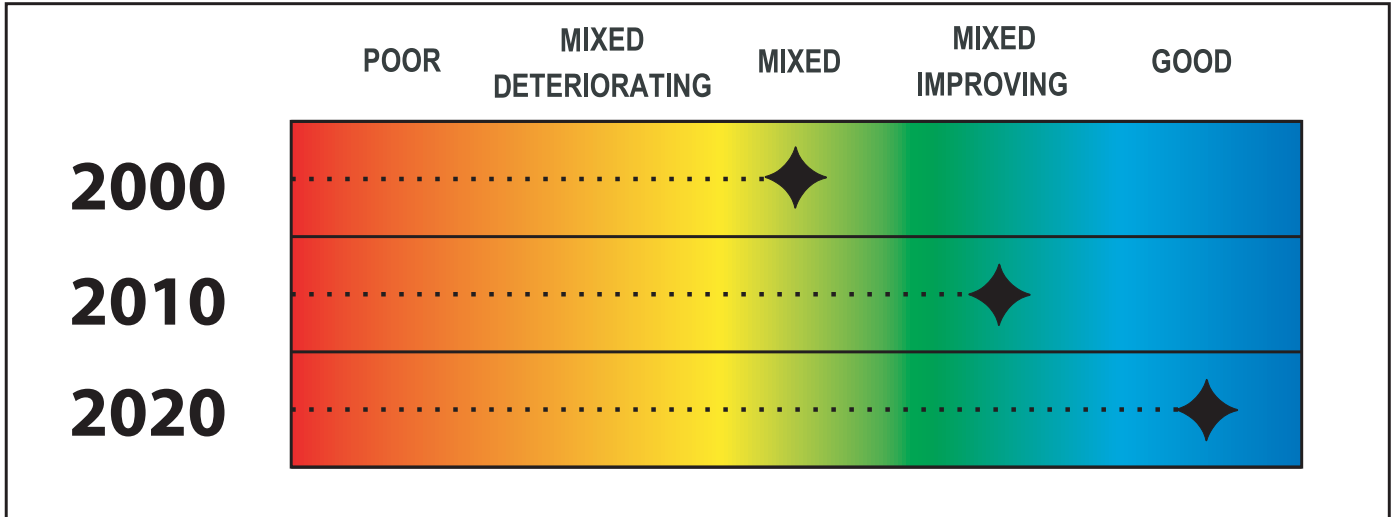


Subgoal 5

Does the public have access to abundant open space, shoreline, and natural areas, and does the public have enhanced opportunities for interaction with the Lake Michigan ecosystem?



Status

Currently, the status of the goal is mixed because of the competing needs of the public and the ecosystem. To move to mixed/improving status by 2010 and finally to good status by 2020, there is a need to find a better balance between public access and ecosystem protection. The Lake Michigan LaMP focuses on the health of the Lake Michigan ecosystem, so management actions implemented

under the LaMP are to take an ecosystem approach to remediation and protection. The 1994 SOLEC Integration Paper developed by EPA and Environment Canada states that “Governments have traditionally addressed human activities on a piecemeal basis, separating decision making on environmental quality from decision making on natural resource management or on social or economic issues.... An ecosystem approach to management is a holistic approach that recognizes

Lake Michigan Access Guide for Indiana

The Indiana Department of Natural Resources (Indiana DNR) Division of Outdoor Recreation completed an inventory and assessment of recreational facilities and needs in the portions of Lake, Porter, and LaPorte Counties within the Lake Michigan watershed. The study, prompted in part by the Northwest Indiana Public Work Groups of 1995 and a resolution by the Lake Michigan Marina Development Commission, is now available as a guidebook complete with maps indicating locations of recreational sites and the activities available at the sites. The guidebook is available on line at www.state.in.us/dnr/lakemich/pdf/access.pdf



Volleyball on Beach at Grand Haven, Michigan
 Photograph by Rodney E. Rouwhorst,
 Michigan Travel Bureau*



The National Association of State Park Directors identified factors related to recreation and open space that influence business location choices:

- Provision of parks and recreational services plays an influential role in a state's economic development efforts. When companies choose to set up business or relocate, the availability of recreation, parks, and open spaces is high on the priority list for site selection. Recreation and parks have a significant influence on people's preferred living locations.
- Companies that do not have siting limitations based on raw material or energy availability or customer proximity have great flexibility in where they locate, and they make decisions based on the quality of life for their employees. For such companies, most of which are new high-technology firms, recreation and conservation resources are fundamental to their definition of a community's quality of life.
- The National Park Service cites numerous examples of states and communities that identify quality of life as the main factor in recruiting a business. Quality of life includes convenient access to natural settings; recreational and cultural opportunities and open space; and the presence of greenways, rivers, and trails in and adjacent to communities.

For more information, see www.naspd.org

the interconnectedness of and addresses the linkages occurring among air, water, land, and living things.”

Challenges

Public involvement in preservation and stewardship of special natural areas with public access for sport and recreational activities should be fostered by the following:

- (1) Broaden the dialogue with state and local government land-use planners and decision-makers to balance environmental and recreational needs.
- (2) Provide tools for local communities to understand the value of the resource and develop long-term management programs.
- (3) Identify open space multi-use opportunities.

Public Interaction with the Lake Michigan Watershed

According to the Federal Interagency Ecosystem Management Task Force, an ecosystem is defined as: “... an interconnected community of living things, including humans, and the physical environment with which they interact. As such, ecosystems form the cornerstones of sustainable economies. The goal of the ecosystem approach is to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities” (1995). Based

on a collaboratively developed vision of desired future conditions, the ecosystem approach integrates ecological, economic, and social factors that affect a management unit defined by ecological—not political—boundaries. The foundation of the ecosystem approach is relating human beings and their activities to the ecosystems that contain them.

As access to Lake Michigan increases, so does the pressure for development. Growth of summer homes and year-round homes on the shoreline leads to more road construction, pollution from increased use of automobiles, and human use of areas that interrupts the natural web of basin life. In response, Smart Growth policies are being pursued by many communities, and resources such as the “Wisconsin Planning Guide for Smart Growth” and the Northeastern Illinois Planning Commission’s “Environmental Considerations in Comprehensive Planning: A Manual for Local Officials” are becoming more widely available.

Outdoor Recreation Opportunities

Outdoor recreation in the Great Lakes basin is an important component of the region's economy. The region offers outstanding tourism and recreational opportunities ranging from wilderness activities in pristine national parks to swimming at beaches in major cities. A well-defined four-season climate supports many types of recreation ranging from ice fishing, skiing, and snowmobiling in the winter to





The Great Lakes Circle Tour is a series of roadways around the Great Lakes where people can enjoy activities in the basin.

golf, fishing, boating, and swimming in the summer. There are approximately 40 state parks in or near the Lake Michigan basin as well as a large number of national lakeshore parks and fish and wildlife refuges. These can be visited by following the Circle Tour route around Lake Michigan. The Great Lakes Commission, in cooperation with the Great Lakes states and provinces in the 1980s and 1990s, coordinated the creation of the Circle Tours along existing roadways. The Lake Michigan Circle Tour route is marked by signs that feature Lake Michigan and the four surrounding states. In addition, guides prepared by states and localities that highlight enjoyable areas are important tools for promoting public access as well as critical ecosystem protection.

The eight Great Lakes states have about 3.7 million registered recreational boats, or about a third of the nation's total. Michigan leads the nation in the number of boat registrations and six Great Lakes states rank in the nation's top ten in total registrations. The commercial and sport fishing industry in the Great Lakes basin is valued at more than \$4 billion annually.

The Benefits of Open Space

Open space plays an important role in supporting the economy. According to the National Association of State Park Directors, use of geologically or environmentally sensitive areas as open space or for recreational purposes can reduce potential property damage costs. Hazards that can be mitigated through conservation of open space include flooding, slope instability, and structural fire damage.



Canoeing on the Grand Traverse, Michigan

Photograph by Traverse City Convention and Visitors Bureau, Courtesy of the Michigan Travel Bureau*

The combination of habitat protection and recreation is often the highest and best use of lands that are too fragile for development. The cost of not protecting such assets as slopes, aquifers, woodlots, wetlands, fens, alvars, floodways is incredibly high in the long run.

Next Steps

Over the next 2 years, the Lake Michigan LaMP will be focused on achieving the following goals:

- By 2003, the LaMP will partner with the growing coastal zone management programs in the Lake Michigan basin to ensure that public access to the lake is balanced with protection of the ecosystem
- Identify the need for additional facilities and access points (such as boat ramps canoe, and bicycle and walking trails around Lake Michigan).
- Expand the Northeastern Illinois water trail to other states around Lake Michigan.



Indiana Coastal Zone Management Program

The Coastal Zone Management Program is a national initiative, administered by the National Oceanic and Atmospheric Administration (NOAA) that focuses on balancing the economic prosperity and environmental health of the nation's coasts. Participation in the Coastal Zone Management Program will make over \$900,000 available annually to achieve the goals of the Indiana Lake Michigan Coastal Program. Michigan and Wisconsin also participate in the coastal zone management program.

The Indiana Department of Natural Resources has completed the development process for the Lake Michigan Coastal Program, including a framework for Indiana's participation in the Coastal Zone Management Program. The Indiana Lake Michigan Coastal Program was developed to enhance the State's role in planning for and managing natural and cultural resources in the coastal region and to support partnerships between federal, state and local government agencies and organizations. The Lake Michigan Coastal Program is based on a network approach that uses existing state laws and programs. It is a new tool to implement existing programs and to provide funding for unique or under-funded projects.

The Indiana Lake Michigan Coastal Program will, through grants and partnerships with local communities, support activities that achieve the following goals in the coastal region:

- Protect and restore significant natural resources,
- Prevent the loss of life and property in coastal hazard areas;
- Improve public access for recreational purposes;
- Protect and restore important historic and cultural resources;
- Improve government coordination and policy and decision making;
- Prevent, reduce, or remediate nonpoint source pollution that affects coastal waters;
- Revitalize urban waterfronts and ports; and
- Provide for priority water dependent uses.

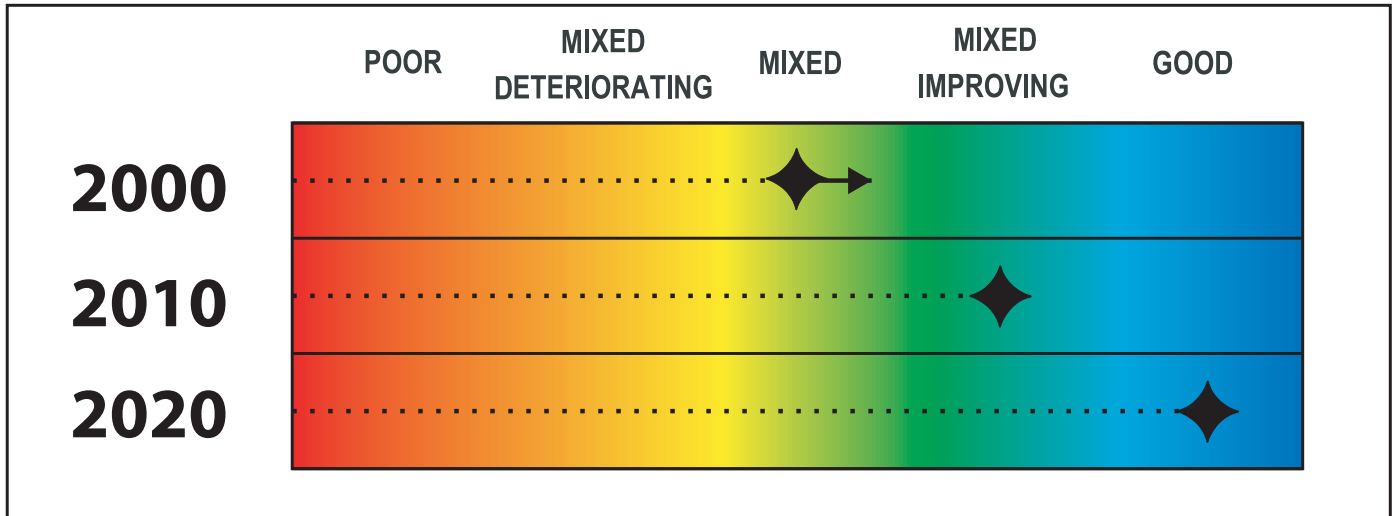
An extensive effort was made to continue public involvement during the development of the Lake Michigan Coastal Program. The public provided comments on both a scoping document that proposed the organization and goals of the Indiana Lake Michigan Coastal Program, released in May 2001, and a draft Environmental Impact Statement, released in September 2001. The Department of Natural Resources also held six public meetings and met with several local organizations and elected officials to hear comments on the program. A final Environmental Impact Statement will be released in 2002. There will be a final 30-day comment period on the final Environmental Impact Statement before NOAA issues its decision on Indiana's participation in the Coastal Zone Management Program.





Subgoal 6

Are land use, recreation, and economic activities sustainable and supportive of a healthy ecosystem?



Status

Land use, recreation, and economic activities are more sustainable, healthy and supportive of a healthy ecosystem, but there is significant work that needs to be done. There is more information available on critical ecosystems, significant activity in better managing water resources and determining the true value of a healthy ecosystem. There is danger, however, that the ecosystem could deteriorate in spite of these activities.

Challenge

Land use and human activities are undertaken by individuals aware of the lake ecosystem's ability to support human and environmental activities.

Sustainability

Effective, sustainable protection of the Lake Michigan ecosystem requires that the LaMP partners focus on promoting balance between the environment and society. The interdependencies inherent in

Lake Levels

Lake Michigan was measured at 2 feet below the long-term average in 2001, having dropped more than 40 inches since 1997 when it was at near record highs. The decrease in precipitation over the last five years and resulted in Lake Michigan being at its lowest point since 1966. Lake levels rose between the mid 1960s and the late 1990s.

The recent lower lake levels has caused problems for the shipping and boating industry. Cargo ships were forced to lighten their loads, and many boat ramps became inaccessible. According to the U.S. Great Lakes Shipping Association, for every inch of water that Lake Michigan loses, a cargo ship must reduce its load by 90 to 115 metric tons, leading to losses of between \$22,000 and \$28,000 per trip.

Early reports for 2002 indicate that the lake may rise eight inches due to increased rainfall early in the year and a decrease in evaporation during the summer/fall 2001. This fluctuation may be part of a 30 year cycle but deserves close monitoring.

Lake Level Monitoring

Current Lake Michigan levels can be monitored online through a new National Oceanographic and Atmospheric Administration website, <http://glakesonline.nos.noaa.gov>. The site provides immediate water level and meteorological data from water level stations. There is a 6 minute interval between data readings and plans for real time wind speed and direction data, in addition to barometric pressure and air temperature data. This augments the U.S. Army Corps of Engineers website that provides water level information <http://huron.lre.usace.army.mil/levels/hmpglv.html>



the ecosystem perspective require a balance between three fundamental elements: environmental integrity, economic vitality, and sociocultural well-being. The ability of these elements to function in balance over time is a measure of sustainability. The ecosystem perspective requires a shift of focus from resource programs to resource systems. It places human activities and communities within an ecosystem and consequently, within ecosystem management. It recognizes that human beings and their activities are part of the ecosystem and that they affect and are affected by its health.

The LaMP helps to identify the activities, partnerships, and locations where ecosystem management needs adjustment in order to attain a sustainable Lake Michigan basin. Sustainable landscapes are local ecosystems that are healthy enough to provide a range of valuable benefits and services, both now and in the future. Such benefits and services to humans include the following:

- Moderating natural events and human activities. Healthy landscapes can make communities safer and more livable by tempering the effects of natural events and human activities. For example, wetland systems can absorb and store storm waters, thereby aiding in flood control and ensuring more predictable stream flows and water levels and often providing for recharging local ground water.
- Enhancing social well-being. Healthy landscapes provide services that make communities more enjoyable and rewarding. For example, they provide opportunities for outdoor recreation. To many, they also serve as a source of civic pride and personal and spiritual well-being.
- Supporting local economies. In sustainable landscapes, people meet the needs of the present without compromising the ability of future generations to meet their needs.

Lake Michigan Potential Damages Study

The Lake Michigan Potential Damages Study (LMPDS) continues in its sixth year. Under the direction of the U.S. Army Corps of Engineers - Detroit District, in association with a number of State and Federal agencies and non-government

Great Lakes Charter Annex 2001

There has been increasing focus on the issue of water withdrawals and diversions of Great Lakes resulting in the Great Lakes Governors and Premiers signing the Great Lakes Charter Annex in June 2001. The Annex is an amendment to the Great Lakes Charter of 1985 which outlined a voluntary process for managing withdrawals of water from the Great Lakes. It sets guidelines for new Great Lakes water withdrawals. It establishes a series of principles for a new standard used to review new water withdrawals that would require new water withdrawals to result in an improvement to the Great Lakes. This standard is the first that would directly link water use to restoration and improvement of the ecosystem. The Governors and Premiers pledged to complete the final agreement by 2004. More information on the Annex is available at www.cglg.org/projects/water/index.html.

Lake Michigan Diversion to Chicago and the Mississippi River System

During the late 1990s, the diversion of water from Lake Michigan to the Chicago River exceeded the U.S. Supreme Court consent decree limit (2.1 billion gallons per day) by nearly 15% because of leakage at the Chicago River control works. Following a Memorandum of Agreement among the Great Lakes states, Illinois agreed to reduce its annual diversion over 14 years to pay off its water debt caused by the leakage. Repairs to the Chicago River locks and construction of new control works were completed in 2000. Because of this and lower lake levels, Illinois exceeded its goal in reducing the water debt between 2000 and 2002. The State of Illinois constructed a new lakefront control wall to prevent unintended leakage from Lake Michigan into the Chicago River as one measure to bring the Chicago diversion into compliance with a Supreme Court Consent Decree.



DuSable Harbor, Chicago, Illinois

The new lakefront control works under construction at the mouth of the Chicago River in 1999. The new wall significantly decreased leakage and allowed the creation of a new marina for pleasure boats.

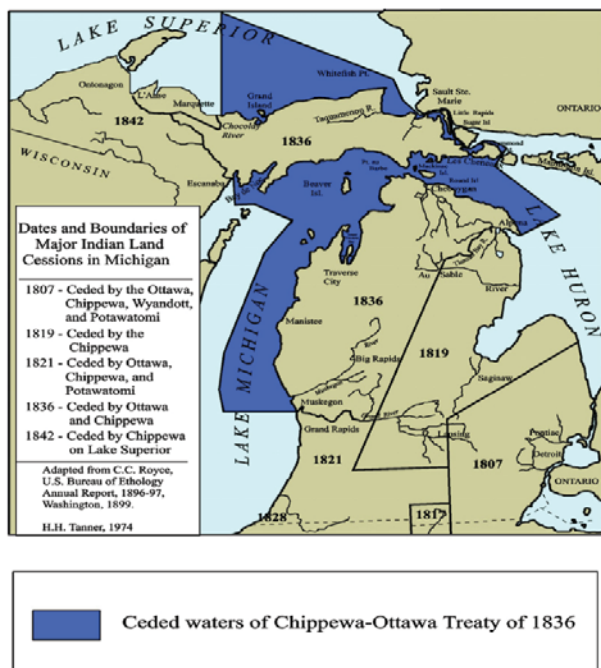
Photography by Daniel Injerd, Illinois Department of Natural Resources



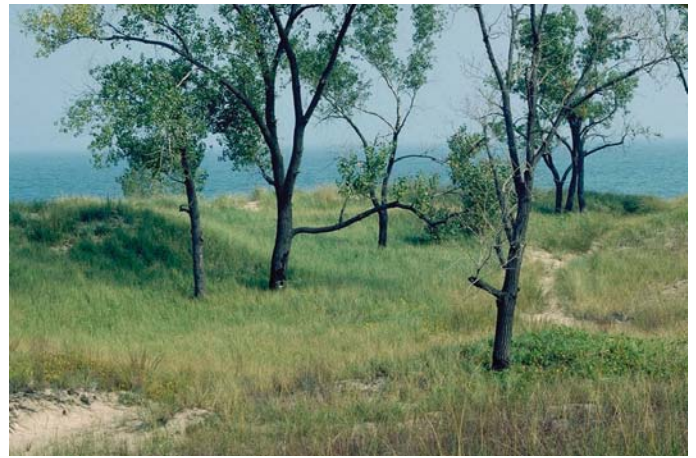
Historic Agreement to Manage Fisheries in 1836 Treaty Waters

On August 7, 2000, after months of negotiations, State of Michigan and federal government officials joined representatives of five Michigan Indian tribes to sign a historic 20-year settlement for treaty fishing rights in the Great Lakes. The agreement facilitates the lake trout rehabilitation effort in Lake Michigan by placing harvest limits on commercial and recreational lake trout fisheries, eliminating “deferred” rehabilitation zones, and recommending increases in stocking in areas containing high-quality spawning habitat. These actions should allow the growth of sizeable spawning stocks, thereby improving the chances for successful reproduction. It is important to note, however, that there are many forces unrelated to mortality caused by commercial or recreational fishing that are impeding lake trout rehabilitation (for example, exotic species, loss of genetic diversity and water quality).

The five tribes include the Bay Mills Indian Community, the Grand Traverse Band of Ottawa and Chippewa Indians, the Little River Band of Ottawa Indians, the Little Traverse Bay Bands of Odawa Indians, and the Sault Ste. Marie Tribe of Chippewa Indians.



organizations. The ultimate goal of the Study is to conduct a long-term assessment of potential shoreline damages over the next 50 years due to fluctuating lake levels along the Lake Michigan shoreline. A number of tasks were completed since 2000. These include:



Miller Woods, Indiana Dunes National Lakeshore, Lake Michigan
Photograph by B. Daum, National Park Service, Indiana Dunes Lakeshore*

- GIS mapping of shore protection and boating structures in drowned rivermouth areas of Lake Michigan’s eastern shore;
- An assessment of water level changes on the recreational boating and charter fishing industry;
- An update and assessment of land use and shoreline management practices;
- Land use trend analyses, land use / land cover change analysis and trend predictions in five prototype counties;
- Completion of the Flood and Erosion Prediction System (FEPS) and its application to five prototype counties;
- An assessment of the impacts to shore protection and harbor structures as a result of changes in water levels;
- Further development of geospatial databases for the Lake Michigan shoreline.

Further information can be found on the Lake Michigan Potential Damages study at <http://huron.lre.usace.army.mil/coastal/LMPDS>

Land Conservation

The urbanized land area in the United States has quadrupled since 1954. To compound the problem, populations in coastal areas, which contain some of the most sensitive ecosystems, have been increasing even faster than in the rest of the country. From 1982 to 1996, the population in the Chicago-Northwest Indiana area grew by 10.9



Can the Value of Lake Michigan be Quantified?

Economic Valuation Study for the Great Lakes

The Northeast-Midwest Institute published a guidebook that is intended to make Great Lakes decision makers more familiar with the techniques available to measure environmental benefits using economic tools. It is intended not as an end point, but as a means to begin a discussion on how to better make decisions that affect the Great Lakes.

The economic tools identified provide more insight into the tradeoffs that decision makers must evaluate. These tools help address such issues as:

- Converting Great Lakes Benefits of the Future to Present-Day Value
- Managing Irreplaceable Amenities and Irreversible Outcomes
- Accounting for Natural Resource Capital
- Risk and Uncertainty
- Sorting Through Benefits from Multiple Projects
- Accounting for Secondary Impacts
- Distribution of Benefits Across Society
- Distribution of Benefits Across Generations
- Placing a Value on Human Life and Health

Economic Valuation Study for Lake Michigan

The Lake Michigan Federation released a study in July 2001 that estimates the economic value that the public places on southern Lake Michigan Natural Resources as between \$3 billion and \$5 billion dollars. The *Natural Capital of the Southern Lake Michigan Coastal Zone: First Steps Toward Economic Valuations* surveyed residents of Northeast Illinois and Northwest Indiana to determine how much they would be willing to pay each year through volunteer activities, donations to conservation groups and taxes to maintain 13 species of birds and six species of fish.

Economic Value of Cleaning Contaminated Sediments

The University of Wisconsin Sea Grant Institute completed a study that estimates the economic benefits of cleaning up contaminated sediments in Great Lakes Areas of Concern. It uses the Lower Fox River/Green Bay as an example to provide a critical view at potential methods for identifying economic benefits of sediment remediation. The study is based upon the question “Do we expect that the benefits of sediment cleanup will be larger than the cost of a particular alternative on a per household basis?” rather than simply asking “What are the benefits of remediation?”

The researchers used contingent valuation analysis that estimated that citizens of the Fox-Wolf water shed are willing to pay \$100 to \$300 per household to clean the Area of Concern. The estimates include a \$222 per household per year benefit from a 100 percent cleanup.



Erosion Along Developed Indiana Shoreline of Lake Michigan

Photograph Courtesy of National Park Service, Indiana Dunes National Lakeshore*

percent but consumed 44.2 percent of the land. (Urban Roadway Congestion: Annual Report 1998) Wetlands, which naturally help control runoff from urban areas by storing flood and surface water and slowly releasing and filtering it, have been destroyed in the Lake Michigan basin to a greater degree than elsewhere in the country.

EPA’s Office of Environmental Information states that “the construction of impervious surfaces such as roads and rooftops leads to the degradation of water quality by increasing runoff volume, altering regular stream flow and watershed hydrology, reducing groundwater recharge, and increasing stream sedimentation and water acidity.” A 1-acre parking lot produces a runoff volume 16 times as large as that produced by an undeveloped meadow. Many impervious construction materials have higher surface temperatures that may cause ambient air temperatures to rise. When combined with a decrease in natural vegetation, areas are subject to what is called the urban heat island phenomenon, which may increase utility bills, cause health problems associated with heat stress, and accelerate formation of harmful smog. Clearly the effect of urban development on our communities and environment is a cross-cutting issue.

Communities around the basin are continuing to support conservation activities. For example, the Milwaukee Metropolitan Sewer District (MMSD) Commission approved a plan in September 2001 to



work with local community groups, municipalities and others to purchase easements or acquire outright properties identified as critical for guarding against future flooding in the Menomonee River, Oak Creek and Root River watersheds. The Commission approved a contract with The Conservation Fund, a national non-profit conservation organization to act on MMSD's behalf in acquiring easements and property, and administering the program.

The Conservation Fund analyzed undeveloped land in the three watersheds and identified 41 sites, totaling 7,065 acres that contained the necessary soil conditions to provide future flood-reduction benefits. In all, the group estimated the sites could provide 4.7 billion gallons of storage. The sites range in size from 30 acres to 674 acres.

Oil and Gas Drilling in the Great Lakes

With the energy "crisis" in California in 2001 came renewed interest in tapping oil and natural gas reserves. In the Great Lakes basin, much of these resources lie under the lakes themselves. Drilling under the lakes raises concerns because a spill would lead to harm to the world's single largest source of freshwater.

Due to this concern, an amendment to the Energy and Water Development Appropriations Act of 2002 prohibits all federal and state governments from issuing leases or permits for new oil and gas directional or offshore drilling in or under the Great Lakes for two years. Michigan's legislature passed legislation that would ban all direct and directional drilling in its portion of the Great Lakes basin. Furthermore, a proposed natural gas pipeline for bottomlands of Lake Michigan from Wisconsin to Indiana was withdrawn in 2001.

Currently in the Lake Michigan basin, only Illinois has never issued an oil or gas mineral lease for Lake Michigan bottomlands. Indiana has permitted limited exploratory

drilling, but no oil or gas has been produced. Wisconsin allows drilling for oil and gas in certain circumstances and Michigan has allowed drilling that begins on land with the pipes "slanting" under the lake .

Upland Michigan Land Use Report

The Michigan Economic and Environmental Roundtable and Public Sector Consultants, Inc. released the final report of the Michigan Land Resource Project in December 2001 – a study that projects the future of agriculture, forestry, tourism, and mining in Michigan if present land use trends continue. Using a land transformation model developed by researchers at Michigan State University, the Michigan Land Resource Project projects the future of Michigan in a mapping format for the years 2020 and 2040. It also features detailed economic forecasts for the land-based industries of agriculture, forestry, tourism, and mining in the state. The economic forecasts were prepared by researchers associated with Michigan State University, the University of Michigan, and Michigan Technological University.

The Michigan Land Resource Project was funded by grants from the W. K. Kellogg Foundation and the Frey Foundation. The complete report is available on-line at www.publicsectorconsultants.com.

Among the major findings of the report:

- Michigan will lose 25 percent of its orchard land in the next 40 years.
- The state's destination resorts, particularly those in the northern lower peninsula, are threatened by encroaching development along the travel corridors that lead to them.
- In order to keep forestry harvesting costs down, access to large parcels is necessary. As the land becomes more fragmented, the price for harvesting Michigan's timber will increase.
- Michigan will lose 1.9 million acres of farmland in the next 40 years.
- Land available for hunting will dramatically decrease, while "edge" species such as white-tailed deer will continue to increase in numbers.
- "Built" land will increase by 4.1 million acres across the state, more than tripling the existing amount of "built" land.
- Transportation costs associated with moving construction materials farther distances will dip into the profit of mining operations.



A Wisconsin Planning Guide for Smart Growth

The Wisconsin Department of Natural Resources (WDNR), in cooperation with the University of Wisconsin-Extension, released an 84-page “how-to” manual titled *Planning for Natural Resources: A Guide to Including Natural Resources in Local Comprehensive Planning*. The natural resources guide is meant to provide useful insights to a broad group of users including local government officials, land use planning consultants, and private citizens interested in preserving wild areas and the natural resources of the state.

WDNR also created a new Internet web site devoted to land use issues and comprehensive planning. The site not only provides a direct link to the department’s own guide to including natural resources in local land use planning, but links to guides and articles written and produced by other state agencies and organizations on the same topic. The entire DNR comprehensive planning guide www.dnr.state.wi.us/org/es/science/landuse is available to read or download from the DNR Web site.

As part of legislation passed by the state legislature in 1999, virtually every community in Wisconsin is required to prepare or be part of a comprehensive land use plan. This is commonly referred to as Smart Growth and all Wisconsin communities must have a comprehensive plan in place by 2010. Each Smart Growth plan is required to include a compilation of objectives, policies, goals, maps and programs to address the conservation, promotion and effective management of the community’s natural resources. According to the legislation, each community’s plan must specifically address several key elements, including transportation, housing, agriculture, and natural resources.

Next Steps

Over the next 2 years, the LaMP is targeting the following for completion:

- Publication and distribution of a Habitat and Land Use Management Tool Box that provides web-based information sources on environmentally sensitive habitat and land use management policies and programs.
- Establishment of a Lake Michigan Watershed Academy to provide training to local planners and policy makers on balancing environmental concerns with economic and social activities in a watershed context.
- Convening of a Brownfield to Greenfield Conference to highlight the need for redevelopment of facilities that have mild to medium contamination rather than developing greenspace.
- Convene Planning Commissions to partner on identifying societal indicators and gathering data.
- On-line habitat atlas will be operational.



Indiana Dunes

Photograph courtesy of National Park Service,
Indiana Dunes National Lakeshore*

