

# Lake St. Clair Coastal Habitat Assessment: with recommendations for conservation and restoration planning

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## Preface

This Assessment is one of several products that came out of a two-year cooperative effort focused on Lake St. Clair's coastal environment. Other products include maps, an integrated coastal management decision support tool and a web site that features all of this information.

The Lake St. Clair Coastal Habitat Assessment brings together the most recent data and information from the U.S. and Canada about the habitats surrounding Lake St. Clair, with a focus on natural habitats, or natural communities.

### FACT

A natural community is a distinct grouping of plants and animals that live together in a common habitat.



A natural community is a distinct grouping of plants and animals that live together in a common habitat. The habitats discussed in this document are considered natural if they are not classified as developed or agricultural lands. Although most have been altered since European settlement, they are natural in that they currently support or can be readily restored to support indigenous plant and animal populations. This assessment documents the extent, qualities and features of

Lake St. Clair coastal habitats, including some of the key species that inhabit them. It also discusses significant habitat stressors and the existing programs and policies intended to mitigate them. Data and knowledge gaps are identified to direct future research efforts. Several new tools have been developed, which incorporate the latest GIS data to identify potential conservation areas and provide guidelines and recommendations for restoration and conservation. Discussed in Section VII, these tools serve as a companion to this document, to implement additional measures necessary to conserve and restore important habitats. They may also be useful in filling some of the identified information gaps.

Lands that have been altered by human development are also documented and discussed. Understanding human development patterns is critical to mitigating or preventing the negative impacts of development and anticipating needs

### HIGHLIGHT

The full text of this document is available online at [www.glc.org/habitat](http://www.glc.org/habitat)



for habitat conservation and restoration. Finally, this document focuses on a 10-mile stretch of land around the lake, for which unified land cover data are available. The project area includes examples of all of the natural communities which originally bordered the lake, including those that are presently at greatest risk from the impacts of human activity, as well as many found further from the lake.

## Section I. Background

### Focus on Lake St. Clair: from “Forgotten Lake to Heart of the Great Lakes”.

The Lake St. Clair Coastal Habitat Project grew out of an array of initiatives beginning in the mid-1990s to focus specifically on Lake St. Clair, which had been dubbed “the forgotten lake.” Although Lake St. Clair was technically part of the

Lake Erie Lakewide Management Plan (LaMP), high profile pollution problems in Lake St. Clair, such as beach closures due to elevated bacteria levels and dead fish on beaches prompted public outcry. The evidence and political support was growing: Lake St. Clair needed its own plan and programs on par with the five Great Lakes<sup>1</sup>. Local, state and federal officials responded. In the Water Resources Development Act of 1999, the U.S. Congress authorized the U.S. Army Corps of Engineers to lead the development of the Lake St. Clair-St. Clair River Management Plan (referred to in this document as The Management Plan). Congress provided limited funds and a deadline. The Great



Lakes Commission (GLC) was contracted to coordinate the development of the Management Plan. The Management Plan provides a framework for managing Lake St. Clair as a natural resource. There was also recognition that certain resource management issues, such as coastal habitat, could benefit from more in-depth data collection and analysis.

This habitat assessment responds to the Lake St. Clair Management Plan’s recommendation for “a habitat strategy to protect, restore and maintain natural physical and biological diversity and identify priority habitat areas for restoration and conservation.” In particular, this assessment responds to most of the suggested elements of such a habitat strategy, including:

- Provide a single coordinated inventory of wetlands and other habitats that identifies protected and managed habitats as well as rare and environmentally sensitive habitats
- Locate, inventory and map imperiled species
- Develop outreach tools...highlight programs that increase interest in, and awareness of, habitat restoration and conservation.....focus on the unique habitat within the watershed and methods to protect it
- Encourage local units of government to preserve and protect unique habitat areas and to restrict development in environmentally sensitive areas
- Provide technical assistance to local units of government to manage local habitat areas

## HIGHLIGHT

This habitat assessment responds to the Lake St. Clair Management Plan’s recommendation for “a habitat strategy to protect, restore and maintain natural physical and biological diversity and identify priority habitat areas for restoration and conservation.”

The Management Plan further acknowledges the coastal habitat project by recommending that stakeholders “use the findings of the Lake St. Clair Coastal Habitat Restoration and Conservation Plan to contribute to a Lake St. Clair habitat strategy.”

A parallel process is being undertaken as part of the Lake St. Clair Canadian Watershed Management Plan to develop recommendations that will be implemented from the Canadian side. A Draft *Lake St. Clair Canadian Watershed Technical Report* has been prepared and will undergo public review and comment after which a series of recommendations will be developed. This document is intended to serve as the basis for a uni-

fied binational approach to coastal habitat conservation and restoration around Lake St. Clair that builds on the two management plans.

## I.A. A Regional Partnership Approach

### The Lake St. Clair Coastal Habitat Project

Landscape Characterization and Restoration (LCR) program. The LCR program calls for developing a digital information resource to help coastal resource managers make resource management, regulatory and/or land use planning decisions. The Great Lakes Commission consulted with multiple Lake St. Clair stakeholders who supported the concept of a partnership approach and focus on Lake St. Clair coastal habitat.

#### HIGHLIGHT

The purpose of the project was to characterize, assess and identify needs and strategies for the conservation and restoration of Lake St. Clair Coastal habitat.

In 2002, the Great Lakes Commission, in partnership with the U.S. National Oceanic and Atmospheric Administration Coastal Services Center (NOAA-CSC: [www.csc.noaa.gov](http://www.csc.noaa.gov)) and the Michigan Natural Features Inventory (MNFI – a program of Michigan State University Extension: <http://web4.msue.msu.edu/mnfi>) formed a partnership to collect, compile and analyze data and information related to Lake St. Clair. Walpole Island First Nation joined that formal partnership in early 2004. Funding was provided by the NOAA-CSC's

Landscape Characterization and Restoration Program ([www.csc.noaa.gov/lcr](http://www.csc.noaa.gov/lcr)). The purpose of the project was to characterize, assess and identify needs and strategies for the conservation and restoration of Lake St. Clair Coastal habitat. The collective effort is known as the Lake St. Clair Coastal Habitat Project.

The project called for the development of several integrated components to achieve this goal:

- A draft coastal habitat restoration and conservation plan
- A web site that features this draft coastal habitat plan, maps, decision-making tools, and information about Lake St. Clair coastal habitat
- An Integrated Coastal Management (ICM) tool for evaluating the impacts of various land use and management decisions on Lake St. Clair coastal habitat

The project was administered through a multi-tiered partnership approach featuring a Project Management Team, a Project Advisory Committee and a Core Group. A Decision Support Working Group was also established to guide the development of the ICM tool.

A Project Management Team (PMT) was formed including federal, state, provincial, tribal/First Nation and local governments, non-profit organizations and academic institutions with a significant responsibility for or interest in Lake St. Clair coastal habitat (Appendix A). The PMT provided information, feedback and leadership in developing all project products.

The Lake St. Clair Coastal Habitat Project Advisory Committee provided an opportunity for interested stakeholders to participate and provide feedback with less direct responsibility. The Advisory Committee was provided with periodic updates on products and meetings, but did not have an active role in specific tasks or their outcomes (Appendix B).

At the core of the PMT were several agencies and organizations that were responsible for the day to day project work and coordination. The Great Lakes Commission was the project coordinator and secretariat to the PMT with lead responsibility for developing the habitat assessment and web site. NOAA-CSC was the lead on developing the Integrated

## HIGHLIGHT

Detailed descriptions of many of the animal, plant and natural communities were developed for the project and are available online at [www.glc.org/habitat/abstracts.html](http://www.glc.org/habitat/abstracts.html)

Coastal Management Tool, including testing the tool and outreach. MNFI applied considerable ecological expertise, leading the efforts to analyze information about unique, rare or endangered species and natural communities and their surroundings and identify and map areas that have high conservation and restoration potential. Walpole Island Heritage Centre provided written materials characterizing their portion of the project area and habitat management challenges to incorporate into this document. MNFI and the Walpole

Island Heritage Centre each also developed a series of detailed abstracts that feature information about rare, unique or endangered species and natural communities that exist in the project area, which complement many that had already been developed by MNFI, and are linked to the project website. Animal, plant and community abstracts for all of Michigan as well as the project area can be found at MNFI's website at <http://web4.msue.msu.edu/mnfi/pub/abstracts.cfm>

## Habitat assessment

This coastal habitat assessment has been developed to serve as the basis for a binational unified approach to coastal habitat conservation and restoration within the larger framework of the U.S. and Canadian Lake St. Clair Management Plans. This document supports those efforts by providing more detailed and coordinated data and information about the Lake's coastal environment and offers new tools to more effectively manage the coastal habitat component of the Lake. The information within this document is based on the best available data to date (mid-2004) and has undergone multiple reviews by managers and experts from around Lake St. Clair. Rather than a prescription of what to do or not to do, this assessment offers detailed scientific and socioeconomic information about the area's coastal habitats and the conservation and restoration of those habitats. State and local governments as well as organizations with land and/or habitat management responsibilities can use this assessment to develop a more comprehensive planning approach for conserving local habitat areas.

## Project Study Area

The study area encompasses a roughly 10-mile buffer landward from the water's edge around the lake. One of the first questions that arose was "What does coastal mean?" "How far inland and out into the lake shall we go?" Coupling the topical focus on the coast with the method's focus on digital data compilation helped to define the geographic scope of the project as that portion of the coastal area for which there was consistent data on both sides of the border. That data source was land cover data provided through NOAA's Coastal Change Analysis Program (C-CAP: [www.csc.noaa.gov/crs/lca/ccap.html](http://www.csc.noaa.gov/crs/lca/ccap.html)), which provided land cover and change data for the U.S. coastal zone. C-CAP data existed for the entire Lake St. Clair watershed on the U.S. side, but not on the Canadian side. In support of this project, NOAA was able to modify an existing contract to get C-CAP data for Michigan to include a portion of Canada around Lake St. Clair. The contractor was able to cover a 10-mile buffer on the Canadian side of the Lake. As a



result, the project was able to obtain land cover and change data for Canada that complemented data already available on the U.S. side. Project partners agreed that the 10-mile buffer area would be the scope of the project study area on both sides of the lake<sup>2</sup>. It should be noted that the buffer is roughly 10 miles; it is not equal on all sides of the Lake. Results from analysis of the C-CAP data, such as extent of land cover types, and land cover change are incorporated

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within relevant sections of this document. A more detailed discussion of C-CAP products and their application in this project is included in Section VII. A.

This project builds on watershed-scale efforts already underway (e.g., the U.S. and Canadian Management Plans) and offers a focused examination of the coastal element of the ecosystem where the pressures and impacts of degradation from activities throughout the

watershed are most keenly experienced. The 10-mile project area around the lake includes 752,555 acres (304,548 hectares) or 1,176 square miles (3046 square kilometers), representing 19 percent of the total watershed. Covering nearly one fifth of the watershed, this area includes examples of all of the natural communities which originally bordered the lake including those presently at greatest risk from the impacts of human activity, as well many found further from the lake, which are characteristic of the larger watershed.

## I.B. Overview of Socio-Economic History of Lake St. Clair

In many ways, Lake St. Clair is a microcosm of the larger Great Lakes Basin. The Lake and its surrounding watershed are shared by two countries and one First Nation. Fourteen counties are wholly or partly in the Lake St. Clair watershed, six of which border the lake itself: Macomb, Wayne and St. Clair counties on the U.S. side and Essex, Kent and Lambton on the Canadian side. More than 3 million people (3,029,237)<sup>3,4</sup>, reside in the coastal counties on the U.S. side and 1,125,566 reside in the Canadian coastal counties. More than 700 cities, towns, villages and named unincorporated

## FACT

In the late 1700s and early 1800s land surveyors documented that the land around Lake St. Clair was primarily deciduous forest with some tallgrass (lakeplain) prairie and large areas of wetlands that included forested swamps.



areas are located partially or wholly within the Lake St. Clair watershed, which is home to about 2,957,000 residents<sup>5</sup>. A subset of the watershed, the 10-mile coastal buffer project area includes approximately 201 cities, towns, villages and named unincorporated areas and is home to approximately 1.7 million residents on the U.S. side alone.

The region's earliest residents likely had marginal impacts on the Lake St. Clair watershed, although use of fire as a management tool did alter the landscape favoring prairies, savannas and open forests that were conducive to hunting and farming. European traders arrived in the area in the 1600s and although they sig-

nificantly impacted native populations through disease, displacement and warfare, they did little to modify the landscape<sup>6</sup>. In the late 1700s and early 1800s land surveyors documented that the land around Lake St. Clair was primarily deciduous forest with some tallgrass (lakeplain) prairie and large areas of wetlands that included forested swamps.

The U.S. portion of the Lake St. Clair watershed was initially settled by Europeans because the St. Clair River and Lake St. Clair provided numerous resources, including a transportation corridor and an abundance of fish and wildlife. Expansive hardwood forests around the lake allowed the settlers to harvest timber and use the lake and associated rivers to the north and south to float logs and ship lumber. In fact, the first sawmills of the Northwest Territory were located

on the St. Clair River and its tributaries with at least eight built before 1800<sup>7</sup>. It is believed that there was a sawmill on the St. Clair River as far back as 1690<sup>8</sup>. The first steam sawmill in the Northwest Territory, the Black River Steam Mill, was built on the north bank of the Black River in 1832 in what is today Port Huron<sup>9</sup>. These sawmills played a significant role in early development along the Great Lakes. For example, the pine timber used to build the Citadel in Detroit is believed to have come from Patrick Sinclair's sawmill on the Pine River. The Ignace Morass mill, located on the Black River, supplied the US Government with spars and ship timbers during the war of 1812, and lumber from the Ai Beard mill at Ruby supplied the lumber to build the city of Milwaukee, Wisconsin<sup>10</sup>. In 1869, more than 64 million feet of logs floated down the Black River alone<sup>11</sup>. The lumbering era reached its peak in the St. Clair River area in the late 1870's, and forests were logged until they were depleted.

The timber industry ultimately and literally cleared the way for subsequent agricultural development. In the late 1700s, permanent settlements began altering the land for agricultural practices and residential development. Throughout the 1800s settlers changed the land from primarily deciduous forests and lakeplain prairies into agricultural land. Approximately half of Harsen's Island was diked by the late 1800s<sup>12</sup> and by the early 1900s most of the forest, swamp and

#### FACT

By the early 1900s most of the forest, swamp and prairie lands around Lake St. Clair were converted to agricultural uses. Wetland destruction was legally sanctioned by governments on both sides of the lake and the U.S. Swamp Lands Act of 1850 encouraged wetlands to be drained for "useful" purposes.

prairie lands around Lake St. Clair were converted into a rural agricultural landscape. Drainage of wetlands to develop agricultural land and build roads significantly modified the hydrology of the landscape, and thus the types of natural communities that it supported. Wetland destruction or modification was legally sanctioned by governments on both sides of the Lake. In particular, the U.S. Swamp Lands Act of 1850 encouraged wetlands to be drained and converted to agricultural or other "useful" purposes.

In addition to agriculture, other economic forces were an important part of Lake St. Clair's history. From the 1840s through the U.S. Civil War, a ship building industry existed in the St. Clair River Delta in the northern part of the lake. In the mid-1860s, both the Toledo and Detroit salt companies exploited the shallow evaporite

bedrock beneath the St. Clair River bank for halite. During this period, Great Lakes shipping utilized the North Channel of the river because this channel was the deepest. Anchor Bay received its name from the ships that anchored there while waiting for their cargo to be lightened for transit over the bar of the North Channel. The transferring of cargo furnished employment for a large percentage of the people living along the Lake St. Clair shoreline.<sup>13</sup>

The Lake's historic role as a transportation corridor expanded in the 1800s with passenger ships, which, coupled with railroads, improved access to the region and aided the expansion of urban settlements and recreational facilities along the lake. By the 1870s, the development and gradual improvement of transportation routes also had a significant impact on the landscape. An electric railway was constructed along the shoreline of Lake St. Clair from Detroit to Algonac and north along the river to Port Huron<sup>14</sup>. The railway was built right through St John's Marsh. In 1873, a channel a little more than 19 feet (6 meters) deep was dredged through the delta's South Channel to avoid shipping delays caused by the sand bar at the mouth of the delta's North Channel<sup>15</sup>. Finally, on the Canadian side, the Lake Erie and Detroit River Line was constructed along the east bank of the St. Clair River joining Sarnia and Port Lambton, Ontario to other agricultural communities in southern Ontario. In addition, the Grand Trunk Railway linked the villages of Stoney Point and Belle River to Windsor, Ontario<sup>16</sup>.

Major dredging began about 1855, establishing a commercial navigation channel through the lake in a northeast-southwest direction from the St. Clair Delta to the Detroit River<sup>17</sup>. This dredging increased its maximum natural depth of 21 feet (6.4 meters) to its current depth of 27.2 feet (8.3 meters).

In 1858, the world's first commercial oil well was drilled in Lambton County, prompting an oil boom in the region that spurred expansion of railway and shipping industries. Oil production and enhanced transportation networks also enhanced Canada's agricultural industry around Lake St. Clair<sup>18</sup>. Oil production has since declined significantly, but the oil industry remains an important economic driver in this part of Lake St. Clair.

As transportation improved access to the delta, more people started to farm along the northern portion of Lake St. Clair and build small cottages on the islands in the delta. To accommodate this development, natural levees were modified by bulkheading (particularly along the South Channel) and filling on the river shoulders, crevasses and edges of

## FACT

As the St. Clair River enters Lake St. Clair, the delta divides flow from the St. Clair River into three main channels and several secondary channels, which create numerous islands, commonly known on the U.S. side as the St. Clair Flats.

deep water bays. In addition to farms and small cottages, several fishing and hunting clubs were established on both sides of the Lake during the 1870s. Five clubs were located on the U.S. side and two on the Canadian side, all but one of which were located on the improved South Channel. Later, resort hotels developed, primarily on the US side. The presence of hunt clubs, hotels and cottages built on backfill and stilts with waterways as the main mode of transportation led to the nickname "Little Venice".<sup>19</sup>

In 1886, the U.S. Congress authorized the deepening of the Clinton River to 7.9 feet (2.4 meters) and Lake St. Clair and the St. Clair Flats South Channel to 27.6 feet

(8.4 meters). Deepening of the Delta's South Channel enabled excursion boats to operate more readily between Detroit and the Flats and tourism in the Flats area blossomed. By the 1890s there were multiple companies with passenger vessels serving the area.<sup>20</sup>

Around the 1900s and particularly on the U.S. side, highway and road construction began to facilitate low-density residential and commercial development. Most urban centers were established strategically in areas that had access to water for transportation and power. The availability of marine transportation aided in the expansion of the petrochemical industries along the St. Clair River to the north. As transportation modes evolved, rail lines and major roads connected the urban communities that had become established based on their proximity to the lake. This urbanization intensified significantly after World War II and by the mid-1970s, much of Michigan's shoreline of Lake St. Clair was developed into homes and small businesses. The Canadian landscape around Lake St. Clair was spared the rapid post-war urbanization, leaving most of the land around the lake in agriculture. This is likely due to the significance of southern Ontario for Canada's agricultural productivity.

Lake St. Clair was a natural place for the establishment of commercial fishing, which was an important industry until the 1900s when overfishing caused the decline of fish populations in Lake St. Clair and eventually the close of the Michigan commercial fishery in 1908. All commercial fishing was closed in 1970 due to the presence of mercury in fish. In 1980, with reduced levels of mercury contamination, the commercial fishery was reopened in Ontario using permits and quota allocation, although no permits for walleye were allocated. Financial returns were poor, however, and today, commercial fishing on Lake St. Clair is limited to a small baitfish industry in Ontario and a few traditional native commercial licenses within Walpole Island First Nation.

Today, the lake is an important binational resource, providing numerous benefits to the nearly 3 million people that reside within its watershed. Industries once based on extraction or consumption of natural resources have mostly been replaced by recreation and tourism so that residents and the millions of tourists who visit Lake St. Clair every year can enjoy activities such as fishing, swimming, boating, hunting and bird-watching. Section II contains a more detailed discussion of the Lake's social and economic characteristics today.

## I. C. Overview of Natural History of Lake St. Clair

Lake St. Clair and the surrounding lands in the project area lie within the former lake bed of Lake Maumee, an early proglacial lake that formed from meltwater along the front of a Pleistocene glacier. As the ice front retreated and then readvanced, and water levels fluctuated, Lake Maumee was the first of a series of lakes that covered huge areas including Lake Erie, Lake St. Clair and parts of southeastern Michigan, northern Ohio and southern Ontario. Initially, these lakes drained westward into the Mississippi by various routes, and then eventually east, ultimately draining via their present route into the Atlantic Ocean<sup>21</sup> (See Figure I. C. - 1).

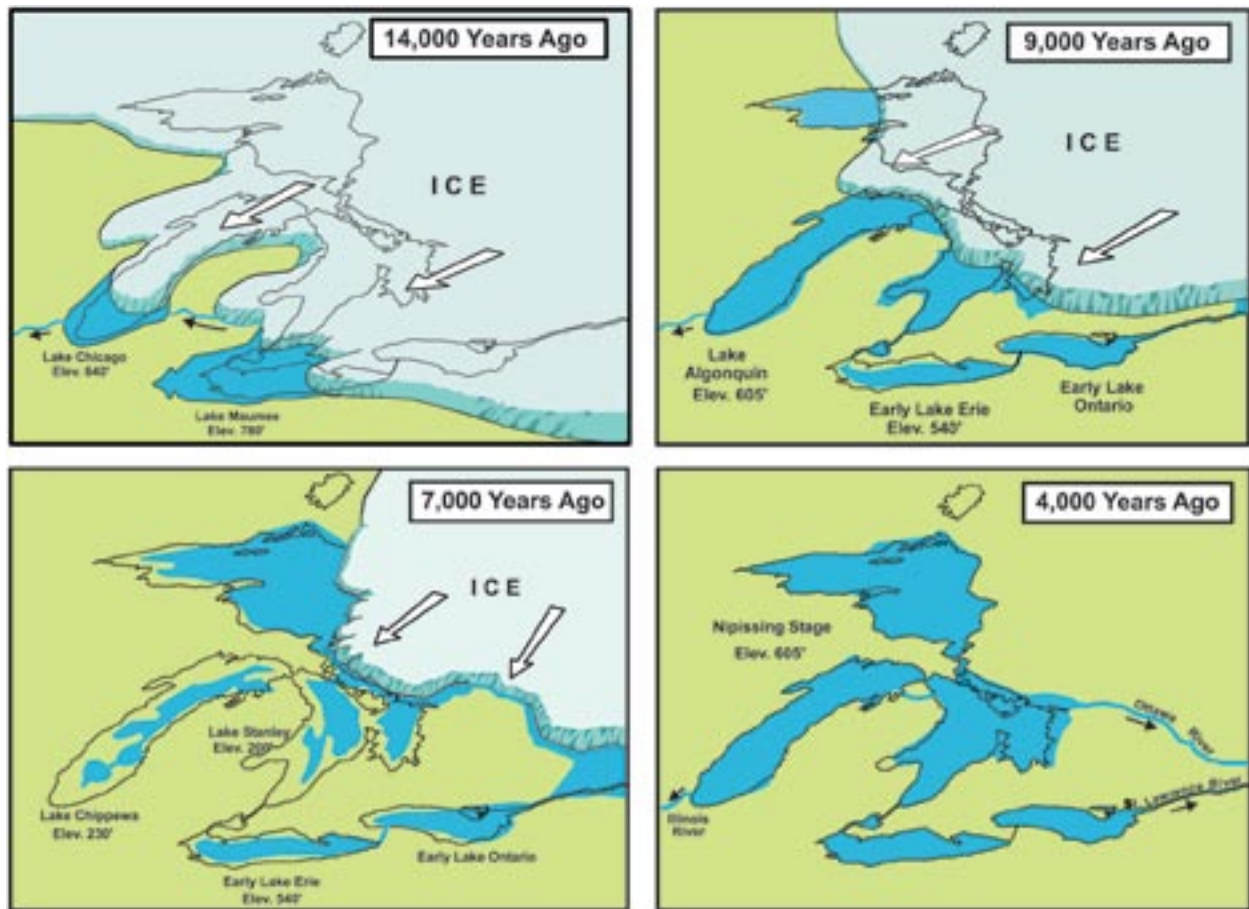


Figure I. C. - 1  
From: "Living with the Lakes" (GLC & ACOE, 1999)

As the water levels dropped, huge areas of former lake bottom were exposed. The exposed lands, or lakeplains, are broad, flat plains formed by the fine sediments that collected at the bottom of glacial lakes. The Maumee lakeplain is a flat, clay lakeplain dissected by broad glacial drainageways of sandy soil and beach ridges from the shores of former Lake Maumee<sup>22</sup>. In Ontario, the lakeplain in the Canadian portion of the project area is referred to as the St. Clair Plain<sup>23</sup>.

### FACT

Lakeplains are broad flat plains formed by the fine sediments that collected at the bottom of glacial lakes.

The Lake St. Clair we know today has an area of 430 square miles (1,115 square km) with a total shoreline length of 169 miles (272 km) including the delta shoreline. Its average depth is only 12 ft (3.7 m) with a maximum natural depth of 21 ft (6.4 m). It is connected to

Lakes Michigan and Huron to the north via the St. Clair River and to Lake Erie to the south via the Detroit River. Lake St. Clair receives 98 percent of its water from the upper Great Lakes (Huron, Michigan, Superior) and as such, serves as an outlet for the upper Great Lakes. These lakes have a combined drainage basin of 146,600 sq mi (379,800 sq km). From this standpoint, the entire upper Great Lakes is part of the Lake St. Clair watershed. From another standpoint, the Lake St. Clair watershed includes the collective watersheds of the six major tributaries that drain into the St. Clair River and/or Lake St. Clair plus

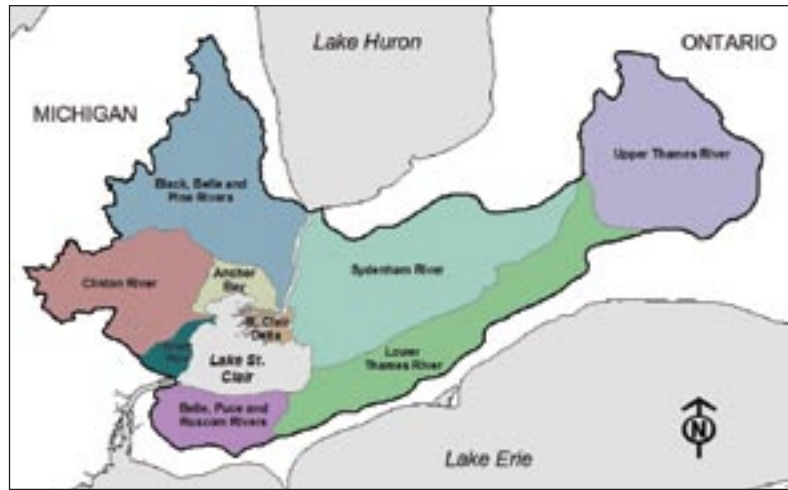


Figure I. C. - 2  
Watersheds that drain into Lake St. Clair

associated lands that drain directly into the lake. These include the Clinton, Belle, Pine and Black Rivers on the U.S. side and the Sydenham and the Thames Rivers on the Canadian side. The Belle, Pine and Black Rivers drain into the St. Clair River first. The Lake St. Clair watershed covers 3,927,175 acres (1,589,270 hectares) or approximately 6,136 square miles (15,893 square kilometers) of land. The project area covers 1,176 square miles (3046 square kilometers) or 19 percent of the total watershed (See Figure I. C. - 2).

**HIGHLIGHT**  
The St. Clair Delta is one of the largest freshwater deltas in the world and is of continental significance to hundreds of thousands of migratory waterfowl, shorebirds and songbirds.

The St. Clair River slows suddenly as it enters the wide, shallow Lake St. Clair. This deceleration, combined with abundant suspended sediments that the river brings from Lake Huron, has formed the St. Clair Delta, the only major river delta in the Great Lakes and one of the largest freshwater deltas in the world<sup>24</sup>. The

delta's wetlands provide important feeding and resting habitats at a critical location along the Mississippi and Atlantic flyways and are internationally recognized as being of continental significance to hundreds of thousands of migratory waterfowl, shorebirds, and songbirds.<sup>25</sup>

The delta divides flow from the St. Clair River into three main channels and several secondary channels. On the western portion of the delta, the North Channel, South Channel and Middle Channel carry the majority of the flow into the lake. On the eastern portion of the delta, the Chenal Ecarte and Johnson Channel carry much lower volumes of water (See Figure I. C. - 3). The split in flow between the channels is never constant and is strongly affected by discharges from Lake Huron, ice buildup in the channels in winter, plant growth in open-water periods, and winds and other atmospheric factors.

**FACT**  
Lake St. Clair's watershed encompasses approximately 3,927,175 acres (1,589,270 hectares) in Michigan and Ontario, partially or wholly draining 14 counties and numerous municipalities.

Prior to European settlement, a large variety of natural communities occupied the Lake St. Clair shoreline. Beech-maple forests were found on the well drained sites, mixed hardwood swamps were located on the poorly drained sites and unique mosaics of wet and dry communities, referred to as Great Lakes marsh com-

plexes, were located at the mouths of the St. Clair and Clinton Rivers. The marshes at the mouth of the Clinton stretched inland as far as 5 miles along large bends of the river. The largest freshwater delta in the Great Lakes basin formed at the mouth of the St. Clair River. Historically, it supported several unique natural communities: Great Lakes marsh, several lakeplain prairies, a unique grassland community adapted to the fluctuating water levels and poorly drained sands, and lakeplain oak openings, another grassland community with scattered wide-spreading oaks, located on the well-drained beach ridges and dunes. In addition, a large oak-hickory forest was located on a well drained site on the mainland adjacent to this complex.<sup>26</sup>

Before the logging era, beech-sugar maple forests, located on the well and moderately well drained sites, dominated the landscape. Mixed hardwood swamps, which contained a large variety of trees including American elm, red ash, and silver maple, often occupied large depressions adjacent to the beech-sugar maple forests. Large pockets of lakeplain prairie were found throughout the lakeplain primarily on poorly drained sandy soils particularly along the shoreline between beach ridges. Dry oak-hickory forests, oak savannas, and prairies occupied the well to excessively well-drained beach ridges. Small pockets of black ash swamp, tamarack swamp, bogs, and emergent marsh were found scattered throughout the lakeplain in poorly drained depressions. Kentucky coffee tree, sycamore, red ash, cottonwood, Ohio buckeye, and hackberry were found on the floodplains along the major creeks and rivers<sup>27</sup>.



Figure I. C. - 3

**HIGHLIGHT**  
 Most natural communities around Lake St. Clair today have been modified from their European pre-settlement state, are highly fragmented and require intensive management to maintain their “natural” state.

The Lake St. Clair watershed lies within the northern portion of the Eastern Deciduous Forest, also referred to as Carolinian Forest in Canada. Many of the species found here are at the northern extreme of their natural range, so what is considered common elsewhere in the bioregion may be considered rare around Lake St. Clair. Section IV. details the variety of natural communities that exist within the project area today.

The channels in the upstream part of the delta create numerous islands, some of which include residential areas on lands that have been maintained by dikes and seawalls, particularly Harsen’s Island and Walpole Island. According to 2000 C-CAP data on both the Canadian and US side, approximately 952 acres (385 hectares), or 1.7 percent of the total area of the 56,000 acre (22,647 hectares) delta consists of either low or high density development. Walpole Island is the largest island in the delta and home to the Walpole Island First Nation people. In addition to Walpole Island itself, the Walpole Island First Nation territory also includes Basset Island, Squirrel Island, St. Anne Island, Potawatami Island, and Seaway Island<sup>28</sup>. Harsen’s Island and Dickenson Island, which is relatively undeveloped, are part of the state of Michigan. The southern part of the delta fans out into a complex shoreline of shallow bays and marshes.

Walpole Island First Nation features important remnants of lakeplain prairies, oak savannas and Great Lakes marsh–natural communities that were once widespread through the Lake St. Clair region. These natural features, once common to the entire Lake St. Clair area are now unique remnants that provide some of the most significant wildlife habitat in the Great Lakes.

The St. Clair Flats Wildlife Area, managed by Michigan Department of Natural Resources, refers to that part of the delta encompassing St. John’s Marsh, Dickinson Island, Harsen’s Island and Algonac State Park and stands as the only major U.S. marsh area remaining on Lake St. Clair. Although their state-owned status offers these lands certain protections from further destruction or alteration, management to maintain and conserve healthy wildlife and plant communities is an ongoing challenge. Implementation of an ecosystem management approach often requires intensive efforts to maintain and conserve healthy wildlife and plant communities. Today’s wetland conservation efforts include enhancing waterfowl production and migration habitat and providing waterfowl hunting opportunities. The challenge becomes balancing the goals of enhancing and restoring wetland ecosystems and wildlife populations with those of providing waterfowl hunting opportunities and public access to these wetland resources.

Channel modification, dyking and draining of wetlands, land clearing and development have dramatically altered the landscape and the ecological makeup around Lake St. Clair. These intentional activities have stimulated an entire suite of unintentional and/or secondary activities and impacts such as the introduction of invasive species, higher erosion and sedimentation rates, nutrient and chemical pollution and other factors that further alter the ecological dynamics of the system. As a result, most natural communities around Lake St. Clair today have been modified from their European pre-settlement state, are highly fragmented and require intensive management to maintain their “natural” state.

With an estimated 75–80 percent of Lake St. Clair wetlands destroyed or highly degraded, it becomes increasingly important to provide management strategies that restore, maintain, and/or mimic natural ecosystem processes. On the U.S. side, experts suggest that the St Clair Flats Wildlife Area should be managed at a landscape scale, in a holistic manner that considers both ecological and recreational goals. Restoration and maintenance of existing natural marsh and prairie habitat provides a window to the region’s ecological past. This complements manipulation of actively managed habitats by providing a reference point for biological integrity and diversity within the scope of Lake St. Clair. Diked impoundments help provide high quality spring and fall staging habitat for resting and feeding migratory waterfowl. Conservation and restoration of these resources can ensure that the region’s biological heritage is not lost and the associated benefits–known and unknown–anthropocentric and ecological–are sustained into the future.

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## Section I Endnotes

1. Although Lake Huron does not have an official Lakewide Management Plan, there is Lake Huron Initiative, which has produced the Lake Huron Initiative Action Plan. The Action Plan is not as extensive as the Lakewide Management Plans being prepared for the other Great Lakes, but is nonetheless a binational effort to address critical issues affecting Lake Huron.
2. Initially, the project study area covered a 1-mile buffer around the lake. Project partners were pleased to learn that data were generated for a 10-mile area, and agreed to increase the project’s geographic scope accordingly. The expanded focus increased the study area sixfold: from 49,813 hectares/123,092 acres to 304,548 hectares/752,555 acres or 1,176 sq mi.
3. SEMCOG. Population and Household Estimates for Southeast Michigan, January 2004. Southeast Michigan Council of Governments, January 2004.
4. Although much of this U.S. coastal county population is in Wayne County, most of which is outside the watershed, the people of Wayne County are part of the Lake’s coastal population. They have a significant impact on the Lake through vehicular and other air emissions, demands on infrastructure that cross watershed boundaries, and as users of the resource. Wayne county residents enjoy fishing, swimming and boating in Lake St. Clair as much as coastal residents in other coastal counties.

5. Canadian population estimate of 750,000 is the sum of the population of the counties within the Lake St. Clair watershed based on the last national census per the Lake St. Clair Canadian Watershed Technical Report: An examination of Current Conditions. Draft. December 30, 2003. U.S. watershed population figure of 2,207,000 provided by SEMCOG in Comparing 2000 Census and 2030 Regional Development Forecast by Watershed, SEMCOG, 2002.
6. Lake St. Clair Management Plan Final Draft. August, 2003.
7. Mitts, D. M. 1968. That Noble Country: The Romance of the St. Clair River Region. Dorrance and Company, Philadelphia, PA.
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9. Mitts, 1968, *op. cit.*
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12. Herdendorf C. E., Raphael, C. N., Jaworski, E., and Duffy, W. G., 1986. The ecology of Lake St. Clair wetlands: a community profile. Prepared for National Wetlands Research Center, Fish and Wildlife Service, U. S. Department of the Interior, Washington, DC.
13. Edsall, Thomas A., Manny, Bruce A., Raphael, Nicholas, 1988. The St. Clair River and Lake St. Clair, Michigan: an ecological profile. U. S. Fish and Wildlife Service. Biological Report no. 85 (7.3).
14. Edsall, et al, 1988, *op. cit.*
15. USACE (U.S. Army Corps of Engineers). 1981. Essayons. A history of the Detroit District. Detroit District, MI. 215 pp.
16. Edsall, et al, 1988, *op. cit.*
17. Brunk, J. W. 1968. Evaluation of channel changes in St. Clair and Detroit Rivers. Water Resourc. Res. 4:1335-1346.
18. The Formation of Lambton County, at [www.lambtoncounty.com/historyformationoflambton.htm](http://www.lambtoncounty.com/historyformationoflambton.htm)
19. Dixon, M.M. 1985. Life at the Flats, Volume I: When Bedore was King. Mervue Publications.
20. Dixon, 1985, *op. cit.*
21. Biodiversity Atlas of the Lake Huron to Lake Erie Corridor. DRAFT. October, 2003. Wildlife Habitat Council.
22. Lake St. Clair Management Plan Final Draft. August, 2003.
23. Lake St. Clair Management Plan Final Draft. August, 2003.
24. Ontario Lake St. Clair MP–Get full reference from E. Kafcas).
25. Michigan Natural Features Inventory, 2003. Summary of the Southeast Michigan Ecosystem Project: 1994-2001. Report No. 2003-07. Michigan State University Extension.
26. The lands that comprise Walpole Island First Nation are under legal dispute between the First Nation and the Government of Canada. For purposes of this document, we will refer to Walpole Island First Nation as the six islands of Walpole, Basset, Squirrel, St. Anne, Potawatami and Seaway Island.
27. MNFI, Ibid