

## LAKE SUPERIOR BINATIONAL PROGRAM



### INTRODUCTION

Several binational and national initiatives have been developed to protect, restore, and maintain the Great Lakes ecosystem. Foremost among them is the Great Lakes Water Quality Agreement (GLWQA), which has been hailed as an important example of international environmental cooperation. The 1978 GLWQA between the United States and Canada commits the governments to “restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem.”

To achieve that goal in Lake Superior, the Canadian and U.S. federal governments, the Province of Ontario, and the States of Michigan, Minnesota, and Wisconsin, in 1991, announced a “Binational Program to Restore and Protect Lake Superior.” The Binational Program, through which the Lake Superior Lakewide Management Plan (LaMP) is implemented, identified two major areas of activity: A Zero Discharge Demonstration Program dedicated to the goal of achieving zero discharge or emission of nine persistent bioaccumulative toxic substances (mercury, PCBs, Dioxin, HCB, and five pesticides); and a “Broader Program” focusing on the protection and restoration of the broader Lake Superior basin ecosystem.

The framework through which participating jurisdictions act to fulfill commitments identified in the 1991 agreement is known as the Lake Superior Binational Program (LSBP). Under the LSBP, committees have been formed to restore the Lake Superior basin ecosystem through work in the following areas: aquatic communities, chemicals, developing sustainability, habitat, and terrestrial wildlife communities. Although not part of a formal committee, cooperative monitoring efforts are a new priority for the Binational Program. The following sections summarize the progress made in each of these ecosystem areas in 2005.

### AQUATIC COMMUNITIES

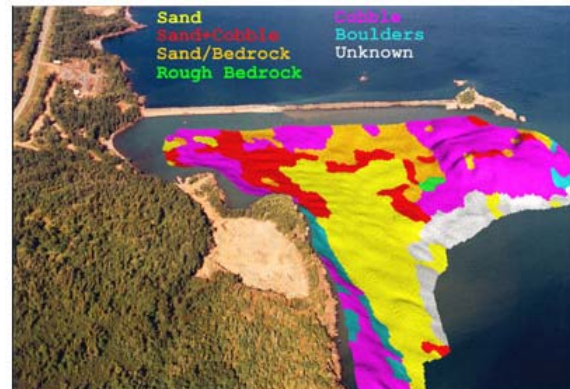
Recent activities in the Aquatic Communities area include:

#### ► Acoustic Surveys

Hydroacoustics is the use of sound waves to measure or monitor underwater processes. Sound waves travel great distances underwater without losing strength, making this an effective tool for studying the open waters of Lake Superior. In 2005, the University of Minnesota-Duluth and U.S. Geological Survey (USGS) continued a hydroacoustic assessment that ranked as the highest priority Aquatic Communities project. The objective is to determine the abundance of prey fish important to lake trout. Sound waves sent from the ship toward the lake bottom bounce off objects (fish, in this case) and return to the ship, where biologists interpret the signals. Mid-water trawls are used to catch fish and verify hydroacoustic data. This year, Michigan waters from Whitefish Bay to the tip of the Keweenaw Peninsula were surveyed. Including work in Ontario and Minnesota waters in prior years, over 2,000 km of transects have now been sampled.



Lower trophic level organism (*Mysis*)



Display of nearshore habitat mapping results

#### ► Lower Trophic Level Monitoring

Understanding lower trophic levels, the base of the aquatic food pyramid upon which prey and predator fish depend, is important for managing Lake Superior's aquatic ecosystem. A binational sampling effort to assess lower trophic levels in Lake Superior began in summer 2005. Benthos (bottom organisms), zooplankton, and *Mysis* (tiny, swimming crustaceans eaten by fish – see image above) samples were collected in spring, summer, and fall by USGS, Environment Canada, the Ontario Ministry of Natural Resources (OMNR), the U.S. Environmental Protection Agency-Mid-Century Ecology Division (EPA-MED), and the Wisconsin Department of Natural Resources (DNR). Over 1,500 samples have been collected for processing.

#### ► Habitat Mapping

Using hydroacoustic technology as described above, agencies have been mapping areas of the lake bottom that are important habitat for key fish species, including lake trout, walleye, coaster brook trout, and lake sturgeon. In 2005, substrate mapping was conducted in Nipigon Bay, Ontario, to describe coaster brook trout habitat and at Buffalo Reef, Michigan, to determine the impact of mining waste on a lake trout spawning reef. This work will help agency managers estimate the number of fish that can be produced by the habitat available in Lake Superior.

## CHEMICAL CONTAMINANTS

The LaMP Chemical Committee has been involved in a variety of projects to reduce the nine toxic chemicals targeted in the Lake Superior Zero Discharge Demonstration Program. Recent reduction activities include the following:

### ► Collections

Ontario completed its first ever hazardous waste collection in portions of the Lake Superior basin last year. The Upper Peninsula of Michigan also conducted a hazardous waste collection, sponsored by a faith-based coalition known as Earth Keepers, on Earth Day 2005. Programs in Minnesota and Wisconsin received funding to continue collecting hazardous waste.

### ► Phase-outs, Exchanges and Equipment

The Ontario government and Ontario Dental Association recently agreed to regulations that require dentists' offices to install amalgam collection systems that trap mercury-bearing amalgam before it enters the sewer system. Some dentists on the U.S. side have agreed to use such systems voluntarily. In Minnesota, the Minnesota Dental Association encouraged dentists to install separators, and the Minnesota Pollution Control Agency offered free separators to dentists in the Lake Superior basin.

Minnesota also completed a PCB transformer phase-out project and is in the process of analyzing the results. In addition, residents of Duluth and Two Harbors were offered the opportunity to exchange their burn barrels for a rain barrel and a pledge to stop burning trash.



PCB transformer phase-out (Grand Marais, MN)



EcoSuperior pesticide collection (Red Rock, ON)

### ► Outreach

Lake Superior partners have produced and distributed materials on mercury and open burning. In addition, both the U.S. and Canadian jurisdictions have obtained funding for a basin-wide mercury reduction project that will focus on inventory and phase-out activities.

## COOPERATIVE MONITORING

In 2001, U.S. and Canadian government agencies identified a need to improve coordination of Great Lakes monitoring activities. Great Lakes managers from Canada and the United States discussed the issue at a series of workshops and developed a set of recommendations for improvement. Based on these recommendations, a Great Lakes Cooperative Monitoring Program was established.

The Cooperative Monitoring approach is above and beyond the routine monitoring programs that agencies normally conduct. It is a binational effort that focuses on one lake each year, with the goal of filling key information gaps as identified through the lakewide management programs. The approach complements and builds upon other monitoring and research projects being conducted on the lake in the same year. Recent developments in Cooperative Monitoring include the following:

### ► Sampling Activities

In 2004, a rotational cycle for Cooperative Monitoring was endorsed, with Lake Superior being the focus for both 2005 and 2006. The Lake Superior LaMP Work Group identified the following key information gaps: atmospheric and open lake concentrations of LaMP pollutants; screening of tributaries to identify sources of LaMP pollutants; status of the lower food web; a better understanding of the comparability of fish tissue contaminant data among agencies; herptile distribution and abundance in the basin; and a method for measuring and reporting on land use changes. In response, during the spring, summer, and fall of 2005, numerous stations in the open lake and nearshore were sampled for LaMP pollutants and the lower food web; additional air and precipitation samplers were installed at Sibley and Eagle Harbor; and Canadian and U.S. tributaries were sampled for LaMP pollutants. The Cooperative Monitoring group is currently awaiting preliminary results from the 2005 sampling efforts. The information collected through the Cooperative Monitoring effort will be shared amongst the principal investigators in order to address LaMP priorities.

### ► Future Plans

In 2006, additional nearshore sampling will continue; a multi-agency intercomparison study is being launched to assess differences in fish tissue contaminant results; and a pilot project to establish a herptile monitoring protocol will be launched. The projects conducted over these two years involve federal, state, and provincial agencies; First Nations/Tribes; and academia.

## DEVELOPING SUSTAINABILITY

The Developing Sustainability Committee (DSC) reported two major accomplishments in 2005:

### ► *Community Awareness Review and Development Survey*

The first phase of the LSBP's "Community Awareness Review and Development" project (CARD) was completed. The CARD was designed to increase knowledge and awareness of issues relevant to the LSBP and, especially, the Lake Superior LaMP. In order to obtain information that may be used to create educational campaigns targeted at local concerns, the DSC surveyed residents in nine basin communities on the U.S. side of Lake Superior, as well as four in Canada.

Economic issues were the most pressing concerns, followed by social then environmental issues. Respondents were asked to rate both their level of knowledge and level of personal concern regarding issues in four general areas – water pollution, air pollution, land use, and health issues. In general, no more than one third reported that they knew a great deal about any given issue. When they did focus on environmental issues, the largest percentage of responses indicated that citizens in the basin were mostly concerned with watershed-related issues and, to a lesser extent, land use practices. Significant numbers of respondents reported little or no knowledge of key sustainability-oriented LaMP issues. The CARD survey also revealed that most respondents cited "inconvenience" and the feeling that one person would not make any difference when describing why people persist in conducting themselves in an environmentally-unsustainable manner.

The next phase of the CARD will use the results of the survey to reach out to the targeted communities. At that time, outreach will focus on demonstrating how to be environmentally responsible and how to capitalize on economic opportunities. Given the preferences discovered in the initial survey, outreach activities will rely primarily upon electronic and newspaper venues for delivering information.

### ► *Lake Superior Basin Riparian Buffer Demonstration Project*

The Central Lake Superior Land Conservancy (CLSCLC) based in Marquette, Michigan, completed a U.S. EPA-Great Lakes National Program Office (GLNPO)-funded project to restore riparian buffer areas and place conservation easements on five demonstration sites in the Lake Superior basin. At each site, a native plant buffer was installed in the spring and summer of 2005 to serve as demonstration and educational venues for the public. Each site has signage explaining what the project entailed, why native plants were used, and what conservation easements accomplish.

The CLSCLC conducted assessment and remediation efforts as recommended by the Lake Superior LaMP. The initiative included identifying and prioritizing potential demonstration sites for the remediation, contacting landowners to secure remediation/preservation agreements, determining the scope of interventions, obtaining needed native flora or construction materials, overseeing remediation, and facilitating publicity and outreach at the conclusion of the project. The CLSCLC will provide ongoing monitoring of the remediation sites and their conservation easement agreements in the future.

## HABITAT

The Habitat Committee is a historic and unique collaborative endeavor by Lake Superior resource managers to protect and restore habitat and the ecological processes that sustain habitat features. Recent habitat accomplishments include:

### ► *Identifying Groundwater Upwelling Areas*

Aerial thermography is being used to survey nearshore areas of Lake Superior, the Nipigon River, and the Lake Nipigon shoreline to locate groundwater upwelling areas, which provide critical habitat for coaster brook trout. Through funding from the Canada-Ontario Agreement (COA), an upwelling survey of the Nipigon River and portions of Lake Nipigon and Nipigon Bay was completed in 2004. A survey from the Pigeon River eastward to Black Bay Peninsula is planned. This information will be used to help protect these critical areas in the future.



Stonefly nymph (often found in unpolluted streams)



Watercourse Stewardship sampling

### ► *LaMP 2000 Chapter Integration*

The Habitat, Terrestrial Wildlife, and Aquatics Committees recently completed a consolidation of four chapters of the LaMP 2000 in order to acknowledge the integrated ecosystems of the region. This chapter describes these interconnected ecosystems in an integrated way and will contribute to sustainability throughout the region.

### ► *Watercourse Stewardship Project*

The goal of this joint project with the Binational Forum is to establish and promote the development of ecosystem indicators to assess the health of the Lake Superior ecosystem.

COA funding has been used in part to produce Watercourse Stewardship Action Kits, and a number of workshops and presentations have been conducted to explain the program and to gain public support, interest, and participation.

## TERRESTRIAL WILDLIFE COMMUNITIES

Recent activities in the Terrestrial Wildlife Communities area include the following:

### ▶ *Lake Superior Basin Herptile Monitoring Program*

Funding from U.S. EPA-GLNPO will establish and test an intensive monitoring program at several sites within the Lake Superior basin. A data repository will be established, and detection probability statistics will be developed that can be applied to existing programs to advance basin-wide analysis capabilities.



Gray Treefrog (photo by G.S. Casper)



10-month-old lynx kitten in the snow

### ▶ *U.S. Forest Service Lynx Surveys*

The Superior National Forest is continuing the National Lynx Detection Surveys and initiating snow-track protocols within the Forest. Lynx DNA collection studies implemented in 2002 show that a minimum of 42 individual lynx genotypes exist within the state; this likely represents a small proportion of the actual numbers of lynx in the State of Minnesota. Lynx DNA collection efforts will continue.

The Natural Resources Research Institute at the University of Minnesota-Duluth, in conjunction with the Superior National Forest and the U.S. Fish and Wildlife Service, initiated a radio tracking project for lynx in Minnesota in 2003. Plans exist for the continuation and expansion of this program in the future.

### ▶ *2005 Peregrine Falcon Survey*

The Lake Superior basin is home to the majority of known peregrine falcon nest sites and territories in Ontario. The spring and summer of 2005 marked the survey window for the national peregrine falcon survey conducted every five years in Canada. As part of this effort, Ontario conducted intensive nest and territory searches within the province. The Lake Superior basin effort was coordinated by the Thunder Bay Field Naturalists, in conjunction with the OMNR and many volunteers. Survey results indicate a continued recovery of falcon numbers, with 43 active territories located in the basin (56.6% of the provincial total), up from 31 territories recorded during the 2000 Ontario survey. A minimum of 79 chicks were fledged in the basin during 2005, the highest number recorded to date. Of these, 47 chicks were banded, bringing the total number of chicks banded on the Ontario side of the basin during the past ten years to 319.



Peregrine falcon (photo by Craig Koppie - USFWS)

## LSBP MEMBER AGENCIES:

1854 Authority  
 Agency for Toxic Substances and  
 Disease Registry  
 Bad River Band of Lake Superior  
 Chippewa  
 Chippewa-Ottawa Treaty Fishery  
 Management Authority  
 Environment Canada  
 Fisheries and Oceans Canada  
 Fond du Lac Band of Lake  
 Superior Chippewa  
 Grand Portage Band of Lake  
 Superior Chippewa  
 Great Lakes Indian Fish and  
 Wildlife Commission  
 Health Canada  
 Keweenaw Bay Indian Community  
 Michigan Department of  
 Environmental Quality  
 Michigan Department of Natural  
 Resources

**FOR MORE INFORMATION:**

**Lake Superior Binational Program home page:**  
<http://www.epa.gov/glnpo/lakesuperior/index.html>

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 Chippewa  
 U.S. Environmental Protection  
 Agency  
 U.S. Fish and Wildlife Service  
 U.S. Forest Service  
 U.S. Geological Survey -  
 Biological Resources Division  
 U.S. National Park Service  
 Wisconsin Department of Natural  
 Resources