



Lake St. Clair
Canadian Watershed Coordination Council

The Lake St. Clair Canadian Watershed Management Plan

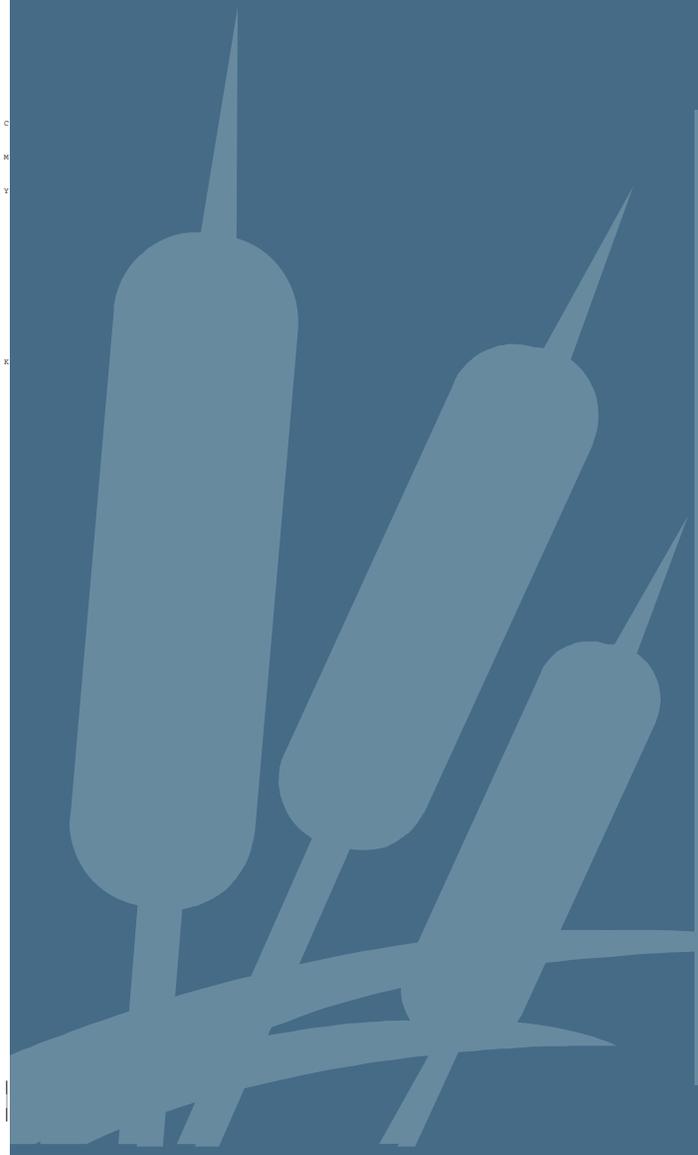
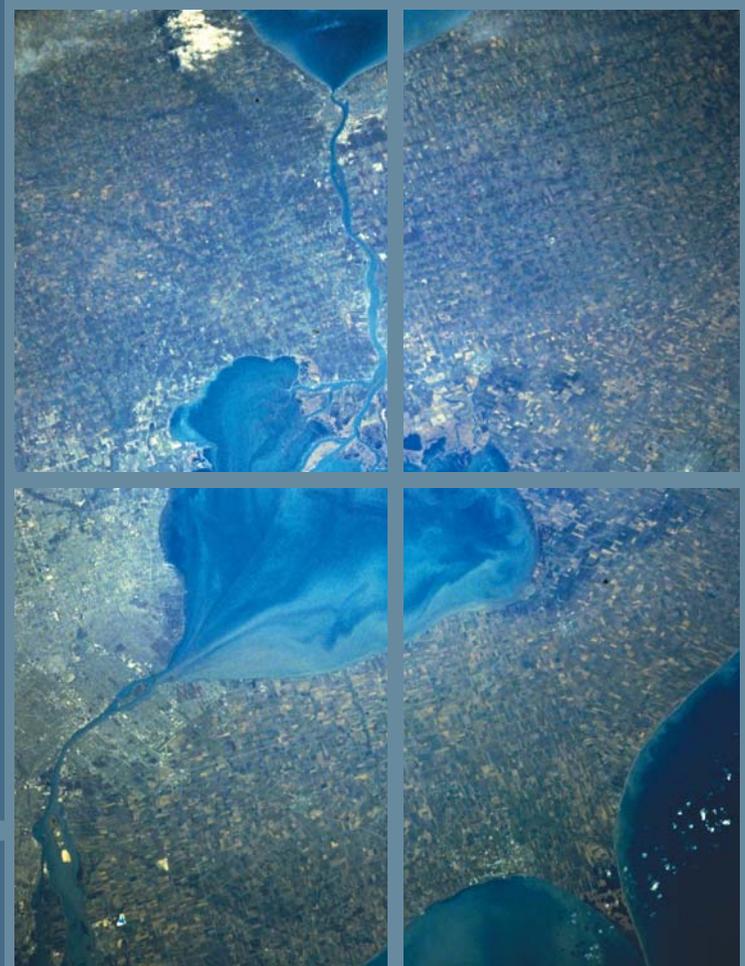


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EXECUTIVE SUMMARY

The purpose of the Canadian Lake St. Clair Management Plan is to recommend actions required to address identified ecosystem management issues affecting the sustainability of the Lake St. Clair ecosystem. The Lake St. Clair Canadian Management Plan contained herein, is the result of six years of work to:

- ◆ gather, interpret, and identify management issues (the Lake St. Clair Canadian Watershed Technical Report (2005));
- ◆ identify a binational vision, principles and goals for the Lake St. Clair basin (The St. Clair River and Lake St. Clair Comprehensive Management Plan, (2003));
- ◆ gather input from over 500 stakeholders, partners, and the public of the Lake St. Clair basin (Public and First Nations Consultation Report (2009); and
- ◆ identify ecosystem management goals to address the identified management issues (Lake St. Clair Canadian Management Plan (2009)).

Lake St. Clair, together with the St. Clair and Detroit rivers, forms the connecting channel between Lake Huron and Lake Erie. As an international boundary water, responsibilities for managing Lake St. Clair are divided among the U.S. and Canadian federal governments, the Province of Ontario, the State of Michigan, and both Canadian and U.S. local governments. Generally, management programs implemented in the Lake St. Clair watershed have been issue-specific in order to meet broader obligations under programs such as the North American Waterfowl Treaty, Species at Risk Act (Canadian) and the Great Lakes Binational Toxics Strategy. The Lake St. Clair watershed becomes one area of focus in a much larger implementation program. There is no doubt that this issue-specific approach has benefited the lake's ecosystem, but the lake lacked a comprehensive *Lake St. Clair specific* focus including a vision, goals, recommendations and actions. A Lake St. Clair specific focus will allow the responsible parties to determine if existing programs are meeting the needs of the Lake St. Clair ecosystem, identify what gaps exist and develop actions to address those gaps.

Under the Lake St. Clair management framework the Lake St. Clair Canadian Watershed Coordination Council (LSCCWCC) undertakes the coordination of ecosystem management activities within the Canadian portion of the lake and watershed.

In 2002 the LSCCWCC began developing the Lake St. Clair Canadian Watershed Technical Report initially in support of a US Army Corps of Engineers' Lake St. Clair and St. Clair River Comprehensive Management Plan. It was evident that the causes of the management issues identified in the Technical Report required management actions at the domestic, Canadian and U.S. watershed levels and there was thus a need for separate Canadian and U.S. watershed management plans. Though separate, the two management plans have a binational vision and goal for the entire Lake St. Clair basin.

This Management Plan summarizes the findings in the Technical Report (2005), addresses the management issues and feedback received during the Public and First Nations Consultation process and makes recommendations for how to improve the current state of the Lake St. Clair Canadian watershed. The Management Plan was developed with the idea of utilizing existing programs and resources already allocated to the Lake St. Clair basin to the best extent possible. Many of the recommendations are not new, but reflect support of ongoing programs and/or policies whose implementation also benefits the Lake St. Clair basin.

Land use was determined to be the single largest stressor to the Lake St. Clair ecosystem. Sustainable land use management would result in the greatest overall improvement to the Lake St. Clair ecosystem. Programs including both regulatory and voluntary actions have begun to address many problems including reducing chemical and bacterial contamination of the waters, but a great deal more work still needs to be done. Specifically, environmentally healthy land use management practices need to be better incorporated into local land use planning, environmentally sustainable land use standards need to be developed, programs that implement beneficial management practices and programs throughout the watershed need to continue and be expanded, and we need continue to encourage greater integration amongst the public sector decision makers in Lake St. Clair regarding land use.

Another major stressor, commercial and recreational boating, has also greatly impacted Lake St. Clair's natural environment. Shipping needs have resulted in hardened shorelines, dredging has permanently altered habitat and flow regimes, and shipping traffic has introduced the risk of spills and aquatic invasive species associated with ballast water being released from commercial ships. Recreational boats, including personal watercraft, are accessing seasonally environmentally sensitive areas disturbing fish and wildlife and damaging habitat, wakes are causing erosion, older two-stroke engines are emitting deleterious substances, and marina dredging is altering habitat and biodiversity. Two studies are recommended: one to more accurately define the impacts of recreational boats accessing environmentally sensitive habitats and determine what management options are available to address the problems, and the other to determine the effects of older two-stroke marine engine emissions are on the aquatic environment in Lake St. Clair specifically. Support needs to continue for programs that stop the introduction and spread of invasive aquatic species, promote environmentally friendly boating practices, and review and update Emergency Response Plans.

Implementation of recommendations to address land use and commercial and recreational boating will have corresponding beneficial effects on: point and non-point sources of pollution and human health. In addition the management plan identifies the need for: research and monitoring into the sources, effects, and remedial measures of point and non-point pollution; the elimination of regulatory exceedances of pollutants: the elimination of sources of mercury and PCBs: an overall reduction in atmospheric emissions causing climate change: source water protection: research technologies to

remove emerging pollutants from treated water: and the need to encourage conservation measures.

Principle threats to habitat and biodiversity include alterations to lake hydrology and sediment movement processes, loss of riparian buffers, habitat degradation, wildlife disturbance during migration and breeding seasons, increases in invasive species, the risk of nutrient, chemical and fuel spills, and increases in marina and land use development. Implementation of recommendations to address land use management, and commercial and recreational boating will result in the greatest improvement to habitat and biodiversity. In addition, the Management Plan recommends: plans should be developed and implemented that address natural function (e.g. natural heritage strategies, fish habitat management plans, shoreline management plans); encourage the completion and implementation of species at risk recovery strategies and action plans; track changes in quantity of habitat within the basin; and stop the introduction and spread of invasive species.

Monitoring programs and scientific studies cover an extremely wide range of parameters. They are established to collect and analyze data which in turn develops policy, legislation and tracks environmental changes. More specifically, this information can be used to protect human health, determine ecosystem health, and evaluate the impacts of management decisions on the environment. Data management is often difficult because of varying data collection standards and management systems across organizations, and limited access to data by selected organizations. In addition to the specific monitoring and scientific studies already mentioned, the Management Plan recommends a coordinated approach to monitoring, scientific studies and data management; and that the results be reported regularly to stakeholders.

Common to all aspects of the Management Plan is the need for a good communication and outreach program that: informs and educates stakeholders and decision-makers about the environmental issues facing Lake St. Clair; promotes sound environmentally sustainable practices to address these issues; regularly reports on progress being made to implement the Management Plan; and provides a forum for discussion.

Another important requirement for the success of any management plan is for the governments responsible for managing the Lake St Clair basin to continue to strive toward greater integration, awareness, and communication within and across governments regarding the decisions affecting Lake St. Clair. There is a strong need for consistent programming and sustainable funding to support beneficial management programs over the long-term (10-25 yrs) and a balanced approach between voluntary programs and enforcement of regulations.

Following the release of the Management Plan, a 5-year work plan to accompany the Management Plan will be developed with the first one covering 2009-2014. The Work Plan will identify specific actions and mechanisms by which the Management Plan will be implemented and identify key partners for each action. A key goal for the Council will be to identify priorities for the implementation of actions in the Lake St. Clair

watershed and to identify where funding is needed. Where applicable, the Council will identify where current funding for programs is deficient and identify the gaps where new actions need to be implemented.

INTRODUCTION

Lake St. Clair forms part of the international boundary water between Canada and the United States. Its management is complex with responsibilities lying with both federal governments, the Province of Ontario, the State of Michigan, First Nations, and local governments. The efforts of many government programs over the last 30 years have improved the environmental health of Lake St. Clair and its adjacent watersheds. However, management programs typically have focused on specific pollution sources and habitat conservation issues, rather than the entire Lake St. Clair ecosystem. In contrast, this management plan focuses on Lake St. Clair and its adjacent lands as a whole rather than a sum of its parts.

Prior to writing the Canadian watershed management plan for Lake St. Clair, hereafter referred to as the Management Plan a review of existing scientific information was completed to provide an assessment of the ecosystem and the identification of management issues. This work was published as the Lake St. Clair Canadian Watershed Technical Report (2005). The Management Plan addresses the issues identified in the Technical Report and makes recommendations to address each of those management issues. Following the release of the Management Plan, efforts will begin to develop an implementation strategy for the plan.

The Management Plan can be read as a stand alone document that outlines for the reader what needs to be done to remediate Lake St. Clair; it does not provide any background information or identification of mechanisms to implement these recommendations. This is because the plan was designed to be read in conjunction with the Lake St. Clair Canadian Watershed Technical Report and the implementation strategy. This approach allows each report to be released upon completion rather than waiting for all three reports to be finished then released, which would have taken many years. For example, the Technical Report (released in 2005) has been well received and is being used by resource managers and researchers in their work. This approach also allows for periodic updates to be completed of the Technical Report, Management Plan and Implementation Strategy as required without needing to update all the information

OVERVIEW OF THE LAKE ST. CLAIR CANADIAN WATERSHED

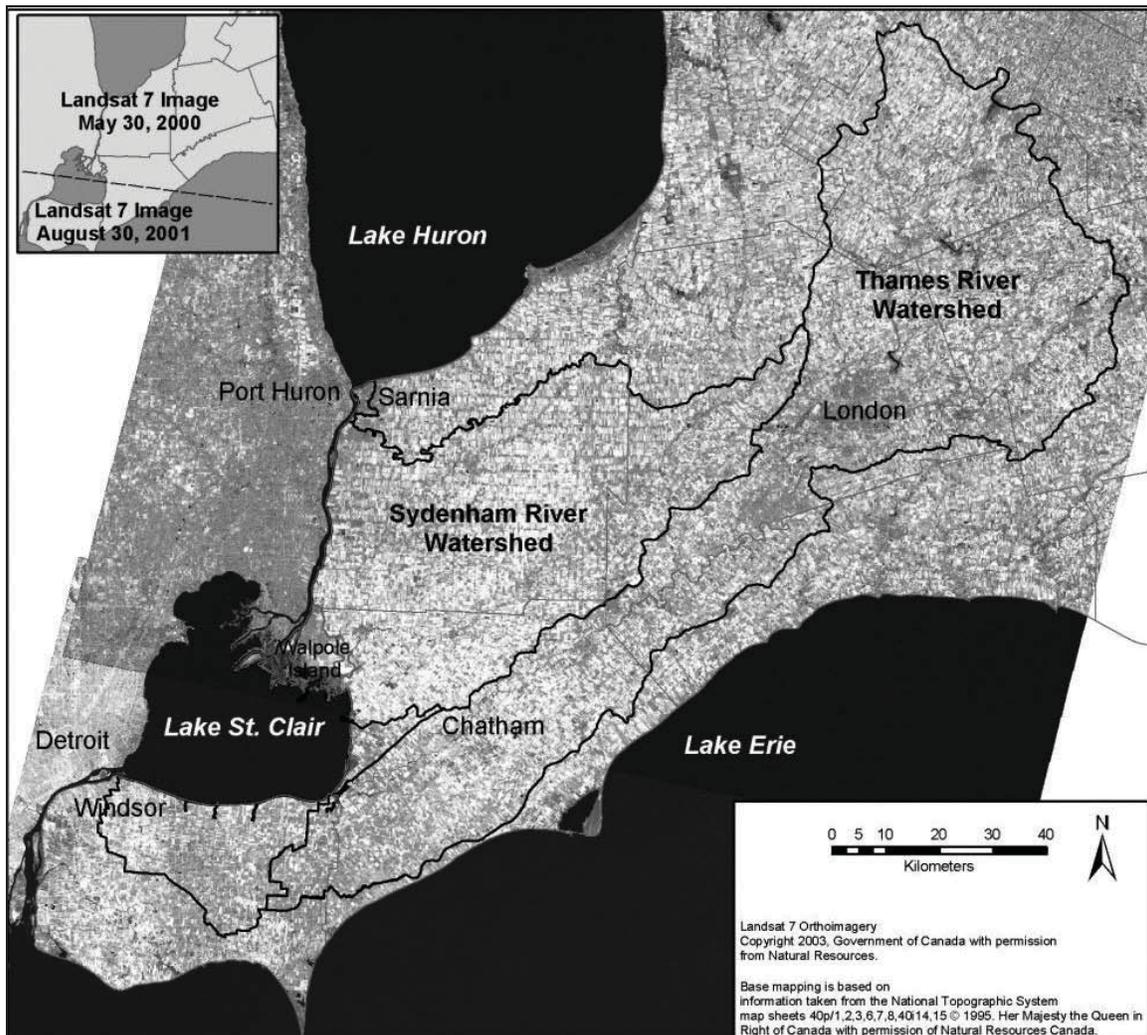


Figure 1. Satellite photo of St. Clair River and the Lake St. Clair Canadian watershed
(Source: Landsat 7 Orthoimagery and St. Clair Region Conservation Authority)

Lake St. Clair, together with the St. Clair and Detroit rivers, provides the connecting channel between Lake Huron and Lake Erie (Figure 1). This corridor is part of the international boundary between Canada and the United States, and serves as an integral link in the major shipping channel that connects the Great Lakes.

Roughly 98% of the water entering Lake St. Clair originates in the upper Great Lakes, which have a combined drainage basin of 146,600 km². The St. Clair River has a short retention time (approximately 21 hours) as it drains into Lake St. Clair with an annual average discharge of approximately 5,000 m³/s. The flow is relatively consistent and fluctuates slightly with the water level in Lake Huron. The river is predominately a straight channel with hardened shoreline structures such as riprap and retaining walls

lining much of the shoreline, narrow beaches, and vegetated cliffs. Both sides of the river have highly urbanized portions.

The flow from the St. Clair River into the lake is divided by the St. Clair delta into three main channels (North Channel, South Channel and Chenal Ecarte) in the upper portion of the delta and a number of secondary channels in the lower portion of the delta (Figure 2). The opening of the South Channel Cutoff in 1962, to improve commercial shipping, decreased the flow in the North Channel and the proportion of river water entering the lake through Anchor Bay. The eastern (Canadian) part of the lake receives a relatively small amount (8%) of St. Clair River inflow via the Bassett Channel and Chenal Ecarte (Environment Canada et al. 1994).

Lake St. Clair has an area of 1,115 km² (430 mi²) with a shoreline length of 272 km (169 mi) not including the delta shoreline area. It has a mean depth of only 3.7 m (12.1 ft) with a maximum natural depth of 6.4 m (21 ft). The Detroit River is the only natural outlet from the lake. To accommodate commercial shipping, an 8.3 m (27.2 ft) navigational channel was dredged in a northeast-southwest direction from the St. Clair River to the Detroit River. Almost two-thirds of the surface area of Lake St. Clair and 77% of the drainage basin area (total area 13 500 km²) is in Ontario (Bolsenga and Ladewski 1993; Leach 1991).

The Lake St. Clair Canadian shoreline includes the eastern and southern shorelines supporting approximately 750,000 residents (Statistics Canada 2001a). The eastern shoreline of the lake is low lying and characterized by agricultural and recreational land uses with dyked and undyked wetlands providing important wildlife habitat. The southern shoreline is largely agricultural with some urban development. The Thames and Sydenham rivers together with several smaller tributaries drain a large area of southwestern Ontario into the southeastern portion of the lake (Figure 1). The land drained by these tributaries is characterized as one of the most productive agricultural areas in Canada.

The watershed area for the Canadian tributaries draining into Lake St. Clair is approximately 10,000 km² (1,000,000 hectares). The two largest tributaries are the Thames River (582,700 ha) and the Sydenham River (272,400 ha). The Thames River discharges into the southeast corner of the lake and the Sydenham River discharges into the Chenal Ecarte. Along the eastern shore, Rankin Creek and several agricultural drains discharge from a small triangle of land located between the Thames and Sydenham rivers. Along the south shore, the Ruscom, Belle and Puce rivers, together with small creeks, drain approximately 66,000 ha of Essex County north to the lake (Figure 2).

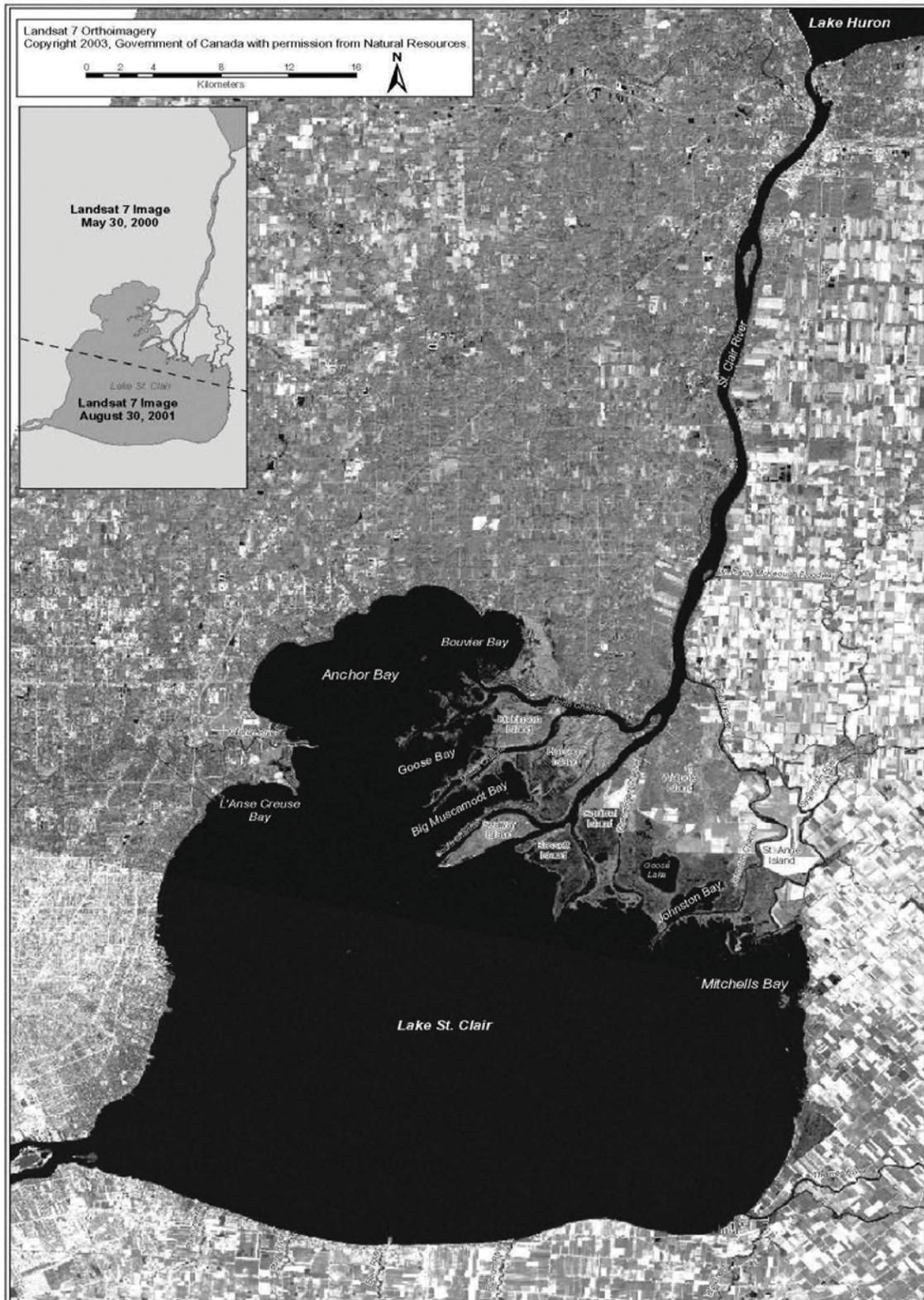


Figure 2. Satellite photo of Lake St. Clair and the St. Clair River.
(Source: Landsat 7 Orthoimagery and St. Clair Region Conservation Authority)

BINATIONAL MANAGEMENT OF LAKE ST. CLAIR

Under the *Great Lakes Water Quality Agreement*, the Four Agency Management Committee established a framework for binational coordination of environmental issues on Lake St. Clair (U.S. Environmental Protection Agency et al. 2004).

The purpose of this management framework was to provide a platform for better coordination of Lake St. Clair issues and efforts so that decision makers can more efficiently and effectively focus their efforts and resources. This framework also enabled participants to have a greater opportunity for consistent interaction and representation of issues at all levels of government.

Five key elements form the basis of the management framework: a Binational Partnership Agreement (Four Agency Letter of Commitment), a binational Four Agency Management Committee, a Binational Working Group, separate local Canadian and U.S. Watershed Coordinating Councils, and a Biennial State of Lake St. Clair Conference.

Binational Partnership Agreement (Four Agency Letter of Commitment)

The basis for the Binational Partnership Agreement is a commitment by the Four Agency Management Committee to binational management roles and responsibilities for the shared binational Areas of Concern (St. Marys River, Detroit River and St. Clair River). The Agreement, in the form of a Four Agency Letter of Commitment, was signed in 1998.

The need for a focus on Lake St. Clair to coordinate and communicate the various on-going programs and to identify areas where work is still needed was recognized by the Four Agency Management Committee and was included under the Four Agency Letter of Commitment in 2000. Under this commitment, a framework for managing Lake St. Clair was completed, a binational monitoring committee was established, and two binational monitoring inventories (Environment Canada et al. 2000, 2002) were published.

Four Agency Management Committee

The Four Agency Management Committee is an existing structure mandated to lead efforts under the Four Agency Letter of Commitment and the *Great Lakes Water Quality Agreement* for the St. Marys, Detroit and St. Clair rivers, and Lake St. Clair. The Four Agency Management Committee members are directors from Environment Canada, U.S. Environmental Protection Agency, Ontario Ministry of the Environment and Michigan Department of Environmental Quality.

Binational Working Group

The Binational Working Group reports to the Four Agency Management Committee and is comprised of staff from Canadian and U.S. federal and provincial/state agencies with responsibility for the resources and/or natural environment of the Lake St. Clair watershed. The Binational Working Group serves as the binational link between the Canadian and U.S. efforts and works directly in support of both regional and local efforts.

Local Canadian and U.S. Watershed Coordinating Councils

The Watershed Coordination Councils undertake the coordination of activities within their respective Canadian and U.S. watersheds that support the management of the Lake St. Clair ecosystem. The Lake St. Clair Canadian Coordination Council is comprised with representatives from the following organizations: Environment Canada (co-chair), Fisheries and Oceans Canada, Walpole Island First Nation, Ontario Ministry of Environment (co-chair), Ontario Ministry of Natural Resources, Ontario Ministry of Agriculture, Food and Rural Affairs, St. Clair Region Conservation Authority, Upper Thames River Conservation Authority, Lower Thames Valley Conservation Authority and the Essex Region Conservation Authority.

Biennial State of Lake St. Clair Conference

A binational conference, held every two years, provides the opportunity to distribute information to the public regarding activities in the Lake St. Clair watershed within the previous two years, and provides a forum for public input on activities anticipated for the next two years.

THE NEED FOR A MANAGEMENT PLAN

Lake St. Clair forms part of the international boundary water between Canada and the United States. Its management is complex with responsibilities lying with both federal governments, the Province of Ontario, the State of Michigan and local governments. The efforts of many government programs over the last 30 years have improved the health of the Lake St. Clair watershed. However, the focus of these programs has been on specific areas of pollution or habitat rather than the entire Lake St. Clair ecosystem.

In 1987, the *Great Lakes Water Quality Agreement (GLWQA)* was amended to direct the governments of Canada and the United States to develop Remedial Action Plans (RAPs) for designated Areas of Concern, defined as areas where localized pollution was deemed to impair the beneficial uses of the ecosystem. Within the Lake St. Clair watershed, RAPs were developed for the St. Clair River and the Clinton River. Environmental agencies recognized that efforts to correct specific pollution issues in the St. Clair and Clinton rivers would benefit Lake St. Clair (Environment Canada et al. 1988a). Significant progress has been made in these Areas of Concern. For example, the St. Clair River RAP 2000 Progress Report (Environment Canada et al., 2005) documents a continuing downward trend in contamination.

The *GLWQA* was also amended to include the requirement for Lakewide Management Plans (LaMPs) for each Great Lake. The Lake Erie LaMP recognizes the St. Clair River-Detroit River corridor (including Lake St. Clair) as an important tributary to Lake Erie (Environment Canada and U.S. Environmental Protection Agency 2000).

In 1999, the United States Congress authorized the development of a Lake St. Clair and St. Clair River Comprehensive Management Plan as part of the U.S. *Water Resources Development Act*. The management plan was to be written for a general public audience. The United States Army Corps of Engineers (U.S. ACE) was designated as the lead agency and began work in 2001. While this plan is a U.S. ACE document, the need for binational participation was recognized early on in the process.

Using the Four Agency Letter of Commitment as a conduit into the Canadian agencies, the Lake St. Clair Canadian Watershed Coordination Council, led by Environment Canada, contributed summarized technical information to the U.S. ACE for inclusion in the Lake St. Clair and St. Clair River Comprehensive Management Plan. However, it was decided that the Lake St. Clair Canadian Watershed Coordination Council would not contribute recommendations for the Canadian watershed until a detailed technical report for the Canadian watershed was drafted and recommendations were developed in consultation with Canadian stakeholders.

THE NEED FOR A CANADIAN WATERSHED MANAGEMENT PLAN

In 2002, Environment Canada established a technical working group, the Lake St. Clair Canadian Watershed Coordination Council, comprised of agencies with a responsibility for the environmental health of the Canadian portion of the Lake St. Clair watershed. The Lake St. Clair Canadian Watershed Coordination Council was tasked with gathering and interpreting the Canadian information to be included into the U.S. ACE Lake St. Clair and St. Clair River Comprehensive Management Plan.

Quite early on, the Lake St. Clair Canadian Watershed Coordination Council recognized that although U.S. actions impact the Canadian Lake St. Clair ecosystem (and vice versa), Canadians only have the ability to manage actions within the Canadian watershed. In order to determine what remedial or program actions were needed, the Lake St. Clair Canadian Watershed Coordination Council first needed to document the current state of the Canadian watershed and identify ongoing Canadian environmental programs. Only after the current state of the watershed was described could management issues be identified and recommendations developed.

The Lake St. Clair Canadian Watershed Coordination Council approach to developing recommendations required the completion of the technical report followed by stakeholder consultation process to obtain input into the development of the Canadian watershed recommendations. The consultation with stakeholders and the development of the recommendations was completed in December 2006. Subsequently, the Lake St. Clair Canadian Watershed Management Plan was developed and complements efforts in the United States portion of the Lake St. Clair watershed.

THE CANADIAN PLANNING APPROACH FOR THE LAKE ST. CLAIR WATERSHED

The approach for the Canadian watershed management plan involves three steps:

1. determine the state of the ecosystem in the Canadian portion of the Lake St. Clair watershed and identify management issues;
2. complete a comprehensive consultation of responsible government agencies, First Nations, landowners, and interested non-government organizations to solicit comments on the management issues identified and on possible management recommendations, and;
3. develop a Canadian watershed management plan including an implementation plan.

The Lake St. Clair Canadian Watershed Technical Report: An Examination of Current Conditions satisfies step one of this planning approach. It provides detailed technical information on the environmental conditions within the Lake St. Clair Canadian watershed, describes some of the environmental programs being implemented, and identifies management issues. This report is presented as Background, Basin Characteristics, Stressors on the Environment, Effects of Stressors on the Environment, and Monitoring the Environment. Management issues are presented at the end of each section.

The Lake St. Clair Canadian Watershed Technical Report contains information readily available to the Lake St. Clair Canadian Watershed Coordination Council, summarizing the best available information. It was recognized that more information existed for some topics or geographic regions than for others. The Lake St. Clair Canadian Watershed Technical Report does not, at this time, contain information regarding the current conditions within the significant land holdings of Walpole Island First Nation. A data sharing agreement between Environment Canada – Ontario Region and the Walpole Island Heritage Centre, on behalf of Walpole Island First Nation, will facilitate the inclusion of this information at a later date.

This approach focused on the needs of the Canadian Lake St. Clair watershed. The Lake St. Clair Canadian Watershed Coordination Council recognized that communication and partnerships with the U.S. Lake St. Clair Watershed Coordination Council will be needed to ensure that the entire Lake St. Clair ecosystem is managed cooperatively.

GUIDING PRINCIPLES

Canadian Vision

We envision a healthy Lake St. Clair watershed in which government, associations, businesses, educational institutions, and individuals work together to protect, sustain and enhance the natural environment while providing opportunities for people to thrive and prosper.

Goals (of the Canadian Management Plan)

- *Integrate Canadian tributary watershed programs and Great Lakes basin-wide initiatives.*
- *Facilitate cooperation and collaboration towards environmental improvements and provide a forum to address issues and share information specifically in the context of Canadian Lake St. Clair watershed.*
- *Support existing resource allocations, and encourage the allocation of new resources to address issues on local, national, and international scales*

Objectives (of the Canadian Management Plan)

- *To identify management issues and develop recommendations pertinent to the Canadian portion of the watershed.*
- *To provide a basis for the development of detailed implementation strategies and action plans*

MANAGEMENT PLAN

Upon completion of the Lake St. Clair Canadian Watershed Technical Report, the Canadian Watershed Coordination Council initiated a broad stakeholder consultation process that encompassed local stakeholders, local government, First Nation communities, and environmental experts. The Council proposed recommendations based on the management issues found in the technical report. Key findings of the technical report, the management issues and proposed recommendations together formed the content of the consultation materials. From March to November 2005, over 500 people were consulted directly through presentations at public meetings, conferences, stakeholder specific meetings, and First Nation community meetings. Several articles appeared in the local media and the information was also available through the internet where comments could be submitted in writing. Specific information regarding the consultation process can be found in the Public and First Nations Consultation Report (Environment Canada et al., to be released with Management Plan).

An important goal of this Management Plan is to expand existing staff and fiscal allocations. Many of the recommendations presented here are not new, but reflect support for ongoing programs and/or policies whose implementation also benefits the Lake St. Clair watershed. By including recommendations that encompass programs/policies already being implemented, the Council hoped to show that the implementation of these programs/policies will also address the management issues identified through the Lake St. Clair Canadian Watershed Technical Report, even if they were not originally designed or imagined to do so. It is the hope of the Council that by demonstrating these added benefits support for the continuation of these programs will be increased.

The recommendations are organized using the same categories as the technical report (Land Use Management, Commercial Navigation and Recreational Boating, Sources of Pollution, Human Health, Habitat and Biodiversity, Fishing and Hunting, Monitoring, Scientific Studies and Data Management) with the addition of a Governance category for those recommendations that relate to coordination, communication, government funding, and enforcement of regulations. This arbitrary approach was chosen as it provides a continuum from the technical report to the management plan. Each category provides a summary of the key findings of the technical report, lists the management issues, and lists the management recommendations to address those management issues. Some of the management recommendations apply to more than one category and some are common to all categories. This reflects the inter-connectedness of both the Lake St. Clair watershed and our human impact on it; the implementation of one recommendation can affect many different issues within the Lake St. Clair system. Those recommendations common to all categories are listed together. Finally, a list of all the management recommendations is provided at the end of this section.

Land Use Management Summary

Land use is the single largest stressor to the Lake St. Clair ecosystem. The appropriate

management of this stressor will result in the greatest overall improvement to the Lake St. Clair ecosystem. Over the last 40 years, government regulations, together with voluntary efforts, have addressed the worst pollution problems, including reductions to the amount of chemical and bacterial contaminants discharged into the local watercourses.

Urban, industrial and agricultural development have altered the natural hydrologic cycle, fragmented forests and wetlands into isolated components, degraded aquatic communities and reduced the habitat of floral and faunal populations. These pressures have created the challenge of protecting, sustaining and enhancing the natural environment while providing opportunities for people to thrive and prosper.

Agricultural and rural land use dominates the landscape (75%) of southwestern Ontario and is expected to continue to be the major land use. The historical and ongoing removal of natural or permanent vegetative cover (buffers) along tributaries, shorelines, drains and ditches threatens biodiversity. The extensive use of tile drainage for agriculture results in field run-off flowing directly into the tributaries thus altering the hydraulic cycle and removing the benefit of the water being filtered by buffers.

Residential and industrial land uses in the Lake St. Clair watershed comprise approximately 13% of the total land use. Residential growth has contributed to the destruction of natural habitat, increased amounts of impervious surfaces, increased volumes of storm water runoff, and increased discharges of sediments and other contaminants (e.g., oil, salt and fertilizers). Sewage treatment bypasses and combined sewer overflows can be discharged into local watercourses resulting in bacterial contamination, increased oxygen demand, and elevated nutrient levels.

Numerous changes are expected to occur as climate change impacts current land use management. There is expected to be increased pressure for water extraction and increased erosion and alteration in runoff patterns that may prevent flushing of nutrients, pesticides and other toxins. Despite some positive changes for agriculture, such as a longer growing season and warmer temperatures, declining soil moisture, thin soils and severe rainstorms might outweigh any benefits to local farms. In urban areas, municipalities may be forced to upgrade water related infrastructure (e.g., sewers) to prevent property damage associated with frequent extreme rainfalls and flooding, and ensure public safety. Marinas and industries may have increased costs resulting from lower water levels, including costs for dredging, adjusting docks, extensions to water intake pipes, and alterations to other infrastructure.

Land Use Management Issues

- Detrimental impacts to water quality and quantity resulting from land use (e.g., reduced natural cover, increased imperviousness) have increased sediment, nutrient, bacterial and chemical inputs.
- Challenges exist for municipal governments to provide a balance among a healthy environment, a healthy lifestyle, and a healthy economy.

- Impacts of climate change on land use, human health and the ecosystem require ongoing research and monitoring, and adaptive and preventative management strategies.

Land Use Management Recommendations

1. Support the implementation of agricultural and rural, industrial and urban beneficial management practices and programs throughout the watershed to enhance water quality, water quantity, and habitat sustainability.
2. Effectively engage the Province of Ontario and lower and upper tier municipalities to develop and promote environmentally healthy land use management planning and development standards.
3. Encourage greater integration amongst the various public sector participants whose decisions affect Lake St. Clair.
4. Develop adaptive management strategies to address the effects of climate change.

Commercial Navigation and Recreational Boating Summary

The navigational channel has impacted the natural environment of Lake St. Clair. Shorelines have been hardened in nearshore areas removing or reducing habitat, dredging has permanently altered habitat and flow regimes, and shipping traffic has introduced the risk of spills and aquatic invasive species associated with ballast water being released from commercial ships.

There is a wide range of motorized and non-motorized recreational watercraft in use on Lake St. Clair and they are important to the local economy. However, the large numbers of recreational boats plying Lake St. Clair has not been without environmental impact. Boats accessing environmentally sensitive areas disturb wildlife and damage habitat, boat wakes erode shorelines, two-stroke engines release pollutants into the water, and dredging to accommodate marina access permanently alters the habitat and biodiversity of the system. These impacts can be significantly reduced when boaters use more environmentally friendly boating practices while on the water.

Commercial Navigation

Historical shoreline hardening to protect against ship or boat wakes and flooding has resulted in restrictions to the necessary landward movement of wetland communities during high water periods. This reduces the size and diversity of wetland communities and changes the way water interacts with the shoreline resulting in changes to coastal currents patterns, sediment transportation, and deposition within the lake.

Dredging is usually associated with the removal of bottom sediments to maintain and improve shipping channels. Navigational dredging has altered the St. Clair River delta area and Lake St. Clair by replacing shoal habitat with channel habitat and by altering flow regimes.

Shipping traffic associated with the presence of the large petrochemical industry upstream of the lake represents an ongoing risk to the ecology of the lake when petroleum products are loaded or unloaded from ships. There is also a risk if ships are

damaged during transit and petroleum products are released into the ecosystem. Any proposed expansion to the current seaway system would provide significantly larger vessels with access to the Great Lakes. While not necessarily increasing the risk of environmental disasters (i.e., spills), the magnitude of disasters could change.

At least one third of the aquatic invasive species that have entered the Great Lakes did so in the ballast water discharged by ocean-going ships. Currently, there is no known treatment technology that is both effective and practical or enforceable to deal with aquatic organisms in ballast water or in ballast sediment. Other methods of invasion include hull fouling, intentional and accidental transfer or release of animals into the watershed, as well as the spread of invasive species from connecting waters.

A number of invasive species have arrived and spread throughout Lake St. Clair, the St. Clair River and the Detroit River. Invasive species have been found in the Lake St. Clair watershed periodically for decades. Some invasive species have profoundly disrupted the ecology (e.g., zebra mussels or phragmites) by causing food web changes and extirpating native species from their preferred habitats (Nalepa et al. 1996).

Recreational Boating

There are 13 marinas located along the Canadian shores of the St. Clair River and Lake St. Clair with more than 2,300 boat slips and 10 boat launches. Most of the boat slips at the marinas are rented on a seasonal basis. By comparison, along the U.S. shoreline there are 211 marinas found in three U.S. counties and more than 200,000 boats registered in the four U.S. counties adjacent to or near Lake St. Clair (U.S. Army Corps of Engineers 2005). Marinas, boat launch facilities, and dredged channels constructed to accommodate recreational boating have contributed to near-shore alterations through changes to the sediment erosion and depositional areas of the lake, altered wave action and current direction impacting the habitat that fish and wildlife depend upon.

The popularity of jet-propelled personal watercraft that can operate in extremely shallow water presents several potential problems as increased wave action can uproot aquatic vegetation, bottom sediments can be re-suspended leading to decreases in water quality, and increased traffic and noise can reduce waterfowl nesting success and the disrupt waterfowl in traditional feeding and resting areas.

The two-stroke marine engines manufactured in the United States pre-1998 or currently manufactured in Canada, can vent between 30% and 50% of their fuel through the combustion chamber unburned and into the water, along with much of the oil that is mixed with the fuel. The two-stroke engine can also emit 15 times more unburned hydrocarbons than the four-stroke engine, and nearly 125 times more than a small van (Environment Canada 2000).

Commercial Navigation and Recreational Boating Management Issues

- Efforts to restrict or prevent the arrival and spread of invasive species into the Great Lakes via hull fouling or the de-ballasting of water and sediment have been limited.

- Shoreline hardening to accommodate commercial navigation and marina development, as well as to protect exposed shorelines against wave-erosion, have resulted in significant reductions in coastal habitat and altered current and sediment deposition patterns.
- The shipping traffic associated with the presence of the large petrochemical industry upstream of the lake represents an ongoing risk to ecology of the lake.
- Lower water levels, caused by climate change, will result in an increased need for dredging at marinas and docks.
- The potential expansion of the seaway system may alter existing habitat by increasing habitat losses, turbulence and wave disturbance, altering flow patterns, and disrupting the distribution of wildlife and plants within the lake, nearshore or adjacent areas.
- Knowledge of the effects of BTEX (benzene, toluene, ethylbenzene, xylenes) emissions from two-stroke marine engines on the environment is limited.
- The increased seasonal boating pressures and the popularity of jet-propelled personal watercraft that can operate in very shallow waters have the potential to increase wave action, uproot aquatic vegetation, and re-suspend bottom sediments, leading to habitat degradation at the shoreline and in nearshore areas.

Commercial Navigation and Recreational Boating Management Recommendations

1. Determine the extent of the impacts of increased seasonal boating pressures and jet-propelled personal watercraft in order to develop appropriate management actions.
2. Communicate and educate stakeholders about environmentally friendly boating practices, and the effects of older two-stroke engines on the environment.
3. Stop the spread of established invasive species and prevent future introductions of other invasive species.
4. Continue to regularly review and update Emergency Response Plans in accordance with regulations.
5. Determine the effects of contaminants on the environment in order to develop appropriate management actions.

Sources of Pollution Summary

Contaminants originating from point, non-point, and atmospheric discharges originating from municipal, industrial, rural and agricultural sources of pollution accumulate in the sediments and water of Lake St. Clair. Sources can be local, regional, or global. They can be current and/or historic discharges. Some contaminants may bioaccumulate through the food chain impacting the health of fish and wildlife communities and causing advisories

for human consumption. Currently there are advisories on the consumption of some fish species in Lake St. Clair due to mercury and PCB contamination.

Point Sources

Wastewater pollution control plants (WPCPs) discharge contaminants including suspended solids, total phosphorus, and traces of metals, organic pollutants, and possibly pharmaceuticals. More than thirty municipal WPCPs are located along the tributaries entering Lake St. Clair while only two municipal WPCPs discharge directly into the lake. All of the WPCPs provide secondary or tertiary treatment of the sewage.

Combined sewers carry both sanitary and storm water. During storm events, if the flow is large enough, the two portions will mix causing sewage to be released into local watercourses.

On the Canadian side of Lake St. Clair most industrial sources of contaminants input to the St. Clair River. The resulting large industrial operations, collectively known as Chemical Valley, were historically the sources of many of the environmental problems that led to the International Joint Commission identifying the St. Clair River as an Area of Concern. Increased government regulation and voluntary efforts throughout the 1970s and 1980s resulted in reductions in contaminant discharges.

Improvements in operations and in compliance have significantly reduced the number of spills from Ontario point sources however, spills still occur.

Remediation of highly contaminated sediment is an important step towards restoring the St. Clair-Detroit River corridor. The St. Clair River RAP program is focusing on removing contaminated sediments in the upper reaches of the St. Clair River. Dredging is being done to remove sediments along the Canadian shoreline that were contaminated by historical point source loadings. While this shoreline contamination is not in the shipping channel, the possibility of contaminated sediment being disturbed by the wake from commercial vessels and recreational boats was identified as an issue of concern in the St. Clair River RAP.

Non-point Sources

The two largest Canadian sources of non-point loadings to Lake St. Clair are the Sydenham River and Thames River watersheds.

The heavy clay soils present in much of the watershed represents a particular concern for the proper design and construction of private wastewater treatment systems. Additional problems such as increased water usage where piped municipal water is available, the lack of proper maintenance, and aging systems can contribute to septic system failure. Faulty systems can result in elevated levels of bacteria and nutrients in local waterways potentially leading to beach closures, nuisance algae, and stress to aquatic organisms.

Improper agricultural practices have been found to be sources of bacterial and nutrient pollution (e.g., milkhouse wash water discharges, livestock access and, run off from manure storage, pesticide and herbicide use).

Out of Basin Sources

Much of the mercury currently entering the waters of the region settles from the air or is deposited in precipitation. Mercury enters the atmosphere through the release of geologically bound mercury by both natural processes and human activities. Waste incinerators, coal-fired power plants and base metal smelting plants are the major contributors of airborne mercury.

Persistent organic pollutants (POPs) enter the environment as a result of human activity and the long-range transport of POPs occurs through a process of multiple cycles of evaporation, transport by air and condensation. The manufacturing and use of most POPs, such as PCBs, DDT, chlordane, dioxins and furans, have been banned or severely restricted in Canada for years. POPs currently entering the Canadian environment come from regional, and/or global sources.

Sources of Pollution Management Issues

- Point and non-point sources of pollution are having a detrimental impact on water and habitat quality (e.g., beach closures, sedimentation).
- Out of basin sources of pollution cannot be addressed through a watershed management plan for Lake St. Clair, but rather should be addressed through national and global plans.
- The risks of chemical and fuel spills threaten fish, wildlife and natural habitat, particularly at certain times of the year (e.g., breeding, migration).

Sources of Pollution Management Recommendations

1. Support the implementation of agricultural and rural beneficial management practices and programs throughout the watershed to enhance water quality, water quantity and habitat sustainability.
2. Support outreach and education initiatives throughout the watershed that promote sound land use management practices, environmentally friendly boating and habitat restoration/protection projects.
3. Continue to investigate the sources and effects of non-point source pollution where they are poorly understood, and monitor the impacts of remediation projects and current legislation e.g. Ontario Nutrient Management Act.
4. Develop remediation programs that address specific issues from a watershed wide perspective, and involve collaborative action by local, regional, provincial, and federal organizations.
5. Eliminate regulatory exceedences from point sources of pollutants.
6. Eliminate sources of mercury and PCBs.
7. Continue to regularly review and update Emergency Response Plans in accordance with regulations.
8. Reduce atmospheric emissions, reduce reliance on non-renewable energy sources, and adopt energy conservation measures.

Human Health Summary

As mentioned previously, the Lake St. Clair Canadian Coordination Council is comprised of natural resource management agencies with jurisdiction in the Lake St. Clair Canadian Watershed. It does not include those agencies (such as local Health Department) responsible for human health. Therefore the Council's approach to addressing human health is limited to the premise that human health issues will be addressed if the fish are edible, there are safe recreational waters and there is reliable drinking water.

Elevated concentrations of mercury and PCBs in fish have resulted in advisories being issued to restrict the consumption of fish taken from Lake St. Clair and its tributaries. Monitoring programs have shown that there have been improvements over the last thirty years but local, regional and global sources continue to contribute to the restrictions.

Beach postings and closures from elevated bacteria counts show the need to address sources of bacteria to improve and protect local recreational waters. Good water quality at Mitchell's Bay shows that safe public swimming areas do exist.

Once treated, water taken from Lake St. Clair provides a safe supply of drinking water for the public. However, nutrients and trace levels of pesticides (herbicides and insecticides) in untreated water show the need to address non-point pollution sources to protect drinking water supplies.

Human Health Management Issues

- Elevated concentrations of mercury and PCBs in fish continue to cause advisories on the consumption of fish caught in the Lake St. Clair watershed.
- Point and non-point sources of pollution are having a detrimental impact on water quality (i.e. fish consumption, beach postings, drinking water).
- Concerns with existing and emerging pollutants (e.g., pharmaceuticals).

Human Health Management Recommendations

1. Eliminate and remediate sources of mercury and PCBs.
2. Maintain high standards of treated water quality for public consumption, updating as required.
3. Protect raw water sources from point and non-point sources of pollution through voluntary compliance and enforcement of regulations.
4. Encourage water conservation measures.
5. Research treatment options and remediation techniques for emerging pollutants in treated water.
6. Continue to investigate the sources and effects of non-point source pollution where they are poorly understood, and monitor the impacts of remediation projects.
7. Communicate and educate stakeholders about drinking water issues (e.g.; "Friends of..", stakeholder forums, school programs).

Habitat and Biodiversity Summary

There are many types of habitat within Lake St. Clair watershed including open water communities, wetlands, river channel communities, abandoned river channel communities, upland forests, residual tall grass prairie, and transition zones of scrub, savanna, meadows, marshes and beaches. The availability of these many different habitats, combined with a climate moderated by the Great Lakes, results in tremendous biodiversity of native flora and fauna.

The original Lake St. Clair watershed has been altered to accommodate agricultural, municipal, industrial, commercial, recreational and shipping activities, leaving only approximately 12% of the pre-settlement watershed as natural habitat. These changes were further exacerbated by the introductions of invasive species. The result has altered hydrology, reduced habitat quality, and fragmented native species distribution and abundance in the Lake St. Clair watershed. As of May 2003, there were 81 species listed as at risk in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) found in the Canadian portion of the watershed.

The St. Clair River and Lake St. Clair provide habitat and are an important corridor for many fish species that move from Lake St. Clair, through the St. Clair and Detroit rivers and into lakes Huron and Erie. Wetlands represent the most biologically significant habitat for migratory birds in the watershed. Many bird species rely on the diversity of aquatic plants found in the lake's wetlands and open lake areas for feeding and resting during migration and breeding.

The principal threats to habitat include alterations to the lake hydrology and sediment movement processes, loss of riparian (streamside) buffers, habitat degradation, wildlife disturbance during migration and breeding seasons, increases in non-native fauna and flora, the risk of nutrient runoff, chemical and fuel spills, and increases in marina and residential/urban development. Land use management, commercial/recreational boating and invasive alien species are the main causes of these principal threats.

Warmer temperatures and reduced ice cover due to climate change may result in lowered lake levels, potentially increasing the likelihood that wetlands will be altered and water quality will decline. Aquatic plant and animal species assemblages are likely to change as habitat alters. For example, with shorter seasons and lower water levels, aquatic plants may not survive in areas where they have existed for decades. As temperatures increase, cold water fish and invertebrate species will be found less frequently, and cool water and warm water species will increase in abundance as they expand their ranges northward. Shorebirds and waterfowl will likely experience alterations in their current migration patterns because of their dependence upon local wetland habitat. Losses of habitat and changes in flood patterns may reduce the ability of birds to successfully breed and may force migratory species to move farther north to reproduce.

Habitat and Biodiversity Management Issues

- Stressors caused by on water activities (e.g. recreational boating) to the biota during sensitive periods of their life history (e.g. breeding, migration).
- Impacts of improper land use management activities on the hydrologic and/or sediment cycles are reflected in impaired quality or reduced quantity of aquatic habitats.
- Habitat loss and fragmentation associated with existing and future land uses has the potential to adversely affect fish and wildlife populations and species diversity.
- Invasive species have, and are expected to continue to, affect the ecology of Lake St. Clair and the diversity of species that live in and around it.

Habitat and Biodiversity Management Recommendations

1. Determine the extent of the impacts of increased seasonal boating pressures and jet-propelled personal watercraft in order to develop appropriate management actions.
2. Support outreach and education initiatives throughout the watershed that promote sound land use management practices, environmentally friendly boating and habitat restoration/protection projects.
3. Develop and implement plans addressing natural function e.g., natural heritage strategies, fish habitat management plans, shoreline management plans.
4. Encourage the timely completion and implementation of Recovery Strategies for Lake St. Clair's watershed species at risk.
5. Track the extent of habitat alterations and species composition at a Lake and tributary watershed scale.
6. Stop the spread of established invasive species and prevent future introductions of other invasive species.

Fishing and Hunting Summary

Fishing and hunting occurs in the watershed. A First Nation traditional fishery exists in Lake St. Clair, on the Thames River and the St. Clair River and several families exercise their right to harvest fish for subsistence. There is a limited commercial fishery that no longer represents an important stressor on Lake St. Clair. A substantial recreational fishery is world renowned for species such as muskellunge and smallmouth bass.

Lake St. Clair is the most important area in southern Ontario for migrating waterfowl, and has a long history as one of the premier hunting areas in the province where mallards, canvasbacks, and scaup are harvested. Turkey, pheasant, and mammals, such as deer and fox, are hunted throughout the watershed. Furbearers, such as muskrat and raccoon, are trapped in the watershed and at current harvest levels do not put the populations at risk.

Renewable natural resources, including fish, waterfowl and mammals, are currently managed in the Lake St. Clair watershed to provide sustainable fishing and hunting opportunities for current and future generations. Continued appropriate management actions and informed decision making will ensure that game species are not over harvested and that they do not over populate limited habitat or food resources.

Fishing and Hunting Management Issues

- Declining waterfowl use of some traditional feeding and resting areas has been linked to increased fall recreational boating and fishing activities.
- Current levels of fishing and hunting are not detrimentally impacting on the fish and wildlife communities that reside in Lake St. Clair, however, spring and early summer fishing activity may harm populations of smallmouth bass if reproduction is interrupted.

Fishing and Hunting Management Recommendations

1. Continue to provide sustainable fisheries, wildlife, and waterfowl resources within the Lake and watershed.
2. Support outreach and education initiatives throughout the watershed that promote environmentally friendly boating and habitat restoration/protection projects. Determine the extent of the impacts of increased seasonal boating pressures and jet-propelled personal watercraft in order to develop appropriate management actions.
3. Stop the spread of established invasive species and prevent future introductions of other invasive species.

Monitoring, Scientific Studies and Data Management Summary

There are large amounts of data and information being collected by various groups however, programs were not always efficiently coordinated, nor were data easily accessible. Programs include the Monitoring Upper Great Lakes Channels Study (2000 and 2002), the Provincial Water Quality Monitoring Network (1960s to present), and the current online monitoring inventory conducted by the Binational Executive Committee (2001 to present).

In general, monitoring programs and scientific studies cover an extremely wide range of parameters often including emerging issues such as chemical pollutants. They are established to collect and analyze data, and generate information. The data collected are used to assess the status of the ecosystem and the success (or failure) of corrective actions, determine the level of control of the treatment processes, and determine the compliance with the law. This information is needed to develop policy and legislation to address impacts. Specifically this information can be used to protect human health, determine ecosystem health, evaluate the impacts of discharges to the environment, and provide important insights into changes in the ecosystem.

Agency coordination of monitoring activities reduces duplication of effort and enables more efficient use of resources. This is challenging as monitoring programs and studies are created to support specific agency programs or legislation. The data are often collected during multi-year programs that have very specific protocols, thus, data are not always transferable from one program to another.

Monitoring, Scientific Studies and Data Management Issues

- A program or policy approach to watershed research, monitoring, and reporting, is not as effective as a coordinated, ecosystem approach.

Monitoring, Scientific Studies and Data Management Recommendations

1. Develop a coordinated comprehensive program for scientific research, monitoring, and reporting.
2. Regularly report to stakeholders the progress being made implementing the Lake St. Clair Canadian Watershed Management Plan.
3. Determine the extent of the impacts of increased seasonal boating pressures and jet-propelled personal watercraft in order to develop appropriate management actions.
4. Track the source, transport and fate of contaminants on the environment in order to develop appropriate management actions.
5. Determine the effects of contaminants on the environment in order to develop appropriate management actions.
6. Continue to investigate the sources and effects of non-point source pollution where they are poorly understood, and monitor the impacts of remediation projects.
7. Research treatment options and remediation techniques for emerging issues.

Governance Management Recommendations

1. Regularly report to stakeholders the progress being made implementing the Lake St. Clair Canadian Watershed Management Plan.
2. Consistent programming and sustainable funding from government is needed to support beneficial management programs over the long-term (e.g., 10-25 years). This can in part be achieved by ensuring all implementation priorities are well developed for the next Canada-Ontario Agreement and federal Great Lakes Program cycles expected in 2010.
3. Support a balanced approach between voluntary compliance and enforcement of regulations.
4. Encourage greater integration amongst the various public sector participants whose decisions affect Lake St. Clair.
5. Continue to work with U.S. partners to ensure a coordinated binational focus on Lake St. Clair watershed management issues.

SUMMARY of MANAGEMENT RECOMMENDATIONS

Listed below are all of the Lake St. Clair Canadian Watershed Management Plan Recommendations:

1. Support the implementation of agricultural, rural, industrial and urban beneficial management practices and programs throughout the watershed to enhance water quality, water quantity, and habitat sustainability. (Land Use Management and Sources of Pollution)
2. Support outreach and education initiatives throughout the watershed that promote sound land use management practices, environmentally friendly boating and habitat restoration/protection projects. (Fishing & Hunting, Habitat & Biodiversity, and Sources of Pollution)
3. Effectively engage the Province of Ontario and lower and upper tier municipalities to develop and promote environmentally healthy land use management planning and development standards.
4. Encourage greater integration amongst the various public sector participants whose decisions affect Lake St. Clair.
5. Develop adaptive management strategies to address the effects of climate change.
6. Determine the extent of the impacts of increased seasonal boating pressures and jet-propelled personal watercraft in order to develop appropriate management actions.
7. Communicate and educate stakeholders about environmentally friendly boating practices, and the effects of older two-stroke engines on the environment.
8. Stop the spread of established invasive species and prevent future introductions of other invasive species.
9. Continue to regularly review and update Emergency Response Plans in accordance with regulations.
10. Determine the effects of contaminants on the environment in order to develop appropriate management actions.
11. Continue to investigate the sources and effects of non-point source pollution where they are poorly understood, and monitor the impacts of remediation projects and current legislation e.g. Ontario Nutrient Act.

12. Develop remediation programs that address specific issues from a watershed wide perspective, and involve collaborative action by local, regional, provincial, and federal organizations.
13. Develop detailed implementation plans addressing natural function e.g., natural heritage strategies, fish habitat management plans, shoreline management plans.
14. Eliminate inputs from point sources of pollutants.
15. Reduce atmospheric emissions, reduce reliance on non-renewable energy sources, and adopt energy conservation measures.
16. Maintain high standards of treated water quality for public consumption, updating as required.
17. Protect raw water sources from point and non-point sources of pollution through voluntary compliance and enforcement of regulations.
18. Encourage water conservation measures.
19. Research treatment options and remediation techniques for emerging issues.
20. Communicate and educate stakeholders about drinking water issues (e.g.; “Friends of.”, stakeholder forums, school programs).
21. Eliminate and remediate sources of mercury and PCBs.
22. Encourage the timely completion and implementation of Recovery Strategies for Lake St. Clair's watershed species at risk.
23. Track the extent of habitat alterations and species composition at a Lake and tributary watershed scale.
24. Continue to provide sustainable fisheries, wildlife, and waterfowl resources within the Lake and watershed.
25. Develop a coordinated comprehensive program for scientific research, monitoring, and reporting.
26. Regularly report to stakeholders the progress being made implementing the Lake St. Clair Canadian Watershed Management Plan.
27. Track the source, transport and fate of contaminants on the environment in order to develop appropriate management actions.

28. Consistent programming and sustainable funding from government is needed to support beneficial management programs over the long-term (e.g., 10-25 years).
29. Support a balanced approach between voluntary compliance and enforcement of regulations.
30. Continue to work with U.S. partners to ensure a coordinated binational focus on Lake St. Clair watershed management issues.

NEXT STEPS

Upon completion of the Management Plan, it will be sent for review and endorsement by the participating agencies of the Lake St. Clair Canadian Coordination Council. A full listing of these agencies is found on page 6 under the heading “Local Canadian and U.S. Coordination Councils”. Once endorsed, the Plan will be presented to the Four Party Managers for their information. Two of those managers (Environment Canada and Ontario Ministry of Environment) will have already endorsed the Plan as co-chairs of the Lake St. Clair Canadian Coordination Council. It is expected that the U.S. members of the Four Party Managers (U.S. Environmental Protection Agency and Michigan Department of Environmental Quality) will share this Plan with the Lake St. Clair U.S. Coordination Council.

Once endorsed, the Management Plan will be forwarded to the International Joint Commission for their information as part of Canada’s commitment under the Great Lakes Water Quality Agreement.

Upon completion of the endorsement process, the Council will begin developing an accompanying Implementation Strategy. The Implementation Strategy will identify the mechanism by which the Plan will be implemented and identify key partners for each recommendation in the Management Plan. The Implementation Strategy should be completed in Draft within one year.

In order to achieve the goals and recommendations set out in this Management Plan partnerships, communication, collaboration and coordination are going to be keystones to a successful Implementation Plan.

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