

United States
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Agency

Great Lakes
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Great Lakes Program Progress Report

United States Report to the
International Joint Commission



EXECUTIVE SUMMARY

This is the fourth progress report on United States actions to protect and restore the Great Lakes ecosystem. It reviews some principal challenges facing the ecosystem; cites some recent actions by Federal, State, Tribal and local governments, and their public and private partners; and outlines future activities on behalf of the Great Lakes. Under the terms of the Great Lakes Water Quality Agreement, the United States and Canada report to the International Joint Commission, on a biennial basis, on activities undertaken by their respective domestic programs, and jointly through binational efforts, to protect and restore the Great Lakes. This report is submitted in fulfillment of this obligation.

Great Lakes Ecosystem Management Priorities

The United States Great Lakes Program is implementing ecosystem management at an unprecedented scale to restore and protect the beneficial uses of the Great Lakes. This multi-stakeholder, multi-media effort is focusing in on the following areas:

- protecting the health of all the residents of the Great Lakes Basin;
- reducing the release of toxics to the environment;
- protecting and restoring species and vital habitats;
- limiting the impact of exotic species; and
- building the knowledge base.

A variety of activities are being implemented to achieve these important goals. This Executive Summary highlights some of the activities contained in the full progress report which follows.

Protecting the Health of Basin Residents

The Great Lakes States have jointly developed a draft of the nation's first uniform fish consumption advisory. This effort seeks to set consistent recommendations for determining the amount of fish that can be ingested without significant health risks. This will foster consistency among states in their advisories, which helps the public better understand the risks associated with consumption of contaminated sportfish and game.

EPA is finalizing a Report to Congress outlining the variety of studies being implemented by the Great Lakes Human Health Effects Research Program. This program, mandated by Congress, addresses the potentially adverse human health effects from consuming Great Lakes fish on particularly sensitive populations. These groups include: pregnant females, nursing mothers, fetuses and nursing infants, infants and children, Native Americans, sport anglers, urban poor, and the elderly. The findings from this Program will provide some of the information that Great Lakes policymakers need to further protect the health of the inhabitants of the Basin.

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EPA and the Agency for Toxic Substances and Disease Registry are funding a variety of projects to develop core curricula in environmental medicine and occupational health aimed at educating healthcare professionals about environmental risks. These professionals can then serve as environmental educators, helping to increase public awareness of health concerns in their Great Lakes communities. In addition, targeted risk communication materials have been developed and distributed to populations which are heavy consumers of Great Lakes fish and to medical professionals who serve these populations, which include Asian immigrants, expectant mothers, Native Americans, charter boat captains, and urban poor.

Reducing the Release of Toxics to the Environment

Significant decreases in point source discharges have been brought about through the Great Lakes Enforcement Strategy, an important federal/state partnership to protect the Great Lakes. Point source loadings of selected critical pollutant loadings to the Great Lakes have dramatically decreased from FY1992 to FY1994. Overall, there was a reduction of over **188,000 pounds** of the selected critical pollutants and approximately **8.75 million pounds** of oil and grease.

A landmark \$4.8 million Clean Air Act settlement (one of the largest of this type) with a copper smelter in Michigan's Upper Peninsula to reduce the levels of mercury, lead and cadmium output from its operation, will help reduce air and water pollution in the northern regions of Michigan and Wisconsin. Funds from the settlement will be used to finance environmental compliance and enforcement activities and for mercury monitoring studies and habitat enhancement projects in the Lake Superior Basin.

The final Great Lakes Water Quality Guidance was published in the Federal Register in March 1995, culminating six years of intensive, cooperative effort among EPA, the eight Great Lakes States, the environmental community, academia, industry, and municipalities. The Guidance consists of minimum water quality standards, antidegradation policies, and implementation procedures for the Great Lakes System. When fully implemented, the Guidance should bring about a **one million pound reduction** in the amount of contaminants entering the Great Lakes.

In 1994, EPA acted on a recommendation from the Minnesota Pollution Control Agency and asked the Defense Logistics Agency (DLA) to suspend sales of mercury, pending consideration of environmental consequences. The federal government holds about eleven million pounds of surplus mercury which it had been selling at auction. EPA has asked DLA to continue a sales suspension through September 1996, while the Agency considers an alternative long term disposition for the mercury.

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EPA has asked Great Lakes utility companies to accelerate their voluntary phasedown of electrical equipment which contain PCBs to prevent the possibility of accidental spills. In response, twelve major utility companies have reported that they have collectively removed almost **90 percent** of their PCBs and that only about 900 PCB transformers and 80,000 PCB capacitors are currently being used by all the utilities in EPA Region 5 states.

PCB contaminated sediments are being removed from the environment. In the period 1991-1994, 32,900 cubic yards of sediments with PCB concentration in excess of 50 parts per million (ppm) were removed, with some concentrations exceeding 100,000 ppm. At the Waukegan Harbor, IL Area of Concern, **over 1 million pounds of PCBs** were removed from soils and sediments.

A leachate collection system and containment wall was completed at a landfill located on the Ottawa River in Ohio. This site is thought to be **the largest single source of PCBs** to the western basin of Lake Erie. A final remedy will involve capping the entire 70 acre site.

From 1991 through March 1995, **nearly 600,000** pounds of waste pesticides have been removed from the Great Lakes Basin by the voluntary collection Clean Sweeps program. Over one third of this amount was removed in 1994. In such pesticide collections, 20 - 60 percent are suspended and canceled pesticides, some found on lists of contaminants of fish tissue and sediments.

Protecting and Restoring Species and Vital Habitats

The American bald eagle, the national symbol that almost disappeared from the continental U.S. just 25 years ago, was removed from the endangered species list in July 1995. After a year-long review, the U.S. Fish and Wildlife Service decided to change the status of the eagle from "endangered" to "threatened" in the 48 contiguous states. There are currently about 4,500 nesting pairs of bald eagles in the U.S., up from 417 back in the 1970s. Environmental laws which reduce toxics and protect vital habitat, and hunting restrictions, are credited with this turnaround.

A February 1994 report, ***The Conservation of Biological Diversity in the Great Lakes Ecosystem***, identified 131 elements within the Great Lakes basin that are critically imperiled, imperiled, or rare on a global basis, including: 31 natural ecological community types, 49 plants, 21 insects, 12 mollusks, 9 fish, 5 birds, 3 reptiles, and 1 mammal.

During FY1994, under a variety of unique programs and partnerships at the federal, state, and local landowner levels, a large number of wetland and upland habitat creation, protection, restoration and enhancement activities were conducted under the North American Waterfowl Management Plan, the National Wildlife Refuge System, and the USFWS's Partners for

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Wildlife Program. Approximately 3000 acres in the Great Lakes counties were affected by one or more of these programs.

At Metzger Marsh, Ohio, 558 acres of Ohio Division of Wildlife and 350 acres of U.S. Fish and Wildlife Service coastal wetlands on the southern shore of Lake Erie will be restored and provide needed emergent wetland for spring and fall migratory birds.

Recently collected data indicates that the structure of Lake Ontario's offshore fish community is changing in response to improved environmental conditions, and that the direction of that change is towards a fish community that more closely resembles that which existed historically.

Limiting the Impact of Exotic Species

Ballast water exchange and inspection regulations have been in place in the U.S. since May 1993 to help limit the introduction of exotic species to the Great Lakes. Under the Coast Guard Ballast Water Inspection Program, the U.S. Coast Guard boards all vessels with ballast entering the St. Lawrence Seaway and spot checks, with additional boardings, those vessels reporting "no ballast on board" in order to insure that they are not carrying pumpable ballast. This program would not be possible without the full cooperation of the Canadian Coast Guard. These regulations are expected to profoundly diminish the number of new invasions of exotic species in the Great Lakes. The Coast Guard will continue to investigate further measures for preventing new exotic species from being introduced to the Lakes.

In November 1993, New York became the first state to develop federally approved and funded nonindigenous aquatic species comprehensive management plan as required under the Federal Nonindigenous Aquatic Nuisance Species Prevention and Control Act of 1990. The plan lays out a strategy for preventing the introduction of nonindigenous aquatic species to the waters of New York State.

The Great Lakes Fishery Commission is implementing an Integrated Pest Management program for sea lamprey in the Great Lakes. This has reduced the dependence on lamprey treatment chemicals by 20-percent to date, and is expected to further reduce the use of these chemicals by increasing the use of barriers and the release of sterile male sea lamprey. The Commission is also developing a control strategy for sea lamprey in the St. Marys River. This is a vital first step for the restoration of native lake trout in northern Lake Huron.

Building the Knowledge Base

The first-ever State of the Lakes Ecosystem Conference (SOLEC '94) brought together Great Lakes experts, managers and other decision makers working in the fields of pollution control,

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natural resource and human health to review the state of the ecosystem and information that could lead to better consideration of impacts on the Great Lakes. A major result of this conference was agreement that habitat loss, exotic species and toxic substances should be given equal attention in working to restore and protect the integrity of the basin's ecosystem. A joint U.S./Canadian State of the Lakes Report was released on September 1, 1995. SOLEC '96 is being planned with a focus on nearshore areas of the ecosystem.

Under section 112(m) of the Clean Air Act, as amended in 1990, Congress authorized EPA to undertake the Great Waters Program to evaluate the atmospheric deposition of fifteen hazardous air pollutants (including mercury and PCBs) to the Great Lakes and other waters. The Program's Report to Congress (May 1994) includes information on the contribution of atmospheric deposition to pollutant loadings, associated environmental or public health effects, source information, and a description of regulatory revisions under applicable federal laws that may be necessary to assure protection of human health and the environment. Program findings concluded that a significant portion of loadings of the pollutants studied are coming from the atmosphere, including 76 to 89 percent of PCB loadings to Lake Superior and 95 percent of lead loadings to Lake Michigan. In addition, pollutants of concern originate from sources that are local to, as well as distant from, the impacted waters.

In summation, the United States is continuing to implement an integrated program for the protection and restoration of the Great Lakes ecosystem. A team consisting of many organizations and citizens are working together to put an ecosystem approach into action. The Program relies on innovative measures and a comprehensive blend of actions to prevent or reduce water, air, and land sources of contamination. It is obtaining demonstrable results. By its aggressive emphasis on "thinking globally and acting locally," the United States is significantly contributing to the protection and restoration of the entire Great Lakes System.

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Report on United States Progress to Protect and Restore the Great Lakes Ecosystem

This is the fourth progress report to the International Joint Commission and the citizens of the Great Lakes Basin on the actions of the United States Program to protect and restore the Great Lakes Ecosystem. This report reviews some principal challenges facing the ecosystem; outlines the approach taken by basin stakeholders to address these challenges; highlights some recent actions by the United States Environmental Protection Agency (EPA), other federal agencies, states, tribes, and their partners to implement this approach; and outlines future activities on behalf of the Great Lakes. The U.S. partners include: EPA, the U.S. Army Corps of Engineers, the National Oceanographic and Atmospheric Administration, the U.S. Coast Guard, the U.S. Fish and Wildlife Service, the U.S. Department of State, the U.S. Department of Agriculture, the U.S. Department of the Interior, the eight Great Lakes States, a number of Tribes and tribal organizations, and a variety of public organizations and private industry groups.



The Great Lakes contain 95% of the United States' surface fresh water.

Aspects of Ecosystem Health

By the start of the twentieth century, human presence in the basin had severely impacted the Great Lakes. Yet, especially over the past thirty years, the people of the region and their governments have achieved encouraging ecological progress, successfully abating excessive algae in Lake Erie, protecting fish populations from sea lamprey predation, restoring oxygen depleted waters, and making strides in restoring and protecting vital habitats. Levels of targeted toxic contaminants have declined substantially in fish and wildlife, resulting in clear improvements in the health of many species. Today, despite these important achievements, the Great Lakes ecosystem faces a range of both new and ongoing environmental challenges.

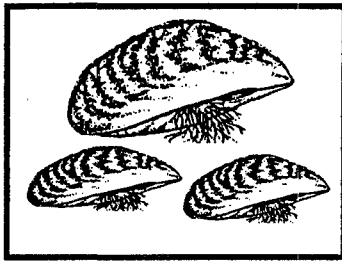
Habitat and Biodiversity

Native Great Lakes ecosystems, including forests, rivers, lakes, wetlands, dunes, savannas, and prairies, provide habitats upon which a diversity of plant and animal species depend. Whereas the pace of habitat conversion today is much less than in prior eras, continuing conversion of these habitats threatens the health and survival of many Great Lakes species. A February 1994 report, *The Conservation of Biological Diversity in the Great Lakes Ecosystem*, identified 131 elements within the Great Lakes basin that are critically imperiled, imperiled, or rare on a global basis, including: 31 natural ecological community types, 49 plants, 21 insects, 12 mollusks, 9 fish, 5 birds, 3 reptiles, and 1 mammal.



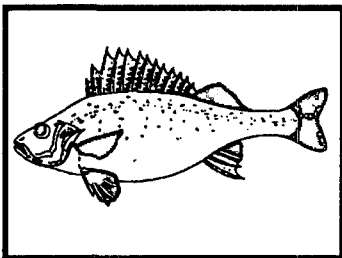
A variety of ecosystems support Great Lakes inhabitants.

Exotic Species



Zebra Mussels are having profound impacts on the Great Lakes.

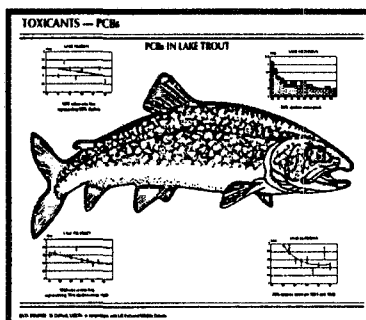
More than 130 exotic (non-native) species have been introduced to the Great Lakes since 1800, nearly one-third carried by ships. Some exotics have profoundly damaged native species. One such invader, the zebra mussel, probably entered the Lakes via ballast water discharge from an oceangoing vessel. This prolific mollusk devours microscopic plants (algae) at the foundation of the food web, creating a food shortage for fish that graze on these plants and causing other less understood effects, which may ultimately threaten predator fish, such as walleye, salmon, and lake trout. Zebra mussels, accidentally transported by recreational boaters, are now turning up in inland waters in all eight Great Lakes states.



The Ruffe is another recent invader to the Great Lakes.

One of the many exotic Great Lakes fish species, the ruffe, a spiny fish with minimal food value, is another recent invader that poses a major threat to the Great Lakes ecosystem. Yellow perch and several other native species have trouble competing with the prolific ruffe. Introduced to Duluth Harbor in the early 1980s, the ruffe has spread much more gradually than the zebra mussel. In western Lake Superior the ruffe has become the predominant fish species in bays and estuaries. Ruffe were recently found near the mouth of the Thunder Bay River at Alpena, Michigan in Lake Huron. This significant finding is the first time this exotic fish species has been identified outside the western Lake Superior basin. Potential consequences of this range expansion could be significant as the suitable habitat for ruffe is far greater in Lake Huron and the lower Great Lakes than in the previous range of western Lake Superior, and could result in much more rapid future expansion.

The latest fish invader, the round goby, was found in the St. Clair River in 1990 and has already spread to Lakes Erie, Huron, Michigan and Superior. Round gobies are voracious predators that feed primarily on zebra mussels, and may ultimately help to stabilize mussel populations. However, they are also fond of fish eggs and juvenile fish, thereby posing a threat to native fish species such as sculpin, perch and lake trout.



Levels of contaminants have fallen in many Great Lakes fish species.

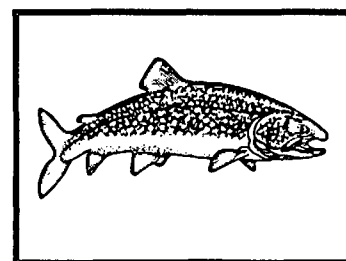
Toxic Contaminants

The Great Lakes food web remains contaminated by a variety of bioaccumulative toxic substances, causing unacceptable levels of these contaminants in some fish and wildlife. Levels are lower than in

the early 1970s, but still justify issuance of public health advisories regarding fish and wildlife consumption. Advisories especially apply to vulnerable consumers, such as children, women who anticipate bearing children, and frequent consumers, such as sport fishermen and Native Americans. In many locations, harmful substances have accumulated in bottom sediments which serve as a reservoir of pollutants that can recycle into the food web. Contaminated sediments may also delay navigational dredging and limit waterborne commerce and are associated with tumors in some bottom-feeding fish.

Fish Communities

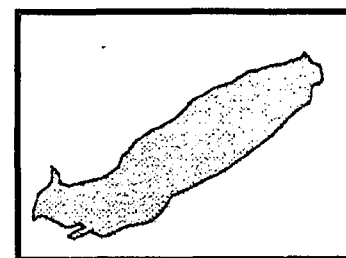
In comparison with two centuries ago, the populations of many native fish species are greatly reduced. Their depletion can be attributed to food chain disruptions, habitat loss and degradation, over-fishing, and competition from exotic species, among other factors. Damage to once abundant native fish populations has been profound. Non-native alewife and smelt have replaced lake herring and bloater as the predominant forage fish since the late 1960s and 1970s. Sturgeon survive today in much depleted numbers, although a significant recovery may be occurring in the upper Niagara River. Natural reproduction of lake trout was minimally successful through the 1970s, and natural recruitment has been generally insufficient. Lake trout stocking programs were continued primarily to promote rehabilitation, to maintain ecological balance, and to replace losses to sea lamprey. The secondary goal was to sustain sport and commercial fisheries.



Human impacts and exotic species have altered Great Lakes fish communities.

Eutrophication

Some waters remain overenriched with phosphorus in some areas that receive agricultural runoff containing fertilizers. For example, in Lake Erie, the situation has greatly improved since the late 1960s when the lake was clogged by foul-smelling mats of algae that depleted dissolved oxygen from bottom waters by their seasonal die-off and decay. Nevertheless, the bottom waters of central Lake Erie continue to suffer exhaustion of dissolved oxygen during late summer. There is evidence to suggest that anoxia (the absence of dissolved oxygen) may have occurred to some degree in Lake Erie before the settlement of the basin. Although we are making much progress in improving the situation, the natural characteristics of the basin may preclude ever totally eliminating anoxia. The encouraging news is that phosphorus

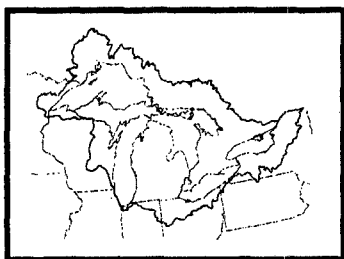


Lake Erie phosphorus targets have been achieved as have those for the other four Great Lakes.



concentrations in the water column of Lake Erie, as in the other Great Lakes, have reached those predicted to achieve desired water quality, that the area of low oxygen is becoming smaller, and that its duration is diminishing.

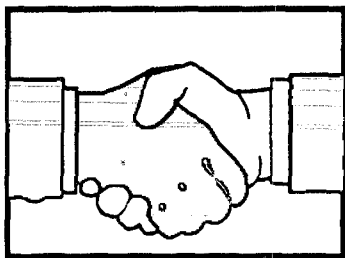
A Framework for Addressing Ecosystem Management



The Great Lakes Basin, a treasured resource shared by the United States and Canada.

The United States Great Lakes Program can be viewed as a nested structure of activities managed and implemented by an alliance of public and private agencies and organizations. This nested structure is meant to parallel the natural boundaries found in the Great Lakes ecosystem: from local landscapes to sub-watersheds and watersheds; to individual lake basins, the entire Great Lakes basin and beyond. *Places* are stressed over programs, with environmental and natural resource programs applied along naturally occurring borders instead of jurisdictional boundaries. The goal of the Program is to achieve significant environmental improvements through the implementation of an ecosystem-based approach which focuses on priority ecological problems and geographic areas. Characteristics of this approach include specific, measurable, collaboratively developed goals and greater involvement by citizens in setting an environmental agenda. Two processes for implementing this approach are the Remedial Action Plans (RAPs) for Areas of Concern (AOCs) and Lakewide Management Plans (LaMPs) for open lake waters. Highlights of activities being undertaken by these processes will be addressed in various sections of this report.

In addition, priority geographic targeting based on human health and ecological hazards facing the Great Lakes region concluded that the most significant U.S. sources of environmental contaminants were concentrated around southeast Chicago, northwest Indiana, Green Bay, Wisconsin, southeast Michigan, Buffalo and Niagara Falls, New York and Cleveland, Ohio. In response, the Great Lakes Program has focused prevention and cleanup efforts in these areas.



Many partners are working together to restore and protect the Great Lakes.

Putting the Ecosystem Approach to Work

EPA and its federal, state and tribal partners are focusing on the Great Lakes in a pioneering, precedent-setting program to protect and restore the integrity of a fragile natural ecosystem. Agencies with stewardship responsibilities for the ecosystem developed a *Joint Great Lakes Five-Year Strategy* that they launched in 1992 and are currently revising to

reflect new priorities for the basin. The Strategy joins environmental protection and natural resource agencies in pursuit of the common goals of reducing releases of toxics to the environment, protecting and restoring habitat, and protecting the ecosystem's living resources. The goals of the Strategy drive the majority of actions highlighted in this report.

Pollution Prevention

EPA and states are using the Great Lakes as a proving ground for innovative pollution prevention efforts. Pollution prevention means source reduction and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water or other resources, or the protection of natural resources by conservation. Prevention is the preferred means to avert the generation of harmful substances and thereby to reduce their release to the environment; it heads off ecological damage and saves resources otherwise needed to treat or clean up contaminants. EPA and its partners are inviting all sectors of society to contribute ideas and energies toward adoption of greener behaviors. Some notable pollution prevention successes follow.

- Great Lakes-specific pollution prevention activities supplement EPA's nationwide initiative, the 33/50 Program, which seeks voluntary reductions of 17 priority contaminants. Through 1993, the most recent year for which the Agency has data, American firms are maintaining a pace of reduction that will meet the Program's objective of 50-percent reduction of priority contaminants from 1988 levels, representing more than a 700 million pound decrease, by the end of 1995.
- The Great Lakes Auto Pollution Prevention Project is a partnership between the American Automobile Manufacturers Association, on behalf of the Chrysler Corporation, Ford Motor Company and the General Motors Corporation, and the Michigan Department of Natural Resources. Launched in September 1991, the partners agreed to a voluntary pollution prevention action plan to reduce the generation and release of 65 persistent toxic substances in the Great Lakes basin. The auto manufacturers have reduced releases of the targeted toxics by 20.2% (as measured by the Toxics Release Inventory) in the first year of the project. A report is anticipated in Fall 1995 regarding reductions achieved in the last few years of

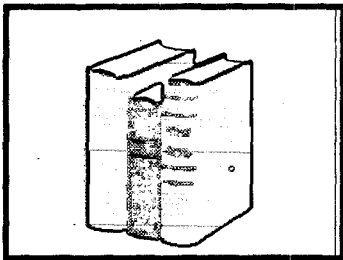


Pollution prevention is the preferred method of averting the generation of harmful substances.



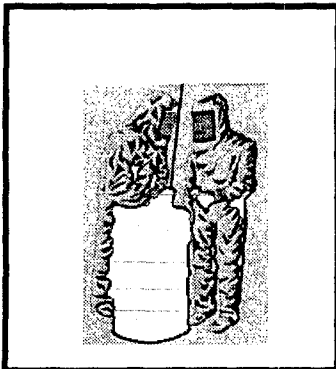
The Big Three automakers have reduced the release of 65 persistent toxic substances by 20% in the first year of the project.

the project. The Auto Project is being coordinated with a parallel project between the Canadian federal and provincial governments and the big three automakers. The same 65 persistent substances are being targeted for prevention, and the U.S. and Canada are working together with joint outreach and workshops for suppliers to the automotive industry.



The Great Printers Project will identify pollution prevention opportunities in the printing industry.

- The Council of Great Lakes Governors, the Environmental Defense Fund, and the Printing Industries of America are spearheading an effort to identify pollution prevention opportunities for the printing industry in the Great Lakes Basin. Printers in Great Lakes States produce 43 percent of the U.S. total printing output and employ more than 340,000 persons. About 80 percent of printing plants employ less than 20 people. The project brings together representatives of government, industry, technical assistance programs, labor, and environmental groups to focus on the common goals of environmental protection and economic strength. The team analyzed technical and regulatory assistance and how it should be provided, ways for consumers to help create the demand for 'great printing', and the role suppliers can play. Recommendations for Great Printing in the Great Lakes Basin were released in July 1994. The States of Illinois, Michigan, Minnesota and Wisconsin are conducting pilot projects to implement the recommendations.



Facility inspections are an important form of prevent pollution.

- The U.S. Lake Superior Pollution Prevention Team, made up of state and federal environmental representatives, released a ***Lake Superior Pollution Prevention Strategy*** in October 1993. A number of pollution prevention opportunities and priorities were recommended in this strategy. To provide further guidance on what stakeholders in the Superior basin should be doing to implement the strategy, the team developed the ***Lake Superior Pollution Prevention Implementation Plan, Recommendations for Achieving Zero Discharge***, due to be released in Fall of 1995. The Implementation Plan focuses on recommendations for reducing mercury, PCBs and dioxin.
- In August 1993, EPA Region II's Air and Waste Management Division conducted pollution prevention inspections of seven industrial facilities that emit toxic pollutants in the Lake Ontario basin. Of the 491,000 lbs of pollutants that were emitted by these facilities, it is estimated that 212,800 lbs of the pollutants (43%)

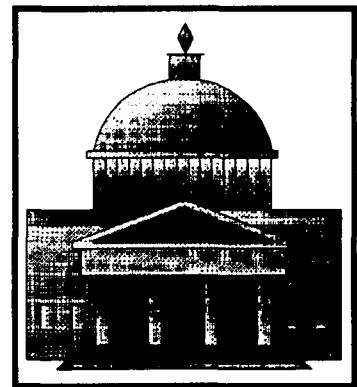
were eliminated as a result of the facilities implementing the pollution prevention measures identified by the inspections.

- Through the vigorous, concerted efforts of the U.S. Coast Guard, EPA, and state and local entities, oil and chemical spills in the U.S. waters of the Great Lakes have been greatly reduced. Oil spills have declined 61 percent over the period 1990-1994. Over the same period, chemical spills have been almost totally eliminated, decreasing from over 28,500 gallons in 1990 to just 91 gallons in 1994. To achieve even further improvement in these areas, the agencies involved will strive for better coordination of emergency response activities at all levels.
- In 1994, five companies, the Indiana Department of Environmental Management, and EPA agreed to work on the Grand Calumet Cooperative Project, a voluntary cleanup of groundwater adjacent to the Indiana Harbor Ship Canal. This is an historic effort aimed at the voluntary remediation of underground hydrocarbons estimated to be in excess of ten million barrels of oil. Through mutual agreement, the Parties will begin a phased remediation of the contaminants.

Great Lakes Water Quality Guidance

EPA published the Final Water Quality Guidance for the Great Lakes System (the Guidance) on March 23, 1995. The Guidance represents a milestone in the 30 years of effort on the part of the Great Lakes stakeholders to define and apply innovative, comprehensive environmental programs for protecting and restoring the Great Lakes. The Guidance includes minimum water quality criteria, antidegradation policies, and implementation procedures that provide a coordinated ecosystem approach for addressing existing and possible pollutant problems, and improves consistency in water quality standards and permitting procedures in the Great Lakes System. The Great Lakes States and Tribes will now use the Guidance to establish consistent, enforceable, long-term protection for fish and shellfish in the Great Lakes and their tributaries, as well as for the people and wildlife who consume them. They now have until March 23, 1997 in which to adopt provisions in their water quality standards programs consistent with the Guidance, or EPA must promulgate the provisions for them.

The Guidance was initially developed by the eight Great Lakes States,



The landmark Great Lakes Water Quality Guidance will achieve significant reductions in Great Lakes contaminants.



EPA, and other federal agencies in open dialogue with citizens, local governments, and industries in the basin. It will affect all types of pollutants, but will target especially the long-lasting pollutants that accumulate in the Great Lakes food web. In addition, the Guidance helps establish consistent goals or minimum requirements for the RAPs and LaMPs, which are critical to the success of the international multi-media efforts to protect and restore the Great Lakes Ecosystem. Once the Guidance is implemented, a reduction of **almost one million pounds** of contaminants entering the lakes will be achieved. Significantly less mercury, PCBs, and toxic pesticides will be in our water, fish, wildlife and ourselves. Implementation of the Guidance will also improve human health, expand commercial and recreational fishing, and improve the quality and safety of recreational activities in the Great Lakes.

Focus on Mercury

Hg

Mercury contamination of fish is a potential threat to aquatic life and to human health. Organic mercury is a potent neurotoxin that can produce irreversible brain damage, resulting in the loss of higher cognitive and motor functions, if ingested at high enough levels. The fetal nervous system is particularly vulnerable with pregnant women being the most vulnerable subpopulation. As stated by the State of Michigan's Environmental Science Board in 1993, "(T)here is a potentially small margin of safety between natural levels of mercury exposure and concentrations that can cause harm in humans...(M)ercury must be taken seriously as a potential threat to public health and the environment."

Mercury contamination also threatens the recreational industry. Michigan has a statewide fish consumption advisory for its 10,000 inland lakes. Wisconsin and Minnesota have advisories for hundreds of their inland lakes. The impacts of mercury varies from lake to lake. For example, New York State has no mercury fish consumption advisories for its portions of Lakes Ontario and Erie. The risk from mercury is not site specific, but widespread (90 percent of mercury reaching the Great Lakes is via atmospheric deposition), with 50-75 percent of atmospheric mercury believed to be from anthropogenic sources. The risk is also indirect, moving up the aquatic food chain. EPA is assessing U.S. mercury emissions in a Report to Congress due in December 1995. Annual emissions are estimated at over 250 tons, with the

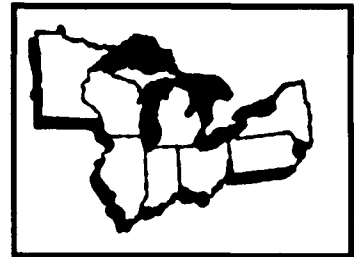
leading sectors appearing to be:

- Waste incineration - municipal, medical, and hazardous waste combustors;
- Incidental releases - coal fired utilities, boilers, mining, and smelting; and
- Intentional uses - e.g., 14 mercury cell chloralkali plants.

The partners in the U.S. Great Lakes Program have implemented a variety of actions to reduce the amount of mercury in the Great Lakes ecosystem.

State Actions

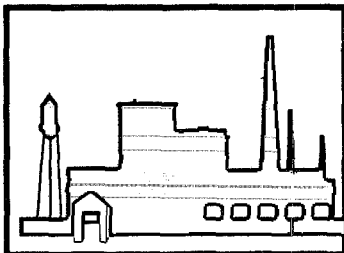
- The States of Minnesota, Michigan and Wisconsin have all issued mercury reports indicating that the major sources of mercury to their environments are atmospheric emissions from waste incineration, coal combustion, latex paint emissions, and in the case of Wisconsin, a chlor-alkali plant located in the state. The States of Michigan and Minnesota have formed mercury task forces. In Michigan the task force is focused on pollution prevention and is made up of industry, government, and environmental representatives. In a formal report, they will present recommendations for action to the governor at the end of this year. The Minnesota task force is made up of staff from the Minnesota Pollution Control Agency and publishes an annual report on strategies for mercury control in Minnesota.
- Illinois, Minnesota, New York, Pennsylvania and Wisconsin have or will limit the use of mercury in packaging materials.
- Minnesota, New York, Michigan and Wisconsin have regulations which reduce the amount of mercury allowed in batteries. Minnesota's regulations will lead to an eventual elimination of mercury content in batteries.
- In Illinois, mercury must be removed before white goods (i.e., refrigerators, stoves) can be disposed of at landfills.
- Indiana has implemented outreach programs to a variety of mercury users (caustic soda and sulfuric acid users, medical and dental professionals, general contractors, analytical laboratories, fluores-



The eight Great Lakes states are key partners in implementing pollution prevention activities.

cent tube manufacturers, and incinerator operators) regarding pollution prevention options and management practices for mercury. And a battery collection program is now serving 39 counties.

- The State of Michigan has developed a Mercury Reduction Program which requires the elimination of mercury discharges to Publicly-Owned Treatment Works from non-domestic users. There is also a Mercury Pollution Prevention Action Plan which sets goals and strategies for mercury pollution prevention.
- The State of Minnesota has adopted solid waste laws which reduce and control releases of mercury to the environment. These include disposal bans for certain battery types and other mercury containing products (unless the mercury is first removed); sales prohibitions for games, toys, and athletic shoes containing mercury; a ban on mercury in inks, dyes, paints, and fungicides; mercury labeling requirements for some products; a ban prohibiting medical facilities from routinely distributing mercury thermometers; and a variety of collection and recycling programs. Recycling opportunities exist for fluorescent lamps which are banned from being disposed of in the solid waste stream by commercial firms.
- Minnesota has also completed a rulemaking for waste combustors, which includes mercury emission limits for all new and existing municipal waste combustors and for new industrial and medical waste incinerators. Coupled with a ban on the operation of existing and new onsite waste incinerators, the rule will (when fully implemented by 1997) reduce potential yearly mercury emissions from waste combustors from 4,369 pounds to 2,067 pounds, a 47-percent reduction.
- Wisconsin has instituted a ban on the sale of mercury-containing toys and clothing that could potentially be handled by children. And an energy efficiency program at a major Wisconsin coal-fired power plant provides comprehensive rebate and outreach information to its customers to promote energy efficiency, thereby reducing emissions of mercury at the plant. The State also has a moratorium on the construction of new medical waste incinerators.



Industry is doing its part to reduce mercury emissions to the environment.

Industry Efforts

- The Potlatch Pulp and Paper Company, the University of Minne-

sota-Duluth, and the Western Lake Superior Sanitary District are working together to identify sources of mercury in pulp mill wastewater and to take necessary measures to reduce sources. This effort could be a pilot for mercury pollution prevention projects for other large industries.

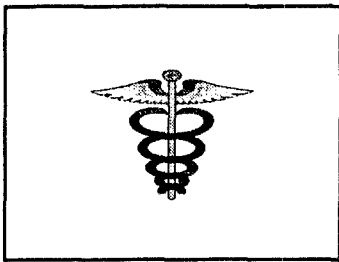
- Through a pilot take-back program established by the Honeywell Corporation, 5,496 mercury bulb thermostats were recycled and their mercury contents were kept out of Minnesota's waste stream during the period January 1994 - March 1995. Honeywell management has recently agreed to expand the take-back program to the other Great Lakes States.

Federal Actions

- In 1994, EPA acted on a recommendation from the Minnesota Pollution Control Agency and asked the Defense Logistics Agency (DLA) to suspend sales of mercury, pending consideration of environmental consequences. The federal government holds about eleven million pounds of surplus mercury which it had been selling at auction. EPA has asked DLA to continue a sales suspension through September 1996 while the Agency considers an alternative long term disposition for the mercury.
- EPA recently finalized a regulation, referred to as the Universal Waste Rule, which will greatly facilitate the environmentally-sound collection, proper recycling, or treatment of mercury-containing thermostats and certain other hazardous wastes often produced by households and small businesses as well as by large companies (e.g., nickel cadmium and other batteries and certain waste pesticides). The Universal Waste Rule exempts these wastes from the full set of hazardous waste regulations, which were considered to be a major impediment to national collection and recycling campaigns. The Rule now subjects the wastes to a set of streamlined requirements for their collection. This Rule will greatly ease the regulatory burden on retail stores and others that wish to collect mercury-containing thermostats and other universal wastes and send them, directly or indirectly, to fully-regulated hazardous waste facilities.
- EPA, the U.S. Geological Survey, the four Lake Michigan states, and a number of universities are participating in a multi-agency

effort to determine mercury loads, by sample collection and streamflow monitoring, to Lake Michigan from tributary streams. This project is part of a larger effort to produce a mercury mass balance for Lake Michigan and for the first time put into context the relative contributions of atmospheric and terrestrial sources of mercury.

- The Green Lights Program, sponsored by EPA, encourages installation of energy-efficient lighting technologies. Reduced energy usage results in less mercury emitted as a by-product from coal combustion. Under this voluntary program, facilities are upgraded with these technologies whenever they are profitable and maintain or improve lighting quality. As the success of this program continues to grow, strategies are being developed to address the additional amounts of mercury that will be introduced into the municipal waste stream as a result of the increased use of fluorescent lighting. This is necessary to avoid the cross-media transfer of mercury.



Partnerships are in place to reduce the use of mercury in the medical community.

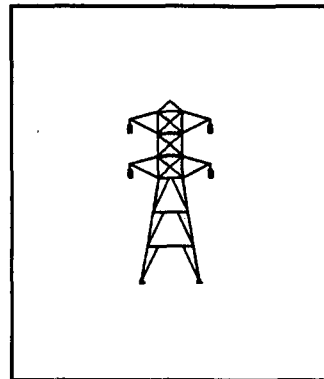
- EPA, working with several of the Great Lakes states, is engaged in a project to reduce sources of mercury from medical waste through targeted education and outreach. The project seeks to enhance the medical community's understanding of the dangers of mercury in the environment, particularly for certain high-risk populations; to form partnerships with hospitals, medical trade associations, and others in the medical care and public health community; to promote awareness of alternatives to use of mercury-containing products; and to encourage recycling or proper disposal if alternatives are not practicable.
- Region 5 EPA has developed a mercury pollution prevention outreach strategy for medical waste incinerators (MWIs), one of the largest sources of mercury emissions. New and existing MWIs will be regulated by April 1996. This strategy gives MWIs the opportunity to achieve emission reductions prior to this date.
- The 1990 Clean Air Act amendments mandated a study to describe the contribution of mercury emissions and other hazardous air pollutants from utilities. If the study finds that there is a public health risk posed, EPA can recommend that utilities be regulated for these emissions.

Focus on PCBs

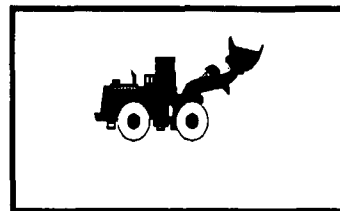
Polychlorinated biphenyls (PCBs), although banned or tightly restricted in almost all industrial and commercial uses due to their persistence and high toxicity, remain a major cause of contamination in the Basin. All five of the lakes, as well as numerous inland lakes, have fish consumption advisories as a result of PCB contamination.

PCBs

- EPA has asked Great Lakes utility companies to accelerate their voluntary phasedown of electrical equipment which contain PCBs to prevent the possibility of accidental spills. In response, twelve major utility companies have reported that they have collectively removed almost **90 percent** of their PCBs and that only about 900 PCB transformers and 80,000 PCB capacitors are currently being used by all the utilities in EPA Region 5 states.
- Approximately 18,000,000 pounds of metal from PCB transformers, capacitors, and related components were recycled rather than incinerated or landfilled, limiting potential PCB releases to the environment.
- Since the implementation of the PCB Notification and Manifesting Rule in 1990, the amount of PCBs received at storage and disposal facilities have been tracked. In 1993, over 77,000,000 pounds of PCBs were taken out of service, lessening the likelihood of further PCB contamination in the environment.
- PCB contaminated sediments are being remediated. In the period 1991-1994, over 33,000 cubic yards of sediments with PCB concentration in excess of 50 parts per million (ppm) were removed, with some concentrations exceeding 100,000 ppm. Examples of past and planned remediations include:
 - **Over one million pounds of PCBs** were removed from the Waukegan, Illinois Harbor AOC and area soils under a Superfund cleanup project completed in 1993. Additional maintenance dredging is proposed by the U.S. Army Corps of Engineers as soon as a secure landfill site can be located for the sediments which contains less than 50 ppm of PCBs. This will achieve additional removal of remaining low level PCBs. The Stage II RAP report for this project was completed in February 1995. Regular fish tissue sampling is being conducted to



Great Lakes utilities are accelerating the voluntary phase down of PCB-containing equipment.



PCB contaminated sediments are being removed from the environment.



verify progress to eliminate use impairments in the area of the harbor as a basis for delisting it as an AOC.

- 7,500 cubic yards removed from Cedar Creek, Wisconsin, with concentrations ranging up to 150,000 ppm.
 - At an automotive facility in the River Raisin Area of Concern, a 200 cubic yard test batch was removed in preparation for dredging 44,000 cubic yards of sediments with concentrations above 50 ppm.
 - An outfall ditch and stream below a sludge lagoon which served an automotive plant in Ypsilanti, Michigan (within the Huron River Watershed), will be dredged of 331,000 cubic yards of PCB contaminated sediments with concentrations up to 1,800 ppm. Construction of an on-site landfill to contain the sediments will begin in September 1995.
 - At the Manistique River, Michigan AOC, through the RAP process, a decision has been reached to have the Potentially Responsible Parties cap approximately 18 acres of PCB contaminated sediments in Manistique Harbor, beginning in September 1995. Concentrations of PCBs in the sediments are as high as 810 ppm. In addition, EPA will dredge approximately 10,000 cubic yards of contaminated sediments from an upriver site to demonstrate innovative dredging and treatment technologies.
 - Approximately 83,500 cubic yards of PCB contaminated sediments will be dredged from the St. Lawrence River/Massena Area of Concern near three industrial facilities. Land-based remedial activities are also progressing towards completion.
- Ohio EPA has completed site investigations for 23 uncontrolled waste sites in the Maumee River AOC. Sixteen of these sites are located along the Ottawa River, where a health advisory has existed since 1991 due to high concentrations of PCBs found in fish and sediment samples. Some important actions taken as a result of these assessments include:
 - A leachate collection system and a containment wall were completed at a landfill located on the Ottawa River. This site is thought to be *the largest single source of PCBs to the western basin of Lake Erie*. A final remedy will involve capping the entire 70 acre site.
 - Interim actions to remove gross soil contamination have been completed at two sites, removing PCBs and 48,000 tons of creosote-contaminated soil.



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- At another landfill in the AOC, a collection system will treat up to 30,000 gallons per day of leachate which may contain lead, cadmium, chromium, and arsenic.

Niagara River Toxics Management Plan (NRTMP)

The Parties to the NRTMP have identified 18 toxic chemicals as problems in the Niagara River or Lake Ontario. By 1996-97, they have committed to reduce by fifty percent the inputs of ten toxics that have significant sources in the Niagara River basin. Six of the ten substances are EPA priority pollutants. The majority of toxic inputs are from sites on the U.S. side of the river. There have already been significant reductions in toxic inputs under the Plan. For example:

- New York State and EPA report a greater than 80-percent reduction in loadings of toxics to the river from point sources since 1981-82.
- Approximately 7,600 cubic yards of contaminated sediments were removed from a tributary to the river, eliminating 20 percent of the PCB load from the Niagara River to Lake Ontario.
- The Falls Street Tunnel has been identified as the source of greater than 50 percent of the U.S. point source loadings of the toxics targeted for 50-percent reduction. It now has all dry weather flow diverted to the City of Niagara Falls Treatment Plant for tertiary treatment including carbon filters. This will significantly eliminate four of the six priority pollutants in the tunnel discharge, including 85 percent of the tetrachloroethylene and 70 percent of the mercury.
- EPA and New York State have determined that virtually all toxic inputs from U.S. hazardous waste sites come from 26 sites. Remediations to date have reduced potential toxic inputs from waste sites by 25 percent. Scheduled remediation should reduce potential inputs by 80 percent by the end of 1996, and 99 percent by the year 2000.

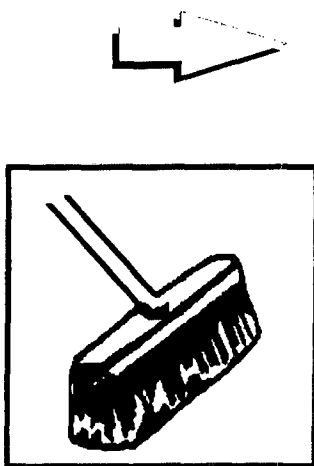


Focus on Pesticides

The Great Lakes Program has implemented a multi-faceted approach to address pesticides and the attendant potential for groundwater contamination in the Great Lakes Basin.

- In Great Lakes Basin counties, the overall use of alachlor, atrazine, metolachlor (the three of which account for approximately 50 percent of the pesticides used in the U.S. Great Lakes Basin) and cyanazine have continued to trend downward, with a 9-percent decrease in use from 1990 to 1993.
- In August 1995, the Du Pont Corporation agreed to voluntarily phase out the production of cyanazine, a pesticide that is a possible human carcinogen. Du Pont has agreed to stop selling cyanazine by 1999, although stocks may still be used through 2002. Du Pont plans on replacing the pesticide with a safer and more effective substance.
- Six Great Lakes states have submitted generic Pesticide State Management Plans to protect groundwater from contamination.
- The State of Wisconsin instituted a model Atrazine Management Plan in 1991 to address atrazine contamination of groundwater. This has led to much lower application, and in some areas, has prohibited atrazine applications where the maximum contaminant level (MCL) has been exceeded. Results of monitoring sites in these Atrazine Prohibition Areas have shown declining levels over the last seven years.

Agricultural Clean Sweeps



Agricultural Clean Sweeps are a cost-effective method of removing pesticides from the environment.

From 1991 through March 1995, *nearly 600,000* pounds of waste pesticides have been removed from the Great Lakes Basin by the voluntary collection Clean Sweeps program. Over one third of this amount was removed in 1994. In such pesticide collections, 20 - 60 percent of the substances collected are suspended and canceled pesticides, some found on lists of contaminants of fish tissue and sediments. Basinwide amounts of several suspended and canceled pesticides collected in 1994 include:

3364 pounds of DDT	1214 pounds of chlordane
2707 pounds of lead arsenate	1927 pounds of pentachlorophenol
4350 pounds of 2,4,5-T (a dioxin contaminant)	

Of these amounts, 3,721 pounds of 2,4,5-T were collected in the Lake Superior Basin in Minnesota and Michigan, 1,400 pounds of pentachlorophenol were collected in the Lake Superior Basin in Minnesota, 1,605 pounds of lead arsenate were collected in the Lake Michigan Basin in Wisconsin, and 1,575 pounds of DDT were collected in the Lake Erie Basin in Ohio.

A 1994 pilot Clean Sweep program held in Erie County (NY) resulted in over 8,000 pounds of pesticides collected, including DDT, Treflan, Furadan, chlordane, and arsenic. Later that year, Erie County expanded the program to three neighboring Great Lakes counties, while holding a second collection for itself. The four counties collected about 21,000 pounds of pesticides, including 700 pounds of dioxin-bearing pesticides. In 1995, the Clean Sweep program moved eastward to the four additional counties where 27,000 pounds of pesticides were collected, including 222 pounds of dioxin materials. In the next year, Erie County expects to help three more counties conduct Clean Sweep programs.

In addition, pesticide container recycling programs have recycled 500 tons of polyethylene pesticide containers during the 1992-1995 period.

Oil Spill Prevention and Response Actions

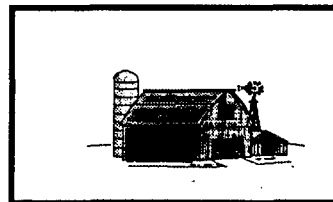
The multi-agency Inland Area Planning Committee (IAPC) is developing an Area Spill Contingency Plan, and a sub-area plan is being piloted in southeast Michigan. In addition, the IAPC is compiling data on environmentally and economically sensitive areas in the Great Lakes Basin so that these areas can receive appropriate protection in the case of a spill event. A database of available response equipment and facilities in the Great Lakes Basin has been developed to strengthen coverage and to facilitate quick and effective spill response. And in order to better focus spill prevention activities, those areas in the Basin that are most likely to experience spills will be identified.

Excessive Nutrient Loadings

All of the International Joint Commission open water phosphorus target levels have been achieved through the combined efforts to improve the performance of sewage treatment plants, reduce levels of phosphorus in detergents, and agricultural Best Management Prac-



Protecting the lakes from oil spills is a major ongoing program.



Best Management Practices on agricultural lands are helping reduce nutrient loadings to the Great Lakes.

tices, throughout the Great Lakes basin. Some notable accomplishments which have led to the achievement of these targets follow.

The Saginaw Bay National Watershed Initiative is a cooperative effort between citizens, local, state and federal governments to coordinate activities that will protect and restore water quality in the Saginaw Bay Watershed Area of Concern. Problems in this AOC are mainly caused by high amounts of soil erosion, excessive nutrients, and contaminated sediments. Significant achievements over the last three years include:

- Soil erosion control projects implementing Best Management Practices which have resulted in decreased pollutant loadings to the Bay and watershed. These decreases include: 287,372 tons of soil, 293 tons of phosphorus, and 236 tons of nitrogen.
- Implementation of 45,148 acres of conservation tillage and 36,415 acres of nutrient management.



Excess phosphorus loadings from Ohio agricultural sources to the Lake Erie Basin have decreased significantly since Best Management Practices were implemented. For the period 1992-1994, loadings decreased by almost 50 percent from 400,000 metric tons to just over 200,000 metric tons. This has been supported by an increase in the number of acres implementing conservation tillage practices during the same period. In 1992, approximately 850,000 acres of corn and soybeans were under conservation tillage. In 1994, this amount rose to approximately 1,250,000 acres.

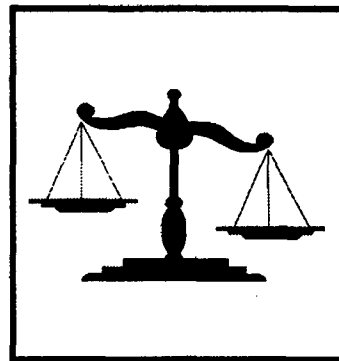
Lake Ontario phosphorus control efforts have effectively restored the lake to its original oligotrophic condition. Mean summer total phosphorus levels are now approaching estimated pre-colonial levels, which are below those expected from full achievement of the loading objectives of the Great Lakes Water Quality Agreement.

In Wisconsin, as an outgrowth of the Green Bay RAP, a private group known as Fox-Wolf 2000 has formed. This group of local citizens and public officials has assisted the State in accelerating the nonpoint source priority watershed programs in the tributaries to Green Bay. Implementation of these projects will lead to reductions in the nutrient and sediment loads to the bay which are causing some of the use impairments identified in the RAP.

Environmental Regulation and Compliance

The federal/state commitment to ecosystem protection is buttressed by strong compliance with and enforcement of environmental laws. EPA and states continue to take enforcement actions around the Great Lakes region. Some examples of this commitment follow.

- Significant decreases in point source discharges have been brought about through the Great Lakes Enforcement Strategy, an important federal/state partnership to protect the Great Lakes. Point source loadings of selected critical pollutants to the Great Lakes have dramatically decreased from FY1992 to FY1994. Estimated decreases include: PCBs (91 percent), PAHs (68 percent), lead (56 percent), cadmium (51 percent), chromium (48 percent), and mercury (22 percent). Loadings also have steadily decreased for all other critical pollutants targeted by the Strategy. Overall, there was an estimated reduction of over **188,000 pounds** of the selected critical pollutants and approximately **8.75 million pounds** of oil and grease.
- A landmark \$4.8 million Clean Air Act settlement (one of the largest of this type) with a copper smelter in Michigan's Upper Peninsula to reduce the levels of mercury, lead and cadmium output from its operation, will help reduce air and water pollution in the northern regions of Michigan and Wisconsin. A new smelter will also be built to curb future pollution. Funds from the settlement will be used to finance environmental compliance and enforcement activities and for mercury monitoring studies and habitat enhancement projects in the Lake Superior Basin.
- Under the terms of a Clean Water Act Consent Decree, the dredging of a northwest Indiana steel company's intake flume is in progress. This action will remove and properly dispose of approximately 150,000 cubic yards of sediments contaminated with oil and grease.
- A \$34.5 million Clean Water Act Consent Decree with a northwest Indiana Steel Company includes \$7.5 million for sediment characterization and remediation, along with \$25 million for in-plant environmental improvements. These improvements have already resulted in an annual decrease of 200,000 - 300,000 gallons of oil and grease into the Grand Calumet River. In addition, the company has submitted a proposal to dredge at least 500,000 cubic yards of



The enforcement of environmental regulations is an important method of achieving environmental improvement.



sediments from a five-mile stretch of the river and to dispose of them in a RCRA/TSCA landfill to be built on-site.

- The seven counties of southeast Michigan were redesignated as an ozone attainment area in 1995. Monitoring data has indicated that the area was in attainment in 1993 and 1994. A maintenance plan demonstrates that emissions of ozone precursors, volatile organic compounds, and oxides of nitrogen, will stay below 1992 levels through 2005. Reductions occurring from the Federal Motor Vehicle Control Program is the largest factor in the future decline of emission levels. Western Michigan's two moderate ozone non-attainment areas have also filed a request for redesignation to attainment.
- As of August 1, 1995, the City of Toledo, Ohio was redesignated as in compliance with federal ozone standards.
- A settlement of a complaint regarding high levels of fish mortality at a electric power pumping station on the eastern shore of Lake Michigan was signed in October 1994. The State of Michigan estimates that the proposed settlement's environmental and recreational benefits to the people of Michigan have a value of \$172 million. The settlement provides for payment for past fish losses, ensures payment for future fish losses, sets aside land for habitat and recreational development, and provides incentives for the development of additional fish protection measures.
- In December 1994, the State of Michigan entered into a Consent Judgment with a cement manufacturer which used hazardous waste fuels in the cement manufacturing process. The resulting waste cement kiln dust (CKD) is subject to state and federal waste regulations. The manufacturer is currently in compliance with the terms of the agreement which include meeting applicable federal and state hazardous waste requirements, providing financial assurance to facilitate the completion of closure, remediation, and long-term monitoring and maintenance of the CKD disposal area, a payment of a \$700,000 civil penalty, implementation of a \$27 million waste minimization program, and a licensed on-site landfill for disposal of future CKD. Waste minimization efforts to date have resulted in a 70-percent reduction of CKD as well as significant reductions in air emissions.



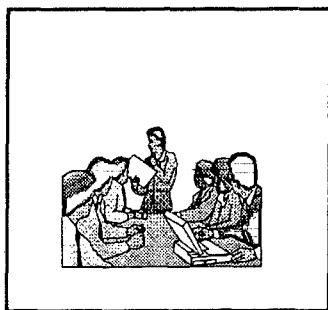
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- Sediments in drainage ditches at a Westlake, Ohio industrial site are contaminated with metals. The drainage ditches lead into Porter Creek, which flows into Lake Erie. Removal of 3,921 cubic yards of sediments in the settling basin and southern and western drainage ditches was conducted in late 1994.
 - The United States is pursuing cleanup and restoration of natural resources at sites impacted by contaminants through Natural Resource Damage Assessments (NRDAs). The U.S. Fish and Wildlife Service is conducting NRDA's in several Areas of Concern, including Green Bay, Saginaw Bay, and northwest Indiana. The major goals of NRDA's are to eliminate or reduce the impact of persistent contaminants on natural resources, to restore the services and benefits provided to the public by natural resources, and to collect monetary damages for injuries to natural resources. The State of Indiana is coordinating the initial restoration of a 253 acre site acquired in a prior NRDA action, the Clark and Pine East nature preserve, through compliance activities and volunteer stewardship, including prescribed burning of dune and swale/oak savannas.
 - Through joint action between USEPA and Illinois EPA, emergency removals occurred at two hazardous waste sites on the Lake Michigan shore near the Waukegan Harbor AOC. These actions resulted in the removal of approximately 5,000 gallons of volatile organic compounds and a significant quantity of coal tar and coal tar derivatives. Both sites were adversely affecting wildlife and the nearshore waters of Lake Michigan.

Managing Contaminated Sediments

The cleanup of contaminated bottom sediments is another essential element of improving both Areas of Concern and lakewide pollutant problems. The recently completed Assessment and Remediation of Contaminated Sediments (ARCS) Program, undertaken by EPA with the cooperation of a variety of federal, state, and private partners, achieved its objectives to develop an integrated, comprehensive approach to assessing the extent and severity of sediment contamination, the risks associated with that contamination, selecting promising treatment technologies, and demonstrating their effectiveness on site. ARCS staff are now providing resources and guidance to states to effectively address the contaminated sediment problem at Great Lakes AOCs. Through the use of the EPA's *R/V Mudpuppy*, a sediment

assessment vessel, ARCS staff are helping states determine the nature and extent of sediment contamination at: Olcott Harbor, Oswego Harbor (New York); Trenton Channel, Clinton River, White Lake, Muskegon Lake (Michigan); Waukegan Harbor (Illinois); Newton Creek and the Lower Fox River (Wisconsin); St. Louis River (Minnesota); the Maumee and Ashtabula Rivers (Ohio); and Presque Isle Bay (Pennsylvania).

EPA also has an active program for remediating contaminated sites in the Great Lakes Basin, using a wide range of regulatory approaches and an increasing emphasis on partnerships (results of which have been highlighted in other parts of this report). A major effort is the State/EPA environmental initiative for northwest Indiana which has resulted in consent decrees for sediment cleanup at USX Gary, Inland Steel, Gary Sanitary District, and LTV Steel. Also, the U.S. Army Corps of Engineers (the Corps) and EPA are cooperating on a navigational project for the Indiana Harbor Canal. Other active sites are Superfund actions at Waukegan Harbor, IL (cleaned up in 1993), Sheboygan Harbor, WI, Manistique River/Harbor, MI, River Raisin (Monroe, MI), Fields Brook (Ashtabula, OH), and the St. Lawrence River AOC in Massena, NY. A private/public partnership approach is underway for the Ashtabula River/Harbor among local interests, industry, Ohio EPA, the Corps of Engineers, and USEPA.



Involving a variety of stakeholders is necessary to address the complicated issues surrounding contaminated sediments.

In June 1995, EPA convened a Great Lakes Contaminated Sediment Strategy Workshop to bring together various stakeholders to develop recommendations to expedite cleanup of contaminated sediment sites in the Great Lakes Basin. More than 75 participants representing a wide variety of public and private interests were in attendance. Fourteen action items were identified, including: developing consistent methodologies for deriving cleanup goals; defining opportunities for regulatory flexibility within applicable standards and regulations; increasing technology transfer activities related to confined disposal facilities (CDF); and implementing a pilot sediment reclamation project at an existing CDF. USEPA anticipates reconvening another stakeholder workshop during 1996 in order to track progress on the action items described above, discuss emerging sediment issues and continue the dialogue with the diverse Great Lakes stakeholders to determine where resources should be directed to address contaminated sediments.

The Corps continues to manage contaminated bottom sediments dredged from navigational channels of the Great Lakes. The Corps places such

materials in CDFs, which are structures designed to hold and isolate contaminated dredged materials. Maintenance dredging and confined disposal is beneficial to Great Lakes water quality, in that large quantities of contaminated sediments are removed from the aquatic ecosystem. If not removed, the contaminated sediments might otherwise have adverse effects on water quality and aquatic life either by remaining in place, or through resuspension and transport to the open lakes. During FY 1994-1995, construction of a new CDF at Toledo Harbor was completed, and the dikes of the existing Cleveland CDF were raised to provide additional capacity. The construction of a new CDF for Cleveland Harbor is scheduled to begin in FY 1996. During FY 1994-1995, the Corps dredged and placed in CDFs approximately 4.4 million cubic yards of contaminated sediments from Great Lakes harbors and channels. This represents about one half of the total volume of sediment dredged by the Corps each year in the Great Lakes.

Through a peer-reviewed process, EPA is developing Sediment Quality Criteria (SQC) to predict the effect of toxic chemicals on bottom-dwelling organisms. To date, draft SQC exist for endrin and dieldrin (pesticides), and for phenanthrene, anthracene, and fluoranthene (PAHs). They are currently out for public review and comment. The next step is to develop similar values for select metals. A User's Manual is also being developed.

In accordance with a August 1991 Memorandum of Understanding, EPA and the Corps are cooperating agencies on the Indiana Harbor Ship Canal dredging and disposal project. This project proposes the construction of a CDF for 4.6 million cubic yards of contaminated sediments that will be dredged from the Ship Canal (located in the Grand Calumet River/Indiana Harbor Canal AOC), and possibly from other state and federal enforcement actions in the AOC. The Draft Environmental Impact Statement (DEIS) for this navigational dredging project has almost been completed. It is anticipated that remaining issues will be resolved shortly and that the release of the DEIS will occur in late 1995.

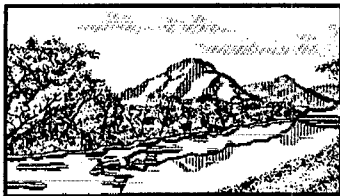
The Corps-Detroit District entered into an agreement with the University of Wisconsin to conduct a study on contaminated sediments in Milwaukee Harbor in support of the Milwaukee Harbor Estuary RAP. The District is also evaluating the bioremediation of contaminated sediments within the Milwaukee CDF.

The Corps-Buffalo District, Ohio EPA, and USEPA are combining resources to conduct additional assessment of sediments in the Ashtabula River in anticipation of a public/private partnership approach to full-scale river cleanup.

The Corps, in concert with EPA, is completing the *Great Lakes Dredged Material Testing and Evaluation Manual*. This manual provides detailed procedures to evaluate the potential contaminant-related impacts associated with the discharge of dredged materials to waters of the Great Lakes. This is then used in the determination of whether the materials are suitable for open-water disposal or will require other management techniques.

New York State and EPA Region II are creating an electronic database of contaminated sediments in the New York Great Lakes basin. The database is being used to prioritize areas of contaminated sediments for remediation. Eighteenmile Creek near Lockport has been identified as an area needing immediate remediation because of high levels of dioxins. A plan for sediment removal from the Erie Canal has been referred to the New York State Thruway Authority for action.

Habitat Protection and Enhancement



A variety of programs are working to protect and enhance Great Lakes habitat.

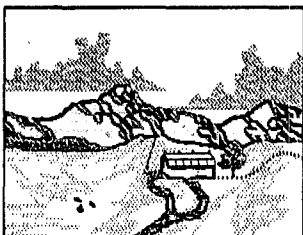
Under a variety of unique programs and partnerships at the federal, state, and local landowner levels, a large number of wetland and upland habitat creation, protection, restoration and enhancement activities are being conducted. These programs include the North American Waterfowl Management Plan, the Conservation Reserve Program, the Wetlands Reserve Program, the National Wildlife Refuge System, and programs run by other federal, state, tribal, and public entities. The following examples illustrate the variety of activities underway.

- At Metzger Marsh, Ohio, 558 acres of Ohio Division of Wildlife and 350 acres of U.S. Fish and Wildlife Service coastal wetlands on the southern shore of Lake Erie will be restored through the application of an ecosystem approach which will attempt to replicate natural lake level fluctuations through the use of fish access and water control structures. This will provide fishery spawning and nursing habitats, as well as needed emergent wetland for spring and fall migratory birds.
- The Kakagon Sloughs on Lake Superior is a 12,000 acre wetland

located on the Bad River Reservation in Wisconsin. This fresh water estuary is a very productive fish spawning ground and waterfowl marsh. A greater understanding of the interrelationships between Bad River Band tribal and alienated reservation lands, watershed land use practices, and other human activity affecting the ecological integrity of the Bad River watershed is being undertaken with the help of EPA, The Nature Conservancy, and state and local governments.

- The Lake Superior Habitat Team, a binational group comprised of federal, state, and provincial agencies headed up by the Minnesota Department of Natural Resources, has put together habitat selection and ranking criteria for Lake Superior and has done work to identify impaired habitats below major dischargers. In addition, the Team has developed a draft list of critical habitat in each state/province in the Lake Superior basin.
- At Ivanhoe Dune and Swale, Indiana, a project at a 100-acre preserve includes restoring the dune and swale topography by removing trash from midnight dumping, removing exotic plant species, providing open habitat for the federally endangered Karner blue butterfly, and planting native vegetation in disturbed areas. EPA is providing financial and technical assistance and the Indiana Department of Environmental Management and The Nature Conservancy are also providing assistance through solid waste compliance activities and the recruitment and training of neighbors as volunteer stewards.
- In 1994, the Wisconsin Natural Resources Board approved the acquisition of the St. Louis and Red River Streambank Protection Area. The project area includes five miles of St. Louis River shoreline, its coastal wetlands, and the entire Red River watershed. The project will protect this highly erosive, sensitive environment and will protect fish spawning and nursery habitat which is critical for the aquatic ecosystem health of the western arm of Lake Superior.
- The State of Pennsylvania has put together a five-year plan to address habitat needs of the Presque Isle Bay AOC as they relate to fish species habitat diversity and angler use. A local fishing group has stepped forward with the resources and volunteers needed to complete the project. And while neither Loss of Fish Habitat or Degradation of Fish Population are considered impairments in the

AOC, the habitat enhancement projects under this plan will improve existing fisheries and result in positive steps towards restoration of the Bay.



Public/Private partnerships on private lands are restoring and protecting vital Great Lakes habitat.

- The U.S. Fish and Wildlife Service's Great Lakes Partners for Wildlife Program continues to focus its efforts on restoring and protecting federal "trust species" habitats on private lands. The restoration of wetlands and adjacent uplands remain a priority because of their value to migratory birds, endangered species, anadromous fish, and their broad ecological value. In FY 1994, approximately 3,000 acres in the Great Lakes counties were affected by this program. Much of this acreage was planted as native prairie species. Planning assistance for fish and wildlife habitat improvement was provided to many private landowners, affecting over 30,700 acres. Also, 68 projects received funding through the Challenge Cost-Share Program.
- The U.S. Fish and Wildlife Service has initiated a multi-agency discussion to pursue potential restoration projects for the Crane Creek watershed in the western Lake Erie basin. This watershed terminates in an estuary with significant fish and wildlife values.
- EPA is working with its partners, including the Fish and Wildlife Service, states, tribes, and The Nature Conservancy, to develop a strategic conservation plan to identify high quality habitats for protection and restoration. Habitats to be inventoried include wetlands, fish spawning and nursery areas, old growth forests, dunes, savannas, prairies, and areas needed by endangered and threatened plant and animal species. A classification and inventory framework for freshwater aquatic biological communities is being developed by The Nature Conservancy to guide the identification and conservation of aquatic biodiversity in the basin.
- Through the Special Area Management Plan (SAMP) process, the Corps is cooperating with federal, state, and local agencies to identify, grade, and map wetlands and other waters within a regional area. The plan is used to help identify high quality wetlands and expedite the Section 404 regulatory process. The Corps-St. Paul District, working with a local steering committee, completed a SAMP for the City of Superior, Wisconsin which identifies wetlands and upland areas to be preserved, and plans for the creation and restoration of wetlands where mitigation is required by permits.
- The Corps constructed five streambank stabilization projects in FY

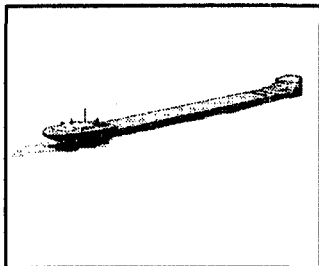
1994-1995 at tributaries to the Great Lakes in: Oconto, WI; Dundee, MI; Sheffield Lake, OH; Seneca Falls, NY; and Muskegon, MI. The Detroit District is preparing to begin construction in FY 1996 of a 210 foot long inflatable dam on the Clinton River Spillway which will improve the overall water quality in the lower portion of the Clinton River, Michigan.

- The Corps-Detroit District and the U.S. Fish and Wildlife Service are providing support to the Wisconsin Department of Natural Resources in the design of nearshore spawning reefs for lake trout. The Detroit District has also provided support to the Potawatomi Community and Oneida Nation in Wisconsin for the development of geographic information systems for mapping resources, including wetlands.
- The U.S. Fish and Wildlife Service, the Corps, the Coast Guard, and the State of Michigan are implementing a Memorandum of Agreement for extended winter navigation in the Great Lakes. Signatory agencies are undertaking a series of ongoing study tasks to evaluate navigation effects due to season opening prior to the traditional date of April 1. Resources of greatest concern include St. Marys River wetlands and river-spawning populations of key fish species, particularly lake herring. The National Biological Service, the State of Michigan, the Corps, the Coast Guard, and the Fish and Wildlife Service will be involved in follow-up study monitoring activities through 1998.
- The Great Lakes Mayors, led by the mayors of the Indiana cities of Hammond, Gary, Whiting, Michigan City, Portage, and East Chicago, passed a joint resolution to protect biodiversity in the Great Lakes. This was a direct result of The Nature Conservancy report, *The Conservation of Biological Diversity in the Great Lakes Ecosystem*.
- A multi-agency task force is implementing a comprehensive interagency fish and wildlife habitat restoration plan for the Buffalo River Area of Concern. This plan was prepared by the U.S. Fish and Wildlife Service.
- The State of Illinois has funded two erosion control projects on the Waukegan River under Section 319 of the Federal Clean Water Act. The State is also exploring the opportunity to promote terrestrial habitat restoration along the lakefront as an overall program for erosion control, esthetics, and habitat restoration to protect and

restore Lake Michigan.

- The City of Chicago, as part of a regional partnership with EPA, The Nature Conservancy, and local forest preserve districts, is actively involved in ongoing wetland and prairie rehabilitation efforts. These urban restoration projects are important not only for maintaining habitat, but also for pollution prevention and environmental justice implications associated with these efforts.

Exotic Species



Inspection of ocean going vessels help protect the Great Lakes from the introduction of exotic species.

- Ballast water exchange and inspection regulations have been in place in the U.S. since May 1993 to help limit the introduction of exotic species to the Great Lakes. Under the Coast Guard Ballast Water Inspection Program, the U.S. Coast Guard boards all vessels with ballast entering the St. Lawrence Seaway and spot checks, with additional boardings, those vessels reporting “no ballast on board” in order to insure that they are not carrying pumpable ballast. This program would not be possible without the full cooperation of the Canadian Coast Guard. These regulations are expected to profoundly diminish the number of new invasions of exotic species in the Great Lakes. The Coast Guard will continue to investigate further measures for preventing new exotic species from being introduced to the Lakes.
- In November 1993, New York became the first state to develop federally approved and funded nonindigenous aquatic species comprehensive management plan as required under the Federal Nonindigenous Aquatic Nuisance Species Prevention and Control Act of 1990. The plan lays out a strategy for preventing the introduction of nonindigenous aquatic species to the waters of New York State.
- The U.S. Fish and Wildlife Service, the States of Minnesota, Michigan and Wisconsin, and the Province of Ontario are considering control mechanisms for the ruffe. The potential benefits and environmental impacts of chemical controls is currently being evaluated. The maritime industry implemented a voluntary ballast water management plan for ruffe in 1993, in consultation with Fish and Wildlife Service and the Coast Guard.
- Ruffe surveillance, conducted since 1992 by the Fish and Wildlife Service, seeks to provide the earliest possible detection of ruffe. The

program consists of both field survey and educational components. Thirty-seven sites in the upper Great Lakes, seven sites on Lake Erie and one on Lake Ontario were surveyed in 1994. In August 1995, ruffe were identified by the Service in northern Lake Huron for the first time. To help combat this exotic species, ruffe identification posters and wallet-size cards have been developed and distributed throughout the basin. In addition, more intensive sampling is being initiated by the Service to better define the degree to which this new population has become established.

- The Great Lakes Fishery Commission, through its agents (U.S. Fish and Wildlife Service and Canadian Department of Fisheries and Oceans) is implementing an Integrated Pest Management program for sea lamprey in the Great Lakes. This has reduced the dependence on lamprey treatment chemicals by 20-percent to date, and is expected to further reduce the use of these chemicals by increasing the use of barriers and the release of sterile male sea lamprey. In addition, the Commission, the Fish and Wildlife Service, and the Corps of Engineers have developed a partnership agreement to cooperate on barrier technology for sea lamprey control. The Commission, through its agents, is also developing a control strategy for sea lamprey in the St. Marys River. This is a vital first step for the restoration of native lake trout in northern Lake Huron.
- Lake Ontario sea lamprey control has never been more effective, with 1994 rates of lake trout lamprey wounds at record low (less than 1.1 wounds per 100 fish).
- The Great Lakes Indian Fish and Wildlife Commission, which is comprised of eleven tribes in the Lake Superior Basin, is preparing a report on the status of Lake Superior wetlands and the restoration efforts needed to mitigate the impacts of purple loosestrife, a European invader which displaces native plants in wetland habitats.

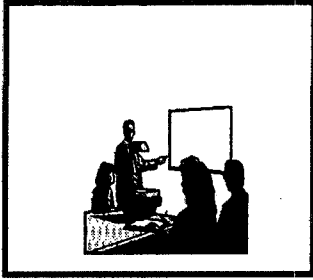
Protecting the Health of Basin Residents

- The Great Lakes States, in consultation with the Food and Drug Administration and EPA, have jointly developed a draft of the nation's first uniform fish consumption advisory. This effort seeks to set consistent recommendations for determining the amount of fish that can be ingested without significant health risks. This will foster consistency among states in their advisories, which helps the public better understand the risks associated with consumption of contami-



Consumption advisories help the public understand the risks associated with consuming Great Lakes fish.

nated sportfish and game. The protocol is currently undergoing additional scientific review. In the interim, three of the states have adopted a modified version of the protocol while two more are considering the same action. Discussions of adopting the original protocol will occur after the review is completed in 1995.



Educating medical professionals about environmental risks will help protect the health of basin residents.

- EPA and the Agency for Toxic Substances and Disease Registry are funding a variety of projects to develop core curricula in environmental medicine and occupational health aimed at educating healthcare professionals about environmental risks. These professionals can then serve as environmental educators, helping to increase public awareness of health concerns in their Great Lakes communities.
- New York State DEC has implemented a project to improve awareness of the health risks associated with eating contaminated fish among people in New York metropolitan areas of the Great Lakes basin. Simplified fish consumption advisory brochures are being translated into Spanish, Ukrainian, and other languages for distribution in Buffalo and Rochester. Meetings on effective health-risk communication have been conducted with community health organizations in the area.
- The Great Lakes Indian Fish and Wildlife Commission developed and produced an educational video on mercury and fish consumption for use in Native American schools in the Lake Superior basin.
- The Chippewa-Ottawa Treaty Fishery Management Authority has initiated testing of tribal commercially harvested species for contaminant loads and are relaying the information through media outlets for the benefit of the consumer public.
- Targeted risk communication materials have been developed and distributed to populations which are heavy consumers of Great Lakes fish or to medical professionals who serve these populations, which include Asian immigrants, expectant mothers, Native Americans, charter boat captains, and urban poor.

Fish and Wildlife Populations: Actions and Successes

- The American bald eagle, the national symbol that almost disappeared from the continental U.S. just 25 years ago, was removed from the endangered species list in July 1995. After a year-long review, the U.S. Fish and Wildlife Service decided to change the status of the

eagle from “endangered” to “threatened” in the 48 contiguous states. There are currently about 4,500 nesting pairs of bald eagles in the U.S., up from 417 back in the 1970s. Environmental laws which reduce toxics and protect vital habitat, and hunting restrictions, are credited with this turnaround. Examples of this recovery in the Great Lakes include:

- The number of successful bald eagle nesting territories within New York State’s Lake Ontario Basin has increased from none in 1979 to six in 1994. To date, these nests have successfully fledged more than sixty eaglets.

- A record 98 bald eagles were found taking up winter residence in Ohio. From a low of only four active nests in 1979, nests in 1995 numbered a record high of 29, with 17 in the Ohio Lake Erie basin.



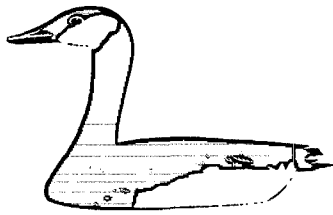
The bald eagle, our national symbol, is recovering in the Great Lakes Basin.

- The American peregrine falcon has soared to near recovery. The U.S. Fish and Wildlife Service has issued its proposal to delist the peregrine falcon from the endangered species list. This species narrowly escaped extinction from the effects of the pesticide DDT. The falcon has been listed as endangered since 1970 and has been brought back thanks to the ban on DDT, protection and recovery programs under the Endangered Species Act, and the determined efforts of a dedicated cadre of falcon enthusiasts. Populations of American peregrines are now estimated at nearly 1,000 nesting pairs in the lower 48 states. Numbers have been steadily climbing even though the American peregrine was eliminated in parts of its range. In some areas, it is more numerous now than it was before the use of DDT.
- The endangered Kirkland’s warbler, a songbird with nesting habitat found nowhere else in the world but in northern lower Michigan, has been increasing in numbers since 1990. A record count of 1,260 adults was achieved in 1994. A new record was assured for 1995, as a minimum of 765 male warblers were confirmed, and for the first time, two pairs were documented nesting in the upper peninsula where eight males were heard singing during the annual June survey. Each year thousands of visitors from throughout the U.S. and worldwide, specifically visit the Grayling and Mio areas of Michigan to see this unique bird. Tours of the warbler’s jackpine ecosystem were developed through a partnership of federal and state agencies and local groups and businesses. This has proven economically benefi-

cial to the local communities, while informing the public of the importance in protecting this species. These collaborative efforts provide a national model of constructive species recovery as a result of protection and funding provided under the Endangered Species Act, and in concert with non-governmental and state partnerships.

- The cormorant population in Ohio's portion of the Lake Erie basin has increased to the point that they are taking over the nesting sites of blackcrowned night herons and the great blues.
- Double-crested cormorant populations in the Lake Ontario basin are healthy and breeding normally. Current populations are nearly three orders of magnitude greater than the mid-1970s and are at an all time historic high.

A positive example of multiple species protection on private lands is the interagency cooperation exhibited by the U.S. Fish and Wildlife Service, U.S. Forest Service, and the Michigan Department of Agriculture, as called for by the Endangered Species Act. This enables the annual treatment of up to 257,000 acres of private forested Michigan lands to control gypsy moth defoliation, while at the same time protecting the threatened bald eagle and the endangered Kirkland's warbler and Karner blue butterfly. This partnership has worked quietly and efficiently for years, yet affects about 126,000 Michigan landowners annually.



Record duck populations are being observed in the Great Lakes.

The U.S. Fish and Wildlife Service recently announced that a second year of plentiful rains and a decade of intensive wetland conservation efforts, fueled by a tremendous partnership among government, conservationists, and private landowners, have yielded the largest breeding duck population in 15 years. The annual breeding duck survey recorded an estimated 35.9 million ducks, up more than 10 percent from last year. Breeding mallard populations rose 18 percent to 8.3 million, the highest level since 1972 and above the 8.1 million goal contained in the North American Waterfowl Management Plan. Some associated Great Lakes successes include: (1) Population estimates for total ducks in the State of Wisconsin was 51-percent higher than the 22 year mean and the third highest population recorded in the last 23 years; (2) Michigan has realized a 43-percent increase in total ducks over the last four years; in the same period, their Giant Canada Geese population has doubled; (3) Minnesota has recording a doubling of total duck breeding population since 1975.

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- The endangered gray wolf, under the protection of the Endangered Species Act, is reoccupying Michigan's Upper Peninsula. Wolf pups were born there for the first time in forty years in 1992. Wolves have increased in number to 58 in 1994. With a viable and secure wild population of more than 100 wolves in Michigan and Wisconsin for the next four years, as well as 2,000 in Minnesota, the wishes of Michigan's citizenry for the wolf will become a reality. These wishes were illustrated by the fact that over 90 percent of individuals commenting in 1993 at public forums supported wolf recovery in Michigan.
 - Since the severe depletion of fish communities by the 1950s, some heartening progress to improve fish resources has been made. Lake whitefish populations are increasing and expanding in all of the Great Lakes. Bloaters have made a dramatic recovery in lakes Michigan and Huron, surpassing alewife as the most numerous forage species. Lake herring have also made a dramatic recovery in Lake Superior. Lake trout reproduction has been so successful on Lake Superior that management agencies are facing the decision to cease stocking in some regions of the lake. Small but consistent numbers of wild lake trout have been sampled in both lakes Ontario and Huron for the last 3-10 years.
 - The U.S. Fish and Wildlife Service, states, tribes, and the Province of Ontario have begun restoration of Lake Superior's unique "coaster" brook trout, once the predominant nearshore game fish in Lake Superior. A status report on the remnant coaster population has been drafted, genetics and movement studies are underway, small-scale restoration experiments have been done, and the Service will collect gametes from remnant stocks for disease clearance as hatchery brood stock in the Fall of 1995.
 - The U.S. Fish and Wildlife Service and the Ontario Ministry of Natural Resources, with the assistance of Lake Huron commercial fishers and the cooperation of the Michigan Department of Natural Resources, have initiated a lake sturgeon tagging project to enhance available information on relative abundance, movement and seasonal distribution of this depleted native fish. Biological and spatial information collected from this long-term project will be used to develop a database regarding status and trends, and assist in the development of inter-agency recovery plans for lake sturgeon in the Lake Huron basin. Long range goals of the project include identification and quantification of critical habitat needs of

the various life-history stages, assisting in the protection, enhancement, and restoration of those important habitats to aid recovery efforts, and to prevent the need for federal listing.

- In cooperation with the National Biological Service, the U.S. Fish and Wildlife Service has retrofit the fish stocking vessel M/V Togue for gillnetting to enable continued monitoring of the developing spawning population of lake trout on the Six Fathom Bank reef complex in the central main basin of Lake Huron. This collaborative effort has allowed the agencies to pool fiscal and personnel resources for the collection of data that has identified a strain of lake trout (Seneca Lake strain) that avoids sea lamprey attacks during the first four years of lake residence, enhancing survival and allowing successful reproduction. Collection of genetic material from the spawning population will enable researchers to identify the most probable strain of origin of progeny resulting from natural reproduction at this site.

Recent data indicates that the structure of Lake Ontario's offshore fish community is changing in response to improved environmental conditions, and that the direction of that change is towards a fish community that more closely resembles that which existed historically. Specific signs of progress illustrated by this encouraging data include:

- Whitefish and burbot populations, Great Lakes native species that require habitat similar to that required by lake trout, have made significant recoveries in Lakes Erie and Ontario.
- The occurrence of natural reproduction of lake trout in Lake Ontario has now been documented for several years. As of August 1995, the number of naturally reproduced lake trout collected during routine New York State fishery survey trawls is eight times greater than the total number collected by New York State and Ontario efforts in 1994. Wild lake trout were caught in every area of the lake in 1994, indicating that successful natural reproduction and survival in the early stages occurred lakewide in 1993-1994. In addition, initial signs of lake trout natural reproduction have been noticed in Lake Erie.
- For the first time in many decades, several year classes, including young, of native lake sturgeon have been observed in the upper

Niagara River, indicating a significant recovery of this species in this area.

- Once indigenous to Lake Ontario and its tributaries, the Atlantic salmon disappeared by 1900 due to mill dams obstructing spawning migrations, and overfishing, as well as deforestation and pollution. The Fish and Wildlife Service is participating in the investigation of the feasibility of restoring Atlantic salmon populations in historic spawning tributaries that flow into Lake Ontario and in the upper St. Lawrence River.
- An Aquatic Habitat Classification System, developed by the Fish and Wildlife Service, was applied to assessing the health of the Lake Ontario ecosystem. The process allowed for the identification of areas of stress. As an expansion of this habitat evaluation, five river enhancement plans (for the Genessee, Oswego, Raquette, Salmon and Black Rivers) were prepared that address water flow and access by fish to these tributaries.
- Control of sea lamprey and stocking of lake trout and pacific salmonids have contributed to the growth of important sport and commercial fishing industries. For example, although once proclaimed "dead," Lake Erie is now globally recognized as the foremost walleye fishery in the world. And for the U.S. side of the basin, five million sport fishermen spend more than \$4 billion each year fishing all the Great Lakes.

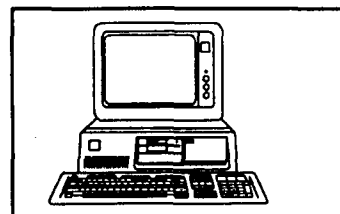
Public Involvement

A cornerstone of the Great Lakes Program is the promotion of public stewardship and direct involvement. Community stakeholders are strongly involved in planning processes. Public Forums are in place and actively engaged on the LaMPs for Lakes Michigan and Superior and are being formed for Lakes Erie and Ontario. In addition, most of the Great Lakes AOCs have Public Advisory Groups which are participating in RAP development at a variety of levels.

EPA and its partners are vigorously pursuing greater public access to relevant Great Lakes environmental information through the INTERNET. Active participation in the Great Lakes Information Network (GLIN) and the Great Lakes Regional Environmental Infor-



Active public involvement is one of the keys to success in the Great Lakes.



The Great Lakes program has made sharing of information one of its top priorities.

mation System (GLREIS) contributes to a full set of information about the Great Lakes available to the public.

In addition, the Great Lakes Computer Center provides a database to support regional information systems including Great Lakes Envirofacts, which consists of USEPA facility information in an easily accessible format, the Regional Air Pollutant Inventory Development System (RAPIDS), and the database of the Lake Michigan Mass Balance. The public is now able to easily search Great Lakes Envirofacts through the INTERNET.

EPA is sponsoring a survey of the general public in the U.S. portion of the Great Lakes basin that will determine perceptions of how clean the Lakes are and how successful our efforts have been to restore and maintain their integrity

Building the Knowledge Base

One of the pillars of the Great Lakes program is a need to gather, act upon, and disseminate accurate and timely information regarding the ecosystem. To ensure that environmental decisions are based on the best scientific information, EPA and its partners are working to improve their understanding of the health of the ecosystem. In the last biennium, the Great Lakes Program has implemented a number of important research related activities to provide governments and the public with the tools they need to make decisions.

State of the Lakes Ecosystem Conference

The highly regarded first-ever State of the Lakes Ecosystem Conference (SOLEC '94) brought together Great Lakes experts, managers and other decision makers working in the fields of pollution control, natural resources and human health to review the state of the ecosystem and information that could lead to better consideration of impacts on the Great Lakes. A major result of this conference was agreement that habitat loss, exotic species and toxic substances should be given equal attention in working to restore and protect the integrity of the basin's ecosystem. A joint U.S./Canadian report entitled *State of the Great Lakes-1995* was released on September 1, 1995. Final versions of the technical papers prepared for SOLEC '94 will be available as appendices to this Report. They include papers on human health, aquatic community health, habitat, toxic contaminants, nutrients, and the



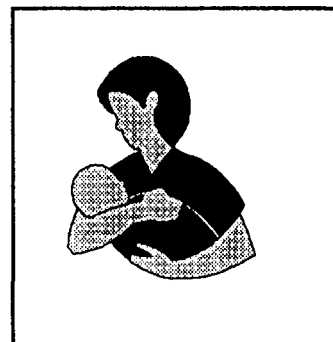
economy of the basin. SOLEC '96 is being planned with a focus on nearshore areas of the ecosystem.

HabCARES Workshop

United States and Canadian environmental protection and natural resources agencies, in recognition that the degradation and loss of habitat is impairing the integrity of the Great Lakes basin, sponsored HabCARES, a workshop on the science and management of habitat restoration and conservation strategies in the basin. The HabCARES Workshop provided contexts and the framework for describing a variety of methods for beneficially modifying habitat. The 47 projects described in the workshop proceedings reasonably reflect the diversity of habitat modification and conservation activities in the basin and provide a framework for selecting and evaluating habitat rehabilitation and conservation methods from a "toolbox" of options. The intended audience for this information are the public and private agencies and organizations working on the RAP and LaMP programs and other watershed activities.

ATSDR Study

EPA is finalizing a Report to Congress outlining the variety of studies being implemented by the Great Lakes Human Health Effects Research Program. This program, mandated by Congress, addresses the potentially adverse human health effects from consuming Great Lakes fish on particularly sensitive populations. These groups include: pregnant females, nursing mothers, fetuses and nursing infants, infants and children, Native Americans, sport anglers, urban poor, and the elderly. The program is being administered by the Agency for Toxic Substances and Disease Registry. The report will provide an excellent and comprehensive historic overview of previous health effects research conducted in the Great Lakes basin, as well as summarizing the current research taking place under the Program. The findings from this Program will provide some of the information that Great Lakes policymakers need to further protect the health of the inhabitants of the Basin.



Protecting the health of all generations of Great Lakes residents is of vital concern to the Great Lakes Program.

Great Waters Program

Under section 112(m) of the Clean Air Act, as amended in 1990, Congress authorized EPA to undertake the Great Waters Program to

evaluate the atmospheric deposition of fifteen hazardous air pollutants (including mercury and PCBs) to the Great Lakes and other waters. The Program's Report to Congress (May 1994) includes information on the contribution of atmospheric deposition to pollutant loadings, associated environmental or public health effects, source information, and a description of regulatory revisions under applicable federal laws that may be necessary to assure protection of human health and the environment. Program findings concluded that a significant portion of loadings of the pollutants studied are coming from the atmosphere, including 76 to 89 percent of PCB loadings to Lake Superior and 95 percent of lead loadings to Lake Michigan. In addition, pollutants of concern originate from sources that are local to, as well as distant from, the impacted waters. The principle recommendations in the Report are:

- EPA will continue ongoing efforts to implement section 112 and other sections of the Clean Air Act, and will use the results of this report in taking reasonable actions to reduce emissions of Great Waters pollutants of concern;
- Recognizing the need for an integrated multi-media approach to atmospheric pollution, EPA will consider authorities beyond the Clean Air Act to reduce exposure to these pollutants; and
- EPA will continue to support research activities and will develop and implement a strategy describing research and policy assessments to address the mandates of section 112(m) of the Clean Air Act.

Related Air Monitoring Activities:

The Regional Air Pollutant Inventory Development System (RAPIDS) has been developed to identify the sources and source categories that contribute most to the total emissions in a given geographic area. Using RAPIDS, the Great Lakes States' air regulatory agencies are building statewide air toxics inventories for point, area, and mobile sources for 49 air pollutants of potential concern to the Great Lakes. These inventories will help guide the States in future regulatory efforts.

EPA and Environment Canada have established five master stations for the Integrated Atmospheric Deposition Network (IADN), one on each of the Great Lakes, to monitor atmospheric deposition of toxic contami-

nants. These five sites have been operational since December 1992. In addition, eight U.S. satellite sites have been established around Lake Michigan as part of the Lake Michigan Mass Balance Study and one U.S. satellite site has been established on Lake Superior. The U.S. also began an intensive one year mercury monitoring program at U.S. IADN sites in October 1994. The first binational report on IADN data, published in December 1994, indicated that there is rather little spatial variability in many of the critical chemical species across the basin.

Another focus of the Lake Michigan Mass Balance Study is the development of integrated air-water models. Once complete, the models will use monitoring information, emission inventory data, and modeling of dispersion/deposition, tributary and sediment loading, and air-water exchange to link concentrations of pollutants in the tissues of lake fish to the original sources of the pollutants (atmospheric point sources, tributary loading). The modeling framework will then be available to adapt to the other Great Lakes. Identifying the sources of contaminants will allow for cost-effective reductions of these pollutants and corresponding improvements in lake ecosystem quality.


The Lake Michigan Ozone Study is a comprehensive investigation of the formation and transport of smog in the Lake Michigan airshed. The study is a joint effort involving the states of Illinois, Michigan, Wisconsin, and Indiana, along with USEPA. The study represents a coordinated approach to a regional problem - ozone formation and transport in the Lake Michigan region. State-of-the-art computer modeling will help planners organize and interpret data. The purpose of the study is to gather the information needed to develop improved ozone control strategies for each of the four participating states.

Rouge River National Wet Weather Demonstration Project

Since 1992, the Rouge River AOC National Wet Weather Demonstration Project has been investigating sources and controls of water pollution in a highly urbanized watershed during wet weather events. The Project's centerpiece is the construction of eleven retention facilities and the separation of seven combined sewer systems, which will be assessed for effectiveness in mitigating pollution from combined sewer overflows (CSOs). Pollutant loadings from nonpoint sources, including contaminated sediments and abandoned landfills, will also be assessed through the Project. Information collected will be used to model water quality improvements resulting from the full

application of various pollution control measures throughout the Rouge River watershed. Program findings will be transferable to other Great Lakes AOCs.

Great Lakes Fishery Resources Restoration Study



Hard work and intensive research by partnering states, federal agencies, tribal governments, and non-governmental partners with the U.S. Fish and Wildlife Service, has resulted in completion of the *Great Lakes Fishery Resources Restoration Study - Completion Report to Congress (1995)*. The Study summarizes historical and current trends in lake resources and the causes of change in fishery resources and management strategies for each lake and for the basin overall. Discussions on implementing an ecosystem approach, setting ecosystem goals and objectives, and achieving basinwide ecosystem partnership coordination are included. Recommendations to meet the *Fish Community Goals and Objectives* for each lake were provided. They call for continuing partnerships between the diversity of interests reliant on the Great Lakes to achieve a functional healthy ecosystem in the future. The Report's information, findings, and recommendations, are intended to guide federal assistance to state partners in their management of the living resources of the Great Lakes, ensuring maximum public benefit and guaranteeing the sustainability of these resources.

Great Lakes National Water-Quality Assessment Program

The U.S. Geological Survey currently has two National Water-Quality Assessment (NAWQA) Program studies underway in the Great Lakes area - the Western Lake Michigan Drainages and the Lake Erie-Lake St. Clair Basin. The long-term goals of the NAWQA Program are to describe the status and trends in the quality of a large representative part of the Nation's surface and groundwater resources and to identify the natural and human factors that affect their quality. In particular, the Survey is measuring the concentrations in surface and ground waters of pesticides used in agricultural and urban areas to determine their distribution and frequency of occurrence. The presence and distribution of nutrients (nitrogen and phosphorus) are also being studied to determine if the major sources of these are agricultural practices, discharges from sewage treatment plants, or combined sewer overflows. The NAWQA Program will produce water quality information that will be useful to policymakers and water managers at the local, state, and national levels of government.

Progress Under the Lakewide Management Plans

The Great Lakes Program has established the Lakewide Management Plan (LaMP) process to restore and protect the beneficial uses on an individual lake basin scale. Agencies working on the LaMPs are developing strategic management plans to streamline and strengthen the integration and application of environmental programs and to create strategic monitoring plans to aide in the analysis and use of environmental data in making decisions regarding the lakes' ecosystems. The LaMPs are also developing ecosystem objectives, targets and indicators as measures of progress. In addition to activities already highlighted under specific topics of this report, a variety of other significant LaMP accomplishments have also occurred during the last two years.

Lake Superior

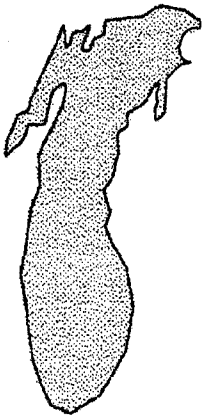
- Major facilities in the United States that discharge into the Lake Superior basin, and which discharge the nine critical pollutants identified for zero discharge by the Lake Superior Binational Program, are at or close to non-detection levels. These contaminants are: chlordane, dieldrin, octachlorostyrene, 2,3,7,8-TCDD, mercury, DDT and metabolites, hexachlorobenzene, PCBs, and toxaphene.
- The loadings of two of the targeted substances, PCBs and mercury, from major U.S. facilities have significantly decreased from approximately 20 and 13 pounds per year respectively in 1991-1992, to non-detect for PCBs and 5 pounds per year for mercury in 1993-1994. These load reductions were calculated by using data from the Great Lakes Enforcement Strategy.
- The monitoring of stormwater discharge from eleven municipalities is being conducted as a cooperative effort between the USGS and the states of Michigan, Minnesota, and Wisconsin. Funding for this effort is being provided by EPA as part of the Nonpoint Source Program. Initial findings indicate that none of the nine zero discharge critical pollutants are present in the monitored discharges.
- The Special Designations Subcommittee is currently undertaking a Biosphere Reserve feasibility study for Lake Superior.



By surface area, Lake Superior is the largest freshwater lake in the world. It holds just over one half of the water in the Great Lakes system.



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- The Lake Superior Binational Public Forum has drafted reduction targets for mercury, PCBs, and some pesticides, which they have forwarded to the Governments for their consideration in setting load reduction targets.
 - The Lake Superior States have instituted a "Riverwatch Program" which provides support to schools for Great Lakes educational materials and for tributary monitoring by students.
 - The Western Lake Superior Sanitary District is building pollution prevention capabilities in the basin by: pollution prevention awareness training for wastewater treatment plant managers and operators across the basin; a toxic pollution prevention needs survey; facilitating local toxic reduction meetings with local organizations; developing business-specific pollution prevention opportunities and waste management guidelines; and assisting three local communities to develop toxic reduction plans.



Lake Michigan is the only Great Lake that lies wholly within the United States.

Lake Michigan

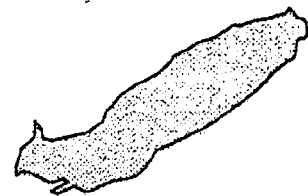
- The Lake Michigan Mass Balance Study/Enhanced Monitoring Program is designed to answer questions that will help environmental managers make well-informed, scientifically based decisions on reducing toxic pollutants in Lake Michigan. Partners in this effort include EPA, USGS, the Lake Michigan states, and a number of universities. The chemicals being monitored are: PCB congeners, *trans*-nonachlor, atrazine and its major breakdown products, and total mercury. The monitoring of loads from tributaries, atmospheric deposition, and contaminated sediments will help determine the importance of each of these sources in the total amount of pollutants entering the lake. The Mass Balance Model will determine what effects reduction in pollutant loads will have on the lake and, in particular, on contaminant levels in fish tissue. The Model's findings will help target future Lake Michigan LaMP toxic load reduction efforts at the federal, state, tribal, and local levels.
- The LaMP has identified lakewide critical pollutants and the four Lake Michigan states have completed their assessments of beneficial use impairments caused by all stressors.
- Michigan DNR is conducting sediment assessments for PAHs in the Manistique and Muskegon Rivers, which ultimately will lead to

remediation of PAH hotspots. In addition, LaMP staff have been providing support to Superfund action on PCB-contaminated sediments in the Manistique River.

- The LaMP Technical Coordinating Committee is finalizing a LaMP workplan which will be used to set priorities for prevention, remediation, and restoration activities.
- The Lake Michigan Forum is securing computers and INTERNET access for selected AOCs around Lake Michigan, and ultimately hopes to secure access for all AOCs. This will improve communications among the RAPs and with the Forum.

Lake Erie

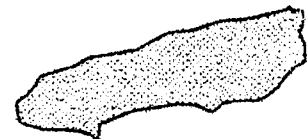
Recent activities and accomplishments include: (1) the release of a Concept Paper for public comment, which describes the framework for LaMP development; (2) the completion of four public workshops to receive input on Lake Erie ecosystem objectives, which are descriptions of the desired future state of the Lake Erie ecosystem; (3) the initiation of the assessment of impairments to beneficial uses, including impacts from pollutants, habitat loss, and exotic species; and (4) the initiation of steps to convene a LaMP Public Forum.



Lake Erie is the smallest of the lakes in volume but is exposed to the greatest stress from urbanization and agriculture.

Lake Ontario

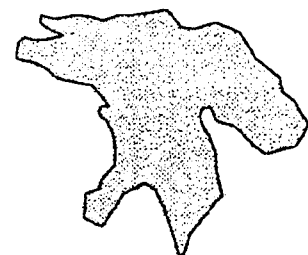
The existing Lake Ontario Toxics Management Plan is being expanded into a LaMP. In support of this, Canadian and U.S. agencies have completed draft beneficial use impairment assessments which have identified the following lakewide impairments: restrictions on fish and wildlife consumption, degradation of fish and wildlife populations, and bird or animal reproductive problems. In addition, the following lakewide LaMP critical pollutants have been identified: PCBs, dioxins, mirex, DDT, and dieldrin. A Canadian sources and loadings report has been completed, while a U.S. report is being finalized. A U.S. report identifying New York hazardous waste sites with a significant potential for contributing critical pollutants to Lake Ontario is also being finalized.



Lake Ontario is the smallest of the lakes in surface area. The Canadian population within the basin is about twice that of the U.S.

Lake Huron

USEPA, the State of Michigan, the Province of Ontario, and other federal agencies are looking to develop and implement a LaMP for Lake Huron,



Lake Huron is literally the lake in the middle both geographically and in environmental quality.

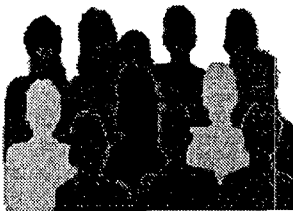
based on the lessons learned in developing LaMPs for the other Great Lakes. At the current time, no date has been set to begin this process.

Progress on Remedial Action Plans

Highlights of current and planned activities to implement Remedial Action Plans (RAPs) in Great Lake Areas of Concern have been incorporated throughout this report. These highlights can only begin to capture the breadth of activities underway in the twenty-six U.S. AOCs and the five connecting channel AOCs shared with Canada. Active multi-stakeholder involvement in all the AOCs is achieving marked progress towards the restoration of beneficial uses. For a much more thorough review of these activities, USEPA and Environment Canada produced a September 1994 report entitled *Progress in Great Lakes Remedial Action Plans: Implementing the Ecosystem Approach in Great Lakes Areas of Concern*. This report, produced in cooperation with the individual RAP groups, is the most comprehensive portrayal to date of progress in the RAPs. This report is available from EPA's Great Lakes National Program Office.



Innovative Partnerships



New and innovative partnerships will help lead the way to restore and protect the Great Lakes.

Partners to the U.S. Great Lakes Program have recognized the need to create new and innovative solutions to the impacts affecting the basin. This approach includes the recognition that new partnerships are needed amongst all sectors of society to achieve the goals of the Program. The following activities present highlights of the implementation of this approach.

Tribal Relations

EPA has expanded its multi-media staffing grants to place an environmental specialist in the majority of tribes in the Basin. This program has been productive in creating and improving EPA-tribal partnerships and professional relationships, building an overall tribal environmental infrastructure, developing capacity to manage media-specific programs, and achieving on-the-ground improvements on tribal lands. Accomplishments under these grants include: surface and groundwater surveys; identification of underground storage tanks; woodburning studies; indoor air education efforts; development of tribal environmental codes and ordinances; draft water quality standards; dump closures; develop-

ment of recycling programs; radon testing; reviews of environmental impact statements; and environmental education efforts.

EPA and the tribes in the states of Michigan, Minnesota and Wisconsin have initiated a formal process to develop joint planning agreements to identify and prioritize tribal environmental needs for 1995-1997. The Minnesota Tribes/EPA agreements were formally signed in May 1995.

EPA is funding a project entitled "Building Great Lakes Tribal Capacity". The purpose of this project is to allow the Native American Tribes in the Great Lakes Basin to raise their levels of awareness and to help tribes determine at what level they wish to be involved in the variety of Great Lakes federal programmatic activities occurring in the Basin. Such activities include, but are not limited to, Lakewide Management Plans, Remedial Action Plans, the USEPA Great Lakes Five Year Strategy, and data integration. The project also seeks to ensure that a tribal perspective is included in all programs and research activities.

In both 1994 and 1995, the Wisconsin DNR provided support for the University of Wisconsin Institute for Environmental Studies to provide workshops entitled "Pre-college Program for Native American Youth in the Lake Superior Basin".

Brownfield Redevelopment

A "Brownfield" can be loosely defined as a site where real or perceived contamination curtails redevelopment or reuse. Redevelopment of these sites is a promising solution for cleaning up valuable land that may have sat idle because of fears of potential liability and cleanup costs. These sites are usually closed or abandoned industrial sites predominantly in urban areas, with the vast majority ranging in size from no more than a storefront to a city block. Through the development of partnerships between federal, state and local governments and public and private organizations, Brownfield redevelopment will seek to benefit the environment and economies of local communities by assessing the extent of contamination at a site, developing risk-based cleanup protocols that are linked to future use scenarios, and by addressing liability issues, while still being protective of human health. Grants have been made to Great Lakes state and local governments to develop the capacity to conduct Brownfield assessments, to perform cleanup and redevelopment activities, and to develop regulations for their respective programs.



Redevelopment and reuse of urban sites will help improve the environment and economy of these areas.

Ashtabula River Partnership

EPA, the Corps, the State of Ohio, and a large number of diverse public and private organizations at the federal, state and local levels have formed the locally based Ashtabula River Partnership. The Partnership, an outgrowth of the Ashtabula River RAP process, seeks to address and implement an ambitious, comprehensive full-scale cleanup of the contaminated sediments in the Ashtabula River and Harbor in Ohio in order to restore beneficial uses. Signatories to the Partnership are strongly committed to investigating the extent of contaminated sediments in the river and harbor, to developing a plan for the dredging and disposal of river sediments, to identifying resources necessary to carry out the cleanup, and to generating a timeline of milestones and activities. The sediments are contaminated with PCBs, other chlorinated organic compounds, and heavy metals which have limited the amount of dredging and which precludes open water disposal. The Partnership plans to remove and properly dispose of roughly 750,000 cubic yards of contaminated sediments from the river and harbor through the innovative use of multiple authorities.

Fox River Coalition

EPA, the Corps of Engineers, and the Fish and Wildlife Service have provided technical assistance to another public-private partnership which is dedicated to contaminated sediment remediation planning and implementation in the Fox River, Wisconsin. The Fox River Coalition is a group of industry, business, and local and state government officials established in 1992. The group's goal is to cooperatively develop a process for determining the degree of cleanup, cost-effective methods, funding mechanisms, and a timetable for addressing 39 miles of the river. Based on the estimates from the EPA-led 1989 Green Bay Mass Balance Study, there are about 44,000 - 88,000 pounds of PCBs in 9-11 million cubic yards of contaminated sediment in the Lower Fox River. The Mass Balance Study, the first in the world to determine the presence, transport, and fate of bioaccumulative toxic substances in a river and bay environment, provided a substantial data base to begin sediment management decision-making. Since 1992 the Fox River Coalition has also determined the presence of heavy metals at levels consistent with impacts to aquatic insects, prioritized contaminated sites in 32 miles of river, and funded and initiated remedial investigations and feasibility studies on four sites. The group has used Mass Balance computer models to draft remediation strategies and provided partial funding for additional PCB

data collection on seven miles of river. The additional data, to be gathered with EPA assistance, is needed to increase confidence in model prediction and evaluate the appropriateness of preliminary recommendations for remedial projects. Cleanup of the Lower Fox River is an important step in the implementation of the RAP for lower Green Bay and the Lake Michigan LaMP.

Coordinating Monitoring Efforts in Wisconsin

Effective environmental monitoring is essential to understanding, managing, and protecting water resources. Personnel from several agencies are collecting water quality information throughout Wisconsin. In 1992, the USGS, Wisconsin DNR, and EPA began a partnership to try and strengthen the coordination of these monitoring efforts. This partnership is part of a national thrust program called the Intergovernmental Task Force on Monitoring Water Quality (ITFM). The primary goals of the ITFM program in Wisconsin are to (1) develop a framework that will coordinate and improve information being collected on surface and groundwater quality; (2) develop and recommend application of environmental indicators and standard descriptors of aquatic conditions; and (3) recommend linkages between various information systems that would result in a water information network that allows personnel from various agencies to share data quickly and easily. A field study was conducted as part of this program during the summer of 1994 to compare water quality sample collection methods used by the USGS and WDNR. The goal of this study was to determine the comparability of methods being used to collect data by these two agencies. By understanding the similarities and differences in the data collection by each agency, a larger data base will potentially be available to all data users in Wisconsin.

Partners for Clean Air

The City of Chicago's Department of Environment is an active participant and steering committee member of the Partners for Clean Air. This innovative coalition consists of regulatory agencies, private industries and businesses, and not-for-profit organizations working together to promote the idea of voluntary reductions of emission-generating activities on days when ozone levels are forecast to be unhealthy. Partners for Clean Air is a regional coalition, combining efforts of the Chicagoland ozone attainment area with counties in northwest Indiana. It is similar to programs operating in Milwaukee, Detroit, and other Great Lakes cities. This approach avoids regulatory mandates, and educates both

industry and the general public as to the effect that individuals and individual operations can have on air quality.

Government/Industry Partnerships

As part of a national initiative to address municipal waste combustors (MWCs) that were deemed likely to cause high emission levels of dioxin/furans, EPA Region 5 has been working with identified MWCs located within the Region. These are MWCs that utilize high temperature electrostatic precipitators. Some of these MWCs have decided to close or be retrofitted with dry scrubber/baghouse systems. Since compliance with proposed revisions to the emission guidelines for existing sources is still several years away, Region 5 has approached two of these MWCs about incorporating short term voluntary emission reduction measures. These sources have indicated a willingness to consider steps to reduce the emissions through changes in combustion practices. Region 5 has asked these MWCs prepare a strategy and to enter to Memoranda of Understanding that would formalize such efforts.

Future Actions in Support of the Great Lakes

Reducing Releases of Toxics to the Environment



EPA and Environment Canada are drafting a *Binational Strategy for the Virtual Elimination of Persistent Toxic Substances in the Great Lakes Basin*. The Strategy is based on a set of fundamental principles: a commitment to open, interactive, public participation; an emphasis on pollution prevention; the support of state and provincial initiatives; and the use of the LaMPs and RAPs as the primary means of achieving **in-basin** reductions. The LaMPs and RAPs are also responsible for the development of quantitative targets and timeframes for contaminant reductions of LaMP/RAP identified critical pollutants. The Strategy will be the primary mechanism by which to achieve load reductions within the Great Lakes from out-of-basin sources. The Strategy will include: quantifiable targets and timeframes for the reduction of specific persistent toxic substances; baseline measurements (where possible) for tracking and measuring progress towards reductions; a process for evaluating the sources of the toxics; assessing the current regulatory framework for addressing the toxics; and options for achieving further reductions. It is anticipated that the Strategy will be finalized by February 1996.

EPA will continue to develop and implement its Virtual Elimination Project which is exploring options for improving current regulatory and non-regulatory frameworks so that it encourages individuals and/or firms to make ongoing reductions -- beyond compliance -- in their use and release of selected toxic chemicals. The Project builds upon the work of the IJC's Virtual Elimination Task Force and seeks to implement elements of their findings, along with new elements as developed by the Virtual Elimination Project, on the U.S. side of the Basin. In its initial phase, the Project is addressing mercury and PCBs. To date, the Project has convened two meetings of stakeholders which helped form the basis for the development of a Virtual Elimination Strategy for mercury. A similar PCB options paper is being developed.

In addition, the following toxic reduction actions are planned:

- EPA and the Great Lakes States will continue to implement the highly successful Great Lakes Enforcement Strategy which focuses state and federal enforcement of point source discharge limits on targeted toxic pollutants.
- The U.S. Department of Agriculture, states, and EPA will invite the public via Clean Sweep campaigns to dispose of pesticide stocks.
- States and EPA will continue the cleanup of priority abandoned hazardous waste sites and oversight of active ones, focusing cleanups and corrective actions on sites suspected of loading bioaccumulative contaminants to the Lakes.
- States and EPA will continue to inspect oil facilities in order to review their spill prevention measures and readiness to respond to accidental spills.
- States and EPA will continue to implement mercury pollution prevention outreach to the medical community to achieve reductions of mercury going into medical waste incinerators, wastewater treatment plants and landfills.
- States and EPA will continue to exchange information on mercury reduction activities through the Great Lakes Air Mercury Workgroup. Some EPA programs have included mercury reduction projects as funding options in their FY 1996 grant guidance.



- EPA is proposing the development of a joint project with states, tribes and other entities to demonstrate a full-scale contaminated sediment remediation project in the Great Lakes basin. The Agency is offering to commit \$1 million over the next two years to help jump-start such a project. The goal is to combine these monies with other potential sources of funding to conduct a remedial project. This project will demonstrate how coordination and leveraging of resources can work and help begin to address the contaminated sediment problem, leading to site remediation.

Protecting and Restoring Habitat



- Through proposed 1995 Farm Bill legislation, the Natural Resources Conservation Service will be addressing nonpoint source pollution impacts and prevention through an ecosystem-based planning process focusing on a watershed approach. The Service's national policies, such as water conservation, flood control, riparian areas, wetland restoration and enhancement, water management, and soil quality protection and improvement will also be considered in the planning process.
- Continuation of the existing Conservation Reserve Program, along with enrollment of additional acres, will protect the most highly sensitive lands, reducing excessive pesticide and sediment loading into lakes, rivers, and streams. Broadening land eligibility within the Wetlands Reserve Program will increase the enrollment of environmentally sensitive wetlands.
- EPA, the Fish and Wildlife Service, the Natural Resources Conservation Service, and states will work together on demonstration projects to restore important Great Lakes habitats.
- The Fish and Wildlife Service will support states and tribes in the restoration of beneficial uses in Areas of Concern by identifying the habitat requirements of various fish and wildlife species in these areas. The Service will similarly work with EPA, states, and tribes to identify the habitat needs of species on a lakewide basis.
- States, EPA, and the Fish and Wildlife Service will pursue Advance Identification projects that identify wetlands of high ecological value and inform landowners of this information.

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- The Corps of Engineers and EPA will continue their administration of the primary federal program regulating the physical modification of wetlands and others waters. Pursuant to Section 404 of the Clean Water Act, they administer a permit program to regulate the discharge of dredge or fill materials into the waters of the United States, including most wetlands. Approximately 7,100 permits were issued by Corps districts within the Great Lakes basin during FY 1994-1995 (through the third quarter of FY 1995).
 - The Corps of Engineers will look for opportunities to incorporate environmental improvements into its Great Lakes projects. The Detroit District is scheduled to begin construction of a barrier trap for sea lamprey at the old U.S. hydroelectric power house at Sault Ste. Marie, Michigan in FY1996. Another potential project which would restore coastal wetlands at Hennepin Marsh on the Detroit River is being considered.
 - The Fish and Wildlife Service will work with its partners to the North American Waterfowl Management Plan to protect, enhance, and create critical waterfowl habitat. The Service will add protected acreage through its Private Lands Program and increase surveillance for illegal dredge and fill activities.
 - All eight Great Lakes States will take specific actions to restore and protect vital aquatic and terrestrial habitats within the Great Lakes Basin.
 - The Indiana Department of Environmental Management and the Natural Resources Conservation Service have begun a five-year research project to develop a single method for restoring native vegetation to the 16,000 acres of steel slag in the Calumet Region. The results may also apply to other Great Lakes locations with steel slag site.

Protecting Human Health and Restoring Fish and Wildlife Populations

- EPA, the Agency for Toxic Substances and Disease Registry, the Great Lakes States, medical researchers, private industry, and academia will continue to research the health implications and

impacts of consuming Great Lakes fish and wildlife and other potential health effects posed by persistent toxic substances.

- Partners to the U.S. Great Lakes Program will continue to monitor for and address new and existing sources of persistent toxic substances. For example, recent data indicate that a mixture of chlorinated chemicals similar to the pesticide toxaphene (banned in the U.S in 1982 and one of the zero-discharge substances under the Lake Superior Binational Program) is a principle source of fish consumption risk in Lake Superior and northern Lake Michigan. Initial studies of Great Lakes fish and sediments indicate the possibility of local sources and continued loadings of this mixture to these areas. EPA will convene a meeting of experts to examine the data and determine the steps required to address this issue.
- States, EPA, and the Natural Resources Conservation Service will implement programs to reduce human exposure to harmful bacteria in Great Lakes waters. One focus will be ending the discharge of untreated human wastes from combined sewer overflows by upgrading municipal sewer systems and treatment capacity. The Service will promote adoption of waste management systems to reduce runoff from livestock facilities.
- A variety of agencies will work together to prevent further introductions of exotic species and to mitigate the harmful effects of those that have already entered the Great Lakes. They will monitor the ecosystem for new exotic species and conduct research on environmentally kind control techniques for disruptive exotic species.
- The Fish and Wildlife Service, states, and tribes will continue to stock hatchery reared fish, such as lake trout, to bolster the abundance of important species. The Service will also continue application of lampricides to tributaries where sea lamprey spawn in order to control the ravages of this exotic species upon sport fish.
- The Fish and Wildlife Service and states will continue to take measures to protect and restore populations of endangered and threatened Great Lakes species.

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- The Fish and Wildlife Service and states will continue to pursue Natural Resource Damage Assessments and Claims for past harm to the Great Lakes.
 - EPA, states, and the Natural Resources Conservation Service will continue activities to reduce phosphorus loadings to areas of the Lakes that are vulnerable to nutrient overenrichment.

Implementing the Great Lakes Five-Year Strategy

Partners to the Strategy will continue to focus efforts on critical pollutants and on geographic areas which have the highest ecological and human health risks; will use the Remedial Action and Lakewide Management planning processes to define research priorities, ecological needs, objectives and indicators, and appropriate remedial actions; will develop a Report to Congress and to the people of the Great Lakes region on implementation of their joint Strategy and progress toward their environmental goals; and will continue to pursue opportunities to work with our Canadian partners on Great Lakes issues of common concern.

By successfully implementing these goals, the United States Great Lakes Program will continue to make significant progress towards the time when there is a balanced, productive, self sustaining fishery, when fish consumption advisories are no longer needed, and when the bald eagle and other vulnerable species can again thrive within the Great Lakes ecosystem. Heartening environmental progress during the past several decades offers promise that today's challenges can be met.

