

Chapter 6: Strategic Action Agenda: Next Steps

Status of the Lake Michigan Ecosystem

“An outstanding natural resource of global significance, under stress and in need of special attention”

Lake Michigan supports many beneficial uses: safe drinking water for 10 million; internationally significant habitat and natural features; food production and processing; fish for food, sport and culture; and valuable commercial and recreational activities. The quantity and quality of Great Lakes water has recently caused international debate over exporting possibilities.

Nonetheless, despite 20 years of overall reductions in conventional and toxic pollutant loads, data indicate pollutants still exert negative impacts on the chemical, physical and biological components of the Lake Michigan ecosystem. The irreversible damage of aquatic nuisance species demands immediate attention, as does monitoring for the potential effects of global climate change. The current rate of sprawl and resulting habitat destruction is causing irreversible habitat loss in the basin.

The remaining challenges are significantly related to legacy contamination that results in fish consumption advisories, impairment to aquatic organisms and wildlife. Nonpoint source pollutants result in episodic beach closures, drinking water impacts and pesticides have been detected in the open water. The long-range transport of both airborne pollutants and non-native species into the ecosystem pose serious environmental and national/international management issues. The lake, as a natural system, is also a moving target and presents the challenge to have continual monitoring and assessment based on indicators of environmental status collectively agreed upon.

Lake Michigan has 10 Areas of Concern that have documented from 5 to 14 beneficial use impairments on a local level. A number of major and hot spot removals and other measures are addressing and preventing pollution but much remains to be accomplished in these areas and sufficient commitments are not in place.

Recommended Short Term Strategic Agendas

Human Health Agenda: Determine what level of statutory protection is adequate for the drinking water source for 10 million people and convene coastal communities to determine what are the necessary actions to open all the lake’s beaches, focusing attention on sewer systems and runoff.

Restoration and Protection Agenda: Identify the eco-rich areas in the basin, the connecting corridors and flyways, the fish spawning areas, the status of protection, and provide the data on line.

Sustainable Use Agenda: Provide assistance to LaMP partners to enable them to more effectively manage, maintain and beneficially use the Lake Michigan ecosystem. Ensure lakewide ecosystem perspectives are integrated into land use planning activities.

Remediation and Pollution Prevention Agenda: Address all legacy sites so that plans are under way in the next two years at all 10 AOCs and other Superfund sites. Begin at least one pollution prevention project for a major source of mercury, aquatic nuisance species (ANS), non-point source pollution and pesticides in the basin by 2002.

Information Sharing, Collaboration, and Stewardship Agenda: Work in partnership to provide information and tools to the coastal communities and promote watershed planning, including agriculture pollution prevention. Coordinate with the Great Lakes Fishery Commission on ANS and other issues.

Research and Monitoring Agenda: Complete the LMMB model runs and EEGLE project, and promote dialogue and research on long range transport issues. Implement the Lake Michigan Monitoring Coordinating Council and collaboratively develop a monitoring plan for the basin that supports data needs for long range air transport research and TMDL efforts.

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Chapter 6: Strategic Action Agenda: Next Steps

6.1 About This Chapter

The purpose of this chapter is to present a Strategic Action Agenda by moving the issues and action items forward from previous chapters. Attempt has been made to match the sources and stressors with actions from programs that are addressing the problem, new actions, and determine gaps in data that identify research and monitoring needs. Reduction targets have been pulled from other initiatives to use as a reference point in discussions. In some cases, they represent national commitments, while others are challenges. Section 6.2 of this chapter highlights the next steps leading to LaMP 2002.

Agencies Actions

In the 30 years since the first Earth Day in 1970, much of the tall stacks and end-of-the-pipe pollution has been effectively controlled by what are now core regulatory programs at the federal, state, and tribal level. We are left with a set of difficult, persistent problems that remain due to their multifaceted nature. In response, agencies are developing new tools to address the complexity (for example, Total Maximum Daily Loads [TMDL], mass balance models, and layering information on maps using Geographic Information Systems [GIS]). All of these tools pull together multiple sources of data and provide insights to solving the problem. The effective use of these tools to remediate and preserve an ecosystem requires the convening of multiple agencies and stakeholders in the LaMP process described in Chapter 1. This requirement recognizes the importance of partnerships and education and outreach actions that are included in the action agenda.

The most sobering findings are the documentation of emerging problems. The global scale of both the long-range transport of air pollution and the irreversible damage of aquatic nuisance species (ANS) presents management challenges on an equally large scale. The very real potential of global climate change and endocrine disrupting pollution effects, adding to an already full environmental agenda, requires that issues be prioritized with the lead role assumed at the most effective level. Determining a value-added role for a lake basin LaMP for these issues involves a very pressing need for public discussion in the next 2 years. The discussions leading toward the development of a Great Lakes Five-Year Strategy may be the most appropriate scale and level to address these types of issues.

Lake Michigan LaMP Goals and Objectives

Great Lakes Water Quality Agreement of 1978

The purpose of the Parties is to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem.

Lake Michigan Vision Statement-Desired Outcome

A sustainable Lake Michigan ecosystem that ensures environmental integrity that supports and is supported by economically viable, healthy, human communities

Lake Michigan LaMP Goal

To restore and protect the integrity of the Lake Michigan ecosystem through collaborative, place-based partnerships.

As part of adaptive management, assessments of existing programs have recently taken place, with the results to be announced or to become effective in the next 2 years. For example, the Clean Water Action Plan was issued in 1998 to address nonpoint source programs that were not achieving the predicted results, and a number of new and refocused methods and procedures are revitalizing ways to address this important source of pollution to Lake Michigan. This suite of actions, involving both regulations and guidance, will work best with appropriate and effective watershed land use plans as a base.

EPA has delivered assessment reports to U.S. Congress on mercury, dioxin, and the impact of long-range transport of air pollution on Great Waters. By 2001, EPA will determine whether to regulate mercury emissions from electric utilities. In addition, a number of new standards and guidelines for municipal waste combustion will reduce mercury and dioxins from these sources by 78 and 98 percent, respectively, when fully implemented in 2000. Similar standards for medical waste incinerators will be implemented by 2002. EPA is also reviewing the effectiveness of the current ballast exchange program to respond to a petition that requested EPA to require permits for discharge of ballast water. A decision on this is expected in 2000.

The large amount of programs and projects in the basin are just barely covered in this document. We have attempted to present examples of some of the efforts that the LaMP process initiated or works with to address an impairment. We present the stakeholders directory and internet addresses to provide linkages to some of the other programs.

LaMP Action Discussion

The next few years will produce not only new tools but also the pressing need to use the available tools, scientific understanding, and predictive models based on mass balance data to stimulate dialogue and decisions about the targets for further load reductions, preservation, and pollution prevention activities. The LaMP actions outlined in this chapter that are underway and proposed are based on the 1998 goals and objectives work, but they can be refined or reprioritized based on new data and modeling results, if necessary.

As part of the 1998 Green Mountain Institute for Environmental Democracy exercise to set goals and objectives using comparative risk tools, the Lake Michigan Technical Coordinating Committee (TCC) and Forum utilized the following framework for determining goals, objectives, and priority actions. While there was not a completed LaMP at the time, the general knowledge and findings were generally known and discussed with the participants.

The following criteria were used in establishing LaMP priorities:

1. Restore, protect, and enhance human and ecological health
 - Does the activity result in a decreased threat to human health?
 - Does the activity result in protecting the ecosystems capacity to (1) promote biodiversity, (2) support species of interest, (3) perform ecological functions, (4) remain resilient to other threats (natural and anthropogenic)?
2. Foster partnerships, leverage funds, and raise awareness of the LaMP effort
 - Does the activity result in linkages among organizations that can work together to protect, enhance, and restore Lake Michigan's environmental status?
 - Are there links to other organizations or activities that are able to increase their investment as the result of this activity?
 - Will this activity raise the awareness of issues surrounding Lake Michigan's ecosystem?

3. Build capacity, utilize existing structures, promote commitment, and timeliness
 - Will this activity provide the infrastructure, staff capability, and knowledge base for additional activities that improve the quality of Lake Michigan's ecosystem?
 - Does this activity rely on existing infrastructure, staff capability, and knowledge base thereby elevating the importance of those previous investments and activities?
 - By carrying out this activity, will managers and leaders better recognize the overall benefits of protecting the Lake Michigan ecosystem, or at least some aspect of its protection?
 - Does carrying out this activity NOW provide benefits that will be lost if the activity is carried out only at a later date?

4. Reduce uncertainty and link science with management
 - Will the completion of this task provide some information that will allow further decisions regarding the lake's ecosystem to be made with more certainty regarding the impacts?
 - Will this activity make it easier to introduce information into decision-making that affects the lake?

5. Technically, politically, and fiscally feasible
 - Do we have the technical knowledge and tools to carry out the activity?
 - Is there political will and authority among those providing the resources and making the decisions to make this activity take place?
 - Are the resources available to carry out this activity?

6. Fits within the scope and scale of the LaMP
 - Is the responsibility for this activity affected by the responsibilities of the agencies and stakeholders involved in the LaMP process?

In 1999, a series of meetings were held. The Lake Michigan Mass Balance Project and its early results were presented to state agencies in each state capital, to the Lake Michigan Forum, and at the State of Lake Michigan Conference, Muskegon, Michigan. The Forum conducted three public workshops on Sediments, Biological Pollution, and Sustainable Urban and Rural Landscapes. The results of the workshops and recommendations were forwarded to the TCC and provide additional input to the priority setting.

Lake Michigan LaMP: General Recommendations 2000-2010 and Specific Action Examples

The Lake Michigan ecosystem is a moving target. We find it is an outstanding natural resource under stress and in need of special attention. Actions will not provide immediate results, so working toward an improved lake for 2010 requires a concerted and aggressive time frame for efforts in the first decade of the 21st century. The following 15 general recommendations evolved from the Green Mountain Institute for Environmental Democracy exercise and continued discussions at meetings, workshops, and conferences. The long-term goal of a pollution- and problem-free lake must happen project by project. The recommendations describe *what* needs to be done, and we hope that all parties will see the potential for their roles and programs. There are many *hows*, and we hope we have provided some clear direction for partners and others.

Recommendations

1. **Ballast Water Control** - The Great Lakes are not only impacted by aquatic nuisance species causing irreversible damage but also serve as a pathway to other connected ecosystems. Standards or guidelines should be developed for ballast water treatment, working toward zero discharge.
2. **Clean Legacy Sites** - The Lake Michigan Mass Balance Project has confirmed that contaminated sediment sites in the lake remain an ongoing source of contamination in the food web, causing fish advisories and delaying dredging of navigable waterways, both of which affect local economies. In order to move swiftly to clean up contaminated legacy sites, both on land and at sediment sites, we will convene federal and state Superfund, RCRA Corrective Action, Drinking Water, and Surface Water programs for planning discussions focused on the Lake Michigan ecosystem. The goal is to complete almost all plans by 2005 and actions by 2010. A few of the major sediment sites may require additional time.
3. **Protect Source Water** - As the drinking water source for 10 million people, with globally significant features, it is important to determine if the level of protection is sufficient using the state assessments that delineate source areas and assess significant potential sources of contamination. If the assessment indicates that the intake is not affected by potential shoreline contaminants, then RAP, LaMP, and mass balance materials would be used. Consideration should also be given to the question of exporting the resource.
4. **Protect Habitat** - It is important to determine a priority for preservation sites within the recently mapped ecologically rich clusters, including connecting corridors between clusters as well as the sites identified in the North American Waterfowl Management Plan. Wetland areas, particularly those with connection to the lake that are important to many species, and restoration of coastal brownfields to greenfields, should be highlighted. Natural areas not only provide habitat but also serve to filter sediments and nutrient runoff as well as to store flood waters and recharge groundwater. Provide this information on line.
5. **Fish Collaboration** - Develop joint projects with the Great Lakes Fishery Commission that implement both the LaMP and the Joint Strategic Plan for Management of Great Lakes Fisheries. Collaborate on the development of fish spawning maps to aid protection and provide adjacent land use planners with tools and data.
6. **Match Decision Makers with Issues** - Convene and engage the appropriate level of government and other nontraditional groupings to accomplish LaMP goals and match the needed control with the most likely control point by promoting the following:
 - National dialogue for control of aquatic nuisance species and air deposition of toxics
 - Academic and agency dialogue to promote sharing of data, define research needs, and develop lake-related courses
 - Local dialogue to provide tools and a lakewide perspective to land use planners
7. **Control Combined Sewer Overflows (CSO) Sanitary Sewer Overflow (SSO)** - The mixed discharge of storm water and domestic waste causes beach closings and is a pathway for pathogens to enter the lake. Provide tools, training, and data to local governments to promote full compliance with CSOs, SSOs, and storm water regulations, and system maintenance with awareness of land use planning on a watershed basis.

8. **Develop Agriculture P2 Strategy** - Include and coordinate among states, NRCS, and the Lake Michigan Forum's Agriculture Task Force to promote nonpoint source pollution prevention using stream planted buffer strips and pollution prevention for pesticides, confined animal feed operations, and nutrient controls. Food web disruptions in Lake Michigan relate to sedimentation and continuing nutrient pollution.
9. **Implement Areas of Concern (AOC) Remedial Action Plans (RAP)** - AOC RAPs are in various stages of completion. Many RAP and watershed groups, as well as local communities, have included the watershed in their planning and have developed a list of priorities found in Addendum 6-B. These groups need support that include tools, technical assistance and training, and some level of funding to provide the ability to leverage scarce resources.
10. **Fill Data Gaps** - Promote research with the following goals:
 - Define in-basin and out-of-basin air pollution
 - Develop technology to control aquatic nuisance species in ballast water
 - Understand pesticides, pathways, and longevity in open water
 - Reuse contaminated sediments
 - Understand endocrine disruptors, their effects, sources, and possible controls
 - Identify fish spawning site locations
 - Review and refine Lake Michigan pollutants list
11. **Clean Sweep Strategy** - Years after certain pesticides were canceled and restricted, pesticides such as DDT/DDE, dieldrin, and chlordane; they are still recovered in clean sweep operations, indicating the effectiveness of the tool. However, there is no special source of funding for these activities; therefore there is a need to develop a strategy to ensure long-term consistent funding or ownership of annual pesticide, household hazardous waste, and small business PCB/mercury Clean Sweep programs for each state.
12. **Measure and Report** - Continue development of the Lake Michigan Monitoring Coordinating Council and jointly develop a Monitoring Plan for Lake Michigan that includes expanding the USGS National Water-Quality Assessment Program (NAQWA) monitoring to Michigan's eastern shore and drainage. Develop a strategy for duplicating the coordinated monitoring (simultaneous air, water, land, open water and tributary mouths) of the Lake Michigan Mass Balance Project (LMMB 1994) in 2004 to have data for a 10-year analysis. Establish a beach community monitoring network and a volunteer basin monitoring network.
13. **On-Line Information, Public Involvement Activities** - Promote sharing of public information and public involvement by providing the following: (1) on-line data site that includes public health information, (2) an on-line habitat atlas of the basin showing ecologically rich areas, and (3) a running summary of comments and responses. Continue the Forum's public meetings, workshops and boat tour in partnership with organizations such as Grand Valley State University, which also sponsors the State of Lake Michigan Conference.
14. **TMDL Strategy** - Total Maximum Daily Loads (TMDL) must be developed when waters do not meet state-adopted water quality standards, even after the implementation of technology-based controls. TMDLs are calculated to return waters to their designated uses. States develop TMDLs for their tributaries, and a strategy for cooperative TMDL work for Lake Michigan that includes a public involvement process is needed.







15. **Stewardship Actions** - The majority of the land that drains to the lake is privately owned and managed. America's cities and towns account for 80 percent of energy use. Of that 80 percent, land use planning and urban design affect about 70 percent, or 56 percent of the nation's total energy use. Energy production and transportation are major sources of air pollution. The message from these statistics is that every basin resident is a "Lake Michigan Manager." We need to strengthen partnerships with other education and outreach efforts to promote the activities necessary to accomplish the following: (1) promote recycling efforts, energy and water conservation, and trash barrel burning awareness; (2) place special emphasis on preventing the spread of aquatic nuisance species by boat owners for the next 2 years; (3) communicate the importance of private efforts in habitat preservation on both public and privately owned land; and (4) develop an Areas of Stewardship program for local communities and watersheds.






Action Examples

Figure 6-1 presents the goals, objectives, and actions by subgoal and places them in strategic groupings called agendas to aid "implementers" who will approach the LaMP with a point of view (such as a researcher, regulator, or volunteer steward). Addendum 6-A to this chapter contains a comprehensive list of all the objectives and short, medium, and long-term actions needed to achieve these objectives. Addendum 6-B contains a list of the Lake Michigan AOC RAP priorities. Table 6-1 includes several examples of short-term actions, both planned and proposed, which were extracted from the information presented in the two addendums.

Much of the work reflected in the Strategic Agenda can be accomplished by focusing the efforts of existing programs. However, success will require coordination among those programs as well as special basin-wide initiatives because of the basin's size and multiple political jurisdictions. While government agencies are in a position to provide leadership for implementing the LaMP, success will depend on leveraging private sector and nongovernmental organization involvement and resources. A major component of success will require engaging local government, whose authority and local decision-making collectively have a significant impact on the natural resources and sustainability of communities throughout the Lake Michigan basin. All of these steps require institutionalized coordination and strong communication among government agencies and stakeholders. Therefore, the Strategic Action Agenda presents a Lake Michigan LaMP implementation process and roles for not only participating governmental agencies, but also the Lake Michigan Forum, other basin stakeholders, and the general public.

Figure 6-1 Strategic Groupings


End Point Subgoals			Strategic Action Agenda
Subgoal 1	We can all eat any fish.		Human Health Actions that prevent human exposure to pollutants in the ecosystem and prevent or minimize sources
Subgoal 2	We can all drink the water.		
Subgoal 3	We can all swim in the water.		
Subgoal 4	All habitats are healthy, naturally diverse, and sufficient to sustain viable biological communities.		Restoration and Protection Actions that restore, enhance, and sustain the health, biodiversity, and productivity of the ecosystem
Subgoal 5	Public access to open space, shoreline, and natural areas is abundant and provides enhanced opportunities for human interaction with the Lake Michigan ecosystem.		Sustainable Use Actions that concurrently sustain the health of the environment, the economy, and the communities of the ecosystem
Subgoal 6	Land use, recreation, and economic activities are sustainable and support a healthy ecosystem.		

Means (to End Points) Subgoals			Strategic Action Agenda
Subgoal 7	Sediments, air, land, and water are not sources or pathways of contamination that affect the integrity of the ecosystem.		Remediation and Pollution Prevention Actions that achieve substantial pollution reduction by remediating sites, controlling pathways, preventing or minimizing sources
Subgoal 8	Exotic species are controlled and managed.		
Subgoal 9	Ecosystem stewardship activities are common and undertaken by public and private organizations in communities around the basin.		Information Sharing, Collaboration, and Stewardship Actions that provide data access and exchange, facilitate involvement, and build capacity
Subgoal 10	Collaborative ecosystem management is the basis for decision-making in the Lake Michigan basin.		
Subgoal 11	We have enough information/data/understanding/indicators to inform the decision-making process.		Research and Monitoring Actions that monitor the ecosystem, reduce uncertainty, and inform our decisions

The following matrix of actions (see Table 6-1) are examples of the work both planned and underway to accomplish the goals and objectives. These actions are grouped by strategic agenda. Some actions are stand-alone actions but many are linear, with a first step defined in the short term in order to accomplish the long-term objective. For the purpose of this plan, short term refers to the next 2 years. Stewardship actions could also make a significant impact on the lake if begun now, utilizing partners and the data, tools, and training provided by the LaMP process. The listing is not complete and suggestions are welcome for funding items that lack funding and for new projects that should be highlighted.

Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>HUMAN HEALTH AGENDA - Actions that prevent human exposure to pollutants in the ecosystem and prevent or minimize sources</p>	 <p>Funding Status</p>
<p><i>Impairment: Drinking Water Restrictions</i> <i>Stressors: Pathogens, Chemicals</i></p> <p>HH1. Assess Sources of Drinking Water EPA and all the Great Lakes states, tribes, and local water utilities have adopted a Great Lakes Source Water Protection Protocol for use in source water assessments to be conducted by 2003. The standardized protocol for conducting assessments of public drinking water supplies will delineate source areas and assess significant potential sources of contamination in order to protect water supplies and inform beach managers.</p>	<p>Funding Status</p> <p>Lead: LK MI States, Tribes Assist: EPA, local communities Forum Priority</p>
<p><i>Impairment: Beach Closings</i> <i>Stressor: E. Coli in Surface Water</i></p> <p>HH2. Convene Great Lakes Beach Conference Convene a National Great Lakes Beach Conference in Chicago in 2001 to provide the latest in <i>E. coli</i> guidance, research and other beach issues such as lake levels. Research is underway to develop quicker methods of testing for <i>E. coli</i> and using DNA to help pinpoint the contamination source responsible for beach closings. This will build upon East and West Coast Conferences but add the fresh water focus.</p>	<p>Funding Status</p> <p>Lead: EPA Headquarters, Region 5 Assist: City of Chicago, National Park Service, RAP Priority</p>
<p>HH3. Convene Lake Michigan Beach Communities Convene the Lake Michigan Beach Communities to explore establishing a Lake Michigan Beach Task Force to facilitate communication, technology transfer, and data sharing at the local level of government with beach management responsibilities. The Task Force could benefit from the work of the Northwest Indiana <i>E. coli</i> Task Force and the Lake Michigan Monitoring Coordinating Council.</p>	<p>Lead :EPA Assist: LK MI States, NW IN E-Coli Task Force, Funding needed for local government participation and facilitation</p>
<p>HH4. Implement EPA Region 5 Capacity, Management, Operation and Maintenance Pilot (CMOM) EPA will work with one state and beach community to run a pilot to review the wastewater collection and treatment systems to pinpoint system problems and solutions. Possible follow up to pilot involves work with states to provide local governments with planning tools as a key to addressing control strategies for CSOs, SSOs, storm water permits, and other issues.</p>	<p>Lead: EPA Forum Priority</p>
<p>HH5. Provide On-Line Human Health Information By the end of 2000, utilize the Great Lakes Information Network (GLIN) to provide a human health information site with links to each state department of health site and other federal agencies sites.</p>	<p>Lead: EPA grant to Great Lakes Commission</p>
<p>HH6. Promote Epidemiological Research on Water-Borne Disease in the Lake Michigan Basin Promote epidemiological research on exposure and health effects from water borne diseases for both recreational and drinking waters.</p>	<p>Lead: NIEHS, ATSDR, EPA Funded nationally; no funding targeted for Great Lakes Basin.</p>


Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

	Lead: EPA Beach Program
	Funding Status
<p>HH7. Continue Development of Rapid Sampling Technologies and Techniques for Microbial and Viral Contamination Promote the dissemination and use of the instrument and sampling methods to local governments. <i>Impairment: Restrictions on Fish and Wildlife Consumption</i> <i>Stressor: Mercury</i></p>	<p>Lead: MI and WI Assist: EPA GLNPO Grant</p>
<p>HH8. Remove Mercury from Dairy Farms (Michigan and Wisconsin) Michigan Department of Agriculture and Wisconsin Department of Natural Resources, at reduced cost to farmers, will replace mercury manometer gauges used on dairy farms with nonmercury gauges, reducing the potential for spilling mercury into the environment. Mercury gauges will also be collected from inactive dairy farms.</p>	<p>Lead: EPA, ATSDR Assist: IL, IN, Sea Grant</p>
<p>HH9. Increase Awareness, Use, and Effectiveness of Fish Advisories Increase awareness, particularly among high consumption populations in the Lake Michigan basin (minority, subsistence fishers, and immigrants) and sensitive population (women of childbearing age, children, and the elderly)</p>	<p>Lead: EPA/OST Unfunded Future Project Assist: IL, IN, Sea Grant</p>
<p>HH10. Research Health Benefits of Fish Consumption Research the health benefits of fish consumption to better quantify those benefits for use in risk assessment for developing fish consumption advice.</p>	
<p>Other actions to address this impairment are included under the Restoration and Protection Agenda and the Means to an End Subgoal Agendas</p>	

Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>RESTORATION AND PROTECTION AGENDA - Actions that restore, enhance, and sustain the health, biodiversity, and productivity of the ecosystem</p>	 <p>Funding Status</p>
<p><i>Impairment: Loss of Fish and Wildlife Habitat</i> <i>Stressors: Physical Destruction, Nonpoint Source, and Invasive Species</i></p> <p>RP1. Protect Tributaries from Agricultural Loading (Wisconsin, Indiana, and Michigan) Wisconsin Department of Natural Resources and Michigan Department of Agriculture are undertaking new efforts to protect tributaries from the nonpoint discharge of ammonia, pathogens, and other unregulated pollutants from confined animal feeding operations with greater than 1,000 or more animal units. They will be using compliance assistance activities, and Wisconsin will issue WPDES permits in state priority areas.</p>	<p>Lead: WI, IN and MI Assist:</p>
<p>RP2. Implement (or develop) Great Lakes Aquatic Nuisance Species Action Plan The Great Lakes Panel on Aquatic Nuisance Species Spring 2000 Great Lakes Action Plan responds to the need for a formal mechanism to facilitate interstate decision-making and joint actions to pursue nuisance species prevention and control and has been presented to the Council of Great Lakes Governors. A national plan is also called for in the February 1999 Executive Order on Invasive Species and is due in 2000.</p>	<p>Lead: ANS Panel Assist: GLC GLNPO grant, Great Lakes Fishery Commission, IL and IN Sea Grant Forum Priority</p>
<p>RP3. Implement Great Lakes Aquatic Habitat Network and Fund The Tip of the Mitt Watershed Council will help increase citizen involvement in aquatic habitat protection at the local level by providing direct support to local initiatives through the Great Lakes Aquatic Habitat Network and Fund mini-grant programs to local groups.</p>	<p>Lead: TIP of the MITT Assist: GLNPO grant Need funding to expand Forum Priority</p>
<p>RP4. Ballast Water Management and Pollution Prevention Develop clear and concise biological standards or guidelines for treatment of ballast water tanks working toward zero discharge. Focus on best practical technology and devise a short-term plan for dealing with the No-Ballast-On-Board (NOBOB) issue. Require newly built ships to incorporate technology as pollution prevention for the ballast water problem.</p>	
<p>RP5. Identify Clusters of Eco-rich Regions, Species by County EPA, federal, state and tribal partners have produced an analysis of clusters of remaining ecologically rich regions remaining in the basin and will provide it on-line by 2002. The Region's and the USFWS' analysis of species by county provide the base for a discussion of protection targets and is another useful tool for land use planners providing lakewide perspective on eco-rich regions. This data will be incorporated into the on-line Lake Michigan atlas and will serve as the base for prioritizing protection activities in the basin and clarifying connecting coordinators and other elements that should be considered for protection</p>	<p>Lead: EPA, USFWS, States, Tribes Assist: Conservation groups RAP and Forum Priority Follow-up unfunded</p>



Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>RP6. Develop Habitat and Biodiversity Recovery Plans The fate of habitat and biodiversity is controlled by local land use planners. A biodiversity recovery plan tailored to different basin areas would provide tools and information on protection and restoration methods. The Chicago Wilderness/Southern Lake Michigan (including Indiana and Wisconsin areas) biodiversity pilot has developed an implementation manual for the local planners in the Illinois area of the basin. This pilot provides a template for developing similar implementation manuals for the whole lake, tailored by state or area, and could be provided on line. The basic data exists but a partnership and committee will be needed to reformat or add data.</p>	<p>Lead: Northeastern Illinois Planning Commission Assist: Need partners, funding Rap Priority</p>
<p>RP7. Convene LaMP/RAP/Superfund Forum on Habitat Restoration LaMP and RAP habitat priorities will be presented to EPA Remedial Project Managers in 2000 at a forum to exchange site information and discuss the potential to include habitat restoration as part of site remediation.</p>	<p>Lead: EPA Assist:</p>
<p>RP8. Inventory Northwest Indiana Wetlands Northwest Indiana Advanced Identification of Wetlands (ADID) project will be complete by the end of 2000. This wetlands inventory in the Lake Michigan basin portions of Lake, Porter, and La Porte Counties will provide an assessment of their biological and hydrological functions. It will include floristic diversity, wildlife habitat, stormwater retention, and water quality or mitigation functions. The GIS-produced maps will use the National Wetlands Inventory with a variety of overlays that includes nature preserves, flood control, and recreation areas and the Area of Concern. This effort is intended to assist community planners and developers with the advance notice of high quality wetland locations in this fast developing area.</p>	<p>Lead: EPA Assist: IDEM, IDNR, and many local partners</p>
<p>RP9. Develop and Implement Purple Loosestrife Control Strategies for Urban Wetlands The City of Chicago, Department of Environment is devising a strategy of manual, biological, and chemical controls specifically suited to the urbanized wetlands of the Lake Calumet, southern Lake Michigan area. Implementation of herbicide treatment and leaf-eating beetles will focus on the 140-acre Indian Ridge Marsh.</p>	<p>Lead: City of Chicago Assist: GLNPO grant Forum Priority</p>
<p>RP10. Continue "Go Native! With Native Plants" Program Michigan Association of Conservation Districts will continue their program to develop prototypes of successful native plants working with private growers and other local, state, and federal agencies throughout the Great Lakes Basin with the goal of stimulating commercially available materials and education programs.</p>	<p>Lead: MACD Assist: EPA GLNPO, Partners Forum Priority</p>
<p>RP11. Provide Funds for Coastal Restoration USFWS coastal program is providing small grants to restore stream-side habitat important to native recreational fisheries, restore shoreline wetlands to improve fish spawning success, and to acquire habitat for Piping Plovers and Bald Eagles. These small grants will leverage partners funds.</p>	<p>Lead: USFWS Assist: Partnerships</p>



Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>SUSTAINABLE USE AGENDA - Actions that concurrently sustain the health of the environment, the economy, and the communities of the ecosystem</p>	 
<p><i>Impairment: Degradation of Aesthetics</i> <i>Stressor: Physical - Land Use</i></p>	<p>Funding Status</p>
<p>SU1. Provide Brownfields to Greenfields Technical Assistance Superfund will assist LaMP/RAP partners to provide education and technical assistance on Brownfields redevelopment and possibilities of restoration and increased acreage of naturalized spaces in the Lake Michigan basin through outreach to land use planners and holding a conference in 2001.</p>	<p>Lead: EPA Assist :States RAP and Forum Priority</p>
<p>SU2. Develop Land Use GIS-Based Decision Support System Software By 2001 EPA will make available on line two software programs as decision support systems to estimate the hydrological and water-quality impacts of alternative land use development scenarios; the second program calculates environmental impacts for transportation-derived air quality parameters.</p>	<p>Lead: Purdue Assist: EPA</p>
<p>SU3. Provide Tools and Lakewide Perspective to Land Use Planners Develop a “Green Area” Contrast Map for the basin to contrast the percentage change in development of the basin between 1970 and 1990 and make it available on line and to basin land use planners.</p>	<p>Lead: EPA/ORD Assist Region 5 RAP Priority</p>
<p>SU4. Map Sensitive Area Maps for the Lake Michigan Basin By 2002 completed GIS maps of the basin will be available on line. The maps include detailed data on location of sensitive species, tribal lands, natural areas, managed lands, economic resources, and potential spill sources. Superfund commits to ongoing refinement of these plans to enhance local capacity in identification of important habitat and species in the basin and plans to prevent and respond to emergencies.</p>	<p>Lead: EPA Assist: States, NOAA</p>
<p>SU5. Develop and Implement Sand Dune Education and Protection Project The Lake Michigan Federation will develop and disseminate an educational program on the ecological and economic value of Lake Michigan’s sand dunes working toward consensus on protection and preservation efforts.</p>	<p>Lead: Lake MI Federation Assist :EPA GLNPO</p>
<p>SU6. Reduce Energy Use and Production of Toxics The Delta Institute will focus on achieving toxics reductions through commitments from private and public sector owned and operated energy production units. They will look at promoting energy efficiency and pollution prevention and barriers that exist to investments in these practices. Methods to quantify the reduction of toxics from energy efficiency and conservation will be explored.</p>	<p>Lead: Delta Institute Assist: EPA GLNPO</p>
<p>SU7. Expand Lake-Based Recreation Opportunities Develop a Lake Michigan “Water Trail Plan” for use by canoes and other water craft for all four Lake Michigan states; coordinate at the boundaries and join with the 1999 Northeastern Illinois Trail Plan and Partnership.</p>	<p>Lead: Northeastern IL Plan Commission Assist: Funding Needed</p>

Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>REMEDIATION AND POLLUTION PREVENTION AGENDA - Actions that achieve substantial pollution reduction by remediating sites, controlling pathways, preventing or minimizing sources</p>	 
<p><i>Impairments: Restrictions on Fish and Wildlife Consumption, Tumors or Other Deformities, Restrictions on Dredging Activities</i> <i>Stressors: PCBs, Mercury, Dioxin, and Canceled Pesticides</i></p>	<p>Funding Status</p>
<p>RPP1. Develop EPA/State Superfund Strategy: All Lake Michigan Sites Addressed by 2005 EPA Superfund Program will convene a meeting with the Lake Michigan states to discuss development of a coordinated strategy for sites affecting the lake with a September 2005 target for completing the decision documents and remedial plans and a target of 2010 for completing the construction phase of all but the most complex sediment cleanup portions, which may take longer.</p>	<p>Lead: EPA Assist: States RAP and Forum Priority</p>
<p>RPP2. Expand and Formalize PCB Phasedown Program Formalize the PCB Phasedown Program pilot project with the major utilities in the Great Lakes basin, which is designed to encourage phasedown of PCB-containing equipment. Expand the program to federal departments and agencies in the basin. Follow up by sending letters to determine actions taken and compile a status report.</p>	<p>Lead: EPA Assist: Follow-up unfunded</p>
<p>RPP3. Remediate White Lake, Spring 2000 (Michigan) The remediation of White Lake contaminated sediments by the State of Michigan is planned for Spring 2000. An estimated 36,000 cubic yards, up to eight feet, of contaminated sediment and tannery wastes will be dredged from Tannery Bay on White Lake, Muskegon County, Michigan.</p>	<p>Lead: MI Assist: EPA GLNPO RAP Priority</p>
<p>RPP4. Conduct White Lake Outreach Project The Lake Michigan Federation (LMF) and the White Lake Public Advisory Council (PAC) plan to conduct public outreach on the cleanup effort, explaining its benefits and involving community members.</p>	<p>Lead: LMF,PAC Assist: MI, EPA GLNPO RAP Priority</p>
<p>RPP5. Assess Contaminated Sediments in Muskegon Lake This project will assess the nature, extent, and ecological significance of sediment contamination in Muskegon Lake, Muskegon County, Michigan, by Grand Valley State University. The fate and transport of sediments in drowned river mouths will also be investigated.</p>	<p>Lead: Grand Valley State University Assist: MI, EPA GLNPO RAP and Forum Priority</p>
<p>RPP6. Perform Additional Site Assessment for Michigan and Wisconsin EPA Superfund working with state and local partners will assess one geographic area in Michigan and Wisconsin in areas with an industrial history and abandoned facilities or areas with sediment contamination concerns.</p>	<p>Lead: EPA Assist: MI and WI RAP and Forum Priority</p>

Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>RPP7. Develop Contaminated Sediment Assessment Guidance Manual The Sustainable Fisheries Foundation will review relevant literature and develop an ecosystem-based framework for assessing and managing contaminated sediments consistent with the International Joint Commission guidance and publish the framework as an EPA-GLNPO document.</p>	<p>Lead: Sustainable Fisheries Foundation Assist: EPA GLNPO RAP and Forum Priority</p>
<p>RPP8. Implement Michigan GIS Contaminated Assessment Project Michigan Department of Environmental Quality will purchase software, hardware, and training to assess and define hot spots and volumes of sediment contamination at five sites. Project results will be used as a model for other efforts in the future.</p>	<p>Lead: MI Assist: EPA GLNPO</p>
<p>RPP9. Develop Rapid PAH Screening Tool for Sediment Assessment University of Wisconsin-Milwaukee will measure sediments with the rapid screening technique with a detection limit of 1 ppm in sediment samples and will demonstrate the system at two Areas of Concern.</p>	<p>Lead: UW/MIL. Assist: EPA GLNPO</p>
<p>RPP10. Assess Fox River Contaminated Sediments Wisconsin Department of Natural Resources has undertaken a remedial investigation and feasibility study of the Fox River. Concurrently, dredging demonstration projects have been undertaken to remove PCBs. Final decisions based on the assessment work are expected in 2000.</p>	<p>Lead: WI Assist: EPA and GLNPO</p>
<p>RPP11. Decide Sheboygan River Dredging Needs A responsible party study and plan on the PCB-contaminated sediments in the Sheboygan River is needed to complete additional dredging after follow-up assessments to hot spots removal indicated additional actions were necessary. A final decision is expected in 2000.</p>	<p>Lead: EPA Assist: WI</p>
<p>RPP12. Expand the Forum's Mercury Pollution Prevention Project to the Basin Expand the Lake Michigan Forum's primary metals mercury P2 Project to another Lake Michigan state building on the success of the Indiana steel mill project.</p>	<p>Lead: EPA Assist: Four states</p>
<p>RPP13. Perform Southwest Lake Michigan Scrap Yards Compliance Assistance Inspections EPA will conduct at least three compliance assistance/pollution prevention inspections focusing on mercury in automobile scrap and salvage yards in the southwest area of the Lake Michigan basin. A similar pilot project sponsored by the New York Department of Environmental Conservation will prevent an estimated 500 pounds of mercury from entering the basin from crushing and shredding operations at scrap and salvage yards.</p>	<p>Lead: Assist:</p>
<p>RPP14. Share Mercury Pollution Prevention Methodology By the end of 2000, EPA will publicize, including through posting on its web site, information on how to develop a mercury reduction plan at a manufacturing plant. This information will include mercury reduction plans developed at three steel mills under a voluntary agreement between the mills, EPA, the Indiana Department of Environment, and the Lake Michigan Forum.</p>	<p>Lead: EPA Assist: States</p>
<p>RPP15. Distribute "Mercury Education and Reduction In Schools" Information By the end of 2000, EPA will distribute through the Binational Toxics Strategy Mercury Workgroup a package of information related to mercury reduction at schools, including advice on how to eliminate mercury from school laboratories.</p>	<p>Lead: UW Assist: EPA GLNPO states, other partners</p>



Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>RPP16. Continue “Clean Sweep” Projects Clean sweeps for household hazardous waste and agriculture pesticide products at no fee to the user collect and remove from the environment LaMP and RAP targeted substances that are impacting the basin. The very successful results of these efforts have demonstrated an ongoing need to provide disposal options to households, farms, commercial sector, and local government participants. There is no one source of annual funding for these projects.</p>	<p>Lead: State and Local government Assist: EPA GLNPO Funding needed</p>
<p>RPP17. Remedial Action (RA) Start at Petoskey Municipal Well Field In November 1999, RA began for Operable Unit 1, which included soil excavation and operation of a Soil Vapor Extraction Unit to remove trichloroethene (TCE) in subsurface soils. RA for Operable Unit 2 - Groundwater is scheduled for May 2000. Groundwater contaminants include TCE, vinyl chloride, and chromium; soil contaminants include lead, mercury, barium, and zinc.</p>	<p>Lead: EPA Assist:</p>

Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>INFORMATION SHARING, COLLABORATIONS, AND STEWARDSHIP AGENDA - Actions that provide data access and exchange, facilitate involvement, and build capacity</p>	 
<p><i>Impairment: Adding Costs to Agriculture or Industry</i> <i>Stressor: Unsustainable Actions Based on Lack of Ecosystem Knowledge</i></p>	<p>Funding Status</p>
<p>IS1. Share Lake Michigan Mass Balance Model for Basin Wide Discussion Present LMMB model runs data on LaMP pollutants to four Lake Michigan states, forum and other interested groups, and the Lake Michigan Management Committee to (1) better target reduction of sources of loadings and emissions, (2) prioritize enforcement and compliance efforts, and (3) prioritize P2 work and monitoring.</p>	<p>Lead: EPA Assist: States RAP Priority</p>
<p>IS2. Conduct Education Conference and Outreach Boat Tour Summer 2000 Replicate the Lake Michigan/Grand Valley State boat tour of AOCs, Chicago, and other ports with ties to teachers and university level courses. Roosevelt University, in Chicago, Illinois, will sponsor a Pedagogical Conference that will tie in to the Great Lakes Commission development of network and web site for Great Lakes-related educational materials, including curriculum and other tools.</p>	<p>Lead: Grand Valley State University, Roosevelt University Assist: EPA, GLC Only Partially funded</p>
<p>IS3. Develop the Lake Michigan On-line Atlas Provide on-line maps and technical assistance to support local watershed-based ecosystem management efforts that are linked with lakewide activities. Include greenness/development contrast maps, ecologically rich areas, wetlands, threatened and endangered species by county, key connecting corridors, fish spawning areas, and other sensitive elements.</p>	<p>Lead: Great Lakes Commission, USFWS Assist: EPA RAP Priority</p>
<p>IS4. Promote Local Planning on a Watershed Basis Target local government planners in AOC areas and other key models of Lake Michigan Forum's Kalamazoo's Watershed Project to identify new tools and methods, utilize developed materials and conferences to influence land use/watershed decisions in at least four Lake Michigan communities to reduce nonpoint source loadings and habitat protection.</p>	<p>Lead: Assist: IL, IN sea Grant RAP and Forum Priority Unfunded</p>
<p>IS5. Coordinate with the Great Lakes Fishery Commission on Aquatic Nuisance Species and Other Issues Work with Great Lakes Fishery Commission's Lake Michigan Committee to coordinate issues affecting the aquatic resources of the lake, including aquatic nuisance species, identifying and protecting spawning areas, and adding to the on-line atlas.</p>	<p>Lead: EPA, States Assist: Unfunded Forum Priority</p>
<p>IS6. Provide On-line Response to LaMP Comments Maintain a Lake Michigan Home Page with key links to partners. Communicate LaMP comments and responses during 2000 to 2002. Develop new fact sheets on stressors and areas of stewardship.</p>	<p>Lead: EPA Assist: RAP Priority</p>
<p>IS7. Develop and Maintain RAP Priority List of Projects Develop and maintain a list of priority projects that have been developed by the RAP Committees to provide opportunities for partnerships.</p>	<p>Lead: EPA, States Assist: RAP and Forum Priority</p>


Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>IS8. Implement LaMP Public Involvement Plan Implement LaMP 2000 communications plan including the reproduction and distribution of the "Lake Michigan Explorer" software and LaMP 2000 fact sheets, mailings, press releases, Federal Register notice, and public meeting opportunities.</p>	<p>Lead: EPA Assist: States, Forum</p>
<p>IS9. Conduct St. Joseph River (Indiana and Michigan) Bi-State Stewardship Dialogue The Great Lakes Commission will work with the Friends of the St. Joseph River and Indiana and Michigan to develop and implement a St. Joseph River Bi-State Stewardship Dialogue for pesticides and nonpoint source issues.</p>	<p>Lead: GLC Assist: IN, MI Friends of the St. Joseph River</p>
<p>IS10. Expand On-Line Sediment Data Expand on-line sediment data, identify basin issues, and research needs related to beneficial reuse of contaminated sediments working with the Region 5 Sediment Team and the EPA/State Corps Dredge Team; support possible pilot project.</p>	<p>Lead: EPA Assist: States RAP Priority</p>
<p>IS11. Develop a list of Priority Actions for Supplemental Work for Possible Use in Enforcement Cases Develop a Lake Michigan Supplemental Environmental Project (SEP) inventory utilizing documented remediation and protection needs for RAP priorities and ecologically rich areas.</p>	<p>Lead: EPA Assist:</p>
<p>IS12. Support Partnership Efforts Continue support of state and tribal staffing and Public Advisory Councils' efforts that provides multiagency, multimedia dialogue in LaMP development and implementation for further collaborative efforts, refine the grant and planning process, and facilitate the Lake Michigan Forum.</p>	<p>Lead: Assist: Funding Needed</p>
<p>IS13. Support Agriculture P2 Task Force The Lake Michigan Forum will begin a basin-wide dialogue that addresses sustainable agriculture and pollution prevention for nutrients, pesticides, and sediments. Current efforts at the committee level will need funding to provide a basin-wide dialogue project.</p>	<p>Lead: Forum Assist: EPA, NRDC Funding needed</p>

Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

RESEARCH AND MONITORING AGENDA - Actions that monitor the ecosystem, reduce uncertainty, and inform our decisions		
<i>Actions in Support of All Six End Point Subgoals to address information gaps noted in research in preparing the LaMP Document</i>		Funding
		Status
<p>RM1. Continue Grand Calumet River, Indiana Harbor TMDL The Indiana Department of Environmental Management, in cooperation with the US Army Corps of Engineers, have begun work on developing a TMDL for the East and West Branches of the Grand Calumet River and Indiana Harbor Ship Canal. The partnership has completed a round of “pay for your own samples” and hopes to have models by summer 2000 and begin developing an implementation plan by fall 2000.</p>	<p>Lead: IN, USCOE Assist: Partnership</p>	
<p>RM2. Complete Wisconsin TMDL Pilot EPA will complete the pilot project to establish TMDL allocations for two waterbodies receiving mercury from atmospheric deposition to (1) evaluate the integration of air and water program technical tools and authorities and (2) examine emission reduction options. EPA will also work with states that have identified waterbodies whose impairment may be the result of atmospheric deposition to develop tools to assist in establishing TMDLs that account for air sources. For example, based on the outcome of the pilot project, EPA will explore the possibility of providing states with modeled regional baseline (1996) and projected (2010) deposition estimates.</p>	<p>Lead: EPA, WI Assist:</p>	
<p>RM3. Add Organic Contaminants Study to Episodic Events (EEGLE) Project The University of Iowa in conjunction with the EEGLE research project, which is studying the large annual sediment and nutrient plume in Lake Michigan, will study toxics in the plume. The study should provide data necessary to determine the spatial and temporal variations of loadings across the lake.</p>	<p>Lead: UI Assist: EPA GLNPO</p>	
<p>RM4. Implement Lake Michigan Monitoring Coordinating Council Implement the Lake Michigan Monitoring Coordinating Council and provide leadership, secretariat, and on-line guide to monitoring activities. Develop a coordinated Lake Michigan monitoring plan with corresponding indicators that can be utilized on both a local and lakewide basis. Explore a volunteer network that reports on similar indicators around the lake. Establish a beach community monitoring network and a volunteer basin monitoring network.</p>	<p>Lead: GLC Assist: EPA, USGS, MI RAP Priority</p>	
<p>RM5. Conduct Air Deposition Research Identify the relative importance of air deposition in loadings to the lake and location of emissions sources in and out of the basin for regulatory and nonregulatory control strategies using mass balance models, RAPIDS, IADN, Great Waters report, TMDL work, and other data.</p>	<p>Lead :Delta Institute Assist: EPA Forum Priority Funding Needed</p>	
<p>RM6. Implement Integrated Atmospheric Deposition Network : Phase II This binational project provides data to determine loadings of air toxics to the Great Lakes as mandated by Annex 15 of the Great Lakes Water Quality Agreement.</p>	<p>Lead: EPA GLNPO Assist:</p>	

Lake Michigan LaMP 2000-2002 Actions In Response to Identified Impairments

Table 6-1 Examples of Short-Term Actions

<p>RM7. Support Mercury Research in a Number of Priority Areas EPA has committed approximately \$6 million in FY2000 and FY2001 funds to support mercury research in a number of priority areas, including transport, transformation, and fate; and human health and wildlife effects of methyl mercury. These research activities are aimed at reducing the uncertainties currently limiting EPA's ability to assess and manage mercury and methyl-mercury risks. A particular target of research will be collection and analysis of information on mercury emissions and control options for coal-fired utilities to support Office of Air and Radiation (OAR)'s mandate for a regulatory determination on mercury controls for utilities by December 15, 2000.</p>	<p>Lead: EPA Assist:</p>
<p>RM8. Complete Regional Air Toxics Emissions Inventory of Hazardous Air Pollutants By 2001 EPA and the Great Lakes States will create a picture of the 1999 inventory of point, area, and mobile sources for all 188 hazardous air pollutants. The Great Lakes Commission provides the report and on-line site.</p>	<p>Lead: Great Lakes States Assist: Great Lakes Commission</p>
<p>RM9. Initiate Marsh Monitoring Volunteer Program The Great Lakes United will recruit and coordinate volunteers for monitoring the flora and fauna of the marshes of the Great Lakes.</p>	<p>Lead: GLU Assist: EPA GLNPO</p>
<p>RM10. Discuss Follow-up Monitoring for the LMMB (LMMCC) Hold a planning meeting to plan and obtain commitments for years 2004 and 2005; 2005 sampling to complement 1994 and 1995 LMMB sampling, with consideration given to fish food web, mercury, and indicators of long-range transport.</p>	<p>Lead: EPA, States Assist: LMMCC</p>
<p>RM11. Review Lake Michigan LaMP Pollutant List For 2002 Review and report in LaMP 2002 research data and, if needed, respond with possible changes in LaMP pollutant list and recommendations for LaMP partners for action due to environmental effects on human health, such as fish advisories or emerging data on endocrine disruptors.</p>	<p>Lead: LK MI TCC Assist:</p>
<p>RM12. Baseline Clam Monitoring Study at Cannelton Industries Site Baseline clam monitoring was conducted in 1997 to determine if the site remedy was effective at reducing concentrations of bioavailable trace elements (including mercury and methyl mercury) in Tannery Bay at the Cannelton Industries Site in Sault Ste. Marie, Michigan. Though not in the Lake Michigan basin, the results of this study may be useful for understanding similar remediation efforts in the basin. Monitoring is still being conducted.</p>	<p>Lead: NOAA Assist:</p>

6.2 Next Steps

LaMP

The public involvement process outlined in Chapter 1 is not just to inform the public about the LaMP but to engage the public in discussions about the findings and suggested actions. Many aspects of this plan are incomplete, and the public dialogue process is intended to gain input, fill data gaps, and move the decision-making process forward. Comments are needed on the following :

Chapter 1. The concept of Area of Stewardship

Chapter 3. Priorities for the indicator list

A list of indicators cross-walked with the LaMP subgoals is presented for public comment. The LaMP will be working with the Lake Michigan Monitoring Coordinating Council to develop a monitoring plan that will provide clear monitoring commitments and the data to measure an indicator.

Chapters 4 and 5. Efforts needed to continue to fill in data gaps

The LMMB models will be completed within the 2000 to 2002 time frame, as will the EEGLE Project lead by the National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory www.glerl.noaa.gov/eegle/. EEGLE will incorporate currents, temperature, wave, and ice along with sediment transport and food web simulations to determine the impact of the massive spring turbidity plume along 200 miles of southern Lake Michigan shoreline. EEGLE and LMMB models will be presented to ecosystem managers and the public in 2002.

Additional monitoring is needed to fill in the gaps in our data. We need to plan now to sample some of the same locations on the 10-year anniversary of the LMMB (in 2004) to document trends and gather data for TMDL efforts in the basin.

Chapter 6. Actions, priorities, and other concerns such as the following:

◆ **Ecologically rich areas and habitat identification placed on-line in GIS mapping**

Identification of ecologically rich areas where protection activities should be a priority are underway. The Great Lakes Commission has been funded by EPA to gather Lake Michigan data to produce an on-line atlas as a tool for basin-wide land use planning and protection. USFWS is mapping the threatened and endangered species in the basin by county. The EPA Region 5 Ecosystem Team, in partnership with Region 5 states, is preparing ecologically rich area maps. EPA Office of Research and Development is preparing "greenness contrast" maps for all the Great Lakes, beginning with Lake Michigan, in spring 2000. The purpose of these maps is to present a large scale overview of the amount of green cover that has been lost to development in the last few decades.

◆ **TMDL Strategy**

There are many efforts underway that provide an opportunity to use the LaMP and LMMB Project data and models. We are requesting comments on the TMDL Strategy in Appendix E as soon as possible as work on developing the strategy and gathering data need to begin soon.

◆ **Quantified Targets for Pollution Reduction**

Reduction targets presented have been pulled from national EPA commitments and from other initiatives like the Binational Strategy and are therefore funded through EPA Regional Office and State grants. They are presented as interim or working targets. The public and multi-agency discussion on specific reduction targets is pending the results of the LMMB model runs. Specific targets and commitments will be part of the 2002 report.

LaMP Report 2002

LaMP 2000 is not the end but the beginning of a basin-wide dialogue on which pollutants and stressors we should prioritize, what reduction targets should be applied to them, and which ecologically rich areas should be preserved. Some issues, like aquatic nuisance species, legacy sites, and drinking water protection require immediate attention. Others will be the subject of public dialogue at workshops. LaMP 2002 will present the latest data and research findings, status reports on the action projects, a list of indicators, monitoring plan and a list of target reductions.

Table 6-2 Lake Michigan LaMP Summary Table (Chapter 6)







CHAPTER 2	CHAPTER 3		CHAPTER 4		
Lake Michigan LaMP: Vision, Goals and Ecosystem Objectives	Indicators and Monitoring of the Health of the Lake Michigan Ecosystem		Lake Michigan LaMP: Current Status of the Ecosystem, Beneficial Use Impairments and Human Health		
Endpoint Goal	Monitoring	Human Activity	Impairment	Spatial	Temporal
1. We can all eat any fish. 	<ul style="list-style-type: none"> Chemical contamination in fish Site assessments Eagle reproduction 	<ul style="list-style-type: none"> Fish advisories Congressional reports on: <ul style="list-style-type: none"> - Great Waters - Mercury - Dioxin 	<ul style="list-style-type: none"> Restrictions on fish and wildlife (F/W) consumption Tainting of F/W flavor 	Local Local	Ongoing Episodic
2. We can all drink the water. 	<ul style="list-style-type: none"> Raw water quality data Source water assessments 	<ul style="list-style-type: none"> Water utility notifications Source water protection 	<ul style="list-style-type: none"> Restrictions on drinking water consumption or taste and odor problems 	Local	Episodic
3. We can all swim in the water. 	<ul style="list-style-type: none"> <i>E Coli</i> levels in recreational water 	<ul style="list-style-type: none"> Beach closing advisories State 305(b) WQ reports 	<ul style="list-style-type: none"> Beach closings 	Local	Episodic
4. All habitats are healthy, naturally diverse and sufficient to sustain viable biological communities. 	<ul style="list-style-type: none"> Fish assessments Bird counts Wetlands inventories and assessments Stream flows Eco-rich area assessments 	<ul style="list-style-type: none"> Endangered species list Wetlands mitigation and protection Zoning Fish stocking Fish refuges USFWS refuges Ballast water exchange Dune protection Eco-rich cluster map 	<ul style="list-style-type: none"> Degradation of F/W populations Fish tumors, or other deformities Degradation of Benthos Eutrophication or undesirable algae Degradation of phytoplankton and zooplankton Loss of F/W habitat Bird or animal deformities 	Regional Local Local Local Lakewide Lakewide Local	Evolving Episodic Ongoing Episodic Ongoing Ongoing Episodic
5. Public access to open space, shoreline and natural areas is abundant and provides enhanced opportunities for human interaction with the Lake Michigan ecosystem. 	<ul style="list-style-type: none"> Urban density Coastal parks acreage Conservation easements 	<ul style="list-style-type: none"> Open space funding and protection statutes Coastal zone management 	<ul style="list-style-type: none"> Degradation of aesthetics 	Local	Evolving
6. Land use, recreation and economic activities are sustainable and support a healthy ecosystem. 	<ul style="list-style-type: none"> Contaminants in recreational fish Sustainable forests 	<ul style="list-style-type: none"> Superfund cleanups, dredging CRP percent of eligible farm lands Brownfields to greenfields redevelopment 	<ul style="list-style-type: none"> Restrictions on dredging Added cost to agriculture or industry 	Local Local	Evolving Evolving

Table 6-2 Lake Michigan LaMP Summary Table (Chapter 6) (continued)

CHAPTER 5		CHAPTER 6	
Lake Michigan Stressor Sources and Loads		Strategic Action Agenda: Next Steps	
Stressors	Source	Means to an End Goal	Recommendations
<ul style="list-style-type: none"> • Chemical <ul style="list-style-type: none"> - PCBs - Mercury - Dioxin - DDT - Chlordane 	<ul style="list-style-type: none"> • Air deposition • Legacy sites • Sediments • Incinerators • Burn barrels 		Implement AOC RAPs Clean Legacy Sites Clean Sweep Strategy TMDL Strategy Stewardship Actions
<ul style="list-style-type: none"> • Biological <ul style="list-style-type: none"> - Pathogens - ANS 	<ul style="list-style-type: none"> • Land use • Point source • Nonpoint source 		Protect Source Water Fill Data Gaps
<ul style="list-style-type: none"> • Biological <ul style="list-style-type: none"> - Pathogens • Physical • Chemical 	<ul style="list-style-type: none"> • Land use • Point source • Storm water • CSO/SSO 		Control CSO, SSO Develop Agricultural P2 Strategy On-Line Information, Public Involvement Activities
<ul style="list-style-type: none"> • Physical <ul style="list-style-type: none"> - Sedimentation - Habitat destruction • Biological <ul style="list-style-type: none"> - ANS • Chemical <ul style="list-style-type: none"> - Nutrients - Toxics 	<ul style="list-style-type: none"> • Land use/sprawl • Point source • Air deposition • Ballast water • Storm water • Agriculture runoff 	<ul style="list-style-type: none"> Control pathways Manage ANS Ecosystem stewardship Collaboration Research 	Ballast Water Control Protect Habitat On-Line Information, Public Involvement Activities Stewardship Actions Fish Collaboration Fill Data Gaps Measure and Report
<ul style="list-style-type: none"> • Physical <ul style="list-style-type: none"> - Sprawl • Biological <ul style="list-style-type: none"> - ANS 	<ul style="list-style-type: none"> • Land use 		On-Line Information, Public Involvement Activities Stewardship Actions
<ul style="list-style-type: none"> • Physical • Biological • Chemical 	<ul style="list-style-type: none"> • Land use • Point source • Legacy sites 		Fill Data Gaps On-Line Information, Public Involvement Activities Stewardship Actions Match Decision Makers with Issues

ADDENDUM 6-A

**LAKE MICHIGAN STRATEGIC ACTION PLAN
OBJECTIVES AND ACTIONS**

ADDENDUM 6-A

STRATEGIC AGENDA: Protect Human Health (SUBGOALS 1,2,3) - Actions that prevent human exposure to pollutants in the ecosystem and prevent or minimize sources**Subgoal 1: We can all eat any fish**

Contaminated sediments, non-point source run off and airborne transport of persistent, bioaccumulative chemicals are major sources of contamination to the lake, fish consumption advisories are still needed due to many of these toxic substances, most often PCBs.

OBJECTIVES

1.1 Reduce LaMP pollutant loadings from non-point urban air sources.

Short-term actions

- ◆ *By 2001, collect PCBs, mercury, and banned pesticides through Cleansweep Projects (A pilot project is underway in Cook County, IL. Results will be reported in 2002.)*
- ◆ *By 2002, develop and publish a work plan for the TMDL Lake Michigan Strategy (The draft strategy can be found in Appendix E of the LaMP.)*
- ◆ *By 2002, develop a schedule for preparing workplans in order to define tributary loadings, utilizing TMDL models for priority waterbodies determined by the 303(d) list and the LMMB data*

1.2 Reduce loadings from in-place (contaminated sediments) sources, principally, at the 10 AOC sites in Lake Michigan.

Short-term actions

- ◆ *By 2002, EPA will convene the four Lake Michigan State Superfund, surface water, and dredging programs to develop a coordinated strategy for sites impacting the lake; provide technical methods exchange; and function as the LMMCC Superfund Subcommittee for reporting purposes.*
- ◆ *By 2002, obtain commitments to delineate sediment problems in Milwaukee and White Lake. (Proposed milestones will be developed at the Superfund, surface water, and dredging programs meeting.)*

Intermediate actions

- ◆ *By 2005, Lake Michigan Basin National Priority List sites impacting the lake will have a decision document and a remedial plan scope of work.*
- ◆ *By 2005, TMDL identified loadings limits for certain tributaries will begin to be factored into permits and unified watershed assessments and remedial nonpoint source plans that will help achieve a 20% reduction from 1992 levels.*

- ◆ *By 2006, remedial activities will have begun at sediment sites with a completion target of 2010.*

Long-term action

- ◆ *By 2010, remedial activities will be substantially complete except for the most complex sediment cleanups.*

Subgoal 2: We can all drink the water

OBJECTIVES

2.1 Reduce loadings of LaMP pollutants to Lake Michigan waters.

Intermediate action

- ◆ *By 2005, discharges from key point sources and nonpoint source runoff will be reduced by at least 20% from 1992 levels.
(EPA National Strategic Plan)*

2.2 Reduce loadings of pathogens in Lake Michigan waters.

Short term actions

- ◆ *By 2003, EPA hopes to develop management agreements with states and tribes to adopt E.Coli ambient water quality criteria under Section 303(c) of the CWA.*
- ◆ *By 2003 the TCC will review State source water protection assessments for basin in order to determine lakewide actions and provide suggested actions by state, federal and research agencies
(Federal regulations under the SDWA require that the assessments be completed by 2003.)*

GLFC: Pursue the reduction and elimination of toxic chemicals, where possible, to enhance the fish survival rates and allow for the promotion of human consumption of safe fish.

Subgoal 3: We can all swim in the water

OBJECTIVES

3.1 Reduce loadings of pathogens to Lake Michigan waters.

Short-term action

- ◆ *By 2002, examine O and M programs for successful models of system failure prevention with consideration given to (1) checking all system failures for possible basin wide problems; (2) developing a Four State communication network, and (3) piloting the capacity, management, operation, and maintenance (CMOM) at one beach community. (Proposed by EPA)*

Intermediate action

- ◆ *By 2005, annual point source loadings from Combined Sewer Overflows, Publicly Owned Treatment Works and industrial sources will be reduced by 30% from 1992 levels (EPA National Strategic Plan)*

3.2 Reduce pollution-related health risks to swimmers in Lake Michigan waters.**Short-term actions**

- ◆ *By 2001, EPA, the City of Chicago, and other partners will sponsor a Beach Conference to provide exchange of information to basin residents and beach managers at state and local levels*
- ◆ *By 2002, convene a Four State E.Coli Network to function as the LMMCC beach monitoring subcommittee and provide transfer of methods for rapid collection and reporting of research and monitoring data*
- ◆ *By 2002, develop an on-line beach status report providing real time data and advice. EPA's current national "Beach Watch" at www.epa.gov/ost/beaches, will be expanded to other links and regional sites.*

3.3 Complete additional research.**Short-term actions**

- ◆ *By 2000, EPA will develop Implementation Guidance for Bacteria Criteria to provide recommendations to help states, territories, and authorized tribes implement EPA's recommended water quality criteria for bacteria.*
- ◆ *By 2001, EPA will complete development of the guidance for recreational beach managers, which will be used as a tool for public health officials to reduce the risk of disease to users of recreational waters through improvements in water quality monitoring and public notification programs.*

Intermediate actions

- ◆ *By 2004, EPA will develop feasible techniques for isolating and quantifying viruses and parasites in recreational waters.*
- ◆ *By 2004, EPA will conduct research to determine pathogen occurrence and indicator relationships associated with wet weather flows.*
- ◆ *By 2004, EPA will conduct research to better understand the health risks associated with inhaling contaminated aerosols generated by vigorous recreation water activity.*

STRATEGIC AGENDA: RESTORATION AND PROTECTION (SUBGOAL 4) - Actions that restore, enhance, and sustain the health, biodiversity and productivity of the ecosystem

Subgoal 4: All habitats are healthy, naturally diverse and sufficient to sustain viable biological communities

OBJECTIVES

4.1 Identify, maintain and protect environmentally sensitive/biodiversity investment areas.

Short-term action

- ◆ *By 2002, EPA will provide an on-line atlas (Phase I) of Lake Michigan environmentally sensitive areas that highlights ecologically rich areas*

Intermediate actions

- ◆ *By 2005, identify and map critical habitat in the Lake Michigan watershed for all listed species - endangered/threatened/special concern/vulnerable*
- ◆ *By 2005, complete recovery plans for listed species where those plans do not already exist*
- ◆ *By 2005, identify and map habitat for species of economic and cultural significance*

4.2 Increase the amount of wetlands protected and restored.

Short-term actions

- ◆ *By 2002, the on-line atlas (Phase II) will include dunes, wetland protection and restoration priorities*
- ◆ *By 2002, identify environmental corridors between fragmented habitats and migratory bird flyways.*
- ◆ *By 2002, prevention of isolation of wetlands from Lake Michigan will be recognized through partnership agreements and MOAs*

Intermediate actions

- ◆ *By 2005, 75% of basin waters will support healthy aquatic communities (EPA National Strategic Plan)*
- ◆ *By 2005, at least one ecologically-rich wetland area per state will be placed into protective status, targets: Door County, Milwaukee River, SE Chicago Lake Calumet area, IN Grand Calumet area, St. Joseph River and Grand Traverse Bay in Michigan based on SOLEC information on eco-rich areas.*

4.3 Increase acres of naturalized or restored coastal brownfields.

Intermediate actions

- ◆ *By 2004, the term and classification criteria for coastal brownfield will be agreed upon and commonly used by local land use planners in the basin through LaMP land use training efforts and an on-line atlas.*
- ◆ *By 2004, the on-line atlas (Phase II) will include corridors and coastal brownfields*

GLFC:

- Protect and enhance fish habitat and rehabilitate degraded habitats.
- Achieve no net loss of the productive capacity of habitat supporting Lake Michigan's fish communities. High priority should be given to the restoration and enhancement of historic riverine spawning and nursery areas for anadromous species.

STRATEGIC AGENDA: SUSTAINABLE USE (Subgoals 5, 6) - Actions that concurrently sustain the health of the environment, the economy, and the communities of the ecosystem

Subgoal 5: Public access to open space, shoreline and natural areas is abundant and provides enhanced opportunities for human interaction with the Lake Michigan ecosystem

OBJECTIVES

- 5.1** Increase information from the entire lake perspective regarding the sufficient quality, quantity, and availability of diverse recreational opportunities on Lake Michigan.

Short-term action

- ◆ *By 2002, begin development of the Lake Michigan canoe water trail plan building on the Illinois Lake Michigan Water Trails Plan adopted in 1999.*

- 5.2** Engage the recreational community of Lake Michigan in a sustainability dialogue.

- 5.3** Promote the need to increase the acreage of natural and restored areas on Lake Michigan shoreline, with possible utilization of brownfields, to land use planners.

Short-term action

- ◆ *By 2001, convert Brownfields to Greenfields Conference.*

Subgoal 6: Land use, recreation and economic activities are sustainable and support a healthy ecosystem

OBJECTIVES

- 6.1** A strong infrastructure (infrastructure includes indicators, local capacity, lead agencies identified, responsibilities defined, plans in place, etc) is in place to support protection or healthy aquatic communities utilizing the Clean Water Action Plan tools.
- 6.2** A strong infrastructure is in place to support restoration of degraded aquatic communities.
- 6.3** Increase the acreage of existing high quality wetlands in permanently protected status.
- 6.4** Increase the acreage of degraded wetlands restored each year.

Short-term action

- ◆ By 2001, pilot Purple Loosestrife control strategies for urban wetlands
- 6.5** Increase the quantity and quality of information about wetland landscape functions such as corridors and linkages into land use planning.

Short-term action

- ◆ *By 2001, inventory Northwest Indiana wetlands*
 - ◆ *Please refer to Short-Term and Intermediate Actions under Objectives 4.1 and 4.2*
- 6.6** Increase the number of communities incorporating ecological sustainability (see definitions) into community planning and development.

Short-term action

- ◆ *By 2002, develop habitat/biodiversity recovery plan manuals*
- 6.7** Increase the use of science-based ecological assessments in local land use decision making process.

Short-term action

- ◆ *By 2001, develop a green area contrast map (1970 - 1990) and land use GIS software*
- 6.8** Increase the number of site cleanups which go beyond human health and incorporate habitat requirements into clean up standards.
- 6.9** Decrease the acreage of brownfields in the Lake Michigan Basin by increasing the percentage of coastal brownfield projects incorporating habitat restoration.
- ◆ *Please refer to Intermediate Actions under Objective 4.3*

- 6.10** Increase capacity and infrastructure for collaboration and partnership.
- ◆ *Please refer to Short-Term Action under Objective 5.3*
- 6.11** Increase institutional capacity for assessing/addressing emerging issues.
- 6.12** Decrease the number of navigable areas with dredging restrictions.
- 6.13** Increase the implementation of Remedial Action Plan measures which relate to sustainability.
- 6.14** Increase the acreage of natural and restored areas on Lake Michigan shoreline.
- ◆ *By 2001, provide habitat restoration grants to improve spawning and bird reproduction*
- 6.15** Increase the consideration of environmental justice and equity in LaMP planning.

Short-term action

- 6.16** Develop brownfields for increased open space habitats within urban areas.

GLFC:

- Establish self-sustaining lake trout populations.
- Establish a diverse salmonine community capable of sustaining an annual harvest of 2.7 to 6.8 million kg (6 to 15 million pounds) of which 20 to 25% is lake trout.
- Maintain self-sustaining stocks of yellow perch, walleye, smallmouth bass, pike, catfish, and panfish. Expected annual yields should be 0.9 to 1.8 million kg (2 to 4 million pounds) for yellow perch and 0.1 to 0.2 million kg (0.2 to 0.4 million pounds) for walleye.
- Maintain a diversity of planktivore (prey) species at population levels matched to primary production and to predator demands. Expectations are for a lakewide planktivore biomass of 0.5 to 0.8 billion kg (1.2 to 1.7 billion pounds).
- Maintain self-sustaining stocks of lake whitefish, round whitefish, sturgeon, suckers, and burbot. The expected annual yield of lake whitefish should be 1.8 to 2.7 million kg (4 to 6 million pounds).

STRATEGIC AGENDA: REMEDIATION AND POLLUTION PREVENTION (SUBGOALS 7, 8)

- Actions that achieve substantial pollution reduction by remediating sites, controlling pathways, preventing or minimizing sources

Subgoal 7: Sediments, air, land and water are not sources or pathways of contamination that affect the ecosystem health.

OBJECTIVES

7.1 Reduce loadings of human pathogens to Lake Michigan waters.

◆ *Please refer to Short-Term and Intermediate Actions under Objectives 2.2 and 3.1*

7.2 Reduce non-point source loadings of pesticides into Lake Michigan.

Short-term action

◆ *By 2002, implement a St. Joseph River Bi-State Stewardship Dialogue regarding the use of pesticides and other non-point source issues in partnership with the Great Lakes Commission*

7.3 Reduce non-point source loadings of nutrients into Lake Michigan.

7.4 Reduce non-point source loadings of sediment into Lake Michigan.

Short-term action

◆ *By 2002, convene a basin-wide Agriculture P2 Task Force in cooperation with NRCS, Conservation Districts, and the Lake Michigan Forum.*

7.5 Reduce the quantity of LaMP listed substances in use throughout the basin.

Intermediate action

◆ *By 2004, develop targeted P2 projects.*

7.6 Reduce the quantity of PCBs, mercury, and banned pesticides improperly stored throughout the basin.

Short-term actions

◆ *By the end of 2000, EPA will publicize, including through posting on its web site, information on how to develop a mercury reduction plan at a manufacturing plant. This information will include mercury reduction plans developed at three steel mills under a voluntary agreement between the mills, EPA, the Indiana Department of Environment, and the Lake Michigan Forum.*

◆ *By the end of 2000, EPA will distribute through the Binational Toxics Strategy mercury workgroup a package of information related to mercury reduction at schools, including advice on how to eliminate mercury from school laboratories.*

- ◆ *By 2001, review the PCB, Mercury Clean Sweep Pilot to determine usefulness and need to move to other basin areas- target other urban areas.*
- 7.7 Increase the number of Superfund sites cleaned up.
 - ◆ *Please refer to Short-Term and Intermediate Actions under Objective 1.2*
- 7.8 Increase the remediation rate of non-superfund contaminated sites in the Lake Michigan basin.
- 7.9 Reduce tributary loadings of LaMP pollutants.
 - ◆ *Please refer to Intermediate Actions under Objective 1.2.*
- 7.10 Reduce loadings from in-place (sediment) sources of LaMP listed pollutants.
 - ◆ *Please refer to Short-Term and Intermediate Actions under Objective 1.2.*

Long-term action

- ◆ *By 2010, reduce air toxic emissions by 75% from 1993 levels (EPA National Strategic Plan)*

CANADA-UNITED STATES STRATEGY FOR THE VIRTUAL ELIMINATION OF PERSISTENT TOXIC SUBSTANCES IN THE GREAT LAKES

Table 6-A-1

(* indicates LaMP pollutant)

Level I Substances	Level II Substances
Aldrin/dieldrin*	Cadmium*
Benzo (a) pyrene [B(a)P]	1,4-dichlorobenzene
Chlordane*	3,3-dichlorobenzidine
DDT (+DDD+DDE)*	Dinitropyrene
Hexachlorobenzene (HCB)*	Endrin
Alkyl-lead	Heptachlor
Mercury ad mercury compounds*	Hexachlorobutadiene
Mirex	Hexachlorocyclohexane
	4,4-methylenebis
Octachlorostyrene	Pentachlorobenzene
PCBs*	Pentachlorophenol
PCDD (dioxins) and PCDF (furans)*	Tetachlorobenzene
Toxaphene*	Tributyl tin

7.11 The Lake Michigan LaMP supports the efforts of the Great Lakes Binational Toxics Strategy (BNS). The U.S. Environmental Protection agency, working in cooperation with their partners, have accepted the following challenges as significant milestones on the path toward virtual elimination of substances listed in Table 6-A-1 (the Canadian challenges in the Strategy are not directly applicable to Lake Michigan). Through the Binational Toxics Strategy, USEPA has committed to work with their partners on the following:

Short-term actions

- ◆ *By 2002, confirm that there is no longer use or release from sources that enter the Great Lakes basin of five bioaccumulative pesticides (chlordane, aldrin/dieldrin, DDT, mirex, toxaphene), and of the industrial byproduct/contaminant octachlorostyrene.*
- ◆ *By 2002, confirm that there is no longer use of alkyl-lead in automotive gasoline.*
- ◆ *By 2002, promote pollution prevention and the sound management of Level II substances to reduce levels in the environment of those substances.*
- ◆ *By 2002, assess atmospheric inputs of Strategy substances to the Great Lakes (data gap).*

Intermediate actions

- ◆ *By 2006, seek a 90% reduction nationally of high-level PCBs (>500 ppm).*
- ◆ *By 2006, seek a 50% reduction nationally in the deliberate use of mercury and a 50% reduction in the release of mercury from sources resulting from human activity.*
- ◆ *By 2006, seek a 75% reduction in total releases of dioxins and furans from sources resulting from human activity.*
- ◆ *By 2006, complete or be well advanced in remediation of priority sites with contaminated bottom sediments in the Great Lakes Basin.*

Subgoal 8: Exotic species are controlled and managed.

A strong federal lead through federal/state/tribal/local partnerships, like the national Aquatic Nuisance Species Task Force, is needed to address the problem of ballast water introductions of aquatic nuisance species into the Great Lakes, along with continually evaluating current prevention and management tools.

OBJECTIVES

8.1 Prevent exotic species introduction to Lake Michigan and Tributaries.

Short-term actions

- ◆ *Continued research, development, monitoring and implementation of the effective measures to exclude nonindigenous nuisance species from the Great Lakes through ANS Task Force.*

8.2 Reduce and manage existing nuisance species to minimize ecosystem impacts.

Short-term actions

- ◆ *Continue development, approval, and funding to implement state management plans for Lake Michigan States.*
- ◆ *Enhanced coordination with the Great Lakes Fishery Commission to coordinate/conduct fisheries research and management activities. This includes maintenance of a full sea lamprey control program; re-registration of lampricides; and research development of alternative (non-pesticide) control technologies.*

8.3 Increase Aquatic Nuisance Species education and outreach.

Short-term actions

- ◆ *Continued information outreach to industry, recreational boaters and anglers regarding containment and control of aquatic nuisance species.*

8.4 Increase the use or development of management tools based on the effectiveness of current methods.

GLFC:

- Suppress the sea lamprey to allow the achievement of other fish-community objectives.
- Protect and sustain a diverse community of native fishes, including other species not specifically mentioned earlier (for example, cyprinids, gars, *Lepisostedius* spp., bowfin (*Amia calva*), brook trout, and sculpins). These species contribute to the biological integrity of the fish community and should be recognized and protected for their ecological significance and economic values.

STRATEGIC AGENDA: INFORMATION SHARING, COLLABORATION, AND STEWARDSHIP (Subgoals 9, 10) - Actions that provide data access and exchange, facilitate involvement, and build capacity

To achieve sustainability in the ecosystem, a policy of stewardship is required on the part of individuals, governments, and nongovernmental organizations at three scales: local, watershed and lake basin. In order to be a steward at any of these scales there is a need for competence for the tasks undertaken, an ethic of responsibility and knowledge of the ecosystem condition at the local, watershed and basin scale.

Subgoal 9: Ecosystem stewardship activities are common and undertaken by public and private organizations in communities around the basin.

OBJECTIVES

9.1 Increase the understanding of the relationship between individual land use decisions and the cumulative effects on habitat integrity and water quality.

Short-term actions

- ◆ *By 2002, inventory the information available to landowners, developers and local governments on the impacts of land use on aquatic habitats.*
- ◆ *By 2002, distribute information/communication materials that summarize the linkages between land use and aquatic community health in the basin.*
- ◆ *By 2002, develop a packet of incentives to encourage local governments and landowners to foster healthier land-water linkages.*

Intermediate actions

- ◆ *By 2004, develop and distribute decision support tools using GIS data and models.*
- ◆ *By 2004, focus attention on restoration and maintenance through environmental education.*
- 9.2** Increase the acreage of existing high quality wetlands in permanently protected status. (See Objective 6.3)
- 9.3** Increase the number of communities incorporating ecological sustainability (see definitions) into community planning and development. (See Objective 6.6)
- 9.4** Create a strong Lake Michigan/LaMP Great Lakes Fishery Commission habitat partnership as the infrastructure to support restoration of degraded aquatic communities.
- 9.5** Decrease the acreage of brownfields in the Lake Michigan Basin. (See Objective 6.9)
- 9.6** Increase the percentage of coastal brownfield projects incorporating habitat restoration. (See Objective 6.9)
- 9.7** Increase capacity and infrastructure for collaboration and partnership.
- 9.8** Increase the consideration of environmental justice and equity in LaMP planning.

Subgoal 10: Collaborative ecosystem management is the basis for decision-making in the Lake Michigan basin

This means goal is the responsibility of the Management Committee that of implementing the actions identified as needed in order to restore and protect the Lake Michigan basin ecosystem. The LaMP process is one of not only gathering data, but also making collaborative decisions on strategies and priority actions needed and to secure the commitments necessary for implementation. The LaMP represents the data gathering and detailed statement of the problem that can be utilized by many basin entities as the basis for independent, but coordinated action. The action items will have a wide range, utilizing enforcement as well as compliance assistance, government and non-governmental actions. For many of the actions, tools and authority exist but resources are scarce. Therefore, priorities need to be established and phases and/or timing need to be considered.

OBJECTIVES

- 10.1 Increase capacity and infrastructure for collaboration and partnership.
- 10.2 Increase institutional capacity for assessing/addressing emerging issues.
- 10.3 Increase the implementation of Remedial Action Plan measures using partnerships and enhanced interagency cooperation.

Short-term action

- ◆ *By 2002, publish a prioritized, phased list of actions by AOC.*
- 10.4 Ensure the consideration of environmental justice policies in LaMP planning and decision making processes.
- 10.5 Increase infrastructure for multi-agency communication and decision-making.

STRATEGIC AGENDA: RESEARCH AND MONITORING (Subgoal 11) - Actions that monitor the ecosystem, reduce uncertainty, and inform our decisions

Subgoal 11: We have enough information/data/understanding/indicators to inform the decision-making process.

OBJECTIVES

- 11.1 Increase the quantity and quality of information about landscape sensitive ecological habitat functions such as corridors and linkages.
 - ◆ *Please refer to Short-Term and Intermediate Actions under Objectives 4.1, 4.2, and 4.3.*
- 11.2 Incorporate science-based ecological assessments into planning and decision making by providing an on-line atlas.
 - ◆ *Please refer to Short-Term and Intermediate Actions under Objectives 4.1, 4.2, and 4.3.*
- 11.3 Increase the scientific knowledge base for ecological assessments by providing an on line directory of monitoring programs.
 - ◆ *Please refer to Short-Term and Intermediate Actions under Objectives 4.1, 4.2, and 4.3.*
- 11.4 Develop and use an integrated monitoring and reporting system to support decision making for LaMP goals.

Short-term action

- ◆ *By 2002, complete the Lake Michigan Monitoring Plan and continue cooperative efforts to maintain the Lake Michigan Monitoring Coordinating Council.*

- 11.5** Increase institutional capacity for assessing and addressing the ecosystem status.
- 11.6** Increase scientific knowledge base for assessing and addressing emerging issues like endocrine disruptors.
- 11.7** LMMB models run and a report issued with recommendations for modification or additional actions for LaMP endorsement.
- ◆ *By 2002, all 10 Lake Michigan areas of Concern will have a completed Stage 2 RAP defining sources and loadings from the area, prioritized identified remedial actions.*
- 11.8** Begin plans for LMMB follow-up monitoring and sampling in 2005.

Short-term action

- ◆ *By 2002, hold a planning meeting to plan and obtain commitments for years 2004 and 2005 sampling to compliment 1994 and 1995 LMMB sampling.*

Lake Michigan AOC: List of RAP Priorities

Grand Calumet River

Priorities

The Stage 2.5 will be complete by autumn 2000. The CARE committee will propose a suite of short-term and long-term environmental indicators and endpoints to delist each beneficial use. The CARE committee expects to have a list by the end of 2000.

Remediation

- Complete design of the proposed confined disposal facility that will hold dredged sediments from the Canal's Federal Navigation Channel
- Continue planning USX project to dredge five miles of Grand Calumet River

Habitat/Resource Management

- Continue the Natural Resources Damages Assessment

P2/Nonpoint Source

- Complete year 2 of the 3-year Total Maximum Daily Load for the River and Canal

Human Health

Stewardship Sustainability

Education and Outreach

Research Projects/Data Gaps

Kalamazoo River

Priorities

The Kalamazoo River Watershed Council (KAWC) believes that the clean-up level used for PCB contaminated sediments should be the most stringent ones applicable and protective of life in and along the river. The KRWC has published the Position Statement on the Clean-up and Protection of the Kalamazoo River, and is actively seeking endorsements. To date, a number of organizations, county and local governments, and state and federal elected representatives have endorsed this position statement.

Remediation

- Superfund Records of Decision finalized and recommendations implemented.

Habitat/Resource Management

- Habitat restoration at sites identified by local organizations and district staff.

P2/Nonpoint Source

- Nonpoint source pollution control projects completed at sites identified by local organizations and district staff.

Human Health

Stewardship Sustainability

- Local land use planning educational efforts for elected and appointed local officials. GIS data is available for this application.

Education and Outreach

- Public education on health issues and pollution prevention.
- Support for the Kalamazoo River Watershed Council.

Research Projects/Data Gaps

Manistique River

Priorities

EPA anticipates that all the dredging activities will be completed by winter 2001: Most of the BUI's should be restored; and the process for delisting the AOC may begin.

Remediation

- Completion of the EPA Superfund dredging of contaminated sediments in the harbor.

Habitat/Resource Management

P2/Nonpoint Source

- Streambank erosion control (with nonpoint source pollution best management practices) is needed in the upper watershed to restore fish habitat and prevent sedimentation in the harbor.

Human Health

Stewardship Sustainability

Education and Outreach

- Several local educational projects have been accomplished, but additional efforts by and support for the PAC are needed.

Research Projects/Data Gaps

Menominee River

Priorities

Remediation

- Local brownfields restoration projects.

Habitat/Resource Management

- Fish population and habitat restoration.
- Local waterfront redevelopment projects.

P2/Nonpoint Source

- Pollution prevention education and projects.

Human Health

Stewardship Sustainability

Education and Outreach

- Support for Citizens Advisory Committee.

Research Projects/Data Gaps

Milwaukee Estuary

Priorities

The restoration of the Milwaukee Estuary AOC will require a long-term commitment, spanning 25 or more years. Approximately 70 recommendations have been developed thus far by the RAP workgroups. Thirty-one recommendations are targeted for implementation in the next few years (i.e. 12 recommendations pertaining to assessment and monitoring in order to make informed, cost- and resource-effective decisions; six recommendations pertaining to demonstration projects like controlling runoff from storage piles, creating buffer strips, restoring streambanks and increasing public access; twelve recommendations pertaining to community information and education and one recommendation pertaining to supporting and advancing federal stormwater regulations). As these projects are completed and programs are set in place, a better understanding of what it will take to restore and maintain the Milwaukee Estuary AOC will be obtained. Subsequent recommendations will be developed to address identified needs.

Remediation

- The highest priority in the AOC continues to be addressing contaminated sediments. Funding is needed to continue moving forward with the sediment management strategy.

Habitat/Resource Management

P2/Nonpoint Source

- Continue various demonstration projects being conducted throughout the basin.

Human Health

Stewardship Sustainability

Education and Outreach

Research Projects/Data Gaps

Muskegon Lake

Priorities

The Muskegon Lake PAC is dedicated to actively participating in the continuing improvement of the quality of Muskegon Lake. RAP Team and PAC coordination is being pursued through scheduling regular monthly meetings, developing common objectives, and developing timetables and budgets for recommended actions.

Remediation

- Contaminated sediment remediation on Muskegon Lake's south side.
 - Division St. Stormwater Outfall in Muskegon Lake between Heritage Landing & the YFCA;
 - Former Grand Trunk Railroad/Sweetwater brownfield/State-City Public Launch Ramp site at Lakeshore Dr. and McCracken St.;
 - Ruddiman Creek and mouth at Muskegon Lake including the Amoco Tank Farm brownfield site;
 - Ryerson Creek and mouth at Muskegon Lake including the Teledyne brownfield site;
 - Westran Corporation Lake Fill and Harshorn Marina site on Muskegon Lake's south side;
 - Muskegon River mouth wetland buffer zone including the Zephyr site and the Causeway/City Dump site;
 - Coal gasification "tar ball" site offshore from Morris St. on Muskegon Lake's south side.

- Brownfield remediation on Muskegon Lake's south shore.
 Numerous brownfield sites are adjacent to the contaminated sediments sites listed above. Three priority sites for a coordinated soil and sediment cleanup approach are:
 - Amoco site at Ruddiman Creek mouth;
 - Teledyne site at Ryerson Creek mouth;
 - Former Grand Trunk Railroad/Sweetwater/Public Launch site.

Habitat/Resource Management

- Remove and prevent sediment load at mouth of river in Muskegon Lake's northeast end to restore critical fish and wildlife habitat
- Restoration of native habitat landscapes on brownfield/foundry fill areas along Muskegon Lake's south and east shoreline
- Permanent easement/conservancy of identified sensitive wildlife habitat and critical fish habitat areas (based on existing natural features inventory; pre-settlement vegetation maps; 1995 Muskegon Lake Habitat and Aquatic Plant Assessments; MDNR Fisheries Division information).

P2/Nonpoint Source

- Phase II Voluntary Stormwater ordinance and technical assistance program to incorporate Best Management Practices (BMP) into shoreline and watershed brownfield redevelopments.
- Implement BMPs on sites identified in the Muskegon River Streambank Erosion Inventory.

☑ Human Health

- Identify and correct sanitary sewer integrity and cross connection problems to prevent direct sewage discharge and health advisories for Muskegon Lake and immediate tributaries.
- Determine impact of contaminated groundwater on the ecosystem in the Bear Creek, Bear Lake and Zephyr Oil sediment/wetland areas.
- Drinking water protection assessments (correlate Lake Michigan Mass Balance information with Lake Michigan and Muskegon Lake current and discharge information).

☑ Stewardship Sustainability

- Develop a coordinated volunteer water quality monitoring program in Muskegon Lake, tributary creeks and Muskegon River watershed tributaries (based on results of the lake Michigan Tributary Monitoring project).
- Sustainability Training Program to institutionalize “Adopt-A-Watershed” activities throughout the Muskegon Lake AOC/River watershed (initiating sustainable volunteer and school programs to monitor ecosystems, restore habitat, clean up waterways, stencil storm drains, provide teacher training on ecosystems and watersheds).
- Single contact/gateway program established for public access to technical information, public involvement opportunities and long term training for public stakeholders capacity, leadership and empowerment for natural resources stewardship.

☑ Education and Outreach

- Increase youth/adult public knowledge on ecosystem principles, remediation of contaminated sites, needs, management via programming in schools, conservation districts, university extensions and community colleges.

☑ Research Projects/Data Gaps

- Identify health of benthic/ecosystem of nearshore sediments adjacent to brownfield (high potential redevelopment/dredge areas).
- Map/Identify groundwater quality from contaminated sites discharging/leaching into the lake and rivermouth area.
- Identify atrazine “tributary source” and Mass Balance pollutant “soil source” hot spot areas in the Muskegon River watershed for best management practice, education and remediation potential.
- Muskegon Lake nutrient budget (TMDLs, sediment loads, etc).
- Identify point source water quality discharged from regulated sources to lake/tributaries/storm drains.
- Sediment characterization in Bear Lake at Bear Creek mouth.

Lower Green Bay and Fox River

Priorities

Substantial progress has been made in developing the RAP and implementing recommended actions. However, despite incremental improvements implemented to prevent water pollution, restore habitats, improve public access, and further define the causes of impaired uses, none of the problems in the AOC has been completely solved. Recommendations are being implemented sequentially—the easiest have been started, the more difficult have yet to be implemented. Full RAP implementation will be well beyond the year 2000.

Remediation

- Contaminated (PCB) sediment remediation in 39 miles of the Lower Fox River

Habitat/Resource Management

- Restore an eroded chain of barrier islands and associated aquatic habitats (Cat Island archipelago)
- Restore littoral habitats
- Protect remaining wetlands
- Exotic Species Prevention

P2/Nonpoint Source

- Comprehensive watershed projects to abate runoff pollution
- TMDL for phosphorus and suspended solids in the Fox-Wolf Basin
- Riparian buffers throughout the Fox-Wolf Basin

Human Health

Stewardship Sustainability

- Sustainable Green Bay Initiative
- Enhance public access

Education and Outreach

Research Projects/Data Gaps

- State of the Bay Report

Waukegan Harbor

Priorities

Four major remedial actions have been completed that will significantly reduce the quantity of contaminants in Waukegan Harbor and the nearshore area. Approximately 453,600 kg (1 million pounds) of PCBs were removed during remediation activities at the Outboard Marine Corporation site. The other three major remedial actions include the Johns-Manville Company, Waukegan Paint and Lacquer and the Waukegan Tar Pit. At Waukegan Paint and Lacquer, approximately 15 m³ of paints, solvents and flammable solids were removed from weathered tanks before leaking into sandy soil next to Lake Michigan. At the Johns-Manville site, asbestos covering nearly 24 ha has been remediated to prevent entry into Lake Michigan. Two remedial investigations are underway on adjacent property of Waukegan Manufactured Gas and Coke and the Greiss-Pfleger Tannery. Both of these sites are suspected of contributing to surface and groundwater contamination. These remedial investigations are being funded by private parties through coordination with state and federal regulatory agencies.

The Waukegan CAG has been instrumental in obtaining cooperation from local parties involving additional investigations. Groundwater monitoring from local parties was completed in an area south of the harbor. The CAG helped obtain access from private businesses and federal grant money to install the monitoring wells. An adjacent salvage yard ceased operation in 1993 and the CAG is working with a local bank, who holds the property title, to resolve environmental concerns about the site.

Remediation

- Facilitate an agreed upon location for a confined disposal facility that would house sediment dredged from the shipping channel.
- Raise funds to fulfill the local share match for the U.S. Army Corps of Engineers dredging of the shipping channel.

Habitat/Resource Management

- Fish sampling of the harbor during Spring, 2000.

P2/Nonpoint Source

Human Health

Stewardship Sustainability

Education and Outreach

- Co-sponsor the GLWQB annual meeting in May, 2000.

Research Projects/Data Gaps

White Lake

Priorities

The White Lake PAC is dedicated to actively participating in the continuing improvement of the quality RAP Team and PAC coordination is being pursued through regular meetings, development of common objectives, and developing timetables and budgets for recommended actions.

The Lake Michigan Federation and the White Lake PAC have completed a study of habitat and wetlands around White Lake. The study was undertaken in response to the 1995 White Lake RAP Update, which noted loss of fish and wildlife populations and recommended that a habitat assessment be conducted.

The study was designed to establish a baseline of information to assist in making future decisions regarding development around the lake. Conducted by a wildlife biologist, the study noted that sixty percent of the quarter-mile study area was already developed. It also found four high-quality marsh areas worth preserving and nearly continuous forest cover along most of the shoreline that provides valuable habitat for birds and other animal species.

Remediation of contaminated sediments in Tannery Bay is scheduled for as early as summer 1999.

Remediation

- The Hooker Chemical/Occidental Chemical Company is currently sampling and evaluating sediment contamination. Remediation of specific lakebottom sites is likely and would benefit from a match of federal funds.
- Further study of the extent of contamination from the Whitehall Leather Company is needed, in addition to possible remediation funds.
- Assessment is needed of sediments at discharge points for other contaminated sites, including Muskegon Chemical/Koch Chemical, the White Lake landfill, an old Whitehall city wastewater treatment facility, and a former landfill on the marsh upstream of the lake.

Habitat/Resource Management

- Acquisition of two large, undeveloped shoreline tracts owned by Dupont and Hooker Chemical/Occidental Chemical.
- Funds for outreach and implementation of habitat study recommendations.
- Native fish species (white bass, Great Lakes spotted muskellunge) restoration.

P2/Nonpoint Source

- Assessment and remediation of shoreline sewage gaps.

Human Health

☑ Stewardship Sustainability

- Public education programs on ecosystems for schools and adult populations.

☑ Education and Outreach

- School curriculums, tying environmental issues to state tests, such as the MEAP.
- Habitat education programs for shoreline property associations and schools, including fact sheets that can be tailored to specific ARCs.

☑ Research Projects/Data Gaps

- Quantitative information on the extent and impact to sediments of historical pollution from contaminated sites around the lake.
- Regular assessment of the health of benthic populations.
- Specific fish and wildlife contaminant monitoring data based upon knowledge of contaminated sites and sediments to direct sampling.

Sheboygan River and Harbor

Priorities

Improving the quality of the Sheboygan River Basin ecosystem and achieving the “desired future state” will require a long-term commitment from all levels of government, as well as local interest groups and citizens. RAP implementation must promote such involvement at a feasible pace, allowing results to materialize one step at a time. This step-by-step implementation will pivot on RAP recommendations. The RAP recommendations, which are implementable in two to five-year periods, will be important steps toward basin restoration. These are not the first steps, many projects and programs are underway. Recommendations will continue to materialize as more is understood about the most efficient and lasting ways to restore the Sheboygan River and Harbor.

Remediation

- Superfund Record of Decision finalized and sediment remediation initiated.

Habitat/Resource Management

- Completion of the Natural Resource Damage Assessment

P2/Nonpoint Source

Human Health

Stewardship Sustainability

- Completion of the Franklin Dam project

Education and Outreach

- Web site to manage volunteer water quality monitoring data using the Pigeon River watershed pilot project as an example.

Research Projects/Data Gaps

- Compile data from the stream assessments for the State of the Basin report.