

# Great Lakes Restoration Priorities Workshop

Proceedings

Rochester, New York  
April 27<sup>th</sup>, 2004



## **Preface**

This proceedings document presents the outcome of a workshop held in Rochester, New York on April 27, 2004. The workshop was a cooperative effort of the Great Lakes Commission, the New York Sea Grant College Program, and the Council of Great Lakes Governors. Additional steering committee members included representatives from the New York State Department of Environmental Conservation's Great Lakes Program and Department of State's Division of Coastal Resources, the Center for Environmental Information; the Finger Lakes - Lake Ontario Watershed Protection Alliance; the Great Lakes Basin Advisory Council; the Great Lakes Fishery Commission; the Great Lakes Research Consortium; and the U.S. Fish and Wildlife Service. The meeting brought together a range of participants from various Great Lakes constituencies to provide feedback on the Great Lakes Governors' priorities for restoration of the Great Lakes ecosystem and on the coordinative processes needed to achieve these priorities.

This meeting is part of a series of similar events being conducted throughout the Great Lakes region. The Council of Great Lakes Governors has assembled a number of priorities for restoring and protecting the Great Lakes. The workshop series, supported by the National Sea Grant College Program, provides an opportunity for Great Lakes constituents to review these priorities and inform their further development and implementation. Workshop outcomes will be shared with the region's Governors, Premiers, other public officials, workshop participants and the larger Great Lakes community. A primary objective is to inform and advance the restoration efforts of the region's leadership.

## Acknowledgements

The Great Lakes Commission expresses its sincere thanks to New York Sea Grant and the Council of Great Lakes Governors for their efforts as partners in hosting this workshop. Additional thanks are also in order for the workshop's steering committee members: New York State Department of Environmental Conservation's Great Lakes Program; Department of State's Division of Coastal Resources; the Center for Environmental Information; the Finger Lakes - Lake Ontario Watershed Protection Alliance; the Great Lakes Basin Advisory Council; the Great Lakes Fishery Commission; the Great Lakes Research Consortium; and the U.S. Fish and Wildlife Service.

Special thanks are in order for conference speakers: Dr. Jack Mattice and Chuck O'Neill of New York Sea Grant; Don Zelazny, Gerry Mikol, Jeff Myers and Robert Townsend of the New York State Department of Environmental Conservation; Fred Anders of the New York State Department of State; and Dr. Edward Mills of Cornell University.

The Great Lakes Commission also recognizes the efforts of Dave Naftzger and Peter Johnson (Council of Great Lakes Governors), and the many New York Sea Grant staff members who helped ensure a well attended, successful event. Jon Dettling of the Great Lakes Commission staff is also to be recognized for his assistance in compiling these proceedings.

Dr. Ron Baird, director of the National Sea Grant Program, warrants special recognition for his personal support of this initiative and for facilitating his office's financial support for the workshop series.

Finally, and most importantly, thanks to all who joined us in Rochester and shared their thoughts and recommendations with us.

Sincerely,

A handwritten signature in black ink that reads "Michael J. Donahue". The signature is written in a cursive, flowing style.

Michael J. Donahue, Ph.D.  
President/CEO  
Great Lakes Commission

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## I. Background

This workshop was one in a series of similar events held throughout the Great Lakes basin as part of a collaborative project between the Great Lakes Commission, the Council of Great Lakes Governors and the Sea Grant Programs in the Great Lakes region. Funded by the National Sea Grant Program, the project is directed at advancing Great Lakes ecosystem restoration and protection efforts through the development of action items and ideas on how to implement them through a regional process.

Project collaborators recognize that development of a Great Lakes protection and restoration strategy must be based upon sound science, and proceed with a clear understanding of ecosystem conditions and objectives, relevant research activity, and the science/policy/management linkages needed to achieve the strategy's vision. This workshop, along with the corresponding workshops in other Great Lakes jurisdictions, will provide input from the broader Great Lakes community into this process.

The New York workshop was designed to maximize the opportunity for the public to offer input into the process of implementing basin-wide protection and restoration strategies for achieving the Governors' priorities. The meeting used the list of nine priorities released by the Great Lakes Governors on October 1, 2003 as a framework for discussion (Appendix C). Following several brief introductory presentations, the workshop was divided into four breakout groups. Each of the groups was tasked with discussing the following two questions:

- What is your input on the Great Lakes Governors' priorities and how are these priorities important to New York?
- What advice do you have on the design and implementation of a large scale restoration plan to advance the Governors' priorities for the Great Lakes ecosystem?

More than one hundred participants attended the workshop. The objective of the workshop was not necessarily to reach consensus, but to capture the diversity of thoughts throughout the state on Great Lakes restoration needs and approaches. Section II of this document presents a summary of the opening remarks and presentations. Section III summarizes the outcomes of the breakout group discussions, as recorded in the minutes. A summary statement and conclusion are offered in Section IV. The appendices contain a list of participants, the workshop announcement and agenda, a copy of the Governors' press release announcing their restoration priorities, and the original summary notes taken during the breakout sessions.

## II. Presentations

The morning began with a welcome and introduction from Dr. Jack Mattice, Director of New York Sea Grant. Dr. Mattice briefly explained the details of the Great Lakes restoration bills that have recently been introduced in Congress. The purposes of this workshop are to help define what the goals of Great Lakes restoration efforts, such as those called for in these bills, should be. More specifically, Dr. Mattice specified the goals of the workshop as: 1) to help identify what we should spend the money on first; and 2) to make sure that the wants and needs of the Lower Great Lakes - Lakes Erie and Ontario - are presented and included in the mix of work that is done when the legislation is finally written and passed.

Dr. Mattice then gave a selective historical look at Lakes Erie and Ontario and made a few observations to help guide thinking during the workshop.

A few years ago, great excitement accompanied the news that a blue pike had been found in someone's freezer. No one had seen a blue pike for years – they were thought to be extinct. Many people were excited by the possibility to obtain a copy of the gene pool of the blue pike and perhaps even to clone the species to restore it to the Great Lakes. It turned out that this was a false alarm. It was not a blue pike. So far as we know, it is still impossible to include blue pike in the restoration plans.

The lesson in this story is that, even if we wanted, we could not restore the Great Lakes to their original state.

In the 1950s, Lake Erie's yellow perch, walleye and blue pike fishery collapsed as a result of degraded environmental quality and population pressure from overfishing. In the mid-to-late 60s the lake was considered by almost everyone to be dying or dead. The lake was hyper-eutrophic – there were so many nutrients in the lake water that it was green. Summer decay of dead algae and the occurrence of toxic blue-green algae (*Microcystis*) in the lake made life impossible.

Jumping ahead to the late 1970s, reductions in sewage and other nutrient inputs to the lake in response to the U.S. Clean Water Act, the Canada Water Act and the Great Lakes Water Quality Agreement made life in the lake possible again. Organisms began to re-populate the lake and recreational fishing became possible again. Unfortunately, some of the species moving into Lake Erie were non-indigenous species (quickly to be known as aquatic nuisance species) such as the zebra and quagga mussels. These mussels remove nutrients from the water, clearing it of suspended matter. In recent years some concern has been expressed that perhaps the nutrient levels have dropped too low – low enough that the fishery has declined and a sustainable fishery might not be feasible.

This conclusion is controversial. The lesson in this story, whether the conclusion is really true or not, is “Be careful what you ask for, you may get it.” It is true that water can be too clean to maintain uses that we might want.

A final example from Lake Erie surrounds Type E, or Avian, botulism. Fish and birds in eastern Lake Erie have been dying in large numbers over the last few years. There is some anecdotal evidence that the mortalities have been mediated through the food chain that includes the invasive round goby. The hypothesis involves two paths for food chain transfers to kill birds. In both paths, the round goby eats organisms in the sediments that are contaminated by botulism bacteria. Then, either 1) contaminated gobies are eaten by the birds directly; or 2) the birds eat the flesh of larger dying fish that have eaten contaminated gobies; either case would lead to bird deaths.

The lesson here is that we need to understand the etiology of Type E botulism before we can develop a plan to restore the lakes to the conditions that existed more than five years ago before the outbreak of fish and bird kills.

Experiences on Lake Ontario have also provided valuable lessons. Banning of use of organochlorine pesticides, such as DDT, has permitted populations of fish eating birds such as peregrines and cormorants to restore themselves. In 1970, there were 89 cormorants in all the Great Lakes; by 2001 there were over 200,000. To smallmouth bass fishermen on eastern Lake Ontario near Little Galloo Island, it must have seemed as if all 200,000 cormorants reproduced there. This smallmouth fishery is one of the draws that bring tourists and their much-needed dollars to the economically depressed eastern Lake Ontario region. Besides killing trees and other vegetation and driving away other birds wherever they nest, cormorants eat large numbers of smallmouth young-of-the-year. Finally, after research proved the impact of cormorants on smallmouth bass, some control methods are being allowed.

The lesson here is that restoration can be a double-edged sword, improving conditions for some indigenous species while deteriorating them for others. It can also carry with it economic or other impacts that were not predicted and/or require secondary responses to balance all ecosystem components including human.

Lake Ontario now has world class Coho, Chinook and Atlantic salmon, as well as brown trout and steelhead fisheries. In the mid-1960s I remember seeing windrows of alewife on the shores of Lake Ontario. Prior to the 1960s, a combination of poor water quality, excess nutrients, damming of tributary streams, and invasion of the alewife and parasitic lamprey via the opening of the St Lawrence Seaway resulted in loss of the Atlantic salmon and lake trout fisheries. Low water quality and uncontrolled alewife populations resulted in spring/summer kills. Subsequent introduction and continuous stocking of the salmon, brown trout and steelhead non-indigenous species led to fast growth, record catches and great influx of tourist dollars. The fishery peaked in the late 80s and early 90s, but still is critical to the economy of upstate NY.

The lesson here is that non-indigenous species are not always perceived as bad.

As a last example, we know that lake sediments especially around Great Lakes urban areas are contaminated with materials such as PCBs, dioxins, furans, organochlorine pesticides (such as DDT), polycyclic aromatic hydrocarbons (PAHs) and heavy metals (cadmium, lead and mercury). Fish advisories are still in force intermittently on the Great Lakes especially for children and pregnant or child-bearing-age women. Some studies have shown that the

economics of clean-up favor spending large amounts of money to get rid of the contaminated sediments.

The lesson here is that local economics may be an appropriate driver for some restoration and free up federal money for less economically feasible restoration.

Dr. Mattice concluded by reiterating that restoration is not a simple process. The goals and mechanisms need to be thought out carefully, perhaps after conducting some critical eye-opening research. Mattice encouraged the participants to consider the lessons he's mentioned as they discuss Great Lakes restoration throughout the workshop.

Following Dr. Mattice's opening remarks, two keynote addresses were presented. The first of these, by Don Zelazny, New York State Department of Environmental Conservation, provided a New York perspective of the state of the Great Lakes. Mr. Zelazny gave examples of the significance of the Great Lakes: it is the largest fresh surface water system on Earth; home to over 33.5 million people; the water route into heart of the continent; and a great influence on both native and modern cultures. A series of maps and photographs showed New York's Great Lakes basin, its important tributaries and its international rivers: the Niagara and St. Lawrence. New York's Great Lakes are important for drinking water, recreation, fish and wildlife as well as for bulk shipping, industry and hydropower. But the legacy of the Great Lakes also includes combined sewer overflows and sanitary sewer overflows, hazardous waste sites, industrial emissions, and aquatic invasive species.

Mr. Zelazny showed charts depicting hydrographs of Lake Erie and Lake Ontario and discussed water quantity and water quality policy and issues. Great Lakes policy comes about from a hierarchy of international and tribal treaties and conventions; binational agreements, strategies and plans; statewide programs; and regional and local initiatives. New York's Great Lakes water quantity policy is the result of the International Boundary Waters Treaty of 1909; the Great Lakes Charter of 1985 and Annex 2001. The International Joint Commission, a binational government body, oversees flows and hydropower uses on the two international rivers through the International Niagara Board of Control and the International St. Lawrence River Board of Control.

Water Quality policy comes about through the Great Lakes Water Quality Agreements of 1972, 1978 and 1987; the Great Lakes Binational Toxics Strategy of 1997; Lakewide Management Plans (LaMPs), Remedial Action Plans (RAPs), and the Niagara River Toxics Management Plan. The goals of water quality policy is to have drinkable water, swimmable water, and edible fish. The focus of the Agreement is to address critical pollutants such as persistent toxics, to remediate 14 beneficial use impairments in Areas of Concern, and to employ an ecosystem approach to restoration. The contaminants that cause fish consumption advisories in Lake Erie are PCBs and mercury; in Lake Ontario, these are PCBs, dioxin and mirex.

Mr. Zelazny also discussed the management of fish and wildlife habitat in the islands, coastal wetlands and uplands of New York's Great Lakes region. Management policy comes about through the Canadian/U.S. Convention on Great Lakes Fisheries of 1955; Lake Ontario and Lake Erie Fish Committees; North American Bird Conservation Initiative; and North American

Waterfowl Management Plan. A State of the Lakes Ecosystem Conference (SOLEC) indicators assessment chart was presented to show the kinds of pressures affecting the environment of Lake Erie and the status of efforts to improve the situation. Some factors which are showing improvement are: sea lamprey control, contaminants in colonial nesting water birds and edible fish, acid rain, and contaminants affecting productivity of bald eagles. However, shoreline hardening is increasing and such emerging issues botulism and aquatic nuisance species are affecting the environment of the lakes.

The second keynote, by Fred Anders, of the New York State Department of State, focused on Great Lakes shoreline communities.

Following these keynote addresses, a series of additional presentations were made, providing an overview of the state of the Great Lakes and some initial thoughts on planning for a restoration initiative. Dr. Edward Mills, Director of Shackelton Point Biological Field Station at Cornell University, discussed ecological changes in the Lake Ontario ecosystem from 1970 to 2000. Phosphorus controls implemented in the Lake Ontario ecosystem in the early 1970s were undeniably successful; lower food web studies showed declines in algal abundance and epilimnetic zooplankton production, and a shift in pelagic primary productivity toward smaller organisms. Stressors on the fish community prior to 1970 such as exploitation, sea lamprey (*Petromyzon marinus*) predation, and effects of nuisance populations of alewife (*Alosa pseudoharengus*) were largely ameliorated by the 1990s. The alewife became a pivotal species supporting a multi-million dollar salmonid sport fishery, but alewife-induced thiamine deficiency continued to hamper restoration and sustainability of native lake trout (*Salvelinus namaycush*). Expanding salmonine populations dependent on alewife raised concerns about predator demand and prey supply, thereby leading to reductions in salmonine stocking in the early 1990s. Relaxation of the predation impact by alewives and their shift to deeper water allowed recovery of native fishes such as threespine stickleback (*Gasterosteus aculeatus*) and emerald shiner (*Notropis atherinoides*).

The return of the Lake Ontario ecosystem to historical conditions has been impeded by unplanned exotic-species introductions. Establishment of *Dreissena* spp. led to increased water clarity and increased vectoring of lower trophic-level production to benthic habitats and contributed to the collapse of *Diporeia*, behavioral modifications of key fish species, and the decline of native lake whitefish (*Coregonus clupeaformis*). Despite reduced productivity, exotic-species introductions, and changes in the fish community, offshore *Mysis* populations remained relatively stable. The effects of climate and climate change on the population abundance and community dynamics of Lake Ontario fish were unknown in 1970, but a historical temperature time series begun in the late 1950s in the Kingston Basin has since provided evidence of climate warming and associated fish community changes. Ecological surprises should be expected in the coming decades that will challenge scientists and fishery managers especially in the face of naturalized and new exotic species, climate warming, and escalating stakeholder demands on the Lake Ontario resource. Continuous long-term ecological studies were critical toward interpreting changes in Lake Ontario's fish community over the past three decades and will be essential for both scientific understanding and management of the Lake Ontario fishery resource in the future.

The following presentation, by Jeff Myers of the New York State Department of Environmental Conservation, provided an overview of NYSDEC water quality assessment programs and efforts to identify water quality priorities in New York State. Myers explained that Clean Water Act Section 305(b) requires states to report on the quality of all state waters. Categories for classifying water bodies include: no known impacts (good); minor impacts/threats (okay); impaired waters (problems); need verification (maybe); unassessed (questionable). Clean Water Act Section 303(d) requires states to identify waters that do not meet water quality standards and do not support designated uses. These impaired waters require a restoration strategy.

There are numerous water quality programs underway at NYSDEC. These include: the Statewide Water Monitoring Program, with 2-year basin monitoring studies; the Waterbody Inventory and Priority Waterbodies List, which assesses all waters in each basin, is compiled biennially, and includes impaired waters, waters with minor impacts and threatened waters; the Clean Water Act Section 305(b) Water Quality Report; the Clean Water Act Section 303(d) List of Impaired Waters, which includes waters that do not support designated uses and problems requiring restoration strategy; and the Restoration and Protection Strategies, which are segment-specific watershed strategies.

The Waterbody Inventory and Priority Waterbodies List update water quality data and information for 2 or 3 basins each year. The entire state is updated over 5 years. The update effort is a public process incorporating all available data and information. This effort is coordinated through the NYSDEC Department of Water (DOW) office in Albany, DOW regional staff, and local water quality partners (WQCC/SWCD).

Myers provided an overview of New York's 303(d) list of impaired waters. Of the 718 waterbody/pollutant listings:

- 212 (30%) are acid rain impaired
- 209 (29%) are due to impaired fish consumption, of which
  - 57% are due to organics in sediment
  - 20% are due to atmospheric deposition
  - 19% are due to “migratory species”
  - 3% are due to industrial or hazardous waste
- 67 ( 9%) are shellfishing restricted waters
- 79 (11%) are due to urban, storm, and combined sewer overflow, of which
  - 35% of which are in New York City
  - 65% are elsewhere
- 21 ( 3%) are small, high nutrient lakes
- 51 ( 7%) have other site-specific issues
- 79 (or 11%) require verification of impairment or pollutants, of which
  - 67% require verification of impairment
  - 33% require verification of the pollutant

Robert Townsend, of the NYSDEC, offered additional perspective on Lake Ontario water quality problems. Townsend addressed five water quality topics which should be considered in any

Great Lakes restoration planning effort: background activities; trends and issues; modeling results; impairment listings; and Areas of Concern.

The statewide priority pollutants include: aldrin/dieldrin, alkyl-lead, benzo(a)pyrene, camphechlor (toxaphene), chlordane, dichlorodiphenyltrichloroethane(DDT) (+DDD & DDE), dioxins/furans, hexachlorobenzene, mercury and mercury compounds, mirex, octachlorostyrene, polychlorinated biphenyls (PCBs).

Some of the actions that are being taken to improve New York's Great Lakes water quality, and means of measuring the progress, include:

- Great Lakes LaMPs and RAPs
  - Fish and Wildlife Health Advisories
  - Specific Studies and Remedial Measures
  - Ecosystem Objectives & Environmental Indicators
- Statewide Programs
  - Monitoring
  - Threshold Reporting
  - Permits and Plans (SPDES)
  - Health Surveys / Special Samplings
- Voluntary Actions
  - Industrial Incentives, Benefits and Costs
  - Pesticide Collection (Clean Sweeps Funding)
  - Hospitals for a Healthy Environment

Information on the *Pesticides Clean Sweeps* was presented and can be found on the NY Sea Grant web site at <http://www.nyseagrant.org/glrestoration>

A chart on *Great Lakes Ecosystem Goals* for Restoration and Pollution Prevention can also be found at the Sea Grant website at <http://www.nyseagrant.org/glrestoration>

Things that can be done to prevent pollution include: preventing introduction; reducing the risk of exposure (to humans/environment); halting media transfer (air, water, land); substituting materials; reducing waste; reuse and recycling of materials; implementing proper disposal methods; employing good housekeeping and careful materials handling; and training employees in better inventory control and careful use of materials.

A number of charts from this presentation can be found at <http://www.nyseagrant.org/glrestoration>. These charts show:

- Percent Reductions in Niagara River Basin Suspended Solids Contaminant Loads (to Lake Ontario 1986 – 1999)
- PCB Trends in Sediment (ug/Kg)
- Lake Ontario Surface Water Critical Pollutant concentrations compared to NYS water quality standards (WQS)/ criteria
- 50 cm Coho Salmon Skinless Fillet 1976 – 2001
- Lake Trout PCB Trends 1977 – 2001
- Whole Fish Age 4 – 6, Lake Trout PBDE Trends 1978 – 1998

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- Biomagnification of Contaminants through the Foodweb
- Lake Ontario Lakewide Fishery Contaminant Issues
- Recovery of Lake Ontario Bald Eagles
- PCB Mass Balance Model Results
- Relative Contribution of PCB loadings
- Baseline and Load Reduction Scenarios
- Lake Ontario PCB Mass Balance information
- LOTOX2 Findings – Management of PCBs in Lake Ontario
- Model Confirmation - Lake Trout PCBs
- Priority Waterbody Listings for the Great Lakes Basin (NY)
- Areas of Concern (AOCs) for Lake Ontario

Mr. Townsend discussed the common impairments found in the Areas of Concern, including:

- Fish Consumption Restrictions
- Contaminated Sediments
- Degraded Benthos
- Habitat Loss
- Fish Tumors / Deformities

Information on the general content of the Remedial Action Plans (RAPs) for the Buffalo River AOC, the Niagara River AOC, the Eighteen Mile Creek AOC, the Rochester Embayment AOC, the Oswego River AOC, and the St. Lawrence River at Massena AOC can also be found at the website: <http://www.nyseagrant.org/glrestoration>.

Mr. Townsend summarized the fundamental principles and strengths of the RAP process:

- Public involvement
- Use of an ecosystem approach
- Identification of a sequence of events required
- Working to influence events

Priority AOC monitoring measures include:

- Land-based remediation
- Sediments and benthos
- Water quality and point sources
- Plankton population
- Fish tissue and tumors
- Habitats

Among the things that have been learned from the AOC RAP process are:

- Work needs to be comprised of manageable components
- Concerns are not limited to AOC geography
- The ecosystem approach is complex
- Public participation in restoration efforts is essential
- Environmental monitoring is very important

Dr. Michael J. Donahue, President and CEO of the Great Lakes Commission, offered some remarks on ensuring the sustainable use of Great Lakes resources. Dr. Donahue began his presentation with the “take home message” that ecosystem restoration has multiple dimensions, and we need to acknowledge and accommodate them as we establish our vision. He focused his presentation on four key points: the relationship between ecosystem restoration and sustainable use; the benefits of sustainable use; some ideas on restoration priorities; and, sustainability in the context of ecosystem planning.

He defined *sustainability* as a state of resource usage “which meets the needs of the present without compromising the ability of future generations to meet their own needs.” *Restoration* was defined as “reinstatement of beneficial uses in an ecosystem through projects and activities that improve environmental quality and ensure environmentally sound and sustainable resource use.” He then discussed the socioeconomic importance of Great Lakes water resources as a mode of transport, a factor of production, a supporting resource, and a marketable amenity.

According to Dr. Donahue, restoration (in the context of sustainability) can be categorized into: decision support systems; scientific and research infrastructure; and sustainable use laws, policies and programs. Dr. Donahue discussed sustainability in the context of ecosystem planning. Some operational and structural characteristics of such planning include: explicit recognition of state/provincial stewardship role; precise definition of “restoration;” true partnership among stakeholders; use/exploitation of existing mechanisms; clear set of priorities to allocate resources; benchmarking and monitoring; and long term adequate funding that augments, not replaces, resources.

In conclusion, Dr. Donahue restated his take home message that ecosystem restoration has multiple dimensions and we need to acknowledge and accommodate them as we establish our vision.

### **III. Breakout Group Discussions**

The group breakout sessions saw productive discussion on a wide range of topics. The major discussion points, along with comments and recommendations that emerged were captured by a recorder in each session. This section contains a summary of the group discussions organized by topic.

#### ***A. Water Resource Management***

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Several groups noted the importance of developing a regional strategy for managing water resources. It was generally agreed that Great Lakes water should not be diverted outside the basin. In addition to preventing diversions, participants noted the importance of decreasing water consumption. Water resource management was described as an act of balancing numerous competing demands on the region's water resources. Further development of the region's legal and scientific capabilities for such management decisions is needed. It was recognized that water will continue to become a more limited resource and that demands on it will grow. It was noted that natural factors play a large role in the hydrology of the Great Lakes system; these factors go beyond any influence that management decisions may have. A need was mentioned for adapting use patterns to natural fluctuations. There were several comments during the sessions concerning the need to restore the region's natural hydrological components (such as embayments, streams, rivers and coastline).

#### ***B. Human Health***

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Many participants in the workshop noted a strong connection between the health of the ecosystem and the health of the region's human populations. Further scientific and epidemiological studies to clarify these connections were recommended. Several uses of the region's water resources were specifically discussed with regard to their impact on human health. There were a number of comments concerning the quality of drinking water and the need to protect drinking water supplies from pollution sources. The need to restore the quality and safety of swimming beaches, many of which have bacterial problems, was highlighted. Reduction of contaminants in fish was also cited as an important goal for improving human health.

#### ***C. Nonpoint Source Pollution***

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Preventing pollution of the Great Lakes basin from nonpoint sources was a popular topic of discussion, focusing on a wide range of source types and recommended actions. Runoff of nutrients and chemicals from agricultural and residential lands was identified as a leading problem. Improving stewardship and land management practices among homeowners and farm operators was identified as a prospective solution, as was developing incentives for proper management practices. Several participants also commented on the need to improve regional sewerage systems and upgrade sewer infrastructure. Eliminating sewer overflows and improving

technology for waste water treatment plants were recommended. Lack of funding for such programs was cited as a significant impediment.

Many participants noted the need to address issues of pollution and sedimentation on a watershed basis. Significant exceptions to this were the topics of atmospheric deposition of toxic chemicals and acid rain. In these instances, decreasing sources of pollution often require actions at a larger scale that transcend individual watersheds and even nations.

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#### ***D. Land Use***

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Several comments centered upon the need for improved land use planning policies. There was considerable recognition that land use patterns and urban sprawl are closely linked to several aspects of environmental degradation throughout the region, including habitat loss and nonpoint source pollution. Suggestions for actions which regional governments should be taking include establishment and enforcement of zoning laws; building codes and community plans; improved community coordination; public acquisition of land and development rights; urban revitalization; and changing of policies that create incentives for living in cities. A lack of resources and incentives at the local level were cited as major impediments to implementing these actions.

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#### ***E. Persistent Bioaccumulative Toxics***

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Reducing or eliminating toxic substances from the region's waters was a goal mentioned by several participants. A preventive approach was advocated for stopping the introduction of new chemicals. There was support for increased education among the public and politicians on toxics issues. Deposition of these substances from the atmosphere was frequently mentioned as a dominant route of entry into the region's waters; continued development of scientific and political solutions for mitigating this problem is needed.

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#### ***F. Non-native Aquatic Invasive Species***

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Workshop participants agreed that both preventing the spread of existing invasives and preventing the introduction of additional species are high priorities. Many comments focused on the need to implement effective technological and legal measures to stop additional introduction and spread through ballast water. Lack of resources, cooperation and legislation were cited as major impediments. In addition to stopping non-native invasions, restoring native species populations was a frequently mentioned priority.

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#### ***G. Protecting Coastal Wetlands, Fish and Wildlife Habitats***

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The protection and restoration of wildlife habitat was of priority interest to many participants, with wetlands and nearshore aquatic habitats of particular interest. This was regarded as a vital step in maintaining biodiversity, protecting threatened species, restoring original species distributions, and restoring commercial fisheries. In addition to aquatic habitat issues, several participants mentioned habitat restoration on land, such as preserving forestation in coastal

zones. Numerous competing demands on the resource, the difficulty of defining goals and targets, and the lack of funding were all mentioned as impediments in realizing progress on this restoration priority.

#### ***H. Restoring Areas of Concern and other Toxic Hot-spots***

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Restoring the use of the region's Areas of Concern was recognized as an important component of a basin-wide restoration strategy. Remedial Action Plan implementation efforts are viewed as an important part of such a strategy. In addition to the Areas of Concern, remediation of contaminated sediments at other sites throughout the basin is also needed. The identification and development of appropriate disposal methods for contaminated sediment was noted as a continuing impediment to achieving these needs.

#### ***I. Research, Monitoring and Information Sharing***

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Considerable interest was expressed in improving and standardizing methods of collecting, sharing and using regional data and information. The need for improved monitoring systems was emphasized, both as a basis for research programs and as a system of benchmarking and measuring progress toward restoration goals. A desire was expressed for a long-term monitoring system that could measure a set of standardized criteria. A need was also expressed for improved models that are able to represent the high level of complexity of the system. A call was made to initiate a whole-ecosystem modeling framework. A need was cited to distill scientific information to an understandable level and provide this information to policy makers and the public. Major impediments to such a large-scale monitoring system include lack of funds, inadequate staffing, lack of technology and a lack of will to maintain the programs.

#### ***J. Sustainable Use and Economics***

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Numerous participants commented on the need to achieve sustainable use of Great Lakes resources. It was emphasized that a balance needs to be struck between economic development and environmental protection that promotes both of these items simultaneously, rather than one at the expense of the other. It was mentioned that a lack of quality information concerning the linkages between the environmental and economic aspects often prevents good management decisions. In particular, tourism and recreation were mentioned as uses of the Great Lakes that can contribute to the sustainability of the system. Increasing the profile of regional tourism opportunities is a method of improving the region's economy while protecting the environment. It was mentioned by several participants that lack of adequate public access is currently hampering the use of the lakes for recreational purposes. A systematic plan for public acquisition of prime recreational lands, and developing them in a way that balances use with preservation, was advocated as a way to increase the use and value of these resources, while preserving them for future generations. The contamination of many public beaches was cited as an additional hindrance to recreational opportunities.

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**K. Public Education, Outreach and Involvement**

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The inclusion of public education and outreach components into a restoration strategy was advocated by a large number of participants. Education was seen as necessary to compensate for a general lack of understanding concerning many Great Lakes topics and to increase the public's support for restoration efforts. High priority audiences include private landowners and local governments, both of whom have significant impacts on many environmental quality issues and are often uninformed concerning what actions they can take to protect the region's resources. In addition to education, inclusion of the public in making management decisions was advocated as part of a comprehensive public involvement component of a larger restoration strategy.

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**L. Implementation**

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Workshop participants shared numerous comments and recommendations concerning the implementation of a regional restoration strategy. Many of these comments focused on political and institutional barriers that are likely to be encountered during future restoration efforts. The need to compete with political interests in other regions to obtain support and funding was one item mentioned. Reaching consensus among diverse interest groups concerning the relative importance of Great Lakes issues is needed. In addition, building greater support for restoration among a public that is sometimes disinterested was a cited concern. Thoroughly involving the public was mentioned as a necessary step for success, and the inclusion of public involvement in the Remedial Action Plan process was cited as a prospective model. Involvement of a diversity of groups, including various cultural groups and Native Americans, was considered essential.

Recommendations to involve and empower local governments on an unprecedented scale were also offered by participants. Many local governments have had limited involvement in Great Lakes and other environmental issues. For those governments that are actively pursuing environmental protection and restoration, there is a lack of capacity to adequately address these issues. Increasing the number of trained people at the local level, as well as increasing the tools available to local governments, was mentioned as an important part of a locally-focused strategy. A call was also made to reevaluate the structure of agencies at a regional level. Impediments to effective regional management include the lack of enforcement of existing regulations and a high turn-over rate in government which inhibits the stability of programs and funding. In addition, a preventive approach to ecosystem management was advocated.

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**M. Other Items**

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Several additional needs were mentioned at the workshop, with adequate and stable funding being frequently mentioned. The difficulty of obtaining such funding in an "anti-taxation" climate was discussed. The need for increased efforts to control algae and weeds was also mentioned by several participants. These efforts should include a multi-faceted approach that includes nutrient control from several sources, research and education. The development of a comprehensive plan to oversee dredging activities in the region was mentioned as an important

need. Deteriorating infrastructure throughout the region, particularly in cities, was mentioned as a future challenge. Understanding and addressing the potential impacts of climate change on the system was also identified as a priority need.

## IV. Concluding Observations

The workshop successfully brought together over one hundred individuals to discuss the needs, priorities and strategies for implementation of a large-scale restoration effort for the Great Lakes. As described above, the participants shared a wide variety of comments concerning what such restoration effort might seek to accomplish and how it might be organized. Below are some summary conclusions and observations provided by Dr. Jack Mattice, Director of the New York Sea Grant Program at the State University of New York at Stony Brook.

The organization of discussion topics presented above in sections III-A through III-J (except for III-D) mirrors the priorities of the Great Lakes Governors. This scheme is one of a number of possibilities for organizing the information, but the fact that the breakout topics reasonably fit the Governors' priorities indicates the wisdom and validity of the Governors' choices. However, by comparing lists from all the breakout groups, several larger umbrella issues surfaced. Although these issues have some overlap, each is organized around scientific concepts that require similar types of information and ways of integrating that information. The following summary presents this second perspective, not better, but perhaps more pragmatic in the sense that it is organized around the collection, coordination and integration of information for graded solutions to problems and opportunities for Great Lakes Restoration.

### **Ecosystem and human health impacts of toxic contaminants**

The umbrella issue that seemed to play across all the breakout sessions and encompass the largest number of categories within the lists was ecosystem and human health impacts of toxic contaminants. Examples of topics that fit under this umbrella include: losses of aquatic organisms due to release of new chemicals (e.g., PCBs--polychlorinated biphenyls), endocrine disruption in fish by pharmaceuticals in sewage effluents, fish consumption advisories due to sediment contaminants, and clean-up of Areas of Concern (AOC).

One category of information needed to deal with this issue is related to ecosystems effects and requires an accounting of contaminants from their production through detoxification. Identifying industrial or municipal sources is the starting point, followed by estimating realistic exposures based on hydrology of the water bodies. Then, the levels of toxicity of the contaminants to individual organisms can be measured or predicted. Measurement requires development of valid monitoring protocols and prediction requires development of contaminant risk assessment methodologies. Finally, effective schedules, processes and impacts of mitigation would complete the analytical requirements.

Another category of information needs is the prevention of effects on humans and requires measurement of significant contaminant burdens in sediments and biota and assessment of their potential impacts on human health. Measurement of bioaccumulation, food chain magnification, and body burdens at various stages of human development from fetus to adult is important in determining the need for advisories and to clean up "hotspots" or AOCs. Assessment of the risk benefit of various decisions is important for making the right choices for society.

### **Non-Indigenous, Aquatic Nuisance and Invasive Species**

A second umbrella issue that bubbled up from all the breakout groups was referred to by several acronyms including NIS (Non-Indigenous Species), ANS (Aquatic Nuisance Species) and IS (Invasive Species). The presumed mode of introduction of these species has been in ballast water of ships bringing raw materials and finished goods in and out of the Great Lakes. A primary example is the zebra mussel, the species that brought the issue of invasive species into public consciousness because of its rapid and well-publicized transport around the Great Lakes Basin, its effects on municipal water and power plants and its potential impacts on the entire Great Lakes ecosystem.

There was universal consensus at the workshop that the Lower Great Lakes (Lakes Erie and Ontario) have been impacted economically and ecologically by introduced species. The most obvious negative economic impacts have resulted from the effects of IS on structures and processes of industries that withdraw lake water for cooling, drinking and other uses. Estimates of the costs of these impacts and their prevention or control are in the billions of dollars. Conversely, the stocking of non-indigenous salmon and trout has had a positive economic impact by bringing in tourism stimulated by the establishment of world-class fisheries. The total economic impact of these fisheries is in the hundreds of millions of dollars per year. Some ecological changes that have been attributed to species introductions include shifts in food web structure from the water column to the lake bottom (benthification), occurrence of Type E Botulism in eastern Lake Erie, and decline in smallmouth bass recruitment due to cormorant predation. Although the economics of ecological change is difficult to assess, the sustainability of lake ecosystems in the face of species introductions is a major concern.

Information that seems most effective for dealing with NIS/ANS/IS involves prevention of introduction; control after introduction is frequently difficult or impossible. The first line of defense is developing methods and schedules of ballast water treatment that will prevent transport of organisms over long distances into new environments. But public education also is needed to prevent activities that lead to unintended introductions or to make clear the substantial damage that can occur from supposedly valuable intended introductions. Knowledge of the biology and ecology of each NIS that might be introduced, as well as the biology of similar indigenous species, is critical for evaluating the impacts of introduction.

During the discussion of introduced species, all groups agreed that the goal of restoration of historical species complements efforts to enhance the biodiversity of the Great Lakes. Many participants espoused the idea of a return to native species. Others maintained that this goal was ultimately impossible given the loss of some species such as the blue pike. Still others pointed out that the upstate New York economy now is heavily dependent on the introduced salmon and trout fisheries, making such a goal extremely controversial. Regardless, one conclusion was that fuller representation of user stakeholders would be required to give validity to any consensus regarding a return to native fish communities.

### **Non-point source pollution**

Non-point pollution was a third umbrella issue identified by all of the groups. The focus in this issue seemed primarily related to storm sewers, septic system controls and other nutrient management. Examples presented were impacts of nutrient (fertilizer) runoff and groundwater

influences. Source controls and avoidance of runoff were major subjects to be mined for needed information. Stormwater runoff control received consensus emphasis. Education, such as incorporated in the Non-point Education for Municipal Officials (NEMO) program, was identified as an important contributor to the restoration needed to rehabilitate the Great lakes.

### **Coastal processes and related issues**

The fourth umbrella issue included a range of topics related to coastal processes and implications for uses of the Great Lakes. Lake level control seems to be an organizing principle that pulls these different topics together. One primary concern is the transport of water outside the Basin. With the Great Lakes containing about 95% of the North American fresh water supply, pressures to use Great Lakes water to solve shortages are increasing along with the fresh surface water demands in other areas of the US and Canada. Executives of Basin area states and provinces have banded together to head off such future out-of-basin uses. However, current lake levels are influenced by consumptive uses within the Basin and multiple competing goals of flow control. Lake levels in the future also may be influenced by the effects of global climate change on Great Lakes rainfall and temperatures. Lake levels, in turn, affect erosion and influence sedimentation rates. This translates to changes in dredging requirements to maintain navigation channels and lake access from private property, marinas and boat ramps. Lake levels also affects future needs for land acquisition and development rights of community property for public access.

The scientific information needed to support decisions on lake level and coastal processes management covers a wide scope. It includes: influence of global climate change on basin-wide rainfall and evaporative rates; development of water use prediction tools; environmental and economic assessment and risk analysis of flow decision trade-offs; social sciences of negotiation and decision-making; effects of lake level and storm occurrence on erosion, erosion control, and sedimentation; and assessment and schedules of sediment removal techniques such as dredging.

### **Watershed management**

The fifth and final umbrella issue was watershed management to maintain habitat. Clearly, the watershed management concept is important for the point and non-point contaminant effects and the coastal processes issues as well. However, the participants wished to emphasize that land uses and surface and ground water hydrology distances away from the Great Lakes themselves have important influences on Great Lakes habitat. They mentioned the maintenance or restoration of wetlands in particular because of their role in processing contaminants and nutrients and for providing reproductive havens for so many aquatic species. Some wetland species are important in their own right because they are endangered, threatened or harvested, or because of their unique niche in the ecosystem.

The primary information needs for this issue are likely to be indicated by watershed ecosystem models that focus on quantifying surface and ground water hydrology and processes as they relate to the conditions needed to maintain wetlands species components, as well as those important in other desirable habitats. Process-level understanding of wetlands and other habitats is also necessary for development of effective and lasting habitat restoration as well.

Many other specific topics or issues were identified in the breakout sessions and appear in Appendix D. It is instructive that the issues identified by the Governors' priority list and by the

participants of this workshop demonstrate a significant degree of similarity. This reinforces confidence that major issues have not been omitted.

### **Impediments to restoration**

The various breakout groups considered impediments to restoration in different ways. Some groups identified impediments in general, while others considered the primary impediments for each issue. Regardless of the process, the overall list was, again, very similar from one group to the next. Adequacy of funds for restoration, particularly in an environment of competition for funds that are inadequate to do everything, was at the top of all lists. Other impediments included lack of knowledge; lack of public understanding; lack of political will; degraded infrastructure for attacking problems; and lack of consensus on the appropriate endpoints of restoration.

These impediments included some issues that would have to be addressed in the interest of developing and implementing effective Great Lakes restoration programs. Education of the public appears to be the first and most critical task required for the initiation of a restoration program. Involvement of the public, including **all** stakeholders, users, conservers and preservers alike, into the restoration planning process is necessary for developing the will, the ultimate goals and the funding stream for the program. Another necessity is to identify and collect the scientific information needed to effectively restore the Great Lakes to the conditions supported by consensus agreement. Finally, social sciences techniques must be applied (or first developed then applied) to compare results of trade-offs and facilitate the consensus that will be necessary to foster the political will to conduct what will be a long and involved process. If all this is accomplished, the restoration plan will balance conflicting uses in ways that will be espoused by the stakeholders.

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## **Appendix B: Workshop Announcement and Program**

### ***Event Details:***

On April 27, 2004, New York Sea Grant will host "Great Lakes Restoration Priorities Workshop: Your Chance to Make a Difference in Our Lakes' Future." This event, to be held in Rochester, will bring together public and private stakeholders from along New York's Lake Erie and Lake Ontario shorelines to identify and refine lake-wide restoration needs and priorities and to help foster a collective vision to guide the process. Everyone who uses or is interested in New York's Great Lakes resources is invited to attend the workshop.

The Great Lakes Commission first embarked upon this project to provide the scientific and technical assistance needed to inform the development of legislative, appropriations, and policy priorities for the Council of Great Lakes Governors' Great Lakes restoration initiative. At this meeting, New York Sea Grant, in association with the Great Lakes Commission, will seek input on the priorities from stakeholders interested in New York's Great Lakes waters. This input will help develop a shared vision and the principles, goals, objectives and strategic actions needed to achieve that vision.

### ***Agenda Items:***

- GL Restoration Financing Act H.R. 2720 (Congressman Reynolds invited)
- The State of the Great Lakes
- GL Shoreline & Economic Development
- Ecosystem, Fisheries and Invasive Species
- Water Quality and Pollution Prevention
- Ensuring the Sustainable Use of Resources

### ***Breakout Sessions:***

- What are your priorities for Great Lakes restoration you wish to share with the Great Lakes governors?
- What advice do you have on the design and implementation of a large-scale restoration plan to advance the Governor's priorities for the Great Lakes ecosystem?

### ***Background on this Great Lakes Initiative:***

The Great Lakes make up one-fifth of the world's fresh surface water resource, so large that it would seem nothing could ever damage them. But the lakes are in peril. Human development and use of this unique natural resource has degraded the lakes to the point that the lakes are in need of protection and restoration. To this end, the Governors of the eight Great Lakes states have generated priorities toward the development of restoration strategies for the lakes.

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In response to this, the Great Lakes Commission is sponsoring a series of workshops throughout the Great Lakes states (including New York, Ohio and Pennsylvania) in the Winter and Spring of 2004 to solicit public input on the development and implementation of priorities for ecosystem restoration. The initiative is funded by the National Sea Grant Program and each workshop features a partnership between the state's Sea Grant Program, the Governor's office, relevant state agencies and the Great Lakes Commission.

Participants will have an opportunity to review and discuss restoration priorities developed by the Council of Great Lakes Governors, and share additional thoughts and ideas relevant to their jurisdiction and the entire region. Workshop outcomes will be captured in proceedings documents and shared with Great Lakes leadership and the entire community of stakeholders in the interest of promoting consensus and unity of purpose in restoration and protection initiatives.



## GREAT LAKES RESTORATION WORKSHOP

### Rochester, NY, 27 April 2004

8:00 a.m.	Registration	
8:30 a.m.	Welcome and Introduction	Dr. Jack Mattice, New York Sea Grant Dr. Michael Donahue, Great Lakes Commission
8:45 a.m.	Great Lakes Restoration Policy Initiatives	Dr. Michael Donahue
	<b>Keynotes:</b>	
9:00 a.m.	State of the Great Lakes: A New York Perspective	Don Zelazny and Gerry Mikol, NYS DEC
9:45 a.m.	Great Lakes Shoreline Communities	Fred Anders, NYS DOS
10:30 a.m.	<b>Break</b>	
	<b>The State of the Great Lakes</b>	
10:45 a.m.	Ecosystem, Fisheries and Invasive Species	Dr. Edward Mills, Cornell University
11:15 a.m.	Identifying Water Quality Priorities for NYS; Lake Ontario Water Quality Priorities	Jeff Myers and Robert Townsend, NYS DEC
11:45 a.m.	Ensuring the Sustainable Use of Resources	Dr. Michael Donahue
	<b>Great Lakes Basin Restoration</b>	
12:15 p.m.	Council of Great Lakes Governors Priorities for Great Lakes Restoration	Dr. Michael Donahue
12:30 p.m.	<b>Lunch</b>	
1:20 p.m.	Charge to Breakout Groups	Chuck O'Neill, New York Sea Grant
1:30 p.m.	Breakout Groups - Addressing two questions: 1. What are your priorities for Great Lakes restoration you wish to share with the Great Lakes governors? 2. What advice do you have on the design and implementation of a large scale restoration plan to for the Great Lakes ecosystem?	Facilitators
2:45 p.m.	<b>Break</b>	
3:00 p.m.	Breakout Groups Reports	Facilitator
4:00 p.m.	Consensus-Building	Moderator: Dr. Jack Mattice
4:30 p.m.	Wrap-up and Next Steps	Dr. Michael Donahue
4:45 p.m.	<b>Adjourn</b>	



## **Appendix C: Governors' Restoration Priorities Press Release**

### **GREAT LAKES GOVERNORS RELEASE PRIORITIES FOR PROTECTION AND RESTORATION OF THE GREAT LAKES**

October 1, 2003

Contact: David Naftzger or Peter Johnson  
312-407-0177

The Council of Great Lakes Governors today released nine priorities for the protection and restoration of the Great Lakes. The Great Lakes ecosystem is critically important to the quality of life for our citizens and to the economic vitality of region," said Ohio Governor Bob Taft, Council chairman. "In endorsing these priorities, the Great Lakes Governors affirm our commitment to protecting and restoring the natural habitat and water quality of the Great Lakes Basin, preserving diverse and thriving plant and animal communities, protecting the water supply, and safeguarding human health."

The priorities were included in a letter to the sponsors of S. 1398, the Great Lakes Environmental Restoration Act, and H.R. 2720, the Great Lakes Restoration Financing Act. The Great Lakes Governors praised Congressional sponsors and cosponsors for introducing legislation to address ongoing threats to the Great Lakes by providing substantial federal financial support to complement extensive state and local spending on protection and restoration projects.

"We applaud the strong bi-partisan commitment in Congress to restore and protect the Great Lakes," said Governor Taft. "The Great Lakes Governors look forward to partnering with Congress to secure the future of this irreplaceable national treasure."

The Council of Great Lakes Governors agreed that these priorities should guide Great Lakes restoration and protection efforts:

- Ensure the sustainable use of our water resources while confirming that the States retain authority over water use and diversions of Great Lakes waters.

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- Promote programs to protect human health against adverse effects of pollution in the Great Lakes ecosystem.
- Control pollution from diffuse sources into water, land and air.
- Continue to reduce the introduction of persistent bioaccumulative toxics into the Great Lakes ecosystem.
- Stop the introduction and spread of non-native aquatic invasive species.
- Enhance fish and wildlife by restoring and protecting coastal wetlands, fish and wildlife habitats.
- Restore to environmental health the Areas of Concern identified by the International Joint Commission as needing remediation.
- Standardize and enhance the methods by which information is collected, recorded and shared within the region.
- Adopt sustainable use practices that protect environmental resources and may enhance the recreational and commercial value of our Great Lakes.

The Great Lakes Governors also committed to working with local governments, Canadian provinces, and other stakeholder organizations on a coordinated approach to safeguarding the Great Lakes, which are the largest source of fresh surface water in the world.

## Appendix D: Breakout Session Summary

Below are the transcripts of the recorders' notes from the Breakout sessions. Only grammatical and punctuation changes have been made.

### **Group 1**

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- Economic impact - cost/benefit
- Water quality
- Restoration of native species - commercial fishery
- Research/education/scientific monitoring (detection and evaluation)
- Shoreline erosion
- Land acquisition - public ownership for stewardship
- Urban sprawl - land use - pesticides
- Great Lakes water should not be diverted outside basin.
- Restore structure and function of coastal zone by managing watershed (embayments, streams, rivers, coastline)
- Lakeshore wetlands (protection and restoration)
- Economic and biological sustainability
- Protecting and restoring natural hydrology
- Education needed
- Watershed based impact from upper watershed
- Human health and ecosystem health must be restored.
- All bird conservation
- Recovery of threatened and endangered species
- Protect of ecologically significant areas.
- Implement cost effective technology to deal with invasive species.
- Goal - eliminate / prevent future exotic invasion
- Reduce erosion and sedimentation due to agriculture.
- Take a preventive approach to chemical use and introduction.
- Native American involvement/multi-cultural involvement
- Need better models to predict complex system
- Impacts of global climate change

- Restore swimmable waters.
- Impact of recreation on water quality
- Development of managed wetlands
- Cleanup contaminated sediments.
- Restoration efforts should include small and large scale projects.

### **Impediments/Solutions**

- Degrading infrastructure - “big cities”
- Inadequate socio-economic data
- No enforcement of existing laws
- No long term goal for restoration
- Current engineering technologies limited - funding allocations
- Economic impact - regulation / enforcement
- Political/lack of public education, toxins
- Expectations are not always realistic or easily obtained.
- Crisis management
- Secure funding stream
- Lack of education - concept of “big picture”
- Private landowner
- Money - fear of more taxation
- Zoning laws/building codes - inadequate plans
- Limited town resources
- No incentive for community coordination
- Water is becoming a limited resource. Economic pressures are outweighing environmental concerns. Water use is excessive.
- Agency structure
- Focus of RAPs
- Lamps focus on offshore.
- Lack of trained people - money
- Local perspective - need regional approach
- Development pressures
- Politics
- Inability to develop wetlands naturally

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- The definition of sustainability includes both economic/environmental.
- Told either or choice
- Lack of complete scientific knowledge of “natural” hydrology
- Competing interests for water levels
- Lack of public understanding
- Local politics and home rule autonomy
- Lack of knowledge link between ecosystem health and human health
  - Lack of adequate incentive programs - landowners
- No incentive for private landowners to cooperate

**Group 2**

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1. Aquatic Nuisance Species - manage existing species, reduce new invasions
  2. Impacts of contaminants on human health
  3. Cleaning up contaminated sediments and AOCs.  
Create a balance of species.  
Include nearshore areas and embayment.
  4. Public education and outreach  
Sustainable economy
  5. Habitat restoration - wetlands  
Groundwater interactions at hazardous waste sites  
Nonpoint source pollution  
Use a watershed approach.
  6. Out-of-basin influences (atmospheric deposition)  
Smart growth-zoning  
Monitoring programs
  7. Need for standardized criteria
- ANS - stop new introductions
  - Aquatic nuisance species
  - NIS - both plants and animals
  - Public involvement
  - Existing manage those species
  - Cleaning up contaminated sediments - remediate AOCs figure out methods of disposal
  - Out of basin (atmospheric) influences of contaminants must be defined and reduced.
  - Address impacts of contaminants on human health.
  - Habitat destruction
  - Wetland restoration
  - Loss of biodiversity
  - Minimize water quality impacts through smart growth - zoning
  - Include infrastructure, land-use (WWTP) - CSOs
  - Groundwater interactions with hazardous waste
  - Reduce or minimize nonpoint sources such as pesticides, fertilizers, agriculture run-off, and lawns.
  - Monitoring systems long-term - ships, buoys

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- Balanced species mix - pelagic, nearshore, avian which mirrors original mix in lake
- Public education and outreach - research sharing
- Watershed approach (lake-shed)
- Standardized criteria for (fish consumption) contaminant levels - impediment epidemiological studies
- Make water-dependant economies - sustainable and thriving include recreation
- Nearshore and embayment areas must be included

### **Impediments**

- Funding
- Data gaps - lack of long-term data - need for data linkages - information needs to get to decision makers - need long-term planning
- Lack of public will and concern
- Lack of political will conflict of political priorities
- Lack of local ownership - must move from local government up
- Lack of scientific understanding - disconnect between science and policy
- Out-of-basin sources (atmospheric) don't lend themselves to in-basin problems
- Legal liability (polluters)

### **Steps for implementing**

- Need for whole - ecosystem model framework
- Long-term monitoring program is essential
- Pass HR2720 and fund

### **Group 3**

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#### **Priorities Ranked**

1. Algae and weed management
2. Address ballast treatment - Invasive species introductions.
3. Tied - Building local capacity to address restoration issues  
Atmospheric and water deposition of toxics into Great Lakes system
4. Focus on restoring the nearshore area.
5. Create greater public access to the lake shore.
6. Develop long term monitoring for environmental conditions
7. Tied - Maintain recreational fishing.  
Addressing storm sewer overflow abatement
8. Create a unified channel dredging plan.
9. Address the balance between conflicting uses of the lake resource.

#### **Suggestions**

- Ballast - cleaning - implementing - steam-clean tanks - recirculate exhaust
- Focus on nearshore forestation.
- Carry out unified channel dredging - managed by one organization make efforts coordinated
- Greater public access to the lake shore especially Lake Erie
- Include a focus on potable water in terms of information and restoration.
- Reduce production of algae.
- Build local capacity to address restoration issues.
- Atmospheric deposition - to be addressed as a cross border issue - even beyond borders of this watershed
- Acid rain needs to be addressed as a global issue beyond watershed borders.
- Evaluate and approve effective ballast water treatment technologies.
- Address storm sewer overflow abatement.
- Maintain recreational fishing.
- Purchase of development rights of commercial properties
- Develop management tools based on successful program models like clean sweeps.

- Outreach programs to local governments at low or no cost to governments.
- Reduction of toxics and organics entering the water
- Address the balance between conflicting uses of the lake resource
- Mechanism needs to be developed to assure long term monitoring
- Develop practical approaches to weed control.

### **Impediments**

- Ballast cleaning impediments
  - shipping industry
  - money
  - legislation - lack of defined standards for discharge
- Nearshore restoration
  - Balance of competing interests
  - Ecological question - how productive is “good”
  - Nearshore habitat conditions which are best for restoration/protection - what is “good”
  - Lack of funding for extant plans
- Channel dredging - developing a coherent management plan
  - lack of funds
  - need an overarching regulatory/management group
- Need for great public access
  - need support from local governments
  - private ownership is a problem.
  - need a plan to prioritize land acquisition
  - need a comprehensive development plan to balance access/commercial development/ open space/ habitat preservation - will require partnerships
  - storm sewer and combined sewer outfall discharges contaminating beaches and other public access area.
- Focus on potable water
  - funding
  - lack of a network for water treatment plants to communicate. They need to have outreach to let them define common interests.
- Algae and macrophyte control
  - nutrient control
  - educate shoreline residents about septic.
  - agricultural runoff contributes to problem - management problem

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- develop programs to educate farmers - outreach
- lack of best management practice programs already in place
- research focus with coherent plan developed to address weed control
- Building local capacity to address restoration issues
- Outreach programs to local governments
  - turnover in governments that results in a lack of continuity in responses and funding.
  - difficult to build a constituency for involvement in a specific issue.
  - pilot projects lacking that demonstrate an effective solution
  - lack of regional approaches to a problem on a greater than local scale
- Acid rain/atmosphere deposition
  - need to be able to influence areas outside of the region contributing to the problem
  - jurisdictional issues within the basin. Who is in charge?
  - both air and water pollution inputs from outside the watershed and jurisdiction
- Storm sewer overflow
  - funding lacking
  - current technology inadequate
  - education of watershed residents lacking
- Maintain recreational fishing
  - contaminants in the fish
  - invasive species disrupting the food web
  - lack of access to fishing sites or lake itself
  - lack of public interest in fishing
  - perception of water quality/animal rights issue/
- Balance of conflicting issues
  - Lack of education/consensus among stakeholder groups
  - Lack of compromise on “turf” issues - “giving up something”
  - Lack of management options
- Long term monitoring
  - lack of funds
  - turnover of monitoring personnel
  - technology inadequate
  - lack of management options
  - lack of will to maintain programs

**Group 4**

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- Lake level issues
- Some managed some Mother Nature
- Phosphorus loading
- Residential nonpoint source
- Funds
- Prevention and control of invasive species
- Loss of aquatic habitat
- Lack of monitoring
- Increasing drinking water quality decrease pollution
- Improve health of system by performing research and increasing monitoring developing restoration program for system as whole
- Clearly define where we are holistically
- Restoration of native fish species
- Lack of public access
- Lack of public participation in official management
- Agriculture nutrient management
- Need for public consensus on end points
- Lack of political support
- Control of water diversions and consumption
- Accumulation of toxic contaminants
- Sedimentation
- Perception of economic reality
- Septic system controls
- Toxics / pharmaceuticals
- Increasing native species
- Tourism promotion
- Urban revitalization - anti sprawl
- Identification of diverse stakeholders and their interests
- Plan that impacts largest audience “Tourism” If follow that plan this will be accomplished
- To move process forward

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- Successes of RAPs
- Strong public participation
- Spirals
- Funding drops as involvement drops
- Respond to crisis
- Ounce of prevention worth pound of cure
- Too willing to use cure
- Process flawed, not representative sample of publics at this meeting
- Need to include public in management process
- EPA structure
- Involvement vs. participation
- If want to reach “public” find out what “public” is define and reach each target audience in means effective to them.
- Process engagement overcome obstacles
- It is critically important to define process of gaining public priorities and build it into whatever we do, including:
  - education
  - media
  - planning
  - technical approaches
  - dollars
  - communicating research
  - representative public
  - Native Americans
  - farmers
  - inner city
- Public participation in a real sense must be built in
- Discussion revolved around classic issues and impediments
- Took step further to say what’s missing
- We should review the process that has us where we are today and determine what we’ve learned and what we’re doing wrong.
- Sustainability of institution and resources

### **Impediments**

- Changing habits

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- Lack of understanding
- Competition for money
- Will and money
- Hopeless case
- Funding
- Pressure for multiple uses
- We need to restore pre-industrial biodiversity.
- Lack of will and knowledge
- Time and funding
- Funds and true ability to work together
- Challenge of coordination to eliminate overlap
- Funds self preservation
- Funding - would ecosystem support it
- Money: existing development fish hatchery - Lake Erie
- Lack of money and political support
- Structure
- Slurry for money
- The bureaucratic process creates obstacles.
- People have other priorities
- Legal
- Lack of knowledge for proper methods
- Requires tributary renovations
- Land stewardship
- Lack of vision
- Political
- Public education
- Coordinated infrastructure
- Political process that is anti-city
- No real interest in broadening the base
- Impediments:
  - self-appointment
  - funding
  - landownership
  - structure
  - process-openness
  - complexity

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- dedication
- technology
- perceptions
- standards
- education
- long-term
- politics
- engagement