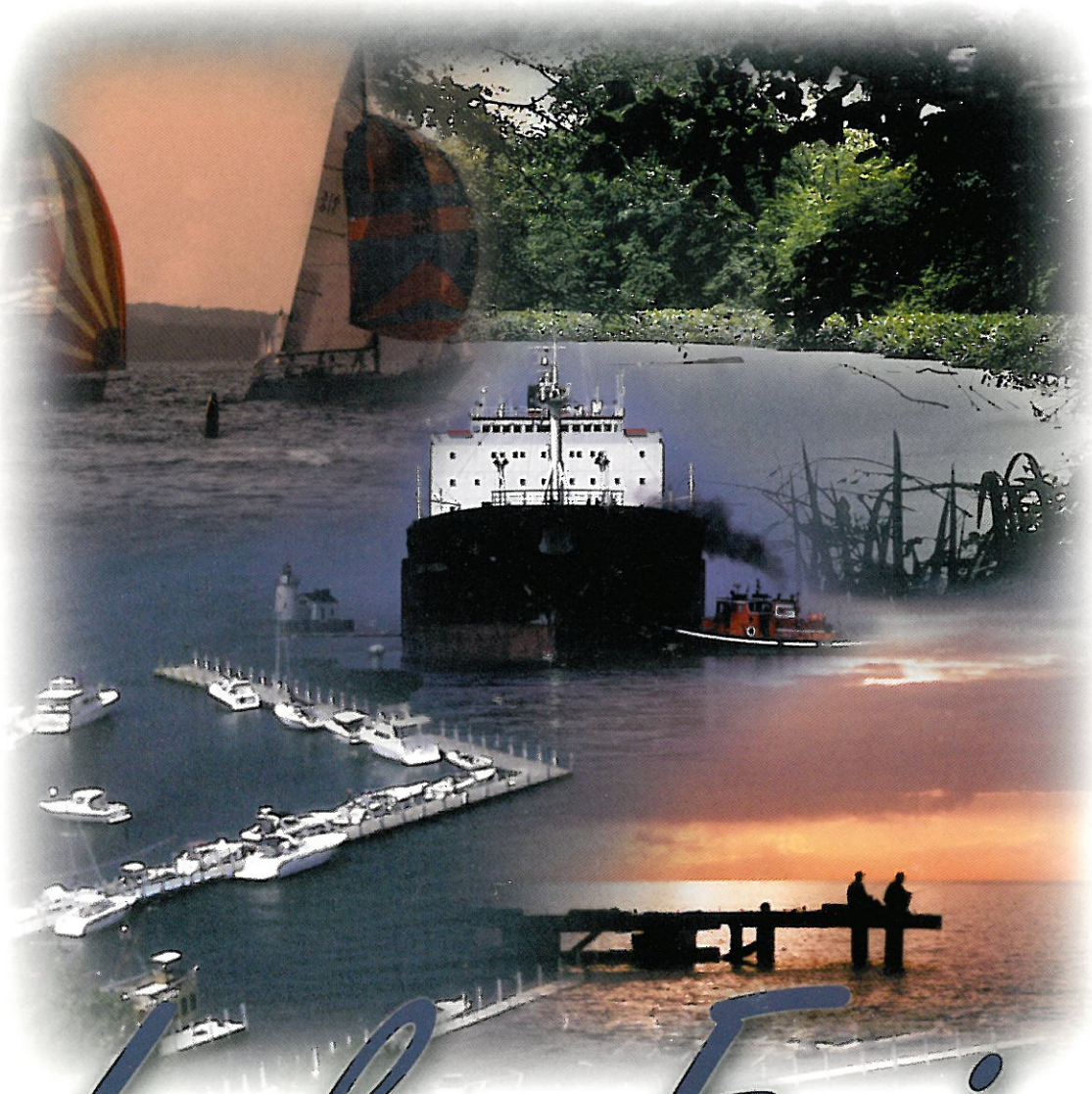

Lake Erie

Protection & Restoration Plan

Ohio Lake Erie Commission
2000

Our Mission ...

The Ohio Lake Erie Commission is a State of Ohio Agency created for the purposes of preserving Lake Erie's natural resources, protecting the quality of waters and ecosystem, and promoting economic development. The Commission is comprised of the Directors of the Ohio Department of Natural Resources, Ohio Environmental Protection Agency, and the Departments of Agriculture, Development, Health, and Transportation. The Commission maintains a staff, located in Toledo, Ohio, at One Maritime Plaza. The staff administers the business of the Commission and executes many Lake Erie Commission programs such as the Lake Erie Protection Fund, Ohio's Coastweeks program, Lake Erie License Plate Sales program, and the Lake Erie Quality Index. The Lake Erie Commission meets quarterly and the meetings are open to the public.

Ohio Lake Erie Commission

Dr. Samuel W. Speck, Commission Chair and Director; Ohio Department of Natural Resources
Christopher Jones, Commission Secretary and Director; Ohio Environmental Protection Agency
Fred L. Dailey, Director; Ohio Department of Agriculture
C. Lee Johnson, Director; Ohio Department of Development
Dr. J. Nick Baird, Director; Ohio Department of Health
Gordon Proctor, Director; Ohio Department of Transportation
Dr. Jeffrey L. Busch, Executive Director; Ohio Lake Erie Commission Office

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Lake Erie Protection and Restoration Plan

Legend of Abbreviations

AOCs ..... Areas of Concern

ANS ..... Aquatic Nuisance Species

BMPs ..... Best Management Practices

CAFO ..... Concentrated Animal Feed Operations

CREP ..... Conservation Reserve Enhancement Program

IBI ..... Index of Biotic Integrity

LEPR ..... Lake Erie Protection & Restoration Plan

LEQI ..... Lake Erie Quality Index

NPDES ..... National Pollutant Discharge Elimination System

ODA ..... Ohio Department of Agriculture

ODH ..... Ohio Department of Health

ODNR ..... Ohio Department of Natural Resources

ODOD ..... Ohio Department of Development

ODOT ..... Ohio Department of Transportation

OEPA ..... Ohio Environmental Protection Agency

OEPA-DEFA ..... Ohio Environmental Protection Agency-
Division of Environments & Financial Assistance

OSU ..... The Ohio State University

PAHs ..... Polyaromatic Hydrocarbons

PCBs ..... Polychlorinated Biphenyls

QHEI ..... Qualitative Habitat Evaluation Index

TMDL ..... Total Maximum Daily Load

VAP ..... Voluntary Action Program

Plotting a Course for the Future

Our Great Lake is a precious resource. It provides us with a seemingly endless supply of our most fundamental need – water. Lake Erie was the magnet that drew our forebears to its shores over 200 years ago and is still a crucial gear in Ohio's economic engine. The lake provides identity and joy to the millions who live and play on its shores.

Jane F. Rodwan

The good news is that Lake Erie and its surrounding Ohio watershed has improved remarkably over the past 25 years. The ***Lake Erie Quality Index,*** released by the Ohio Lake Erie Commission in 1998, evaluated 10 separate indicators of Lake Erie quality. Positive trends were seen in many environmental, economic, and recreational indicator scores. Water quality has improved considerably, largely from steep reductions in phosphorus loading. The investment of hundreds of millions of dollars in sewage treatment plant upgrades, adoption of pollution prevention technologies and improvements in industrial wastewater treatment have resulted in reaching our reduction goals for most point source pollutants. The combination of all these actions has also contributed to an eight-fold increase in water clarity – greatly increasing the aesthetic enjoyment of Lake Erie. The ***Lake Erie Quality Index*** also showed that improved water quality has spawned a booming tourism industry, accounting for over $1.5 billion in direct sales annually.

Lake Erie Quality Index

Indicator	Rating
Water Quality	Good
Pollution Sources	Fair
Habitat	Fair
Biological	Good
Coastal Recreation	Good
Boating	Good
Fishing	Excellent
Beaches	Good
Tourism	Excellent
Shipping	Fair

Source: 1998 Lake Erie Quality Index

These improvements did not occur by accident – but through the dedicated work of thousands of people throughout the Great Lakes and beyond. It also required the investment of many billions of dollars into reducing the flow of pollutants into the lake, restoring a great deal of damaged landscape and assisting in the recovery of our fish and wildlife.

In other areas, however, little progress towards mitigating the impacts of past practices has been made. Serious problems still exist that diminish the health of the ecosystem and limit the benefits of this magnificent lake to the people of Ohio. We must face the fact that the present condition of the Lake Erie watershed is not satisfactory – particularly in the western portion of the watershed. Consider some of these facts brought out in the Lake Erie Quality Index:

- Since the original European settlement of the Ohio Lake Erie watershed, over 90% of our Lake Erie marshlands have been filled or converted to some other use.
- None of our 12 major Lake Erie tributaries are rated "excellent" by the Qualitative Habitat Evaluation Index (QHEI) - and only two are considered in "good" condition. On the other hand, four rated only "fair" and six received a ranking of "poor."
- Of the 11,649 square miles comprising the Ohio Lake Erie watershed, over 78% has been altered from its original state - only 22% remains relatively intact as forest cover or wetlands, posing severe challenges for sustaining a healthy ecosystem.
- On average, some 1.5 million tons of sediment are transported every year down our four largest tributaries (Maumee, Sandusky, Cuyahoga and Grand Rivers). This is three times the desired load calculated in the Lake Erie Quality Index as essential to reduce detrimental sediment loading impacts.
- Although vastly improved from the 1960s and 1970s, our Lake Erie beaches are still under a "No Swimming" advisory some 20% of the summer due to nearshore bacterial contamination.
- The Lake Erie nearshore areas cannot support healthy biological communities across the shoreline. Of 21 areas assessed by the Index of Biotic Integrity (IBI), none are rated as "excellent," two are "good," 14 rate "fair" and five receive a rating of "poor."

"Water quality has improved considerably, largely from steep reductions in phosphorus loading."

The Lake Erie Quality Index was an effort to gather available data measuring the status or quality of the Lake Erie ecosystem, establish specific goals and devise scoring systems to communicate the current

Lynette Habilitzel

condition of the lake to the citizens of Ohio. The Index did not address what the State of Ohio, along with all its other private and public partners, needs to do to achieve the established environmental, recreational and economic goals. Within this present publication, the Lake Erie Protection & Restoration Plan, the Ohio Lake Erie Commission intends to map out a long-term strategy for achieving these goals and ensuring the future improvements for Our Great Lake.

It is important to put the ***Lake Erie Protection & Restoration Plan*** into context with all of the ongoing state efforts to enhance the lake. The Lake Erie Commission agencies – along with local communities, the federal government and numerous private efforts – have been continuously engaged in enhancing every aspect of the Lake Erie ecosystem (**see Table 1**). Nothing in this plan is meant to replace these ongoing efforts or to minimize their importance. Rather, the Commission's task was to focus on the various quality metrics established in the ***Index***, catalogue all of the current efforts of our constituent agencies and identify additional initiatives or resources necessary to accomplish the ***Quality Index*** goals and objectives.

Table 1 – Ohio Lake Erie Programs & Initiatives

Indicator	Program	Focus
Water Quality	Ohio Fish Consumption Advisory Program	Analysis of sportfish caught in Ohio waters for toxins – results given in recommended meal size and frequency.
	Drinking Water Program	Oversight of public water systems to ensure compliance with all state & federal drinking water standards & regulations.
	Source Water Assessment and Protection Program	Assessment of Ohio's 6,200 source waters for public water use & evaluation of potential contamination threats by 2003.
	Clean Water Act Section 401 Permitting Program	Federal permit required for any discharge of dredgings or fill materials into the waters of the U.S. or filling of wetlands.
	Clean Water Act Section 404 Certification	State water quality certification required to protect Ohio waters from activities requiring Section 401 permit & any federal license or permit.
	Clean Water Act Section 305 (b)	Federal requirement to provide a biennial report on the status of the waters of the State of Ohio.
Pollution Sources	Conservation Reserve Enhancement Program (CREP)	Joint Ohio/federal program that pays annual rentals to landowners for implementation of soil conservation practices.
	ODNR Coastal Urban Streams Program	Nonpoint pollution abatement program focusing on urban/residential/commercial sources.
	Coastal Nonpoint Pollution Control Program	Enhancement of Statewide Nonpoint Program with coastal focus & use of additional management measures and authorities.
	Statewide Nonpoint Source Management Program	State program with federal assistance to manage the major source categories of nonpoint pollution & aquatic habitat modifications.
	Great Lakes Water Quality Initiative	1995 federal initiative resulting in more stringent water quality & discharge standards for states of Great Lakes region.
	House Bill 110 Programs	Local health departments delegated authority by OEPA to inspect & regulate semi-public sewage treatment plants.
	National Pollutant Discharge Elimination System (NPDES)	All entities discharging to waters of the State are required to obtain an NPDES permit.
	OEPA Stormwater Program	Large industrial & municipal facilities with separate stormwater sewer systems must obtain an NPDES permit.
	Clean Water Act Section 303(d) Programs	Protection of impaired or threatened state waters through development of a Total Maximum Daily Load (TMDL) by 2013.
	Sediment Database	Program to collect sediment data in the Lake Erie watershed & organize into a comprehensive, usable database.
	Phosphorus Reduction Strategy	Long-term program underway since 1970s to reduce phosphorus loading to Lake Erie.
	Toledo Harbor Long-term Management Strategy	Comprehensive program to reduce the loading of sediments & associated pollutants to Toledo Harbor.
	Ohio Cleansweep	Free voluntary disposal of unwanted pesticides conducted by the Ohio Department of Agriculture.
	OEPA Office of Pollution Prevention	Technical assistance provided to business & industry to achieve implementation of pollution prevention practices.
	Ohio Lake Erie Buffer Initiative	Collaborative public & private effort to promote the installation of buffer strips along Lake Erie tributaries.
	Conservation Reserve Program	Federal program which provides financial assistance to landowners for implementing soil conservation practices.
Biology	ODNR Bald Eagle Management Program	Intensive management program for the reestablishment of bald eagles throughout Ohio.
	Biological Indices	Ohio EPA indices measuring the health of streams based on the health & diversity of aquatic communities.
	Ohio Biological Diversity Strategic Plan (ODNR)	Plan to increase biological diversity & protect rare & endangered species throughout Ohio.

Table 1 – Ohio Lake Erie Programs & Initiatives – Cont.

Indicator	Program	Focus
Biology (Continued)	Ohio State Management Plan for Aquatic Nuisance Species	Program to control the spread of exotic species & prevent introductions of new infestations in Ohio waters.
	North American Waterfowl Plan	Plan to protect & restore sufficient & suitable habitat to maintain healthy populations of waterfowl in North America.
Habitat	Ohio Farmland Preservation Program	Drafting rules to a state/local matching grant program to purchase agricultural easements to preserve farmland in Ohio.
	Voluntary Action Program (VAP)	Effort to minimize red tape & maximize resources for voluntary cleanup of environmentally contaminated sites.
	Ohio Wetlands Program	Collaborative OEPA & ODNR strategy to effectively manage, restore, protect & expand the wetlands of Ohio.
	Coastal Erosion Area Program	Development in Lake Erie shoreline areas expected to be lost to erosion over a 30-year period is designated & regulated.
	Lake Erie Qualitative Habitat Evaluation Index (OEPA)	A qualitative habitat evaluation index to assess & monitor the quality of Lake Erie nearshore & tributary habitats.
Coastal Recreation	ODNR Lake Erie Access Program	Inventory of recreational & public access areas in the coastal area & make recommendations for increasing & enhancing public access.
	Ohio Rails to Trails Program	Program to provide a safe, dedicated corridor for trails linking other trails, cities, parks & surrounding areas.
Boating	ODNR Ohio Safe Boating	Dissemination of educational materials & courses to the boating public to promote safe boating practices throughout Ohio.
Fishing	Creel Surveys	Annual surveys taken throughout the state to gauge fishing effort & total catch.
	Fish Ohio Day	Annual promotion for fishing within the State of Ohio that allows citizens to fish for one day without a fishing permit.
Beaches	Bacterial Beach Monitoring (ODH)	Monitoring of popular Ohio swimming beaches for fecal bacteria contamination – uses E. coli as test organism.
Tourism	Ohio Lake Erie Circle Tour Program	Designated tourist road route along Lake Erie shoreline highlighting attractions & scenic viewing opportunities.
	Ohio's Coastweeks (Lake Erie Commission)	A series of public activities held each September to increase the awareness of Ohioans concerning their Great Lake.
Shipping	Ohio Port Council	Ohio Department of Development council promoting the interest of Ohio's port authorities.
Comprehensive Programs	Ohio Coastal Management Program (ODNR)	Federally approved state program that coordinates the Lake Erie coastal policies & programs of the State of Ohio.
	Ohio Sea Grant Program	Greater knowledge & stewardship of Lake Erie provided through research, extension services & public outreach.
	Great Lakes Forecasting System (OSU)	Ohio State University Internet accessible forecast system providing real time physical measurements of Lake Erie.
	Lake Erie Protection Fund	Lake Erie Commission grants program which funds Lake Erie implementation & research projects.
	Lake Erie Quality Index	Set of quantitative indicators measuring the quality of Lake Erie environmental, recreational & economic resources.
	Coastal Management Assistance Grants Program	The Coastal Management Program funds projects promoting resource protection & public use of the coast.
	Remedial Action Plans (OEPA)	Locally coordinated plans to restore health of Maumee, Black, Cuyahoga & Ashtabula River Areas of Concern.
	Lake Erie Lakewide Management Plan (LaMP)	Bi-national plan to protect & restore beneficial uses to Lake Erie, particularly those associated with pollutants.

In preparation for this task, the Ohio Lake Erie Commission conducted 16 discussion groups with stakeholder experts, representatives from numerous environmental organizations and local government officials. They taught us a great deal about pressing Lake Erie issues. They also gave us their best ideas on what to do about them. Finally, we borrowed many ideas from existing programs in other states as well as from published works from interest groups, think tanks and academia.

After digesting all of these ideas, we produced 84 specific recommendations on specific strategic actions to improve the environment, recreational opportunities and economy of Lake Erie and its watershed. These ideas are presented in this report under the same indicator headings used in the ***Lake Erie Quality Index.***

During discussions with our stakeholders and in constructing the list of recommendations, a recurring theme resonated throughout our work. The first point of that theme was the acknowledgment that the problems experienced in the lake itself or in our streams and rivers were not caused just by local sources, but rather by the cumulative result of actions taken throughout the watershed. Simply stated, **the quality of Lake Erie is a reflection of the quality of the entire watershed.** Moreover, we are only fooling ourselves if we believe we can address the lake in isolation, separating it from the influences of its drainage basin. We must truly consider the entire Lake Erie ecosystem in devising a plan to protect and restore our lake and protect public health.

Joann Fleck

The second point was that the development of northern Ohio often occurred without fully understanding or anticipating the impact this development would have on the natural and social environment. Too often, our land use and development decisions have accelerated erosion and nonpoint pollution, urban sprawl, abandonment of central cities,

congestion of streets and highways, the loss of natural habitat and farmland, and degraded the health and diversity of plant and animal communities.

Marina Dewald

Consider the following:

- *Between 1960–1990, for every one percent increase in population, there was a correspond–ing five percent increase in the conversion of green space to urbanized land use.*

- *While Lake Erie may be one of the most beautiful places on earth, there are very few places where people can enjoy this wondrous lake. Only 15% of its 262–mile Ohio shoreline is accessible to the public.*

- *From 1954–1992, over 50% of the cumulative available farmland in Ashtabula, Cuyahoga, Lake, Medina, Portage and Summit counties was taken out of cultivation and converted to industrial or residential use.*

The final point and ultimate conclusion of our groups was that we must fundamentally change the manner in which we make land use, energy use and development decisions in the Lake Erie watershed. Our predisposition to view activities in isolation has resulted in a less than healthy Lake Erie ecosystem that cannot support healthy natural communities of aquatic plants and animals. Neither can it provide the full range and scope of benefits and enjoyment that we should expect from living along the shores of one of the five Great Lakes.

What actually resulted from this planning effort was not so much a list of discrete and disparate recommendations for improvement. Rather, woven throughout the 84 recommendations are a set of basic philosophies or *"Guiding Principles"* for how we view ourselves in relation to the environment around us. These principles connect our desires for a healthy and sustainable environment, while at the same time stimulating a robust and competitive economy and ensuring a sustainable future for northern Ohio and its citizens.

10 Guiding Principles

for a Sustainable Lake Erie Watershed

Attaining a Living Equilibrium Between a
Strong Diversified Economy and a Healthy Lake Erie Ecosystem

Activities in the Ohio Lake Erie watershed should:

1. Maximize reinvestment in existing core urban areas, transportation, and infrastructure networks to enhance the economic viability of existing communities.
2. Minimize the conversion of green space and the loss of critical habitat areas, farmland, forest and open spaces.
3. Limit any net increase in the loading of pollutants or transfer of pollution loading from one medium to another.
4. To the extent feasible, protect and restore the natural hydrology of the watershed and flow characteristics of its streams, tributaries and wetlands.
5. Restore the physical habitat and chemical water quality of the watershed to protect and restore diverse and thriving plant and animal communities and preserve our rare and endangered species.
6. Encourage the inclusion of all economic and environmental factors into cost/benefit accounting in land use and development decisions.
7. Avoid development decisions which shift economic benefits or environmental burdens from one location to another.
8. Establish and maintain a safe, efficient and accessible transportation system that integrates highway, rail, air, transit, water and pedestrian networks to foster economic growth and personal travel.
9. Encourage that all new development and redevelopment initiatives address the need to protect and preserve access to historic, cultural and scenic resources.
10. Promote public access to and enjoyment of our natural resources for all Ohioans.

The people living near the shore and within the Lake Erie watershed have been blessed with a great gift. With this gift however, comes great responsibility. We must share a commitment to pass on to future generations a lake that is not only as good — but cleaner, healthier, and even more beautiful than the one we now cherish.

The ***Lake Erie Protection & Restoration Plan*** does not pretend to be the final solution to the recovery of Lake Erie. It is hoped that it provides a new focus — a course adjustment to our ongoing efforts to make ***Our Great Lake*** even greater.

Below are the highest priority recommendations from the 84 strategic actions contained within this plan (**see Table 2**). We believe that these 11 strategic actions will provide the most significant benefit to the health of the Ohio Lake Erie ecosystem and will greatly accelerate the progress towards a sustainable Lake Erie watershed.

Table 2 - Priority Recommendations for Lake Erie

Strategic Objective	*Strategic Actions & Responsible Parties*
Remediate (remove, seal, neutralize) contaminated sediments in Lake Erie's harbors and tributaries — complete remediation of high priority sites by 2015 and all sites by 2025	**(WQ - 4)** More strongly support efforts to assess and address contaminated sediments. Consider sediment remediation as part of overall environmental improvement and as a cross program issue — not as a separate topic. **OEPA, ODH** • Establish standardized criteria by which to evaluate sites in the Lake Erie watershed. • Continue to support weight of evidence approach to prioritize sites in the Lake Erie watershed. • Continue to expand assessments to include ecological risks as well as human health factors.
Reduce bacterial contamination (and other pollutants) coming from inadequate or non-functioning private home septic systems	**(WQ - 6)** Implement laws and rules for new permitting requirements and operation of private home septic systems. **ODH, Ohio General Assembly** • Require permits to install and operate home septic systems. • Require operational assessments of new and existing home septic systems. • Establish funding mechanisms at both state and local levels to cover costs of sewage disposal program activities. • Support additional use of existing OEPA-DEFA funding programs for replacement or upgrades of malfunctioning home sewage systems.

Table 2 – Priority Recommendations for Lake Erie – Cont.

Strategic Objective	*Strategic Actions & Responsible Parties*
Reduce agricultural sediment loading from the Lake Erie watershed by 67% (as defined in the ***Lake Erie Quality Index*** protocol)	**(PL - 3)** Increase from 52% to 80% the percentage of agricultural acreage in the Lake Erie watershed under conservation tillage practices by 2010. **ODNR, OEPA, ODA** **(PL - 4)** Establish buffers on 80% of Lake Erie watershed ditches, streams and tributaries. **ODNR, OEPA, ODA, Lake Erie Commission** • Support Ohio Lake Erie Buffer Team Initiative. • Support initiatives that promote or fund the placement of buffers, including the Lake Erie Buffer Program and the Conservation Reserve Enhancement Program (CREP).
Better integrate economic, environmental and social impacts into all State of Ohio land use planning and investments	**(H - 8)** Commission a ***Balanced Growth Blue Ribbon Task Force,*** comprised of government officials, business leaders, conservationists, academia, agriculture and other stakeholder groups to be charged with advising the Lake Erie Commission on ways to: **Lake Erie Commission** • Develop strategies that will balance the protection of the Lake Erie watershed with continued economic growth.
Limit future introductions and spreading of exotic species in the Lake Erie basin	**(B - 1)** Fully implement Ohio's Aquatic Nuisance Species (ANS) Plan by 2003. **ODNR** • Support efforts by the Great Lakes Commission and Great Lakes Protection Fund to develop technology and regulations to eliminate ballast water introductions by marine commerce. • Develop and maintain monitoring programs in Lake Erie for early detection of new infestations. • Conduct effective information/education campaign on the prevention of ANS introductions. • Develop and implement abatement strategies to eradicate or reduce populations of targeted nuisance ANS in Lake Erie.
Infuse best available ***Balanced Growth*** principles in local land use decision making	**(H - 5)** Publish and distribute a ***Lake Erie Model Zoning Ordinance*** and ***Building Code*** by 2003 and encourage its voluntary acceptance by local communities. **ODOD, Lake Erie Commission** • Ensure that all interested concerns (local communities, developers, conservationists, agriculture, etc.) have the opportunity to fully participate.

Table 2- Priority Recommendations for Lake Erie - Cont.

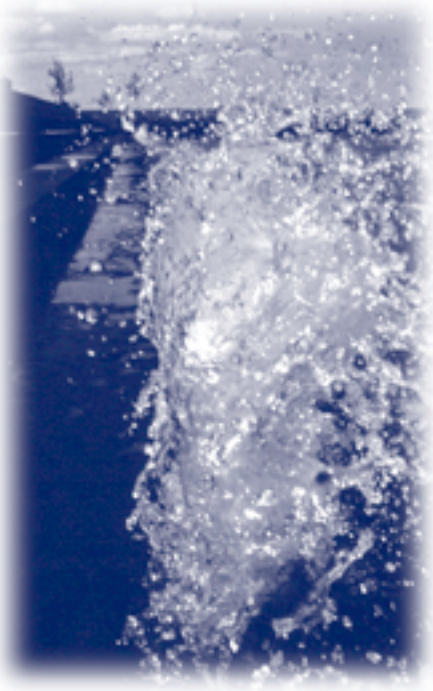
Strategic Objective	*Strategic Actions & Responsible Parties*
Acknowledge, celebrate and foster the adoption of ***Balanced Growth*** Best Management Practices throughout the Lake Erie watershed	**(H - 6)** Institute a Lake Erie Lighthouse designation for entities practicing sound ***Balanced Growth*** principles by 2003. **Lake Erie Commission** • Establish a suite of practices and/or characteristics that would qualify for Lighthouse designation. • Create suitable awards to recognize and celebrate those entities receiving the designation. • Consider making the Lighthouse designation a factor in the selection process for specific Ohio grants and loans programs. • Types of entities may include communities, farms, businesses, schools, etc.
Enhance public access to Lake Erie for all Ohioans	**(H-11/CR-1)** Make coastal parcels a high priority for state/local acquisition through direct purchases or purchase of conservation easements from willing sellers. **ODNR, Gen. Assembly** • Create list of high priority parcels for purchase when available or other protection strategies by 2002. • Create special fund by 2002 for property purchases or purchase of easements on valuable coastal properties for recreation and habitat conservation.
Protect critical fish spawning areas within Lake Erie and its watershed	**(F - 1)** Identify, designate and enforce special protection areas for offshore reefs, nearshore areas and tributaries that are essential for the propagation of Lake Erie sportfish by 2010. **ODNR, Ohio General Assembly** • Special Protection Areas will be protected from inappropriate development, waste disposal, overfishing and mineral extraction damages.
Obtain an annual real tourism growth rate of 4% in Ohio's Lake Erie counties (as measured by the ***Lake Erie Quality Index*** protocol)	**(T - 1)** Implement comprehensive program to promote cultural and eco-tourism as tools to expand Lake Erie tourism revenues and conserve natural and cultural resources by 2002. **ODOD, ODNR, Lake Erie Commission** • Provide training to business owners, local officials and natural resource managers to better capture eco-tourism dollars. • Provide grants for signage, trails, landscaping, security, access and parking at suitable natural areas and cultural landmarks. • Increase state staffing of naturalists to provide better customer service to eco-tourists at state facilities. • Partner with county tourism bureaus in developing and implementing a comprehensive strategic plan to promote cultural and eco-tourism. • Review ways to improve signage to tourism attractions along the lake and tributaries. **ODOT**

Water Quality

Lake Erie has finally shed its reputation as a national embarrassment. In fact, ***Our Great Lake*** is now often held up throughout the world as a restoration success story. Many of the ***Lake Erie Quality Index*** scores do indeed support this notion. The most noticeable improvement that has taken place in Lake Erie over the past 25 years is the remarkably increased clarity of the water.

Not long ago, the lake had a greenish cast and clarity was less than a foot throughout much of the year. Now the lake often takes on a brilliant crystal blue hue and one can see the bottom many feet below the surface. Most of this improvement has been brought about by the concerted efforts during the past 25 years to reduce the input of pollutants in the lake – particularly excessive amounts of phosphorus. The rest has been accomplished by the collective filtering of the billions of zebra mussels now making Lake Erie their home. It must be pointed out that zebra mussels have posed serious ecological and economic problems for the lake. Also, we fully understand that water clarity does not necessarily translate to water quality. Still, this enhanced aesthetic appeal of the lake has been responsible for a rebirth in recreation and tourism on our North Coast. The enhanced quality of life for all Ohioans and the additional tourism dollars generated have certainly been worth the investment in pollution abatement.

Karen Huebel



Lake Erie is also an exceptional source of high quality drinking water. The supply is abundant, the concentrations of contaminants are low and federal drinking water quality standards are consistently met.

Despite these improvements, our lake and its tributaries still suffer from the past legacy of environmental neglect. Problems still exist in many rivers and streams emptying into the lake, as well as much of the nearshore zone that still impair the full use and enjoyment of Lake Erie. In particular, the sediments deposited in these areas serve as a repository of wastes from our industrial past. Elevated levels of nutrients (phosphorus); metals (mercury, cadmium, lead, chromium, cyanide, copper and zinc); and industrial contaminants (cyanide, polychlorinated biphenyls [PCBs] and polyaromatic hydrocarbons [PAHs]) are present.

The contaminants contained in these sediments do not stay buried forever. Churning from floods and waves, the burrowing of bottom dwelling animals or the stirring from a propeller all serve to resuspend these sediments in the water column. Here they may be absorbed into the cells of simple plants and animals, passed up the food chain into the fish we catch and eat, and ultimately reside in the tissues of our own bodies. This contamination is manifested in the advisories that the

State of Ohio must issue to safeguard susceptible groups of people (pregnant women and small children) from consuming excessive amounts of Lake Erie sportfish. Ohio supports the goal of the International Joint Commission of reaching the virtual elimination of persistent toxic substances, as set forth in the ***Great Lakes Water Quality Agreement.***

The inadequate treatment of human and animal wastes still contaminates many of our beaches and water sources. Coastal waters are fouled through municipal sewer leakage and overflows, inadequate or failing package plants and septic systems and animal feedlot runoff. A wide variety of disease-causing microorganisms can be transmitted to humans through contact with contaminated water. While our public swimming beaches have vastly improved since the 1960s (when many were permanently closed), advisories against swimming still need to be posted roughly 20% of the summer swimming season.

Four of our major Lake Erie tributaries (Maumee, Black, Cuyahoga and Ashtabula Rivers) have the dubious distinction of being on the list of Great Lakes' Areas of Concern. These are areas that are severely contaminated and are limited in the beneficial uses that can be sustained.

Lake Erie Quality Index Goals:

- *Reduce the concentration of toxic contamination in Lake Erie, so that no fish consumption advisories exist for any species at any location in Lake Erie.*
- *Remediate all contaminated sediments in Lake Erie to the extent that they do not cause fish consumption advisories, are not toxic to organisms living in the sediments, and may be disposed of anywhere (in the lake or on land) when dredged.*
- *Eliminate sources of disease-causing microorganisms into Lake Erie so that no Lake Erie beach is ever under advisory.*
- *Maintain sufficient purity of raw Lake Erie water such that treated drinking water standards are always met.*

"The most noticeable improvement that has taken place in Lake Erie over the past 25 years is the remarkably increased clarity of the water."

Continuing the job of improving and restoring Lake Erie requires that we not only restrict the current and future flow of pollutants – but also clean up from the damage done during the past century.

The persistent problem of the re-circulation into the ecosystem of sediment derived toxins is not one that is going away soon or easily.

Karen Huebel

Determining the extent of sediment contamination, their removal and their ultimate disposal or remediation are all extremely difficult and costly given the huge quantity of sediments that are contaminated along the North Coast. Progress can be significantly accelerated through standardized evaluation and prioritization of existing sites, so that our limited resources available for actual cleanup will yield the greatest benefit to the ecosystem.

Standardization of information and more consumer-friendly and accessible information is needed to advise the public about Lake Erie fish consumption and swimming advisories. Improved research and dissemination of important information also will help meet strategic objectives to increase recreational fishing and beach usage.

We also need to tackle the very difficult and expensive job of properly managing our domestic sewage. First, although hundreds of millions of dollars have been invested in upgrading sewage treatment systems in our large cities – the job is not done yet. Second, where sewage treatment services are not available, we must insist on adequate design and maintenance of private and semi-public package plants and septic systems.

Finally, it is essential that we establish a comprehensive monitoring program for Lake Erie and its watershed. Ohio has never had the ability to monitor with assurance the physical, chemical and biological integrity of the Lake Erie ecosystem. We no longer can afford to view regular monitoring as a luxury if we truly want to be able to measure the results of implementation and address emerging problems before they reach a crisis level.

Lake Erie Water Quality Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Toxic Contamination	Bolster Lake Erie Fish Consumption Advisory Program	**(WQ - 1)** Promote the acceptance by all Great Lakes states of the standardized Great Lakes protocol for the determination of fish consumption advisories by 2001. **ODH, ODNR, OEPA**

Lake Erie Water Quality Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Toxic Contamination	Bolster Lake Erie Fish Consumption Advisory Program	**(WQ - 2)** Support efforts to communicate fish consumption advisories with the public. Reach out to the majority of the Ohio fishing population with this information by 2001. ODH, ODNR
	Increase our understanding of contaminant pathways and health impacts in Lake Erie	**(WQ - 3)** Prioritize funding for research concerning the bioaccumulation of contaminants and their pathways, and health impacts to humans and wildlife. **OEPA, ODH, Lake Erie Commission, Ohio Sea Grant**
Contaminated Sediments	Remediate (remove, seal, neutralize) contaminated sediments in Lake Erie's harbors and tributaries – complete remediation of high priority sites by 2015 and all sites by 2025	**(WQ - 4)** More strongly support efforts to assess and address contaminated sediments. Consider sediment remediation as part of overall environmental improvement and as a cross program issue – not as a separate topic. OEPA, ODH • Establish standardized criteria by which to evaluate sites in the Lake Erie watershed. • Continue to support weight of evidence approach to prioritize sites in the Lake Erie watershed. • Continue to expand assessments to include ecological risks as well as human health factors. **(WQ - 5)** Create information clearinghouse for all Ohio Lake Erie contaminant sediment and fish tissue data by 2003. **OEPA**
Bacterial Pollution	Reduce bacterial contamination (and other pollutants) coming from inadequate or non-functioning private home septic systems	**(WQ - 6)** Implement laws and rules for new permitting requirements and operation of private home septic systems. **ODH, Ohio General Assembly** • Require permits to install and operate home septic systems. • Require operational assessments of new and existing home septic systems. • Establish funding mechanisms at both state and local levels to cover costs of sewage disposal program activities. • Support additional use of existing OEPA-DEFA funding programs for replacement or upgrades of malfunctioning home sewage systems.

Lake Erie Water Quality Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Bacterial Pollution (Continued)	Enforce compliance with existing state regulations concerning small semi-public package plants	**(WQ - 7)** Assist each Lake Erie watershed county in establishing a self-supporting House Bill 110 inspection program by 2003. **OEPA, Lake Erie Commission.** • Require biennial inspections for semi-public sewage treatment facilities.
	Eliminate the dumping of untreated sewage and other wastes from recreational and commercial vessels.	**(WQ - 8)** Declare Ohio's portion of Lake Erie a "No Discharge Zone" by 2003. **ODNR, ODH**
	Provide accurate and timely information to the public on potential risks at Lake Erie bathing beaches	**(WQ - 9)** Fully implement new state law mandating posting of swimming advisories at Ohio beaches. **ODH, ODNR** **(WQ - 10)** Establish Internet based forecasting system for presenting bacterial levels and beach advisories at state beaches to provide timely and accurate warning to citizens by 2003. **ODH, Lake Erie Commission** **(WQ - 11)** Support the development of technologies and field studies to identify and trace sources of local bacterial contamination. **ODH, OEPA, Lake Erie Commission, Ohio Sea Grant**
Drinking Water	Provide the public with water quality information concerning Lake Erie public drinking water supplies	**(WQ - 12)** Publicize availability of drinking water quality information through OEPA drinking water web sites. **OEPA** • www.epa.gov/safewater • www.epa.gov/enviro/html/ef_overview.html • www.epa.state.oh.us/ddagw/
Water Clarity	Adequately monitor long-term trends in Lake Erie water quality parameters	**(WQ - 13)** Collaborate with federal, local, and private organizations in establishing monitoring stations and regular sampling schedules that include offshore and nearshore stations for water clarity, water chemistry and biological sampling by 2001. **OEPA, ODNR, Ohio Sea Grant**
Other	Restore all beneficial uses in Ohio's Four Areas of Concern (AOCs)	**(WQ - 14)** Support efforts that assist in restoring and protecting all the beneficial uses to Ohio's four Areas of Concern. **OEPA**

Pollution Sources

The bulk of the effort to clean up the lake over the past 25 years has centered on limiting the discharge of pollutants that reach the lake through a pipe – or "point source" pollution. Many billions of dollars have been spent in Ohio and around the Great Lakes in the construction of facilities to treat both domestic and industrial wastewater. Ohio has met and surpassed its point source objectives for three of the five critical pollutants measured in the ***Lake Erie Quality Index***. Since 1984, all five pollutants have been reduced by at least one-half, with the loading of lead and mercury reduced more than five-fold.

Progress towards reducing pollutant loading through other pathways has not enjoyed the same success. Today, nonpoint pollution is the primary cause of continued degradation of Lake Erie and is the area that needs the most focused attention. Until recently, limited resources have been expended toward reducing the input of nonpoint pollutants, particularly from agriculture, streambank erosion and construction runoff. The primary nonpoint pollutant of concern, sediment, still causes damage to Ohio's streams and rivermouths. Excess sediment covers valuable underwater habitat and chokes aquatic plant growth in rivermouths and nearshore areas, exacerbates the need for maintenance dredging and greatly diminishes the aesthetic appeal of our lake.

Contaminants also are reaching the lake from leaking landfills and waste sites. The enormous cost of restoring these sites has delayed their remediation. Although waste sites, urban nonpoint sources and atmospheric sources are all contributors to the continued loading of pollutants, additional work is needed to characterize loadings and identify specific sources.

Lake Erie Quality Index Goals:

- Maintain point source discharges into Lake Erie at or below loadings allowed through National Pollutant Discharge (NPDES) permits.
- Reduce the cumulative annual sediment load in the Maumee, Sandusky, Cuyahoga and Grand Rivers to below 500,000 metric tons.
- Clean up all remaining Lake Erie watershed waste sites.
- An objective for Urban Nonpoint Sources has not yet been developed.
- An objective for Atmospheric Pollution has not yet been developed.

Although the reduction of point source pollutants throughout the country has been the most tangible accomplishment in pollution reduction over the past 25 years, still more can be done. In light of significantly lower loading standards derived through the Great Lakes Water Quality Initiative for many point source pollutants, each discharge permit needs to be reevaluated and reissued. Ohio also needs to continue its pollution prevention efforts. Much can be done through education and incentives to substitute for or reduce the use of toxic compounds in numerous industrial and commercial businesses, as well as private households throughout the watershed.

"Our most urgent recommendations focus on reducing the amount of sediment being eroded from the watershed and subsequently loaded into the lake by 67% ."

Our most urgent recommendations focus on reducing the amount of sediment being eroded from the watershed and subsequently loaded into the lake by 67%. Of primary importance is significantly increasing the acreage utilizing conservation tillage farming practices and maximizing the use of conservation buffer strips to protect the watershed's tributaries.

The goal of assessing, prioritizing and remediating all old and abandoned contaminated waste sites in the Lake Erie watershed by 2025 will be a tremendous challenge. Existing hazardous waste cleanup programs need to be thoroughly evaluated – and changes made to increase the effectiveness of these efforts and expand the number of sites undertaking voluntary remediations. Also, we need to take better advantage of existing funding sources and perhaps institute new sources that will provide money for local communities to perform cleanups and attract federal matching funds.

The remaining two pathways of pollutants, urban nonpoint and atmospheric pollution, also are significant pathways of pollutants into the Lake Erie ecosystem. Both need to be developed as ***Lake Erie Quality Index*** metrics to better understand the magnitude and trends of these pollution sources. Specific recommendations concerning urban nonpoint pollution include developing effective collection systems for household and small business hazardous wastes, establishing watershed-based stormwater management plans, continuing efforts to modernize wastewater and stormwater sewer systems, and maximizing the use of riparian buffers in developed areas.

Numerous ongoing programs of OEPA's Division of Air Pollution Control address Ohio's effort to further limit air emissions and clean the air we breathe. As related to the quality of Lake Erie, we need to better monitor the deposition of contaminants from the atmosphere. Also, Ohio can promote the reduction of air emissions through innovative strategies for energy conservation and efficiency.

Lake Erie Pollution Sources Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Point Sources	Continue reducing toxic point source pollutants into Lake Erie	**(PL - 1)** Rewrite all Ohio Lake Erie NPDES permits to comply with new ***Great Lakes Water Quality Initiative*** standards and Ohio anti-degradation standards by 2003. **OEPA** • Enforce tighter compliance of approved permits. **(PL - 2)** Expand efforts to reduce and substitute for the use of hazardous materials in industry and small business and provide technical assistance by 2002. **Ohio Environmental Education Fund, OEPA, Lake Erie Commission** • Prioritize pollution prevention implementation and research for Lake Erie Protection Fund projects. • Set goal of 90% of watershed dischargers to have implemented P2 plans by 2015. • Set goal of 15% of enforcement settlements will contain supplemental pollution prevention projects in place of additional financial penalties.

Lake Erie Pollution Sources Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Watershed Sources	Reduce agricultural sediment loading from the Lake Erie watershed by 67% (as defined in the ***Lake Erie Quality Index*** protocol)	**(PL - 3)** Increase from 52% to 80% the percentage of agricultural acreage in the Lake Erie watershed under conservation tillage practices by 2010. **ODNR, OEPA, ODA** **(PL - 4)** Establish buffers on 80% of Lake Erie watershed ditches, streams and tributaries. **ODNR, OEPA, ODA, Lake Erie Commission** • Support ***Ohio Lake Erie Buffer Team Initiative.*** • Support initiatives that promote or fund the placement of buffers, including the Lake Erie Buffer Program and the Conservation Reserve Enhancement Program (CREP). **(PL - 5)** Complete and begin implementing Ohio's Coastal Nonpoint Plan by 2000. **OEPA, ODNR** • Provide funding and technical resources to help meet the highest priority objectives and geographic target areas of the finished plan. **(PL - 6)** Prioritize funding for implementation of soil conservation projects and research into new conservation practices. **Lake Erie Commission, ODNR**
	Apply pesticides and fertilizers more efficiently	**(PL - 7)** Continue funding research and implementation into precision fertilizer application and other best management technologies. **Lake Erie Commission, ODA**
	Reduce animal feedlot nonpoint pollution	**(PL - 8)** Enact legislation to improve regulations for concentrated animal feed operations ***(CAFO)*** by 2001. **ODNR, ODA, OEPA** • Encourage County Soil & Water Conservation districts to educate livestock producers regarding requirements for concentrated animal feeding operations and all producers for meeting Best Management Practices (BMPs) requirements to minimize water quality impacts to meet the goals established under the federal Clean Water Act. • Formulate strategy to encourage implementation of best management practices on farms with less than 1,000 animal units.

Lake Erie Pollution Sources Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Dumps and Landfills	Assess, prioritize and remediate all contaminated waste sites in the Lake Erie watershed	**(PL - 9)** Clarify requirements and expand the number of sites eligible for Voluntary Action Program (Brownfields). **OEPA** **(PL - 10)** Improve the hazardous waste cleanup program by developing uniform cleanup standards, using new and improved methods for remediation and improving site assessment methodologies. **OEPA** **(PL - 11)** Implement recommendations of the Divisions of Emergency and Remedial Response & Hazardous Waste Management Advisory Committee for improvements in the hazardous waste cleanup programs. **OEPA** **(PL - 12)** Provide resources for cleanup. **OEPA, Ohio General Assembly** • Establish a state cleanup fund for sites which impact public health. • Establish grant/loan fund for local communities to access sites, perform cleanups and/or attract federal matching funds. • Take further advantage for site cleanups through the Water Pollution Control Loan Fund.
Urban NonPoint	Establish metric for the *Lake Erie Quality Index*	**(PL - 13)** Establish an objective for Urban Nonpoint pollution reduction for inclusion in the 2003 *Lake Erie Quality Index.*
	Reduce loading of toxins and other pollutants from small businesses and households	**(PL - 14)** Assist Lake Erie communities in developing regional recycling facilities for disposal of hazardous wastes from small businesses, households and agriculture – set goal of making such services available in all Lake Erie watersheds by 2010. **OEPA, ODOD, ODA, Lake Erie Commission**
	Establish stormwater management programs for each Lake Erie watershed	**(PL - 15)** Encourage and fund the completion of comprehensive watershed stormwater management plans in all Lake Erie sub-watersheds by 2005 and assist in their implementation. **OEPA, ODNR, Lake Erie Commission**

Lake Erie Pollution Sources Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Urban NonPoint (Continued)	Eliminate combined sewer and sanitary sewer overflows	**(PL - 16)** Support USEPA's ***Combined Sewer Overflow Strategy.*** **OEPA**
	Establish forested riparian buffers on urban and suburban tributaries	**(PL - 17)** Establish urban riparian buffers. Set goal of reestablishing forested buffers on 50% of residential tributaries and 25% of urban tributaries. **ODNR**
Atmospheric Pollution	Establish metric for ***Lake Erie Quality Index***	**(PL - 18)** Establish an objective for Atmospheric Pollution for incluson in the 2003 *Lake Erie Quality Index.* **OEPA, Lake Erie Commission**
	Monitor and quantify the deposition of toxic compounds into the Lake Erie watershed	**(PL - 19)** Establish two state-funded air contaminant collectors as part of the ***Great Lakes Integrated Atmospheric Deposition Network.*** **OEPA, Lake Erie Commission**
	Reduce emissions of Lake Erie watershed pollutants	**(PL - 20)** Prioritize funding for projects that encourage energy conservation through reducing electrical consumption, retire emission credits or result in other environmental improvements in the advent of electrical deregulation. **ODOD, Lake Erie Commission**

Habitat

The land comprising the Lake Erie watershed would be unrecognizable to the people who originally settled here. Most of the forests have been cleared and the wetlands filled or drained to make way for farms and communities. Since the mid-1800s, significant degradation of our tributaries and coastlines has been caused by logging, navigation projects, power production, dam construction, shoreline development, agriculture and waste disposal. Streams and rivers have been straightened, rerouted, dredged and bulkheaded. Much of the shoreline has been filled and armored.

The results of these activities have had the cumulative effect of diminishing our natural environment by limiting the natural processes that support the lake ecosystem. These impacts are clearly seen in the Qualitative Habitat Evaluation Index (QHEI) scores published in the ***Lake Erie Quality Index***. None of our 12 major Lake Erie tributaries are rated "excellent" and only two are considered in "good" condition, while four rated only "fair" and six received a ranking of "poor."

This damage to shorelines and waterways is further reflected in the impaired biological communities that inhabit these areas. Many stretches of shoreline, rivermouths and streams can no longer sustain healthy, biologically diverse communities of fish, invertebrates or plant life. Many species dependent on high water quality or rare habitat have been drastically reduced in numbers or are absent altogether.

Lake Erie Quality Index Goals:

- Habitat Quality, as measured by the Qualitative Habitat Evaluation Index (QHEI) shall average at least "good" (score of 55 or better) for the Lake Erie Shoreline and Lake Erie Rivermouth Indices.
- An objective for Wetlands has not yet been determined.
- An objective for Land Use has not yet been determined.

The Lake Erie watershed has been so drastically altered from its natural state that it is difficult to decide what are reasonable goals to set, let alone devising strategic actions. Our plan is to first attack specific components of the watershed with narrowly focused actions. Secondly, we need to begin a serious dialogue on bringing about the necessary changes to establish a sustainable Lake Erie watershed.

Our first task is to promote restoring the natural hydrology and flow characteristics of our Lake Erie tributaries. Actions which will have the net effect of removing all possible impediments to flow, protecting the water storage and flood protection capacities of floodplains and wetlands, and further limiting the wasteful and destructive loading of sediment into our waterways must be a high priority.

Another critical need in Ohio is to restore or protect coastal wetlands and natural areas for natural habitat value as well as to provide Ohioans with additional opportunities to enjoy the Lake Erie shoreline. Necessary components of this strategy must be to restore sites to full natural function, eradicate invasive nuisance plants which limit the value of much of the North Coast, and use non-intrusive technologies to protect the shoreline from accelerated erosion.

The more difficult task is to find ways to better balance our use of the watershed's natural resources with the long-term conservation of these same resources. This issue is of course not unique to northern Ohio. Achieving a sustainable relationship between economic growth and preserving the natural environment is one which we are struggling with from the smallest watershed to a global scale.

Principles for balancing environmental health with economic expansion have been around for many years under many names, such as ***Sustainable Development*** or ***Smart Growth***. The term that we will use to describe our intent is ***Balanced Growth***.

"We need to start considering all the consequences of our land use and development decisions."

Balanced Growth acknowledges that we will continue to expand our economy and will inevitably experience continued development and population growth. But, ***Balanced Growth*** also is a belief that growth can occur in ways that will minimally impact the health of the ecosystem.

We need to start considering all the consequences of our land use and development decisions. Besides the obvious desired economic benefits, we must determine and factor in secondary effects such as additional pollution, relocation of businesses and population, alterations to the natural hydrology, and impacts on historical, social and cultural resources.

The great difficulty is how to integrate these ***Balanced Growth*** action principles into our decision-making process at all levels. Especially

perplexing is how to implement change and minimize impinging on individual economic freedoms or private property rights.

First, the State of Ohio must be a source of information so that those who want to incorporate ***Balanced Growth*** locally may have access to the most current research and best management technologies. Second, Ohio must provide feedback, recognition and incentives to local communities and institutions to accept and implement the principles of ***Balanced Growth***. Finally, the State can take a leadership role by ensuring that its investment and management policies integrate both economic enhancement and environmental protection of the Lake Erie watershed.

Lake Erie Habitat Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Tributaries	Reestablish more natural flow regimes to Lake Erie tributaries	**(H - 1)** Assess the environmental and economic benefit of each Lake Erie tributary dam and encourage the removal of non-beneficial dams, or modify existing dams with fish passage structures where appropriate by 2025. **ODNR** **(H - 2)** Limit additional development and restore flood retention capabilities of Lake Erie tributary floodplains. **ODNR, OEPA, Lake Erie Commission** • Use federal and state conservation reserve programs to purchase conservation easements on flood plain and upland wetlands. **(H - 3)** Support local jurisdictions and conservation groups by providing funding and technical assistance for comprehensive watershed planning. **ODNR, OEPA, Lake Erie Commission** **(H - 4)** Give greater scrutiny concerning maintaining local watershed hydrology during the permitting of future development projects. **ODNR, OEPA** • Establish headwaters water quality standards. **OEPA**

Lake Erie Habitat Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Watershed Land Use	Acknowledge, celebrate and foster the adoption of ***Balanced Growth*** Best Management Practices throughout the Lake Erie watershed	**(H - 5)** Publish and distribute a ***Lake Erie Model Zoning Ordinance*** and ***Building Code*** by 2003 and encourage its voluntary acceptance by local communities. **ODOD, Lake Erie Commission** • Ensure that all interested concerns (local communities, property owners, developers, conservationists, agriculture, etc.) have the opportunity to fully participate. **(H - 6)** Institute a Lake Erie Lighthouse designation for entities practicing sound ***Balanced Growth*** principles by 2003. **Lake Erie Commission** • Establish a suite of practices and/or characteristics that would qualify for Lighthouse designation. • Create suitable awards to recognize and celebrate those entities receiving the designation. • Consider making the Lighthouse designation a factor in the selection process for specific Ohio grants and loan programs. • Types of entities may include communities, farms, businesses, schools, etc. **(H - 7)** Establish by 2003 the Governor's Lake Erie Balanced Growth Awards – monetary award program from the Lake Erie Protection Fund for innovative examples of balanced growth practices. **Lake Erie Commission** • Award money would be earmarked for continued implementation of these practices.
	Better integrate economic, environmental and social impacts into all State of Ohio land-use planning and investments	**(H - 8)** Commission a ***Balanced Growth Blue Ribbon Task Force,*** comprised of property owners, government officials, business leaders, conservationists, academia, agriculture and other stakeholder groups to be charged with advising the Lake Erie Commission on ways to: **Lake Erie Commission** • Develop strategies that will balance the protection of the Lake Erie watershed with continued economic growth.
	Protect prime agricultural lands in Lake Erie watershed from urban sprawl	**(H - 9)** Fully implement Ohio Farmland Preservation Program. **ODA, OEPA, ODNR** • Provide incentives and easements to keep prime agricultural farmland in production.

Lake Erie Habitat Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Watershed Land Use (Continued)	Reforest riparian corridors and marginal agricultural acreage in the Lake Erie watershed	**(H - 10)** Reforest marginal agricultural acreage, floodplains and wetlands of the Ohio Lake Erie watershed, utilizing the Lake Erie Buffer Initiative, Conservation Reserve Enhancement Program (CREP), the Governor's Bicentennial Tree Planting Program and other programs. **ODNR**
Coastal Shorelines	Enhance public access to Lake Erie for all Ohioans and protect/restore critical coastal habitat	**(H - 11)** Make coastal parcels a high priority for state or local acquisition through direct purchases or purchase of conservation easements from willing sellers. **ODNR, Ohio General Assembly** • Create list of high priority parcels for purchase when available or other protection strategies by 2002. • Create special fund by 2002 for property purchases or purchase of easements on valuable coastal properties for recreation and habitat conservation. **(H - 12)** Encourage local communities through financial inducements to limit shoreline development to water-dependent uses. **ODNR, Lake Erie Commission** • Prioritize funding for coastal planning grants.
	Protect and restore valuable coastal properties	**(H - 13)** Implement Lake Erie Marshes Focus Plan as part of North American Waterfowl Plan by 2020. **ODNR** **(H - 14)** Use incentives to encourage proper use and placement of shoreline erosion structures. **ODNR** • Prohibit use of inappropriate fill materials on shorelines. • Promote the natural movement of sand along Lake Erie's shoreline and nearshore area. • Promote use of non-structural shoreline protection strategies. • Develop and implement cost effective technologies to move available off shore sand deposits into the littoral zone for beach nourishment, barrier building, etc.

Lake Erie Habitat Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Coastal Shorelines (Continued)	Protect and restore valuable coastal properties (Continued)	**(H - 15)** Establish intensive programs by 2003 to eradicate purple loosestrife, ***Phragmites***, and other noxious exotic plants in prime Lake Erie coastal wetlands by 2015. **ODNR** **(H - 16)** Educate coastal beach managers on integrating conservation of rare beach habitats into beach maintenance programs by 2001. **ODNR**
	Increase public education of all coastal and Lake Erie environmental principles	**(H - 17)** Implement voluntary program for all Lake Erie watershed schools to receive an extensive Great Lakes curriculum and field experience by the 8th grade by 2005. **ODNR, Lake Erie Commission, Ohio Sea Grant**
Wetlands	Expand wetlands within the Lake Erie watershed	**(H - 18)** Define and inventory where acquisition/protection of wetlands and buffer areas and other enhanced management is needed to protect these resources. **ODNR, OEPA** • Create prioritized list for enhanced management. • Use conservation reserve program for restoration of upland wetlands (see **H - 2**).

Arnold W. Ehrsam

Biological

The Biological Indicator of the ***Lake Erie Quality Index*** focused on the most crucial evaluative factor concerning the Lake Erie ecosystem — its ability to sustain life. The ***Index*** evaluated the biological well-being of Lake Erie in two ways. First, the population trends of the key indicator species were evaluated and scored. Bald eagles (the top bird predator), walleye (the predominant predator fish) and mayflies (an invertebrate dependent on oxygen in the bottom waters) have all made remarkable comebacks over the past 20 years. This is mainly due to a dramatic reduction in lake pollution, restoration of suitable habitat and extensive wildlife management efforts.

Ruth Rittichier

The second measure is based on the premise that community health integrates a wide range of environmental factors (water chemistry, habitat availability, food web structure, etc.) and can be measured. The index that has been produced is the ***Index of Biotic Integrity***, or IBI. The IBI takes a more fine-grained look at the ability of the ecosystem to support healthy and biologically diverse communities.

The IBI results were not encouraging. The average cumulative score for the Lake Erie nearshore zone across the entire shoreline was only "fair." The average score for the 17 Ohio tributaries flowing into Lake Erie was also "fair," with five individual rivermouths ranking as "poor." Surely, we have a long way to go in reestablishing healthy diverse biological communities throughout the watershed.

The causes of the degradation of aquatic communities throughout the Lake Erie watershed are many. Release of toxic compounds — including industrial and municipal wastes, agricultural pesticides, home chemicals and atmospheric deposition from faraway sources have stressed or outright poisoned organisms.

The past excessive loading of nutrients dramatically changed the assemblage of species in the lake, favoring less diversity and eliminating many highly desirable plants and animals.

Loading of sediments, along with straightening of streams, blockage by dams, dredging and filling of lake and river bottoms, and shoreline protection/construction have dramatically altered the physical structure of our tributaries and coastlines. The complex variety of habitat necessary for diverse and healthy communities is rare or nonexistent along many stretches of northern Ohio rivers and shorelines.

Over-harvesting many fish and game species such as sturgeon, blue pike and river otter have greatly reduced or removed highly prized animals from the lake and watershed.

Finally, species accidentally or deliberately introduced have in many cases come to dominate particular niches, driving out native species. Introductions such as ***Phragmites*** (giant reed), purple loosestrife, zebra mussels, carp and the round goby are all examples of species that have dramatically altered the natural biota of the region.

Lake Erie Quality Index Goals:

- Healthy reproducing populations of key indicator species shall be maintained in Lake Erie. Specifically:
  - Bald eagles will maintain an annual average reproduction rate of at least one eaglet per nest.
  - Lake Erie walleye stocks will be maintained at a minimum of 30 million fish.
  - The average concentration of mayfly nymphs in Lake Erie's western basin sediments shall be 500 nymphs per square meter.

- The biological quality of Lake Erie as measured by the ***Lake Erie Index of Biological Integrity*** shall score "excellent" or "good" for Lake Erie nearshore, island and rivermouth areas.

Meeting the Biological Indicator objectives of the ***Lake Erie Quality Index*** will only be realized with a continued commitment to restoring the Lake Erie watershed. Recommendations cited in other chapters of this plan – reduction in both point and nonpoint pollution loading, greatly enhanced soil conservation efforts, adoption of ***Balanced Growth*** practices, cleanup of contaminated sediments, etc. – will support healthy, diverse and sustainable plant and animal communities that we are striving to attain.

"We need to start considering all the consequences of our land use and development decisions."

Many management initiatives will help in this ambitious effort. Fully implementing Ohio's new programs for aquatic nuisance species (ANS) should greatly diminish new infestations of damaging exotic species. Enacting a Biological Diversity Program will protect Ohio's rare and endangered species. Finally, special management programs such as that

which has benefitted the bald eagle to Ohio should be implemented to restore other extirpated species such as trumpeter swans, osprey and otter to the North Coast.

Lake Erie Biological Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Key Indicator Species	Limit future introductions and spreading of exotic species in the Lake Erie basin	**(B - 1)** Fully implement Ohio's Aquatic Nuisance Species (ANS) Plan by 2003. **ODNR** • Support efforts by the Great Lakes Commission and Great Lakes Protection Fund to develop technology and regulations to eliminate ballast water introductions by marine commerce. • Develop and maintain monitoring programs in Lake Erie for early detection of new infestations. • Conduct effective information/education campaign on the prevention of ANS introductions. • Develop and implement abatement strategies to eradicate or reduce populations of targeted nuisance ANS in Lake Erie.
	Develop a comprehensive inventory of all Lake Erie coastal biological resources	**(B - 2)** Complete the inventory initiative of the ***Biological Diversity Strategic and Implementation Plan*** by 2003 emphasizing: **ODNR** • Comprehensive inventories of coastal biological resources within Lake Erie and its watershed. • Identification of rare and endangered species and their habitat areas. • Objective criteria for management, protection and acquisition of threatened habitat and biological resources. • Prioritization of sites to be used as a basis for acquisition and enhanced management.
	Implement special management programs to protect or restore rare and endangered native species	**(B - 3)** Continue intensive bald eagle management program with goal of establishing 50 nesting pairs within the Lake Erie watershed by 2025. **ODNR**

Lake Erie Biological Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Key Indicator Species (Continued)	Implement special management programs to protect or restore rare and endangered native species (Continued)	**(B - 4)** Maintain or restore viable populations of Lake Erie water snake, trumpeter swans, osprey and otter by 2025. **ODNR** • Institute specific management programs for the above species. • Identify and protect essential habitat refuge.
Index of Biotic Integrity	Continue development of biologically-based assessment tools of the Lake Erie ecosystem	**(B- 5)** Continue development, refinement, and measurement of OEPA's ***Index of Biotic Integrity*** by 2005 – adopt as metrics for the ***Lake Erie Quality Index.*** **OEPA, ODNR** • Develop separate integrated index that incorporates plankton, benthic invertebrates and higher vertebrates as indicator species for: - Lake Erie tributary communities - Lake Erie nearshore communities - Lake Erie coastal wetland communities - Lake Erie offshore communities **(B - 6)** Establish monitoring network and evaluate above indices every five years and publish in ***Lake Erie Quality Index***. **Lake Erie Commission**

Michael Saletra

Coastal Recreation

The Lake Erie shoreline is host to an array of activities and events, from nature walks and picnicking to ice fishing and scuba diving. The natural beauty of the North Coast draws Ohioans and visitors alike to its shoreline to participate in their favorite pastimes throughout the year. Improvements in Lake Erie water quality, greater access to many coastal natural areas and several new or upgraded park facilities have stimulated increases in both participation and satisfaction of coastal recreation activities.

Carolyn Foster

With the rebirth of Lake Erie, traditional shoreline pursuits have quickly revived and flourished. Boating, fishing, swimming, waterside entertainment districts, camping and the hotel/cottage industries have rebounded from the polluted 1960s. The improving Lake Erie ecosystem also has allowed for additional forms of recreation that are particularly sensitive to a healthier lake. Bird watching, wreck and reef diving, and bass and pike fishing are activities that promise to flourish in the future.

Still, the main obstacle to improving coastal recreational opportunities to Ohioans is the lack of available coast. Of the 262 Lake Erie shoreline miles in Ohio, only 15% are accessible to the public for free or on a fee basis.

Lake Erie Quality Index Goal:

- Attain a score of "excellent" on the standardized ***Lake Erie Quality Index*** Coastal Recreation public survey.

The primary mission of the State of Ohio in regards to coastal recreation on Lake Erie must be to provide more shoreline miles and with it more opportunities for recreation to the public.

The State of Ohio has a mandate through its Coastal Management Program to thoroughly review and assess the availability of recreational facilities on Lake Erie. This effort needs to be coupled with identifying and prioritizing for acquisition available parcels of coastal properties from willing sellers. Finally, money must be appropriated to make the purchases.

A special focus should be given to developing hiking/biking and scuba diving on the North Coast. Improvements that can be made to the quality of hiking available in the Lake Erie area include the creation of additional

bikeways/hikeways along the Lake Erie Circle Tour as well as to and from area attractions. Underwater activities can be improved by designating areas for snorkeling and scuba diving and protecting the archeological and ecological sites in these areas. These sites should be accessible by shore where feasible.

The Ohio Lake Erie Commission and other state agencies are committed to continued improvements to Lake Erie's coastal resources, making each and every visit to the lake more enjoyable than the last.

Lake Erie Coastal Recreation Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Coastal Activities	Increase public access to the Lake Erie shoreline for recreational activities	**(CR - 1)** Make coastal parcels a high priority for state/local acquisition through direct purchases or purchases of conservation easements from willing sellers. **ODNR, Gen. Assembly** • Create list of high priority parcels for purchase when available or other protection strategies by 2002. • Create special fund by 2002 for property purchases or purchase of easements on valuable coastal properties for recreation and habitat conservation.
	Increase opportunities for hiking/biking along the Lake Erie shoreline	**(CR - 2)** Continue to work with local governments to assist with development and funding of bike and pedestrian facilities. **ODNR, ODOT, Lake Erie Commission** • Create spurs and side trips to Ohio Lake Erie attractions. • Create adjoining bikeways/hikeways along Ohio's Lake Erie Circle Tour route. • Set goal of providing a biking/hiking route from Michigan to Pennsylvania linking cultural, natural, historical and recreational resources.
	Protect valuable underwater ecological and cultural resources while promoting their enjoyment	**(CR - 3)** Use federal and state authorities to designate underwater sanctuary reserves to protect valuable Lake Erie underwater habitat and archeological sites by 2001. **ODNR** • Create beach embarkation points for shore accessible dive destinations.

Boating

Boating is an immensely popular pastime on Lake Erie. There are 407,688 registered boats in the state, with these Ohioans making an average of 4.3 trips to the lake each summer, according to Ohio State University's Ohio Sea Grant College Program. An Ohio Sea Grant survey estimates that boating annually generates approximately $650 million for the North Coast economy. Sailing, powerboating, canoeing, kayaking, windsurfing and jetskiing attracts people from across the state as well as visitors from throughout the Midwest.

From the survey results generated from the ***Lake Erie Quality Index***, boaters are generally satisfied with the services available along the North Coast, but they also cite several areas for improvement. The primary issue is the availability of dockage and launching facilities – particularly along the eastern part of the Lake Erie shoreline. From Toledo east through Lorain County, the availability of facilities generally outpaces demand. Within Cuyahoga County and east to Conneaut, a dearth of facilities often results in long waiting lists for dockage and long lines at existing launch ramps.

Safety is always a concern. Boating accidents and fatalities have decreased dramatically in Ohio over the past four decades. The ***Lake Erie Quality Index*** reported that fatalities caused by boating accidents in Ohio has declined from 23 per 100,000 registered boats in 1962 to 2.5 in 1996. These statistics show that the combination of law enforcement, boating safety education, improved boat building technology and public awareness has accomplished a great deal to make boating an activity that can be safely enjoyed by all. Yet with more boats and ever faster and more powerful boats coming on the market, we need to look at new ways to keep boating safe.

John Ferguson

Lake Erie Quality Index Goals:

- An objective for Available Dockage has not yet been determined.
- An objective for Boat Launching Facilities has not yet been determined.
- The State of Ohio will work to attain a ranking in the top 10 of all states nationally for the lowest number of boating fatalities.
- Recreational boating on Lake Erie will attain a score of "excellent" on the standardized ***Lake Erie Quality Index*** boating survey.

Most of the strategic actions recommended for Lake Erie boating are dependent on generating additional revenues. To that end, recent legislation passed by the General Assembly that earmarks recreational boating's fair share of the Ohio gasoline tax revenues to the Waterways Safety Fund will be put to good use.

The additional gasoline tax revenues will allow for two important initiatives. First, boaters identified boating access as their primary concern. They were equally concerned that existing launch facilities be repaired and/or improved. Grants programs can be supplemented with the intent of assisting local communities in planning and implementation of harbor improvements, channel dredging and habitat protection needed to provide more high quality dock and launch facilities. Attention also must be paid to maintaining and upgrading existing state operated marinas and launch facilities. As has been experienced elsewhere on Lake Erie, first-class and full-service marinas are desirable destinations to the boating public. Ohio needs to do much more towards providing the transient facilities that will attract guests throughout the Great Lakes.

Additional revenues also will allow for increased boating safety programs and enforcement of existing boat operation laws on the part of ODNR. Participants in our discussion groups indicated that they would enthusiastically welcome a greater presence of state and local law watercraft officers and tighter enforcement of existing boat operation, equipment and education regulations.

Lake Erie Boating Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Boat Dockage	Provide adequate harbors of refuge and transient boat dockage along the Lake Erie shoreline	**(BT - 1)** Establish an objective for Boat Dockage for inclusion in the 2003 ***Lake Erie Quality Index.*** Then, implement a program to achieve the LEQI objective by 2010. **ODNR, ODH** • Provide public operated or partner with private marinas to provide full-service transient dockage at least every 15-25 miles along Ohio's Lake Erie shoreline at market rates. • Give high priority for expanding transient dockage at the Lake Erie islands and Cleveland's Inner Harbor.

Lake Erie Boating Recommendations – Cont.

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Launching Facilities	Provide sufficient quantity and quality of boat launch facilities along the North Coast	**(BT - 2)** Establish an objective for Launching Facilities for inclusion in the 2003 ***Lake Erie Quality Index.*** Then, implement a program to achieve the LEQI objective by 2010. **ODNR** • Consider boat launch access initiatives to Lake Erie tributaries and rivers as well as direct Lake access. **(BT - 3)** Evaluate all state-operated launch facilities and make improvements when appropriate by 2010. **ODNR** • Expand the number of lanes. • Increase available parking. • Improve lighting and security. • Improve access roads and signage. • Make grants/loans available for local ramp developers.
Boating Satisfaction	Calculate fair share of Ohio gasoline tax revenues for boating enhancement Improve ease of boater registration	**(BT - 4)** Periodically evaluate the percentage of fuel purchased in Ohio which is used by recreational boats. Use this information to make adjustments to the funds appropriated to the Waterways Safety Fund. **ODNR, Ohio General Assembly** **(BT - 5)** Make boater registration available online on the Internet by 2003. **ODNR**
Boating Safety	Foster safer boating on the waters of Lake Erie	**(BT - 6)** Increase the presence and activity of state and local law enforcement on Lake Erie and stiffen boating operation laws. **ODNR, Ohio General Assembly** • Increase the number of Ohio watercraft officers and explore opening one additional Lake Erie field office. • Double the number of annual check points/boardings. • Provide support facilities (secure impoundment areas) for more stringent enforcement of all boating safety laws.

Fishing

Fishing in the Ohio waters of Lake Erie is a cherished pastime for millions of Ohioans and has a significant impact on the economies of many coastal communities. The warm, shallow and productive waters of the lake, combined with the countless reefs, mudflats and rivermouths, account for the most diverse and abundant fishery of any of the Great Lakes. The walleye, yellow perch, smallmouth bass and steelhead trout fisheries in particular are world class. Other sport species such as catfish, white perch, crappie, largemouth bass, rock bass and sunfish also are caught in great numbers. With the steadily improving Lake Erie ecosystem, high quality fish such as northern pike, muskellunge and sturgeon also are beginning to be landed in significant numbers.

Fishing was one of two ***Lake Erie Quality Index*** indicators receiving a score of "excellent." We found that a tremendous number of Ohioans were enjoying fishing on the lake and that they were also highly successful in catching fish. Our research also revealed that access to the fishery by boat or on the shoreline was adequate and people were fairly satisfied with the services available on the North Coast.

There is always room for improvement. The ***Index*** as well as our discussion groups pointed to several initiatives that would further enhance both the fishery and people's enjoyment of fishing. Foremost is continuing the good fight to restore the Lake Erie ecosystem. Our experience tells us that a healthy thriving fishing industry is one of the most valuable dividends of our investments in cleaner water and a healthier habitat. These efforts must continue.

While more than 90% of the total annual Lake Erie fishing effort is attributable to boat anglers, there are many who either by choice or by necessity fish from shore. Shoreline fishing can be exceptional for walleye, yellow perch, channel catfish, and a variety of other species. However, much can be done to improve these shoreside facilities, ensuring that they are clean, easily accessible and safe.

Lake Erie Quality Index Goals:

- Maintain "excellent" average angler success ratings for the following species (fish caught per hour):
  - Walleye: 0.35
  - Yellow Perch: 3.0
  - Smallmouth Bass: 0.5
  - White Bass: 2.0
- An objective for Shoreline Fishing Access has not yet been determined.
- Maintain the annual number of Lake Erie total boat fishing hours at 6.675 million hours.
- Attain a score of "excellent" on the standardized ***Lake Erie Quality Index*** fishing survey.

As a living resource of the Lake Erie ecosystem, the fishery (and hence the fishing industry) will continue to recover if the quality of the natural environment also improves. With further decreases in the emission of toxic pollutants, enhancing the quality of existing fish habitat and the procurement of additional habitat, the Lake Erie fishery will largely take care of itself. Previous sections of this report which address recommended environmental actions will all contribute to this objective.

"Ohio should fully take advantage of this opportunity to return such species as northern pike, sturgeon and muskellunge to the tributaries, embayments and open waters of Lake Erie."

Improving conditions in the Lake Erie ecosystem are steadily driving changes in its fishery. The murky fertile lake of the 1970s and 1980s allowed for tremendous walleye and perch catches. The combined effects of decreased nutrient loading and zebra mussel filtering has dramatically cleared the water by reducing the available algae. This enhanced clarity – along with many secondary changes – has provided favorable habitat conditions to restore many high quality sportfish which have been absent or severely reduced for many decades. Ohio should fully take advantage of this opportunity to return such species as northern pike, sturgeon and muskellunge to the tributaries, embayments and open waters of Lake Erie.

The strategic recommendations also focus on the improvement of services and facilities offered along the North Coast. Whereas facilities for shoreline fishing access appear adequate to meet the demand, a great deal can be done to improve the efficiency, aesthetics and safety of these sites.

More public education concerning various fishing issues would benefit Ohioan's fish enjoyment and safety. We need to ensure that the fishing public receives accurate and understandable information concerning any consumption advisories pertainable to Lake Erie sportfish. Next, there is a need to provide the best information concerning available locations, safe practices and emergency procedures for the increasingly popular sport of ice fishing. Finally, assistance in teaching new generations on the enjoyment, safety and good stewardship of fishing needs to continue.

Lake Erie Fishing Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Angler Success	Protect critical fish spawning areas within Lake Erie and its watershed	**(F - 1)** Identify, designate and enforce special protection areas for offshore reefs, nearshore areas and tributaries that are essential for the propagation of Lake Erie sportfish by 2010. **ODNR, Ohio General Assembly** • Special Protection Areas will be protected from inappropriate development, waste disposal, overfishing and mineral extraction damages. • To the extent feasible, hydrological connections should be maintained or reestablished.
	Restore healthy and productive populations of historically important native sportfish	**(F - 2)** Reestablish viable fisheries for Lake Sturgeon, Muskellunge and Northern Pike by 2025. **ODNR** • Evaluate and establish catch rate goals for 2005 management plan.
	Create additional offshore fish bottom habitat	**(F - 3)** Evaluate the impacts and effectiveness of offshore artificial reefs as a method for expanding fisheries in Lake Erie. **ODNR, Lake Erie Commission, Ohio Sea Grant**
Shoreline Fishing	Provide sufficient quantity and quality of public shoreline fishing opportunities	**(F - 4)** Establish an objective for Shoreline Fishing for inclusion in the 2003 ***Lake Erie Quality Index.*** Then, implement a program to achieve the LEQI objective by 2010. **ODNR**

Lake Erie Fishing Recommendations – Cont.

LEQI Metric	Strategic Objective	Strategic Actions & Responsible Parties
Shoreline Fishing (Continued)	Provide sufficient quantity and quality of public shoreline fishing opportunities (Continued)	**(F - 5)** Evaluate all state fishing facilities and make necessary improvements by 2005. This effort will emphasize: **ODNR** • Installation of weather protection structures (roofs and wind blocks). • Safety and handicap accessibility of approaches and fishing areas. • Restroom facilities. • Cleaning tables and refuse disposal. • Aesthetics and natural landscaping of facilities and surroundings.
Fishing Satisfaction	Provide better information to the public concerning fish consumption advisories	**(F - 6)** Provide timely and consistent publication and dissemination of fish consumption advisory information by 2001. **(See WQ - 2) ODNR, ODH, OEPA**
Fishing Participation	Maintain 6.675 million boat hours annually for Lake Erie sport fishing	**(F - 7)** Develop portable program and equipment for a beginner fishing class that can be implemented through existing clubs and organizations by 2003. **ODNR** • Maintain and expand ***Hooked on Fishing Not on Drugs*** program and other programs to promote fishing.
	Promote safe ice fishing	**(F - 8)** Produce and widely disseminate a guidebook on "smart" ice fishing that includes public access points, parking availability and associated services by 2001. **ODNR**

Dr. Jeffrey M. Reutter

Beaches

As Lake Erie water quality has steadily improved over the past 25 years, the beaches along the North Coast have become a very popular place to be again. Last year, more than 1.4 million visitors enjoyed the nine public beaches on Lake Erie operated by the State of Ohio.

Three issues concern Ohioans regarding their Lake Erie beaches. First, they wish there were more of them. Of Ohio's 262 miles of Lake Erie shoreline, only 6.7 miles (roughly 3%) is publicly accessible beach.

Public beaches are a rare commodity in Ohio for a number of reasons. First and foremost is the scarcity of sand. Many of the state's beaches need to be regularly supplemented with outside sources of sand or they would quickly disappear. Second, a high percentage of the Lake Erie shoreline from Huron eastward is shale cliff with high, abrupt drops to the lake below. Abnormally high lake levels in recent years further limit the number of sites where beaches can be developed and maintained. Finally, much of the suitable beachfront that does exist is private property. The lakefront has always been a highly desirable place to live – even more so for beachfront property.

Facilities at many beaches need upgrading. A laundry list of needed improvements includes more and cleaner restroom and changing rooms, better food and recreation concessions, and more maintenance and/or cleaning of existing facilities.

Finally, people interviewed were most concerned with personal safety while at the beach. This concern encompassed the need for more lifeguards, as well as the need for additional security for both themselves and their property while visiting a beach.

Arnold W. Ehrsam

Lake Erie Quality Index Goals:

- An objective for Beach Availability has not yet been developed.
- Attain a score of "excellent" on the standardized ***Lake Erie Quality Index*** beach survey.

As measured by the ***Lake Erie Quality Index,*** satisfaction levels with Lake Erie beaches are relatively high. The primary challenge ahead is to improve existing beaches and develop new publicly

accessible beaches – both in number of beaches and total shoreline miles. Ohio DNR is presently completing an inventory of existing beaches and will evaluate locations for possible future beach development. Any such development must include an evaluation of any adverse impacts on adjoining areas.

Facility improvements such as improved access, parking, concessions, beach services, safety and security will be undertaken. By improving the quality of services offered at Lake Erie's beaches, and expanding those services to include any additional beaches, if needed, Ohioans' enjoyment of their North Coast beaches should improve.

Lake Erie Beaches Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Beach Availability	Increase the availability of public beaches along the Ohio Lake Erie shoreline	**(BCH - 1)** Establish an objective for Beach Availability for inclusion in the 2003 ***Lake Erie Quality Index.*** Then, implement a program to achieve the ***LEQI*** objective by 2015. **ODNR** • Inventory beaches to produce an accurate assessment of available public swimming beaches and public demand. • Prioritize the acquisition of available tracts of Lake Erie beach properties and acquire them from willing sellers. • Seek partnerships with local governments and organizations to provide public access to beaches. • Reestablish or maintain new public beaches using beach nourishment technologies where feasible.
Beach Satisfaction	Improve the quality of Ohio Lake Erie beaches	**(BCH - 2)** Evaluate and make necessary improvements at all state-managed beaches by 2010 to include: **ODNR** • improved access • parking • concessions • services • safety and security **(BCH - 3)** Organize local sponsorship and stewardship programs to maintain state managed beaches by 2005. **ODNR**

Tourism

The beauty and excitement of Lake Erie attracts millions of visitors each year. Whether exploring the unique island communities or enjoying the lively nightlife of the Cleveland Flats, tourists are drawn to the unique and appealing activities offered along Lake Erie.

The ***Lake Erie Quality Index***, released in 1998, rated the quality of tourism along Ohio's North Coast as "excellent." According to the Ohio Department of Development's Division of Travel and Tourism, direct sales from tourism in Ohio's seven Lake Erie counties totaled more than $1.5 billion in 1996 and supported some 50,000 jobs with a payroll of approximately $638 million. The marketing efforts of many private and public organizations have dramatically improved North Coast tourism and the overall economic vitality of the Lake Erie region.

Lake Erie Quality Index Goal:

- Maintain the level of Lake Erie tourism at $1.6 billion (1997 dollars) with an annual rate of increase of 4%.

Data collected from local businesses suggest that the tourism industry in the Lake Erie area has boomed over the past two decades. Continued improvements to Lake Erie water quality, clarity and enhanced facilities for lake activities such as swimming, fishing, beaches and camping should attract still more people and dollars to our North Coast.

Doreen Kirk

The greatest opportunity for future growth along the North Coast lies in developing our cultural and eco-tourism assets. Bird-watching in a coastal wildlife preserve, walking a wetland boardwalk, hiking a park trail or paddling along one of the hundreds of watershed tributaries are all eco-tourism activities.

Studies show that eco-tourists spend more money than any other type of visitor. In Ottawa County alone, eco-tourists spend $5.6 million annually on lodging, meals, gasoline and other purchases. Eco-tourism also strategically complements Ohio's need to preserve green space and restore suitable habitat for wildlife and rare plant communities.

The recommended strategic actions focus on increased marketing and promotion of tourism destinations found along the Lake Erie shoreline. To best benefit from eco-tourism, the natural areas around Lake Erie should be publicized and made more accessible. Increases in signage and available maps or travel plans should increase eco-tourism in the area. Eco-tourism also places additional demands on personnel, requiring naturalists and staff for kiosks and travel sites. Also, existing routes such as the Lake Erie Circle Tour should be expanded and publicized.

Another exciting opportunity for North Coast tourism is the resurrection of the Great Lakes cruise industry. Our region's combination of expansive freshwater seas, vibrant cities and quaint waterfront towns is enticing travellers from around the world. In recent years, many ocean-going cruise liners have been adding the Great Lakes to their summer schedules. Ohio should take advantage of this growing trend by assisting in marketing Lake Erie destinations as cruising ports-of-call.

Lake Erie Tourism Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Tourism	Obtain an annual real tourism growth rate of 4% in Ohio's Lake Erie counties (as measured by the ***Lake Erie Quality Index*** protocol)	**(T - 1)** Implement comprehensive program to promote cultural and eco-tourism as tools to expand Lake Erie tourism revenues and conserve natural and cultural resources by 2002. **ODOD, ODNR, Lake Erie Commission** • Provide training to business owners, local officials and natural resource managers to better capture eco-tourism dollars. • Provide grants for signage, trails, landscaping, security, access and parking at suitable natural areas and cultural landmarks. • Increase state staffing of naturalists to provide better customer service to eco-tourists at state facilities. • Partner with county tourism bureaus in developing and implementing a comprehensive strategic plan to promote cultural and eco-tourism. • Review ways to improve signage to tourism attractions along the lake and tributaries. **ODOT** **(T - 2)** Support the reestablishment of the Great Lakes cruising industry. • Work to attract cruise liners into the Great Lakes and include Ohio ports-of-call in their cruise itineraries. **(T - 3)** Enhance the Lake Erie Circle Tour by 2003. **ODOT, Lake Erie Commission, ODOD** • Ensure route appears on state road maps. • Maintain and improve signage to ensure that the Lake Erie Circle Tour is recognized at major intersections. • Enhance appearance of Tour destinations through kiosks, shelters, signage, etc. • Incorporate adjoining bikeways/hikeways, natural preserves and cultural landmarks with Lake Erie Circle Tour.

Shipping

The industrial/commercial seaports along the Ohio shores of Lake Erie are a vital component of the North Coast economy – providing employment, tax revenues and a reliable means of exporting and importing raw materials and finished goods for hundreds of businesses throughout the Midwest. The breadth of businesses involved in the shipping industry includes: freight forwarding, ship supply, towing and pilotage, fueling, marine surveying, chemical testing, ship construction and repair, longshoremen services, terminal facility operations, warehousing, trucking and financial services. In 1995, the Ohio seaports of Lake Erie employed nearly 19,000 workers, moved more than 57 million tons of cargo across their docks and generated slightly over $1.0 billion in direct revenues.

Another benefit of the shipping industry to Lake Erie and its watershed is the high efficiency of waterborne transportation. If you ever stood next to a modern Great Lakes freighter, you can imagine the great quantity of coal, iron ore or limestone it can move on each trip. In fact, moving the 65,000 tons of bulk cargo that will fill a 1,000 foot lake freighter would require more than 600 rail cars or 1,500 trucks. This reduction in air pollution and traffic congestion on our highways is enormous.

Arnold W. Ehrsam

The role of the Great Lakes ports in the world economy has been evolving since the opening of the St. Lawrence Seaway in 1955. One of the biggest challenges currently facing lake ports is the trend in the shipping industry toward larger, deep draft ships. The larger ships cannot use the current St. Lawrence Seaway lock system. Consequently, there has been a shift in cargo movements to the coastal ports. While Ohio ports still have not recovered to the level of revenues generated in the 1970s and 1980s, they have seen increases in revenues in recent years by responding with new port strategies. To ensure this continued growth, Ohio seaports must continue to develop innovative strategies to address the needs of Ohio industries in the 21st century and secure their role in the global economy.

Lake Erie Quality Index Goal:

- Attain a level of Ohio Lake Erie Port Revenues of $1.2 billion (1995 dollars) as measured by the ***Lake Erie Quality Index*** protocol.

Ohio seaports perform a valuable role in the value-added process as both a destination for raw materials as well as a distributor of finished goods. Industries could reduce their transportation costs by locating at one of the many available industrial properties found in all Ohio Lake Erie industrial seaports. To assist in the development of these sites, policies and programs that stimulate the redevelopment of brownfield sites will significantly enhance the overall role of seaports and their economic benefits to Ohio.

The State also can be instrumental in the formation of a St. Lawrence Seaway marketing and Advocacy Group to develop this instrumental asset to its fullest potential.

"Ohio seaports perform a valuable role in the value-added process as both a destination for raw materials as well as a distributor of finished goods."

Finally, state government can assist the ports by continuing to partner with local port authorities in strategic planning, improving land side access and upgrading cargo handling equipment. These efforts will help make Ohio seaports more competitive.

Lake Erie Shipping Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Shipping	Increase composite Lake Erie annual seaport revenues to $1.2 billion (1995 dollars) as measured by the ***Lake Erie Quality Index*** protocol	**(S - 1)** Implement ***Ship Ohio*** Program by 2002. **ODOD, Ohio General Assembly** • Support the development and use of Ohio's ports. • Establish position of ***Ship Ohio*** coordinator within Ohio Department of Development.

Lake Erie Shipping Recommendations

LEQI Metric	*Strategic Objective*	*Strategic Actions & Responsible Parties*
Shipping (Continued)	Increase composite Lake Erie annual seaport revenues to $1.2 billion (1995 dollars) as measured by the ***Lake Erie Quality Index*** protocol (Continued)	**(S - 2)** Direct Great Lakes regional management forums to support interests of Great Lakes shipping community by 2002. **ODOD** • Develop ***Ship Great Lakes*** initiative. • Encourage the completion of a 50-year St. Lawrence Seaway strategic plan. **(S - 3)** Include intermodal transportation access to seaports in strategic highway planning. **ODOT**

Sharon Bouchonville