chenal Ecarte wetland creation, broaden the scope of wetland habitat projects to include creation, rehabilitation, acquisition, and maintenance within the Walpole Island First Nation delta and headwaters of AOC creeks (as per the *Updated Habitat and NPS Rehabilitation Priority Sites*).

ACTION 4 Identify and engage landowners, seek funding, and implement coastal wetland habitat projects within the AOC to maintain and improve the integrity and hydrological connectivity of coastal wetlands for fish spawning, nursery, and feeding areas and aquatic wildlife needs.

STATUS *In Progress*

A partnership between SCRCA, Ducks Unlimited, and six other environmental organizations was initiated in 2011 to protect and enhance Peers wetland, located northeast of Wallaceburg, Ontario. A funding proposal was submitted to support a project that would include the conservation and restoration of 12.9 ha (31.8 acres) of wildlife habitat, including 7.7 ha (18.9 acres) of wetland and 5.2 ha (12.9 acres) of upland habitat. The wetland is located along the Atlantic and Mississippi waterfowl migration corridor and has the potential to provide valuable staging habitat for migratory birds in the spring and fall.

ACTION 5 Assess the quality of coastal wetland habitat in the Chenal Ecarte and WIFN delta by collecting data on water quality, aquatic macroinvertebrates, amphibians (if possible), marsh birds, and submerged aquatic vegetation (for more detail see Section 4 – Research and Monitoring).

STATUS *In Progress*

In 2011, EC reassessed the wetlands located in the St. Clair River AOC. Draft results are anticipated in 2012 and will provide insight into whether wetland health has changed. To date, AOC wetlands assessed by Environment Canada staff have not included wetlands within Walpole Island as WIFN is planning to undertake this activity starting in 2012.

#3.6 RECOMMENDATION Promote the protection, preservation, and rehabilitation of the natural heritage features of the St. Clair River AOC by encouraging Lambton County and municipalities, and the Municipality of Chatham-Kent to incorporate wording in their Official Plans such that the St. Clair River Area of Concern is recognized as a priority area in need of water quality protection and fish/wildlife habitat conservation and protection.

ACTION 1 Encourage Lambton County and municipalities and the Municipality of Chatham-Kent to strengthen “Natural Heritage Policies” for the AOC when amending their Official Plans (OPs) to provide greater protection to water quality and fish and wildlife habitat.

STATUS *In Progress*

Lambton County started the review process in 2011 to update their 1998 OP.

Chatham-Kent approved a “Sustainable Shorelines Secondary Plan” and a “Shoreline Areas Community Sustainability Plan” in April 2011, as amendments to their OP. These documents indicate their vision for shoreline areas is “promoting the sustainability of its shorelines by balancing community, economy, and environmental considerations, to contribute to healthy and vibrant shorelines and communities.” It includes the recognition that the long-term health of the shoreline areas of Lake St. Clair are vital to Chatham-Kent’s economy, health and wellbeing, its social and recreational activities, and the health of the overall environment.

Project Highlights

In 2011, the subcommittee successfully implemented 15 restoration projects which yielded approximately 30 ha (74 acres) of wildlife habitat including 8 ha (20 acres) of wetland with the remainder being a combination of wooded and tallgrass prairie habitat. Approximately 2 km of riparian habitat were also created.

A decade of habitat restoration and non-point source (NPS) pollution prevention projects were successfully digitized and mapped, facilitating the subcommittee's ability to report on progress as well as plan and prioritize future projects. By digitizing each project, there is now a "footprint" of that project on the map which allows the Committee to calculate the contribution of each project to enhancing the aquatic and upland habitat within the AOC.

Partnerships with industry, municipalities, and other agencies continue to be fostered and developed by partners on the subcommittee. These partnerships, and those created with private landowners, are essential in the efforts of the subcommittee to restore and naturalize the AOC landscape to benefit fish and wildlife.



Mink photo courtesy of Randy Heath, Marysville, Michigan

Section 4 – Research and Monitoring Work Plan

Detroit and St. Clair River Areas of Concern Beneficial Use Impairment Workshop

On September 28 and 29, 2011, representatives from a number of partner agencies, including the Ontario Ministry of Environment (OMOE), the Ontario Ministry of Natural Resources (OMNR), and Environment Canada (EC), met at the Great Lakes Institute for Environmental Research (GLIER) in Windsor, Ontario, to discuss research and monitoring initiatives relating to four beneficial use impairments (BUIs) in the St. Clair River: restrictions on fish and wildlife consumption; fish tumours and other deformities; bird or animal deformities or reproductive problems; and degradation of fish and wildlife populations. Through presentations and discussions, additional suggested research activities were provided to guide the assessment of these BUIs. These activities will be reviewed further for implementation considering available resources and data:

- Applying a Fish Consumption Hazard Assessment model similar to the one currently used in the Detroit River AOC to predict contaminant concentrations in selected sportfish in the St. Clair River;
- Collection and analysis of 100 walleye from the St. Clair River to address concerns raised over deformities and lesions observed in this species; and
- Selection of a species common to both the St. Clair River and Detroit River to facilitate the Huron-Erie corridor-wide assessment of bird and animal deformities and reproductive problems.

A number of additional recommendations, updates, and action items were identified to promote future work that will lead to the re-designation of these four BUIs.

Beneficial Use Impairment (BUI) Re-designations

Two Beneficial Use Impairments (BUIs) were removed by the Canadian Remedial Action Plan Implementation Committee (CRIC) in 2011: Tainting of Fish and Wildlife Flavour and Added Cost to Agriculture and Industry. The decision to re-designate the Tainting of Fish and Wildlife Flavour BUI was also endorsed by the Binational Public Advisory Council (BPAC) based on surveys conducted on Canadian anglers, First Nation communities, and the general public. The surveys found that 95% of the respondents identified St. Clair River fish taste as excellent, good, or fair and that essentially, the flavour of fish and wildlife from the St. Clair River AOC is no different than that found in non-AOC areas. The official re-designation of the Added Cost to Agriculture and Industry BUI is pending BPAC approval and agreement with the four Agencies and the Canada Ontario Agreement Annex Implementation Committee.

Revised Delisting Criteria

Upon completion of the draft revised delisting criteria report for the St. Clair River Area of Concern (AOC) in 2010, the report was distributed to the First Nation communities of Walpole Island and Aamjiwnaang in the Spring of 2011. Consultation was conducted following First Nation protocols and comments from both communities were received by the Canadian Remedial Action Plan Implementation Committee (CRIC) in late 2011. Overall, the draft report was well-received with only two revised criteria obtaining comments for consideration: restrictions on drinking water consumption, or taste and odour problems, and loss of fish and wildlife habitat. Future steps to be conducted by CRIC include reviewing and addressing comments obtained from First Nation community members, revising the report where needed, and CRIC approval and finalization. This process is expected to be complete in early 2012.

Section 5 – Public Outreach and Education Work Plan

#5.1 RECOMMENDATION Continue to develop and implement education and communication programs to deal with significant actions for RAP implementation.

ACTION 1 Support the BPAC in their efforts to enhance local coordination of present and future public outreach projects (e.g., Photo Contests and Promotions, Advertising campaigns, News Releases, PowerPoint Presentations, Portable Display, Report Card, Fact Sheet).

STATUS *Completed and Ongoing*

Continued public consultation and outreach occurred in 2011. The RAP Coordinator made presentations to all of the municipal councils in the AOC, updating them on progress and encouraging their participation. Outreach activities were conducted with WIFN and AFN through presentations or attendance at Chief and Council meetings, community events, and open houses.

In 2011, FOSCR held their second “Celebrating the St. Clair” digital photography contest. The contest ran from July 1 to October 31, 2011 and a total of 179 images were submitted covering four categories that ranged from the human enjoyment of the St. Clair River to fall colours. The winners accepted their prizes and were recognized at a 2012 BPAC meeting held in Sarnia, Ontario.

ACTION 6 Celebrate successes and milestones via site visits for public and agency trips to implementation sites.

STATUS *Completed and Ongoing*

A successful media event was held in August 2011 to celebrate the binational re-designation of the Tainting of Fish and Wildlife Flavour BUI to “Not Impaired.” The numerous stakeholders and partners involved in the St. Clair River AOC attended along with the general public. The official announcement occurred on August 26, 2011 at the Point Edward Waterfront Park and in the US at Port Huron waterfront.



The re-designation event for the Tainting of Fish and Wildlife Flavour BUI hosted by the Co-Chairs and Vice Co-Chairs of BPAC. Pictured are Kris Lee, Canadian Co-Chair (left), Terry Burrell, Canadian Vice Co-Chair (below left), and Kris Lee with Patty Troy, U.S. Co-Chair (below right).





Bluewater Bridge photo courtesy of Dorothy Alexander, Sarnia, Ontario



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