

Chapter 7: Fisheries, Recreational Boating and Commercial Navigation

Our Goal:

- Recreation and economic activities impacting the lake are sustainable and support a healthy watershed.

The city of Detroit was founded in 1701 and has since been a focal point for navigation on the Great Lakes. Detroit became a major gateway to the Northwest Territory for settlers and their supplies coming from the east coast during the early 19th century. The discovery and shipment of iron ore and other natural resources from the upper Great Lakes area helped make the Lake St. Clair and Detroit region a leading commercial center in the early 1800s and one of the world's largest manufacturing locations by the 1940s.

The city of Sarnia, Ontario, became a prominent deep-water port during the 1920s when many of the shipping facilities were constructed including a winter harbor, an elevator slip and large grain elevators. The availability of marine transportation for oil and petroleum products was also an important component in development and expansion of the petrochemical industries along the St. Clair River.

The shallow waters of Lake St. Clair restrict the development of deep-water commercial harbors, but the waters are excellent for small boats. Recreational boating on Lake St. Clair has experienced tremendous growth since World War II. Lake St. Clair and the St. Clair River provide unmatched resources for boating, fishing, diving, and swimming, which contribute significantly to the economy of southeast Michigan and southern Ontario.

Based on conservative estimates, Lake St. Clair contributes more than \$249 million a year in recreational boating related expenditures to the Macomb, Oakland and St. Clair counties, Michigan. In addition, Lake St. Clair and the St. Clair River form a vital link for 4,000 -- 5,000 commercial vessel transits each year.

Environmental impacts such as increased access to environmentally sensitive areas, shoreline hardening, pollution, navigational channel dredging, and the introduction of invasive species have negatively impacted water quality and permanently altered the habitat and biodiversity of the system. Maintaining and enhancing habitat without impairing this resource for the enjoyment and use by future generations is a major challenge.

St. Clair River and Lake St. Clair Comprehensive Management Plan, June 2004
Chapter 7 – Fisheries, Recreational Boating and Navigation

Key issues:

- 1) Pollution prevention from marine industries
- 2) Fisheries management
- 3) Dredging and contaminated sediments
- 4) Lake levels
- 5) Invasive species and ballast water management
- 6) Public access

Recreational Boating

Recreational boating on Lake St. Clair is significant and includes the full range of watercraft, including sailboats, large pleasure craft, small fishing boats, pontoon boats, canoes, kayaks, personal watercraft, and virtually any other floating device. Fishing constitutes the majority of recreational boating activity on the lake, but pleasure boating, water-skiing, and racing are also common. The excellent fishing, relatively clean and protected water, interesting islands and bays, accessible boating facilities, and proximity to major urban areas has made Lake St. Clair one of the major recreational boating centers in North America.

Did you know...

Michigan has been first in the nation in boat registrations for the last decade.

Throughout the 1990s, Michigan has had more registered boats than any other state in the nation. In 2001, that number surpassed 800,000 and a survey that year found that more than 20 percent of those boats were in southeast Michigan, primarily on Lake St. Clair. In fact, more than 200,000 boats are registered in the four U.S. counties adjacent to or near Lake St. Clair. This number represents more registered boats than some entire states, including coastal Maryland and Connecticut and Kentucky, which has numerous inland reservoirs.

A 1994 study by Michigan State University indicated 626 coastal marinas in the state. Of these, 211 were in Wayne, Macomb, and St. Clair counties (64, 75, and 72 marinas, respectively). The number of marinas and boat registrations has been increasing over the past several years.

There are 13 marinas located along the Canadian shores of the St. Clair River and Lake St. Clair. More than 2,300 boat slips are available and 10 boat launches along the shores of the lake and river give boaters access for daily excursions. While most of the boat slips at the marinas are rented on a seasonal basis, the Sarnia Bay Marina in Sarnia has approximately 190 visitor slips and the municipal docks at Wallaceburg and Chatham have facilities to accommodate more than 150 visiting boats. In addition to the marinas and public docks, private facilities and docks located along the shoreline give cottage and homeowners sites to moor their boats.

Economic Contribution

Conservative estimates suggest that recreational boating contributes over \$249 million a year in direct boating related expenditures to the economies of Macomb, Wayne and St. Clair counties. Based on 2003 research by Michigan State University, it is estimated that active boats in the tri-count area of Macomb, Wayne and St. Clair counties represented a total of 3,104,000 days of use during 2002 (1,168,000 for Macomb; 1,584,000 for Wayne; and 352,000 for St. Clair county). Total spending on trips by active boats in Macomb, Wayne and St. Clair counties were \$97 million, \$128 million, and \$24 million, respectively.

Tourism is an important component of recreational boating. The Thames and Sydenham rivers allow access from Lake St. Clair to the inland communities of Chatham and Wallaceburg, attracting visiting boaters. The Sarnia Bay Marina also attracts tourists, and devotes approximately two-thirds of the slips to visiting boats.

The sport fishery on Lake St. Clair is substantial, supporting one of the most valuable recreational fisheries in the world for walleye, yellow perch, smallmouth bass, and muskellunge. Thirty-three percent of all fish and 48 percent of all sport fish caught in the Great Lakes are caught in Lake St. Clair.

The current estimated direct value of the recreational fishery for Michigan and Ontario waters combined is likely in excess of \$30 million per year. Most anglers that fish Lake St. Clair use private boat slips and the majority of anglers (more than 60%) travel into Ontario waters directly from U.S. waters. As a result, while the Canadian waters of the lake are an important part of the sport fishery, much of the economic revenue from the recreational fisheries does not benefit Ontario.

Recreational, Native and Commercial Fishery

Recreational Fishery

Since 1989, Michigan charter boat operators have been required to report their charter fishing catch to the Michigan Department of Natural Resources (MDNR). In 2001, Michigan charter boat anglers on Lake St. Clair and the St. Clair River caught 12,507 fish. Yellow perch (51%), “other” species (28%), and walleye (20%) made up the bulk of the catch, accounting for about 99 percent of the total harvest. The “other” species category is thought to consist mainly of smallmouth bass and muskellunge.

In 2002, the Ontario Ministry of Natural Resources conducted a survey of anglers in the Ontario waters of Lake St. Clair, interviewing a total of 4,410 anglers. In 2002, only 17 percent of anglers fished for walleye, catching only 14,000 fish compared to the average walleye catch of 85,000 fish annually in the late 1970’s and 1980’s. The fishery for yellow perch has increased significantly and currently represents 31% of angler effort. The 2002 fishery was similar to the fishery observed in the 1940’s. As discussed previously in Chapter 4, the substantial change in the fishery is attributed to changes in the habitat of the lake due to increased water clarity and an increase in communities of rooted, submerged aquatic plants.

Also in 2002 the Michigan Department of Natural Resources, Fisheries Division conducted a creel survey of the boat anglers on Lake St. Clair. This intensive study resulted in an estimate of over 1,368,500 angler hours on just the Michigan waters of the lake. The entire Michigan Great Lakes fishing effort in 2002 was about 10 million angler hours – so the Lake St. Clair fishery (an area of less than 1 percent of the state’s Great Lakes waters) accounts for nearly 14 percent of the Great Lakes fishing for the entire state. This survey also resulted in the following estimated angler harvests for 2002: 455,621 yellow perch; 41,972 walleye; 12,100 smallmouth bass; 10,074 bluegill; 8,500 rock bass; 2,400 pumpkinseed; 1,175 black crappie; 1,483 northern pike; 1,072 freshwater drum; 713 channel catfish and about 1,000 other fish for a total U.S. harvest of over 536,000 fish.

During the period since 1990, walleye catch rates have declined markedly for U.S. charters on Lake St. Clair U.S., although the 2001 charter catch rate for Lake St. Clair walleye increased to the highest level recorded since 1991 (see Figure 7-1). Non-charter anglers reported walleye fishing in the Michigan waters of Lake St. Clair was consistently good throughout most of the summer. The factors behind improved walleye fishing in Lake St. Clair in 2001 are not clear, but could include increased

Did you know...

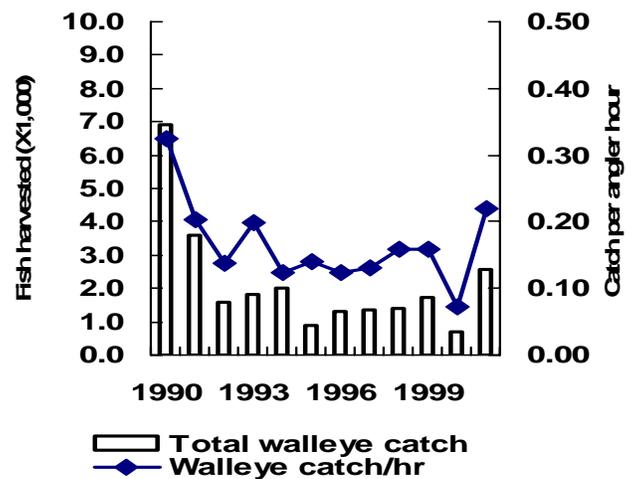
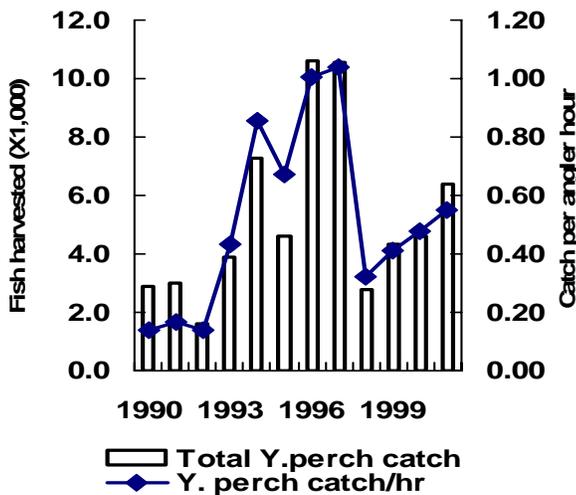
33 percent of all fish and 48 percent of all sport fish caught in the Great Lakes are caught in Lake St. Clair.

movement of walleye into the Lake from Lake Erie, where the 1999 walleye year class appears quite strong.

Yellow perch catch rates for charter boats on Lake St. Clair have been more variable (see Figure 7-2), but continued a trend of improvement in 2001. The Lake St. Clair charter boat fishery for yellow perch occurs mainly in September and October. Varying weather patterns during those months seem to play a major role in annual variations in the catch rate. Due to unseasonably warm weather, the fishery was very late to develop in 1998, 1999 and 2000, with the best fishing occurring in late October and November, after most charter businesses had closed for the season.

Figure 7-1: Walleye Catch Rates 1990-1999 (MDNR 2002)

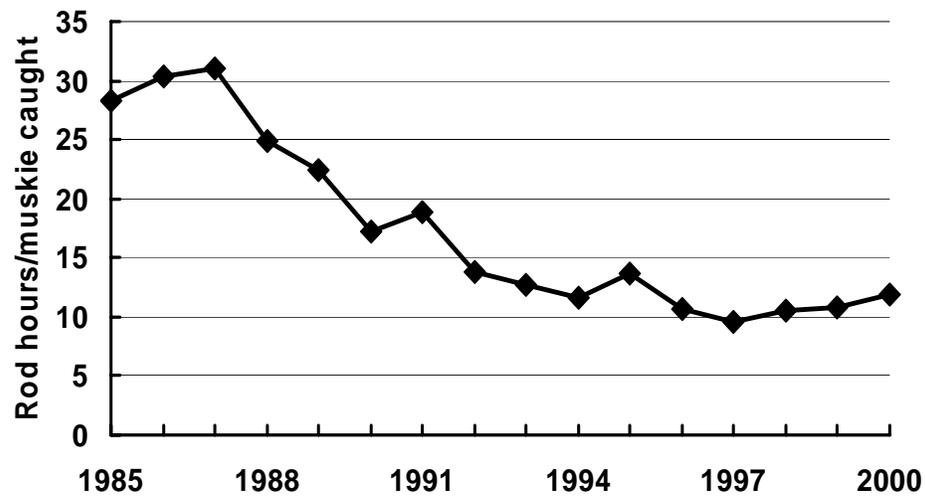
Figure 7-2: Perch Catch Rates 1990-1999 (MDNR 2002)



The muskellunge fishery exceeds that of any other period in modern history, with annual catches in excess of 5,000 fish in the Ontario waters alone. Muskellunge catch rates derived from the Angler Diary Program on Lake St. Clair verify these reports (see figure 7-3). It is believed that factors contributing to the dramatic improvement in this fishery include:

- a positive response to increased minimum size limits on both sides of the lake since the mid-1980s
- physical and biological changes in the lake such as clearer water and increased aquatic plant growth, resulting in improved habitat for Great Lakes muskellunge
- increased voluntary catch and release fishing for muskellunge in Lake St. Clair by both sport and charter anglers

Figure 7-3: Lake St. Clair Great Lakes Muskellunge Catch Rate



The brief closure of the Lake St. Clair fishery due to mercury contamination in the early 1970s had a significant economic impact on the area's tourist and recreational facilities. As previously discussed in Chapter 5, federal, state and provincial regulations have addressed pollutants that affect fisheries but efforts must continue to protect fish habitat and the recreational benefits to the region. Additional fisheries information can be found in Chapter 4.

Traditional Native Fishing

Traditional native fisheries exist in Lake St. Clair, on the Thames River, and the St. Clair River using mainly nets, or hook and line methods. Annual harvests for walleye have been estimated at 60,000 kg in the 1970s, 30,000 kg in the 1980s and 13,000 kg through to the mid-1990s.

There are a few commercial licenses held within the Walpole Island First Nation community, and several families exercise their right to harvest fish in a subsistence fishery. Recreational fishing within the Walpole Island First Nation territory is governed by the First Nation community, which issues sport licenses and maintains bag limits similar to other Ontario sport licenses.

Commercial Fishing

Commercial fishing prior to the 1900s contributed extensively to the decline of the lake herring and lake whitefish populations in Lake St. Clair. The Michigan commercial fishery was closed in 1908. All commercial fishing was closed in 1970 due to high levels of mercury contamination in fish.

In 1980, once mercury contamination had been sufficiently reduced, a limited commercial fishery was re-opened in Ontario using a permit and quota allocation system (no walleye allocated). By the 1990s, low economic returns to the fishers from the sale of under-utilized species and the lack of a walleye quota allocation had reduced

the importance of commercial fishing as an industry on Lake St. Clair. There is an Ontario baitfish industry on Lake St. Clair that supplies local bait shops with species such as emerald, mimic and spottail shiners. In 2000, approximately 99 gallons of baitfish were harvested from the lake in Ontario.

Commercial Navigation

Lake St. Clair, the St. Clair River and the Detroit River form one of the world's busiest commercial shipping waterways. Canadian, American, and foreign ships make approximately 4,000 – 5,000 transits upstream and downstream each year during the shipping season. The main shipping season begins in early March and ends in late January. Some commercial navigation continues throughout the winter months with the assistance of Canadian or U.S. Coast Guard icebreakers or during periods of little or no ice. The St. Lawrence Seaway is usually open from the end of March to the end of December. Currently the St. Lawrence Seaway operates at approximately 60 percent capacity.

On average, the U.S. and Canadian flag fleets along with overseas vessels move more than 170 million net tons of cargo on the Great Lakes each year. Approximately 40 percent of that amount traverses Lake St. Clair. The so-called “big three” – iron ore, stone and coal – make up nearly 80 percent of the bulk commodities shipped each year in the Great Lakes.

Commercial shipping is an important contributor to the local economy of southeast Michigan. Based upon cargo volume in 2000, the Detroit/Wayne County Port Authority estimated that commercial products shipped in and out of the port created more than 10,000 jobs and generated \$551 million in total income and nearly \$165 million in business revenue. While not all of the cargo exported or imported through the Port of Detroit traverses Lake St. Clair, the economic benefits realized by the Port of Detroit provide insight into the value of commercial navigation in the immediate vicinity.

On the Canadian side of the St. Clair River, commercial shipping continues to have an important link to the local economy. The Sarnia (Cargill) grain terminal transfers locally grown crops to lake freighters and receives shipments of fertilizer and feed corn. Along the riverfront, ships deliver coal to the Lambton generating station and gravel/crushed stone to local docks.

The availability of marine transportation for oil and petroleum products was also an important component in development and expansion of the petrochemical industries along the St. Clair River. The bulk loading and unloading of petroleum products occurs at several petrochemical facilities along the river. Shipments of heating oil, gas and diesel fuel are made to northern ports in the Great Lakes. Also, more than 1,500 ships stop to take on fuel at the refinery docks.

Table 7-1 shows that fuel efficiency, air emissions, and accident rates of Great Lakes commercial shipping compare favorably with those of other methods of transporting commercial goods.

Table 7-1. Fuel efficiency, air emissions and accident rate for Great Lakes shipping compared to other modes of commercial commerce.

	Modal Impact Factors		
	Fuel Efficiency Ton Miles/Gallon	Emissions Pounds/Gallon	Accident Rate/Incidents
Truck	60	.31	76.6/100,000,000 miles
Rail	204	.69	1/51,310 miles
River	514	.37	1/600,000,000 ton miles
Great Lakes	607	.37	1/2,590,000,000 ton miles

Findings and Recommendations

The following pages review major findings and recommendations regarding the key recreational boating and commercial navigation issues in the Lake St. Clair watershed.

These issues include:

- Pollution prevention from marine industries
- Fisheries management
- Dredging and contaminated sediments
- Lake levels
- Invasive species and ballast water management
- Public access

The U.S. recommendations regarding Lake St. Clair are presented as part of this management plan. Canadian recommendations for Lake St. Clair will be developed following public review of and input into the management plan. In addition, the St. Clair River has a set of binational goals and objectives that were established as part of the binational St. Clair River RAP (see www.friendsfstclair.ca).

Many Lake St. Clair issues are already being addressed, at least in part, by existing efforts to remediate problems in the watershed tributaries and the Great Lakes. Both public input and existing objectives will be important in developing the binational recommendations for Lake St. Clair.

Pollution Prevention from Marine Industries

The high use of recreational watercraft in Lake St. Clair has not been without adverse environmental impacts. Marine facility management practices that impact the environment include boat sewage disposal, pumpout and dump station use, boating litter and fish waste disposal, fueling and bilge care, and boat repair and maintenance. Impacts from accidental spills of gasoline and oil during outboard motor fueling can also be a problem. Individually, minor spills and other discharges may be insignificant, however, the cumulative effect can be more serious, especially in areas where the minor discharges are concentrated.

Emissions from motorized pleasure craft on the upper section of the St. Clair River are a significant contributor of toluene, an organic chemical that makes up 10 percent to 15

percent of gasoline, to the river. Studies and routine monitoring of the river by the Sarnia-Lambton Environmental Association show an increase in the measurable level of toluene during the summer weekends when recreational boats are most active. While the levels are well below concentrations that would raise concerns for drinking water or protection of wildlife, it is notable that loading from recreational sources now appears to exceed the point sources of toluene discharges to the river. A similar impact would be expected in Lake St. Clair given that recreational boating use is high.

Impacts from accidental spills of gasoline and oil during outboard motor fueling can also be a problem. Individually, spills might be of small volume; however areas of repeated spills and the combined effects of many small spills can be detrimental to the health of the watershed.

Programs and Initiatives

United States: In 1999, the Macomb County Health Department, with funding from the Michigan Department of Environmental Quality (MDEQ), formed a cooperative partnership to promote voluntary pollution prevention in the marine industry. Two components of this program were directed at pollution prevention for marinas and recreational boating. The first component was a pollution prevention assessment of 34 marina facilities and development of a pollution prevention plan for each facility. The second component was a program to raise awareness of boat-related waste disposal and to promote the use of marina and boating Best Management Practices (BMPs). It is hoped that the program will serve as a pilot initiative that can be used to expand pollution prevention efforts statewide.

The Macomb County Health Department (MCHD) is also undertaking a project that focuses on pollution prevention (P2) measures at boat maintenance and repair facilities (BMRFs). This project is an extension of the pollution prevention project aimed at marinas. A Marina Pollution Prevention group has been organized to evaluate potential P2 technologies that might be applicable to BMRFs. Technologies will be installed at BMRFs to determine the reduction in contaminants generated by these operations. The final product aimed at BMRF and marine industries will consist of reference listings, education and information material on waste reduction and pollution prevention, site evaluations, and pollution prevention technologies that may be applicable to their facility.

In conjunction with the previous marina P2 program conducted by the MCHD, MDEQ released four publications aimed at marinas and boaters that describe pollution prevention and waste reduction tips. These documents are available by contacting MDEQ.

In July, 2002, the Michigan Clean Marinas program was created to guide and promote BMPs and pollution prevention strategies to preserve and protect Michigan's Great Lakes and its connecting waterways. This program is a cooperative effort between the Michigan Boating Industries Association (MBIA), Michigan Sea Grant College Program, and MDEQ.

With regard to environmental regulations affecting marina operations and boat use, Michigan's Great Lakes waters became a "no discharge zone" for all recreational vessels in 1970. During 1994 and 1995, Michigan State University extensively evaluated vessel use patterns and marina pump-out inventories as a result of the

Federal Clean Vessel Act. Michigan has an extensive and effective marina pump-out program and inventory of facilities. Marinas are regulated by MDEQ and require marina-operating permits. Also, based on the type of activities in the facilities, pump-outs must be permitted through the National Pollution Discharge Elimination System administered by the state's general permitting authority.

Canada: Sewage discharges from recreational watercraft are regulated under the Ontario Environmental Protection Act, Regulation 343. The law requires that no person discharge or deposit sewage from a pleasure boat. "Sewage" means organic and inorganic waste, and includes fuel, lubricants, litter, paper, plastics, glass, metal, containers, bottles, crockery, rags, junk or similar refuse or garbage, and human excrement. Regulation 351 of the Ontario Environmental Protection Act requires that the operator of a marina shall have pump-out facilities that are easily accessible to and can be conveniently used by occupants of pleasure boats in which toilets are installed.

Under the Ontario Ministry of the Environment's (OMOE) surface water program, staff focuses their efforts on activities that are most likely to have human health impacts, impacts on aquatic organisms, cause impairment of fish habitats, cause water supply interference or result in exceedances of water quality limits. In that regard, staff does not routinely conduct inspections of boats and marinas. The OMOE encourages voluntary compliance through education/outreach activities through the Clean Marine Partnership Program. This program promotes awareness of environmental issues through industry associations. Generally, enforcement occurs when the boating public or marina associations report problems.

A Clean Marine Manual was developed in 1997 through the cooperation of the Ontario Marine Operators Association (OMOA), Environment Canada (EC) and the OMOE. The manual, which was updated in 2001, provides guidance to marinas for environmentally responsible practices in all marine operations and sets out more than 200 environmental practices that cover all aspects of marine operations from fueling to waste oil and paper recycling. More information about this program can be found at OMOA's web site www.omoa.com.

The Clean Marine Eco-Rating Certification Project is a three-year agreement between the OMOA, the OMOE, and Environment Canada to audit 150 marinas. Over 250 marinas throughout Ontario are now participating in this voluntary program, and are at various stages of implementing environmental best management practices. To date, 150 marinas have been audited by an independent third party using the environmental criteria of the Clean Marine Manual, and given an "eco-rating" ranging from low (1) to high (5). Three marinas on Lake St. Clair and the St. Clair River received their Eco-Ratings in 2003. Certified marinas are listed at the OMOA's web site www.omoa.com.

Environment Canada also sponsors an Environmental Choice program that provides boaters with a number of products and services that are less harmful to the environment. These products include fuel additives, waxes, hull paints, lubricants, and others that display an Eco-Logo and are certified to have minimal environmental impact.

Transport Canada manages marine vessels in Canadian waters, under the Canada Shipping Act and associated regulations. The Great Lakes Sewage Pollution Prevention Regulations control the treatment and discharge of human sewage on commercial vessels. The Oil Pollution Prevention Regulations cover procedures and

Canada's "Environment Choice" Eco-Logo symbol of certification features three doves intertwined to form a maple leaf, representing consumers, industry and government working together to improve Canada's environment.



controls to protect the environment from oil and oily water discharged from ships and from loading and unloading facilities. The Response Organizations and Oil Handling Facilities Regulations control the four Canada Shipping Act designated oil handling facilities along the St. Clair River where petroleum products are being loaded or unloaded from ships.

Fisheries, Recreational Boating and Commercial Navigation Candidate Management Plan Recommendations for Actions in the U.S. Watershed:

Marine Industry Pollution Prevention

- 7-1. Develop and implement pollution prevention programs for marine industries and recreational activities
 - 7-1.a. *Expand pollution prevention programs to target boat maintenance and repair facilities in all counties bordering Lake St. Clair*
 - 7-1.b. *Support implementation of a Clean Marina Program to educate marina operators about best management practices in order to avoid pollution releases to the environment and encourage implementation of these BMPs*
- 7-2. Assure compliance with existing rules and regulations for watercraft users
- 7-3. Increase the number of pump-out stations in the watershed to accommodate increasing boater demand

Fisheries Management

Lake St. Clair continues to support a valuable fish community and fishery in spite of significant loss of its most valuable wetland habitat and colonization by invasive species. It is considered a world-class recreational fishery for yellow perch, smallmouth bass, muskellunge and walleye. Within the Walpole Island First Nation community, many families depend on the fish they catch for subsistence.

Some of the concerns for fish management in Lake St. Clair are:

- Loss of wetland habitats and native fish populations,
- Impacts of harmful invasive species,
- Shoreline hardening and ecological effects from the extra entrained energy;
- Climate warming;
- Channel modifications for commercial navigation and water level control;
- Chemical contaminants in the system, and
- User conflicts and impacts of boats on sensitive habitats.

Programs and Initiatives

Formal agreements on management and protection of shared fisheries resources are primarily based upon the Convention on Great Lakes Fisheries, a treaty between the two federal governments signed 1955. The treaty is administered by the Great Lakes Fishery Commission (GLFC), which provides the structure and institutional framework to resolve issues of common concern. The GLFC also develops coordinated programs of research on the Great Lakes and recommends measures that will permit maximum sustained productivity of fish stocks.

St. Clair River and Lake St. Clair Comprehensive Management Plan, June 2004
Chapter 7 – Fisheries, Recreational Boating and Navigation

Did you know...

The Great Lakes Fishery Commission has been working with management agencies to develop fish community objectives for Lake St. Clair.

The GLFC has been working with fish management agencies toward development of fish community objectives for Lake St. Clair. These objectives commit management agencies to protect and restore the lake's fish community. They are, in part, statements of qualities desired within the fish community and, in the case of yield, the kinds and quantities of fish that would be caught. The objectives reflect an understanding that natural systems are dynamic and provide some latitude in adjusting management approaches to different conditions that might arise. The GLFC completed draft fish community objectives for Lake St. Clair in 2003 and the public review process was initiated.

**Fisheries, Recreational Boating and Commercial Navigation
Candidate Management Plan Recommendations for Actions in the U.S. Watershed:**

Fisheries Management

7-4. Fulfill obligations under the Great Lakes Fishery Commission's *Fish Community Goals and Objectives for Lake St. Clair and Connecting Waters (St. Clair System)*

Navigational and Environmental Dredging

The St. Clair River Federal navigation project embodies a 40-mile section of the Great Lakes connecting channels flowing southerly from Lake Huron and discharging into Lake St. Clair. The initial 1892 authorization provided for a 20-foot deep channel. Subsequent authorized project modifications resulted in a current deep draft navigation project depth of 27 feet. The Federal channel is periodically (1-2 year cycle) dredged to remove shoals and maintain the project depth.

Federal navigation improvement on Lake St. Clair began with the construction of two dikes, completed in 1892. Subsequent project modifications included channel improvements (deepening and widening) and associated maintenance dredging. The project is now comprised of an 800-foot wide, 27.5-foot deep, up and downbound deep draft navigation channel that bisects Lake St. Clair in a northeast-southwest direction between the St. Clair Delta and the Detroit River. The Federal channel is periodically dredged (on five-year plus cycle) to remove accumulated sediments to maintain the 27.5-foot project depth.

The Federal channel improvements have impacted Lake St. Clair by altering flow regimes and replacing productive shoal-water habitat with less productive channel habitat. In addition, scientists believe that dredging the navigation channel has affected water levels, permanently lowering the levels of lakes Huron and Michigan by almost one foot (0.3 meters). While the public generally recognizes the need for commercial navigation and maintenance dredging to support waterborne commerce, people are also concerned about the siting of dredged material disposal sites, whether the sediments are clean or contaminated.

Prior to 1970, sediments removed from the Lake St. Clair navigation channel during maintenance dredging operations were routinely placed in the open water. In 1970, this disposal practice was suspended due to high mercury levels in the sediments. Subsequently, a confined disposal facility (CDF) was designed and constructed to

contain the dredged sediments from Lake St. Clair and portions of the St. Clair River navigation channels. The CDF was sited on a high pre-modern delta deposits on Dickinson Island adjacent to the St. Clair Delta's North Channel. This new disposal practice addressed the growing federal interest in pollution abatement and water quality restoration. To date, more than 500,000 cubic yards (CY) of contaminated sediments have been placed in the CDF and removed from the Lake St. Clair system as a result of maintenance dredging of the federal project. In addition, more than 700,000 CY of dredged material removed from the St. Clair River project have been placed in the CDF.

The removal of contaminated sediments for the specific purpose of restoration is usually termed environmental dredging. Environmental dredging was identified as an issue of concern in the St. Clair River RAP. Environmental dredging is being conducted to remove sediments that were contaminated by historical point source loadings along the upper reaches of the Canadian St. Clair River shoreline. While the contaminated site is outside of the shipping channel, there is the possibility that commercial and recreational use of the river, as well as weather related events could disturb the sediments.

Programs and Initiatives

United States: The USACE is the regulatory agency for navigation safety and improvements and work in navigable waters of the United States, and must approve plans to build or modify any structure or conduct work, including dredging, in or over such waters. When a USACE-operated CDF is available and has capacity, the USACE will consider whether or not it can be used for the disposal of dredged material from permitted dredging operations.

Section 404 of the Clean Water Act is the primary federal statute that regulates the discharge of dredged or fill material into waters of the United States. The USACE is the lead agency authorized to issue permits providing such discharges are within the guidelines published by the EPA to implement Section 404(b)(1) of the Clean Water Act and will not result in unacceptable adverse impacts on municipal water supplies, shellfish beds, wildlife, fisheries or recreational areas.

The Great Lakes Dredged Material Testing & Evaluation Manual is a regional guidance manual used for determining if a dredged material is suitable for placement in the Great Lakes. Developed by the USEPA and Corps, this manual is intended to be used as a decision making tool for dredge and fill permits issued by the Army Corps of Engineers, states or First Nations under Section 404 of the Clean Water Act. The manual can be accessed online at: <http://www.epa.gov/glnpo/sediment/gltem/>. This regional guidance is consistent with the national guidance presented in Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. - Testing Manual (USEPA/USACE, 1998), also known as the "Inland Testing Manual."

In Michigan, the USACE jointly administers this program with the MDEQ. The MDEQ requires a submerged lands, inland lakes and streams, shorelands or wetlands permit, depending upon where the activity is to take place. There is a list of 10 criteria that is used by state permit reviewer to determine the public's interest in the project as described in the 1994 Michigan Public Acts 324.30311(2).

While in water placement of dredged or fill material is regulated through the USACE's Section 404 regulatory program, upland disposal of dredged material is not. Michigan has established a Sediment Testing Procedure that is used to determine disposal requirements for dredged material if it is to be placed in the upland (as opposed to in water or in a CDF).

According to the procedure, where upland disposal is proposed, dredging projects with sediments having less than 95 percent sand and involving more than 300 cubic, require testing for metals, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs) to determine if the material is considered to be a solid waste. If the material to be dredged is determined to be solid waste it must be disposed of in a Type II or Type III licensed landfill. If material is determined not to be a hazardous waste, it does not require disposal in a landfill. Methods and contamination limits have been determined by the MDEQ under Part 115 of the Natural Resources and Environmental Protection Act (NREPA), and administrative rules, which contain regulatory authority for solid waste management. More information about the Sediment Testing Procedure can be found at: <http://www.michigan.gov/deq>.

The MDEQ has established dredging windows for certain waterbodies in the state and allowed dredging times are specified on permits issued for these waterbodies. Dredging windows are those periods of the year when dredging activities may be conducted because regulators have determined that the adverse impacts associated with dredging and disposal are minimized at these times. Additional timing requirements may be incorporated into permits based on comments provided by the Department of Natural Resources, Fisheries or Wildlife Divisions. With the designation of environmental areas under the Shorelands Rules, areas of fish spawning, nursery, feeding, protection and migration are restricted from dredging and filling activities without a permit from the department or local governmental agency.

Dredging techniques are specific to each project and permit. The M DEQ requires the least-impacting alternative, using best available technology. Requirements for preventing accidental takings of certain species are permit-specific. Protection measures have been required to be maintained during a dredging project in order to prevent harm to listed species.

The USACE operates the U.S. Federal navigation projects in the St. Clair River and Lake St. Clair. This responsibility includes maintenance of the navigation channels and related structures to ensure continued safe operation for the specified use. The USACE addresses the maintenance of the St. Clair River and Lake St. Clair navigation projects, including dredging and disposal and related environmental requirements and permits, through long- term, dredged material management plans. The USACE dredged material management planning process establishes the least costly, environmentally sound alternative. Other alternatives may be considered, although the local sponsor's cost share requirement may increase, based on related issues including beneficial use of the dredged material; local sponsor needs; and state regulatory requirements.

The USACE is currently addressing the controversial issue of open water disposal of slightly contaminated sediments. To this end the USACE is developing a procedure for evaluating the quality of dredged sediment and disposal methods so that it does not contaminate the receiving waterbody.

While the USACE has authority to remove sediments to maintain safe navigation, it has limited authority to control the sources of sediments or sediment contamination. Through the Great Lakes Remedial Action Plan program, the Corps has worked in partnership with state agencies in the Great Lakes region to develop plans for the remediation of contaminated sediments.

In 1996, the USACE was authorized to develop sediment transport models of Great Lakes tributaries which would highlight areas where soil conservation and non-point source control measures by state and local interests might be most effective in reducing the loadings of sediments to downstream navigation channels.

The Corps is also working with state and local agencies to perform environmental dredging of contaminated sediments from areas outside Federal navigation channels under its Environmental Dredging authority (Section 312, WRDA 96, as amended).

Canada: The Ontario MOE's Guidelines for the Protection and Management of Aquatic Sediment Quality sets safe levels for metals, nutrients and organic compounds for protection of the aquatic environment. These guidelines, published in 1993, replaced the Ministry's 1976 Open Water Disposal Guidelines. The Aquatic Sediment Quality guidelines are available online at www.ene.gov.on.ca.

Sediment cores taken along the Canadian side of the river have shown high concentrations of mercury, cadmium and chlorinated organic compounds. Corrective actions to reduce point source loadings have been taken by industries and municipalities and will continue as part of the St. Clair River RAP. The St. Clair River RAP 2000 Progress Report, Volume 1 – Synthesis Report and Volume 2 – Technical Addendum provide summaries of sediment and sediment benthic quality studies completed in the past few years. Additional information on the St. Clair River RAP is available at the Friends of the St. Clair website www.friendsofstclair.ca.

Dow Chemical Canada, Inc. has implemented a St. Clair River Sediment Remediation Project that focuses on a strip of riverbed, called the Outfall Area, immediately adjacent to its Sarnia site. The contaminants of concern, including mercury and chlorinated organic compounds, were deposited by historical operations no longer in use. While this shoreline contamination is not in the shipping channel, there is a possibility that contaminated sediment will be disturbed by the wake from commercial vessels and recreation boats. This was identified as an issue of concern in the St. Clair River RAP.

In 2002, a pilot project was initiated by Dow to test a hydraulic vacuum technology and a specially designed sediment and water management system. Intensive monitoring and engineering evaluation of the pilot project indicated that the removal technology was well suited to the unique conditions present at the St. Clair River site. Downstream monitoring during the pilot phase determined there was no adverse impact on drinking water anywhere in the river and no significant movement of sediment downstream. Phase 2, completed in 2003 removed the majority of this contaminated sediment – approximately 17,500 cubic meters over a distance of 700 meters. A final phase 3, expected to occur in 2004, will be required to complete the remaining 150-meter strip of riverbed.

**Fisheries, Recreational Boating, and Commercial Navigation
Candidate Management Plan Recommendations for Actions in the U.S. Watershed:**

Dredging

- 7-5. Support efforts of the Great Lakes Dredging Team to develop risk-based guidance to establish contamination thresholds for different beneficial use applications of dredged material, based on the physical and chemical properties and end uses
- 7.6. Ensure that all dredging is done in an environmentally sound manner, utilize dredging equipment and techniques that will minimize downstream impacts

Lake Levels

Between 1969 and 1999, the Lake St. Clair annual average water level was above the long-term average. The drop in water levels throughout the Great Lakes in the late 1990s and early 2000s resulted, in part, from low precipitation in the Lake Superior watershed during the winter of 1998-99, which caused less water to flow into that lake. A second reason was warmer air temperatures during 1999-2000, which caused warmer water temperatures and increased evaporation rates. See Chapter 1 for more information on lake levels and trends.

Freighters that carry iron ore to area steel plants suffered financially during this time because ships of varying size were forced to carry 100 to 270 metric tons less cargo for every inch that lake levels fell. A 1999 Michigan State University study said that Michigan marinas lost \$30 million that year due to high dredging costs.

The variation in water level is natural and the ecosystem of Lake St. Clair is adapted to the pattern of change. This pattern of change is necessary for the ecosystem to remain healthy. However, low water levels can reduce the amount of freight that commercial ships can carry and may cause access problems for recreational boats. High water levels increase the potential for flooding and shore erosion increasing the demand to harden shorelines. Home and cottage owners may need or want to extend docks and beaches in low water years and to protect residences in high water years.

Programs and Initiatives

See chapter 4 for information on programs and initiatives relating to lake levels. Recommendations can also be found in Chapter 4.

Invasive Species and Ballast Water Management

Since the 1800s, more than 160 aquatic invasive organisms, including plants, fish, algae and mollusks, have established themselves in the Great Lakes. Many of these are now found in Lake St. Clair and the St. Clair River. These species often have no native predators and out-compete native species for food and habitat. As a result, approximately 10 percent of these species are considered a nuisance and have created severe problems.

More than one-third of these invasive organisms have been introduced in the past 30 years, a surge coinciding with the expansion of the St. Lawrence Seaway. This evidence shows that shipping practices, most notably the discharge of ballast water from ocean-going vessels, have been responsible for the introduction of many non-native, aquatic invasive species into the Great Lakes. However, new species may also be introduced through aquaculture, baitfish shipments, and species acquired for aquarium use.

U.S. Coast Guard regulations require (see NANPCA and NISA below) that partially laden ships destined for the Great Lakes from abroad discharge and exchange their ballast water in mid-ocean with the intent to flush out potential invaders. However, this ballast water exchange program is only a first step to reduce future invasions.

Transport Canada is responsible for the management of ballast water on board ships entering Canadian waters. Guidelines regarding ballast water in the Great Lakes and St. Lawrence Seaway were developed in 1989 and extended to all Canadian waters in 2000.

Fully loaded ships are exempt from conducting any type of ballast management or treatment. These ships, which number about 400 and represent 80 percent of the ocean-going vessels transiting the Great Lakes each year, are known as “NOBOB” vessels because they declare to have “no ballast on board.” This claim is a misnomer. These vessels may actually contain between 50 and 100 metric tons of unpumpable water and residual sludge, in which invasive species can potentially reside. Those that survive can be resuspended during ballasting and de-ballasting operations and, thus, be discharged into the Great Lakes.

While published literature dating back to the 1890s suggests that invasions of invasive species are not new phenomena, modern studies show that more unwanted pests are poised to make their journey to the Great Lakes in the near future. Once introduced into the lakes, some species are easily spread by anglers and recreational boaters, especially those who do not thoroughly wash bait buckets or boat bottoms immediately upon haul out at boat ramps.

Given that interstate commerce is protected by the U.S. Constitution, international trade agreements, and the geographic scope of the Great Lakes, many believe that more action at the federal level in the United States and Canada is required to address this issue.

Programs and Initiatives

United States: The enactment of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA, Public Law 101-646) has provided federal legislative support for programs aimed at invasive species prevention and control. A Great Lakes program developed to implement and enforce U.S. regulations (at 33 CAR 151 Subpart C), as required through mandatory compliance with NANPCA, was enacted in May of 1993. These regulations stipulate that vessels bound for the Great Lakes exchange freshwater ballast with open-ocean salt water that contains organisms not likely to survive in freshwater.

In October of 1996, NANPCA was reauthorized through the National Invasive Species Act of 1996 (NISA). Under NISA, studies are assessing the effectiveness of various technologies for ballast water control. NISA also expands the ballast management

[St. Clair River and Lake St. Clair Comprehensive Management Plan, June 2004](#)
[Chapter 7 – Fisheries, Recreational Boating and Navigation](#)

program to be national in scope and requires detailed ballast exchange reporting by all vessels.

In August 2001, the Michigan Legislature passed Public Act 114 of 2001 to address the on-going invasion of invasive species. The law, which was supported by the maritime industry, requires the MDEQ to determine:

- Whether vessels operating on the Great Lakes and the St. Lawrence Seaway are complying with ballast management techniques,
- Whether ballast water management practices have been made a condition of passage on the St. Lawrence Seaway, and then
- Compile and maintain lists of vessels that comply with these management practices or treatment methods.

In February 2002 the U.S. Department of Transportation announced regulations for the St. Lawrence Seaway that require vessels to adopt and comply with best management practices for ballasting operations in order to minimize introduction and dispersal of aquatic invasive species. These management practices must be met before a commercial vessel can be cleared for transit in the seaway system. Management practices include:

- Regular inspection of ballast tanks, maintenance and removal of sediment accumulation
- Recordkeeping and reporting
- Application of precautionary principles to minimize ballasting operations in areas known to have toxic algae blooms and in areas where harmful aquatic organisms and pathogens, sewage outfalls and dredging are known to occur.

Moreover, the U.S. Environmental Protection Agency has prepared a Draft Ballast Water Report (2001) that summarizes the results of a study on aquatic invasive species in ballast water discharges. The final report which has not yet been released will include a number of regulatory and non-regulatory recommendations to address this issue. However, critics suggest that these initial steps are inadequate to sufficiently stem the tide of ongoing invasions. This report, entitled “Aquatic Nuisance Species in Ballast Water Discharges: Issues and Options” can be accessed online at:

http://www.epa.gov/owow/invasive_species/ballast_report.

On March 5, 2003, a bill was introduced to the U.S. Senate to reauthorize NISA as the National Aquatic Invasive Species Act (NAISA). If passed, NAISA will reauthorize and strengthen regulations required under NISA. Additionally, NAISA will require that all vessels equipped with ballast operating in waters of the United States shall have in effect an aquatic invasive species management plan that prescribes safe and effective means by which the master of the vessel shall minimize introductions and transfers of invasive species.

Canada: Under Transport Canada guidelines, all ships entering Canadian waters must verify compliance and samples may be taken from their ballast water. Currently, this is a voluntary program for the purpose of reducing the risk of introducing harmful aquatic non-indigenous organisms and pathogens. Flushing and refilling a ship’s ballast tanks with mid-ocean saltwater while still at sea is currently the most accepted method of control but it is not always effective.

Binational: The Great Lakes Panel on Aquatic Nuisance Species is a coordinative body that works on aquatic nuisance species prevention and control in the Great Lakes. This panel is comprised of representatives from U.S. and Canadian federal agencies, the eight Great Lakes states and the province of Ontario, regional agencies, user groups, local communities, tribal authorities, commercial interests, and the university and the research community. The panel was officially convened in late 1991 by the Great Lakes Commission in response to section 1203 of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (P.L. 101-646), which directed the panel to perform the following tasks:

- Identify Great Lakes priorities
- Assist and make recommendations to a National Task Force on Aquatic Nuisance Species (also established via P.L. 101-646)
- Coordinate exotic species program activities in the region
- Advise public and private interests on control efforts
- Submit an annual report to the task force describing prevention, research and control activities in the Great Lakes basin

**Fisheries, Recreational Boating and Commercial Navigation
Candidate Management Plan Recommendations for Actions in the U.S. Watershed:**

[Aquatic Invasive Species and Ballast Water Management](#)

- 7-7. Prevent the introduction of aquatic invasive species from ballast water and other commercial vectors throughout the Great Lakes-St. Lawrence system
- 7-8. Evaluate and recommend ballast water management practices and treatment technologies
- 7-9. Disseminate educational materials to prevent and limit the spread of aquatic nuisance species by recreational boaters, fishermen, and riparian property owners

Public Access

Public access is a term generally associated with boat launch facilities, but it is much more than just boating areas. Public access also includes providing areas where people can just go to enjoy the natural beauty of the watershed, to picnic and play within the watershed, and to have an opportunity for quiet reflection. More information about public access and recreational areas can be found in Chapter 6.

**Fisheries, Recreational Boating and Commercial Navigation
Candidate Management Plan Recommendations for Actions in the U.S. Watershed:**

[Public Access](#)

- 7-10. Provide adequate public access to Lake St. Clair by means of environmentally sound marinas, boat launches, and related facilities

Conclusion

The Lake St. Clair watershed provides some of the best opportunities for boating, fishing, diving and swimming in the Great Lakes region. Recreational boating and commercial navigation on these waterways contribute significantly to the economy of southeast Michigan and southern Ontario. However, these activities and the infrastructure that supports them degrade the integrity of the natural systems of Lake St. Clair and the St. Clair River. Responsible management of these resources must seek sustainable solutions that allow competing uses and ecological vitality.

The excellent fishing, relatively clean and protected water, interesting islands and bays, accessible boating facilities, and proximity to major urban areas has made Lake St. Clair one of the major recreational boating centers in the nation. Based on conservative estimates, boaters on Lake St. Clair contribute more than \$249 million per year to the economy of southeast Michigan. The recreational opportunities of the lake are directly tied to the health of the lake's ecosystem.

The availability of reliable water transportation attracted European settlement to the region. Today, much of the local economy still relies on commercial shipping to move products such as petroleum and grain to all parts of the Great Lakes and the world with between 4,000 and 5,000 commercial vessel transits each year. In many instances, water transportation in the Great Lakes region has the potential to be both economically and environmentally preferable to other modes.

However, the alteration of the lake and river to accommodate these ships and the activity of commercial and recreational vessels has resulted in damage to the St. Clair ecosystem in the form shoreline hardening, sediment cycle alterations, increased erosion through increased wave action, and disruption of fish and wildlife habitat and populations. Recreational boating also impacts the system by contributing pollutants and disrupting fish and wildlife and habitat. Although the individual boater impacts may be insignificant, the cumulative effect of many boaters can have more serious effects.

The benefits and impacts of recreational boating and commercial shipping are clearly outlined in this chapter. While promoting these economically advantageous activities, the impact of recreational boating and commercial shipping on the sustainability of Lake St. Clair's fish and wildlife populations must be given careful consideration prior to any management decision that alters the natural system of the lake. Finding a sustainable management plan for the Lake St. Clair-St. Clair River system requires finding solutions that simultaneously benefit the environment, the economy and society.

