

Lake Erie Protection & Restoration Plan

2013



Ohio

Lake Erie
Commission

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Acronyms

ACT	Avoid, Control and Trap
AIS	Aquatic Invasive Species
ANS	Aquatic Nuisance Species
AOC	Area of Concern
BLLUP	Best Local Land Use Practice
BMP	Best Management Practice
BOW	Boating on Ohio's Waterways
BUI	Beneficial Use Impairment
CAFF	Concentrated Animal Feeding Facilities
CELCP	Coastal and Estuarine Land Conservation Program
CSMI	Cooperative Science and Monitoring Initiative
CWNS	Clean Watersheds Needs Survey
CLM	Certified Livestock Managers
CSO	Combined Sewer Overflow
CZARA	Coastal Zone Act Reauthorization Amendments
DMR	Discharge Monitoring Report
DRP	Dissolved Reactive Phosphorus
GLLA	Great Lakes Legacy Act
GLRI	Great Lakes Restoration Initiative
HAB	Harmful Algal Bloom
HEC-RAS	Hydrologic Engineering Center River Analysis System
HUC	Hydrologic Unit Code
HSTS	Home Sewage Treatment System
IJC	International Joint Commission
IR	Integrated Report
IRT	Interagency Review Team
LaMP	Lakewide Management Plan
LEPF	Lake Erie Protection Fund
LEPR	Lake Erie Protection & Restoration Plan
LEQI	Lake Erie Quality Index
LESEMP	Lake Erie Shore Erosion Management Plan
LTCP	Long Term Control Plan
MACT	Maximum Achievable Control Technology
MS4	Municipal Separate Storm Sewer System
NERR	National Estuarine Research Reserve
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRD	Natural Resource Damages
ODA	Ohio Department of Agriculture
ODH	Ohio Department of Health
ODNR	Ohio Department of Natural Resources

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ODOT	Ohio Department of Transportation
ODSA	Ohio Development Services Agency
OEPA	Ohio Environmental Protection Agency (Ohio EPA)
OLEC	Ohio Lake Erie Commission
OWRC	Ohio Water Resources Council
PAH	Polyaromatic Hydrocarbons
PCA	Priority Conservation Area
PCB	Polychlorinated Biphenyls
PDA	Priority Development Area
POTW	Publicly Owned Treatment Works
RAP	Remedial Action Plan
SFY	State Fiscal Year
SWCD	Soil and Water Conservation District
SWIF	Surface Water Improvement Fund
SWMP	Storm Water Management Plan
TMDL	Total Maximum Daily Load
TRI	Toxic Release Inventory
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VHS	Viral Hemorrhagic Septicemia
WAP	Watershed Action Plan
WBGP	Watershed Balanced Growth Plan
WPCLF	Water Pollution Control Loan Fund

Introduction

The *Lake Erie Protection & Restoration Plan 2013* (LEPR) reflects the state of Ohio's planned actions over the next several years to protect, preserve and restore our Great Lake. The purpose of this plan is to identify the state's strategic direction and near-term actions in the Lake Erie watershed to achieve established environmental, recreational and economic goals. The plan communicates state efforts and coordinates its actions through the Ohio Lake Erie Commission. The LEPR complements regional and local partners' initiatives in the Lake Erie basin and throughout the Great Lakes region, and is written to be consistent with regional efforts such as the Great Lakes Restoration Initiative (GLRI) and the *Lake Erie Lakewide Management Plan* (LaMP).

The LEPR is organized into 12 priority areas with associated goals, strategic objectives and action items. Some actions are new, while others reflect ongoing activities from the *Lake Erie Protection & Restoration Plan 2008*.

Lake Erie Protection Fund grant applicants are expected to indicate the strategic objective in the plan that their work will support. Further action to meet the strategic objectives in upcoming fiscal years will be determined through plan updates. For more information, please visit the Ohio Lake Erie Commission's website: <http://lakeerie.ohio.gov>.

Lake Erie is the southernmost, shallowest, warmest and most biologically productive of the five Great Lakes. Lake Erie has three basins: the Western basin

Ohio Lake Erie Commission

The Ohio Lake Erie Commission is comprised of the directors of the Ohio departments of Agriculture, Health, Natural Resources and Transportation, as well as the Ohio Environmental Protection Agency and the Development Services Agency.

The mission of the Ohio Lake Erie Commission is to preserve Lake Erie's natural resources, protect the ecological quality of its watershed, and to promote economic development on the north coast. This is accomplished through coordination and implementation of state policies and programs pertaining to water quality, habitat protection and restoration, recreation and tourism, and resource management within the Lake Erie basin. These policies and programs are implemented by the Ohio Lake Erie Commission and its member state agencies. The commission also oversees the Lake Erie Protection Fund, which provides grants to public sector, academic and non-profit organizations for the protection and restoration of Lake Erie resources. Education and promotion of the importance of Lake Erie is the goal of the commission's public outreach activities.

includes the islands area; the Central basin extends from the islands to about Erie, Pennsylvania; and the Eastern basin extends from Erie to the east end of the lake. It is about 241 miles long, about 57 miles wide, and has about 312 miles of shoreline in Ohio, including the Lake Erie islands. Lake Erie's maximum depth is 210 feet in the eastern basin. There are approximately 30,400 square miles of land that drain directly into Lake Erie from its watershed.

The economic and social significance of Lake Erie to Ohio cannot be understated. It provides abundant tourism and recreation opportunities, boasts the largest Great Lakes sport fishery, and is an important source of drinking water for millions of Ohio residents. It is also a major mineral source, including salt and limestone, and is used for shipping and transportation within the basin. In addition, Lake Erie helps create an identity for northern Ohio, as the Lake Erie economy is rich with opportunities to attract the labor force of the future. Lake Erie is a vital and precious asset that will shape the future of Ohio, just as it has shaped the past.

Economic studies have shown that while the overall restoration of the Great Lakes could cost \$26 billion, this expenditure would yield over \$50 billion in long-term economic benefits and between \$30 and \$50 billion in short term benefits. These studies have also shown that there would be a direct benefit of \$2.1 to \$3.7 billion to the Cleveland area alone.¹

From Planning to Implementation

Planning for programs and projects occurs at local, state and federal levels. Plans link together vision and direction to provide a framework for targeted, cooperative action.

Numerous funding sources, and applicants for projects, rely on plans for information about priorities. The Lake Erie Protection Fund relies on the *Lake Erie Protection & Restoration Plan* for project selection. Similarly, the *Great Lakes Restoration Initiative Action Plan* provides the framework for federal GLRI funding priorities.

Setting these goals into a framework and establishing links between federal, state, and local priorities enables the efficient use of limited resources for implementation projects that will protect and restore Lake Erie.

Lake Erie is a dynamic system, subject to constant change. Natural processes, such as variations in rainfall, ice cover, and evaporation, can cause changes in lake levels. Human activities throughout the watershed affect the shoreline and

¹ http://www.brookings.edu/metro/pubs/20070904_gleiecosystem.pdf

impact life in the lake. As a steward of Lake Erie, the state will monitor, evaluate, and adjust policies and actions to respond appropriately and efficiently to protect and restore the lake.

Focus on the Great Lakes

Since the publication of the *Lake Erie Protection & Restoration Plan 2008*, the Great Lakes have experienced significant exposure as a national and regional priority. The Great Lakes Restoration Initiative has provided more than \$80 million in restoration projects in Ohio complementing state and local investments in Lake Erie stewardship. Ohio's adoption of Amended House Bill 473 to implement the Great Lakes – St. Lawrence River Basin Water Resources Compact (compact) establishes a program for the management and regulation of new or increased water withdrawals and consumptive uses. The compact provides a critical tool for effective management of water resources in the Great Lakes basin. These efforts are unprecedented in the history of the Great Lakes and have provided tools and resources for advancing the protection and restoration of Lake Erie.

In 2014, Lake Erie will be the next Great Lake in the rotational cycle for the Cooperative Science and Monitoring Initiative (CSMI). The CSMI is a partnership among the U.S. and Canadian governments to conduct intensive, coordinated monitoring and research on a five-year rotation. The CSMI is tailored to each Great Lake to address particular issues in each lake. The CSMI is critically important to Lake Erie, as it is the lake most susceptible to environmental influences. The more we learn about the ever-changing dynamics of Lake Erie, the better our policies and programs can keep pace with responding to its needs.

The state will continue to work with binational, provincial, state and local partners on the *Lake Erie Lakewide Management Plan*. The LaMP serves to coordinate the broader objectives of Lake Erie with the multijurisdictional partners that share the boundaries of the lake. Working with partners beyond Ohio's borders is important in addressing the complex issues unique to Lake Erie.

Lake Erie Quality Index: State of the Lake Report

In 1998 and again in 2004, the Ohio Lake Erie Commission released the *Lake Erie Quality Index: State of the Lake Report* (LEQI). This document provided an evaluation of the Lake's condition. The index is an effort to gather available data to measure the status of Lake Erie, devise scoring systems to communicate the current condition of the lake to policy makers and the citizens of Ohio, and measure progress toward specific goals.

Lake Erie and its surrounding Ohio watersheds have improved significantly since the 1960s and 1970s when improvement efforts were first initiated. The 2004 *Lake Erie Quality Index* evaluated 11 separate indicators of Lake Erie quality. Positive trends were seen in many environmental, economic, and recreational indicator scores.

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 adoption of best management practices greatly reduced runoff from nonpoint sources. Coastal recreation, swimming, boating, and fishing remain popular activities and important parts of the local economy.

However, not all of the metrics show progress. Results showed that water quality began to decline after having previously improved. Increases in soluble phosphorus combined with the effects of the zebra and quagga mussel invasions resulted in an increase in harmful algal blooms and related declines in water clarity and quality. Harmful algal blooms reappeared in the Western basin, and the “dead zone” or area of low to zero oxygen levels still exists in the Central basin.

The LEQI shows that there are areas where state agencies and partners can continue to make improvements in order to realize the full potential of Lake Erie. Periodic updating of the index allows the commission to measure the effectiveness of our collective efforts to improve the lake’s quality. The next update to the LEQI is scheduled to occur in 2015.

Lake Erie Quality Index Indicators:

Ambient Water Quality
Human Exposure Risks
Pollution Sources
Aquatic Habitat
Land Use
Biological
Coastal Recreation
Boating
Fishing
Beaches
Economy

Priority Area: Nonpoint Source Pollution

Goal: Reduce nonpoint source loadings to Lake Erie tributaries.

Goal: Improve assimilative capacity of Lake Erie tributaries to restore ecological functions.

Goal: Ensure proper handling and application of pesticides for protection of water resources.

Introduction

Nonpoint source pollution continues to impact Lake Erie, particularly in the nearshore area and the western basin. The mid-1990s saw the reemergence of blue-green algal blooms causing significant public concern. Increased nutrient loading to Lake Erie, particularly dissolved reactive phosphorus (DRP), has emerged as a primary issue of concern.

In addition to nutrients, siltation/sedimentation, habitat modification, hydromodification, and organic enrichment/dissolved oxygen (DO) are listed as the top five nonpoint source causes of impairment to aquatic life in streams and tributaries in the Ohio EPA's 2012 *Integrated Report (IR)*. Two of the three Assessment Units developed for Lake Erie in the 2012 IR report non-attainment of recreational beneficial use due to bacterial exceedances. Additional metrics for assessing attainment status will be used in future Integrated Reports as Ohio EPA's recently implemented nearshore monitoring program provides data for a more complete analysis of Lake Erie water quality.

Strategic Objectives

The following strategic objectives have been identified to move Ohio closer to meeting the goals for nonpoint source pollution reductions. These objectives are meant to provide ambitious targets that will be evaluated as part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Reduce nutrient loading, especially Dissolved Reactive Phosphorus, and reduce sediment loading to Lake Erie.

Since the 1990s, dissolved reactive phosphorus loading from the Maumee and Sandusky rivers has increased dramatically and is now higher than any other time during the 35-year monitoring period.² Awareness of nutrient issues has been generating momentum in implementation of best management practices, strategy development and needed research. The Ohio EPA developed an Ohio Nutrient Reduction Strategy, submitted as final to U.S. Environmental Protection Agency (USEPA) in June 2013. The strategy provides an overall assessment of nutrient enrichment issues in Ohio with information on current and needed actions for both point and nonpoint sources of nutrients. The actions below are specific strategies, many of which are included in the strategy for nonpoint sources, with additional actions that have emerged in recent months.

2014-2015 Actions

- Implement, as appropriate, priority Phase II Ohio Lake Erie Phosphorus Task Force recommendations. *Ohio EPA, ODNR, ODA*
- Track annual and spring phosphorus loadings against the target loads recommended by the Ohio Lake Erie Phosphorus Task Force. *Ohio EPA*
- Implement the Ohio Clean Lakes Initiative, including those activities supported by the Healthy Lake Erie Fund. *ODNR*
- Adopt new water quality criteria for nutrients in 2014. *Ohio EPA*
- Support development and implementation of Total Maximum Daily Loads (TMDLs). *Ohio EPA*
- Support limiting manure and fertilizer application to levels that meet the agronomic need of the crops being grown. *Ohio EPA, ODNR, ODA*
- Support education and training for the 4R Program (right fertilizer source, right rate, right time, right placement). *Ohio EPA, ODNR, ODA*

² Lake Erie Phosphorus Task Force – Rationale Statement - <http://www.epa.state.oh.us/dsw/cafo/PTaskForce/RationaleforWorkGroupformation.pdf>

- Support agricultural practices that avoid, control and trap (ACT) nutrients and sediment not only on the fields, but at the edge of fields and downstream, in addition to implementing the 4R's of nutrient management on each field. *Ohio EPA, ODNR, ODA*
 - Support implementation of practices that will result in placement of commercial nutrients below the soil surface or application to growing crops. *Ohio EPA, ODNR, ODA*
 - Encourage management techniques to reduce runoff rates within the Lake Erie watershed, including design of effective buffers for overland flow or installation of water management control structures to address the impact of subsurface drainage systems. *Ohio EPA, ODNR, ODA*
 - Encourage retirement of high risk and vulnerable riparian lands in order to restore hydraulic buffers to reduce flow runoff rates and assist with restoration of natural flow regimes. *Ohio EPA, ODNR, ODA*
 - Encourage and facilitate voluntary establishment of no plow zones in areas along Lake Erie tributaries. *Ohio EPA, ODNR, ODA*
 - Offer newly developed Technical Development Program Module for Nutrient Managers beginning 2013. *ODNR*
 - Support programmatic and other regulatory changes for the handling and management of fertilizers. *ODNR, ODA*
 - Encourage development of Watershed Action Plans, particularly in the Maumee River basin, and support regular updates to Plans, as needed. *ODNR, Ohio EPA*
 - Encourage implementation of Endorsed Watershed Action Plans. *ODNR, Ohio EPA*
- 2) Implement effective livestock management strategies to meet water quality goals, including nutrient reduction.

As of August of 2002, all large Concentrated Animal Feeding Facilities (CAFFs) are required to obtain Permits to Install prior to constructing facilities. Those permits require geological explorations, determinations of groundwater availability, setbacks from waters of the state, roads, neighbors, design specifications for manure storage and construction, and certifications of construction including as-built drawings to prevent

discharges to waters of the state. They also must have five year renewable Permits to Operate, which include manure management, insect and rodent control, mortality management, emergency management and operating records requirements. Manure management requires manure to be utilized for agronomic use, replacing commercial fertilizer with application of best management practices, including prohibitions of application on frozen and snow-covered soils. These permits are public noticed in local papers and each facility is inspected on a regular basis.

2014-2015 Actions

- Train soil and water conservation district technicians on animal waste management through the Technician Development Program. *ODNR*
 - Train livestock managers on proper management of livestock wastes through the Livestock Environmental Assurance Program. *ODNR*
 - Concentrate and prioritize Ohio Department of Natural Resources (ODNR) resources on agricultural pollution abatement program. *ODNR*
 - Acquire National Pollutant Discharge Elimination System (NPDES) permitting authority via coordination with the USEPA. *ODA*
 - Promote adoption of anaerobic digester technology to utilize waste on livestock farms. *ODA*
 - Address livestock operations that are polluting or have a high potential to discharge to waters of the state. Investigate and resolve pollution complaints in the Lake Erie basin. *ODNR, ODA*
 - Continue to require annual well testing for nitrates and bacteria for each permitted CAFF. *ODA*
 - Continue to certify and inspect Certified Livestock Managers (CLM) that land apply 25 million gallons or 4,500 tons or more of manure per year. *ODA*
- 3) Ensure pesticide applications meet nuisance abatement goals and protect against environmental harm.

Misuse and abuse of pesticides can have an impact on the environment and human health. Management of these substances from purchase through proper disposal of the packaging is necessary to minimize the potential for unintended impacts. Licensing dealers and applicators is an important ongoing part of this program.

2014-2015 Actions

- Conduct outreach and education on proper use of pesticides and fertilizers, soil testing and interpreting soil analysis. *ODNR, ODA*
 - Continue best management practice (BMP) installation support involving chemical storage and handling. *ODNR, ODA*
 - Inspect farms and fertilizer distributors that store more than 5,000 gallons of fertilizer to ensure compliance with secondary containment requirements of 2007. *ODA*
 - Offer training and testing and inspect Ohio Department of Agriculture (ODA) licensed pesticide dealers and applicators to assure safe use of pesticides and prevent mishandling and misuse. *ODA*
 - Inspect pesticide bulk storage facilities. *ODA*
 - Test well samples for pesticides throughout the state, including karst areas of Lake Erie Watershed. *ODA*
- 4) Implement approved management measures in Ohio's Coastal Nonpoint Pollution Control Program.

The federal Coastal Nonpoint Pollution Control Program, which falls under Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA), is jointly administered by National Oceanic and Atmospheric Administration (NOAA) and the USEPA. The Program establishes a set of management measures for states to use in controlling polluted runoff, rather than cleaning already contaminated water. The management measures are grouped into five chapters of the *Coastal Nonpoint Program Plan* by source category: agricultural sources, urban areas, marinas and recreational boating, hydromodification, and wetlands and riparian areas. The measures are designed to control runoff from six main sources: forestry, agriculture, urban areas, marinas, hydromodification (shoreline and stream channel modification), and wetlands and vegetated shorelines, or riparian areas. In addition to the management measures, each chapter includes discussion of the various programs, enforceable policies, and

mechanisms currently available to implement the management measures.

2014-2015 Actions

- Prioritize implementation of Endorsed Watershed Action Plans in reviewing Coastal Management Assistance Grant applications. *ODNR*
 - Increase the number of pledged and certified Ohio Clean Marinas. *ODNR*
 - Implement the Lake Erie Water Quality Dam Management Program. *ODNR*
- 5) Achieve full federal approval for the conditionally approved elements of the *Ohio Coastal Nonpoint Source Pollution Control Program Plan* by NOAA and USEPA.

All coastal and Great Lakes states and territories that participate in the Coastal Zone Management Program are required to develop coastal nonpoint pollution control programs.³ The Ohio Coastal Nonpoint Program will be considered a complete success when all of the management measures are implemented throughout Ohio's Lake Erie basin.⁴ The following link provides additional detail:

[ftp://ftp.dnr.state.oh.us/Soil & Water Conservation/WS%20Program/Ohio Remaining Coastal NPS Measures.pdf](ftp://ftp.dnr.state.oh.us/Soil%20&%20Water%20Conservation/WS%20Program/Ohio%20Remaining%20Coastal%20NPS%20Measures.pdf). The current plan, conditionally approved by USEPA and NOAA June 4, 2002 is available here:
<http://www.dnr.state.oh.us/Portals/12/programs/coastalnonpoint/cnpcp/finalcnpcp.pdf>.

2014-2015 Actions

- Coordinate with appropriate agencies and stakeholders to develop implementation strategies and mechanisms for 14 *Ohio Coastal Nonpoint Pollution Control Program Plan* management measures necessary to achieve full federal program approval. *ODNR*

³ The Coastal Nonpoint Pollution Control Program, NOAA, <http://coastalmanagement.noaa.gov/nonpoint/welcome.html>

⁴ Ohio Coastal Nonpoint Pollution Control Program, Executive Summary – p. 4

- Update the *Ohio Coastal Nonpoint Pollution Control Program Plan* by 2015. *ODNR*
- 6) Ensure permitted municipal separate storm sewer system (MS4s) are fully implementing their Storm Water Management Programs (SWMPs).

Polluted stormwater runoff is commonly transported through MS4s, from which it is often discharged untreated into local waterbodies. To prevent harmful pollutants from being washed or dumped into an MS4, operators must obtain a NPDES permit and develop a storm water management program.⁵ The Phase II small MS4 stormwater management program is comprised of six minimum control measures that are intended to reduce the contamination of stormwater runoff and prohibit illicit discharges. Implementation of BMPs is the primary method for controlling stormwater discharges.

The Chagrin and Grand River watersheds have a mixture of urban development, agricultural land uses such as cultivated crops, and forest, yet both face significant development pressure. As a result, Ohio EPA has proposed development of an alternative general permit for storm water associated with construction activity specific to each of these watersheds. The alternative permit will implements many of the basic recommendations regarding the programs, activities and Best Management Practices developed through the Total Maximum Daily Load process. Ohio EPA believes implementation of these recommendations is necessary to protect the unique water quality and biological integrity of these watersheds.

2014-2015 Actions

- Complete audits of the permitted MS4s in the Lake Erie basin by 2014. *Ohio EPA*
 - Develop and propose unique construction general permits for the Grand and Chagrin watersheds. *Ohio EPA*
- 7) Reestablish more natural flow regimes to Lake Erie tributaries.

Habitat and flow alterations result from the manipulation of drainage. Common practices in agricultural areas include channelization,

⁵ Stormwater Discharges from MS4s, USEPA, <http://cfpub.epa.gov/npdes/stormwater/munic.cfm>

installation of subsurface tile systems, and removal of riparian vegetation. Riparian areas and wetlands naturally control flooding, maintain adequate low flow stream volumes, limit erosion, and protect water quality. Impacts to stream flow in urban and urbanizing areas can include increases of impervious surfaces resulting in higher and faster flow runoff rates, and the removal of riparian vegetation and channelization of streams. Channelized streams are constructed to increase capacity, flow rate, and efficiency of upland drainage systems. Habitat lost from channelized streams and removal of vegetation directly impacts biological communities by limiting the complexity of living spaces available to aquatic organisms. Very efficient drainage systems keep water from ponding and slowly filtering through the soil, thus recharging groundwater and augmenting the stream at a lower volume and more sustained rate.

2014-2015 Actions

- Provide training to local communities regarding design of post-construction storm water practices. *ODNR*
- Update the Rainwater and Land Development Manual with current standards, including incorporation of volume control crediting in order maintain pre-development flow regime. *ODNR*
- Encourage use of edge of field hydraulic buffers to assist with restoration of natural flow regimes. *Ohio EPA, ODNR*

8) Protect, restore and enhance headwater streams.

Headwater streams with a watershed area generally less than one square mile are termed primary headwater streams. Over 80 percent of stream miles in Ohio are composed of these primary headwater streams. Primary headwater streams are like the capillary system of a blood supply network – just as the health of the whole organism depends upon a functioning capillary system, the health of larger streams and rivers depend upon an intact primary headwater stream network.⁶

⁶ The Importance and Benefits of Primary Headwater Streams, Fact Sheet, Ohio EPA

2014-2015 Actions

- Implement recommendations, as appropriate, from draft BMP guide for rural drainage construction and maintenance. *Ohio EPA, ODNR*
- Encourage and facilitate restoration of riparian buffers on all major rivers draining to Lake Erie. *Ohio EPA, ODNR*
- Increase riparian acreage under conservation easement or protected by acquisition. *Ohio EPA, ODNR*
- Encourage and facilitate establishment of stream corridor setback ordinances along Lake Erie tributaries. *Ohio EPA*
- Use natural channel design restoration methods in state funded stream restoration projects, when flow conditions are appropriate. *Ohio EPA, ODNR*
- Encourage removal of low-head dams. *Ohio EPA, ODNR*
- Reduce sediment loading by stabilizing eroding stream banks. *Ohio EPA, ODNR*
- Evaluate stream corridor setback recommendations based upon the stream beltway concept. *Ohio EPA*
- Evaluate the ability of actively restored headwater streams to provide desired environmental benefits, e.g. channel stability, biological diversity, habitat, nutrient cycling, flood attenuation, and sediment removal. *Ohio EPA, ODNR*
- Provide technical support and guidance for local headwater stream protection and restoration projects. *Ohio EPA, ODNR*

Priority Area: Invasive Species

Goal: Minimize the potential for invasive species to negatively affect native fauna and flora habitat.

Introduction

Within Ohio, both aquatic and terrestrial invasive species continue to be of great concern. Vectors including ship ballasts, recreational boats, landscaping practices, and intentional introduction have contributed to the proliferation of invasive fish, mussel, plant, bird and insect species that have impacted the Great Lakes. Sea lamprey, round goby, zebra and quagga mussels, purple loosestrife, reed canary grass, narrow-leaved cattail, phragmites and emerald ash borer are just a few of the more publicly visible species that call the Lake Erie watershed home. These invasive species can kill or out compete native species, creating monocultures or reducing the diversity necessary to support the intricate food web that has evolved around Lake Erie's productive ecosystem. The compounding impact of changing weather patterns will likely have additional impacts on the viability and distribution of invasive species into the future.

Asian carp have emerged as a species of concern due to their reproductive success, long life spans, and feeding habits. Their potential for introduction within the Lake Erie basin has been met with aggressive state and federal efforts to decrease the possibility of establishment.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to its goal for addressing invasive species issues. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Complete and implement Ohio's *State Management Plan for Aquatic Invasive Species* and *Rapid Response Plan*.

Ohio has updated the *State Management Plan for Aquatic Invasive Species* to coordinate management and communication efforts related to aquatic nuisance species (ANS) and to qualify for federal funding related to such under the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990. The plan outlines 26 different management strategies organized within ten objectives under the following five goals: (1) leadership, (2) prevention, (3) early detection and rapid response, (4) control and management, and (5) research and

education.

Since the last LEPR was developed, several new invasive species have entered the Lake Erie watershed or other Great Lakes, creating additional uncertainty and complexity around the potential impacts of ANS on the ecosystem. Ohio will release a *Rapid Response Plan* to address new or emerging ANS issues by mid-year 2014.

2014-2015 Actions

- Implement *Ohio's Comprehensive Management Plan for Aquatic Invasive Species*. ODNR
- Develop a *Rapid Response Plan* for the eradication of newly detected invasive species by mid-year 2014. ODNR
- Support programs that address phragmites control. ODNR
- Support programs that address control of emerging invasive species, including, but not limited to, hydrilla, Eurasian watermilfoil and European frog-bit. ODNR

2) Implement Asian carp prevention and control programs.

State agencies will continue to work with partners to implement federal strategies for Asian carp prevention and control.

2014-2015 Actions

- Complete the *Ohio Asian Carp Tactical Plan* by December 2013. ODNR
- Develop legal authorities to address movement of live fish for aquaculture, bait, the live food market and for stocking private/pay lakes. ODNR
- Develop closure strategies for the four direct water connections identified by the U.S. Army Corps of Engineers in the Great Lakes Mississippi River Interbasin Study to prevent the movement of aquatic invasive species (AIS) between the Lake Erie and Ohio River basins. ODNR
- Continue to monitor for Asian carp in Lake Erie using traditional fish sampling gear and environmental DNA. ODNR

3) Coordinate invasive species management programs and activities within the Lake Erie basin.

2014-2015 Actions

- Identify available funding sources and evaluate their utility in addressing Lake Erie invasive species priorities. *ODNR*
- Optimize available funding sources to leverage funds for invasive species management. *ODNR*
- Work with federal, state and local partners to ensure that invasive species efforts in the Lake Erie basin remain current; are based on the most recent science; and are coordinated with other relevant invasive species programs. *ODNR*
- Evaluate compliance with Section 401 Water Quality Certification conditions for ballast water including salt water flushing as tracked by the St. Lawrence Seaway Development Corporation. *Ohio EPA*
- Track progress of litigation and any associated legislative changes to federal permit actions related to the control of ballast water treatment. *Ohio EPA*
- Evaluate monitoring results from lampricide applications in 2013 and review conditions to the Pesticide General Permit to reduce non-target mortality. *Ohio EPA*
- Review the Pesticide General Permit as part of the 2014 renewal process for any necessary changes for effective control of phragmites in coastal wetland areas. *Ohio EPA*

4) Develop an early detection strategy for invasive species.

2014-2015 Actions

- Assemble a committee to evaluate current early-detection programs, identify gaps, and make recommendations for improved monitoring of priority invasive species. *ODNR*
- Ensure that collection records for priority AIS are entered into the U. S. Geological Survey (USGS) Nonindigenous Aquatic Species Database <http://nas.er.usgs.gov>. *ODNR*
- Support development of a regional screening tool to determine whether a species has the potential for being invasive. *ODNR*

- 5) Eliminate the introduction and spread of invasive species in the Lake Erie basin.

The elimination of an invasive species from the Lake Erie ecosystem is nearly, if not completely, impossible. The single most powerful tool for combating the impacts of invasive species is to stop their introduction. Airborne species are likely the most difficult to manage. Terrestrial and aquatic species are almost exclusively moved through human actions. Ballast water management is a key technique to prevent foreign invasives that inadvertently are introduced through shipping. However, all potential vectors for introduction should be managed.

2014-2015 Actions

- Evaluate the effectiveness of existing management and regulatory tools for preventing the introduction of invasive species in the Lake Erie basin and develop regulations that address gaps in authorities. *ODNR*
- Identify BMPs, potential certification options, and other approaches for key industry and user groups to help keep invasive species out of the basin. *ODNR*

- 6) Reduce the negative impacts of invasive species establishment.

Once an invasive species is present, its impacts are likely to be realized in multiple ways. Local, state, federal, and private entities will be faced with recreational, biological, and even industrial impacts from invasive species. Quarantine, suppression, and testing programs can assist in the management of invasives.

2014-2015 Actions

- Develop educational briefings and programming on the threats, economic and ecological impacts, solutions, and identification of invasive species throughout the Lake Erie basin. *ODNR*
- Support the work of the Ohio Invasive Plant Council. *ODNR*
- Implement control strategies based on the best available scientific information. *ODNR*
- Implement programs for education, identification and quarantine of emerald ash borer and sirex wasp throughout the Lake Erie watershed. *ODA*

- Support ongoing efforts to mitigate the impacts of emerald ash borer in riparian forests through tree plantings and other woodland management practices. *ODNR*
 - Implement gypsy moth suppression, detection and eradication efforts throughout the watershed. *ODA*
 - Continue to designate invasive plant species as noxious weeds under OAC 901:5-37 and control propagation or sale of purple loosestrife. *ODA*
 - Continue to offer practitioner and producer viral hemorrhagic septicemia virus (VHS) laboratory testing, as well as fish necropsy training, to stem spread of VHS. *ODA*
- 7) Support projects that address impacts of invasive species on Lake Erie beach ecology.

2014-2015 Actions

- Support protection of ephemeral palustrine sandplain/siltplain habitats. *ODNR*
- Encourage projects that study sensitive plant and animal species on Lake Erie beaches, e.g. Tiger beetles. *ODNR*

Priority Area: Coastal Health

Goal: Eliminate the release of untreated and inadequately treated sewage to Lake Erie and its tributaries with special attention to human uses of the Lake and its beaches.

Goal: Develop and implement plans to restore beaches and shoreline habitat.

Goal: Provide safe, healthy, accessible coastal areas for all Ohioans.

Introduction

As a source of drinking water, recreational and commercial fisheries, and other recreational opportunities for millions of Ohio residents, the nearshore waters of Lake Erie should pose a *minimum* human health risk through direct contact. A goal of swimmable, fishable, drinkable (with conventional treatment) waters is considered appropriate for all nearshore areas. Beach closures, coastal erosion issues, aging wastewater infrastructure, failing home septic systems, and combined sewer and sanitary sewer overflows impact the quality of nearshore areas. In addition to the direct impact on health and property, secondary impacts may include reduced property values and lower tourism rates. Elimination of human health threats from bacteria and assuring safe and appropriate use of coastal property is a state priority.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to addressing its goals for coastal health. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Reduce bacterial contamination (and other pollutants) coming from inadequate on non-functioning private home sewage treatment systems.

A 2012 survey of local health district data compiled by the Ohio Department of Health (ODH) shows that 31 percent of all existing sewage treatment systems (on and off-lot) are reported as failing. The survey also reports that nearly 28 percent (178,500) of Ohio's sewage systems discharge offlot, and of those discharging systems, 39 percent (69,300) are reported as failing. These systems often discharge raw or

partially treated sewage, making them a significant source of nutrient loadings and bacteria contamination in Lake Erie tributaries. County health departments are responsible for addressing identified public health nuisance conditions and ordering the replacement of failing systems. These departments are often understaffed and rely on complaints filed by citizens to identify areas of failing systems, and have variable local rules and capacity for enforcement of sewage systems.

ODH assists Ohio EPA with the Clean Watersheds Needs Survey (CWNS) by surveying local health districts to identify problem areas. The CWNS, which is completed every four years by Ohio EPA, is crucial in estimating the monetary needs of local municipalities and counties for funding of water and wastewater infrastructure improvements.

Adoption of proposed state sewage rules in early 2014 will bring consistency and modernization to the design, permitting, and installation of sewage treatment system in Ohio. New state law and the proposed rules require implementation of monitoring of maintenance of sewage systems by local health districts. This program will help ensure that new systems are properly maintained and allow local health districts to phase in operation permits and maintenance monitoring for existing systems, which will over time, lead to the correction of many existing failing systems thereby minimizing discharges to surface and ground water. The Bureau of Environmental Health is also developing and implementing a statewide web-based database application for local health district environmental health permitting to provide electronic recordkeeping capabilities and promote consistency in permit records.

2014-2015 Actions

- Adopt Sewage Treatment System rules (Ohio Administrative Code Chapter 3701-29 as state standards for the siting, design, permitting, installation, operation, maintenance and abandonment of sewage treatment systems). *ODH*
- Continue to work with Ohio EPA and local health districts to implement the requirements of the General Household NPDES permit for discharging replacement systems in the Lake Erie basin including required annual sampling and service contracts. *ODH*
- Review, in coordination with the Sewage Treatment Systems Technical Advisory Committee, and approve replacement of discharging home sewage treatment systems that comply

with the effluent discharge standards for the General Household NPDES permit. *ODH*

- Identify unsewered areas in the nearshore that have failing sewage treatment systems and prioritize those areas for funding and installation of public sewers. *ODH, Ohio EPA*
 - Raise the profile of the sewer agencies in the Lake Erie basin. *ODH, Ohio EPA*
 - Support initiatives to identify funding alternatives for areas without adequate sewage infrastructure, and identify current funding for repair or replacement of home sewage treatment systems through Water Pollution Control Loan Fund (WPCLF) funding. *ODH, Ohio EPA*
- 2) Eliminate combined sewer and sanitary sewer overflows according to each community's Long Term Control Plan (LTCP).

Combined sewer overflows (CSOs) are the primary source of untreated sewage discharges to Lake Erie. These discharges impact water quality and introduce bacteria that can present a public health threat. In the Lake Erie basin, 62 communities had or have CSOs. The table on page 18 shows the communities in the Lake Erie basin that discharge the highest volume of CSO annually. The estimated baseline and current CSO volumes are based on modeling CSO volume estimates for a typical year developed as part of a LTCP or based on facility self-monitoring data submitted to Ohio EPA in Discharge Monitoring Reports (DMR). The respective data source for each baseline and current CSO volume value in the table is further described in the comments section of the table. Ohio EPA estimates that Ohio's six largest Publicly Owned Treatment Works (POTWs) discharged a baseline volume of approximately 15,300 million gallons per year of CSO prior to implementing significant LTCP projects. The table on page 18 also includes the resulting reduction in CSO being discharged from each of these cities annually; the reduction is a comparison of the CSO volume that was discharged annually from a community under baseline conditions and the CSO volume that is discharged annually under current conditions. Ohio EPA estimates that implementation of LTCP projects in these six communities, which discharge an estimated 85 percent of the CSO volume in the Lake Erie basin, has already reduced annual CSO discharges by approximately 6,300 million gallons to date. Further reductions in CSOs are projected through 2035.

Highest CSO Volumes Discharged in Lake Erie Basin

CSO Community	Baseline Annual CSO (MG)	Current Annual CSO (MG)	Reduction in Annual CSO (MG)	Comments
Akron	2500	1500	1000	Baseline CSO volume and current CSO volume estimates from the Akron Long Term Control Plan
Fremont	1270	1235	35	Baseline CSO volume was calculated using the average annual reported overflow volume from 2005-2008 DMR data; current CSO volume is based on the average annual reported overflow volume from 2009-2012 DMR data
Lima	663	663	0	Reliable baseline CSO volume data unavailable; baseline and current CSO volumes are based on the average annual reported overflow volume from 2009-2012 DMR data
NEORS	9000	4400	4600	Baseline CSO volume and current CSO volume estimates from NEORS Long Term Control Plan.
Sandusky	500	241	259	Baseline CSO volume based on values from the Sandusky Long Term Control Plan; current CSO volume is the average annual reported overflow volume from 2009-2012 DMR data.
Toledo	1323	900	423	Baseline CSO volume was calculated using the average annual reported overflow volume from 2005-2009 DMR data-the current Toledo Long Term Control Plan to address overflows was finalized in 2010; current CSO volume is based on the average annual reported overflow volume from 2010-2012 DMR data.
Total	15256	8939	6317	

Notes:

CSO – combined sewer overflow

MG – million gallons

DMR data – Discharge Monitoring Report data is self-monitoring data submitted to Ohio EPA under the National Pollutant Discharge Elimination System (NPDES) permit program

NEORS – Northeast Ohio Regional Sewer District

2014-2015 Actions

- Ensure compliance with approved LTCPs through inspections, permit reviews, coordination with USEPA, and tracking of milestones defined in the LTCPs. *Ohio EPA*
 - Complete sewer separation and implement or have a plan in place to control overflows in accordance with an approved LTCP. *Ohio EPA*
 - Continue to work with communities to finalize and submit any unapproved LTCPs. *Ohio EPA*
 - Finalize LTCPs currently under negotiation with state and federal agencies. *Ohio EPA*
- 3) Complete the Lake Erie Shore Erosion Management Plan (LESEMP) outreach package.

Erosion along Ohio's Lake Erie shore has been a noted issue for decades. The variability of the Lake Erie shore combined with urban development presents a unique coastal management challenge. Over the years, different types of erosion control measures have shown mixed results. To assist property owners in their efforts to control lake-based erosion, the ODNR has developed the LESEMP. By viewing erosion on a regional scale, the LESEMP products incorporate multiple characteristics of Ohio's coast, including shore and nearshore geology, as well as habitat for a myriad of species. It provides communities and individual property owners with solutions that include: natural types of erosion control, structures that incorporate aquatic habitat enhancements, offshore sand resources, sand dredged from harbors, beach nourishment, sand bypassing, BMPs for docks/piers, mitigation for loss of sand and aquatic habitat due to structures, and soft measures with small structural components where necessary. The LESEMP aims to promote successful means of controlling erosion by developing erosion control recommendations that are based on regional site conditions.⁷

2014-2015 Actions

- Continue to implement LESEMP guidance. *ODNR*
 - Complete recommendations for all LESEMP regions by 2014. *ODNR*
- 4) Publish an updated Coastal Design Manual.

The implementation of practices recommended by the *Coastal Design Manual* will require training and assistance from the ODNR Office of Coastal Management. This document provides guidance for designing shore structures and is written for engineers, surveyors and other design professionals implementing coastal practices.

2014-2015 Actions

- Complete the second edition of the Coastal Design Manual with a focus on monitoring, consideration of extreme weather events, adaptation engineering design, and bypassing of littoral materials. *ODNR*
 - Update the Coastal Design Manual to reflect changes to regulatory programs. *ODNR*
 - Host training sessions for contractors, design professionals, public officials and property owners on methods to restore beaches and coastal habitat. *ODNR*
- 5) Provide accurate and timely information to the public on potential risks at Lake Erie bathing beaches.

The Bathing Beach Monitoring Program is a cooperative effort of the Ohio departments of health and natural resources, local health departments with public beaches within their jurisdictions and private and public organizations along the Lake Erie border and throughout Ohio. ODH provides support for monitoring and notification of selected public and semi-private beaches located along the Ohio Lake Erie coast, and posts sample results and advisory notices on the BeachGuard website (<http://publicapps.odh.ohio.gov/BeachGuardPublic/Default.aspx>).

The purpose of beach monitoring is to test the water quality of the state's swimming beach waters and to notify the public whenever bacteria levels present a potential health risk to those engaged in water activities. BeachGuard provides data on advisories as well as monitoring activity.⁸ Swim advisories or closings issued by beach managers are based on standards for concentrations of fecal-indicator bacteria, such as *E. coli*.

The Ohio Nowcast is a system developed by USGS that uses a predictive model to provide near real-time information to "nowcast" water-quality conditions. Once data for the predictive model has been analyzed and calibrated for each individual site, results and advisory notifications are posted on the Ohio BeachGuard website. The Ohio

Nowcast system is being used at four Lake Erie beaches in 2013 with data collection and analyses underway for additional sites. Continued implementation of technologies that allow same day forecasting of bacteria levels will help beach managers protect the public health with a greater degree of accuracy and in a more timely fashion.⁹ To learn more about the Ohio Nowcast system, please visit <http://www.ohionowcast.info/index.asp>.

2014-2015 Actions

- Support the development and implementation of technologies and field studies to identify and trace sources of local bacterial contamination. *ODH, Ohio EPA, ODNR*
 - Support the continued implementation of the BeachGuard monitoring and notification program. *ODH*
 - Support the continued implementation of same-day beach advisory systems. *ODH, Ohio EPA*
 - With USGS, continue efforts to expand the use of Nowcast predictive water quality monitoring efforts for Lake Erie beaches. *ODH*
 - Evaluate the feasibility of incorporating enterococci in Nowcast predictive water quality modeling efforts for Lake Erie beaches. *ODH*
 - Evaluate USEPA 2012 Recreational Water Quality Criteria for implications at Lake Erie beaches. *Ohio EPA, ODH*
 - Identify and secure funding for future beach monitoring efforts. *ODH*
 - Continue to promote public education on beach advisory information via the Ohio EPA's ohioalgaeeinfo.com website, HAB Advisory Map, and ODH's BeachGuard website for bacteria monitoring. *ODH, Ohio EPA*
- 6) Implement Coastweeks and other cleanup programming on Lake Erie beaches.

Coastweeks is held in all 50 states as part of a national celebration of the nation's waters and shorelines. The debris collected during Ohio's cleanups and throughout the world as part of the Ocean Conservancy's International Coastal Cleanup program, is recorded on

data cards and submitted to the Ocean Conservancy for data compilation.

2014-2015 Actions

- Organize Coastweeks as part of the Ocean Conservancy's International Coastal Cleanup program, and other litter removal activities. *OLEC*
 - Continue support of the NOAA Marine Debris Program for the Great Lakes region. *ODNR*
- 7) Promote efforts to provide accurate and timely information about algal toxins associated with harmful algal blooms (HABs).

HABs are cyanobacteria (also referred to as "blue-green" algae) that can produce liver, nerve and skin toxins (algal toxins). The state of Ohio is working on many fronts to reduce the incidences of HABs and to minimize the risk of exposure to HABs and any associated toxins.

2014-2015 Actions

- Continue implementation of the *Ohio Harmful Algal Bloom Response Strategy* as Ohio's approach to HAB monitoring and response protocols when a HAB is detected. *Ohio EPA*
- Utilize the strategy to assist municipal and county entities in management of public recreation areas in water bodies not managed by the state of Ohio. *Ohio EPA*
- Continue the use of the ohioalgaefinfo.com website as the "go-to" site for algal toxin monitoring results and general information about HABs. *Ohio EPA*
- Support the efforts of ODH, Ohio EPA and ODNR to provide outreach to the public about HABs. *OLEC*
- Support research on algal toxins in Ohio to better inform and assist public managers on the causes and effects of algal toxins. *Ohio EPA*

⁷

http://www.dnr.state.oh.us/Coastal_Main_Menu/HelpforLandowners/ProgramsforResourceImprovement/LakeErieShoreErosionManagementPlan/tabid/20501/Default.aspx

⁸ <http://publicapps.odh.ohio.gov/BeachGuardPublic/Default.aspx>

⁹ Models for Predicting Recreational Water Quality at Lake Erie Beaches, USGS, p. 1

Priority Area: Great Lakes Areas of Concern

Goal: Delisting the Maumee, Black, Cuyahoga and Ashtabula Rivers from the list of Great Lakes Areas of Concern.

Introduction

In 1987, the United States and Canada committed to restoring the most degraded portions of the Great Lakes basin. Working through the International Joint Commission (IJC), the Great Lakes states and provinces designated 43 Areas of Concern (AOCs), including 26 in United States waters and five in binational waterways. AOCs were identified based on 14 types of impairment, reflecting human uses—such as eating fish, drinking water and swimming—and ecological impacts, such as loss of diversity in aquatic life and destruction of fish and wildlife habitat. The most common sources of impairment are contaminated sediments, sewage treatment plant discharges and combined sewer overflows, nonpoint source runoff, runoff from hazardous waste sites, and habitat degradation and destruction.

Within Ohio, there are four Areas of Concern. They include all or portions of the Maumee, Black, Cuyahoga and Ashtabula rivers. These major Lake Erie tributaries suffer from various impairments resulting from past industrial use along their banks and other human activities. Locally based committees worked with Ohio EPA to develop Remedial Action Plans (RAPs) that define the sources and causes of impairment and propose remedial actions. The RAP committees are comprised of state, federal and local agency representatives as well as local stakeholders. Once the committee has identified needed actions, those actions are taken by the committee, a member agency/partner, or a governmental agency with the proper regulatory authority. Implementation is often based on the grants that the RAP committee or its partners are able to procure. Under the Great Lakes Restoration Initiative, restoration of the AOCs has been a priority, and a significant amount of funding has been directed to projects across Ohio's four AOCs since 2010. The state of Ohio will need to work with the local RAPs and federal partners in order to complete many of the actions presented under this priority area.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to addressing its goal of delisting the Areas of Concern. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Work towards remediation (remove, seal, neutralize) of contaminated sediments within all AOC sites by 2025.

Despite many improvements, Lake Erie and its tributaries still suffer from the past legacy of environmental neglect. Sediments deposited in the nearshore areas, streams, and rivers serve as a repository of wastes from our industrial past. Elevated levels of nutrients, metals, and industrial contaminants such as polychlorinated biphenyls (PCBs) and polyaromatic hydrocarbons (PAHs) are still present. The contaminants contained in these sediments do not stay buried forever. Floods, waves, the burrowing of bottom dwelling animals, and the stirring from a propeller all serve to re-suspend these sediments in the water column. Here they may be absorbed by plants and animals then passed up the food chain.

Many AOCs were initially identified due to contaminated sediments and multiple Beneficial Use Impairments (BUIs) are affected by the sediments. The Great Lakes Legacy Act (GLLA) has been instrumental in providing the large scale funding required to characterize and remediate contaminated sediments across Ohio AOCs.

2014-2015 Actions

- Work with federal partners to complete dredging in the Ashtabula River's main channel to remove PCB hotspots, and complete the GLLA sediment project at Jack's Marine North Slip. *Ohio EPA*
- Monitor post-dredging concentrations of contaminants in sediment in the Ashtabula River AOC to determine if BUI restoration targets for dredging and benthos have been met. *Ohio EPA*
- Support assessment of Black River sediments at upper turning basin by federal partners. *Ohio EPA*
- Provide assistance/support for GLLA projects in the Maumee AOC (Maumee River, Swan Creek, Duck Creek and Otter Creek). *Ohio EPA*
- Continue to be involved in and support Natural Resource Damages (NRD) cases for the Ottawa River, Duck Creek and Otter Creek. *Ohio EPA*
- Evaluate the potential to remediate PAH-contaminated sediments in the Old Channel of the Cuyahoga River. *Ohio EPA*

2) Restore all beneficial uses in Ohio's Four AOCs.

Below is a consolidated table listing the impairment status of all the beneficial uses in each Ohio AOC. A beneficial use was listed as impaired if it was impaired anywhere within the boundaries of the AOC. Several of the RAPs have prepared more detailed assessments that further assign use impairment by tributary or stream segment within their AOC. Actions are designated by their corresponding State Fiscal Year (SFY), spanning between July 1 and June 30, and include SFYs 2013-2015 to reflect current and evolving AOC program progress.

Beneficial Use Impairment		Ashtabula	Black	Cuyahoga	Maumee
BUI 1:	Restrictions on Fish Consumption	Impaired	Impaired	Impaired	Impaired
	Restrictions on Wildlife Consumption	Not Impaired	Not Impaired	Not Impaired	Impaired
BUI 2:	Tainting of Fish and Wildlife Flavor	Not Impaired	Not Impaired	Not Impaired	Not Impaired
BUI 3:	Degradation of Fish Populations	Impaired	Impaired	Impaired	Impaired
	Degradation of Wildlife Populations	Not Impaired	Not Impaired	Not Impaired	Not Impaired
BUI 4:	Fish Tumors or Other Deformities	Impaired	In Recovery	Impaired	Impaired
BUI 5:	Bird or Animal Deformities or Reproductive Problems	Not Impaired	Not Impaired	Not Impaired	Not Impaired
BUI 6:	Degradation of Benthos	Impaired	Impaired	Impaired	Impaired
BUI 7:	Restrictions on Dredging Activities	Impaired	Impaired	Impaired	Impaired
BUI 8:	Eutrophication or Undesirable Algae	Not Impaired	Impaired	Impaired	Impaired
BUI 9:	Restrictions on Drinking Water Consumption or Taste & Odor Problems	Not Impaired	Not Impaired	Not Impaired	Not Impaired

BUI 10:	Beach Closings (Recreational Contact)	Not Impaired	Impaired	Impaired	Impaired
BUI 11:	Degradation of Aesthetics	Not Impaired	Impaired	Impaired	Impaired
BUI 12:	Added Costs to Agriculture or Industry	Not Impaired	Not Impaired	Not Impaired	Impaired
BUI 13:	Degradation of Phytoplankton and Zooplankton Populations	NA	NA	NA	NA
BUI 14:	Loss of Fish Habitat	Impaired	Impaired	Impaired	Impaired
	Loss of Wildlife Habitat	Not Impaired	Impaired	Not Impaired	Impaired

Near-term Actions

Statewide

- Update the Ohio Delisting Guidance and Restoration Target document. *Ohio EPA*

Ashtabula River AOC

- Remove fish consumption BUI. *Ohio EPA*
- Remove any other BUIs that meet delisting targets. *Ohio EPA*
- Publicize BUI removal(s) with RAP and AOC stakeholders. *Ohio EPA*

Black River AOC

- Prepare documents to remove any BUIs in upper watersheds that meet targets. *Ohio EPA*
- Support Lorain County's efforts to determine HSTS hotspots in the AOC. *Ohio EPA*
- Support and assist with developing a video celebrating the successes of habitat work in the lower Black River by the city of Lorain. *Ohio EPA*
- Re-assess status of all remaining BUIs with the updated restoration targets. *Ohio EPA*

Cuyahoga River AOC

- Re-assess remaining BUIs with the updated restoration targets and identify management actions needed. *Ohio EPA*
- Organize watershed groups within the Cuyahoga AOC to ensure action plans are proposed, developed, implemented and monitored in an efficient way that will benefit all groups and lead towards delisting BUIs within the Cuyahoga AOC. *Ohio EPA*
- Assist with the feasibility study for the Euclid Creek Spillway East 185th Street project. *Ohio EPA*
- Assist with U. S. Fish and Wildlife Service (USFWS) Contaminants of Emerging Concern study by taking water and sediment samples, collecting wild fish and deploying caged fish within the Cuyahoga AOC. *Ohio EPA*
- Assist local RAP with presenting a two-day State of the River Symposium to gather all Cuyahoga River related groups under one roof promoting integration of local water resource information. *Ohio EPA*

Maumee AOC

- Support development of web-based data management and delisting system. *Ohio EPA*
- Re-assess status of all BUIs with updated restoration targets and identify management actions needed. *Ohio EPA*
- Prepare documents to remove any BUIs that meet targets. *Ohio EPA*
- Continue to support projects in Maumee AOC that are providing collateral benefits toward the removal of BUIs (i.e. 319 NPS projects, Lucas County Surface Water Improvement Fund (SWIF) projects, non-AOC GLRI projects). *Ohio EPA*

SFY 2014-2015 Actions

Ashtabula River AOC

- Evaluate any BUIs not removed in 2013 for remedial actions. *Ohio EPA*

Black River AOC

Lake Erie Protection & Restoration Plan 2013

- Evaluate any BUIs not removed in 2013 for remedial actions. *Ohio EPA*
- Work with the RAP to secure funding to preserve Henderson Bridge Wetland. *Ohio EPA*
- Identify management actions needed to remove remaining BUIs. *Ohio EPA*

Cuyahoga River AOC

- Support removal of the State Route 82 Dam (a.k.a. Brecksville/Station Road Dam). *Ohio EPA*
- Support removal of the Gorge Dam (a.k.a. Ohio Edison Dam). *Ohio EPA*
- Support development of a comprehensive plan for habitat restoration. *Ohio EPA*
- Support Northeast Ohio Regional Sewer District and the city of Akron's CSO Long Term Control Plan. *Ohio EPA*
- Assist in developing a Hydrologic Engineering Center River Analysis System (HEC-RAS) for Yellow Creek to evaluate the impacts of projects to protect the banks of Yellow Creek from further erosion. *Ohio EPA*
- Finalize the Little Cuyahoga River Balanced Growth Plan. *Ohio EPA, OLEC*

Maumee AOC

- Complete development and begin maintenance/use of data management and delisting system. *Ohio EPA*
- Continue/complete process for removal of any BUIs that meet updated restoration targets. *Ohio EPA*
- Celebrate BUI removal(s) with RAP and AOC stakeholders. *Ohio EPA*
- Complete development of a list of known critical management actions for delisting the Maumee AOC. *Ohio EPA*
- Develop implementation plans and begin to secure partners and funding for critical management actions. *Ohio EPA*

- Continue to support projects in Maumee AOC that are providing collateral benefits toward the removal of BUIs (i.e. 319 NPS projects, Lucas County SWIF projects, non-AOC GLRI projects). *Ohio EPA*
- 3) Align the plans and activities for Remedial Action Plans, Watershed Action Plans, and Watershed Balanced Growth Plans related to all four Areas of Concern as applicable.

In addition to Remedial Action Plans (RAP), the state of Ohio administers other planning programs including the Watershed Action Plans (WAP) and Watershed Balanced Growth Plans (WBGP). These programs have different purposes and can serve to complement one another to achieve program goals. Coordination at the state and local level is necessary to build on project successes.

2014-2015 Actions

- Provide assistance to watershed groups to facilitate integration of planning activities and projects with WAP, WBGP and RAP objectives. *Ohio EPA, OLEC, ODNR*
- Provide training for watershed coordinators to promote integration of local water resource information with all local planning. *Ohio EPA, OLEC, ODNR*

Priority Area: Toxic Pollutants

Goal: Reduce the loadings of persistent bioaccumulative toxics to Lake Erie.

Goal: Clean up brownfield sites to eliminate loading to Lake Erie and its tributaries.

Introduction

Despite a significant reduction in many persistent toxic substances during the past thirty years, aquatic and land-based toxics issues continue to impact the quality of the environment, human health, and economic growth. PCBs, PAHs, mercury, dioxins and pesticides are among the many chemicals released into the environment that can cause harm to both wildlife and humans. Impacts to sport fish are also problematic, creating advisories for consumption throughout the basin. Persistent toxic pollutants come from contaminated bottom sediments, industrial processes, nonpoint sources, loadings from atmospheric deposition and cycling of the contaminants. Continuous cycling of these persistent pollutants within the Great Lakes system contributes to their long-term impacts. To mitigate these problems, the release of toxic chemicals must be reduced and eliminated where possible, and additional research on sources, transport, persistence and impacts is needed. Legacy sources such as brownfields, contaminated bottom sediments and continuing airborne deposition must be addressed. A comprehensive approach to addressing the social, economic and environmental realities of toxics is critical to a long-term resolution.

Strategic Objectives

The following strategic objectives have been identified to move Ohio closer to addressing its goals for reducing toxic pollutants. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Assess the concentration of toxic contamination in fish tissue and reevaluate consumption advisories based on updated data.

Ohio has issued annual fish consumption advisories for 20 years to help Ohio anglers decide how to safely eat their catch. A statewide advisory of one meal per week for most fish remains in place due to mercury, including walleye from Lake Erie. Mercury poses the greatest risk for women of childbearing age, pregnant and nursing mothers and children under age 15. Fish contaminated with high levels of mercury

have been shown to cause neurological damage and impaired development of young children. In Lake Erie, brown bullhead is the only species that has a one meal per month advisory due to mercury concentrations. All other advisories for fish caught in Lake Erie are due to the presence of PCBs. Care in the preparation and cooking of these fish species can reduce the consumer's exposure to PCBs.

The most recent Ohio Sport Fish Consumption Advisory (02/18/2013) identifies 11 fish species and fish size categories where consumption advice is one meal per month. The recommendation for yellow perch from Lake Erie is two meals per week. Common carp larger than 27 inches is the only species placed in the one meal per two-month category. The advisory information for six species has remained unchanged over the past five years. Lower PCBs levels were found in whitefish under 19 inches, common carp less than 27 inches and channel catfish of all sizes resulting in less restrictive consumption advice for these species and size categories. The contaminant levels recently detected in rock bass and brown bullheads (PCBs and mercury, respectively) resulted in adding one meal per month advisories for these species in 2010.

2014-2015 Actions

- Assess concentrations of PCB and mercury in fish tissue from the Ashtabula River AOC to reassess the need for the precautionary do not eat advisory issued during the 2006-2008 removal of contaminated sediments. *Ohio EPA*
 - Assess concentrations of PCB and other contaminants in fish tissue from the Ottawa River in the Maumee AOC to reassess the do not eat advisory to measure the impact/improvement from the 2009-2011 removal of contaminated sediments. *Ohio EPA*
 - Collect fish tissue samples (in-lake and tributaries) for analysis of mercury, PCBs and other metals and pesticides. *Ohio EPA*
 - Issue sport fish consumption advisories based upon the results of tissue samples and data analyses. *Ohio EPA, ODH*
- 2) Reduce loading of toxins and other pollutants from businesses and households.

Ohio continues to rank among the top states nationally for toxic releases to the environment since the Toxic Release Inventory (TRI) was created in 1987. Ohio EPA has initiated several programs to help

reduce these releases through voluntary efforts. Ohio EPA's Tox-Minus initiative asked the top 100 Toxic Release Inventory Reporters to voluntarily reduce toxic releases by describing their toxic release reduction efforts and providing annual updates on progress from 2007 to 2011. This initiative was completed in 2011.

Ohio EPA's Encouraging Environmental Excellence Program was created to compel Ohio business and other organizations to voluntarily reduce toxics and other pollutants throughout Ohio, and provide them with an incentive to commit to future environmental stewardship efforts. The program established the Bronze, Silver and Gold levels between March 2012 and May 2013. The first Bronze Level participants were recognized in November 2012 and the first Silver Level awards were honored in May 2013.

2014-2015 Actions

- Continue to implement Ohio EPA's Encouraging Environmental Excellence Program. *Ohio EPA*
 - Review *Pollutant Minimization Plans* for NPDES permit holders with approved mercury variances during compliance evaluations and permit renewals. *Ohio EPA*
 - Continue to implement the Ohio mercury ban on consumer products. *Ohio EPA*
 - Continue to promote green chemistry opportunities. *Ohio EPA*
 - Continue to encourage proper disposal of pharmaceutical waste. *Ohio EPA*
 - Continue to encourage participation in The Ohio Good DEED Program: Dedicated to Environmental Excellence in Dentistry. *Ohio EPA*
- 3) Monitor and quantify the deposition of toxic compounds into the Lake Erie watershed.

Section 313 of the Emergency Planning and Community Right-to-Know Act provides for the collection and public release of annual Toxic Release Inventory (TRI) reports regarding the release of toxic chemicals within the community. Tracking of releases through the TRI is the first step towards reduction of releases through voluntary programs. Ohio EPA's Division of Air Pollution Control has the primary responsibility in Ohio for collecting, processing and distributing information submitted under TRI. Annual TRI reports for Ohio and

county summaries are available at this link:
<http://epa.ohio.gov/dapc/tri/reptsdb.aspx>.

U.S. EPA also compiles reports into a database that can be accessed using the Internet. Annually, U.S. EPA compiles TRI data submitted electronically by regulated facilities and makes data available through online tools for accessing and analyzing TRI data. The national TRI database contains information on nearly 650 chemicals and/or chemical categories being reported across the country since 1987. Since the first TRI reports were made available to the public, TRI has expanded to include information on waste generation, additional reportable chemicals and new industrial sectors (based on Standard Industrial Classification codes).

2014-2015 Action

- Assure the TRI data is reported for required facilities. *Ohio EPA*
- 4) Reduce deposition of airborne emissions in Lake Erie.

Significant pathways for toxic pollutants to enter Lake Erie are through atmospheric deposition, contaminated runoff and discharge from wastewater treatment plants. These toxins then work their way through the food chain and accumulate in fish, birds, other wildlife and humans. Strict discharge limits have been instituted to reduce toxic discharges from treatment plants but there is still a need to cut down on air emissions and to remove toxic materials from the environment. Mercury emissions from coal fired power plants as well as from the disposal of products such as thermometers and switches need to be reduced or eliminated. Dioxins and furans result from the uncontrolled burning of household waste and must be addressed through enforcement of open burning laws. The Toxics Release Inventory identifies other toxics being released by industries and provides a guide for opportunities to reduce such releases.

2014-2015 Action

- Assure compliance for existing sources and new sources of air toxics emissions with the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, air toxics requirements, and new Maximum Achievable Control Technology (MACT) standards. *Ohio EPA*
- 5) Eliminate brownfield sites as sources of contamination.

The industrial development of Ohio in the past 150 years resulted in the use of waterfront and tributary-adjacent sites throughout the Lake Erie basin for industrial waste disposal. The legacy of these sites is the contribution of contaminated water and sediment run-off to Lake Erie. These brownfield sites must be remediated to remove or contain contaminants and prevent off-site migration. The state of Ohio encourages, supports and assures monitoring of brownfield site cleanups. Over 35 brownfield sites in the Lake Erie basin have been restored after going through either the Voluntary Action Program or the Remedial Response Program.

2014-2015 Action

- Track the number of brownfield sites restored in the Lake Erie watershed and the potential contaminants associated with them. *Ohio EPA*

Priority Area: Habitat and Species

Goal: Promote diversity of native flora and fauna by protecting and restoring habitat.

Introduction

The presence of suitable habitats throughout the landscape and the associated species diversity affects human health, ecosystem diversity, natural processes and services, and the social and economic vitality of the region and nation. Great Lakes boating, fishing, hunting and wildlife watching generate an estimated \$50 billion in economic activity annually.

The protection of a variety of habitat types is essential to the successful preservation of native flora and fauna. Wetland loss, especially coastal wetlands, impacts water quality and species diversity in Ohio, across the Great Lakes, and on an international scale. Lake Erie's coastal wetlands serve as rest stops for migrating avian species using heavily traveled flyways that span across North and South America. Preservation, research and restoration of critical habitats are the only pathway to preserving native species diversity.

Strategic Objectives

The following strategic objectives have been identified to move Ohio closer to addressing goals to promote diversity of native flora and fauna by protecting and restoring habitat. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Protect, enhance and restore wetlands and their functionality and expand wetland acreage within the watershed, with a priority focus on coastal wetlands.

The protection of wetlands is essential to maintaining the level of ecosystem diversity and stormwater management benefits that they provide. Expansion and restoration of wetland acreage is encouraged to offset impacts realized from impervious surface creation and habitat loss in many communities within the basin. Strategically located and properly designed wetlands will provide a multitude of benefits. In order to improve the overall understanding of wetland resources and provide information necessary to further protect these valuable resources, the Ohio EPA produced the Wetland Program Plan, which was approved in 2011 and covers a five-year period (2011-2015).

Lake Erie coastal wetlands are considered automatic Category 3 wetlands, which are those considered to be in excellent condition and provide the highest level of ecological services. They are protected at a higher level than wetlands in lower ecological condition (i.e. Category 1 or 2) and are regulated as such if they meet specific criteria.

Ohio EPA generally prefers that wetland mitigation take place within the same watershed where wetland impacts occur, if opportunities for successful wetland restoration exist. The Ohio Interagency Review Team for mitigation banking (IRT) encourages in-watershed mitigation by typically limiting the extent of service areas to the 8-Digit Hydrologic Unit Code (HUC) in which the bank resides, for impacts to higher quality resources. Recent changes to isolated wetland law also assigns a 1.5 times penalty for mitigation to higher quality resources that occur outside the approved service area of a given bank. However, if no viable mitigation site exists within a watershed, rather than trying to impose wetland mitigation to sites that are not amenable to restoration, and therefore not likely to provide the desired ecological services, contingencies do exist to allow mitigation beyond the watershed boundary.

2014-2015 Actions

- Continue to implement Ohio EPA's Wetland Program Plan.
Ohio EPA
- Support incorporation of wetlands into the TMDL process as a tool for helping to restore impaired watersheds. *Ohio EPA*
- Continue to support protection of Ohio's coastal wetland habitats. *Ohio EPA*
- Mitigation of Lake Erie wetlands impacted by projects requiring regulatory review must take place within the Lake Erie basin, and should be kept within the same watershed where feasible. *Ohio EPA*
- Support partnerships with agencies, local governments, and non-governmental entities for wetland protection, enhancement and restoration efforts. *Ohio EPA, ODNR, OLEC*
- Acquire and conserve high quality natural areas, wetlands and other significant coastal resources using Ohio's Coastal & Estuarine Land Conservation Program (CELCP), and other applicable programs. *ODNR*

- Implement the Maumee Bay Wetland Restoration Project with the ODNR Division of Parks to achieve habitat restoration through the control and eradication of invasive species utilizing prescribed fire, physical removal and chemical treatment. *ODNR*
- 2) Protect, enhance and restore important Lake Erie basin habitats and species. Specific habitats include beaches, dunes, fish spawning areas, nearshore habitat, oak savannas, alvars, caves, riparian and instream habitat in channels, and streams that are subject to impacts from hydromodification, due to stream maintenance or dams.

Funding from a variety of state license plate programs, including the Lake Erie Marblehead Lighthouse, Cardinal, and Scenic Rivers plates have aided in the planning or direct implementation of habitat protection and restoration. Federal funds through the Great Lakes Restoration Initiative, which come through several federal agencies and programs including the Coastal and Estuarine Land Conservation Program, are also dedicated to habitat restoration in the Lake Erie watershed.

2014-2015 Actions

- Acquire and conserve high quality natural areas, wetlands and other significant coastal resources using Ohio's Coastal & Estuarine Land Conservation Program, and other applicable programs. *ODNR*
- Develop and implement state-led habitat restoration projects in parks, natural areas and other Lake Erie watershed areas using the Great Lakes Restoration Initiative. *Ohio EPA, ODNR, OLEC*
- Coordinate stakeholders (such as local governments, nongovernmental organizations) and develop partnerships for habitat restoration projects that seek funding through the Great Lakes Restoration Initiative. *Ohio EPA, ODNR, OLEC*
- Continue to track rare species and their habitats in Ohio through the Natural Heritage Database and update the Rare Native Ohio Plants Status List. *ODNR*
- Continue to support landowner assistance and woodland management programs that promote the reforestation of riparian forests for habitat and water quality benefits. *ODNR*

- Continue to implement ODNR's Fisheries Tactical Plan 2011-2020. *ODNR*
 - Continue to address conservation of native fish stocks for sustainable Lake Erie fisheries. *ODNR*
 - Conserve dredged material relocation areas for migratory bird and wildlife habitat, where feasible. *ODNR*
 - Investigate feasibility for in-water restoration projects in coastal and nearshore habitats. *ODNR*
 - Support identification of priority management areas and fish restoration habitat in nearshore and coastal habitats. *ODNR*
- 3) Restore habitat and address water quality issues through the removal or modification of non-beneficial dams. Modify beneficial dams by adjusting the operation of dams and/or utilizing BMPs where appropriate to address water quality and habitat issues.

The installation of dams creates a change in the aquatic ecosystem of streams and rivers due to a shift in the flow regime. Dams also create barriers to the upstream and downstream migration of aquatic species and can directly impact the water quality of the water bodies associated with each dam.

ODNR has developed a five year strategy to review all Class 1, 2 and 3 dams in the Ohio Lake Erie watershed to determine potential BMPs that could be utilized at each dam if impairments are identified through the TMDL process. ODNR's review will assist Ohio EPA in determining ways in which adjustments to existing dams might be useful in addressing water quality and habitat issues.

ODNR has also developed a lowhead dam identification program that catalogues and maintains an inventory of lowhead dams throughout the state. This inventory is constantly updated and available to the public. The ODNR Division of Wildlife is actively working to identify lowhead dams owned by the division, and has partnered with researchers at The Ohio State University to develop a process for prioritizing the removal of lowhead dams owned by ODNR. Both of these efforts will provide information and direction to ODNR, Ohio EPA, and other public agencies on how to best address water quality and habitat issues related to the presence of lowhead dams.

2014-2015 Actions

- Implement a strategy for determining effective BMPs related to water quality and habitat enhancements at Class 1, 2 and 3 dams within the Ohio Lake Erie basin. *ODNR*
- Continue updating lowhead dam inventory and make the inventory available to the public. *ODNR*
- Continue the identification of lowhead dams owned by the ODNR Division of Wildlife. *ODNR*
- Continue to develop a process for prioritization of removal or modification to lowhead dams owned by ODNR. *ODNR*

Priority Area: Indicators and Information

Goal: Measure the effectiveness of efforts to improve and protect Lake Erie.

Introduction

Lake Erie is a complex ecosystem that requires careful monitoring of ambient lake conditions both in the offshore and nearshore areas. Ongoing measurement of sediment contamination, pollutant loadings from tributaries, land use changes, nutrient contributions from agricultural and urban uses and the condition of the shoreline are important metrics for determining trends. Economic conditions, shipping, tourism and recreational activities are also important indicators to be tracked as we gauge our impact on the lake and its impact on the people of Ohio. Finally, it is important that program actions be measured as we track our progress and chart our future. All of this information must be collected regularly, consistently, and organized and presented in a manner useable for decision makers and citizens.

A separate document of the Ohio Lake Erie Commission, the *State of the Lake Report – Lake Erie Quality Index*, summarizes much of this information and is meant to provide a report to the citizens of Ohio regarding the current state of Lake Erie, as well as provide managers with information they need to adjust state actions to improve both the ecology and the economy of the basin. The Ohio Lake Erie Commission agencies will work toward the strategic objectives contained in this *Lake Erie Protection & Restoration Plan* and then measure the results in 2015. Pushing forward on the strategic objectives and actions below will provide necessary data and information for improved information on Lake Erie conditions and provide critical input for a robust analysis for the LEQI.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to addressing its goal for developing indicators and information. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Support nearshore and open lake monitoring in Lake Erie.

Ohio EPA is working with the USEPA and others to develop a comprehensive nearshore monitoring program designed to address data gaps, establish baseline conditions and track changes over time. Agencies will also encourage open lake monitoring.

2014-2015 Actions

- Encourage open lake monitoring to better understand trends and seasonal variability. *Ohio EPA*
 - Support continuation of Ohio EPA's recently developed nearshore monitoring program. *Ohio EPA*
 - Determine feasibility of development of indices for diatoms, phytoplankton and other biological classes for use in determining trends in Lake Erie. *Ohio EPA*
 - Support efforts to monitor emerging pollutants of concern including microplastics. *Ohio EPA*
 - Support volunteer data collection by the Lake Erie charter boat captains in the western basin. *Ohio EPA*
- 2) Support coordination among agency, university and local partners on monitoring efforts in Lake Erie.

In 2012, state and federal agencies and universities that conduct nearshore and open lake monitoring in Lake Erie came together to collaborate and build upon each programs' strengths. This effort helps to ensure we have the best coverage across Lake Erie. In addition, the collaboration enables us to synchronize sampling dates, minimize costs and work towards developing uniform sampling procedures. The state of Ohio will continue to support this and other collaborative efforts on behalf of both routine and event-based monitoring to provide a comprehensive understanding of Lake Erie.

2014-2015 Actions

- Support collaborative efforts with partners and stakeholders conducting monitoring in Lake Erie. *Ohio EPA*
 - Work with partners to identify gaps in data collection efforts across the basin. *Ohio EPA*
 - Encourage consistency of data collection methods across the basin. *Ohio EPA*
 - Provide information and outreach on data collection efforts and data results. *Ohio EPA*
- 3) Track short and long-term trends of harmful algal blooms (HABs).

The presence of microcystis and other harmful algal blooms is a concern due in large part to their potential impacts on human health, drinking water supplies, and Lake Erie ecology. The Ohio Lake Erie Phosphorus Task Force developed dissolved reactive phosphorus targets in 2013 with the goal of significantly reducing harmful algal blooms. These targets focus on Ohio's loading contributions of phosphorus into the western basin. The task force recommended targets provide a framework for measuring progress toward loading targets and HAB reduction. Other tools being used include the cyanobacteria index and other satellite imagery analyses to track changes over time.

2014-2015 Actions

- Track and communicate progress of phosphorus targets developed by the Ohio Lake Erie Phosphorus Task Force. *Ohio EPA*
 - Support state and federal partners in the analysis and communication of annual HAB forecasting. *Ohio EPA*
 - Support state and federal partners in tributary stream gaging and water quality monitoring to support forecasting efforts and data collection necessary for phosphorus loading analyses. *Ohio EPA*
 - Assist in information outreach on HAB predictions. *Ohio EPA*
 - Assist in the tracking of information about HAB trends and related impacts. *Ohio EPA*
- 4) Support efforts to make Lake Erie monitoring data and information available and accessible to users.

The Ohio Credible Data Program is a program that classifies surface water monitoring performed by watershed groups, state agencies, consultants, schools, local volunteers and other organizations. Ohio EPA uses the data submitted under the program in ways prescribed by state law. An online database is available for data submission through the Ohio EPA eBusiness Center.

2014-2015 Actions

- Support the Ohio Water Resources Council's efforts on data storage in the credible data database or the Water Quality Exchange Network. *Ohio EPA*

- Work with Lake Erie Protection Fund (LEPF) grantees to support data storage and accessibility initiatives, as appropriate. *OLEC*
- 5) Report on statistics, trends, conditions and project/monitoring efforts within and about Lake Erie.

The LEQI is compiled and released approximately every 10 years. It provides a status report on the condition of the Lake using data-driven metrics to characterize overall health. The next update is scheduled to occur in 2015. This LEPR 2013 is one-step towards improving indicators measured as a part of the LEQI.

2014-2015 Actions

- Issue a *State of the Lake Report* every 10 years using the LEQI. *OLEC*
- Review the need for additional or revised metrics for the LEQI in preparation for 2015 *State of the Lake Report*. *OLEC*
- Support development of assessment methodologies for existing Lake Erie Assessment Units (LEAUs) for Ohio EPA's 2014 *Integrated Report*. *Ohio EPA*
- Explore the feasibility of further developing the Ohio Balanced Growth Program suite of indicators to track program progress. *OLEC*

Priority Area: Sustainable Development

- Goal:** Practice and promote sustainable practices that protect the natural resources of the Lake Erie basin and make them available for current and future generations to enjoy.
 - Goal:** Practice and promote sustainable practices in urban areas to minimize impacts to the Lake Erie ecosystem and improve the quality of life within watershed communities.
 - Goal:** Sustain a commercial and recreational fishing industry in Ohio waters of Lake Erie.
-

Introduction

Sustainability means managing the use of limited resources in ways that allow those resources to continue to be available in the future. Sustainable development is an approach to achieving balance between economic, societal, and ecological needs for land and water resources. Sustainability works from the bottom-up, rooted in actions and decisions by individuals, private enterprises, and local communities. State and federal governments play important roles in promoting sustainable behavior. They provide guidance and outreach to enhance the capacity of local communities, and make supporting policy and funding decisions.

Within Ohio, efficient use of land and water resources is at the heart of sustainable development. Negative impacts to local water resources can result from the way land is used in both rural and urban areas. For example, impacts can result from unnecessary impervious surfaces and unmanaged storm water runoff pollution from roads, parking lots, rooftops, and lawns. Through efforts such as the Ohio Balanced Growth Program, communities can access tools and resources to determine the least costly and most water resource protective locations and designs for conservation, development, redevelopment, and the protection of agricultural industry.

Fishing, boating, tourism, recreational facilities development, and commercial shipping are other areas where the responsible use of resources must be considered. Balanced use of the Lake and protection of its resources will allow people to continue to enjoy working and playing along the Lake Erie shore now and into the future.

Strategic Objectives

The following Strategic Objectives have been identified to move Ohio closer to addressing its goals for sustainable development. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each Strategic Objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Support local watershed balanced growth planning and implementation and align state programs with endorsed local balanced growth plans.

A Watershed Balanced Growth Plan is a locally driven and voluntary process. The state provides incentives for voluntary participation and implementation. The program is designed to encourage local communities to update their local plans and existing regulations. The intent is to promote efficient land use and water, sewer and transportation networks that also protect water quality.

The state has developed the *Ohio Balanced Growth Strategy* that describes how state programs, policies, and incentives will be aligned with local efforts to focus development and/or redevelopment efforts in Priority Development Areas (PDAs) and promote successful conservation efforts in Priority Conservation Areas (PCAs). The Strategy also describes agency efforts to provide incentives and other actions in support of the program.

If local governments can voluntarily agree on areas where development and/or redevelopment is to be encouraged and areas which are to be conserved, the state of Ohio will support those decisions by aligning state programs to support those decisions.¹⁰

2014-2015 Actions

- Assist in the development and endorsement of Watershed Balanced Growth Plans. *OLEC*
- Continue to include implementation of comprehensive community plans, watershed balanced growth plans, and implementation of endorsed watershed action plans as rotating priorities for Coastal Management Assistance Grants. *ODNR*

¹⁰ Ohio Balanced Growth Strategy, December 12, 2011, p. 1.

- Continue to develop effective state support and incentives for local governments to encourage updating land use practices so that they not only meet the needs of the community, but also protect water quality. *OLEC, Ohio EPA, ODNR, ODA, ODH, ODOT, ODSA*
 - With the Ohio Water Resources Council (OWRC), identify and develop new tools to provide financial and legal support for balanced growth planning by local governments. *OLEC*
 - Emphasize urban redevelopment opportunities as a part of balanced growth planning with particular emphasis on the waterfront. *OLEC, ODNR*
 - Support transportation projects proposed in accordance with land use plans developed to protect the Lake Erie watershed. *ODOT*
 - Utilize current state programs designed to rehabilitate and clean up vacant sites, historic structures, and urban areas including: JobsOhio Cleanup Fund (formerly Clean Ohio), the Ohio Water Development Authority's Brownfield Loan Program, and Ohio Development Services Agency's Ohio Historic Preservation Tax Credit, the Ohio New Markets Tax Credit, and the Ohio Vacant Facilities Fund. *ODSA*
 - Fund transportation research to determine the cost effectiveness of land use planning based on the Ohio Balanced Growth Program and expand transportation recommendations based on that research. *ODOT*
- 2) Assist local government with adoption of practices in the *Linking Land Use and Water Resources: Best Local Land Use Practices* (2012).

Guidance for land use practices can be used by Ohio local governments to voluntarily update existing land use codes. This will allow them to be more protective of local water resources and Lake Erie, while at the same time providing clear direction and support for continued development and redevelopment in existing urban areas. The continued implementation of an annual education program is necessary to educate local professionals on the use of these practices, to achieve maximum benefit.

2014-2015 Actions

- Provide training and technical assistance to agencies, watershed groups, and communities on the Balanced Growth Best Local Land Use Practices. *OLEC*
 - Coordinate with the Ohio Water Resources Council to train agency staff about the program and practices. *OLEC, Ohio EPA, ODNR, ODA, ODH, ODOT, ODSA*
- 3) Ensure that wind power development in Lake Erie minimizes impacts to natural resources while providing a sustainable source of alternative energy.

Lake Erie's east-west orientation and long fetch make for ideal conditions for the generation of wind power. Alternative energy sources are important for Ohio's economy and future. With multiple users of lake resources, it is also important for the state to manage wind power development so that the lake and the public trust are protected.

2014-2015 Action

- Continue involvement with wind power working groups, and provide recommendations for site location and wind power best practices to protect Lake Erie resources. *ODNR*
- 4) Preserve and protect valuable farmland for future agricultural uses.

2014-2015 Actions

- Continue the Agricultural Easement Purchase Program, which requires successful applicants to have and use a conservation plan on their farm. The program has preserved 97 farms in the Lake Erie watershed and expects to add another 50 farms by 2016. *ODA*
 - Continue to support the use of Priority Agriculture Areas in the Ohio Balanced Growth Program and to provide additional agriculture-specific resources for the best local land use practices. *ODA*
- 5) Protect and restore ecologically and culturally significant coastal properties.

There are many significant coastal and estuarine environments remaining along the Lake Erie shore in Ohio. These function as critical

habitats for a variety of plant and animal species, and have important recreational, historical, and aesthetic value. The protection of ecologically and culturally significant properties can allow local communities to maintain a sense of place and quality of life for their citizens and visitors.

2014-2015 Action

- Use Ohio's *CELCP* Plan and other funding sources to assist public entities with the acquisition of ecologically and culturally significant coastal properties as projects become feasible. *ODNR*
- 6) Reduce significant adverse impacts of repeated flooding on resources, people, and property.

Flooding impacts both the natural and the built environment. There are two goals of sound floodplain management: risk reduction and promotion of beneficial natural function. A comprehensive approach to stormwater management and the adverse impacts of repeat flooding on developed properties is important to protecting capital investments made within the watershed.

The state promotes a range of tactics and information for meeting and exceeding minimum National Flood Insurance Program standards. Within the regulatory floodplain areas, there is an ongoing federal flood hazard remapping of the Lake Erie shore and associated, although limited, introduction of wave velocity zones. Local floodplain administrators in the coastal areas of the Lake Erie watershed will benefit from additional education about these efforts.

2014-2015 Actions

- Continue to maintain an inventory of ≈ 750 local floodplain resource management authorities to assist with education and outreach efforts.¹¹ *ODNR*
- Continue ongoing long-term efforts to assist with the strengthening of *ODNR* and other Ohio agency compliance with ORC 1521.13(D): Floodplain management activities. *ODNR*

¹¹ <http://www.dnr.state.oh.us/Portals/7/floodpln/communitylist.pdf>

- Ensure that floodplain development funded by state agencies is sustainable and avoids unnecessary flood risk. *ODNR*
- Provide educational outreach to all local floodplain administrators in the Lake Erie watershed to increase awareness for flood hazard management in watershed context beyond regulatory floodplain areas. *ODNR*

7) Identify and address gaps in green infrastructure in urban communities within the Lake Erie basin.

The use of more natural stormwater management systems in urban communities can help reduce flooding, allow for groundwater recharge, and provide important recreational grounds for urban residents. Planning for the proper types and locations of this 'green infrastructure' will allow for the most effective use of available space.

2014-2015 Actions

- Update the Rainwater and Land Development Manual with current standards, including incorporation of volume control crediting in order to maintain pre-development flow regime. *ODNR*
- Increase awareness of state programs, which offer financial and technical assistance for the design and construction of green infrastructure, including the Ohio Development Services Agency's (ODSAs) Alternative Stormwater Infrastructure Loan Program, the Ohio EPA's SWIF and Section 319 programs, and the Water Pollution Control Loan Fund. *ODSA, Ohio EPA, OLEC*

8) Enhance and increase public access opportunities to Lake Erie, public beaches, parks, nature preserves, and wildlife areas.

Recreation along Lake Erie and throughout the watershed relies on public access. However, only 17 percent of the Lake Erie shoreline is open to public access. Providing adequate publicly accessible areas and information about where to find them is an essential piece of allowing all Ohioans the opportunity to enjoy the recreational opportunities that Lake Erie provides.

2014-2015 Actions

- Continue to develop, improve and administer the Ohio Coastal Atlas suite of resources, including the Lake Erie

Public Access Guide and Coastal Tributary Access Guide.
ODNR

- Pursue funding for restroom renovations at Geneva State Park as part of a larger project plan in partnership with Ashtabula County. *ODNR*

9) Create new water-based recreational opportunities along or near Lake Erie on public lands.

Water-based recreation includes a variety of activities, from boating and fishing to swimming and diving. Providing adequate facilities and opportunities across the watershed is necessary to make these activities more accessible to all Ohioans.

2014-2015 Actions

- Develop a Lake Erie Island water trail system to promote tourism and Lake Erie islands history. *ODNR*
- Finalize plan for a Euclid Beach Fishing Pier along the city of Cleveland lakefront. *ODNR*

10) Create new land-based recreational opportunities along or near Lake Erie on public lands.

Land-based recreation includes a variety of activities, from hiking and camping to biking and bird watching. Providing adequate facilities and opportunities across the watershed is necessary to make these activities more accessible to all Ohioans.

2014-2015 Actions

- Provide technical assistance to funded communities to complete the *Safe Routes to School Program*. *ODOT*
- Complete a walking loop around the North Coast Harbor in the city of Cleveland. *ODOT*
- Cooperate with local agencies in the development of a Cuyahoga River East Bank boardwalk in downtown Cleveland. *ODOT*
- Cooperate with local agencies in the completion of the final six miles of the Ohio & Erie Towpath Trail to its northern terminus on the Cuyahoga River in downtown Cleveland. *ODOT*

- Cooperate with the city of Cleveland to implement their Lakefront Plan including the reconstruction of the West Shoreway with pedestrian friendly connections such as the new West 73rd extension and reconstruction of pedestrian tunnels to Edgewater Park. *ODOT*

11) Develop and maintain ODNR facilities with sustainable practices and products where practical.

The use of more sustainable practices is especially important when development occurs within publicly funded recreational and natural areas. On state owned properties, operating in a sustainable way increases the long-term efficiency of the facilities and lowers long-term costs. This also helps protect the natural areas in which they are often located.

2014-2015 Action

- Explore potential for inclusion of sustainable practices during implementation of all state park maintenance and improvement activities. *ODNR*

12) Provide an equitable distribution of fisheries benefits among commercial fishermen and recreational anglers.

Lake Erie waters and tributaries have traditionally supported diverse commercial and sport fisheries. The underlying motivations to fish are different for these two groups and it is challenging to balance their interests. Equitable distribution of benefits and impacts among the various fisheries can be achieved by establishing biologically feasible, sustainable, science-based fishery opportunities that do not significantly compromise participation by any group.

2014-2015 Actions

- Continue to work together with the Great Lakes Fishery Commission through the Lake Erie Committee to establish safe harvest levels of fishes from Lake Erie on an annual basis. *ODNR*
- Work with the Lake Erie Percid Management Advisory Group to establish economically and ecologically viable harvest strategies for Lake Erie fishes. *ODNR*

13) Provide a diversity of recreational fishing opportunities for Ohio anglers on Lake Erie waters and tributaries.

Fishing opportunities within the Lake Erie watershed are as diverse as Ohio's seasons. Ice fishing on the Lake in winter, steelhead fishing on the Chagrin and walleye runs in the Maumee in the spring, smallmouth fishing in the summer, and yellow perch fishing in the fall provide a variety of species, locations and times for enjoying fishing experiences within the Lake Erie basin. Ohio waters of Lake Erie support more than 3.5 million angler hours of recreational fishing effort annually, and supports more than 700 licensed charter boat operators. These recreational fishing activities generate about \$800 million for Ohio's economy each year. Providing adequate facilities and opportunities across Lake Erie waters and tributaries is necessary to make these activities more accessible to all Ohioans and visitors.

2014-2015 Actions

- Continue to periodically assess subordinate fisheries (e.g. shoreline, steelhead, ice fisheries) and additional human dimensions research to better understand what makes a quality fishing experience for recreational anglers and incorporate these findings into management strategy evaluations. *ODNR*
- Continue to conduct regular creel surveys to obtain relevant statistics and learn about angler interests. *ODNR*
- Enhance seasonal sport fishing information to Lake Erie anglers. *ODNR*
- Identify fishing access areas and prioritize for improvements. *ODNR*

14) Sustain a commercial fishing industry in Ohio waters of Lake Erie, with an emphasis on under-utilized fish species.

The Ohio commercial fishery on Lake Erie consists of 18 active trap net and 12 active seine licenses, producing an annual average catch of about 3.9 million pounds with an average dockside value of about \$10-20 million. On average, yellow perch account for about 80 percent of the annual economic value, but only about 38 percent of the annual catch. The remaining 62 percent of the commercial catch consists of a variety of species that are under-utilized by the Ohio recreational fishery, most prominently white bass, white perch, freshwater drum, carp, and channel catfish. Efficient use of a variety of under-utilized fish species in a well-monitored fishery is ODNR's goal for commercial fisheries on Lake Erie.

2014-2015 Action

- Continue to monitor commercial fishing activity to ensure a stable fishery. *ODNR*

15) Provide adequate harbors of refuge and transient boat dockage and launch facilities along the Lake Erie shore.

An estimated three million Ohioans, or nearly one in four, go boating each year across the state. Facilities that allow boaters to travel Ohio's north coast by boat increase local tourism and provide a unique experience that few states can offer. Maintenance and development of adequate facilities are necessary to handle these boaters.

2014-2015 Actions

- Conduct dredging operation in 2013 at Geneva State Park marina to provide boating channels for safe moorage and Lake Erie access. *ODNR*
- Secure funding for a sand by-pass feasibility study and engineering report at Geneva State Park. *ODNR*
- Continue park development to improve twenty-one campsites on the shore of Lake Erie and construct a new shelter house near the marina at Middle Bass Island State Park. *ODNR*
- Pending completion of dredging at West Harbor, relocate dredging operation to East Harbor (spring 2013) to increase the depth and width of the navigation channel for Lake Erie access at East Harbor State Park. *ODNR*
- Pursue locations and initiate partnerships with local political subdivisions and with the Division of Wildlife and Division of Parks for construction/improvement of launch ramps, transient moorage, protective break walls, slips, docks, put-in points, and other amenities in concert with *Boating on Ohio Waterways (BOW) Plan* and the *Comprehensive Boating Facilities Plan*. *ODNR*
- Actively reinvest boaters' dollars into access and facilities to enhance boating opportunities. *ODNR*
- Market financial assistance programs such as the Cooperative Boating Facilities grant program, the Boating Infrastructure Grant Program, Clean Vessel Act grant

program and the Recreational Marine Loan Program in key access areas. *ODNR*

- Continue grant funding, programmatic support, and partnership with the Division of Parks for dredging to ensure recreational boating access to Lake Erie. *ODNR*
- Target regions on Lake Erie for boating access development and renovations using guidance from the *Comprehensive Boating Facilities Plan* and the *BOW Plan*. *ODNR*
- Assist local municipalities in the sustainable design and construction of waterway access projects emphasizing updates to address boaters' needs and minimize environmental impacts. *ODNR*
- Gather and evaluate customer input to determine the level of customer satisfaction with watercraft services. *ODNR*
- Complete five-year rule review and update of the marina rules. *ODNR*

16) Foster safer boating on the waters of Lake Erie.

In 2012, there were more than 442,000 registered boats operating in Ohio. Providing the education and patrols necessary to create a safe boating environment allows more Ohioans to share the water.

2014-2015 Actions

- Increase public education on Lake Erie by creating watercraft education officers in Toledo, Sandusky, Cleveland, and the Ashtabula ODNR Division of Watercraft Field Office locations to provide enhanced safe boating instruction year round. *ODNR*
- Continue local communication efforts with local, state and federal marine law enforcement agencies to better coordinate resources on the water and help eliminate multiple boardings of recreational vessels. *ODNR*
- Continue to support and increase the general boating publics' knowledge of the "sober boater" campaign and the "Wear it Ohio" personal flotation device campaign. *ODNR*
- Continue to support existing safe boating councils in the western, central and eastern basins of Lake Erie, developing

partnerships and providing safe boating opportunities and festivals to grow and promote recreational boating on Lake Erie. *ODNR*

Priority Area: Water Withdrawals

Goal: Prohibit significant adverse impacts from new or increased withdrawals and losses in the Great Lakes basin.

Introduction

On December 13, 2005, the Great Lakes Governors and Premiers signed the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement (agreement). At the same time, the Governors endorsed the companion Great Lakes – St. Lawrence River Basin Water Resources Compact (compact). The compact was ratified by all eight Great Lakes states, consented to by Congress, signed by President George W. Bush, and became effective on December 8, 2008. The compact is a binding agreement between the eight Great Lakes states that includes prohibitions on new diversions of water outside the Great Lakes basin with limited exceptions, and provides a framework for each state to enact measures for protection and management of the Great Lakes basin.

In May 2012, the state legislature passed Amended House Bill 473. It was signed by Governor Kasich in June 2012, and became effective in September 2012. Am. H.B. 473 addresses the compact's requirement that each state develop a program for the management and regulation of new or increased water withdrawals and consumptive uses (Section 4.10). Am. H.B. 473 establishes a permitting program for new or increased water withdrawals and consumptive uses within the basin. The legislation also creates an advisory group to make recommendations for the application of compact Section 4.11.2. The recommendations must be designed to ensure that permits issued under section 1522.12 of the revised code will result in no significant individual or cumulative adverse impacts to the quantity or quality of the waters and water dependent natural resources of the Great Lakes basin considered as a whole or the Lake Erie watershed considered as a whole.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to addressing its goals for water withdrawals within the Lake Erie basin. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Comply with the requirements of Am. H.B. 473 for implementing the Great Lakes Compact.

2014-2015 Actions

- Develop rules for the implementation of the water withdrawal and consumptive use permitting program. *ODNR*
 - Continue progress of the advisory group charged with the development of legislative recommendations designed to ensure that permits issued under the compact will result in no significant individual or cumulative adverse impacts to the quantity or quality of the waters and water dependent natural resources of the Great Lakes basin considered as a whole, or the Lake Erie watershed considered as a whole. *ODNR*
- 2) Continue to work with the other Great Lakes states and provinces in active stewardship of the lakes and implementation of the compact and the agreement.

2014-2015 Action

- Participate in the Compact Council (eight Great Lakes states) and the Regional Body (eight Great Lakes states and two Canadian Great Lakes provinces) to ensure sustainable use across all the Great Lakes. *ODNR*
- 3) Ensure the sustainable use of Ohio's water resources within the Lake Erie basin for all stakeholders.

2014-2015 Action

- Continue development and implementation of a voluntary water conservation program including the identification of BMPs for individual water use types (e.g. municipal, industrial) and work toward the publication of a web page with water conservation and efficiency information. *ODNR*

Priority Area: Climate Change

Goal: Emphasize public policy options and adaptive management strategies to assist in planning and response to changing weather patterns.

Goal: Promote environmental and economic resilience to minimize impacts from extreme weather events and climate variability.

Introduction

Scientific data shows that climate is changing. In response, local communities are developing climate adaptation and resiliency plans and strategies to address human and ecological vulnerability. Adaptation is the process of making long-term changes to existing practices or policies in response to changing conditions. Resilience is the ability to recover quickly from short-term events caused by changing conditions, while minimizing economic losses and preserving ecological integrity.

Fostering development of locally generated strategies will be important in the protection of the natural and built environment along the Lake Erie coast. Although complexity in human and ecological systems complicates responses to climate change, adaptation and resiliency strategies will help alleviate its impact within the Lake Erie basin.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to addressing its climate change goals. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Support local communities interested in addressing adaptation and resilience planning in response to changing weather patterns, particularly the frequency of high intensity storms.

2014-2015 Actions

- Incorporate adaptation planning into guidance for Watershed Balanced Growth Plans. *OLEC*

- Support individual local community approaches to develop adaptive capacity with information and technical resources. *ODNR*
 - Support the delivery of the ODNR's "Planning for Climate Change" workshops in communities in the Lake Erie basin. *ODNR*
 - Identify training opportunities for agency staff to develop knowledge and skills to provide site-specific technical assistance to local communities on adaptation measures. *ODNR*
 - Identify opportunities to assist communities in understanding different climate scenarios. *ODNR*
- 2) Support research and other data collection efforts to assist policy makers about changes to the natural world and the built environment.

2014-2015 Actions

- Support research by the Great Lakes Fishery Commission and other partners on biological community structure and shifts, species distribution changes and habitat use. *ODNR*
- Support research on potential impacts to Ohio habitats, infrastructure and other information needs for local communities. *ODNR*
- Support research on changes and/or updates for stream flow analyses such as stream flow rate curves, peak discharges and design storm calculations and modeling. *ODNR*
- Support research for development of stormwater infrastructure design specifications based on updated precipitation projections. *ODNR*
- Support agency program efforts to address updated data needs (e.g. flow rate curves, precipitation data) for incorporation into flow modeling utilized for water resource programs such as TMDL, CSO and stormwater. *ODNR*
- Support ODNR Old Woman Creek National Estuarine Research Reserve (NERR) research priorities on understanding the impacts of climate change on coastal wetlands. *ODNR*

- Support coordination with other agencies, local governments, and non-governmental entities to develop and disseminate climate data, information and tools. *ODNR*
 - Evaluate results of NOAA's partnership with the city of Toledo to pilot an economic study focused on identifying green infrastructure options for reducing flooding from extreme weather events. The city of Toledo has been selected to develop and implement climate adaptation strategies by the Kresge Foundation, in partnership with the University of Michigan. *ODNR*
- 3) Promote efforts to optimize the resiliency of natural habitats (dunes, wetlands, beaches and reefs) and the protection of infrastructure.

2014-2015 Actions

- Develop resources and capacity to conduct vulnerability assessments for both the natural and built environments on a reach-by-reach basis along the Ohio Lake Erie coast. *ODNR*
- Work with local communities to identify the socio-economic issues related to variability of lake levels and shallow draft harbors on the Ohio Lake Erie coast. *ODNR*
- Promote awareness of the value of natural coastal habitats as providing resiliency against the impacts of extreme weather events. *ODNR*
- Manage existing diked wetlands as habitat resources and as buffers against changing water levels. *ODNR*
- Support the use of green infrastructure, adaptive engineering and habitat enhancement in infrastructure design. *ODNR*
- Assist landowners and local communities to ensure the design and installation of new shore structures are developed with current stream flow, storm intensity and lake level data to protect infrastructure investment. *ODNR*
- Provide support materials for coastal infrastructure along with adaptation planning as communities make infrastructure improvements. *ODNR*

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- Implement new guidance for reviewing marina dredging waivers due to low water levels while protecting fish communities. *ODNR*

Priority Area: Jobs and the Economy

Goal: Promote economic growth in the Lake Erie basin and the retention and creation of jobs linked to sustainable uses that depend upon Lake Erie waters, such as tourism and transportation.

Introduction

A healthy Lake Erie and its environs require a healthy environment and a robust economy. Ohio continues to see steady economic growth amid an ever-improving business landscape offering an optimistic outlook for the future. The Lake Erie region continues to play a critical role in Ohio's economy with shipping ports and transportation networks that provide efficient access to markets. The population centers in the Lake Erie region provide access to a workforce and education systems that are vital for continued growth. These factors, located around Ohio's Great Lake, create a region that brings people to the area for work and recreation. Tourism spending along Lake Erie generates an economic impact of more than \$11.5 billion. The economic and ecological importance of Lake Erie to the region helps drive support for its protection and restoration. Ohio's Lake Erie region calls for integrated stewardship of its environmental and economic assets.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to addressing its jobs and economic growth goals. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Promote the initiatives of JobsOhio and its regional and local partners, as well as other agencies in the Lake Erie basin.

2014-2015 Actions

- Support agency grant programs that seek to achieve environmental benefits and job creation and retention, such as Ohio EPA's Recycling Market Development Grant Program. *Ohio EPA, ODSA, ODNR, ODA, ODH, ODOT, OLEC*
- Seek opportunities to support JobsOhio in the implementation of the JobsOhio 2013 *Strategic Plan*. *ODSA*

- 2) Develop partnerships with TeamNEO and the Regional Growth Partnership to mutually support each organization's mission and initiatives.

2014-2015 Actions

- Convene meetings with TeamNEO, the Regional Growth Partnership and the Greater Cleveland Partnership to identify assets along the Lake Erie coast to assist with positioning the Ohio Lake Erie region for business investment. *ODSA, OLEC*
- Work with Team NEO, the Regional Growth Partnership and the Greater Cleveland Partnership to develop a revised methodology for the economy indicator in the next edition of the *Lake Erie Quality Index* to be completed in 2015. *ODSA, OLEC*

- 3) Track annual tourism economic trends in Ohio's Lake Erie counties.

Tourism spending along Lake Erie generates an economic impact of more than \$11.5 billion. Increasing the economic impact of tourism requires a two-prong approach: acquiring enough marketing power to promote the region, and developing quality products to attract guests. Increasing access and improving facilities in the Lake Erie basin provides new products and opportunities for the tourism industry.

2014-2015 Actions

- Promote regional and statewide cooperation to market the Lake Erie experience to travelers. *ODSA*
- Promote development of quality Lake Erie exhibits and experiences that can both entertain and educate visitors within the region. *ODSA*
- Support America's Byways to enhance the Lake Erie Coastal Ohio Trail experience and economic impact potential. *ODSA, ODOT*
- Work with TourismOhio and the Ohio Travel Association to develop updated metrics for the Economy Indicator in the next edition of the *Lake Erie Quality Index* to be completed in 2015. *OLEC, ODSA*

- Collaborate with the tourism industry to mitigate potential impacts on tourism resulting from environmental issues. *ODSA*

- 4) Work with regional Great Lakes tourism partners to enhance the Great Lakes image.

There is a need for developing a coordinated approach for marketing the Great Lakes experience. State partners aim to build outreach that brands the Great Lakes as an exceptional, healthy and competitive place to live, work, invest and play to regional and national markets. The ability to build a sense of ownership and pride in regional ecosystems and attract new residents and businesses will be critical to the success of the region. Robust economic health and ecological integrity will develop national support for the restoration and protection of the Great Lakes because of its ecological and economic importance to the country.

2014-2015 Actions

- Support Ohio and Great Lakes states tourism and educational alliances to develop sustainable tourism initiatives. *ODSA*
- Identify and develop tools for bridging the gap between scientists, planners, managers, local, county and municipal staff and the tourism industry, to help them understand the relationship between their role and tourism's economic potential. *ODSA, OLEC*

- 5) Utilize Lake Erie coastal tourism for sustainable economic development and protection of historic, natural, recreational, scenic, cultural, and archaeological resources.

Sustainable tourism involves more than just marketing and image building; one of its priorities is helping to protect resources that are important for environmental and economic integrity. Creating a regional vision for the future lakeshore by working with communities and their existing and proposed development plans is an essential strategy. The long-term benefit of creating this vision is the ability to move toward a clean, healthy Lake Erie that provides access, charismatic communities, and memorable experiences for residents, employees and visitors.

Short-term benefits include identification of existing community improvement projects related to public access priorities and development of new community-driven improvement projects that

further enhance the coastal experience for residents and visitors. Increased regional cooperation and communication, along with development of a master list of projects (comprised of both existing and new projects that meet local community planning priorities) will be critical to enhancing education and visitation.

2014-2015 Actions

- Implement Lake Erie tourism programs to promote tourism, increase revenues, and conserve areas of historical, scenic and ecological importance. *ODSA*
 - Assist local communities with coastal infrastructure planning, development and acquisition to ensure growth of tourism opportunities. *ODNR, ODSA, OLEC*
 - Coordinate a coastal plan for a united vision of coastal tourism development and a concept of linked signage, interpretation and public outreach to promote Ohio's north coast as a complete tourism destination. *ODSA*
- 6) Enhance and increase public access opportunities to Lake Erie, public beaches, parks, nature preserves, and wildlife areas.

Recreation along Lake Erie and throughout the watershed relies on public access to these facilities. Currently, only 17 percent of Ohio's Lake Erie shore is publically accessible. Providing adequate public access areas is an essential piece of allowing all Ohioans and visitors the opportunity to enjoy Lake Erie.

2014-2015 Action

- Support public access projects within Lake Erie communities as defined by regional or community-based master planning. *ODNR, OLEC*
- 7) Create new water-based recreational opportunities along or near Lake Erie.

Water-based recreation includes a variety of activities, from boating and fishing, to swimming and diving. Providing adequate facilities and opportunities throughout the watershed is necessary to make these activities more accessible to all Ohioans.

2014-2015 Actions

- Support local initiatives that are implementing and/or designating water-based recreational opportunities, including paddling experiences along tributaries and Lake Erie. *ODNR*
 - Support the National Park Service to coordinate and connect local paddling initiatives to create a Lake Erie experience – Enhance recreational boating opportunities by assisting with the establishment of access sites, signage and a brochure for the designation of paddling experiences to link the mainland to the Lake Erie islands. *ODNR*
- 8) Create new land-based recreational opportunities along or near Lake Erie.

Land-based recreation includes a variety of activities, from hiking and camping to biking and bird watching. Providing adequate facilities and opportunities across the watershed is necessary to make these activities more accessible to all Ohioans and visitors.

2014-2015 Action

- Support regional and local initiatives to enhance land-based recreational opportunities along Lake Erie. *ODNR*
- 9) Integrate water resource protection with economic development into land-use planning and infrastructure investments along the Lake Erie shore in alignment with Balanced Growth Program principles.

Working waterfronts are defined in the Keep America's Waterfronts Working Act of 2009 (H.R. 2548) as places with water-dependent commercial activities. These include, among others, commercial fishing, recreational fishing, tourism, aquaculture, boat building, and water transportation. The state of Ohio would like to improve access to waterfront planning information along the Lake Erie shore. This will help local communities and state agencies support these vital and unique water-based economic activities and working waterfronts while protecting the water resource that generates the activity.

The state of Ohio can also help positively influence the future of Ohio's waterfront communities through thoughtful expenditure of transportation, preservation and redevelopment funds.

2014-2015 Actions

- Support working waterfronts by encouraging waterfront communities to plan for water-based economic activity and jobs. *ODNR, ODSA*
- Continue to seek new ways to integrate and take advantage of Ohio's maritime resources (including transportation) by supporting Ohio's industry in the global economy. *ODSA, Ohio EPA, ODNR, ODOT, OLEC*

Priority Area: Dredged Sediment Management

Goal: Work with Port Authorities, U.S. Army Corps of Engineers, Ohio EPA and other stakeholders to develop a sustainable management program for sediments dredged for navigational purposes.

Introduction

There are fifteen federal harbors along the Ohio's Lake Erie coast. A federal channel or harbor has been authorized by Congress. These harbors serve commercial navigation, recreational navigation or both. This number does not include the numerous smaller areas along the shoreline dredged by public and private entities for the purpose of safe recreational navigation. Please reference the table on page 70 for information about individual harbors.

Variability in soil types in the Ohio watersheds draining into Lake Erie, from the tight clay soils in northwest Ohio to the higher sand content soils in northeast Ohio, results in wide ranging potential for beneficial reuses of dredged material. Ohio continues to support strategies that address both beneficial reuse and land-based sediment reduction efforts.

Strategic Objectives

The following strategic objectives have been identified to help move Ohio closer to addressing its goals for dredged sediment management. These objectives are meant to provide an ambitious target that will be evaluated as a part of the 2015 *Lake Erie Quality Index*. Each strategic objective is followed by one or more actions to be taken in State Fiscal Years 2014-2015.

- 1) Support best management practices that reduce sedimentation and minimize the need for harbor and channel dredging.

2014-2015 Actions

- Support efforts to develop sustainable sediment management strategies, such as the Port of Cleveland's bedload interception. *Ohio EPA*
- Support implementation of BMPs that reduce runoff and control and trap soils in upland areas, such as riparian setbacks, wetland projects and agricultural field tile control. *Ohio EPA, ODNR, ODA*

- 2) Support research/studies on the impact of dredging disposal activities and those activities involved with mechanical dredging.

2014-2015 Actions

- Review data to be provided by the U.S. Army Corps of Engineers on nutrient releases in the open lake disposal area in the western basin. *Ohio EPA*
- Evaluate the applicability of development of water quality criteria protective of beneficial uses. *Ohio EPA*

- 3) Support beneficial reuse of dredged material.

2014-2015 Actions

- Support a Toledo Harbor pilot project for the management of dredged material as identified in the *Toledo Harbor Sediment Management and Use Plan (2012)*. *OLEC, Ohio EPA*
- Support development of sediment standards for upland placement of dredged material. *Ohio EPA*
- Support development of sediment standards for in-water reuse. *Ohio EPA*
- Work with the U.S. Army Corps of Engineers and other stakeholders on the evaluation of the costs and benefits of environmental impacts and economic impacts of different dredged material management and disposal techniques. *Ohio EPA*

- 4) Seek funding for beneficial reuse of dredged material.

2014-2015 Actions

- Work with partner agencies and other stakeholders in identifying funding opportunities for the development of beneficial reuse opportunities. *OLEC, Ohio EPA*
- Support the Toledo-Lucas County Port Authority in the development of the recently conceived concept for a Center of Innovation for Dredged Material in northwest Ohio to support research and innovative pilot projects in dredged material reuse. *OLEC, Ohio EPA*

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Harbor Name	Recommended Cubic Yard (CY) Removal	Recommended Frequency	Estimated Backlog Amount (CY)	Date and Volume of Last Dredging Event
Ashtabula	100,000	Every 2-3 years	Not specified	2011 Dredged, 111,000 CY 2013 Scheduled
Cleveland Harbor	225,000	Annually	600,000	2012 Dredged, Amount not specified, 2013 Scheduled
Conneaut Harbor	120,000	Every 2-3 years	Not specified	2010 Dredged, 122,000 CY 2013 Scheduled
Cooley Canal Harbor	10,000	Every 5-10 years	Not specified	2004 Dredged, 7,500 CY
Fairport Harbor	150,000	Every 1-2 years	Not specified	2011 Dredged, 118,000 CY
Huron Harbor	190,000	Every 1-2 years	Not specified	2009 Dredged, 303,000 CY
Lorain Harbor	200,000	Every 3 years	Not specified	2012 Dredged, 126,000 CY
Port Clinton Harbor	Not specified	Not specified	10,000	Not specified
Put-in-Bay Harbor	Not specified	Infrequent	Not specified	2000 Dredged, 5,000 CY
Rocky River Harbor	Not specified	Every 3-4 years	22,000	2004 Dredged, 18,400 CY
Sandusky Harbor	140,000	Annually	Not specified	2011 Dredged, 140,000 CY 2013 Scheduled
Toledo Harbor	850,000	Annually	Not specified	2012 Dredged, 850,000 CY 2013 Scheduled
Toussaint River	Not specified	Every 3-4 years	25,000	2004 Dredged, 24,000 CY
Vermilion Harbor	Not specified	Every 2-3 Years	59,000	2004 Dredged, 32,000 CY
West Harbor	Not specified	Infrequent	86,000	2004 Dredged, 48,000 CY

Source: U.S. Army Corps of Engineers, July 2013