S. HRG. 108–360

# GREAT LAKES RESTORATION

## FIELD HEARING

BEFORE THE

## COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED EIGHTH CONGRESS

FIRST SESSION

ON

OVERSIGHT OF CURRENT AND FUTURE EFFORTS TO RESTORE AND PRESERVE THE GREAT LAKES

AUGUST 25, 2003—CLEVELAND, OHIO

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# GREAT LAKES RESTORATION

**MONDAY, AUGUST 25, 2003**

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
*Cleveland, Ohio.*

The committee met, pursuant to notice, at 10 o'clock a.m. at the Great Lakes Science Center, 601 Erieside Avenue, Cleveland, Ohio, Hon. George V. Voinovich [acting chairman of the committee] presiding.

Present: Senator Voinovich.

## OPENING STATEMENT OF HON. GEORGE V. VOINOVICH, U.S. SENATOR FROM THE STATE OF OHIO

Senator VOINOVICH. I'd like to thank all the witnesses here this morning and I apologize for being a little bit late. Perhaps it was an opportunity for some of the witnesses to meet each other.

First and foremost, again, thank you for taking time out of your busy schedules to participate at today's field hearing of the Senate Environment and Public Works Committee to examine the current and future efforts to restore and protect the Great Lakes.

Second, I thank Chairman Inhofe for calling this hearing at my request. And I look forward to continuing to work with my colleagues in the Committee and the House and Senate in advancing legislation to address what I believe is one of the most pressing environmental issues facing our Nation, restoration of the Great Lakes. I want to also thank the staff of Senator Inhofe and Senator Jeffords for being with us today and, as many of you know, this record will be kept and will be shared with the other Senators.

While restoration is important to the plants and animals that call it home and to the 40 million people in the U.S. and Canada that depend on it for drinking water, it is also important to the economy and people's jobs.

I know that quite well, as being former Governor of the State of Ohio. The Great Lakes region maintains the largest bilateral trade relationship in the world with the primary economic activities in recreation, tourism, shipping, agriculture and manufacturing. I'm glad we have representatives here today from the Canadian government and welcome you here today and thank you for taking time out of your busy schedule to listen to these hearings and I'm looking forward to talking to you after this hearing today.

In terms of tourism, the eight Great Lakes States have about 3.7 million registered recreational boats, or about a third of the nation's total. Retail expenditures for recreational boating in the Great Lakes region is .6 billion annually, slightly less than one-

third of the national expenditures in this category. The Great Lakes commercial and sport fishery alone is valued at more than $4 billion annually. It's been estimated that tourism in the Lake Erie area accounts for an estimated 1.5 billion in retail sales and more than 50,000 jobs.

While I was Governor, I was very proud of this, Ohio moved from seventh to sixth place in travel and tourism and a lot of it had to do with the fact, with Lake Erie of the Great Lakes. As a mater of fact, we worked with the Council and Great Lakes Governors to promote the whole Lake Erie, Great Lakes area as a destination. Trying to get the Europeans particularly to say if you really want to see America, come to the Midwest and the Great Lakes.

Businesses also rely on the Great Lakes because, among other things, they provide an inexpensive and environmentally friendly means of transportation. And you'll see a lot more of that when you're on the Great Lakes. In 2000, this system provided an estimated $1.2 billion in transportation cost savings to steel mills, utilities, grain terminals and other key industries located near the 6 U.S. ports in the system. These industries provide more than 37,000 direct jobs and are able to compete in the world economy because they can keep transportation costs low About one third of the land in the Great Lakes basin is used for agriculture, supporting about 7 percent of U.S. agricultural production. And, again, from my own point of view in Ohio, agribusiness is our No. 1 business in the State of Ohio. So for some that may come as a surprise. But it contributes about $90 billion to our State's Federal gross domestic product. One-fifth of U.S. manufacturing activity is based on the Great Lakes, and the region, combined with Canada, accounts for about 60 percent of steel production in North America.

Over the last century, these activities have been both a detriment to this resource and a blessing for the people in the region. Regardless of the past, restoration of the Great Lakes benefits both.

Today's hearing may seem like deja vu to some of you. One year ago I held another field hearing in Cleveland at the Coast Guard station, which is just a stone's throw away, and the purpose of that hearing was to look into the recurrence of dead zones or low oxygen areas in Lake Erie.

I'm pleased that Jeff Reutter of the Ohio Sea Grant Program, who I have been out to see at Stone Lab on Gibraltar Island, was able to testify at that hearing and is here today to provide an update on this situation and the water quality of Lake Erie.

Where is Jeff at? OK. Hi, Jeff. I saw Steve Goldman from the Lake Erie Center and he's all excited. He thinks he's figured out the dead zone. I'm sure you're interested. I am, too.

Jeff is one of the premier scientists working on Ohio's Great Lake and I welcome him today.

Also, on the second panel is Ms. Elaine Marsh from the Great Lakes United, who testified at last year's field hearing as well. Great Lakes United is a U.S. and Canadian coalition dedicated to preserving and restoring the Great Lakes. Last month, the organization testified at a hearing that I held as Chairman of the Subcommittee on Oversight of Government Management in the Gov-

ernmental Affairs Committee on the management of Great Lakes Programs.

I met with Ms. Marsh and several of her colleagues before the hearing on a report they released earlier this year on how to clean up the Great Lakes. I look forward to hearing from her this morning on the coalition's recommendations on how to move forward in restoring the Great Lakes.

I also welcome on our second panel Mr. Sam Speck, who is Director of the Ohio Department of Natural Resources and Chair of the Great Lakes Commission. Sam will be providing the Committee with an update on his work to implement a binding agreement between Canada and the U.S. on a standard for making decisions on proposals to export water out of the Great Lakes. Sam and I have been friends for a long time, and we've worked together in organizations. We worked together on applications to hire Environmental Protection Agency and also a landmark piece of legislation stamp.

Dr. Roy Stein, who is Vice Chair of the Great Lakes Fishery Commission and is also Director of the Aquatic Ecology Laboratory at the Ohio State University, will also testify on the second panel about invasive species and the state of the fisheries in the Great Lakes.

Last, I welcome the two witnesses we have for our first panel. Tom Skinner and Colonel William Ryan, who testified at the hearing that I chaired last month. Mr. Skinner is the U.S. EPA's Great Lakes National Program office manager and Colonel Ryan is the Deputy Commander of the Great Lakes Ohio River Division of the U.S. Army Corps of Engineers. They will both be providing information on our current restoration efforts and their thoughts on where we need to go from here to restore the Great Lakes.

While today is in many ways a follow-up to the hearings I held last year here in Cleveland and last month in the Governmental Affairs Committee, I think of it as just one more step toward my lifetime goal of restoring the Great Lakes.

Thirty-seven years ago, when I saw firsthand the effects of pollution on Lake Erie and the surrounding region, I knew we had to do something to protect our environment. At the time, Lake Erie was suffering from eutrophication and was known worldwide as a dying lake. As a matter of fact, it was a poster child at that time. Its decline was heavily covered by the media and became an international symbol of pollution and degradation.

At that time as a State legislator—and by the way, my district, the northern boundary of my house district was Lake Erie. As a matter of fact today, if I look out of my living room window, I don't live on the lake, but I can see the lake out of my living room window, in those days we were worried about our house falling in. There's two that will fall in before mine. But that's no longer a problem, as you know. But I'm sure some day it will be again, because the lake comes up and it goes down.

I continue this fight, what I call the second battle of Lake Erie, as a State Legislator, County Commissioner, Lieutenant Governor, Mayor of Cleveland, Governor of Ohio and now United States Senator. So it's been a long time. I consider the efforts, my efforts, to preserve and protect the lake to be among the most significant of my career goals.

One of the first actions I did as a State Legislator was to introduce a resolution calling for a $360 million bond issue for municipal sewage treatment plant construction along Lake Erie. In a nutshell, I think all of us know that the major causes of pollution at that time were industrial and municipal sewage. And also because our detergents at the time had phosphates in them. And because of the Federal 5/25 program, because we created the Ohio Water Development Authority, which issued—allowed us to issue revenue bonds for the industries to clean up their pollution, we really made some magnificent progress during that period of time.

Unfortunately, many of those facilities are pretty old today, and we need to rededicate ourselves to dealing with those facilities.

When I became County Commissioner, the Department of Energy—this is an old one that's been around. They were going to put nuclear waste in the salt mines of Lake Erie, and I didn't think that was a very good idea. So we put a stop to that one very quickly. And then as Governor of the city of Cleveland, I held the first international conference of zebra mussels here in Cleveland. And at that time, they were clogging up our water and lifts. And like Cleveland Illuminating, was having problems. And then, of course, that problem now has been around for a while. We're still dealing with it, aren't we, Jeff? And it's even gotten worse with the quagga mussels.

And then when I was Governor, we had a Great Lakes Protection Fund. And Ohio hadn't kicked in their $14 million, and so we did that. And I think people should be very, very excited about the fact that we do have the $100 d million endowment that the Great Lakes Governors put together, that the income from which is distributed every year based on population, and then there are many opportunities through special research grants that some of you I'm sure sitting here have taken advantage of.

And I guess the last thing that I'm very proud of, and Sam Speck is working on it, it's the 1998 water quality index where we really looked at the things that we, the various aspects of the Great Lakes to see if, particularly Lake Erie, to see where we were. We needed, I thought, a baseline to see where we were and then we could come back and measure if we made any progress or not.

So we've been avowed for a long time. And then as a freshman Senator in 1999, I was fortunate to be selected as the Chairman of the Subcommittee on Transportation and Infrastructure. And I think the staff people know that. That was the first time that that ever happened. And it, of course, got yanked the next session by Jim Inhofe because he wanted it. And then became chairman. So I may, if I get back there, maybe some day be chairman of that committee again.

But one of the initiatives that we offer is the Great Lakes Fishery and Ecosystem Restoration Program, which authorized the Corps of Engineers to plan, design and implement projects that support the restoration of the fishery, ecosystem, and beneficial uses of the Great Lakes. And WRDA at that time authorized $100 million specifically for projects to restore the Great Lakes fishery and ecosystem.

And last year we cosponsored the Great Lakes Legacy Act, which was signed into law in 2002 to authorize $50 million per year for

5 years for the cleanup of the contaminated sediments of Areas of Concern. Unfortunately, we only got $15 million. We certainly need a whole lot more money to deal with that problem. Again, it's like everything else. We've gotten started with something that's long overdue.

Through the years, I've also worked long and hard in addressing our nation's critical wastewater infrastructure needs. And unfortunately, billions of dollars more are needed to upgrade aging systems and bring communities into compliance with the Clean Water Act. And that's why I introduced legislation in the 106th, 107th, 108th to reauthorize the highly successful, but undercapitalized, Clean Water State Revolving Loan Fund program at a level of $3 billion per year for 5 years. So I think that, again, you've got to get back to basics. If we don't upgrade our sewage treatment—this was very interesting. I was in Akron—not Akron. Lorainne. They have an old plant over there, 50 years old, 49 years old. It takes about 15 million gallons. The guy that runs it told me that when it rains, they get about 40 million gallons going through. So they only take care of 15. The rest of it just goes in the lake.

Then when he we had this blackout just recently, because we didn't have backup pumps, we put a lot of raw sewage into the lake. So I think that we need to get out of that. We need to do the same thing with drinking water. Infrastructure is a very important issue that has been neglected for too long.

In addition, we've been avowed with the Ottawa National Wildlife Refuge Complex in Ohio and the Detroit River International Wildlife Refuge in Michigan along the coast of Lake Erie. We've expanded that. We need to have more wetlands.

Responding to the hearing last August on dead zones, we introduced a bill that reauthorized the Harmful Algal Bloom and Hypoxia Research and Control Act expanded to the Great Lakes, not just the coastal marine waters. I then worked with the members of the Commerce Committee to include my provision to create a Great Lakes research program in a bill they passed. They passed that, and finally we're going to be able to take advantage of it. So many of these Federal programs for people here in Ohio just deal with the coastal and they don't even include us.

For example, a couple years ago I found out that we had an estuary program in the Federal Government and no money for estuaries in Great Lakes. They didn't even know there were estuaries in Great Lakes. We got that amended. So now we can take advantage of some of those dollars.

We also cosponsored the great Lakes Water Quality Indicators and Monitoring Act to expand the index that we created as Governors to measure water quality in Lake Erie to cover all the Great Lakes. And, Sam, you know we're trying to get you some more money, have you upgrade yours.

Furthermore, continuing to fight against aquatic invasive species that are wreaking havoc in the Great Lakes. I refer to them as aquatic terrorists, are entering this great natural resource in the ballast water of boats from all over the world. And that's got to be stopped. And so we cosponsored that act to help prevent the Great Lakes from these species.

In June, we participated in a hearing on this bill. And we've got to get this passed. We've got some legislation there, but we have no teeth—the Army Corps will tell you we don't have the money to be enforcing it to get it done. We have to get serious about this problem because God only knows what the next thing is that's going to come in here and we'll be dealing these—new things are coming in and we have our hands full just dealing with what we've got. So there's a lot more to be done.

I emphasize that this is an urgent need that deserves the demands of a well coordinated effort, one that cannot be met by simply adding individual programs to those that exist. And many of you are familiar with the GAO report, Overall Strategy and Indicators for Measuring Progress are Needed to Better Achieve Restoration Goals. That the title of it. And that the number of programs is not the problem. The problem is we're not coordinating them.

In responding to that report, my long held concerns about restoration, we've recently sponsored the Great Lakes Environmental Restoration Protection and Recovery Act. In short, this bill moves us closer to our goal of restoring the Great Lakes by providing funding and promoting coordination.

As some of you may know, I was intimately involved in the restoration of the—comprehensive plan for the restoration of the Everglades. Rich Worthington, also from the Corps of Engineers, I'm so glad to see you here. And now it's your goal, as coming to you on loan from the Army Corps, it's really helped us out. And I was the proud sponsor of WRDA 2000, which approved this ambitious plan.

Earlier this year I spoke at the Eleventh Annual Everglades Coalition Conference in Florida and told them, quote, what I would love to do as Senator is to be able to put the same kind of coalition together that you've been able to do for the Everglades for the Great Lakes. This is my dream.

Right now we have many groups, Governors, mayors, environmental groups, Congress, and others, that are all working separately on proposals and priorities to restore the Great Lakes. However, the fact of the matter is if we're going to get something done, we need to create a symbiotic relationship with all of the public and private players of the United States and Canada to develop a comprehensive restoration plan for the Great Lakes.

I'm very active on the Canadian Parliamentary Group and we've talked about this and I think we can get something going and be able to get support of that for our efforts.

This plan, in my opinion, is absolutely essential if we expect to continue to restore and improve one the world's greatest treasures, the Great Lakes. And, frankly, from a selfish point of view at this stage in my life, this would be the capstone to my legacy to Lake Erie. And more importantly, to my children, and to my grandchildren and yours.

I would again thank our witnesses for being here today and I am excited about the prospects that we have if we can just all understand we have a symbiotic relationship with each other and start working in the same direction. It's amazing, as I've seen over the years, what you can do when you have that kind of attitude present.

So I'd like to first call on Tom Skinner. Tom, again, thank you for being here.

**STATEMENT OF THOMAS V. SKINNER, REGIONAL ADMINISTRATOR, U.S. ENVIRONMENTAL PROTECTION AGENCY REGION 5, CHICAGO, ILLINOIS**

Mr. SKINNER. Thank you, Senator. It's a pleasure to be with you again. I'm pleased to be here today to talk about our efforts to restore and protect the Great Lakes which, as you well know, is the largest freshwater system on earth. I'd like to start just by taking the opportunity to highlight mechanisms that the EPA has developed to carry out Great Lakes priority setting and planning. Over the past few years, we've built a sound structure for achieving a collective vision of comprehensive ecosystem management for the Great Lakes.

We have a good understanding of the major environmental problems facing the Great Lakes today. And in recognition of these problems, the fiscal year 2004 budget that the administration president put out increased EPA's Great Lakes funding by $15 million, nearly doubling the fiscal year 2003 levels. These additional funds will support the contaminated sediment projects newly authorized by the Great Lakes Legacy Act that you mentioned earlier.

Efforts to develop the Great Lakes Strategy 2002 combined with the information for the State of the Lakes Ecosystem reports have provided much valuable information and experience to all of us. EPA continues to gather more information on the condition of the Great Lakes as part the Agency's scientific research program.

For example, we're working to develop integrated methods of detecting and predicting the spread of new invasive species introduced into the Great Lakes. We're also developing more rapid methods for measuring beach water quality to give results in one to 2 hours, rather than the current 24 to 48 hours, improving our protocols for monitoring, our goal being to better understand the relationship between water quality and its health impacts on beachgoers.

What we do know now is that, first, invasive species in the Great Lakes, now in excess of 160, are causing serious economic and ecosystem health impacts. It is virtually certain more invasives will enter the system in future years.

Next, toxic contamination has triggered more than 1,500 current fish advisories in the Great Lakes Basin. Cleaning up contaminated sediments and addressing the inputs of toxic chemicals into the lakes are key to solving this problem.

Record numbers of beach closings have occurred in the Great Lakes in recent years due to nonpoint source runoff and sewage problems.

A dead zone of water lacking oxygen has appeared in Lake Erie, impacting aquatic life and indicating that the health of the lake may be compromised.

Your hearing last year, in fact, helped us substantially to raise awareness of this issue and refocus our efforts on this issue.

The Great Lakes Strategy 2002, working along with the Lakewide Management Plans for each of the Great Lakes and Remedial Action Plans, identifies these problems and the three form

a complementary framework for current and future efforts to address them. A suite of goals and measures in this strategy is guiding governmental partners toward solving these problems. Some of most important goals are: By 2005, cleanup and deal with three areas of concern, with a cumulative total of ten by 2010. By 2007, reduce concentrations of PCBs in lake trout and walleye by 25 percent. By 2007, establish 300,000 acres of buffer strips in agricultural lands using non-regulatory Federal and State programs. By 2010, 90 percent of Great Lakes beaches to be open 95 percent of the season. By 2010, restore or enhance 100,000 acres of wetlands in the Basin. By 2010, substantially reduce the further introduction of invasive species, both aquatic and terrestrial, to the Great Lakes Basin Ecosystem. And accelerate the pace of sediment remediation, leading to the cleanup of all designated sites by 2025.

We have other challenges in restoring the Great Lakes. They include the sheer geographic size of the system and the range of problems present in the Great Lakes. The Great Lakes also require binational cooperation to achieve results.

Coordination with numerous partners and jurisdictions is another issue. We have 8 Great Lakes States, over 10 Federal agencies, and over 30 Indian tribes responsible for carrying out environmental and natural resource management programs to protect and restore the Great Lakes. Many other key organizations such as the Council of Great Lakes Governors, The Great Lakes Commission, the Great Lakes Fishery Commission, and the International Joint Commission, or IJC, also have extremely important roles.

Public involvement. The very nature and value of the Great Lakes as a natural resource means many non-governmental partners and individuals from all sectors of society are interested in the Lakes' health.

The potential for duplication of efforts. There are currently a number of plans and planning efforts for the Great Lakes that address different geographic scales. It is important to coordinate these efforts, as you mentioned. And it is important that they do not cause unnecessary confusion, wasted resources, or lead to reinventing the wheel.

Finally, where do we go from here? Our goal right now, our intent right now is to implement the Great Lakes Strategy in conjunction with the LMPs and the RAPs. It's going to be important to move forward and continue to work with the Council of Great Lakes Governors to ensure that the Governors' priorities are emphasized and that duplication of efforts is, in fact, avoided. I have a great deal of respect for the Council.

Senator you have no reason to remember this, but when I was a young staffer for their Governor Jim Thompson of Illinois, we actually worked with you and your folks in forming the Great Lakes Protection Fund. So I have a long history with that group and a great appreciation for the work that they do.

The Great Lakes Strategy 2002, the Management Plans and the RAPs can serve as the starting point for all of this work, including the Governors Council. And finally, we're following closely, as you might imagine, the Great Lakes Environmental Restoration and Recovery Act you are sponsoring in the Senate and the similar bill that has been introduced in the House. It raises some interesting

possibilities I think for all of us, and I'm sure will be the subject of much discussion in the coming months.

In closing I would like to thank you for the opportunity to speak today. I'm certainly more than happy to take questions. But even more, I would like to thank you for your tireless, and as you noted, your lifelong efforts on behalf of not only Lake Erie but all of the Great Lakes. You're a true champion of Great Lakes' causes, and we very much appreciate that.

Senator VOINOVICH. Thank you, Tom. Very nicely said.

Colonel Ryan?

**STATEMENT OF COLONEL WILLIAM E. RYAN, III, DEPUTY COMMANDER, GREAT LAKES OHIO RIVER DIVISION, U.S. ARMY CORPS OF ENGINEERS**

Colonel Ryan. Thank you, Senator Voinovich. I'm pleased to testify before you on the restoration of the Great Lakes.

As chairman of the transportation and infrastructure subcommittee, you balance flexibility, adaptic management, good science, evaluations appropriate for a professional oversight and all those things are critical.

We recently had experience in the Everglades restoration and it will be important in restoring, protecting the environmental resources of the Great Lakes while continuing to maintain Great Lakes' critical role in the economic vitality of the region.

The Great Lakes system is one of our nation's most vital natural resources. The world's largest freshwater system provides millions of U.S. and Canadian residents water for consumption, transportation, power, recreation, and a number of other uses. I look forward to continuing to work with our sister agencies, such as EPA, and other partners and stakeholders, including Great Lakes United, on approaches for restoring and protecting the Great Lakes.

My comments focus on Federal and non–Federal roles in addressing water issues on the Great Lakes and the importance of an integrated and collaborative process involving all affected parties to assure the protection of this vital resource. I will continue with an overview of the various Corps' civil works programs and other activities that are focused on addressing the Great Lakes water resources issues.

Primacy for water resources management in the U.S. has been and must continue to be at the State and local level. While is it appropriate for the Federal Government to be involved in issues of international, national or multi–State significance, such as the management of the Great Lakes water resources, it is the States, and in particular the Governors, who should be establishing the priorities for management of these shared water resources.

The scope and technical complexity of water issues and the extent of desired participation by stakeholders means that the Federal Government can facilitate State and local leadership by being responsive to their requests for effective coordination among Federal and non–Federal restoration programs and by bringing Federal analysis and program support to State and local efforts.

The diversity of restoration challenges of the Great Lakes Basin has spawned a number of intergovernmental organizations and

committees to coordinate one or more specific issues, whether it is invasive species, wetlands restoration, water management, non-point source pollution. A significant amount of planning and coordination has already been accomplished through the existing organizations and committees, including the U.S. Policy Committee, Great Lakes Commission, Council of Great Lakes Governors, and Great Lakes Fishery Commission.

The restoration challenges facing the Great Lakes are numerous and complex. The Great Lakes restoration challenges include contaminated sediments, invasive species, non-point source pollution, habitat alteration and loss, fish and wildlife conservation, and water management within a framework of two countries, eight States and two provinces.

We believe that continuing restoration of the Great Lakes would benefit from a watershed perspective, emphasizing collaborative and integration of all the stakeholders and their perspectives, such as Great Lakes United. Success requires the participation of all interested parties in the planning and decisionmaking process. This participation would foster an open dialog to integrate sometimes competing or conflicting water resource needs. Such integration and collaboration are indispensable to meeting water challenges.

As you know, the Corps has a variety of Civil Works programs that are being utilized for the protection, enhancement and restoration of the Great Lakes ecosystem. The size and importance of this water resource and the complexity of the challenges before it necessitate a team approach to its management. The Corps has worked as a team member, as well as team leader, in different aspects of the collective environmental programs for the Great Lakes Basin.

The Corps has been a member of the team that monitors, predicts and regulates water withdrawals, flows and diversions through our support to the International Joint Commission Boards of Control and reference studies. The Corps has been a member of the U.S. Policy Committee, and participated in the development of their Strategic Plan to facilitate the implementation of the Great Lakes Water Quality Agreement.

The Corps has provided technical assistance to the U.S. Environmental Protection Agency in the development of the Lakewide Management Plans. The Corps has also provided technical assistance to States and local groups for the development and implementation of Remedial Action Plans at 16 of the Great Lakes Areas of Concerns.

The Corps has been a leader of team efforts to protect and restore the Great Lakes ecosystem from invasive species, including the dispersal barrier on the Chicago Sanitary and Ship Canal and sea lamprey barriers at various Great Lakes tributaries. The Corps is also leading the Great Lakes Fishery & Ecosystem Restoration Program and other programs to restore and enhance aquatic habitat in the Great Lakes Basin in partnership with the Great Lakes Fishery Commission, Great Lakes States and Tribes.

Perhaps the most significant program the Corps has lead to date is the removal and confinement of contaminated sediments from Federal navigation channels in the Great Lakes. Although this program was conceived as a measure for environmental protection rather than restoration, the Corps, in partnership with State and

local governments, has removed over 90 million cubic yards of contaminated sediments from the Great Lakes through this program. Over 70 million of that was from Great Lakes Areas of Concern.

Using its expertise in management of contaminated sediments, the Corps has been working with other Federal agencies and Great Lakes States on sediment cleanup projects. The Corps continues to work in partnership with the EPA to evaluate and demonstrate new and improved technologies for managing contaminated sediments.

Through a more recent program, the Corps is currently leading projects for environmental dredging at eight Great Lakes AOCs in partnership with State and local agencies.

The Corps conducted one of the first ecosystem restoration plans for Lake Erie in cooperation with the EPA approximately 30 years ago and is conducting watershed management planning for what some call the sixth Great Lake, Lake St. Clair, in partnership with Federal, State and local agencies.

The Corps has four basinwide studies ongoing that are addressing specific or general water resource needs of the Great Lakes. The first of these is a U.S.–Canadian collaborative study of the existing navigation infrastructure in the Great Lakes and St. Lawrence Seaway. We are working with the U.S. Department of Transportation, Transport Canada, and the U.S. and Canadian Management organizations for the St. Lawrence Seaway to establish the baseline conditions of the existing infrastructure, commercial navigation uses, and the environmental conditions of the Lakes and St. Lawrence River that may be impacted by the navigation system. We are also developing a bi-national framework for collaboration and partnership among the States and Provinces, Federal agencies, local entities, and stakeholders.

The second basinwide study is an inventory of biohydrologic information relevant to the Great Lakes water management and will include a gap analysis of water-related data. This study is closely integrated with the Annex 2001 activities of the Great Lakes.

The third basinwide study we have initiated in partnership with the Great Lakes States is an evaluation of the economic benefits of recreational boating in the Great Lakes, in particular those utilizing the Federal navigation system.

And our fourth Great Lakes study the Corps is helping to develop a strategic plan in collaboration with the Great Lakes Commission. As authorized in Section 455(a) of the Water Resources Development Act of 1999, this study will produce a report to Congress with an analysis of existing water resource needs identified by Great Lakes States and stakeholders and recommendations for new or modified authorities to address unmet needs.

In conclusion, the Corps is pleased to have had the opportunity to appear before you and provide testimony on this important subject. We value highly the water resources of the Great Lakes, the partnerships we have formed with our sister Federal agencies, the Canadians, the Great Lakes State, Tribes, local governments and stakeholder groups in managing and protecting this unique resource.

We look forward to continuing these partnerships. This concludes my remarks. Sir, I'll be happy to answer your questions.

Senator VOINOVICH. Thank you very much. One thing I would like to do is I would like to introduce my staff person, Brian Mormino. Brian has done an outstanding job for me since he came to work for me in the U.S. Senate. And it's kind of a special day for his family, because his mom and brother are here today. We would want to welcome you. Brian's been telling you about all this hard work he's been doing. Now you're here to witness it.

Mr. Skinner, we talked about at the end of last month's hearing about restoring the Great Lakes. And it seems to me that you as the manager of the Great Lakes National Program Office may have thought more about restoration than perhaps anyone else. So as you well know, there seems not to be an agreement on how this, you know, should be done. One of the things that I think that we need to do is to define restoration.

And do you want to take a shot at defining restoration?

Mr. SKINNER. Did I mention earlier what an excellent job Brian does on your staff.

Senator you're correct and well aware of the big issue. I think in terms of the Great Lakes Strategy 2002, we look at restoration largely through the context of cleanup within Areas of Concern. In part, because those are readily identifiable. In part because those areas alone are overwhelming in terms of the demands and effort and dollars. But it's also easy to do because they're readily identifiable.

I think there are other issues characterized as restoration that are not as easily classified. An example is what we're seeing in Lake Erie right now with the so-called dead zone, the anoxia problem. There's been a dramatic reduction in phosphates over the course of the past 30 years. I think we all believe that we're at reasonable levels in the last 10 years. Yet nonetheless, there's seems to be a rise in phosphates and phosphorus within Lake Erie. This dead zone appears out of nowhere to some extent, and we're all struggling to determine what it is that's causing it and exactly how to deal with it.

So restoration can be either very narrowly defined or very broadly defined.

The consequent problem is coming up with the funding that's really necessary in order to do the amount of work that's there. The Great Lakes Legacy Act, which was introduced and approved by Congress last year and that the President funded to the tune of I think about $15 million in this year's budget, will be extremely helpful in getting us started on that process. But it is just a start. The $15 million is going to be a significant increase and will allow us to begin to clean up the areas of concern immediately.

However, that's a down payment in terms of the overall cost of just cleaning up the AOCs. We believe that $15 million is adequate right now because it's going to take us some time to get these projects going. And if there had been an influx of a $100 million this year, it really wouldn't have increased the pace that we would be able to set here. But those demands are out there. In terms of defining restoration, again, I think it depends on what your goals are.

The other thing we're struggling with, and we talked about this at your hearing last month, is the number of entities, organizations

and individuals that are involved in this process. I sometimes think that it might be a lot easier for us all to rent a big bus and just travel from meeting to meeting and hearing to hearing together because it's largely the same people that appear at these various sessions of representatives working on Great Lakes issues. I'm concerned that we could never—we'd each have our own little bit different conception of what that bus should like. And, therefore, we'd never get to the point of where we actually rented the bus. And we'd all end up walking.

There's an analogy there that I'm trying to draw to the overall Great Lakes issues. I think we're all trying to do the right thing, we're all trying to protect the Great Lakes. Many of us serve in different capacities in those different groups, but the risk is that each of those groups comes up with a slightly different view of what ought to be done, what restoration is. And as result, we don't have a single unified comprehensive vision of Great Lakes restoration, and it makes it very difficult then to complete the case to Congress, complete the case to the White House that that vision ought to be acted upon and that funding for that vision ought to be either provided or increased. And that's an ongoing struggle.

I mentioned the Council of Great Lakes Governors and our desire to work closely with that group. I know Mayor Daley in Chicago, Mayor Campbell here in Cleveland, and others on the Great Lakes have formed their own organization. And Mayor Daley very much wants a voice in the discussion, a voice in the debate about what's going on in the Great Lakes. That's a positive thing because it's the cities that are doing a lot of the work along with the States. It makes it somewhat more complex though because it's another player——

Senator VOINOVICH. But it's a really good thing because the fact is is that a lot of the Mayors have not paid attention to this and have not been as interested in this as they should be. So that to me, it's a good initiative on their part.

Mr. SKINNER. Absolutely. And they're very committed to it. I can tell you that Mayor Daley is a hundred percent personally behind it. In fact, they hired Dave Ullrich, who was the Deputy Regional Administrator for Region 5, to head up the Mayors' office on Great Lakes issues. So we know we have a colleague and an ally there. We know that the Mayor is going to continue to work hard. Yes. The challenge is coming up with a single restoration plan.

Senator VOINOVICH. Well, the real question is that, you know, who should be the orchestra leader. But the challenge maybe for our committee is that let's get those players and develop a definition of what restoration is, which, you know, which—some compromise. And then who are the groups that can start to develop the overall planning. And then the issue then becomes who is the orchestra leader that convenes the group. And I know we've talked about that at the hearing with several people over there. And just as happened on this blackout thing that we had, it's very good that Canada and the U.S. are going to have a joint get-together. In terms of from my perspective.

If you're looking at the international aspect of this, what group should that be? What is your opinion on that?

Mr. SKINNER. Well, we actually have a group now, the Bi–National Executive Committee. It's made up of various representatives at both Federal Governments on the U.S. and Canadian side. Environment Canada coordinates it for our neighbors in the north and the EPA, my shop, coordinates it for the U.S. side. So in terms of the environmental issues, we have a pretty effective mechanism for dealing with that right now. We work very closely together. We meet formally twice a year but communicate regularly.

Senator VOINOVICH. How does that deal with the IJC?

Mr. SKINNER. The IJC is—yes. Sometimes I still struggle to understand the relationship of all these organizations. The IJC, International Joint Commission, is actually a separate independent body that is charged with, among other things, overseeing the two governments' efforts in the Great Lakes under the Great Lakes Water Quality Agreement. They are, you know, in some way the watch dog group. So they sit separately from the Bi–National Executive Committee and other groups that get together.

But the reality of it is we coordinate with the IJC on a regular basis as well. We work closely with Dennis Sharnack, the current U.S. Chair, and Herb Grag, the former Minister from Canada, who both had come on recently. Both had a great deal of enthusiasm for the Great Lakes issues because they're both from the Great Lakes areas. And I think that relationship continues to evolve.

Senator VOINOVICH. Well, what I'd like to have from you in writing is a, would be your dream of—you know, you've been charged with the coordination. And just how would you relate to the international, so that we have an international flavor here, or just some of these other organizations. I think we need to really add that now. Who are the groups, and does this group that you're meeting, this bi-national group, include all of the groups in the U.S. that are involved in some way with the Great Lakes and its Canadian counterparts doing the same thing?

Mr. SKINNER. It includes all of the—on the U.S. side, it includes all of the governmental entities involved in the Great Lakes, but not the NGO's. And so it's really a government effort to coordinate the various activities that are going on. It's our way of beginning to get at your question of whether you have an orchestra leader or not. Is there a way to coordinate activities. We've had——

Senator VOINOVICH. In addition to coordinate activities, how do you take and develop a plan and identify the roles of the various organizations and how do they fit in and, you know, identify if there's going to be any kind of duplication that may be taking place. But I think we really need to get going on this thing. We need to put some stuff down on a piece of paper.

And I'd be interested in, Colonel Ryan, your familiarity with the Everglades. It was my understanding the, that South Water Management Group is kind of the governmental umbrella organization working with the Army Corps of Engineers. And then you have the Everglades Coalition Group. And I'm interested in what was—in developing the comprehensive plan, what was the relationship there. Non-governmental groups, were they observers, were they at the table? Tell us what happened.

Colonel Ryan. Well, it kind of developed over time. Initially, you had the governmental agencies, the EPA, Tom. You had other

types of Governors that were commissioned out there that were working on it. But it's very important that we bring in all those stakeholders as you're working to develop the plan. And that includes a variety of obviously Federal non-governmental agencies, interest groups that need to be brought to the table at the beginning as you help to put together that overall comprehensive strategy, as you try to develop programs that address specific needs and then try to prioritize so to better serve the end quickly.

Senator VOINOVICH. But who actually put the plan together? Was it—it was the Army Corps of Engineers, correct?

Colonel Ryan. We worked extensively with the plan to develop it and used our planning expertise. But once again, you had all of these different agencies involved as we put back in. It was not a plan that the Federal Government——

Senator VOINOVICH. You—so in other words, you wrote the plan in conjunction with the South Water Management District and got input from the Everglades Coalition at the same time and dealt with some of the special agribusinesses and so forth?

Colonel Ryan. That's correct.

Senator VOINOVICH. And the difference with the Great Lakes is you defined many of the things the Army—the Army Corps has got some pretty big studies that you're working on right now. So I have a hard time keeping track of them. So that's, you're very much involved in doing some studies right now of various things. The issue becomes and as part of what you are doing in the studies, how does that fit in with the overall—what would be the overall plan? This is a navigation study and you've got some of the other things——

Colonel Ryan. That's correct.

Senator VOINOVICH. When they're completed, those could be used as the basis of fitting into how they interface in terms of the restoration effort, correct?

Colonel Ryan. That's correct.

Senator VOINOVICH. And those studies right now that you're doing, are you touching base with EPA and with consequently Governors around the NGO's?

Colonel Ryan. If I can give you an example. As you know, one of our authorities has to do with navigation. And we're now at the beginning of a study of the Great Lakes and St. Lawrence Seaway and looking at the navigational infrastructure. As part of that, you have to obviously look at the environmental impacts, the environmental impacts as based on the studies. And we're trying to form an actual bi-national organization to manage that, part of that project delivery team that will put its study together. You have environmental components that we're working on addressing right now with our sister that should be organized and who should be participants in that to open the final solution.

Senator VOINOVICH. So the point is that this is a big area, and part of this may be defining pieces of it and then letting groups work on pieces of it in their respective area. St. Lawrence Seaway, certain States, Canada, fish and wildlife, environmental groups and so forth. That would be a piece of the restoration and making sure that the navigation problem—the use of navigation and making sure you're not destroying the ecology in the area. You've got to keep bumping and once in a while——

Colonel Ryan. You have to have that comprehensive strategy, overall strategy.

Senator VOINOVICH. So I think that just to getting everybody, identifying some key staff people to sit in a room and start to write this down, bridged on how it all fits in and what the—how everybody is, what everybody's doing and try to bridge this thing together would be, I think, the best thing for it. And the planning part, a lot of the stuff you're doing would be a piece of the overall strategy and how does that fit in with, you know, the strategy that you have. Is it—the Army Corps—the GAO in their report says that there was no strategy. There was a list of things, but there was no strategy about how to get this done.

Mr. SKINNER. Senator, with all due respect, the GAO, as you heard last month, we have some differences where we come out on those issues is the question. We believe that the Great Lakes Strategy 2002 does provide the framework. It could be characterized as a modest framework given the overall scope of problems with the Great Lakes, but the framework is there.

I also wanted just to add that although the U.S. Policy Committee is made up of the State and Federal Governmental partners, we do have NGO's that are present as observers and present as participants in those meetings as well. So this is not an exclusive group in that sense. We are getting—we do work with those other folks, and we do get a good sense of where they're coming from on it.

But if—again, the Everglades is a great example of a program that we've been successful in funding and creating a vision for. This is not an excuse. It's simply a reason. In there it's a little bit simpler because you have a similar State and similar Federal Government. It's a much more limited resource, as big as it is, than we have in the Great Lakes. It's somewhat more complex in that way.

Senator VOINOVICH. Yes. But now, the U.S. side, if you have the Army Corps and the EPA, and then maybe you have representation from the Council of Great Lakes Governors, the NGO's, and maybe start with this, you collaborate with the Corps and get all this stuff down on a piece of paper, and then, you know, get out some information to the folks and have another meeting and have them come in and start to work on this. That might be—what I'm looking for is a way to get to this and as quickly as possible and making sure that we identify all the players. Because if you do it and you don't have everybody at the table or at least feel they're part of it, once you get done, you know, they'll grenade it. They end up trying to get—trying to get, redo our health bill. Every system in the United States is trying. You need to identify it, we need to get in a room to look at it and so forth.

Mr. SKINNER. If I may add one more thing, I'll be glad to submit the sort of mission that you're looking for. I can tell you what we've done in a month or month-and-a-half since we were last together. I've given a great deal of thought to this. My intent is to sit down with—I hope to sit down with Governor Taft, the Chair of the Council of Great Lakes Governors, in a very short order here, within the next month or so, and working with the Governor to put something together to come up with exactly that, a plan to reach

agreement that will work together, and then come up with a plan to get everybody in the room together and really begin that process of identifying with the appropriate parties, and then getting to work on the vision that all of us share.

Senator VOINOVICH. And from an international point of view, we have to identify, you know, on a Canadian side, who the groups are on the Canadian side that would be doing the same thing as the Army Corps and with, you know, the EPA.

Mr. SKINNER. Yes. I think John Mills from Environment Canada really has, as far as I know, really the lead on the Canadian side and would be able to coordinate on that side of the border. I talk to John regularly, our staffs meet regularly and deal with these issues on a daily basis. So that part of it is actually the easiest in my opinion because that framework is there.

Senator VOINOVICH. And again, how do you fold in what—the studies that the Army Corps is doing?

Mr. SKINNER. I think we have to, we have to, before getting involved with the Corps, is the Corps moves along on its progress. And I fully expect that we'll participate in their studies, and they'll participate in ours.

Senator VOINOVICH. And the other thing, too, is we've got to make sure we technicalize in terms of some of the stuff that we're doing now. Even some of the things the Corps is doing. You're not fully funded on some of this stuff. And the concept would be to look at where are you with what you're doing and, you know, could they be doing a little bit more in some of these areas. You could fill in some of the gaps that maybe we need to have filled in.

Mr. SKINNER. That's absolutely right. I don't know whether these numbers came out of the GAO report or whether we came up with these on our own. But the numbers you have in front of you, there are 148 Federal and 200 State programs working on restoration efforts in the Great Lakes today. That right there is indicative of: No. 1, there's a commitment to doing this work, but, No. 2, 200 different programs out there. There is a need to coordinate that work.

Senator VOINOVICH. The other thing is this has been—if people understood the role that they were playing in the big picture, I think they'd be more enthusiastic about it. And I think so often many of these groups feel like they're out in the boonies by themselves and what they're doing, they just kind of lose—I mean, they're doing their thing, but they're looking around and how does this fit in with the big picture. We're doing our thing. But what about the people someplace—are they doing theirs. And then it's—I think you get that enthusiasm that you're part of a plan that's really going to result in some significant change and improvement.

The money part of it is, of course, you know—we get back to it. In other words, we can talk about restoring the lakes, but if you don't—and I think this is really important that we mention the importance, the fundamentals. The fundamentals are we need to do a better job with providing money for sewage treatment in dealing with combined storm overflow. Fundamental stuff. Right?

And then even on the Army Corps of Engineers, Colonel, what's the backlog like?

We started at 400. It's probably up to be about—what is your operation management—what is it called? OMM.

Colonel Ryan. Operation Maintenance.

Senator VOINOVICH. Operation Maintenance, yes. How far are you now? What is the new number?

Mr. WORTHINGTON. I think about 600 million.

Colonel Ryan. 600 million.

Senator VOINOVICH. It's got to be more than that.

Senator VOINOVICH. But we've got—how much of that is attributable to the Great Lakes and then on—and many of the projects that have been authorized, the funding's way low. And talking about coming up—Rich, remember when we were talking about a new system where we'd get rid of the projects that weren't going anywhere and narrow it down?

Mr. WORTHINGTON. Right.

Senator VOINOVICH. We just really kind of need to get going on this issue. And, Tom, the administration, I think, should be looking at this, you know, in terms of a priority. I said, you know, the economy is not that good right now, but there are some Public Works programs—you know, you're spending money, but in return for the money, you're getting something back on it. You're getting—just like we did back in the early 1980's, early 1970's, with the 75/25 program on that.

I don't have any other questions. I think the main thing I'm trying to get at today is where are we with some of these programs and how do we get going. What I would like to do would be to make it in a month's time, maybe the two of you guys—I'll tell you one other idea I have is if maybe we could do a, kind of a strategic plan on what we want to get done, we might try to bring this to the attention of the President and to the Prime Minister and maybe that would be a wonderful way—you know, the relationships with Canada and U.S., we parliamentary, parliamentarians get along real well. And Bill Graham, your Foreign Minister is a good friend of mine.

But there have been some things, a little bit of conflict or differences of opinion. This might be a wonderful way to get the Prime Minister and President to say that we're committed to this, and this would be something great for our countries to do on this wonderful resource that belongs to us.

They might just run that up the flagpole with some of the folks in Washington. I know—I haven't done it yet, but I'll do the same thing and maybe we can make something happen.

Mr. SKINNER. And, Senator, just to close, I had some meetings in the last month-and-a-half with the White House, and I think they're amenable to considering a plan but I think they feel very strongly that there has to be significant State and local participation, consistent with the overall strategy. So that's what's leading me to the Council of Great Lakes Governors.

Senator Voinovich. Well, let's see if we can work on that. I've got some other questions here, but I think they're more technical in nature and maybe I can just submit them into the record and maybe ask you to respond to them. But the flavor here is I want to—I don't know, let's get going.

Mr. SKINNER. We get the message. Absolutely.

Senator VOINOVICH. OK. Thank you very much. One of the things I want to do is anybody here from the Great Lakes Science

Center? I hope you have a chance, those of you not from Ohio, I hope you have a chance to see this place. This is one of our legacy projects when I was Governor for the bicentennial for the city of Cleveland. The State participated substantially in the construction of this facility, which has been a great success. But if it hadn't been for the Gund Foundation who put up a challenge, perhaps we wouldn't have this here today.

So I want to acknowledge the taxpayers of Ohio and the Gund Foundation for this great facility. It's really one of those things that—it's working because my dream would be to know more about the Great Lakes and get them involved in science. And they've got a wonderful program going on with the school system here in the area, and it's achieving what I hoped would be achieved with this, is an educational opportunity for the kids, and get them excited about joining the Great Lakes United or going to work for the Department of Natural Resources and making a difference.

We'll begin the testimony with you, Dr. Stein. Thank you for being here today.

**STATEMENT OF ROY A STEIN, VICE–CHAIR, GREAT LAKES FISHERY COMMISSION, AQUATIC ECOLOGY LABORATORY, COLUMBUS, OHIO**

Mr. STEIN. Happy to be here. Chairman, thank you for inviting me specifically to share our views on the Great Lakes Fishery. I am Roy Stein. I'm the Vice Chair of the Great Lakes Fishery Commission and I'm a professor at Ohio State University.

As you know, the Great Lakes Fishery Commission was established by Canada and the United States in 1956 to control sea lampreys, to coordinate fishery management, which was when fish stocks was a common concern. Here today what I would like to talk about are three important fishery issues. First, sea lamprey control. Second, the National Aquatic Invasive Species Act. And the third, the Corps of Engineers' Great Lakes Fishery and Ecosystem Restoration Program. All of these items and somewhat more are extensively discussed in my written statement. The Great Lakes Fishery is incredibly important to our Nation, as you talked about in your opening remarks.

Senator VOINOVICH. Are you going to talk about the corner of our State, too?

Mr. STEIN. We're going to wait for later for that. You can answer the questions maybe.

Mr. SPECK. We'll help on that.

Mr. STEIN. We're looking at $4 billion annually to attract new anglers this year to support a strong commercial fishery industry. However, as with most shared resources, the system and the fishery is stressed. And one major stressor is sea lampreys——

Senator VOINOVICH. Could you slow down a little bit. I know you want to get it out, but I think if you just go a little bit slower, I can hear you better.

Mr. STEIN. Usually I'm 48 minutes. I'm a university professor. And I have to get all 48 minutes in five. It will be tough. Yes, I will slow down.

Senator VOINOVICH. Thank you.

Mr. STEIN. You're welcome. Sea lampreys invaded the Great Lakes from the Atlantic Ocean in the early twentieth century. And I think it's really difficult in many ways to really exaggerate the impact that these critters—no, it's not a live one. That these critters have on the fishery and on the ecosystem. They attach to the fish with a suction cup mouth that they have right out front, at this end. They rasp a relatively gruesome hole in the fish and then suck out their body fluids. You can think of them as the vampire of the sea.

The average sea lamprey will destroy up to 40 pounds of fish flesh in an annual cycle. Before sea lampreys, the lakes supported a thriving fishery. After lampreys, the ecosystem was thrown into chaos and harvest fell to a small fraction of what it had been. Of course, the Commission was formed in response to this path.

And I believe that we've risen to the challenge of controlling it. Through the use of several techniques, like lampricides, barriers, and what I consider an extremely innovative sterilization technique, the Commission and its partners have reduced sea lamprey populations to 10 percent of their exorbitant abundance.

The fishery depends on lamprey control because without it, we would have no fishery to speak of. Fishery management, such as stocking, would be futile in the face of large populations of this parasite. And also the rub is, sea lamprey control has to be ongoing. OK. The minute that we back off the least bit, they come running right back. So we have to be vigilant in our control of that particular species.

Senator VOINOVICH. Can I ask you something? When did you come back and get it under control? You started out in 1956. And when did you get it to the point where you had it under control?

Mr. STEIN. I'd say late 1970's, early 1980's. Late 1970's.

Senator VOINOVICH. Late 1970's.

Mr. STEIN. And they were really controlled very well.

Senator VOINOVICH. So now it's an ongoing issue?

Mr. STEIN. It's ongoing in their—as we say, it's 10 percent. They're down low in all others. Little bit higher in Huron than what we would like right now, but very low in Lake Erie, for example, low in Michigan, low in Ontario.

Senator VOINOVICH. It's amazing you were able to find out how to control them.

Mr. STEIN. Yes. It's because of the life history. It's because those animals come back to streams to spawn, the adults do, and because the larvae are in those streams from on the order of four to 7 years. And because they're there, we've got a captive audience, and we can actually take the piscicide and drip it into those streams and kill these animals while they're there. If they had a life cycle in which their young were out in the open lake, we would not be able to control them like we do. So in some sense, it's a characteristic of the lifestyle. And they are indeed the only invasive species that we know how to control.

At last count, 162 non-native species, such as zebra mussels, tiny plankton and round gobies, have become established since the late 1800's, many of which have been somewhat of a detrimental effect on the environment.

The main vectors for invasive species include ship ballast water, canals, and the trade of live organisms. The Great Lakes cannot afford even one more unintentional introduction, as any one invader can play ecological havoc in the environment. And I'll repeat that. We cannot afford even one more invader. Even as we plan for them, as Mr. Speck talked about, we can't afford to have another one.

We've been encouraged by the introduction of the National Aquatic Invasive Species Act in both the House and Senate. And among many things and as you know, the Act will address the ocean-going ship ballast water vector by mandating badly needed ballast standards. It will also authorize the invasive species barrier system on the Chicago Sanitary and Ship Canal, which we heard about already. And this by the way will stop the migration of Asian carp from coming from the Mississippi River into the basin space. And the Act provides for the development and funding of rapid responses in case we need to take swift action to stop an invader.

I commend the authors of this legislation, and Senator Voinovich, you're an original cosponsor and we appreciate that very much, for addressing today's most significant invasive species problems. We can't wait another day for this legislation and urge its immediate passage.

Finally, let me turn to fishery restoration, the subject of some conversation earlier in this hearing. Particularly an exciting new program on which the Corps of Engineers and the Great Lakes Fishery Commission have been working together to get off the ground. The Great Lakes Fishery remains stressed and we would benefit tremendously from a comprehensive restoration effort.

One major restoration initiative is the Great Lakes Fishery and Ecosystem Restoration Program. A program authorized by the Water Resources Development Act of 2000. I know that you, Senator Voinovich, are principal author of this provision and commend you for your vigilance. The program authorizes the Corps of Engineer to partner Federal, State and local agencies in the commission to restore the fishery and the ecosystem.

Examples of projects include removing unnecessary barriers, improving fish passage in streams, controlling invasive species and restoring wetland habitat. I'm pleased to report to you that the first step in implementing this program is nearly complete. And we are just about ready to solicit and fund on-the-ground restoration projects.

Folks in the Great Lakes region are quite enthused about this program and what it means for the future of the fishery and its sources. The Commission urges Congress to appropriate funds so that the Corps and the management agencies can partner on restoration efforts.

In summary, the sea lamprey control remains successful and is critical to the fishery. The continuous influx of invasive species is extremely troubling and must stop. I urge Congress to pass immediately and fund the National Aquatic Invasive Species Act.

And finally, I commend you, Senator Voinovich, for authorizing the Great Lakes Fishery and Ecosystem Restoration Program and reiterate just how excited we are about helping to implement this particular initiative. Thank you, Senator, for holding this hearing

on the shores of the Great Lakes and for your interest in protecting the fishery.

Senator VOINOVICH. Thanks very much.

Mr. Speck?

**STATEMENT OF SAM SPECK, CHAIRMAN OF THE BOARD, GREAT LAKES COMMISSION, EISENHOWER CORPORATE PARK, ANN ARBOR, MICHIGAN**

Mr. SPECK. Thank you, Senator Voinovich. First I would like to say ditto to the testimony of Dr. Stein in that the Great Lakes Commission and the Council of Great Lakes Governors for the hope and concern about supporting the passage of and reauthorization of the National Invasive Species Act. Mr. Chairman, we thank you for the opportunity to testify before the Senate Committee on environment and Public Works. This morning, I would like to share with you what the Great Lakes Governors and Premiers are doing collectively to develop a management regimen to protect the waters of the Great Lakes and keep management of those waters in the Great Lakes Basin.

As you are aware, Ohio's Governor Bob Taft is the current Chair of the Council of Great Lakes Governors. I am here this morning in my role as Chair of the Councils's Water Management Working Group and as Director of the ohio Department of Natural Resources. I also served as the Chair of the Great Lakes Commission. But this morning I'm going to be focusing on the work of the Water Management Working Group in developing the management for the Great Lakes.

I believe you already heard from our EPA, who is the Chair of the Great Lakes Priorities Working Group for the Council of Great Lakes Governors, in mid July when he testified, and also the President of the Great Lakes Commission also provided testimony in Washington in a community hearing, and we can provide that for this committee as well.

The Council's Water Management Working Group is at a critical stage in the efforts of the eight Great Lakes States and the two Canadian provinces to strengthen our collective needs for protecting the waters of the Great Lakes Basins. The Working Group is developing a new resource-based decisionmaking standard for diversions and consumptive uses of water in the Basin, and in regard to diversions in accordance with the provisions of the Great Lakes Charter Annex.

The region's Governors are pleased with the leadership that Congress has shown in recognizing the critical importance of the Great Lakes and the pressing need to restore and safeguard them for generations to come. We particularly commend you, Senators DeWine and Levin for the introduction of Senate Bill 1398. The Council of Great Lakes Governors believes that the bills now pending in the House and Senate offer a really wonderful financial resources to implement a restoration plan for the Great Lakes.

Nearly two decades ago our States jointly formed the Council of Great Lakes Governors, in part to fulfill our lead responsibilities as stewards of the Great Lakes Water Basin resources, and in recognition of the tremendous ecological, economic and social benefits they provide. The Great Lakes Governors and Premiers have continued

to provide leadership on Great Lakes issues, including creation of the Great Lakes Charter in 1985 to provide a framework for managing the Basin waters.

The use of the Water Resources Development Act of 1986 as a tool to protect the Basin water resources. Formation of the Council's Great Lakes Priorities Task Force chaired by Ohio Environmental Protection Agency Director, Chris Jones.

In addition to these actions, at their annual meeting here in Cleveland in October 1999 of the Governors and Premiers committed to developing a new agreement which would bind, and I emphasize bind, the Great Lakes States and Provinces more closely to collectively plan, manage and make decisions regarding the waters of the Great Lakes Basin. They laid out the principles and they—to be carried forth and created a working group to work to develop an annex for the Great Lakes Charter at that time.

That group labored and developed a product, and on June 18th, 2001, the Governors and Premiers adopted the annex for the Great Lakes Charter. In the annex, they committed themselves to move forward on a new resource-based decisionmaking standard and basinwide binding agreements, such as an interstate compact and a State–Provincial agreement. The Governors and Premiers extended the Council's Water Management Working Group to develop the agreements called for in the annex, and that's now the focus of my testimony.

A decisionmaking framework is being developed by the Governors and Premiers which includes a two-tier review structure. Under the framework being discussed, new or increased diversions for consumptive uses exceeding the original review threshold level of at this point it looks like about 3 million gallons per day would be reviewed by all ten jurisdictions. Proposals that do not exceed the regional review threshold levels would be reviewed using a common resource-based standard by the individual State or Province in which the diversion or consumptive use is proposed.

Draft decisionmaking criteria being discussed are consistent with the annex principles of minimizing Basin water loss, no significant adverse impact, and improvement to the waters of the Great Lakes Basin. The Governors and Premiers agree to create the necessary agreements within 3 years of the effective date of the annex. In other words, to create those agreements by June of 2004. It's to be a compact, and it would obviously have to go into the State legislatures and ultimately to Congress.

The Water Management Working Group——

Senator VOINOVICH. Excuse me, Mr. Speck. You're saying that when you get done, that it would then have to be passed by the respective legislature and the Provinces in Canada; is that it?

Mr. SPECK. Assuming that it has the form of an interstate compact that the others would take out for hearings in the States and the Prime Ministers of the respective Provinces would presume to do the same, then that would have to ultimately go through the legislatures and through Congress. And that's, you know, that's to get a truly binding agreement that is binding the States.

There are other alternatives, such as uniform legislation. But that doesn't have the binding character to it, and it's more of a moral commitment because each State would change that at a later

date. And there are other options, too. But this is where the focus had been pretty much up to date.

We do expect to release documents for public review later this year or early next year. Regardless of the timetable, a flexible agreement must be drafted that will allow for the incorporation of new scientific information into the decisionmaking process. For example, we do not currently know where the Basin groundwater divides are relative to the surface water divides in a number of areas of the Great Lakes Basin.

And so on a temporary basis, I believe we're probably going to simply assume that they're coterminous until science gives us better answers to that.

The annex will be attempting to do something that has never been done before. And we're trying to protect 20 percent of the world's fresh surface water, not on the basis of economic protection, on the basis of protection of the resource. In reality, there are so many competing and conflicting interests, that the only way it will be accomplished is through partnerships. It will not be enough to simply have State–Provincial partnerships, but Federal Governments, local communities, NGO's, and the private sector will all have to be included. The water management regimen we developed will show how an effective partnership would protect one of the world's great natural resources and may be used by others as a successful model for elsewhere.

I'm glad to answer any questions, Senator.

Senator VOINOVICH. Mr. Reutter?

**STATEMENT OF JEFF REUTTER, DIRECTOR, OHIO SEA GRANT COLLEGE PROGRAM, F.T. STONE LABORATORY, CENTER FOR LAKE ERIE AREA RESEARCH, GREAT LAKES AQUATIC ECOSYSTEM RESEARCH CONSORTIUM, THE OHIO STATE UNIVERSITY, COLUMBUS, OHIO**

Mr. REUTTER. Thank you very much, Senator, for the invitation to participate. I've really enjoyed all that I've heard in this meeting so far from all four previous speakers and also all of your comments to begin this. I'm a strong supporter of your stance on those issues.

I want to begin with a poster that we prepared, and I want to thank Marc Gaden from the Great Lakes Fishery Commission. He's going to hold this for us over here at the side. Senator, this poster is for you and for your staff. We've tried to depict the problem in Lake Erie, and this should help you in explaining this situation to non-scientists and the general public. I also want to thank Brian Mormino, who has been great to work with and very helpful.

When we look at Lake Erie, you can see that it's the southernmost of the Great Lakes and the shallowest. If it's the southernmost and shallowest, it has to be the warmest. It also receives the most nutrients. We get more sediment coming into Lake Erie than the other four Great Lakes combined.

The other Great Lakes are all in excess of 750 feet deep. The deepest point in Lake Erie is east of Long Point there in the Eastern Basin—210 feet deep. So this is a very different system: southernmost, shallowest, warmest, and most nutrient-enriched. In fact, we get more sediment and more nutrients coming from the

Maumee River in Toledo than all the tributaries put into Lake Superior, and Lake Superior is 20 times larger in volume than Lake Erie.

So this is an important resource. Because it is the southernmost, shallowest, warmest, nutrient-enriched, you should be thinking that biologically Lake Erie should be producing more fish than the other Great Lakes. And, in fact, we do. In a typical year, we will produce more fish for human consumption from Lake Erie than from the other four Great Lakes combined.

However, it is possible to have too much of a good thing, and that's really what has happened with the Central Basin of Lake Erie. We've put in too much phosphorus. Phosphorus is the limiting nutrient. It's an essential nutrient for algae growth. But if you put in too much, you can get too much algae. And the problem area becomes the Central Basin.

We divide the lake into three basins—the Western Basin has an average depth of only 24 feet. The Central Basin has an average depth of about 60 feet. The thermocline forms at about 50 feet, which means that the cold bottom layer beneath the thermocline is very thin in the Central Basin of Lake Erie. That's the area that becomes anoxic. On the chart, it is this dark layer here right underneath the thermocline this very thin line.

If the lake were deeper, as it is in the Eastern Basin, we wouldn't have this problem. If we put in less phosphorus, we wouldn't have this problem. We're not going to make the lake deeper, but we can put in less phosphorus.

The rest of this chart goes on to describe the problem. It's not entirely new. If I go back to the period in 1930, in fact, my pointer here, we've seen areas of anoxia in the Sandusky Sub–Basin as early as 1930. These charts show that this anoxic area or hypoxic area—hypoxic meaning dissolved oxygen levels below two parts per million—is not always level or flat. The thermocline is not always 50 feet from the surface. It tends to flow back and forth. If we have a strong north wind, it blows the warm surface layer to the Cleveland area and the cold bottom layer squirts out toward Canada. And the reverse is also true when we have as strong south wind. So we can have what is called "upwelling" as the thermocline rises to the surface, and this allows that cold bottom layer to flow over top of our water intakes here in Cleveland. This creates taste and odor problems when it happens, along with some bacteria problems.

Marc, thank you very much.

The Great Lakes National Program office recently completed——

Senator VOINOVICH. Do you have any smaller ones than that?

Mr. REUTTER. We can break that down for you to a power-point presentation. But at the same time, we felt that was something you could stand in front of and explain.

Senator VOINOVICH. Thank you. I bet Mrs. Voinovich wants that on the wall of our basement.

Mr. REUTTER. Well, I like her taste. EPA's Great Lakes National Program office recently completed a science cruise in Lake Erie with the Lake Guardian from the 14th to the 19th of August. So what I'm going to tell you right now are the preliminary results the most current information we have on Lake Erie.

The results from that cruise indicate that hypoxia was evident at half the stations and only 20 percent of the stations showed dissolved oxygen levels above four parts per million, the minimum level for most fish species. In June of this year, Ohio Sea Grant and Stone Laboratory placed a monitoring instrument one foot above the bottom at a station approximately seven miles north of Huron, Ohio in an area called the Sandusky Sub Basin. This instrument, a YSI 6600, makes hourly readings of dissolved oxygen and five other parameters. This site was chosen because it's among the most productive sites in the entire lake and it was the first area to exhibit anoxia as early as 1930.

This year hypoxia was first observed at this site on the 4th of August and a low value of .2 parts per million was observed on the 8th of August. Oxygen is not likely to return to any of these stations until the lake turns over during a storm this fall.

It's also important to note that Microcystis sp., a harmful form of blue-green algae that produces the toxin microcystin, has been increasing in density in the western Basin for the past 2 weeks and is nearing bloom levels.

I believe the oxygen problem is real and that it's growing. There are clearly a number of exacerbating conditions that are causing this. It now appears clear that Lake Erie has been gradually warming for the past 100 years. Phosphorus concentrations have been increasing since 1995.

Together these conditions reduce the amount of oxygen available in the hypolimnion of the Central Basin and accelerate the use of the oxygen that is available. It also appears likely that the zebra mussel and a close relative, the quagga mussel that is now replacing zebra mussels, are exacerbating the problem by releasing phosphorus and allowing it to cycle more frequently through the system.

It's also important to note that a large reason that we're having this harmful algal bloom of Microcystis is because of the feeding habits of the blue-green algae. They tend to remove everything that competes with microcystis and spit out the Microcystis when they suck it in, so pretty soon you're left with only Microcystis.

What can we due to solve this problem? Well, probably the best thing is to reduce the amount of phosphorus entering the lake. This will be very difficult, but it's possible. And before we he can get into that—and, Senator, you know very well how expensive that can be—we need better loading estimates of what's coming into the lake right now.

We can eliminate the zebra mussel and the quagga mussel. That would be difficult and probably not possible. We can eliminate global warming? That's difficult, and right now most people don't even realize it is a very serious problem. We can increase the water level of Lake Erie? Currently Mother Nature holds all the cards. Furthermore, our models show that with the global warming, if anything is going to occur, we're going to see a reduction in water levels. We badly need an influx of Federal funding on the scale of that used for the Florida Everglades to address the recovery of the Great Lakes ecosystem, including dissolved oxygen problems, contaminated sediment and harmful algal blooms.

We should all support the efforts of Senator Voinovich to sponsor the Great Lakes Environmental Restoration Act and an amendment to include the Great Lakes in the Harmful Algal Bloom and Hypoxia Act. Senator Voinovich has led efforts in the past to improve sewage treatment capabilities. We must get behind him again to eliminate combined sewers and problems like those that arose here in Cleveland at the sewage treatment plants during the August 14th blackout.

We badly need a coordinated plan that includes and coordinates the activities of all agencies. Some of us will be leaders and some of us must accept roles at team players. Currently, there are too many cooks in the kitchen when it comes to managing the Great Lakes ecosystem. We need better coordination. We should all support the recent funding from NOAA Sea Grant to the Great Lakes Commission and the Northeast–Midwest Institute to develop the Great Lakes Restoration Plan.

And finally, on a somewhat different issue, I've also recently been appointed to the Steering Committee for the Global Ocean Observing System and strongly encourage everyone to support the development of an Integrated Ocean Observing System that includes the Great Lakes. We need a string of monitoring buoys around all of the Great Lakes so that we're not caught off guard. Thank you.

Senator VOINOVICH. Thank you. The last thing you said, you called it——

Mr. REUTTER. GOOS, Global Ocean Observing System.

Senator VOINOVICH. The one before that?

Mr. REUTTER. The Steering Committee before that one and before that was talking about—oh, NOAA Sea Grant is funding the Great Lakes Commission and the Northeast–Midwest Institute to develop a Great Lakes Restoration Plan.

The Northeast–Midwest Institute is trying to—their portion of the proposal is to look at what was done at Chesapeake Bay, the Everglades, several other sites around the country, and see how we can duplicate those efforts in the Great Lakes. And the Great Lakes Commission is trying to be the group that brings everyone to the table. Right now, I'm supporting any group that is trying to do that. Because that's really what is needed.

Senator VOINOVICH. The fact is that no matter what—how much have they given to the Northeast–Midwest.

Mr. REUTTER. The Great Lakes Commission.

Senator VOINOVICH. The Great Lakes Commission, to get started with what we're talking about right here.

Mr. REUTTER. Right.

Senator VOINOVICH. So it's really important that they're brought into the room. We're just talking to——

Mr. REUTTER. Right.

Senator VOINOVICH. To Tom and to the Army Corps. And so that should be—we should move——

Mr. REUTTER. The EPA's, the Great Lakes Environmental Research Laboratory, the Sea Grant Program. There are just a number of groups that are really doing lots of research in this system.

Senator VOINOVICH. Does the Sea Grant Program go throughout all the Great Lakes?

Mr. REUTTER. Yes. There's a separate Sea Grant Program in all the Great Lakes States.

Senator VOINOVICH. Thank you.

We're very happy to have you with us again. You're getting to be a regular here.

**STATEMENT OF ELAINE MARSH, LAKE ERIE DIRECTOR, GREAT LAKES UNITED, PENINSULA, OHIO**

Ms. MARSH. Well, I'm very happy be here, Senator. I would like to preface my remarks by saying how very important this work is. How very important it is to support the Great Lakes by policy measures, by dollars and by interest of the public and by all of our government agencies. Because that's what it will take to get this important job done.

I'm Elaine Marsh, project director of Ohio Greenways. And for the past 6 years I have served as a volunteer for the Lake Erie director on the board of trustees for Great Lakes United. And as you mentioned, Great Lakes United is a bi-national organization. It has about 170 members—member organizations and they represent hundreds of thousands of citizens from the eight Great Lakes States, two Canadian Provinces and Tribal territories within the Great Lakes region. We work at the local, regional and international level on projects, programs and policies to protect and restore the Great Lakes–St. Lawrence River ecosystem.

And to that end, we have recently developed a citizens action agenda for restoring the Great Lakes–St. Lawrence ecosystem. And that's specifically what I want to talk about and mainly the process that we went through to arrive at that agenda. Two years ago, there was a discussion during the annual spring get-together organized separately by the Northeast–Midwest Institute and the Great Lakes Commission. And members of the Great Lakes staff and their volunteer directors we're talking with people, and it was evident that there was a growing frustration and a belief that things had become piecemeal and separated. And this was good news to us. We had felt that for some time as well. And so we got together thinking that there might be an opportunity for a real restoration plan and a real move and the possibility of some funding. We said well, if this is going to happen, we want to be ready. We have worked on these issues for a long time.

That spring at our annual meeting we broke into working groups based on seven general areas. And those seven areas are toxic cleanup, clean production, green energy, sustaining and restoring water quantity and flows, protecting and restoring species, protecting and restoring habitat and water and air quality standards.

Once we set up these working groups, we involved Great Lakes United members and non-members alike. We did not want to have an elitist document that represented a Great Lakes insider view of what some of the problems and solutions might be. So we encouraged people who worked on these issues to get involved in this process and they did.

Over a period of 2 years, we had over 50 organizations review and work on this document. As a consequence, it is a very collective and comprehensive look at what the environmental and civic orga-

nizations working on Great Lakes issues have as a view of what the priorities are.

The other thing that we did is look at both policy and program and project issues. Each working group drafted and had authors, and there were over 30 authors of the seven working groups. And the authors drafted the first draft, sent it out to all the people they thought might be interested. There were suggestions from interested parties. We rewrote from the suggestions and put the whole plan together. Then we sent the whole plan out again. There were rewrites from that as well.

The result is a 70-page document that you have a copy of. It covers all of the seven topic areas. It's very specific; there are timetables, as I believe Mr. Skinner mentioned. EPA has a goal of cleaning up ten areas of concern by 2010. And our goal is to clean up all areas of concern by 2015. We'll be delighted to see ten areas cleaned up, as there are only two right now that are listed.

So we tried to be very specific, we tried to break things down. We released the plan this year at our annual meeting. This book, which is the Great Lakes Green Book, is the executive summary. We further broke that down. We have a one-page summary of 12 key recommendations that we feel are very important. So I can speak to those issues, if you would like. I thought I would talk more about the process that we went through and——

Senator VOINOVICH. That's really—because that might give us—you've heard the previous testimony from him. So I might be interested if you want to continue on that vein.

Ms. MARSH. OK. Great. I also wanted to talk about another initiative I was involved in, because I do believe that it is possible to create a consensus view from the general public or the interested public on these issues. It is difficult and time consuming, but it is possible to do if partnerships are set up.

I want to talk just for a minute about another process I was involved in. As project director of Ohio Greenways, I worked with the Ohio Conservation and Environmental Forum to inform the legislative process and support the Clean Ohio Fund, which was a $400 million initiative, initiated by Governor Taft, coordinated by the Ohio League of Conservation Voters, of the more than 30 organizations put their resources and expertise together and over a 12-month period drafted the blueprints for the Clean Ohio Fund, which is this book here. It took us a total of about 12 months of work.

The document was released to the public and distributed to the legislature. It was the central focus of our educational efforts with the public. It served as a point and counterpoint to the treatises produced by members of the administration and other interested parties. And it had a very positive effect both on the process and the outcome of the legislation.

So I would like to conclude by examining the remarkable capacity of the Great Lakes public as demonstrated by the citizens action agenda. And in addition to that, everyone in this room who has worked on these issues knows that when we do have processes that involve the Great Lakes, the public comes out. Particularly in the early and middle 1990's, we had literally thousands of citizens that came to the bi-annual meetings of the IJC. And I think the main

reason that the public participation has recently fallen off at these meetings is that the government progress has slowed down as well.

So what is needed is the invigoration that a restoration plan and funding will provide. And I believe with the invigoration from the point of view of government, we will see reinvigorated the interest of the public.

This particular agenda, the Green Book, is comprehensive in scope and specific in recommendation. It demonstrates that the public and non-profit organizations can focus on the issues. But the main power of the document is its broad support that is derived from the inclusive process that we used in its production. Likewise, we think extensive public involvement in any comprehensive restoration effort will greatly strengthen that effort.

The production of the Green Book clearly demonstrated that the Great Lakes public has the capacity to play a constructive role in any comprehensive restoration plan. We encourage you to engage the public early and often and we offer our assistance in that effort. And while we're not really prepared to say right now what we think the priorities ought to be in that plan, we could use the Green Book as a basis and come to consensus in prioritizing Great Lakes Restoration Projects as they might relate to the legislated funding.

So we are really excited and ready to assist in this process of bringing people together to prioritize those issues which we see and those policies and programs which we believe ought to move forward. Thank you very much.

Senator VOINOVICH. Thank you. The thing that is interesting to me, Ms. Marsh, is that you say 50 organizations came together and developed your recommendations and your plan. If the Great Lakes United were invited to be part of this effort we're talking about, do you believe that these 50 organizations would feel comfortable?

Ms. MARSH. I believe they would. And I think we have tried to be very sensitive to——

Senator VOINOVICH. How long did it take—how much dialog did you have? You said a lot of it before you came out with the Green Book and recommendations. How long did that process take?

Ms. MARSH. It was a total of 2 years from the time——

Senator VOINOVICH. Two years.

Ms. MARSH.—from the time we started talking about it. But now that we have identified those things on which there is a consensus, the process will be efficient. I should note that not every environmental organization agrees with every statement in this book, but it's pretty close to consensus.

I think we have done that work up front. Nobody has called and said, "We're going to pull out of this movement because of recommendation H on page 15."

Senator VOINOVICH. Sure.

Ms. MARSH. So I think there is agreement that we're moving in the right direction and that people would support our efforts. Senator Voinovich. I know I went through the list with you, asked the—you're going to be asked a question about the issue of how do we define restoration. And I think you have defined restoration.

Do you have a written definition of what restoration is somewhere in your Green Book?

Ms. MARSH. We have many vision statements in here. I would have to look, Senator, and see if I could find that.

Senator VOINOVICH. Yes. What I'm getting at is what is the definition of restoration. And then the other issue is who should be at the table. And after the hearing last time in Washington, to talk about that. But I would be very, very interested in getting the perspective of Great Lakes United about who you think should be at the table as we start to develop this overall strategic plan.

Ms. MARSH. Well, we would be happy to look at that and with our partners to make that recommendation.

Senator VOINOVICH. Great. Because it would be wonderful if we could get kind of a consensus that you would be the spokesman for all the groups. Because one of the problems I found in these instances is it's very difficult to get through it and then one or two groups say it doesn't reflect us. And that would be a real important issue, is to gather them together and get some kind of consensus and say hey, this is good. OK, you guys do it, and we'll keep you informed about what's going on.

Ms. MARSH. And I don't know that it's possible to avoid having conflict or having people who may be opposed to it. But if the process is sensitive and it's inclusive and everyone has a voice and there is an attempt to work toward holding firm on those policies which we believe we have to hold firm on and compromise when compromise can be applied, then I think we will be able to continue along the course we're going.

Senator VOINOVICH. And I again compliment you and your organization on the good work that you've done. I think it's a good—it's really good.

Ms. MARSH. Well, Great Lakes United has a magnificent staff and tremendous number of volunteers who put unpaid hours into it. Senator Voinovich. Are you a membership dues organization?

Ms. MARSH. Yes, we are.

Senator VOINOVICH. Dr. Stein, you mentioned the Great Lakes Fishery. When do you expect to actually be ready to fund some of those projects?

Mr. STEIN. Well, the support plan that has been written is nearly done. It's out for review right now.

Senator VOINOVICH. Did you send a copy of that to us?

Mr. STEIN. I think we did.

Senator VOINOVICH. Brian, did you see it?

Mr. MORMINO. I will check.

Mr. STEIN. Given that's not in place, then the opportunity for funds to come to bear and begin Restoration Projects—I mean, we could conceivably, if something would happen in this year's budget. We're a little behind the eight ball in terms of 2004 budget. But 2005 for sure. I don't know if there's any funding to do it in 2004. But if there is, we'll certainly take advantage of it. Because we're just in a spot where we can make that happen.

Senator VOINOVICH. Maybe you just ought to try to move it along and see where we're at. See if there may be some way. Some of the questions I ask my people in Washington is what amendments can we submit for the various appropriations bills. It never hurts to ask. Surprising to me how often we get things done.

That's one of the things I've learned in the Senate. In the first couple years I didn't do very much of that. So I said everybody else is doing it, and so I started doing and it really helps.

Mr. STEIN. All they can say is no.

Senator VOINOVICH. Just going to the Congress committee and getting an amendment to include the Great Lakes and it's done. That's the way it is. So often we think about a bill. But amendments are really a way to get things. This may be the kind of provincial, but the—we still have the problem on the walleye and the perch problem in terms of who gets what.

Mr. STEIN. Allocation issues.

Senator VOINOVICH. Yes.

Mr. STEIN. Allocations for this issue have not been decided. There's a meeting of the Lake Erie Committee which takes all the five States and the provinces into account. They will be meeting again at the end of this month to talk about allocation issues.

This has been a tough one in terms of where we are relative to the walleye fisheries. We had in the mid–1980's probably 15 million fish. Out there now, probably 20 million walleye. The question is, is that what can the lake support and can we come to the consensus with the people around the table to make the appropriate allocations between the U.S. and Canada. And I think the process is in place. It's just a question of—and the people that come to that table—I must say I participated in the last few meetings, and I will participate in the one at the end of this year. Mostly as an observer. Because we in the Commission will serve as arbiter or at least oversee the process of arbitration if it comes to that. We are not there yet.

And the people that are around that table have the resource, the good of the resource in mind, and the question is that can we come to agreement. So it's a bit sticky right now. But I think—I've watched that process and have been a participant in that process for the last 15 years. I have extremely high hopes.

Senator VOINOVICH. Good. I know there is more commercial fisheries as opposed to sport——

Mr. STEIN. There is a bit of that, too. Commercial fisheries and sport fisheries.

Senator VOINOVICH. It's simply reared its ugly head again. And this has been around now for two or 3 years. We've talked about this with our Canadian counterparts and everybody says it's a problem and we should do something about it. But nothing is happening. I've been out there and it's unbelievable. It's almost like an armada. They just move, they come in there and just suck up all the bait fish and just move along. And I think most of us believe that it's hurting our fishery. And is anything going to be done about that?

Mr. STEIN. Well, I don't know. The U.S. Fish and Wildlife has jurisdiction. And so those are the folks that are going to be making decisions about those things. Michigan has proposed that we in the Great Lakes Fishery Commission take charge and control of the species' habitat.

That legislation was introduced last year in the previous Congress. It has not been reintroduced. I'm not sure that that's what

we should be doing. But there are those kinds of proposals that are out there.

Senator VOINOVICH. OK. It's got to get done. So maybe, Brian, we ought to talk to our colleagues and see if we can get something worked out then and get it done. You've done a good job on the issue of the lamprey.

Mr. STEIN. And the question is whether cormorants are really harming the fish population. There's been some work done in New York that suggests that they have an impact on smaller bass populations with some very carefully done interject models and some very good work. The work done around the west Basin, which does not have similar consequences, and the questions is what impact are they really having. I think they're having a very negative impact, but the question is will they have the same kind of negative impacts on the fish population.

Senator VOINOVICH. Well, I can tell there's been a negative impact on the—because you're determining with the bird population. Because they're destroying the habitat for the herons and for other birds and that's important. I means, it's like it's out of balance. So this may be a two footer, to the deal with the problem not only would help the fishery but—we got to get on this right away. I don't think we can—I think that our people stand to know more about it than I do. But I think the folks that we have out at the Wildlife Refuge are really concerned about this.

Mr. SPECK. The EPA and Fish and Wildlife appreciates the problems, and we'll be coming forth with options that give the State new authority to take action in reducing population. And you're absolutely right, Senator, it's critical.

Senator VOINOVICH. Yes. I, the last one we should move on, the other one is the National Aquatic Invasive Species Act. The thing is they're just not being enforced by the Army Corps of Engineers. There's no muscle in this thing right now. Anybody want to comment on that?

Mr. SPECK. Go ahead. No. I speak from a different perspective, Senator. And certainly you've got two problems. One is the possibility of additional invasive species coming in, and the other is dealing with the invasive species that we already have here. But it hasn't necessarily impacted all areas of the Great Lake to the degree that they will. And the first is to get our arms around control over ballast water. And we still don't have that. And that's a part of what the Coast Guard now is trying to do and it's in part by its own order that we authorize these.

You've got to deal with ballast water management effectively if you're going to be able to deal with invasive species.

Senator VOINOVICH. The problem we have is that the Coast Guard claims they don't have the wherewithal to do it. I think that's where we are falling down right now. And it hasn't arisen to a big enough priority. And you almost have to, you know—it's economic interest. They don't want to be bothered with this. It's expensive.

But I think what we need to do, and that's the only reason I'm having this hearing, is that this is a real economic problem for the United States. You know, I mean, it's an ecological problem. It's

also having a dramatic impact on the economy of the Great Lakes region.

If we destroy our fishery, I mean, it will have unbelievable rippling effects across the board. I look sometimes and you've watched the development that's going on. And if it wasn't for the fact that the Great Lakes have come back and it's the fishery that it is and so forth, all that stuff would be gone. Just that fast. So everybody agrees that we need to move on this thing to get it to a higher priority. Right?

Mr. SPECK. Absolutely.

Mr. STEIN. And just to reinforce what Sam was saying. I mean, the standard now in that legislation is eliminate the risk of introduction, and there's money in there and—there would be money in there to make all that sort of stuff happen.

Senator VOINOVICH. I hear 162 and we can't afford——

Mr. STEIN. One more.

Senator VOINOVICH. One more. Now, we can put that money into the budget for that screen to keep the carp out.

Mr. STEIN. That's right. That's in there, too. If those carp get in there——

Senator VOINOVICH. Say that slowly. It's immediately. I want them to understand.

Mr. STEIN. Yes. Asian carp have reached proportions of density in the Mississippi River of 80 to 90 percent of the biomass of fishes that are in some of the pools in the Mississippi River. 80 to 90 percent of the biomass in the short time that they've been in the Mississippi River. They are planktivores. They are eating the small critters in the water columns that essentially allow our sport fish to reproduce. That plankton provides the food for the yellow perch. It provides the food a lot of the walleye. And if these Asian carp come in there at 80 percent of the biomass competing for this plankton, what is going to happen to those species. So keeping those species——

Senator VOINOVICH. I still don't understand why the people—doesn't that destroy the fishing—maybe they don't have any kind of a fishery on the Mississippi. They don't seem to be bothered. There's no mention of it, right? I mean, have you seen anything about it? What is it again? How much is the biomass?

Mr. STEIN. 80 to 90 percent of the biomass in some of the pools in the Mississippi River.

Mr. REUTTER. At those times, the pools don't support the world class walleye population you get in Lake Erie.

Senator VOINOVICH. Mr. Speck, I'm pleased that the annex is moving forward. I have to tell you there's a little bit of anxiety in the Senate. We have some eager beavers. And I'm not as eager as some of the beavers, but we're getting more eager. And they're wondering when is this going to get done.

And one of the things I'm concerned about is you were saying that the States would have to go ahead and pass this. It's our concept that maybe I'm not understanding as well as I should. I thought it was that when you folks got done with that, that we would introduce legislation and get it passed.

Mr. SPECK. Senator, there are probably several ways that deal with it. If you want something that is binding on the States——

Senator VOINOVICH. But I'm just saying, doesn't that require a treaty with Canada?

Mr. SPECK. A treaty would be another way to go. Our discussions with the State Department, our discussions with the great—the Great Lakes Task Force have not indicated a very big interest in following the treaty route. There are challenges in that we can make an agreement binding on the States through an interstate compact. There is no comparable legal structure in Canada in terms of an interprovincial contract. And it would require the Provinces to pass legislation. It would be a commitment, but theoretically it leads—it could be changed later on.

We believe that we can probably, before a State compact would be passed, are take steps under WRDA and take steps in terms of the States and Provinces agreeing to act collectively and above the threshold. But ultimately a compact is what would give you a binding contract over time in terms of an agreement or the standard and the process to make certain that it was carried out.

Senator VOINOVICH. Well, that's something that I think—Mr. Speck. Let me say that we've had a number of groups including Great Lakes United as advisors. We have some 26 advisory groups. And, Senator, let me also comment—and I don't want to get into detail, because I don't have that detail with respect to the Great Lakes Priorities Task Force that Chris Jones is heading. But I think you can expect that within weeks rather than months you will be hearing from the Great Lakes Governors in terms of a set of priorities and that they will be following that up with a set of recommendations for intermediate action between when that is performed and when a complete plan is completed.

Senator VOINOVICH. I think that specifically some of my colleagues, whose names I'm not going to mention, are very much wanting to get involved with this. They're very frustrated and they say the State isn't moving fast enough, if we're going to do anything, it has to be done on the Federal level.

And so I think that what needs to be done is you need to move as rapidly as possible, familiarizing them about the schedule which it is. Contemplate some role that the Federal Government would play. I think if we did by legislation authorize the States in terms of this issue of withdrawal——

Mr. SPECK. Under WRDA the Governors are required to act in terms of the removal of water outside of the Basin, i.e., a diversion. WRDA does not cover in-basin withdrawals. And we believe over the long haul, you've got to both address out-of-basin diversion and in-basin withdrawals.

Senator VOINOVICH. We ought to try to get some dialog going on that pretty rapidly. And then in compact, how do you—if you all agree on it—and the Premiers will be involved as well, correct?

Mr. SPECK. Yes, they're very much involved.

Senator VOINOVICH. And then the issue is what—how do you get this done. I just, it's a subject that I think we need to get some lawyers to look at, to figure out where we're going. OK.

Mr. SPECK. We have them. And let me make one other clarification or explanation that may be helpful. The Sea Grant, as you were mentioning, and the Great Lakes Commission is indeed going to be here—holding some hearings, I think probably in each State

with respect to a restoration plan. What we anticipate they will be doing will be, is using the Governors' priorities as one of the things that we'll be talking about and holding hearings on beginning this summer with the first hearings being in Michigan.

And so there is a linkage between the work of that Task Force, with the Great Lakes Governors and the Great Lakes Commission, which also have been playing a critical role through a grant they received from the Great Lakes Protection Fund, which you put together. The grant sponsored a quarter of a million dollars toward development of a port system for what the Governors are proposing to do——

Senator VOINOVICH. Are you familiar with that, with what he's talking about?

Ms. MARSH. I'm familiar with some of it. I certainly know about the work on the annex, but I'm not really familiar with——

Senator VOINOVICH. With the plan.

Ms. MARSH. No. I've heard about the plan. I didn't know hearings were forthcoming.

Senator VOINOVICH. Well, you know it might be very worthwhile for this committee to—I mean, it looks to me like we're moving in a lot of directions and maybe you ought to get the people who are moving in all directions to get in the room before two are off over here and another group is over here and saying we're all trying to accomplish the same thing. Is it possible that we can coordinate our efforts and not just have a lot of redundancy out there.

Mr. SPECK. Senator, the bill which you cosponsored provides a pretty good template for doing a lot of that. And it specifically asks the Governors to come forward with priorities. It links that in and it creates an advisory group with each Governor to represent it, it's chaired by one of the Governors. So that legislation, if it were to pass, and I'm not here to endorse every, you know, every aspect of it, but if it were to pass, it sets a way to bring these groups together. I think it provides for five of the groups.

Senator VOINOVICH. Is the Army Corps of Engineers involved in that?

Mr. SPECK. Yes.

Senator VOINOVICH. Is Skinner involved in that?

Mr. SPECK. Yes.

Senator VOINOVICH. They are?

Mr. SPECK. Yes.

Senator VOINOVICH. Let's just see if we can——

Mr. SPECK. I don't want to speak for them, but they're involved in it.

Senator VOINOVICH. I think we need to talk about that to see exactly where everyone is at so we don't end up having different—and the other issue, again, is back to, as Dennis Schroeder was talking, let's see, last month, the Chairman of the United States section of the Commission suggests that we revise and update the Great Lakes water quality to form the basis for a major bi-national Great Lakes initiative.

What is your opinion of using this as a vehicle for an economy restoration plan?

Mr. SPECK. I'm for one not ready to comment on this. Get back to me on that.

Senator VOINOVICH. Dennis felt pretty strong about this. And the IJC is a joint Canadian–U.S. thing. So if we're doing—if we have the Great Council of Great Lakes Governors put this thing together—are the Premiers of Canada involved in this, too, or not?

Mr. SPECK. They would, yes, under the IJC.

Senator VOINOVICH. I know that. But in terms of the—what we just talked about 2 minutes ago. How do you get the international——

Mr. SPECK. We're going to be having a meeting with them, Senator, I think it's September 6th. So we'll be meeting with them shortly.

Senator VOINOVICH. I think it's really important that we identify who is there and maybe just kind of see if we can either through a conference call or something see if we can bring people—so the left hand knows what the right hand is doing.

Mr. SPECK. We met with them not long ago in Chicago regarding——

Ms. MARSH. Two years ago at the bi-annual meeting for the IJC there was some discussion about opening up negotiations. And it was Great Lakes United's position that the International Joint Commission should fulfill the agenda it already had on the table rather than negotiating more things to do. I don't know what our opinion would be related to that at this time. Things have changed. But that was our opinion at that time.

Senator VOINOVICH. Dr. Reutter, as you know, we were able to through the committee get amended and include the Great Lakes. Are you familiar with that?

Mr. REUTTER. Yes.

Senator VOINOVICH. The issue now is how do we get some money. And we'd like to talk to you about that.

Mr. REUTTER. It's very important because the same kinds of harmful bloom issues that they have in the Gulf occur, and they're tied to aquatic nuisance species. The passage of that bill are tied to public health issues. They're tied to the health of the fishery. Tied to the health of waterfowl. We know that this particular toxin is toxic to waterfowl.

Senator VOINOVICH. Is that why we're seeing more dead birds?

Mr. REUTTER. That's some of it. But wes also have a Botulism problem that is occurring in the eastern end of the lake and the eastern end of the Central Basin, and that problem appears to be being exacerbated by zebra mussels and round gobies. But we have a lot more research to do in that area.

And then getting back to phosphorus reduction. Blue-green algae require high phosphorus levels. If we had lower phosphorus levels, and we didn't have the nuisance species, we wouldn't have this harmful algae bloom.

Senator VOINOVICH. I know at the last meeting we had we talked a little bit about research from Case Western Reserve. If I remember correctly, they were saying something about we don't know whether we can do anything about the phosphorus that's being contributed by the zebra and quagga, but he was saying something about the fact that we need to punch up or improve what we're doing with our own—what we can control. And that gets back to this whole sewage thing.

Mr. REUTTER. Well, there are efforts underway to reduce agricultural runoff—efforts, such as buffer strips, that hold the phosphorus on agricultural land and prevent it from entering the lake.

Senator VOINOVICH. If you do all of those things, how much of an impact do you think that would have?

Mr. REUTTER. Well, it would have a very significant impact.

Senator VOINOVICH. Do you think if we were able to improve that substantially, take that runoff, we would improve——

Mr. REUTTER. Combined sewers. Yes. An important thing to keep in mind, is that if you wanted to put your finger on the pulse of the Great Lakes, the best place to do that is the Central Basin of Lake Erie. If you wanted to say what is really happening in the Great Lakes right now, are we headed in the right direction or wrong direction, because of the shape of that Basin, the depth, that's the best place to look. It's the first place that is going to show problems.

Senator VOINOVICH. Now, in terms of the water levels, we've had periods where it's been horrible and now they're lower. And if you follow the trend, it goes down and then before you know it, it comes back again. So the issue is—that's an issue of, you know, can you control that and not control that.

Mr. REUTTER. In Lake Erie, we really have very little control over the water level. There are over 20 diversions in and out of the Great Lakes with canals as well as a variety of different things. If you put all of the impacts of all of those water diversions together, they tend to raise the level of Lake Erie by about four inches. So there's very little impact as a result of those.

The biggest thing that we're seeing, we had warmer temperatures, which means we're going to see more evaporation. As we move further into global warming, all the models say that we're likely to have higher levels of precipitation, but they're going to come less frequently. So we'll have severe storms, greater precipitation, greater evaporation between those periods, and the water levels in the lakes will actually go down. So we're very concerned about that.

Mr. SPECK. There's only two places you know where the water levels—one is coming out Lake Superior and the other is coming out of Lake Erie—I mean, Lake Ontario. And those are very mild.

Senator VOINOVICH. Because I know we had the lake froze over this year and everybody thought that we'd have a lot more water. And then what, the other ones didn't freeze? Is that it?

Mr. REUTTER. Well, they did. But the upper lakes are down about 40 percent in precipitation—just about at all time lows. 90 percent of the water that comes into Lake Erie comes in out of the Detroit River. It was very good when Lake Erie froze over. Because when it's frozen, we get much less evaporation. So in that respect, things could have been far worse this summer than they are right now.

Senator VOINOVICH. And we flow into Lake Ontario?

Mr. REUTTER. Yes.

Senator VOINOVICH. One of the really wonderful things that happened this year is I finally got to visualize what is going on because we had our Canadian interparliament meeting at Niagara on the Lake. And we went over to see the power plants and to—I mean,

I never understood how they control the water flow coming out of Lake Erie and that we benefit from it in the U.S. And we almost mimic these hydroelectric facilities in that they—during the day, the flow is larger so that they can give the tourists the benefit of the flow coming over, and then in the evening, they divert it into ponds on both sides of the U.S. and Canadian side. And then when they reduce the—or limit the diversion, then they use these ponds to continue to provide the power for the hydroelectric. It's just really interesting how that was all put together.

I suggested, Ms. Marsh, that probably would never happen again because the environmental condition—and then god only knows where we'll be hit with some of that power.

Anyhow, I would be very interested in—maybe the last question I'd ask all of you is you—we've all heard this discussion about how do we get this, all these players together to get the comprehensive plan put in place. Maybe you can give me your final thoughts on that. How do we get that done?

Mr. REUTTER. I think we have some of the right plans in place right now. We need to support those actions. I think—quite frankly, I think that the pressure from the Federal level requesting that we speak with one voice has been very effective. We've heard a number of different groups say that they are—they have actions underway to plan for more collaboration and cooperation. I think we need to support all of those actions, because that is what is required.

We have, you know, we're very fortunate that the EPA's Great Lakes National Program does a great job. Great Lakes Fishery Commission does a great job. We have strong agencies, and trying to coordinate those agencies and enhance cooperation between them is a challenge. And I think it appears that the groups are ready to grab that challenge.

Senator VOINOVICH. I guess the thing that troubles me is that you have the Council of Great Lakes Governors, and I chaired that group for a couple of years. And you get turnovers to the Governors' offices and they're so busy trying to get themselves organized and their staff set up and everything else, that the priority I think this should be given is not given. And that's where I have some concern about the government involved in this issue. Because you can have people working there and then the new administration comes in, you get a turnover of staff, and then you lose your momentum. And it seems to me that there ought to be an ongoing way to continue to get the Governors input.

But I'd hate like the devil to have them in the driving leadership role because I—I mean, I know. I came in in Ohio and I restored the Great Lakes—the Lake Erie Commission, gave it high priority because this was something I was really interested in. But a lot of my colleagues could 't care less about it. The Governor of New York, that's way up there, you know. And if you don't have the right staff person, it just—Sam, you know what I'm talking about.

So that's what concerns me, is that we got to make sure that you've got some continuity here and that the thing keeps moving down the road and that it doesn't, you know, stop because of change in the administration and so on.

Mr. REUTTER. Keep saying that. Keep the pressure on. We need that.

Mr. SPECK. You need a couple of things. And one is you may call it pressure or you may call it encouragement. Whatever. But, you know, behind that is an indication that Feds might do something that the States might not like so well if the States don't have their act together. We all understand how that operates, Governor.

And the second, Senator, is the dollars. And I think with the legislations you cosponsored, there's an indication that Congress is serious. And I'm not only saying come up with a plan, but if you do, we'll be there to be good partners with you. I think both those elements have to be there. There has to be a belief that there will be resources as well as a belief that there will be consequences if the States don't show some leadership here.

And the legislation you put together gives the Governors an opportunity to move forward, and I see them as really doing this now. And as I indicated, you're probably going to see it in terms of weeks. And I have the authority to say that, weeks instead of months. They're recommended priorities for discussion.

So that, I think that we're on the cusp of really accomplishing something. But it's going to be tough. You know, we've been working on this annex, and the Governors set themselves up every year. We're trying to get Provinces and States and national governments to set up a standard for removal of water. Most of the States have not had any regulation over removal of the water to speak of or regulation of how water is used in their respective States.

So we're asking them to move a tremendous distance from where they have been. And, you know, this is that's never been tried anywhere else in the world. And if we can come up with an agreement, the Governors all endorse it in a 3-year period, it would truly be a remarkable exercise.

Mr. REUTTER. The scientific community has not helped with it as much as I'm sure you would have liked.

Mr. SPECK. Well, now even the IJC—I will be sorry for saying this—had a report that was prepared for them that says, you know, there's no way to take the water very soon and export, and we don't have all the science we need, so we shouldn't hurry this agreement along. I don't know if the IJC is going to figure out what to do with that report they commissioned. But, at least——

Senator VOINOVICH. Well, I can tell you this. And I'm not kidding you. There are people in Congress that have a little different perspective on things than I do, because I'm a former Governor and former mayor. It's like when we were always wanting to try to find something to do. We've got to every day get up early in the morning and try to figure out something we can do. Grab a hold of this and start running with it and say got to get it done. Instead of dragging their feet. We need to move on this thing and get it done. It's going to happen. That's one thing.

Mr. SPECK. The other thing, Senator, I would state, too, is that, you know, I have to acknowledge with five new Governors coming in, it's been a real effort to bring them and their staff up to speed. And we're making progress on that, but it's tough.

Senator VOINOVICH. Maybe what we ought to do is a get a letter from our committee to the Governors talking about how Congress

is interested in this and how we would like them, the new Governors—this is something that we need to—let's do that. Let's send a letter out and maybe that will give it a little higher profile for maybe some that are trying to grapple with it.

Go ahead.

Mr. STEIN. I could think of one issue, too. I think the restoration act is really a nice example, I think, of how to do it. Because it's authorized under the Joint Strategic Plan. And that Joint Strategic Plan has—all the management agencies are signatory to that. So we've brought under one umbrella all of those organizations. And I think we're making progress with these people.

So I think in some sense, even though it's a small area that we're looking at, the fact is that we have management agencies operating under that. The system has already been in place——

Senator VOINOVICH. Yes. I think one of the other things that we really need to do is, just the last thing I ever want to get involved in is to have some cockamamie massive plan and then have it——

Mr. STEIN. Derailed.

Senator VOINOVICH. You go to go see Charlie Brown to see if you can go forward with what you're doing. We've got to make sure that all this stuff that's out there is ongoing, they're moving with it, and we're not, you know, standing in the way of that.

Again, I want to thank you for being here, and I'm hoping before the end of the year we can get a couple other things done and get folks together. And maybe by this time next year, maybe we can be somewhat on the way to moving on this. I know it's not going to happen overnight, and I really want to make sure that we touch base with everybody.

Because I'll never forget, Sam and—we were talking about the coastal, you know, that we were going to put in about requiring people to when they sold their property to notify the purchaser when they live along the coastal——

Mr. SPECK. Coastal erosion.

Senator VOINOVICH. The coastal erosion thing. Well, what we did is—they move very fast, and I'll never forget, they came in the office and said we got this. And I said you really talked to everybody. Oh, yes, we talked to everybody. The fact is they hadn't talked to everybody. And we wrote them, told them to go back and, you know, do it over again.

And even with—this is the Transportation Research Allocation Track Program, which is now in Ohio we have where we prioritize the highways. And the real issue was developing standards that were objective so that somebody couldn't say that, you know, something got on the list because it was fixed. And I'll never forget this as long as I've been—I'm sure Governor Taft has them, these regional Cabinet meetings. So I'm over in Lima, Ohio and there's a bunch of county engineers. And I said, and we're moving forward with track proposal, and I've been assured by Jerry Ray that you all had input, da, da, da, da. So will you stand up if any of you feel that you haven't been involved. Everyone stood up. So, you know, they took that one back and worked on that some more. The point is you've got to make sure that you touch base with everybody. Because if you don't do your homework and touch bases, then you're going to fall right on your face. Because there's somewhere

along you're going to hit a land mine that's going to blow the whole thing up.

I think the real issue right now is let's really try to get the best brains on who the players are that should be at the table. And I'd like you to check back with some of your groups to see if they feel comfortable. Let's say you guys are representing them——

Ms. MARSH. Well, we certainly will talk to the departments.

Senator VOINOVICH. Thank you very much and please return. I would also like to thank the Great Lakes Science Center.

[Whereupon, at 12 o'clock noon, the committee was adjourned, to reconvene at the call of the Chair.]

[Additional statements submitted for the record follow:]

STATEMENT OF HON. GEORGE V. VOINOVICH, U.S. SENATOR FROM THE STATE OF OHIO

The hearing will come to order. Good morning and thank you for coming. First and foremost, thank you all for taking the time out of your busy schedules to participate in today's field hearing of the Senate Environment and Public Works Committee to examine the current and future efforts to restore and protect the Great Lakes.

Second, I thank Chairman Jim Inhofe for calling this hearing at my request. I look forward to continuing to work with my colleagues in the Committee and the House and Senate in advancing legislation to address what I believe is one of the most pressing environmental issues facing our nation restoration of the Great Lakes. Thank you also to the staff of Senator Inhofe and Senator Jeffords that made the trip up here from Washington. I appreciate your assistance in putting this hearing together.

While restoration is important to the plants and animals that call it home and to the 40 million people in the U.S. and Canada that depend on it for drinking water, it is also important to the economy and people's jobs. The Great Lakes region maintains the largest bilateral trade relationship in the world with the primary economic activities in recreation and tourism, shipping, agriculture, and manufacturing.

In terms of tourism, the eight Great Lakes States have about 3.7 million registered recreational boats, or about a third of the nation's total. Retail expenditures for recreational boating in the Great Lakes region is over $2.6 billion annually, slightly less than one-third of national expenditures in this category. The Great Lakes commercial and sport fishery alone is valued at more than $4 billion annually. It has been estimated that tourism in the Lake Erie area accounts for an estimated $1.5 billion in retail sales and more than 50,000 jobs. While I was Governor, Ohio moved from sixth to seventh in travel and tourism and Lake Erie was a major reason for this improvement.

Businesses also rely on the Great Lakes because, among other things, they provide an inexpensive and environmentally friendly means of transportation. In 2000, this system provided an estimated $1.2 billion in transportation cost savings to steel mills, utilities, grain terminals, and other key industries located near the 16 major U.S. ports in the system. These industries provide more than 37,000 direct jobs and are able to compete in the world economy because they can keep transportation costs low.

About one-third of the land in the Great Lakes basin is used for agriculture, supporting about 7 percent of U.S. agricultural production. One-fifth of U.S. manufacturing activity is based on the Great Lakes, and the region, combined with Canada, accounts for about 60 percent of steel production in North America.

Over the last century, these activities have been both a detriment to this resource and a blessing for the people in the region. Regardless of the past, restoration of the Great Lakes benefits both.

Today's hearing may seem like deja vu to some of you. One year ago, I held another field hearing in Cleveland at the Coast Guard station, which is about a stone's throw away from here also on the beautiful shores of Lake Erie. The purpose of that hearing was to look into the re-occurrence of dead zones or low oxygen areas in Lake Erie.

I am pleased that Dr. Jeff Reutter of the Ohio Sea Grant Program, who I have been out to see at Stone Lab on Gibralter Island, was able to testify at that hearing and is here today to provide an update on this situation and the water quality of

Lake Erie. He is one of the premier scientists working on Ohio's Great Lake, and I welcome him to today's hearing.

Also on the second panel is Ms. Elaine Marsh from Great Lakes United, who testified at last year's field hearing as well. Great Lakes United is a U.S. and Canadian coalition dedicated to preserving and restoring the Great Lakes. Last month, the organization testified at a hearing that I held as Chairman of the Subcommittee on Oversight of Government Management in the Governmental Affairs Committee on the management of Great Lakes programs.

I met with Ms. Marsh and several of her colleagues before the hearing on a report they released earlier this year on how to clean up the Great Lakes. I look forward to hearing from her this morning on the coalition's recommendations on how to move forward in restoring the Great Lakes.

I also welcome on our second panel Mr. Sam Speck, who is Director of the Ohio Department of Natural Resources and Chair of the Great Lakes Commission. Mr. Speck will be providing the Committee with an update on his work to implement a binding agreement between Canada and the U.S. on a standard for making decisions on proposals to export water out of the Great Lakes. Sam and I have been long time friends since we were in the legislature together. We worked together to create the Ohio EPA and Ohio's model reclamation law.

Dr. Roy Stein, who is Vice–Chair of the Great Lakes Fishery Commission and is also Director of the Aquatic Ecology Laboratory at the Ohio State University, will also testify on the second panel about invasive species and the State of the fisheries in the Great Lakes.

Lastly, I welcome the two witnesses we have for our first panel, Mr. Tom Skinner and Colonel William Ryan, who both testified at the hearing that I chaired last month on Great Lakes programs. Mr. Skinner is the U.S. EPA's Great Lakes National Program Office Manager and Colonel Ryan is the Deputy Commander of the Great Lakes Ohio River Division of the U.S. Army Corps of Engineers. They will both be providing information on our current restoration efforts and their thoughts on where we need to go from here to restore the Great Lakes.

While today is in many ways a follow-up to the hearings I held last year here in Cleveland and last month in the Governmental Affairs Committee, I think of it as just one more step toward my lifetime goal of restoring the Great Lakes.

Thirty-seven years ago, when I saw firsthand the effects of pollution on Lake Erie and the surrounding region, I knew we had to do more to protect our environment. At the time, Lake Erie was suffering from eutrophication and was known worldwide as a dying lake. Lake Erie's decline was heavily covered by the media and became an international symbol of pollution and environmental degradation. I remember the British Broadcasting Company the BBC even sent a film crew to make a documentary about it.

I made a commitment then, as a State legislator, to do everything possible to stop the deterioration of the Lake and to wage what I refer to as the "Second Battle of Lake Erie" to reclaim and restore Ohio's Great Lake.

I have continued this fight throughout my career as State Legislator, County Commissioner, Lieutenant Governor, Mayor of Cleveland, Governor of Ohio, and now United States Senator. I consider my efforts to preserve and protect Lake Erie and all of the Great Lakes to be among the most significant of my career and of my life.

One of my first actions as a State legislator was to introduce a resolution calling for a $360 million bond issue for municipal sewage treatment plant construction along Lake Erie. I also cosponsored the creation of the Ohio Water Development Commission to help industries eliminate pollution from our rivers and lakes, formed a legislature committee on Lake Erie that was responsible for stopping four States from going forward with exploratory drilling in Lake Erie, and chaired a subcommittee that wrote amendments to Ohio's air and water laws.

In addition, I was the vice-chairman of a seven–State Legislature Committee on the Environment that culminated in legislation to create State agencies of environmental protection in each of those States. Since I sponsored the legislation to create the Ohio Environmental Protection Agency, I am known as the "House Father" of the Ohio EPA.

Moreover, because of concern that the environment was not getting the attention it deserved, I worked to convince the Speaker of the Ohio House to create an Environment Committee, of which I was the first vice-chairman.

When I became a County Commissioner for Cuyahoga County in 1977, I helped stop the Energy Department from considering using the salt mines under Lake Erie as a storage area for nuclear waste.

As Mayor of Cleveland, I was alarmed about the introduction of zebra mussels into the Great Lakes and conducted the first national meeting to discuss the problem.

As Governor, I had another opportunity to continue the fight for Lake Erie's future. I made sure Ohio paid its fair share of the Great Lakes Protection Fund, a $100 million endowment to fund research on the Great Lakes. In addition, we breathed new life into the Ohio Lake Erie Commission Office, locating it in Toledo, and creating the Lake Erie Protection Fund, which is funded by proceeds from the sale of the Lake Erie license plates.

Due to my concern that baseline information had not been established to document where we started or to track the progress we had made, in 1998, we released the Lake Erie Water Quality Index to quantify the results of our efforts to clean up Lake Erie. Ten indicators were developed to provide a baseline on which to measure our progress and identify challenges for the future.

As a U.S. Senator, I am pleased to serve on the Environment and Public Works Committee and to work on many issues that impact our nation's ecosystem. It is comforting to me that 37 years since I started my career in public service, I am still involved, as a member of the U.S. Senate, in the battle to save and restore Lake Erie.

As a freshman Senator in 1999, I was fortunate to be selected as the Chairman of the Subcommittee on Transportation and Infrastructure. As the Chairman, I was the sponsor of the Water Resources Development Act of 2000. Through my involvement in WRDA 2000 and WRDA 1999, I supported environmental restoration programs for the Great Lakes under the U.S. Army Corps of Engineers.

One of the initiatives I authored is the Great Lakes Fishery and Ecosystem Restoration Program, which authorized the Corps of Engineers to plan, design, and implement projects that support the restoration of the fishery, ecosystem, and beneficial uses of the Great Lakes. WRDA authorizes $100 million specifically for projects to restore the Great Lakes fishery and ecosystem.

Last year, I cosponsored the Great Lakes Legacy Act, which was signed into law in 2002, to authorize $50 million per year for 5 years for the cleanup of contaminated sediments at Areas of Concern, such as the Maumee, Black, Cuyahoga, and Ashtabula Rivers in Ohio. While I was pleased that the President provided $15 million in his fiscal year 2004 budget for this program, I recently wrote the Appropriations Committee requesting that the program be fully funded so that we can make real progress toward cleaning up these persistent problem areas in the Great Lakes.

Through the years, I have also worked long and hard on addressing our nation's critical wastewater infrastructure needs. We have made great strides and spent billions of dollars to improve our nation's wastewater collection and treatment systems. In fact, since 1965, the amount of phosphorus entering Lake Erie has been reduced by about 50 percent, with most of the reductions achieved through better treatment of municipal sewage sources and eliminating phosphates in detergents.

Unfortunately, billions of dollars more are needed to upgrade aging systems and bring communities into compliance with the Clean Water Act. That is why I introduced legislation in the 106TH, 107TH, and 108TH Congresses to reauthorize the highly successful, but undercapitalized, Clean Water State Revolving Loan Fund program at a level of $3 billion per year for 5 years.

Just last week, on Thursday, I was honored by the Association of Metropolitan Sewerage Agencies with the National Environmental Public Service Award for 2003. Let me quote from the nomination and introduction that I received for the award:

"Over the last 3 years, Senator Voinovich has been an active member of the Senate Environment and Public Works Committee and has used this role to bring attention to the nation's wastewater infrastructure needs Senator Voinovich believes that preserving the quality of our streams, rivers, and lakes from wastewater pollutants comes down to a question of our commitment to funding. Senator Voinovich should be honored for his ongoing support of and commitment to wastewater infrastructure funding Clean water is ever in the forefront of his efforts for Ohioans and Americans."

During this Congress, I have been working hard with my colleagues on several initiatives. Continuing my efforts as a State legislator, I sponsored an amendment that was included in the fiscal year 2003 Omnibus Appropriations Act to extend the current moratorium on oil and gas drilling in the Great Lakes for 2 years until the end of fiscal year 2005.

Additionally, I am pleased that the President signed a bill earlier this year that I introduced to expand the Ottawa National Wildlife Refuge Complex in Ohio and the Detroit River International Wildlife Refuge in Michigan along the coast of Lake Erie.

Responding to the hearing last August on dead zones, I introduced a bill to reauthorize the Harmful Algal Bloom and Hypoxia Research and Control Act and expand it to include the Great Lakes, not just coastal marine waters. I then worked with the members of the Commerce Committee to include my provisions to create a Great Lakes research program in a bill they recently passed.

I have also cosponsored the Great Lakes Water Quality Indicators and Monitoring Act (S. 116) to expand the Index that I created as Governor to measure water quality in Lake Erie to cover all of the Great Lakes.

Furthermore, I am continuing to fight against the aquatic invasive species that are wreaking havoc in the Great Lakes. These aquatic terrorists are entering this great natural resource in the ballast water of boats from all over the world, and they must be stopped. That is why I have cosponsored the National Aquatic Invasive Species Act (S. 525) to help protect the Great Lakes from these species. In June of this year, I participated in a hearing on this bill, and I will continue to work with my colleagues to take action on this costly problem.

Still, there is much more that needs to be done to improve and protect the Great Lakes. I emphasize that this is an urgent need that deserves and demands a well-coordinated effort, one that cannot be met by simply adding individual programs to those that already exist.

The GAO made it clear in its report released earlier this year entitled: "An Overall Strategy and Indicators for Measuring Progress Are Needed to Better Achieve Restoration Goals" that the number of programs is not the problem. Rather, the report states that while there are many Federal, State, and local programs, restoration of the Great Lakes is being hindered because there is little coordination and no unified strategy for these activities.

Responding to the GAO report and to my long held concerns about Great Lakes restoration, I recently cosponsored the Great Lakes Environmental Restoration, Protection, and Recovery Act (S. 1398). In short, this bill moves us closer toward our goal of restoring the Great Lakes by providing funding and promoting coordination.

As some of you may know, I was intimately involved in the creation of the Comprehensive Everglades Restoration Plan. As Chairman of the Transportation and Infrastructure Subcommittee, I was proud to sponsor WRDA 2000, which approved this ambitious Plan. Earlier this year, I spoke at the 11TH Annual Everglades Coalition Conference in Florida, and I told them: "What I would love to do as Senator is to be able to put the same kind of coalition together that you've been able to do for the Everglades for the Great Lakes." This is my dream.

Right now, we have many groups Governors, mayors, environmental groups, Congress, and others that are all working separately on proposals and priorities to restore the Great Lakes. However, the fact of the matter is that if we are going to get something done, we need to create a symbiotic relationship with all of the public and private players in the U.S. and Canada in order to develop a comprehensive restoration plan for the Great Lakes.

This Plan is absolutely essential if we expect to continue to restore and improve one of the world's great treasures. From a selfish point of view, this plan would be the capstone of my legacy to Lake Erie and more importantly to my children and grandchildren and yours.

Again, my sincere appreciation to all of you for participating in this morning's hearing. I look forward to hearing about some of our current efforts and to having an informative discussion with you on the very important issue of restoring the Great Lakes.

Thank you.

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STATEMENT OF THOMAS V. SKINNER, REGION V ADMINISTRATOR, NATIONAL PROGRAM MANAGER FOR THE GREAT LAKES, U.S. ENVIRONMENTAL PROTECTION AGENCY

Good Morning, Senator. I am Tom Skinner, the U.S. Environmental Protection Agency's (EPA's) Region V Administrator and the National Program Manager for the Great Lakes. I am pleased to be here today to discuss our efforts to restore and protect the Great Lakes, the largest freshwater system on earth.

INTRODUCTION

I want to first take this opportunity to highlight mechanisms that EPA has developed to carry out Great Lakes priority setting and planning. Over the past few years, we have built a sound structure for achieving a collective vision of comprehensive ecosystem management for the Great Lakes.

We have a good understanding of the major environmental problems facing the Great Lakes today. In recognition of these problems, the fiscal year 2004 President's

Budget increased EPA's Great Lakes funding by $15 million, nearly doubling fiscal year 2003 levels. These additional funds will support the contaminated sediment projects newly authorized by the Great Lakes Legacy Act.

Efforts to develop the Great Lakes Strategy 2002, combined with information from the State of the Lakes Ecosystem reports have provided much valuable information and experience. EPA continues to gather more information on the condition of the Great Lakes, as part of the Agency's scientific research program. For example, we are working to develop integrated methods of detecting and predicting the spread of new invasive species introduced into the Great Lakes. We are also developing more rapid methods for measuring beach water quality (to get results in 1–2 hours, rather than the current 24 to 48 hours) and improving our protocols for monitoring, our goal being to better understand the relationship between water quality and its health impacts on beach goers.

What we do know is that:

- Invasive species in the Great Lakes, now in excess of 160, are causing serious economic and ecosystem health impacts. It is virtually certain more invasives will enter the system in future years.
- Toxic contamination has triggered more than 1,500 current fish advisories in the Great Lakes Basin. Cleaning up contaminated sediments and addressing inputs of toxic chemicals to the Lakes are key to solving this problem.
- Record numbers of beach closings have occurred in the Great Lakes in recent years due to nonpoint source runoff and sewage problems.
- A "dead zone" of water lacking oxygen has appeared in Lake Erie, impacting aquatic life, and indicating the health of the lake may be compromised.

The Great Lakes Strategy 2002, working along with Lakewide Management Plans and Remedial Action Plans, identifies these problems and form a complementary framework for current and future efforts to address them. A suite of goals and measures in the Strategy are guiding governmental partners toward solving these problems. Some of the most important goals are:

- By 2005, clean-up and de-list 3 Areas of Concern, with a cumulative total of 10 by 2010.
- By 2007, reduce concentrations of PCBs in lake trout and walleye by 25 percent.
- By 2007, establish 300,000 acres of buffer strips in agricultural lands using non-regulatory Federal and State programs.
- By 2010, 90 percent of Great Lakes beaches will be open 95 percent of the season.
- By 2010, restore or enhance 100,000 acres of wetlands in the Basin.
- By 2010, substantially reduce the further introduction of invasive species, both aquatic and terrestrial, to the Great Lakes Basin Ecosystem.
- Accelerate the pace of sediment remediation, leading to the clean-up of all designated sites by 2025.

CHALLENGES IN RESTORING THE GREAT LAKES

Some of the challenges in restoring the Great Lakes are:

The sheer geographic size of the system, and the range of problems present in

- the Great Lakes. The Great Lakes also require binational cooperation to achieve results.
- Coordination with numerous partners and jurisdictions—Eight Great Lakes States, over ten Federal agencies and over 30 Indian Tribes are responsible for carrying out environmental and natural resource management programs to protect and restore the Great Lakes. Many other key organizations such as the Council of Great Lakes Governors, the Great Lakes Commission, the Great Lakes Fishery Commission, and the International Joint Commission (IJC) also have extremely important roles.
- Public involvement—the very nature and value of the Great Lakes as a natural resource means many non-governmental partners and individuals from all sectors of society are interested in the Lakes' health.
- Potential for duplication of efforts. There are currently a number of plans and planning efforts for the Great Lakes that address different geographic scales. It is important to coordinate to ensure efforts do not cause unnecessary confusion, wasted resources, or lead to "reinventing the wheel."

WHERE DO WE GO FROM HERE?

It will be important as we move forward to continue to work with the Council of Great Lakes Governors to ensure that the Governors' priorities are emphasized and

that duplication of effort is avoided. The Great Lakes Strategy 2002, Lakewide Management Plans, and Remedial Action Plans, can serve as the starting point for this work.

In closing, I would like to thank you for the opportunity to speak today. I look forward to playing a key role working with our partners to continue progress on Great Lakes restoration efforts.

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STATEMENT OF COLONEL WILLIAM E. RYAN III, DEPUTY COMMANDER, GREAT LAKES AND OHIO RIVER DIVISION, U.S. ARMY CORPS OF ENGINEERS

*Introduction*

Senator Voinovich, I am pleased to testify before you on the restoration and protection of the Great Lakes.

The Great Lakes system is one of our nation's most vital natural resources. The world's largest freshwater system provides millions of U.S. and Canadian residents water for consumption, transportation, power, recreation, and a number of other uses. I look forward to continuing to work with our sister agencies, such as EPA, and other partners and stakeholders on approaches for restoring and protecting the Great Lakes.

My comments focus on Federal and non–Federal roles in addressing water issues on the Great Lakes and the importance of an integrated and collaborative process involving all affected parties to assure the protection of this vital resource. I will conclude with an overview of the various Army Corps of Engineers Civil Works programs and other activities that are focused on addressing Great Lakes water resources issues.

*Federal and Non–Federal Roles*

Primacy for water resources management in the U. S. has been and must continue to be at the State and local level. While it is appropriate for the Federal Government to be involved in issues of international, national or multi–State significance, such as the management of the Great Lakes water resources, it is the States, and in particular the Governors, who should be establishing the priorities for management of these shared water resources. The scope and technical complexity of water issues and the extent of desired participation by stakeholders mean that the Federal Government can facilitate State and local leadership by being responsive to their requests for effective coordination among Federal and non–Federal restoration programs and by bringing Federal analysis and program support to State and local efforts.

The diversity of restoration challenges of the Great Lakes Basin has spawned a number of intergovernmental organizations and committees to coordinate one or more specific issue, whether it is invasive species, wetlands restoration, water management, non-point source pollution, or contaminated sediments. A significant amount of planning and coordination has already been accomplished through these existing organizations and committees, including the U.S. Policy Committee, Great Lakes Commission, Council of Great Lakes Governors, and Great Lakes Fishery Commission.

*Integrated and Collaborative Watershed Approach*

The restoration challenges facing the Great Lakes are numerous and complex. The Great Lakes restoration challenges include contaminated sediments, invasive species, non-point source pollution, habitat alteration and loss, fish and wildlife conservation, and water management within a framework of two countries, eight States and two Provinces.

We believe that continuing restoration of the Great Lakes benefits from a watershed perspective, emphasizing collaboration and integration. Success requires the participation of all interested parties in the planning and decisionmaking process. This participation would foster an open dialog to integrate sometimes competing or conflicting water resource needs. Such integration and collaboration are indispensable to meeting water challenges.

*Overview of Corps Great Lakes Programs*

The Corps has a variety of Civil Works programs that are being utilized for the protection, enhancement and restoration of the Great Lakes ecosystem. The size and importance of this water resource and the complexity of the challenges before it necessitate a team approach to its management. The Corps has worked as a team member, as well as team leader, in different aspects of the collective environmental programs for the Great Lakes Basin.

The Corps has been a member of the team that monitors, predicts and regulates water withdrawals, flows and diversions through our support to the International Joint Commission (IJC) Boards of Control and reference studies. The Corps has been a member of the U.S. Policy Committee, and participated in the development of their Strategic Plan to facilitate the implementation of the Great Lakes Water Quality Agreement. The Corps has provided technical assistance to the U.S. Environmental Protection Agency (EPA) in the development of Lakewide Management Plans. The Corps has also provided technical assistance to States and local groups for the development and implementation of Remedial Action Plans (RAPs) at 16 of the Great Lakes Areas of Concern (AOCs).

The Corps has been a leader of team efforts to protect and restore the Great Lakes ecosystem from invasive species, including the dispersal barrier on the Chicago Sanitary and Ship Canal and sea lamprey barriers at various Great Lakes tributaries. The Corps is also leading the Great Lakes Fishery & Ecosystem Restoration program and other programs to restore and enhance aquatic habitat in the Great Lakes Basin in partnership with the Great Lakes Fishery Commission, Great Lakes States and Tribes.

Perhaps the most significant program the Corps has led to date is the removal and confinement of contaminated sediments from Federal navigation channels in the Great Lakes. Although this program was conceived as a measure for environmental protection rather than restoration, the Corps, in partnership with State and local governments has removed over 90 million cubic yards of contaminated sediments from the Great Lakes through this program. Over 70 million of that was from Great Lakes AOCs. Using its expertise in management of contaminated sediments, the Corps has been working with other Federal agencies and Great Lakes States on sediment cleanup projects. The Corps continues to work in partnership with the EPA to evaluate and demonstrate new and improved technologies for managing contaminated sediments.

Through a more recent program, the Corps is currently leading projects for environmental dredging at eight Great Lakes AOCs in partnership with State and local agencies.

The Corps conducted one the first ecosystem restoration plans for Lake Erie in cooperation with the EPA approximately 30 years ago and is conducting watershed management planning for what some call the sixth Great Lake, Lake St. Clair, in partnership with Federal, State and local agencies.

The Corps has four basinwide studies ongoing that are addressing specific or general water resource needs of the Great Lakes. The first of these is a U.S.–Canadian collaborative study of the existing navigation infrastructure in the Great Lakes and St. Lawrence Seaway. We are working with the U.S. Department of Transportation, Transport Canada, and the U.S. and Canadian Management organizations for the St. Lawrence Seaway to establish the baseline conditions of the existing infrastructure, commercial navigation use, and the environmental conditions of the Lakes and St. Lawrence River that may be impacted by the navigation system. We are also developing a bi-national framework for collaboration and partnership among the States and Provinces, Federal agencies, local entities, and stakeholders.

The second basinwide study is an inventory of biohydrologic information relevant to Great Lakes water management and will include a gap analysis of water-related data. This study is closely integrated with the Annex 2001 activities of the Great Lakes Governors.

The third basinwide study we have initiated in partnership with the Great Lakes States is an evaluation of the economic benefits of recreational boating in the Great Lakes, in particular those utilizing the Federal navigation system.

The fourth Great Lakes study the Corps is helping to develop a strategic plan in collaboration with the Great Lakes Commission. As authorized in Section 455(a) of the Water Resources Development Act of 1999, this study will produce a report to Congress with an analysis of existing water resource needs identified by Great Lakes States and stakeholders and recommendations for new or modified authorities to address unmet needs.

*Conclusion*

The Corps is pleased to have had the opportunity to appear before you and provide testimony on this important subject. We value highly the water resources of the Great Lakes, the partnerships we have formed with our sister Federal agencies, the Canadians, the Great Lakes States, Tribes, local governments and stakeholder groups in managing and protecting this unique resource.

The Corps looks forward to continuing these partnerships. Mr. Chairman, this concludes my remarks. I would be happy to answer any questions.

RESPONSES OF COLONEL WILLIAM RYAN TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

*Question 1.* According to the GAO report, $3.7 billion was spent on the Great Lakes Restoration from 1992 through 2001 but because there are so many different programs and groups, actual progress is hard to measure. Can you please describe what successes have been accomplished and provide any data you may have to show that progress has been made?

Response. The most significant accomplishment by the Corps of Engineers toward the restoration of the Great Lakes has been the removal of over 90 million cubic yards of contaminated sediments from Great Lakes harbors and channels through dredging of Federal navigation projects and management of these contaminated sediments at confined disposal facilities (CDFs). More than three-quarters of these contaminated sediments were removed from areas of concern designated by the Great Lakes Water Quality Agreement. A summary report on this program has been developed jointly by the Corps and Environmental Protection Agency (EPA) and will be delivered to Congress following review by the Office of Management and Budget (OMB).

Other accomplishments of significance have been the technical support provided by the Corps to States and local groups with the development and implementation of Remedial Action Plans (RAPs) and watershed management plans for Great Lakes areas of concern and tributaries. There are over 40 individual projects for habitat restoration in the Great Lakes Basin under planning or design by the Corps in partnership with State and local partners. At the same time, the Corps is working in collaboration with the Great Lakes Fishery Commission to develop an implementation plan for the Great Lakes Fishery and Ecosystem Restoration Program, authorized by Section 506 of the Water Resources Development Act (WRDA) of 2000.

The Corps has also provided technical support to the EPA at Superfund cleanups within the Great Lakes Basin, demonstrations of innovative technologies for contaminated sediment remediation under the Assessment and Remediation of Contaminated Sediments (ARCS) program, and support to the development of Lakewide Management Plans (LaMPs). Appendices III and IV of the GAO Report contains a summary of the expenditures on Corps programs that have contributed to the restoration of the Great Lakes.

*Question 2.* You speak a great deal about the Everglades and Chesapeake Bay in your testimony.

Given the level of local involvement as detailed by Ms. Elaine Marsh in her testimony, can you envision a means to develop a comprehensive plan without a Federal agency taking the lead? With so many citizen groups involved as well as State and local organizations, could one of these organizations coordinate the broader effort with Federal guidance but not necessarily Federal leadership, which has thus far failed to result in a comprehensive approach?

Response. What the Corps has learned from the Everglades and similar studies, such as Coastal Louisiana, is that development of a comprehensive restoration plan needs to address water challenges from a watershed view, emphasizing collaboration and integration among all stakeholders to ensure both environmental and economic prosperity. Since the primacy for water resources management resides at the State and local level, we found that the role of the Federal Government was to facilitate State and local leadership; to coordinate State, local and stakeholder involvement; and, to work with State and local interests to develop a framework for partnership and collaboration. Our success with the Everglades project resulted from developing a collaborative framework for actively communicating with and promoting participation of all interested parties in the planning and decisionmaking process. This participation fostered an open dialog on sometimes competing or conflicting water resource needs that had to be integrated into a comprehensive plan. We believe that this concept of integration is the key to meeting the water challenges that we collectively face. Based on what our State and local partners told us, we adopted nine watershed principles to guide our water resources management.

These watershed principles are:

1. Seeking sustainable water resources management;
2. Integrating water and related land management;
3. Considering future water demands;
4. Coordinating planning and management;
5. Promoting cooperation among government agencies at all levels;
6. Encouraging public participation;
7. Evaluating monetary and non-monetary tradeoffs;
8. Establishing interdisciplinary teams; and,
9. Applying adaptive management as changing conditions or objectives warrant.

Within this broad context, watershed partners must collaborate to simultaneously address multiple objectives—environmental quality, social effects, and national and regional economic development.

A comprehensive plan for Great Lakes restoration will require a Federal-State partnership that is inclusive of the diverse interests of multiple stakeholder groups and capable of balancing restoration goals with the needs for water resource use and economic development. Regionally within the Great Lakes Basin, this approach has been applied by the Corps of Engineers in the development of a watershed management plan for Lake St. Clair. For this study, the Corps worked in partnership with the Great Lakes Commission and with participation by Federal, State, Provincial, Tribal and local interests. The Corps has also employed this kind of partnership locally for environmental restoration at the Ashtabula River, Ohio and Onondaga Lake, New York. In these projects, the development of a restoration plan was directed by partnerships of Federal, State and local agencies through a committee structure. Elements of the planning process were then executed by the Corps, other partners, or private contractors. Although Federal funding for these restoration plans flowed through the Energy & Water Appropriations, the restoration plans were a product of the partnership.

Development of a comprehensive Great Lakes restoration plan by a Federal-State partnership would be most effective if private and nongovernmental stakeholder participation were coordinated by a single partner. The Great Lakes Commission, an interstate compact of the eight Great Lakes States with associate membership of the Provinces of Ontario and Quebec has demonstrated its ability to fill this role.

*Question 3.* Mr. Skinner testified that the region is not ready for a significant financial investment because research is still being conducted to show where things need to be changed and where to prioritize the funds. When will the four studies the Corps is working on the completed? Are there preliminary results you can share with the Committee?

Response. The Corps is currently developing the following studies that should each provide information relevant to the balancing of restoration goals with needs for economic development and use of water resources:

- Implementation plan for Great Lakes Fishery & Ecosystem Restoration;
- Inventory of biohydrologic information and report on gaps and inconsistencies;
- Strategic plan on Corps programs in Great Lakes Basin;
- Economic study on recreational boating in Great Lakes, and;
- Great Lakes/St. Lawrence Seaway navigational review.

The effort for the Great Lakes Fishery & Ecosystem Restoration Program (authorized by Section 506 of WRDA 2000) is preparing a plan for implementing the existing Joint Strategic Plan for Management of Great Lakes Fishery developed by Great Lakes States, Provinces and tribes. The plan will outline a process for the identification and prioritization of projects to restore aquatic habitat and restore beneficial uses. The draft plan is scheduled to be submitted to my office for review in November 2003.

The Biohydrologic Information effort (authorized by Section 455(b) of WRDA 1999) has inventoried available physical, chemical and biological data relevant to the management of water in the Great Lakes Basin. This study, conducted in collaboration with the Great Lakes Commission has included an analysis of data gaps and inconsistencies, and will make recommendations to Congress on new or modified data systems needed by States to manage Great Lakes water withdrawals, diversions and consumptive uses in accordance with the Annex to the Great Lakes Charter signed by the Governors and Premiers in 2001. The draft report is scheduled to be submitted to my office for review in November 2003 and will be submitted to Congress following subsequent review at the Washington level.

The Corps is developing a strategic plan for the development and management of Great Lakes water resources, as directed by Section 455(a) of WRDA 1999. This plan, being developed in collaboration with the Great Lakes Commission, has summarized existing Corps projects and programs in the Basin, evaluated regional water resource needs, identified unmet needs, and will include recommendations to Congress for new or modified Corps authorities to address critical, unmet water resources needs. The draft report is scheduled to be submitted to my office for review in November 2003 and will be submitted to Congress following subsequent review at the Washington level.

A study of the economic benefits of recreational boating in the Great Lakes Basin (authorized by Section 455(c) of WRDA 1999) is under development by the Corps in partnership with the Great Lakes Commission. This study is focusing on the benefits of recreational boating in and around Federal navigation projects. This study was requested by Great Lakes States because of concerns about the impacts of de-

ferred maintenance of Federal navigation projects on shallowdraft navigation users. The draft report is scheduled to be submitted to my office for review in June 2004 and will be submitted to Congress following subsequent review at the Washington level.

The Corps completed a report of a Reconnaissance Study on Great Lakes-St. Lawrence Seaway navigation improvements in December 2002. Based on review of this report, the Corps has initiated efforts to supplement the Reconnaissance Study in collaboration with Transport Canada, U.S. Department of Transportation, and the U.S. and Canadian St. Lawrence Seaway organizations. This study will provide baseline information about economic and environmental conditions in the Basin that might impact or be impacted by the binational navigation system. This baseline environmental information should be of particular value for comprehensive planning of Great Lakes restoration. The draft of this supplement to the Reconnaissance Study is expected to be completed in September 2005.

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RESPONSES OF COLONEL WILLIAM RYAN TO ADDITIONAL QUESTIONS FROM SENATOR VOINOVICH

*Question 1.* Based on the Corps' experience with other restoration projects, please estimate how long it would take to develop a comprehensive plan for the Great Lakes.

Response. Depending on the level of funding provided, a comprehensive plan for Great Lakes restoration might require 3–5 years to be completed. The establishment of a coordinating Federal-State steering committee would be essential to completing this study in a timely manner.

*Question 2.* I stated in my statement and at last month's hearing that we need to get everyone together if we are going to make progress on putting together a comprehensive restoration plan for the Great Lakes. Please assume that one of the Federal agencies, not necessarily the Corps, is asked to lead the development of a comprehensive plan. How do you think a project of this scope should be addressed and how can we get everyone together?

Response. A comprehensive plan for Great Lakes restoration will require the establishment of a cooperative Federal-State partnership that is inclusive of the diverse interests of multiple stakeholder groups and capable of balancing restoration goals with the needs for water resource use and economic development. There are several challenges and opportunities facing this task.

One of the challenges is the number of existing plans or strategies that have been developed to address one or more aspects of Great Lakes restoration. While it is important to recognize and utilize the content of these efforts, these plans were not developed with a common set of goals and objectives,. contain limited information on the costs and benefits of specific actions, and do not form an adequate basis for integrating and prioritizing multi-issue restoration activities. A significant effort will be required to inventory these plans and strategies, extract valuable information from them in alignment with a consensus-based set of restoration goals and objectives. Then, a decisionmaking framework should be developed to identify specific actions with estimates of costs and benefits, priorities and measures for monitoring progress.

One of the opportunities is the existing network of organizations for interagency coordination and stakeholder participation. The Great Lakes are blessed with a diverse and well-seasoned network of organizations representing the interests of Federal, State, Provincial, Tribal, municipal, industry, commerce, civic and environmental agencies and groups. The development of a comprehensive Great Lakes restoration plan could be expedited and enhanced by establishing a cooperative framework among existing interagency organizations to facilitate Federal-State oversight and broad stakeholder input.

*Question 3.* Please identify the construction backlog for the Great Lakes region.

Response. A table that outlines the backlog of Corps of Engineers construction projects in the Great Lakes region is attached. The balance to complete these projects is based on working estimates for specific projects or authorized funding limits for programs, and presumes a fiscal year 2004 funding level equal to the Administration's budget request. This table does not include future funding that may be required to construct small projects under the Continuing Authorities Programs (CAP). There are currently over 200 CAP projects in stages of planning, design or construction in the Great Lakes region.

*Question 4.* How do you recommend we develop a comprehensive restoration plan while continuing the programs that are currently successful and not delaying progress?

Response. There are a variety of restoration activities in the Great Lakes Basin that have been ongoing or in preparation for an extended period. Sediment cleanup projects, pollution prevention, soil conservation, habitat restoration, invasive species prevention and mitigation activities are being conducted or planned through a variety of Federal and State programs, including Superfund, Natural Resource Damage Recovery, other enforcement programs, Great Lakes Legacy Act, and several Corps programs for ecosystem restoration. The development of a comprehensive plan for Great Lakes restoration should not delay or impede these activities.

To avoid adverse impacts on existing restoration activities, the Federal-State partnership overseeing the development of a comprehensive Great Lakes restoration plan should recognize and celebrate the accomplishments of these ongoing efforts and provide interim results from the planning process to highlight the importance of these projects.

*Question 5.* Including the bill that I cosponsored (S. 1398, the Great Lakes Environmental Restoration Act), I have seen different mechanisms proposed to coordinate Great Lakes programs, such as a task force. What do you think would work best?

Response. The restoration of the Great Lakes requires a comprehensive plan that can serve as the basis for balancing restoration goals with the needs for water resource use and economic development. If a Federal-State partnership were formed or adapted from an existing interagency organization to develop this comprehensive plan, it would be most appropriate for that same partnership to continue to coordinate the implementation of that plan.

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RESPONSES OF COLONEL WILLIAM RYAN TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

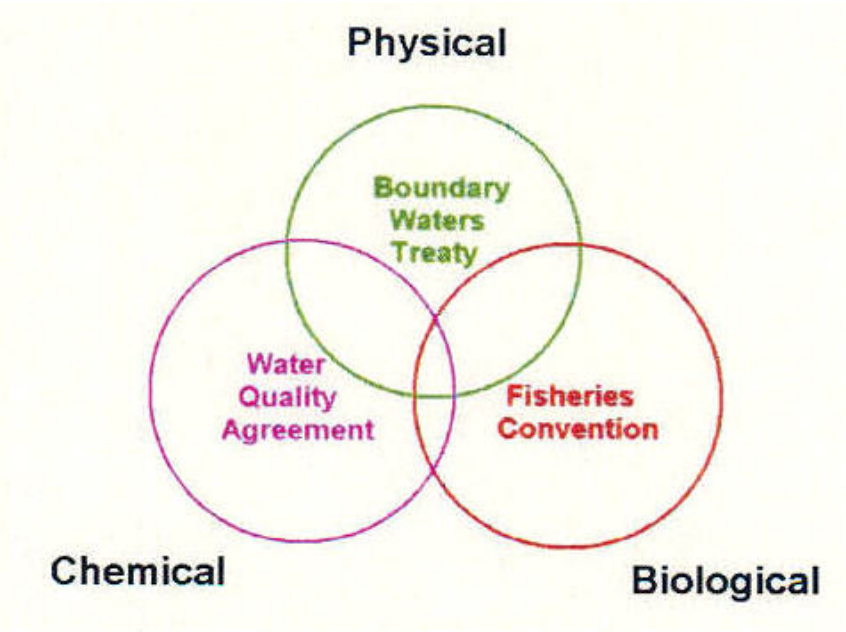
*Question 1.* Please provide an updated copy of the construction backlog, divided by project, by State. Identify the portion of the backlog attributable to the Great Lakes Region.

Response. The attached table and information provided in response to question 3 from Senator Voinovich provide a response to this question.

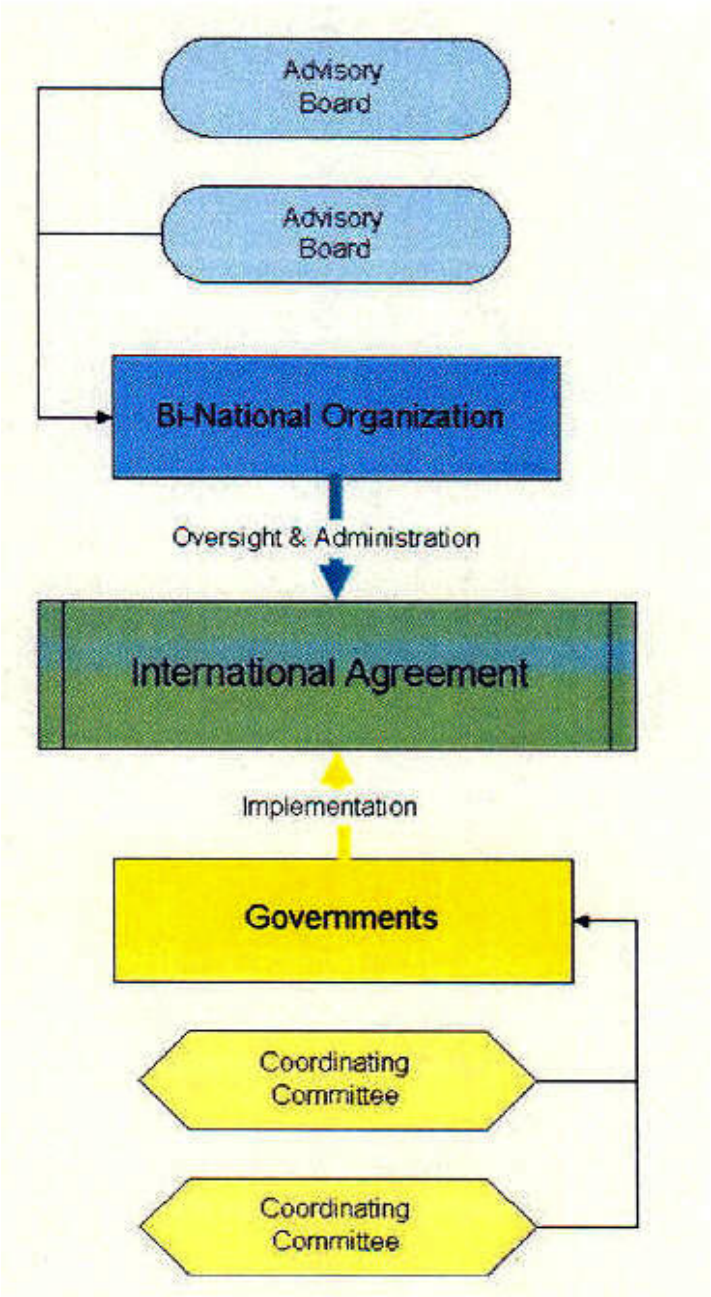
*Question 2.* Please provide a flow chart or other appropriate graphic description of the roles and responsibilities of each of the Federal agencies and the Canadian agencies involved in Great Lakes restoration. Identify what are the guiding strategic plans or other similar documents for the efforts of each agency. Describe the coordination process between the agencies.

Response. The diversity of environmental issues facing the Great Lakes cross multiple agency boundaries in a manner that does not lend itself to graphical representation. However, provided here is a simplified explanation of the binational agreements and institutions established to manage Great Lakes resources, and the general role of Federal agencies in this process.

The physical, chemical and biological resources of the Great Lakes are managed through three binational agreements between the United States (U.S.) and Canada: the Boundary Waters Treaty of 1909, the Great Lakes Water Quality Agreement of 1972, and the Convention on Great Lakes Fisheries of 1955. While these agreements do not explicitly address all issues related to the restoration of the Great Lakes, they serve as a platform for addressing most.



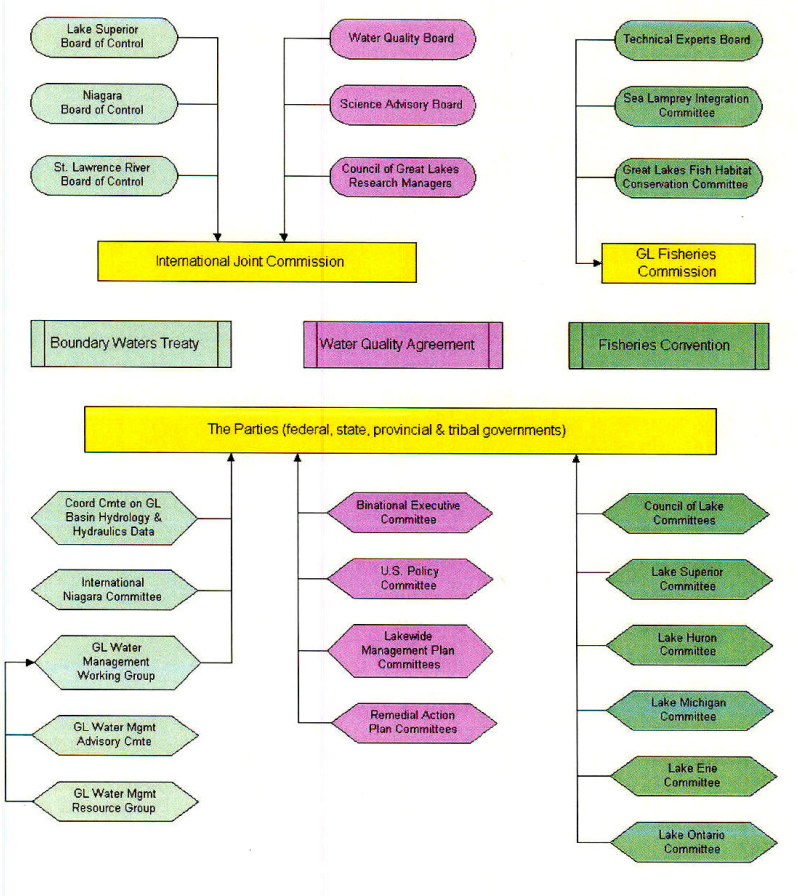

Two binational organizations were established to administer the implementation of these agreements: the International Joint Commission (IJC) and the Great Lakes Fishery Commission (GLFC). The IJC administers facets of the Boundary Waters Treaty and Water Quality Agreement while the Fishery Commission administers the Fishery Convention. In general, the implementation of the agreements is ??the responsibility of the U.S. and Canadian Governments, while the role of the binational organizations is to provide coordination, resolution of disputes, and review progress.




A number of advisory boards, councils and committees have been established by the IJC and GLFC to support their administrative responsibilities. The members on these advisory boards include technical experts from government, academia, and interest groups.

The Governments manage the resources of the Great Lakes in accordance with the terms of the agreements through the actions of Federal, State and Provincial agencies. These actions are coordinated through a number of committees and working groups established by the Governments.

A chart depicting the binational organizations, governments, advisory boards and coordinating committees is provided below. The relationships between the binational organizations and the governmental agencies are not always as simple as this graphic might suggest. Participation in coordinating committees by Federal and State agencies is dependant on the committee's purpose. For example, the Corps is the U.S. lead on the Coordinating Committee on Great Lakes Hydrology and Hydraulics Data and EPA is the U.S. lead on the Binational Executive Committee.




*Question 3.* Please provide your recommendations on how to measure progress in restoring the Great Lakes and how to define restoration.

Response. The goals for restoration of the Great Lakes as well as the measures of progress must be defined in the context of sustainability. As the Corps has learned from other large watershed studies, the restoration of natural resources must be balanced with sustainable economic development and use of the water resources. A comprehensive restoration plan should focus on reinstatement of beneficial uses of the natural resources of the ecosystem while balancing existing and future needs for water resource use and economic development. Sustainable balance is the key to defining restoration for the Great Lakes, and this balance is best developed through a process that emphasizes collaboration and integration.

*Question 4.* Please provide an inventory of all of the strategic plans for the restoration of the Great Lakes that you are aware of that are completed, underway,

or planned. Identify which, from your perspective, provide the most comprehensive approach to restoration.

Response. The GAO Report identified several strategic plans for Great Lakes restoration. The Corps has participated in the development of the Great Lakes Strategic Plan through the U.S. Policy Committee and has supported the development of Lakewide Management Plans and Remedial Action Plans directed by the Great Lakes Water Quality Agreement. The Corps has worked with the Great Lakes Fishery Commission to develop a plan for implementing the Joint Strategic Plan for Management of Great Lakes Fishery and has also worked with the Great Lakes Commission on its Program for Restoration of the Great Lakes.

Each of these plans has served to identify the issues facing the Great Lakes resources, raise public awareness of these issues and contribute information about the types of actions and level of resources required to address these issues. However, none of these plans has attempted to integrate the resolution of diverse resource issues in a sustainable context. None have identified restoration goals with consideration of existing and future water resource uses and economic development needs for the region. Without consideration of regional needs for water resource use and development, plans for restoration cannot be verified as feasible or justifiable.

For these reasons, we do not believe any of the existing plans provide a basis for comprehensive restoration of the Great Lakes in a sustainable fashion.

*Question 5.* What coordination takes place between the Great Lakes sea lamprey control program and sea lamprey control programs throughout the nation?

Response. The Great Lakes Fishery Commission (GLFC) has the lead for the sea lamprey program in the Great Lakes. Since 1955 the GLFC has implemented a sea lamprey control program in the Great Lakes using lampricides, barriers, traps and a lamprey sterilization technique. The Corps and the GLFC as partners constructed sea lamprey traps at the Soo Lock Complex in Saulte Ste. Marie, Michigan. The traps have helped in the management of the sea lamprey populations in the St. Mary's River and Lake Huron. In addition, the Corps has an active sea lamprey barrier program as authorized by the 1999 amendments to Section 1135, WRDA 1986. The Corps with our partner, the GLFC, is currently planning and designing sea lamprey barrier projects in Great Lakes States. The Corps has and will continue to work closely with the GLFC to help manage sea lamprey and restore the fishery of the Great Lakes.

The Corps is aware of the extensive cooperation between the GLFC and the Lake Champlain Fish and Wildlife Management Cooperative (LCC) in the suppression of sea lamprey in Lake Champlain. We recommend contacting Dr. Roy A. Stein, Vice-Chairman, Great Lakes Fishery Commission for a complete understanding of the coordination between the GLFC and LCC.

Summary of Backlog of Construction Projects in Great Lake Region

| State | Project Name | Total Federal Cost[2] ($000) | Allocated to Date ($000) | Balance to Complete ($000) |
|---|---|---|---|---|
| IL | Aurora (environmental infrastructure)[1] | 8,000 | 0 | 8,000 |
| IL | Casino Beach | 4,115 | 2,525 | 1,590 |
| IL | Chicago Sanitary & Ship Canal Dispersal Barrier | 3,238 | 3,122 | 116 |
| IL | Cook County (environmental infrastructure) | 35,000 | 406 | 34,594 |
| IL | Chicago Harbor (major rehabilitation) | 18,410 | 0 | 18,410 |
| IL | Chicago Shoreline | 174,000 | 138,490 | 35,510 |
| IL | Des Plaines River | 38,900 | 1,285 | 37,615 |
| IL | Des Plaines River Wetland Demonstration | 2,200 | 1,036 | 1,164 |
| IL | McCook & Thornton Reservoirs | 600,000 | 75,114 | 524,886 |
| IL | North Branch Chicago River | 23,829 | 23,829 | 0 |
| IL | Waukegan Harbor | 12,242 | 0 | 12,242 |
| IN | Calumet Region (environmental infrastructure) | 10,000 | 5,462 | 4,538 |
| IN | Indiana Harbor Confined Disposal Facility | 64,000 | 20,527 | 43,473 |
| IN | Indiana Shoreline Erosion | 184,000 | 10,257 | 173,743 |
| IN | Little Calumet River | 144,000 | 91,892 | 52,108 |
| IN | Little Calumet River Basin, Cady Marsh Ditch | 18,975 | 2,837 | 16,138 |
| MI | Genesee (environmental infrastructure) | 6,700 | 373 | 6,327 |
| MI | Great Lakes Fishery & Ecosystem Restoration | 100,000 | 0 | 100,000 |
| MI | Negaunee (environmental infrastructure) | 10,000 | 595 | 9,405 |
| MI | Oakland County (environmental infrastructure) | 20,000 | 454 | 19,546 |
| MI | Sault Ste Marie (Replacement Lock) | 166,750 | 6,956 | 159,794 |
| MN | Northeast Minnesota (environmental infrastructure)[1] | 40,000 | 5,171 | 34,829 |

Summary of Backlog of Construction Projects in Great Lake Region—Continued

| State | Project Name | Total Federal Cost[2] ($000) | Allocated to Date ($000) | Balance to Complete ($000) |
|---|---|---|---|---|
| NY | New York State Canal System | 22,370 | 7,563 | 14,807 |
| NY | Onondaga Lake | 180,750 | 14,214 | 166,536 |
| OH | Ashtabula River Environmental Dredging | 33,265 | 1,245 | 32,020 |
| OH | Ottawa River | 2,347 | 455 | 1,892 |
| OH | Ohio (environmental infrastructure) ' | 60,000 | 2,415 | 57,585 |
| PA | Presque Isle Peninsula | 56,310 | 19,630 | 36,680 |
| WI | Northern Wisconsin (environmental infrastructure)[1] | 40,000 | 141 | 39,859 |
| | Total | 2,079,401 | 435,994 | 1,643,407 |

[1]part of this project/program is outside the Great Lakes Basin
[2]total Federal cost based on project estimate or funding ceiling in program authority

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STATEMENT OF DR. ROY A. STEIN, VICE–CHAIR, GREAT LAKES FISHERY COMMISSION AND PROFESSOR, DEPARTMENT OF EVOLUTION, ECOLOGY, AND ORGANISMAL BIOLOGY, OHIO STATE UNIVERSITY

Mr. Chairman and members of the committee, my name is Roy Stein. I am the Vice–Chair of the Great Lakes Fishery Commission. I am also a professor in the Department of Evolution, Ecology, and Organismal Biology at The Ohio State University. On behalf of my Great Lakes Fishery Commission colleagues, I am pleased to be here today to discuss the Great Lakes fishery and to outline some challenges ahead for restoration of this invaluable resource. I commend Senator Voinovich for holding this hearing on the shores of the Great Lakes. The lakes require care and attention and we appreciate all you have done to help protect them for today and for future generations.

THE VALUABLE GREAT LAKES FISHERY

The Great Lakes fishery is a treasure shared by Canada and the United States. The lakes contain 20 percent of the world's supply of fresh water. The fishery draws millions of anglers to the shores of the lakes each year, supports tribal fishing, and creates tens of thousands jobs in the commercial fishing industry. The fishery generates up to $4 billion in economic revenue to the people of the region each year. Moreover, healthy fish communities are an integral part of a healthy Great Lakes environment. Without the fish communities and a healthy fishery, the Great Lakes lose their luster.

Nevertheless, today, like many shared natural resources, the Great Lakes fishery is stressed. Fish stocks require careful management to prevent depletion, native fish stocks require rehabilitation to levels of self-sustainability, the influx of invasive species that disrupt the ecosystem must stop, and sea lamprey control-the backbone of a healthy environment-must improve. Fishery managers at all levels of government must work together closely to coordinate their activities. The lakes are indeed shared resources and cooperation among managers is the key to ensuring a sustained fishery.

The Great Lakes is a complex system that spans a large geographical area. As such, it is very difficult to answer a seemingly simple question like "What is the state of the fishery?" The answer to such a question depends on where you are in the basin and in what species you are interested. The following are brief snapshots of the state of the fishery, on a lake-by-lake basis, based on reports from Federal, provincial, State, and tribal management agencies.

*Lake Superior*

Lake Superior supports a significant recreational fishery throughout the basin, and being more sparsely populated than the other Great Lakes, has the fewest recreational anglers. Lake trout comprise the lion's share of the recreational harvest in Lake Superior, though other species, including chinook and coho salmon, rainbow trout, and brown trout are also popular. The lake also supports important tribal and commercial fisheries, mainly of herring, whitefish, and lake trout. Commercial fishing peaked in the 1940's and today, is about one-fifth of what it once was.

Walleye was once an important species in Lake Superior, providing a harvest of thousands of pounds each year. Today, walleye harvest is negligible due to degraded habitat, poor water quality in the walleye's habitat, hydroelectric dams, and disruptions in recruitment. The management agencies on Lake Superior have established

a goal to maintain, enhance, and rehabilitate self-sustaining populations of walleye and their habitat throughout their historical range.

The Lake Superior fish community has been permanently altered by invasive species and remains at risk from future introductions. Disruptions in the lower food web are implicated in the poor condition of lake whitefish. Lake Superior, despite its relatively pristine state, remains quite vulnerable to human-induced alterations in habitat and water quality.

Despite these and other problems, Lake Superior has seen some spectacular successes in fishery management. The fish community is reverting to a more natural state, resembling historical conditions and requiring less management intervention. Lake whitefish, a staple of the Lake Superior fishery, remain at high abundances, though concern exists about the overall condition of whitefish. Moreover, the decades-long effort to rehabilitate lake trout in Lake Superior has paid off. Thanks to careful stocking, limited harvest, and sea lamprey control, lake trout are now self sustaining in most of the lake to the degree that stocking is no longer necessary

*Lake Michigan*

Lake Michigan supports commercial, recreational, and tribal fishing. Whitefish is the primary commercial species, though at one time, the lake supported smelt, yellow perch, bloater, and alewife fisheries as well. Salmon, trout, yellow perch, and walleye are the most popular sport species and lake trout and whitefish comprise the tribal fisheries.

Total harvest from Lake Michigan peaked in 1985 at 56.6 million pounds. Today, harvest averages 21.6 million pounds, illustrating a downward trend since the late 1980's. One major reason for this downward trend has been a significant imbalance between predators (e.g., salmon, lake trout) and prey (e.g., alewives, sculpins). Since the mid1990's, management agencies have been working successfully with their stakeholders to strike a balance between salmon stocking and the lake's ability to sustain these predators.

Despite these trends, sport anglers today are relatively pleased with the state of the Lake Michigan fishery. The balance between predators and prey have resulted in more salmon and generally bigger fish. The lake supports a thriving charter boat industry.

The lake does have some significant problems, however. Like the other Great Lakes, disruptions in the lower food web threaten to undermine the success of the fishery. For instance, the sharp declines in Diporeia-a native organism that serves as food for larger fish-are linked to invasive species and might be the cause of declines in whitefish abundances and condition. Yellow perch remain at troublingly low levels, thus prohibiting a resumption of commercial yellow perch fishing in Lake Michigan. And lake trout rehabilitation is experiencing extremely slow progress. Sea lamprey abundances (discussed below) remain higher than desired in Lake Michigan, which limits the success of the fishery are impairing rehabilitation.

Overall, the Lake Michigan fishery remains strong and popular. Management agencies work hard to balance salmon predators with their prey. Large-scale changes in the ecosystem, however, threaten to further disrupt an already fragile fish community.

*Lake Huron*

The Lake Huron fishery is dominated by chinook salmon, lake trout, brown trout, whitefish, and burbot. Alewives and smelt are the main prey fish. Predators and prey in Lake Huron seem balanced, though agencies are monitoring the fish community closely to ensure that the prey abundances are able to support the stocked trout and salmon. Agencies are working to bolster the mix of species in the lake by establishing diverse salmon and trout communities, improving walleye and yellow perch abundances, managing whitefish at sustainable levels, and rehabilitating sturgeon.

Habitat loss in Lake Huron remains a major concern. Agencies are working to protect and enhance fish habitat and to rehabilitate degraded areas with a goal of no net loss of habitat. Agencies also are concerned about the poor condition of whitefish and the high abundances of sea lampreys (discussed below) in Lake Huron, as sea lampreys are having a significant impact on the Lake Huron fish communities. The Great Lakes Fishery Commission has reduced the number of sea lampreys in Lake Huron, and agencies remain confident that the commission's recent treatments on the St. Marys River will further reduce sea lamprey populations. Disruptions in the lower food web, likely caused by invasive species, continues to threaten the fishery. Encouragingly, natural reproduction of lake trout is increasing.

*Lake Erie*

The Lake Erie fishery is best known for its walleye and yellow perch. Indeed, these popular fish species attract millions of anglers to the lake each year and sup-

port a lucrative commercial fishery. Strong year classes of yellow perch in the years 1996, 1998, and 1999 have helped sustain the yellow perch fishery in the lake. Yellow perch fishing—both sport and commercial—in 2002 was very good in all jurisdictions and the management agencies on the lake expect the good fishing to continue through 2003. However, a long, cold spring in 2002 resulted in poor yellow perch spawning success. Agencies anticipate reductions in yellow perch catch limits in 2004 in response to these poor spawning results.

The management agencies on Lake Erie reported that walleye spawning had been poor in 2000 and 2002 and recommended reducing the walleye catch limit in 2004. All agencies will be closely monitoring the success of walleye spawning in 2003 (early indications are that this will be a successful year for reproduction), though agencies anticipate significant reductions in the 2004 and 2005 allowable harvest.

A major issue affecting the Lake Erie fishery is a recent outbreak of botulism. Tens of thousands of primarily near shore, bottom-feeding fishes (including smallmouth bass, sheepshead, rock bass, stonecats, round gobies, sturgeon, and channel catfish) apparently succumbed to botulism. Gobies and dreissenid mussels appear to have played a role in recent mortalities attributed to botulism. Current thinking is that dreissenid mussels concentrate the toxin. Round gobies feed on the mussels, which are then eaten by fish and migratory birds. Though this is a plausible hypothesis, research is needed to identify the etiology for Type E botulism. There have been no human fatalities in recent years, but the possibility exists. (Indeed, type E botulism from improperly prepared Great Lakes fish caused several fatalities in the 1960's.) The botulism outbreak in Lake Erie is indicative of serious problems in the lake; problems relating to anoxia and the impact of invasive species such as zebra mussels.

The five jurisdictions along the lake have worked together in a highly successful and cooperative manner. The jurisdictions have expressed a great deal of concern about the recent major changes occurring within the ecosystem of Lake Erie, particularly changes driven by disruptions to the lower food web, probably caused by invasive species like zebra mussels. These changes have a profound influence on both the composition and productivity of the fish communities within the lake.

*Lake Ontario*

Lake Ontario supports a sport fishery comprised mainly of chinook salmon, coho salmon, lake trout, brown trout, and rainbow trout. Other popular species-fished primarily in shallow water-include yellow perch, walleye, smallmouth bass, and northern pike. Lake Ontario also supports some commercial fishing, though primarily in Ontario waters. Commercial species include lake whitefish and yellow perch, though harvest today is a fraction of its historical high in the early 20th century. Fishing in Lake Ontario is dominated by recreational anglers.

The recruitment of American eel, is a major concern in Lake Ontario. America eels have been reduced to 1 percent of historic recruitment levels. The rehabilitation of this important top predator will require an immediate and coordinated international effort, as American ells are highly migratory (they swim thousands of miles from the Great Lakes during their lives) and are extremely vulnerable during many of their life stages.

Charter fishing on Lake Ontario is extremely popular and the number of charter trips (nearly 8000 per year) remains steady. Although harvest of coho and chinook salmon and brown trout is currently lower than it was in the 1980's, harvest has remained steady for most of the 1990's to today, indicating a relatively stable fishery. Lake trout harvest is a fraction of its peak in the mid–1980's and efforts to rehabilitate the species have yet to be realized. Other popular species, such as smallmouth bass, yellow perch, and walleye, fluctuate in abundance from year to year, but harvest has remained relatively strong and stable. Sea lamprey abundances in Lake Ontario remain extremely low, indicating a successful control program.

COORDINATED FISHERY MANAGEMENT ON THE GREAT LAKES

Like any resource that is shared and stressed, careful management helps ensure equitable use for today and sustainability for the future. The Great Lakes present a management challenge as the lakes are shared by two nations, eight States, the Province of Ontario, and tribal authorities. An international border runs through the center of four of the five Great Lakes. The challenge all agencies face is managing a biologically connected fishery through a politically fragmented regime.

*State, provincial, and tribal authority*

Primary fishery management on the Great Lakes rests with the States, the province of Ontario, and two U.S. intertribal agencies. Each of these sub-national enti-

ties has an independent right to manage its portion of the fishery in the manner it chooses. This sub-national management authority has been long established, through common law and court cases. For instance, although the British North America Act gives the Canadian Federal Government control over inland fisheries, the provinces retain ownership of lake and river beds and, it has been ruled, the riparian rights to the fish. Through the Federal Fisheries Act, the Canadian government maintains the right to make and enforce fisheries regulations and policies pertaining to the conservation of fish stocks within Canadian waters. Much of the authority to implement these policies and to enforce these regulations has been granted to Ontario. In the United States, early Supreme Court decisions have upheld the States' ownership of lake and riverbeds and, thus, the fish in those waters.

In the U.S., tribes have management authority on their reservations and in waters ceded through treaties. In Canada, there are still many unresolved and emerging issues with First Nations' fishery management and, thus, the rights of First Nations to manage their own fishing activities is less developed than in the United States.

*Great Lakes Fishery Commission*

Because the lakes are shared by the United States and Canada, binational governance is required. As such, in 1955, the two nations created the Great Lakes Fishery Commission by treaty. The commission has management authority for sea lampreys but limited authority over the Great Lakes fisheries, largely because, for decades, the States and the province were reluctant to cede management authority to a bi-national body. The commission is made up of 4 Canadians appointed by the Privy Council and 4 American (plus one alternate) appointed by the President of the United States.

It was largely the destructive power of the sea lamprey (described below) in the mid 20th Century that prompted the governments to seek a binational fishery management treaty. The Great Lakes Fishery Commission is charged with several responsibilities including: coordinating fisheries research on the Great Lakes; carrying out sea lamprey control; making recommendations to governments about fish stocks of common concern; and, at the request of the sub-national governments, facilitating the implementation of A Joint Strategic Plan for Management of Great Lakes Fisheries (Joint Strategic Plan), discussed below.

*Federal Authority*

The Federal Governments of Canada and the United States also have a management authority on the Great Lakes. Several Federal agencies in both nations work with the sub-national agencies to support the management of the fishery.

The commission conducts sea lamprey control by contract with Federal agencies. Under State approval, the Federal agencies carry out rehabilitation initiatives, most notably, lake trout stocking. The Federal agencies contribute to the generation of information through scientific research. They also negotiate bi-national agreements, support the common good through budget and other initiatives, and have the trust responsibility toward tribes.

*Cooperative management*

Through the Joint Strategic Plan, the Great Lakes Fishery Commission has the responsibility to facilitate cooperative management on the Great Lakes. Indeed, the commission is keenly interested in helping all management agencies on the Great Lakes develop shared fishery objectives and manage the lakes as an ecosystem.

Together, the bi-national, national, and sub-national management agencies approach the Great Lakes from the same general perspective and with the same goals in mind. These perspectives and goals include:

- Working to sustain the Great Lakes fish stocks;
- Protecting diversity;
- Understanding and maintaining the balance between predators and prey;
- Adhering to science-based management; and
- Balancing the interests of stakeholders, including sport anglers, commercial fishers, tribal fishers, the environmental community, and many others.

Despite a generally common approach to Great Lakes fishery management, the various agencies had managed the Great Lakes fishery with little or no formal cooperation for decades. With the States, the province, the tribes, and the Federal Governments often doing their own thing, it is not difficult to envision a situation where consultation was minimal, common objectives non-existent, and agencies working at cross purposes, even, at times, on the same lake.

By the late 1970's, the agencies realized that some mechanism was needed to facilitate cooperation among the jurisdictions. In 1978, the eight States and the prov-

ince of Ontario joined with the Great Lakes Fishery Commission to develop the Joint Strategic Plan. The plan was adopted in 1981 and has been updated regularly, most recently in 1997.

In recent decades, particularly under the Joint Strategic Plan's direction, fishery agencies have been successful in resolving-or partially resolving-many fisheries management problems. Even so, many issues remain unresolved and new issues continually emerge. To assist fishery and environmental agencies in dealing with these problems, agencies, through the Joint Strategic Plan, have identified broad procedures that foster cooperation. The procedures suggested in the Joint Strategic Plan are:

- Consensus
- Accountability
- Information Sharing
- and Ecosystem Management.

Consensus: Agencies agree to reach consensus on management practices before they implement major initiatives. To help achieve consensus, agencies have developed common fish community objectives accompanied by operational plans, plans against which management decisions can be weighed. These objectives outline the goals for the fishery and how to achieve those goals. Agencies also agree that any change in fishery management practice that affects other jurisdictions must be agreed to by the other jurisdictions. In the rare instance where consensus cannot be achieved, the Joint Strategic Plan contains provisions for conflict resolution through the Great Lakes Fishery Commission or third parties.

Accountability: Fishery managers are accountable for implementing the decisions made under the Joint Strategic Plan. They implement the decisions through their own agencies. To promote accountability, the Joint Strategic Plan calls for the production of a decision record-primarily through the publication of meeting minutes. The Joint Strategic Plan also highlights the need for agencies to submit periodic reports about initiatives on each lake and the need for regular reports on progress toward reaching agency objectives.

Information Sharing: Information useful to management is something all agencies need. Information sharing has been difficult at times because the jurisdictions have a history of generating a variety of data in a variety of formats. To maximize information sharing, the Joint Strategic Plan calls for the development and implementation of standards for recording and maintaining fishery management and assessment data. Access to information is critical to the management agencies and to the public. The Joint Strategic Plan calls for agencies and the Great Lakes Fishery Commission to take the steps necessary to publish information and make it available through convenient means, such as the internet. Finally, under the Joint Strategic Plan, agencies pledge to share their data with other agencies.

Ecosystem Management: A guiding principle on the Great Lakes is that managers must look at the Great Lakes as a whole. This means that fishery mangers need to look beyond fishery management activities and respond to all issues that affect the Great Lakes. In particular, the Joint Strategic Plan calls for a heightened interest in environmental issues-such as Lakewide Management Plans or the Great Lakes Water Quality Agreement-in developing, achieving, and assessing the progress on fish community objectives. The Joint Strategic Plan also recognizes the incredible problem the entire ecosystem faces with exotic species and calls upon the agencies to promote procedures to protect the resource.

With these four procedures for cooperative fishery management in mind, how, exactly, does the Joint Strategic Plan function? Long before the Joint Strategic Plan, each lake had its own "Lake Committee," a loose set of Great Lakes Fishery Commission committees designed informally to help the commission and agencies focus on particular issues on each lake. When the agencies produced the Joint Strategic Plan in 1981, they decided to expand the use of the lake committees and use them as more formal means to carry out the Joint Strategic Plan.

Under the Joint Strategic Plan, high-ranking managers from agencies on each lake meet as a committee to address the issues of importance to that lake. For example, managers from jurisdictions on Lake Huron-which include Ontario, Michigan, and the Chippewa–Ottawa Resource Authority-meet as the Lake Huron Committee. A Council of Lake Committees-comprising all members of the lake committees-looks at Great Lakes fishery issues from a basin wide perspective.

The Joint Strategic Plan is designed to be a bottom-up process, where management decisions are driven by science generated by field researchers. To foster that design, each lake committee has a technical subcommittee to conduct and digest research and to report those findings to lake committee members. This structure allows the field researchers and assessment biologists to come to a common under-

standing of the science, free from policy issues considered by the lake committees. Lake committee members then use that bottom-up-produced science as the basis for their management decisions.

The Joint Strategic Plan also provides for a coordinated approach to law enforcement. While each national and subnational jurisdiction maintains its own law enforcement capabilities and responsibilities, there is considerable need on the Great Lakes for law enforcement agencies to work together. Indeed, because the Great Lakes is an ecosystem, it would make little sense for agencies to stop their pursuit of lawbreakers at a political line. To facilitate coordinated law enforcement, a Law Enforcement Committee develops and works to implement common law enforcement initiatives. This committee reports to the Council of Lake Committees.

- Lake Erie Committee
- G.L. Fish Health Comm.
- Technical Committee
- Lake Huron Committee
- Technical Committee
- Lake Ontario Committee
- Technical Committee

Finally, to facilitate interagency cooperation, the Great Lakes Fishery Commission also supports the Great Lakes Fish Health Committee and the Fish Habitat Conservation Committee. The Fish Health Committee studies issues relating to fish disease spread, prevention, and mitigation. The Fish Habitat Conservation Committee-whose members are appointed by the commission-comprises government and non-government habitat experts to study and recommend measures for ensuring fish habitat protection.

Lake committee meetings are held annually, in public. They serve as a forum to develop common objectives for the lake, to share scientific information, and to allow agencies a place to make decisions on such things as stocking, harvest, law enforcement, and environmental management. It is important to note that all decisions made through the lake committee process must still be implemented by the individual agencies. That is, managers agree to take lake committee actions back to their own jurisdictions for implementation. Thus, the consensus-based lake committee process is non-binding and only as successful as the willingness of the individual agencies to adhere to the collective decisions. Even so, this process is highly effective as it serves to maximize cooperative management and minimize conflict. Figure 1 illustrates the lake committee structure.

Council of Lake Committees Law Enforcement

- Lake Michigan Committee
- Technical Committee
- Lake Superior Committee
- Technical Committee
- Habitat Conservation Comm.

(Members appointed by GLFC)

Figure 1: Lake Committee Organization

The Great Lakes are widely viewed as the best example of cooperative fishery management anywhere on earth. Lake committees are clearly the strength of the Joint Strategic Plan. As expected with any shared resource, issues about fairness of the allocation of the fishery, management responsibilities, and transparency arise on the Great Lakes. The Joint Strategic Plan and the lake committee process are capable of handling these challenges. In the absence of this process, agencies would retreat to parochialism, with management chaos ensuing.

INVASIVE SPECIES: THE PRIMARY THREAT TO THE GREAT LAKES FISHERY

One particularly important issue facing the Great Lakes Fishery Commission and the lake committees is invasive species. Invasive species-undesirable plants and animals not native to a system-have been increasing steadily in numbers, particularly as commerce in the Great Lakes region has become more global and dynamic. Invasive species cause enormous ecological and economic damage to the region. Invasive species such as sea lampreys, zebra mussels, Eurasian ruffe, Bythotrephes, and round gobies have changed the very nature of the Great Lakes forever.

According to published reports, 162 non-native species have become established in the Great Lakes region since the late 1800's. Twelve of these species have entered the Great Lakes since 1990, around the time ballast water exchange-designed to protect the lakes against invasion-went into effect. Once a species invades and takes hold, the species becomes a permanent fixture of the ecosystem.

Since the 1950's, when the St. Lawrence Seaway opened the lakes to direct foreign shipping, ballast water has become a dominant means by which new species enter the system. Today, the vast majority of invasive species in the Great Lakes originate from Eurasia and arrive in ship ballast. Invasive species have the potential to enter the lakes through other channels as well, including the Chicago Sanitary and Ship Canal and through the commerce of live food, bait, and aquarium fish.

Concurrent reports from the United States General Accounting Office and the Auditor General of Canada, released in October, 2002, brought major attention to the invasive species problem. The reports provide little reason for optimism. Among the findings of both reports:

- The Federal Governments of Canada and the United States have not responded effectively to the invasive species threat;
- Invasive species are a leading cause of biodiversity loss and economic loss, costing billions of dollars each year;
- Measures put into place to prevent aquatic introductions (such as ballast water monitoring and
ballast water exchange) have not prevented new introductions;
- Canada and the U.S. have neither a binational approach to invasive species nor do they have a
single agency in charge of managing the problem; and
- Effective ballast water management techniques may require at least 10 years to develop and implement.

The Great Lakes remain extremely vulnerable to new invaders, underscoring the critical need to (1) prevent the introduction of new organisms, (2) address the ballast water vector, (3) stop transmigration of species through the Chicago Sanitary and Ship Canal, and (4) address the trade of live organisms from outside and within the region. As one view of the importance of this problem, most scientists and stakeholders working in the Great Lakes today will list invasive species as the most pressing issue the region faces.

The Great Lakes Fishery Commission is deeply encouraged by the introduction of the National Aquatic Invasive Species Act (NAISA–S. 525, H.R. 1080 and H.R 1081). I join with my fellow commissioners in commending Senator Levin and Congressmen Ehlers and Gilchrest for introducing these important bills and thanking Senator Voinovich for being an original co-sponsor of the Senate legislation.

These bills, if passed as written, will be a major step forward in efforts to address the invasive species problem. In particular, the commission believes NAISA includes important safeguards for the Great Lakes, establishes clear deadlines for action, and addresses vital needs such as strong ballast standards for ocean-going vessels, investigation of invasion pathways, rapid response, the construction of a dispersal barrier system near Chicago, and research, just to name a few.

The commission strongly urges Congress to pass this legislation. The sooner the bills are passed, the sooner we will be addressing these pressing problems. We cannot afford to wait a day longer: The next oceanic vessel entering the Great Lakes could have the next "zebra mussel" on board. Asian carp are swimming their way steadily toward the Great Lakes. Millions of potentially harmful fish are sold live in the Great Lakes basin. This legislation will address these and other problems, but we must act now.

The commission also notes that the International Joint Commission (IJC), in its previous two biennial reports, has requested a reference from governments to address the invasive species problem. The commission believes the IJC is an appropriate body to investigate this issue on a binational level and, therefore, urges the governments of Canada and the United States to grant this reference to the IJC.

SEA LAMPREYS AND THEIR DEVASTATION

Let us focus, now, on one particular invasive species: the sea lamprey. Among the more than 162 exotic species that have become established in the Great Lakes basin, the most detrimental to the basin's fisheries has been the sea lamprey, a parasitic fish native to the Atlantic Ocean. Sea lampreys entered the Great Lakes in the early part of the

20th century through federally constructed shipping canals and by 1937 had infested waters of all of the Great Lakes. Unlike the other invasive species we contend with, sea lampreys can be controlled.

During its lifetime, each sea lamprey, by attaching to fish and feeding on their body fluids, can kill and consume 40 or more pounds of fish. By the mid–1940's, sea lamprey predation, combined with overfishing and other problems, destroyed many extremely valuable fisheries in the Great Lakes. Losing predators such as lake trout and burbot and subsequent sea lamprey predation on other species, has led to catastrophic declines in the economic value of Great Lakes fisheries.

The declines in the Great Lakes fishery can hardly be exaggerated. Before sea lamprey control began in the 1950's, nearly 85 percent of the fish in the Great Lakes exhibited sea lamprey wounds and the harvest, which had been about 20 million pounds of fish annually before the sea lamprey invasion, collapsed.

The sea lamprey literally destroyed a way of life for the people of the Great Lakes region and threw the environment into chaos. Even with sea lamprey control measures in place, the lampreys continue to pose a significant threat to the fish. In some areas, sea lampreys still kill more fish than are harvested by humans. We also know that if sea lamprey control were to be relaxed-even briefly the species would spring back quickly and in deadly fashion.

*Sea Lamprey Control*

By the early 1950's, the governments of Canada and the United States, in addition to the province of Ontario and the States, agreed that the sea lamprey problem must be addressed at the highest level if the Great Lakes fishery were to survive. To that end, the Federal Governments negotiated and ratified the 1955 Convention on Great Lakes Fisheries, which created the Great Lakes Fishery Commission. The commission was charged with developing and implementing a sea lamprey control program and with coordinating fisheries research, duties the commission maintains to this day.

The commission actively manages the program and works in partnership with Fisheries and Oceans Canada, the U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers to deliver sea lamprey control. The commission continues to insure that fishery management on the Great Lakes is carried out on an ecosystem basis and in the spirit of binational cooperation. The Convention remains a highly successful blueprint for cooperative fishery management. Canada and the United States each consider the working relationship on the Great Lakes to be a model of successful binational resource management.

Sea lampreys are controlled on the Great Lakes using a number of innovative, effective techniques. The primary management tool is a lampricide, called TFM. TFM is applied in Great Lakes streams where sea lampreys live as larvae. The lampricide is selective to lampreys, meaning it kills lampreys with little to no impact on non-target species. TFM has been applied to Great Lakes streams since 1958 and is fully registered with the Environmental Protection Agency. Streams with sea lampreys present require TFM treatments every 3–6 years, depending on the stream's productivity. Between 60 and 70 streams are treated annually with TFM.

The commission also relies on other alternative, non-chemical techniques to control sea lampreys. Sea lamprey barriers are used to prevent sea lampreys from reaching their spawning grounds. Once a barrier is constructed in a stream, the stream generally does not require lampricide treatments above the barrier. Sea lamprey traps are used to remove lampreys from the system before they spawn. The lampreys caught in traps are used in the innovative sterile-male-release-technique, a technique where spawning male sea lampreys (which are past their feeding stage and, therefore, are not actively destroying fish) are sterilized and released back into the system. The sterilized males compete with fertile males to spawn, thus wasting the female's spawning potential.

Together, these sea lamprey control techniques comprise the tools in the commission's arsenal to combat this destructive pest.

*The Success of Sea Lamprey Control*

The commission's sea lamprey control program has been a tremendous success-probably successful beyond the expectations of those who negotiated the Convention

on Great Lakes Fisheries, and stands as one outstanding example of environmental damage mitigation.

In the Great Lakes, sea lamprey abundances are near or below target levels in Lakes Ontario and Erie. Sea lamprey abundances are slightly above targets in Lakes Superior and Michigan and significantly above target in Lake Huron. The high abundances of sea lampreys in Lakes Michigan and Huron are because of high sea lamprey production in the St. Marys River. The commission began an aggressive, on-going sea lamprey suppression program for the St. Marys River in 1999 and expects the sea lamprey abundances in Lakes Michigan and Huron to approach acceptable levels. Sea lamprey abundances in Lake Superior are a bit higher than we find acceptable and, therefore, the commission will be stepping up its treatment work in that lake.

Overall, the sea lamprey control program has been a phenomenal success. The Great Lakes Fishery Commission and its partners have reduced sea lamprey populations by about 90 percent from their historical abundance. Because sea lamprey eradication is impossible, the control effort is ongoing.

The successful sea lamprey control program is the cornerstone of a healthy and vibrant fishery. Sea lamprey control allows provincial, State, Federal, and tribal fishery management agencies to stock fish and implement other restoration activities with confidence, knowing that their fish will likely survive to reproduce or be caught by humans.

Sea lamprey control allows agencies to make substantial progress in their efforts to re-establish self-sustaining populations of our rare, valuable, native species.

Sea lamprey control promotes a healthier Great Lakes fishery, creates a more stable environment, and provides significant economic and recreational benefits to the people of the region.

Sea lamprey control has increased the popularity of sportfishing in the Great Lakes since the early 1960's, protects tribal fishing, and supports thousands of commercial fishing jobs.

Sea lamprey control is indeed the foundation of a fishery that has rebounded from the most dire conditions of the 1940's. Today, the fishery again is a highly valued resource to the people of North America. The millions of people who fish the Great Lakes recreationally, tribally, and commercially demand the delivery of an effective sea lamprey control program. Investments in sea lamprey control are investments not only in today's fishery, but also are investments in the fishery that future generations will enjoy.

*Alternative Sea Lamprey Control And The Lampricide Reduction Goal*

Despite the importance of the lampricide TFM in the sea lamprey control effort, the commission set a goal to reduce lampricide use by 50 percent by the year 2010. Lampricides are costly and the commission is sensitive to concerns about the use of pesticides, even safe and proven pesticides like TFM. Furthermore, successful pest management programs rely on several techniques working together to achieve target levels of suppression.

To reach its lampricide reduction goal, the commission has invested in alternative, non-chemical means to control lampreys including the aforementioned barriers, traps, and the sterile-male-release technique. Already, the commission has reduced lampricide use by more than 35 percent from the peak use of the 1980's.

Achieving the lampricide reduction goal is possible, but only through continued investment in alternative controls. The commission has been committed to making that investment by devoting greater percentages of the lamprey control budget to alternative techniques. In 2003, the commission will apply approximately 25 percent of its sea lamprey budget to alternative controls. This is an increase from only about 15 percent devoted to alternative controls just a few years ago.

Reductions in lampricides through the research into and the development of alternative techniques is providing real program savings today. Lampricide reductions since the late 1980's are now saving the commission more than $1 million per year in lampricide and treatment costs, while still allowing for the same level of sea lamprey control. Furthermore, sea lamprey control on the St. Marys River depends on alternative controls. Continued reductions in the amount of lampricides used will take place and the commission will remain vigilant that these reductions do not compromise the effectiveness of sea lamprey suppression.

The commission also has a vision to develop and implement at least one new sea lamprey control technique by the end of the decade. The commission is highly encouraged by the success of alternative control techniques (e.g., the sterile-malerelease-technique) and believes it is imperative to research and develop new techniques.

New research into sea lamprey pheromones-another major initiative-will help the commission reach its goal. Pheromones are natural attractants sea lampreys use to indicate to spawning lampreys which streams are suitable for spawning or to attract mates once in the spawning stream. By understanding how sea lampreys use pheromones, scientists seek to direct lampreys into traps or disrupt sea lamprey spawning behavior in some fashion. The commission believes pheromones have much promise to transform sea lamprey control in the Great Lakes basin and, therefore, views enhancing its development and application as a high priority. The commission will undertake major field trials for pheromones as soon as spring 2004.

Sea lamprey control is only as successful as the governments' willingness to fund the effort. Currently, the program receives enormous support in both Canada and the United States, though the control effort is still underfunded. The commission received $12.2 million in fiscal 2003, nearly $1 million less than the fiscal 2002 level and a full $4 million less than was requested by the commission to deliver a full program. The commission requires adequate funding if it is to maintain the successful sea lamprey control effort and devote full attention to lampricide reduction.

ASIAN CARP: AN IMPENDING INVASION

Sea lampreys have been the bane of the Great Lakes for more than 80 years. Asian carp, which are at our doorstep, threaten to be the next "sea lamprey." Two species of Asian carp are making their way toward the Great Lakes-the silver and bighead carp. A third species of concern-the black carp-escaped into the Mississippi River in 1994, but to date, only one has been detected in the wild. Biologists are monitoring the resource carefully for occurrences of the black carp.

The silver and bighead carps were imported, in the early 1970's from Asia by fish farmers in southern States, to control plankton blooms in channel catfish production ponds. Both species escaped into the Mississippi River in the 1980's. Biologists believe that major floods in the early and mid–1990's allowed the carp to significantly expand their range. Currently, bighead and silver carp are found near the Chicago Sanitary and Ship Canal, which connects the Mississippi River to the Great Lakes. The carp are now within 50 miles of Lake Michigan. The silver and bighead carp have a remarkable ability to spread and proliferate. In some areas of the Mississippi, Asian carp now already comprise 95 percent of the biomass.

In addition to the Chicago canal system as a vector, fish are routinely imported live into the region for sale as food and are a popular fish at live-fish markets in the Great Lakes basin. For instance, more than 900,000 pounds of live Asian carp are trucked each year into Ontario from the United States, to be sold at fish markets on the shores of the Great Lakes. Fish markets exist, for instance, in Toronto, Chicago, and New York.

Moreover, millions of juvenile fish are sold as baitfish or as aquarium fish in the Great Lakes basin. Like the carp sold in fish markets, aquarium and baitfish are trucked into the basin (and in some cases reared in the basin) and sold live. Once these live fish are sold, they are out of the control of the sellers. For example, there is a serious risk that once an angler is finished fishing for the day, the angler might release invasive fish (such as Asian carp) that are mixed in with the rest of his or her unused bait.

If the Asian carp are allowed into the lakes, they will likely become a permanent, noxious feature of the Great Lakes environment. They have several characteristics that make them "invasive." They are fecund and they grow rapidly. They are well suited to the climate of the Great Lakes; their native range in Asia is similar to the conditions in the

Great Lakes region. There is little doubt that the carp will survive in the Great Lakes and compete directly with the lakes' native fish for zooplankton (small animals in the water column that form the base of the food web).

Tremendous efforts are underway to prevent an Asian carp invasion. To date, these efforts have centered on blocking the migration of carp from the Mississippi River system into Lake Michigan. An experimental electric barrier constructed by the U.S. Army Corps of Engineers to control invasive species migration began operation on April 9, 2002. This electrical barrier serves as the only line of defense against the Asian carp. A second barrier is currently being built through a partnership with the Great Lakes Fishery Commission, the International Joint Commission, the U.S. Army Corps of Engineers, and the State of Illinois.

In addition to work on the Chicago canal system, there is also significant work to prevent entry via the trade of live organisms. The Council of Lake Committees (composed of provincial, State, and tribal management authorities), and the Great Lakes Law Enforcement Committee (provincial, State, Federal, and tribal law enforcement officials, have been working with governments to encourage sub-national

laws banning the possession of live Asian carp (and other potentially injurious exotic species). Already, several States have banned the possession.

The U.S. Federal Government, along with State and local governments, have spent millions of dollars to help prevent the Asian carp invasion. These investments in the Chicago Sanitary and Ship Canal, while costly, are necessary to the protection of the entire Great Lakes basin and are a fraction of the economic harm these carp could cause to both nations if they are allowed into the system. The commission has several specific recommendations to address the Asian carp problem:

1. Support an annual appropriation (from the U.S. Army Corps of Engineers' budget) for operations and maintenance of the existing invasive species barrier on the Chicago Sanitary and Ship Canal.

2. Support the construction of a second dispersal barrier by supporting section 107 of the National Aquatic Invasive Species Act, by inserting language into the Water Resources Development Act, or by supporting language in the Energy and Water appropriations bill that authorizes the second barrier at full Federal cost. (This authorization should appear in the legislative vehicle most likely to move quickly through Congress.)

3. Support research into a permanent and innovative biological separation of the Great Lakes and Mississippi River watersheds.

4. Support the provision in the National Aquatic Invasive Species Act that calls upon the Corps of Engineers to investigate the effectiveness of dispersal barriers in preventing the spread of invasive species via canals.

5. Support the provision in the National Aquatic Invasive Species Act that establishes a screening process for the importation of new organisms.

6. Support applying the Lacey Act to list as injurious the three species of Asian carp-the black, silver, and bighead carps-in order to ban the importation and transportation of these species.

7. Support the development of a "clean list" (as opposed to a "black list") of species acceptable for live trade. This puts the onus on the importer to prove that the species will do no harm, as opposed to the onus being on society to prove that it will.

8. Urge the States and the Province of Ontario to ban immediately the possession of live Asian carp and other species (e.g., the snakehead) that have the potential to invade the Great Lakes system.

9. Support the application of the Canadian Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA) and the Ontario Fish and Wildlife Conservation Act, to prohibit the importation of live Asian carp into Ontario. Seek the application of these laws to other species.

GREAT LAKES RESTORATION AND THE CORPS OF ENGINEERS

The Great Lakes are our region's treasures and they deserve restoration. The Great Lakes fishery, which remains stressed, stands to benefit tremendously from a comprehensive restoration effort. Although significant progress has been made in cleaning up and protecting the Great Lakes, a recent report by the General Accounting Office (GAO) concluded that binational, Federal, and State strategies to restore the lakes are underfunded and not coordinated as well as they should be. The report points out that restoration efforts in other regions of the country-particularly efforts to protect the Everglades and the Chesapeake Bay-are more sophisticated than restoration efforts in the Great Lakes region and are guided by more effective strategies. The Great Lakes Fishery Commission concurs with the GAO's conclusions and has strongly supported the development of a Great Lakes restoration strategy.

One major fishery restoration initiative is the Great Lakes Fishery and Ecosystem Restoration Program (GLFER), a program authorized by the Water Resources Development Act of 2000. The commission notes that Senator Voinovich was the principal author of this provision and we commend the Senator for his vision to restore the Great Lakes fishery. The program authorizes the Corps of Engineers (COE) to partner with Federal, State, and local agencies and the Great Lakes Fishery Commission to plan, implement, and evaluate projects supporting the restoration of the fishery, ecosystem, and beneficial uses of the Great Lakes. The COE has an authorization to spend up to $100,000,000 for this program. Examples of projects might include removal of unnecessary barriers in Great Lakes tributaries, creation of fish passage devices, riparian habitat stabilization, and restoration and creation of wetlands.

Particularly noteworthy about this program is that the COE is directed to work with signatories of A Joint Strategic Plan for Management of Great Lakes Fisheries and with the Great Lakes Fishery Commission to identify and implement restoration projects. In formulating this program, the COE is also directed to use existing

documents (such as the Fish Community Objectives, Lake Management Plans, and Remedial Action Plans) as the foundation for identifying priorities.

Since the passage of this legislation, the Great Lakes Fishery Commission has worked closely with the COE to get the program up and running. The commission has been very proud to be the local sponsor for the development of the support plan, the first step in implementing this program. The development of the support plan, as called-for in the legislation, has been done in close consultation with Federal, State, and tribal agencies. The management agencies signatory to the Joint Strategic Plan are quite enthused about this program.

As of this date, the support plan is in the final stages of its internal review. Once this support plan is completed, restoration projects may commence. It is envisioned that the signatories to the Joint Strategic Plan will identify priority projects, similar to how they identify projects under the successful Fish and Wildlife Restoration Act.

This program is an enormous opportunity for the Great Lakes. The program will rely on the Joint Strategic Plan process for its success, a major recognition of the importance of cooperative management. The commission urges Congress to appropriate at least $10 million per year under this authorization so that the COE and the management agencies can partner on restoration efforts.

## CONCLUSION

The Great Lakes fishery defines our region and is a key indicator of the overall health of the system. Indeed, the first question people often ask about the Great Lakes is "how are the fish?" Management agencies and the Great Lakes Fishery Commission work very hard to sustain the fishery for today and for the future, to improve the habitat upon which the fish depend, to stop the influx of invasive species, to control sea lampreys, and advance our scientific understanding of the resource.

Sportfishing on the Great Lakes remains extremely popular; commercial fishing remains economically viable. The lakes need constant attention from Congress if they are to sustain this $4 billion fishery, keep sea lampreys in check, and stop the biological invasion that is taking place. New initiatives like the Great Lakes Fishery and Ecosystem Restoration Program and the National Aquatic Invasive Species Act aim to improve and protect the resource. Timehonored institutions like the Great Lakes Fishery Commission and the Joint Strategic Plan for Management of Great Lakes Fisheries strive to maintain the cooperation that is so critical to the ecosystem approach to management. And a commitment to the resource-to the fishery and the environment-by the millions of people who live in the Great Lakes basin will help ensure that the lakes' resources are passed on to future generations.

We thank the committee for focusing its attention on the Great Lakes and we look forward to working with Congress on ways in which we can-together-restore these invaluable treasures.

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RESPONSES OF ROY STEIN TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* What coordination takes place between the Great Lakes sea lamprey control program and sea lamprey control programs throughout the nation?

Response. The Great Lakes and Lake Champlain share a common nemesis: the sea lamprey. The Great Lakes Fishery Commission and the Lake Champlain Fish and Wildlife Management Cooperative have a long history of effective coordination that has contributed to successful suppression of this devastating parasite in the both the Great Lakes and Lake Champlain.

Sea lamprey are native to the marine environment of the Atlantic coast. In its ocean home, this primitive parasitic fish is in balance with the marine ecosystem including the large fish it feeds on and the many creatures that feed on them. Sea lampreys are a pest species only where they have invaded freshwater lakes. Sea lampreys attach to fish and feed on their body fluids. Like many pest species in a new environment, they were freed of their natural predators and were at once out of balance with the smaller native fish that were there in both the Great Lakes and Lake Champlain for them to feed on.

First observations of sea lampreys in freshwater lakes suggest that they were able to invade the Great Lakes once the Erie Canal and the Welland Canal of the St. Lawrence Seaway were constructed. Lake Champlain connects to the Atlantic Ocean through the Hudson River (via the Champlain Canal) and to the St. Lawrence River (via the Chambly Canal). It is through these channels that sea lampreys likely entered the Lake Champlain system. Lake Champlain, the Finger Lakes of New York, and the five Great Lakes have all suffered the effects of this invasive species.

Like the Great Lakes, sea lampreys in the Lake Champlain have caused major stresses on the fisheries and reduced fishing opportunities. Lampreys have slowed or stopped efforts to restore fish populations. Indeed, similar to the Great Lakes of the 1940's, before sea lamprey control, some 87–100 percent of the fish in some parts of Lake Champlain exhibited sea lamprey wounds.[1]

Despite the severe problems sea lampreys cause in both the Great Lakes and Lake Champlain, sea lampreys can be managed. In fact, sea lamprey control in the Great Lakes and Lake Champlain has a successful history. Since 1955, when the Federal Governments negotiated and ratified the Convention on Great Lakes Fisheries, the Great Lakes Fishery Commission has implemented a sea lamprey control program, which uses a number of innovative, effective techniques (including the lampricide TFM), sea lamprey barriers, traps, and a sterilization technique. Sea lamprey control allows provincial, State, Federal, and tribal fishery management agencies to stock fish and implement other fisheries restoration activities with confidence, knowing that their fish will likely survive to reproduce or be caught by humans. Sea lamprey control allows agencies to make substantial progress in their efforts to re-establish self-sustaining populations of our rare, valuable, native species. Because of sea lamprey control, the popularity of sportfishing in the Great Lakes has increased since the early 1960's. It protects tribal fishing, and supports thousands of commercial fishing jobs. The millions of people who fish the Great Lakes recreationally, tribally, and commercially demand the delivery of an effective sea lamprey control program. Investments in sea lamprey control are investments not

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[1]J.E. Marsden et. al, Lake Champlain grapples with it own sea lamprey problem, FORUM (newsletter of the Great Lakes Fishery Commission), Fall, 2000, p. 4.

only in today's fishery, but also are investments in the fishery that future generations will enjoy.

The Lake Champlain sea lamprey control program is earlier in its development, though just as important to the future of the lake's fishery. In 1990, the Lake Champlain Fish and Wildlife Management Cooperative (a partnership between the U.S. Fish and Wildlife Service, the Vermont Department of Fish and Wildlife, and the New York State Department of Environmental Conservation) began an experimental 8-year program to control sea lampreys on Lake Champlain.

The Great Lakes Fishery Commission contributed actively to the success of this initial control effort through direct participation, training, provision of supplies and equipment, and sharing information. During 1990, the commission sent treatment crews from the Fish and Wildlife Service's Marquette Biological Station to lead the first year of stream treatments on Lake Champlain. During this first year, the commission's treatment crews trained the State and Federal staff on the details of safe and effective application of lampricides. The Fish and Wildlife Service continued to send its treatment program leaders to work with the cooperative as advisors on stream treatments throughout the experimental program. The commission also provided the equipment necessary to carry out the first round of stream treatments. All of the lampricides required for these treatments were acquired from the Great Lakes Fishery Commission.

Today, after data analysis established the success of the first round of sea lamprey controls, the Lake Champlain Fish and Wildlife Management Cooperative is continuing the sea lamprey control effort. The Great Lakes Fishery Commission is again working with the Lake Champlain managers in many aspects of their management effort with technical expertise, scientific understanding, and critical supplies. For instance:

- Sea lamprey control specialists from the Great Lakes region and the Lake Champlain region routinely exchange scientific information and expertise in managing sea lamprey populations.
- Biologists from Vermont, New York, and the Fish and Wildlife Service working on Lake Champlain attend many of the Great Lakes Fishery Commission's workshops and symposia, share information, and share state-of-the-art technologies.
- The Great Lakes Fishery Commission has funded and shared in funding research on Lake Champlain. These cooperative studies have scientists from the Great Lakes and Lake Champlain working together to advance the understanding of the sea lamprey and its vulnerabilities. This research has benefited both regions.
- The sea lamprey control staffs of the Fish and Wildlife Service working for the commission have developed extensive standard operating procedures (SOPs) that prescribe the precise science of effective stream treatments. These SOPs are used by the State and Federal staffs delivering the program for the cooperative.
- The commission has made a significant investment in development of new alternative control technologies. The cooperative has applied traps developed on the Great Lakes to control efforts on some Vermont streams. Barriers that use new technologies being applied on the Great Lakes are proposed to block spawning migration on some Lake Champlain streams.
- The commission has provided expert staff to advise and participate in permitting and environmental assessments of the program on Lake Champlain.
- The commission has worked in partnership with the EPA to invest millions of dollars in studies to ensure the environmental safety of all the lampricides used to control sea lampreys in the Great Lakes and in Lake Champlain. The commission maintains the registrations for lampricides with the U.S. Environmental Protection Agency.
- The Great Lakes Fishery Commission works very closely with the cooperative to ensure the adequate supply of lampricide for Lake Champlain. The commission has been successful in establishing a cost-effective and stable supply of these unique lampricides. They have shared this success with cooperative by providing the lampricides needed for Lake Champlain from their inventories at cost.
- Funds for Lake Champlain are provided annually in the Commerce, Justice, State, and Judiciary appropriations legislation, similar to how funding is provided for the Great Lakes.

The Great Lakes Fishery Commission and the Lake Champlain cooperative have come to appreciate that they can learn from each other's experiences. Both regions have suffered tremendously from the sea lamprey, but, fortunately, both regions have a history of cooperation that has allowed for an effective control effort. Sea lampreys can be controlled. Control benefits to the fishery, the environment, and the people who depend on the resource are tremendous.

RESPONSES OF ROY A. STEIN TO ADDITIONAL QUESTIONS FROM SENATOR VOINOVICH

*Question 1.* What does the Great Lakes Fishery and Ecosystem Restoration Program mean to the long-term health of the Great Lakes?

Response. The Great Lakes Fishery and Ecosystem Restoration Program (GLFER), a major new initiative authorized by the Water Resources Development Act of 2000 (WRDA), is designed to vastly improve the Great Lakes environment. While this initiative is in its infancy (the support plan has just been produced and partners are preparing to initiate restoration projects) the Great Lakes Fishery Commission is quite enthusiastic about what it means for the long-term health of the Great Lakes. I commend Senator Voinovich for being the principal author of this provision.

GLFER authorizes the Corps of Engineers (COE) to partner with Federal, State, and local agencies and the Great Lakes Fishery Commission to plan, implement, and evaluate projects supporting the restoration of the fishery, ecosystem, and beneficial uses of the Great Lakes. The COE has an authorization to spend up to $100 million for this program. The $100 million authorized in WRDA represents the Federal component of the program. Projects under GLFER will require non-Federal, cost-sharing partners.

WRDA does not delineate exact projects to be funded under this legislation. Rather, WRDA says that funds under this authorization will be used for projects that restore the fishery, protect the ecosystem, and promote beneficial uses. The long-term implications of a program that authorizes such activities are enormous. GLFER, for example, could fund a wide variety of projects that fit the law's definitions, including (but not limited to):

- Removal of unnecessary barriers in Great Lakes tributaries. This opens up stream habitat for a variety of fish species, helping to increase spawning and to create fishing opportunities.
- Creation of fish passage facilities. This facilitates upstream migration of fish in Great Lakes tributaries, helping to increase spawning and fishing opportunities.
- Creation of soft structures (shoreline enhancement). This increases fish and wildlife habitat along and adjacent to the shoreline, prevents erosion, improves aesthetics, and in some cases protects important landward resources.
- Riparian habitat stabilization. Creation of soft structures to protect existing resources, restore natural habitat, and provide shade to reduce stream temperatures. Reduction of stream temperatures protects trout and salmon, which are sensitive to warm water.
- Replacement of historical reefs and construction of artificial reefs to support fish communities. This creates spawning habitat and creates fishing opportunities.
- Restoration of estuaries and rapids (particularly in connecting channels such as the St. Clair River and the Detroit River). This creates spawning and rearing habitat for fish.
- Restoration and creation of riffle areas in Great Lakes tributaries. This improves spawning and rearing habitat.
- Restoration and creation of wetlands. This provides fish and wildlife habitat, it improves the natural fluctuations in water levels (which are beneficial to fish and wildlife), and it provides a buffer against flooding.
- Construction of carp barriers in conjunction with restoration of wetlands. Carp, because of their foraging habits, destroy vegetation in wetlands. These barriers will prevent carp from entering the wetland, will thereby protect wetlands, and will help increase fish and wildlife habitat.

These types of projects, if funded, would be enormously beneficial to the Great Lakes, the people of the Great Lakes region, and the fish and wildlife that inhabit the ecosystem. These types of projects would significantly improve habitat and would offer additional beneficial uses for the region's stakeholders.

The commission finds it particularly important that this program relies on the signatories of A Joint Strategic Plan for Management of Great Lakes Fisheries (i.e., State and tribal management agencies) for its success. As the legislation calls upon the Joint Strategic Plan signatories to help identify and implement restoration projects, this legislation intimately involves the agencies who have primary management authority over Great Lakes fisheries. This structure has significant implications on the long-term health of the Great Lakes. Fishery managers from agencies who have day-to-day management authority on the Great Lakes will be integral in applying the resources of this program to the areas that need them most. The way this legislation is written, in my opinion, practically ensures that GLFER resources will be directed to the most important fishery and ecosystem problems, with the goal of long-term sustainability of the resource.

I take this opportunity to note that this program, for it to be successful, will require not only the commitment of the COE to implement it effectively, but also the commitment of the partnership agencies (State and tribal agencies and the Great Lakes Fishery Commission) to cost-share projects, and a commitment from Congress to appropriate funds. I have every reason to believe that GLFER will be a success, as all three of these key partners are firmly committed to the effort. I note, for instance, a recent amendment to the Senate Energy and Water legislation (authored by Senators Voinovich and DeWine) to provide funds in fiscal 2004 to begin projects under this legislation. The GLFC urges that these and future funds be appropriated.

*Question 2.* What improvements do you recommend for the bill (S. 525, the National Aquatic Invasive Species Act) that I cosponsored to fight against invasive species?

Response. The Great Lakes Fishery Commission strongly supports S. 525, the National Aquatic Invasive Species Act (NAISA), and commends its author (Senator Carl Levin) and co-sponsors for initiating this important legislation. I believe the essential goal of this legislation must be zero introductions of new invasive organisms. Certainly, the rate of introductions must be reduced rapidly and continually through time until that goal is reached. There is no doubt that NAISA will help us achieve that goal.

For the most part, the Great Lakes Fishery Commission is pleased with the legislation in its current form and our first concern is that this legislation be passed as soon as possible. Additionally, the commission is very pleased that the legislation contains provisions ensuring the collection and dissemination of ballast activity records, the implementation of best management practices for domestic vessels, a screening process for new organisms introduced into trade, improvements to the Chicago Sanitary and Ship Canal, rapid response, and research. I believe these portions of NAISA are critical and should be retained in their current form.

As Congress debates this bill, I offer a few recommendations for improvement.

- Findings: In the "findings" section of the bill, I believe a statement affirming the "precautionary" approach is warranted. The precautionary approach, as defined by the 1992 United Nations Conference on Environment and Development, states that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to protect environmental degradation." The commission believes that, because invasions are irreversible and typically detrimental to the Great Lakes environment, society should take immediate action to stop the influx of invaders.
- Coordination with Neighboring Countries: The commission supports the intent of NAISA to enhance the involvement of the International Joint Commission (IJC) in preventing aquatic invasions. The commission believes, however, that the language in NAISA about coordination with neighboring countries is too prescriptive. I urge the bill be changed to allow more flexibility for the State Department to negotiate with Canada about how the IJC can assist governments in preventing aquatic invasions. I have great confidence in the IJC's ability to approach this issue from a binational perspective and am pleased NAISA recognizes this as well.
- Interim/Final Ballast Water Standards: I am gratified that the bill has adopted a strong interim standard (95 percent kill or removal) that changes to a strong final standard with the goal of eliminating the risk of introduction of live organisms. I support this goal enthusiastically; this is one of the most important provisions in the bill.

The Great Lakes Fishery Commission will gauge the overall success and effectiveness of this legislation on whether the legislation retains strong ballast water standards that eliminate the possibility of further introductions. Anything less will mean the legislation has failed to deliver what is needed to protect the Great Lakes.

As the legislation is written, the ballast water goals appear to be adequate to protect the Great Lakes. However, I am quite concerned about the timeframe for reaching this goal. I believe the environmental sustainability of the Great Lakes would be jeopardized if the final standards do not come into effect until 2011, as written in the legislation. Promulgation and implementation of the final standards should not be delayed. The bill, fortunately, establishes a research program to support the development of these standards, which is critical to the success of this bill. I urge the addition of a deadline to this research section delineating when this research program must be established and initiated, recognizing all the actions and accommodations that government and industry must undertake prior to 2011.

- Incentives: NAISA includes incentives to help ship owners and operators seek new ballast management systems. While the commission supports incentives, I believe this section could be much stronger. Other incentives could include tax incentives, direct subsidies for developing and demonstrating technologies, removal from

liability if a good-faith effort was made, and other rewards for successful treatment systems. This bill provides guidance which, I believe, might not be enough to entice the industry's full participation and cooperation.

• Sea Lamprey Program: I take great pride in the fact that the Great Lakes Fishery Commission implements a successful sea lamprey control program, a program that has reduced the invasive sea lamprey population by 90 percent in the Great Lakes. Because the sea lamprey control program is effective and authorized under existing law, the commission requests that NAISA make it clear that the Great Lakes Fisheries Act (including its sea lamprey control program) and the Convention on Great Lakes Fisheries are not affected by NAISA.

*Question 3.* How do you recommend we develop a comprehensive restoration plan while continuing the programs that are currently successful and not delaying progress?

Response. The Great Lakes Fishery Commission feels that government agencies are, for the most part, adequately authorized to implement initiatives to restore the Great Lakes. I believe that while there are certainly areas that require new authorizations—invasive species is a key example—we need to redouble our efforts to implement the authorities that are currently in place. To that end, the commission believes that Congress should consider adequate appropriations for authorized programs to be the starting point for any restoration initiative.

Many existing programs have the potential to advance Great Lakes restoration; they often just lack adequate funding. The Great Lakes Fishery Commission's sea lamprey control program is a case-in-point. Sea lamprey control has reduced populations of this invasive pest by nearly 90 percent. Nevertheless, the commission currently receives about $4 million less per year than it estimates it needs to do the job, and this has hampered the commission's ability to maintain this success. Sea lamprey populations will rebound if controls are relaxed, and the current funding situation creates the strong possibility that there will be slippage in sea lamprey control.

In addition to adequate funding for existing programs, the Great Lakes Fishery Commission believes a comprehensive restoration plan for the Great Lakes is critical to the long-term sustainability of the resource. Although significant progress has been made in cleaning up and protecting the Great Lakes, a recent report by the General Accounting Office (GAO) concluded that binational, Federal, and State strategies to restore the lakes are underfunded and not coordinated as well as they should be. The report pointed out that restoration efforts in other regions of the country—particularly efforts to protect the Everglades and Chesapeake Bay—are more sophisticated than restoration efforts in the Great Lakes region and are guided by more effective strategies. The Great Lakes Fishery Commission concurs with the GAO's conclusions and has strongly supported the development of a Great Lakes restoration strategy.

I again commend Senator Voinovich and his Great Lakes colleagues form their strong interest in developing a Great Lakes restoration plan. It is my understanding that current efforts to develop this plan involve many stakeholders, elected officials, and government agencies. These efforts include the identification of priorities by a number of entities including Great Lakes United (which reflects grass-roots goals), the Northeast-Midwest Institute (which houses the Great Lakes Task Force), the Council of Great Lakes Governors (which reflects the goals and wishes of the States), and the Great Lakes Commission (which focuses on funding for authorized priorities). In addition to these efforts, members in both houses of Congress have introduced legislation to develop a restoration plan for the Great Lakes. Many, if not all, of these concurrent efforts are being coordinated with each other. The commission believes the current efforts to develop a restoration plan are helping governments and stakeholders to get a handle on a very complex process.

Together, these initiatives are leading the Great Lakes community toward a comprehensive restoration initiative. It is my expectation that these various initiatives will complement each other and help us, together, provide Congress with a clear direction of what we have in place that needs funding, what we need to fill critical gaps, and how we can support the implementation of restoration projects. The success of any Great Lakes restoration initiative will indeed depend on the support of organizations in the region and the support from Congress. I reiterate that adequate funding for existing authorizations is critical.

*Question 4.* Including the bill that I cosponsored (S. 1398, the Great Lakes Environmental Restoration Act), I have seen different mechanisms proposed to coordinate Great Lakes programs, such as a task force. What do you think would work best?

Response. Legislation introduced in the Senate (S. 1398, the Great Lakes Environmental Restoration Act) is designed to draw attention to the Great Lakes and to call for a coordinated Great Lakes restoration effort. It is critically important that agencies at all levels work toward this common goal. It is clear to the commission that programs to protect the Great Lakes, while certainly effective on many fronts, can be greatly improved by enhanced coordination among the agencies and a heightened commitment to funding. We can indeed learn many lessons from how restoration efforts in the Everglades and the Chesapeake have been implemented.

One major strength of S. 1398 is that it creates a Great Lakes Federal Coordinating Council, comprising the heads of all Federal departments with a role in the Great Lakes, to better coordinate Federal agency efforts and to formulate a more-coordinated request in the President's annual Federal budget. The Great Lakes Fishery Commission believes that this coordinating council will help the Federal Government focus on the Great Lakes and better direct its resources. If the council operates as the legislation envisions, Federal activities and annual budgets will be much clearer about how funds are being requested for the Great Lakes and what is being done to restore the Great Lakes. Indeed, much of the anxiety about the lack of progress in Great Lakes restoration arises because we simply do not have a clear idea about what the Federal agencies are doing to protect the Great Lakes and how much funding the Federal Governments are devoting to restoration. This legislation will do a lot to correct that problem.

Another major attribute of S. 1398 is the section authorizing grants for such things as wetlands restoration, water quality improvement, invasive species management, and fisheries habitat improvements. Additional resources to these priority areas are, of course, badly needed and welcomed. This bill has the potential to provide $600 million for these priority areas.

The establishment of the Great Lakes Advisory Board is one way in which we can prioritize Great Lakes initiatives and to present recommendations to Congress for funding. A concern with the Great Lakes Advisory Board, as written in the legislation, is that it does not include all relevant department heads and, therefore, the board might not be in a position to formulate comprehensive recommendations. In other words, by limiting the voting members to the departments listed in the legislation, the process could exclude important programs and initiatives simply because some initiatives lacked a voting advocate on the advisory board. The legislation attempts to correct this by allowing an inclusive group of observers. While this helps assuage the commission's concerns, the fact that some agencies are strong members on the panel vis-a-vis other agencies means that there is the potential for "priorities" to simply be a reflection of who voted on the suite of priorities.

I believe the Great Lakes Federal Coordinating Council and Congress can best play the coordinating role for identifying Great Lakes priorities and implementing the programs. The coordinating council can best present the restoration initiative in a Federal budget and Congress can, through the appropriations process, see that it is implemented. This is not to say that the coordinating council and Congress should operate in a vacuum. The Governors, the Great Lakes Fishery Commission, Great Lakes United, the Great Lakes Commission, and many others are prime resources to help identify and support restoration priorities. Federal agencies and Congress should work with these and other stakeholders to have all important goals and needs identified in an annual, comprehensive Great Lakes package for Congress' consideration.

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STATEMENT OF SAMUEL W. SPECK, CHAIR, COUNCIL OF GREAT LAKES GOVERNORS WATER MANAGEMENT WORKING GROUP, DIRECTOR, OHIO DEPARTMENT OF NATURAL RESOURCES

Thank you for the opportunity to testify before the U.S. Senate Committee on Environment and Public Works. This morning I would like to share with you what the Great Lakes Governors and Premiers are doing to protect the waters of the Great Lakes and keep management of those waters in the Great Lakes Basin.

As you are aware, Ohio's Governor Bob Taft is the current Chair of the Council of Great Lakes Governors. I am appearing in my role as Chair of the Council's Water Management Working Group and as Director of the Ohio Department of Natural Resources. I also serve the Great Lakes Commission as its current Chair. I will summarize my remarks and would request that my full written testimony be submitted for the record.

The Council's Water Management Working Group is at a critical stage in the efforts of the eight Great Lakes States and two Provinces to strengthen our collective means for protecting the waters of the Great Lakes Basin. The Working Group is

developing a new resource-based decisionmaking standard for diversions and consumptive uses of Basin water in accordance with the Great Lakes Charter Annex.

The region's Governors are pleased with the leadership Congress has shown in recognizing the critical importance of the Great Lakes and the pressing need to restore and safeguard them for generations to come. We particularly commend Senators DeWine, Levin, and you, Senator Voinovich, for the introduction of Senate Bill 1398. The Council of Great Lakes Governors believes that the bills now pending in the House and Senate offer an opportunity to focus much-needed financial resources on priority needs. What is important in the near term is continuing the focus on restoration efforts, and Senate Bill 1398 does just that.

Nearly two decades ago, our States jointly formed the Council of Great Lakes Governors, in part to fulfill our lead responsibilities as stewards of the Great Lakes Basin's water resources and in recognition of the tremendous ecological, economic and social benefits they provide. The Great Lakes Governors and Premiers have continued to provide leadership on Great Lakes issues including the following:

Creation of the Great Lakes Charter in 1985 to provide a framework for managing the Basin waters;

- Use of the Water Resources Development Act (WRDA) of 1986 as a tool to protect the Basin water resources;
- Commitment made in 1999 to develop a new agreement which would bind the States and Provinces more closely to collectively plan, manage and make Great Lakes water usage decisions;
- Adoption of the Annex in 2001, an amendment to the Great Lakes Charter to further the principles of the Charter;
- Formation of the Council's Great Lakes Priorities Task Force chaired by Ohio Environmental Protection Agency Director Chris Jones; and,
- Continuation of the Council's Water Management Working Group to develop the agreements called for in the Annex, which is the focus of my testimony today.

*Overview of the Great Lakes Charter Annex*

In 1985, the Great Lakes Governors and Premiers created the Great Lakes Charter to provide a framework for managing the waters of the Great Lakes Basin. This is a good-faith agreement involving prior notice and consultation on large diversions and uses within the Basin exceeding five million gallons per day (MGD). Further, it outlines a commitment to develop programs to manage diversions and consumptive uses.

The next year (1986), Congress enacted WRDA, recognizing the Governors' central role in protecting Great Lakes Basin water resources. WRDA does the following:

- Prohibits diversions unless approved by all eight Great Lakes States Governors;
- Allows a veto without standards;
- Regulates first drop (no threshold);
- As U.S. Federal law, does not include the Provinces regarding decisions; and,
- Addresses diversions, not in–Basin consumptive uses.

In addition, there is a question whether groundwater is included in WRDA.

In 1998, a proposal by the Nova Group, Inc. to export bulk water from the Ontario waters of Lake Superior to the Far East caused the State, Provincial, and Federal Governments to react with calls to re-examine the strength and adequacy of the legal foundations for water management authorities.

Starting in 1999, water levels in the Great Lakes which had been atypically high for much of the preceding 30 years fell considerably as cyclical patterns took effect. While the recent, lower water levels are in fact close to the historic average, the public's perception of dramatic loss has given added impetus to concern about the future of our Great Lakes water resources.

At their annual meeting in Cleveland in October 1999, the Great Lakes Governors and Premiers committed to:

- Developing a new agreement and standard which would bind the Great Lakes States and Provinces more closely to collectively plan, manage and make decisions.
- Securing funds to develop a better base of water use data necessary to make sound decisions.

The Governors and Premiers further stated that the agreement should reflect the following principles:

- Protect the resource;
- Be durable;
- Be simple;
- Be efficient; and,

• In particular, they wanted to retain authority within the Basin to manage the waters based upon resource protection principles.

The Governors' and Premiers' leadership role was recognized in the 2000 International Joint Commission report which recommended maintaining and strengthening the authority of the Governors/Premiers regarding management of Great Lakes waters. The WRDA 2000 amendment also promoted partnership with the Canadian Provinces and encouraged the Great Lakes Governors to develop and implement a mechanism that provides a common standard for decisionmaking.

On June 18, 2001, the Governors and Premiers adopted the Annex to the Great Lakes Charter. In the Annex, they committed themselves to move forward on a number of fronts.

In contrast to WRDA, this initiative under the Annex has the following provisions:

• Requires the use of a common resource-based standard;

• Includes the Canadian Provinces of Ontario and Quebec in all regional decisionmaking;

• Includes the application of a new standard for in–Basin consumptive uses, not just diversions;

• Includes groundwater; and,

• Commits to improve the sources and applications of scientific information regarding the management of the Waters of the Great Lakes Basin.

The Annex includes a set of directives to further the principles of the Charter:

• First, create a new resource-based decisionmaking standard to review new proposals to withdraw water from the Great Lakes Basin.

• Second, draft Basin-wide binding agreements such as an interstate compact and a State–Provincial agreement.

• Third, is a call for the design of a decision support system to include an assessment of available information, update data on existing water uses, identify additional needs and develop a plan to implement an ongoing support system.

• Fourth, a commitment was made to ensure ongoing public input in the preparation and implementation of the agreements.

• Fifth, further commitments were made to improve scientific information, including the role of groundwater.

The Water Management Working Group has been working together with an Advisory Committee and Resource Group over the past 2 years to implement the Annex through Basin-wide agreements including a new decisionmaking standard. The Advisory Committee represents diverse stakeholder interests from about 26 large regional/national organizations representing agricultural, environmental, industrial, municipal, shipping, recreational, manufacturing, and utility groups. In addition, stakeholder interests from governmental and quasi-governmental organizations are also involved through a Resource Group and as invited Observers.

*Draft Decision–Making Framework*

A decisionmaking framework is being developed which includes a two-tier review structure. Under the framework being discussed, new or increased diversions or consumptive uses exceeding a regional review threshold level of three MGD would be reviewed by all ten jurisdictions. Proposals that do not exceed the regional review threshold level would be reviewed using a common resource-based standard by the individual State or Province in which the diversion or consumptive use is proposed.

The draft framework continues to be discussed and revised.

Draft decisionmaking criteria being discussed that will be used for review of diversions and consumptive uses are consistent with the following Annex principles:

• Preventing or minimizing Basin water loss through return flow and implementation of environmentally sound and economically feasible water conservation measures.

• No significant adverse individual or cumulative impact to the quantity or quality of the waters and water dependent natural resources of the Great Lakes Basin.

• An improvement to the waters and water dependent natural resources of the Basin. An improvement means an additional beneficial, restorative effect to the physical, chemical, and biological integrity of the waters and water dependent natural resources.

• Compliance with all applicable State, provincial, Federal, and international laws and treaties.

The resource improvement requirement is unique with no similar standard in existence which we can use as a model. Mitigation of impacts associated with a withdrawal are not being considered as an improvement. An improvement could be

based on hydrologic conditions, water quality or habitat. Most likely, hydrologic improvements will be preferred.

The issue of how to address out-of–Basin diversions is a critical issue for the States and Provinces, yet there are many diverse views on this. For example, Ohio has several communities that straddle the Great Lakes Basin drainage divide. Flexibility is needed to allow these communities to serve their citizens in areas immediately adjacent to the Basin divide where adequate quantities of potable quality water are not available. Yet, Ontario and Quebec have enacted legislation that largely prohibits diversions. The challenge is to craft agreements that will be acceptable to all the jurisdictions and meet the intent of the Annex.

*Timeline*

The Governors and Premiers agreed to create the necessary agreements within 3 years of the effective date of the Annex, in other words, by June of 2004. The Water Management Working Group is on schedule and its goal is to release draft documents for public review later this year. Consensus takes patience and we must allow ourselves adequate time to craft agreements acceptable to all ten jurisdictions.

Regardless of the timeline, a flexible agreement must be drafted that will allow for the incorporation of new scientific information into the decisionmaking process. For example, we do not currently know where the Basin groundwater divides are relative to the surface water divides.

*Conclusion*

The Annex will be attempting to do something that has never been done before. We are trying to protect 20 percent of the world's fresh surface water, not on a basis of economic protection, but on protection of the resource.

In reality, there are so many competing and conflicting interests that the only way it will be accomplished is through partnerships. It will not be enough to simply have State Provincial partnerships but Federal Governments, local communities, NGO's and the private sector will also need to be included. The water management regime we develop will show how an effective partnership can protect one of the world's greatest natural resources and may be used by others as a model in the future.

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RESPONSES OF SAMUEL W. SPECK TO ADDITIONAL QUESTIONS FROM SENATOR VOINOVICH

*Question 1.* As I mentioned during the hearing I held a Government Affairs Committee hearing last month on Great Glades programs, the Chairman of the United States Section of the International Joint Commission, Dennis Schornack, suggested that we revise and update the Great Lakes Water Quality Agreement to form the basis for a major, binational Great Lakes initiative. What is your opinion of using this as a vehicle for a comprehensive restoration plans?

Response. The Great Lakes Water Quality Agreement (GLWQA), first signed in 1972, is an important binational mechanism for multi-jurisdictional management, but is not an appropriate vehicle to use as the basis for a comprehensive restoration plan. It is an agreement between the U.S. and Canadian Federal Governments and, as such, does not provide the Great Lakes Governors and premiers with an explicit leadership role. Similarly, it lacks explicit recognition of—and a role for—other public and nongovernmental entities whose partnership is needed to ensure the success of any restoration initiative.

In its present form, the GLWQA does not have the breadth of focus needed to accommodate the kinds of ecosystem restoration priorities that are emerging from regional entities such as the Great Lakes Commission and Council of Great Lakes Governors. For example, the Agreement does not adequately address such critically important matters as invasive species prevention and control; sustainable water use; habitat biodiversity; land use/water quality linkages; recreational and commercial value of the resource; and other matters that reflect the environmental and socio-economic dimensions of ecosystem restoration. Last revised in 1987, the GLWQA is outdated and in need of a thorough review and potentially significant revision, a conclusion reached by the International Joint Commission's Science Advisory Board several years ago and increasingly embraced by the larger Great Lakes community.

The GLWQA has serves us well for 31 years and, with a thorough review, revision and update, can continue to do so. However, it is best viewed as a vehicle for implementing components of a comprehensive restoration plan; it would not be well-suited to serve as the plan itself.

*Question 2.* How do you recommend we develop a comprehensive restoration plan while continuing thepmgrnms that are currently mcccs ful and not delaying progress?

Response. This region cannot, and should not wait for a large scale, comprehensive plan to be finalized before enhanced restoration activities take place. Adequate guidance to initiate restoration activities presently exists, and should be used while the large scale planning effort proceeds.

Three documents—all complementary—will be of great utility to the Congress in the immediate term while planning takes place. The Great Lakes Program to Ensure Environmnental and Economic Prosperity is a detailed listing of the Great Lakes Commission's U.S. Federal legislative and appropriations priorities. It is appropriately viewed as a foundation for restoration planning efforts, and explicitly identifies strategic actions organized around seven priority themes for restoration; cleaning up toxic hotspots; shutting the door on invasive species; controlling nonpoint source pollution; restoring and conserving wetlands and critical coastal habitat; ensuring the sustainable use of our water resources; strengthening our decision support capability; and enhancing the commercial and recreational value of our waterways. A second source of information is the recently released statement by the Council of Great Lakes Governors (letter of October 1, 2003 to Members of Congress) that presents a set of nine priorities and associated principles. The Council of Great Lakes Governors also committed to submitting a short-term agenda to help guide spending decisions while a more comprehensive protection and restoration funding program is being developed. Finally, the Great Lakes Strategy, produced by the U.S. Policy Committee (a Federal/State body coordinated by the U.S. EPA), offers relevant guidance as well, with an emphasis on restoration initiatives that can be pursued under existing authorities and funding levels.

The restoration priorities embodied in these documents can provide the basis for congressional legislative and appropriations initiatives in the immediate future. They also provide the foundation for a comprehensive planning effort that willl guide efforts over the long term. In brief, we are well positioned to act now!

*Question 3.* Including the bill that I cosponsored (S. 1398, the Great Lakes Environmental Restoration Act), I have seen di ferent mechanisms proposed to coordinate Great Lakes programs, such as a task force. What do,you think would work best?

Response. The Great Lakes Governors must have the leadership role in plan development and implementation for Great Lakes protection and restoration. The Senate bill does provide for a key role by the Governors in establishing environmental restoration goals. However, the advisory board arrangements, as proposed in the bill, may be overly proscriptive and exclusionary. The Governors should have a role in identifying those stakeholder groups that should be included in the planning and implementation effort.

The creation of additional, unneeded bureaucracy in developing and administering a comprehensive ecosystem restoration plan should be avoided. Selection of a coordinating mechanism to guide plan development and implementation should be preceded by a thorough review of the many existing mechanisms to determine their capabilities to perform such functions. Such a review may find that the establishment of a new body is duplicative and unnecessary. For example, the potential of the existing U.S. Policy Committee should be explored. With significant modifications, the U.S. Policy Committee might be able to function as a coordinating body for restoration plan development and implementation.

In the interest of efficiency and effectiveness, the region's multi-jurisdictional agencies, such as the Great Lakes Commission, should have a central role in plan development and coordination. Ecosystem-based restoration planning and implementation is central to the role of the Commission, which has undertaken these activities at various scales for almost 50 years. Comprised of State and provincial members (including Governor/ Premier appointees) with observers representing almost two dozen U.S. and Canadian Federal agencies, regional agencies, tribal authorities and academic bodies, the Great Lakes Commission has a communications, planning, policy and advocacy mandate. The Commission is the only regional agency founded in both Federal and State law (i.e., Great Lakes Basin Compact), and has a "sustainability" mandate; it focuses on the intersection of environmental and economic goals. Its ecosystem restoration planning capabilities arc substantial. Given this, it would be a most appropriate mechanism to serve as a member on, and provide technical and secretariat support to, any body coordinating restoration plan development and implementation.

The "Great Lakes Federal Coordinating Council" concept, as embodied in the Senate bill, does have merit and responds to inefficiencies identified in a recent U.S.

General Accounting Office report. The notion of a single, coordinated Federal appropriations request has considerable appeal.

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RESPONSES OF SAMUEL W. SPECK TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

*Question 1.* Please describe how the Great Lakes Governors and Premiers coordinate with the IJC.

Response. The Great Lakes Governors and Premiers coordinate with the International Joint Commission on several levels. Major initiatives of the Council of Great Lakes Governors, such as the Annex 2001 process concerning water quantity management, provide for substantive IJC input in an advisory capacity. In turn, multiple bodies of the IJC, including its Water Quality Board, Boards of Control and study teams, typically provide for State and provincial membership and consultation. Consultations between senior staff of the IJC and interstate organizations (i.e., Council of Great Lakes Governors, Great Lakes Commission) are pursued on an ongoing basis to ensure coordination and cooperation on initiatives of shared interest.

*Question 2.* Please provide your recommendations on how to measure progress in restoring the Great tikes and how to define restoration.

Response. An explicit, consensus-based definition of restoration is critically important before any planning effort and implementation strategy is developed. Some view restoration as a return to pre-settlement conditions, while others may take a very different view. Unfortunately, neither the Senate nor House bills offer a deflzxition-a problem that needs to be remedied. The Great Lakes Commission recommends that the efinition reflect the environmental, social and economic dimensions of the ecosystem, and the need to reinstate beneficial uses in a manner that addresses these multiple dimensions. More specifically, the following definition is recommended for inclusion in legislation—"the reinstatement of beneficial uses of-the water and related natural resources of the Great Lakes ecosystem through projects and activities that improve environmental quality and ensure environmentally sound and sustainable resource use." The 14 beneficial use impairments articulated in the Great Lakes Water Quality Agreement to guide Areas of Concern cleanup may provide a basis for operationalizing this definition.

Such a definition will allow for the benchmarking of restoration efforts with quantifiable goals, science-based indicators, and a monitoring program that provides continuous feedback. Such functions must be integrated into the plan development and implementation process, and be prominently pursued and reported to ensure strong accountability.

A sound basis for a methodology to measure progress is found in the SOLEC (State of the Lakes Ecosystem Conference) initiative to develop and apply science-based indicators-This is a longstanding collaborative effort involving agencies and organizations within and outside government. Once fully developed and employed, such indicators will provide a continuous means of monitoring progress and making adjustments, as needed. The U.S. EPA and Environment Canada are coordinating this collaborative effort. Major challenges include resources (i.e., funding and staff) to maintain the program and ensure long term, uninterrupted data collection and analysis. Federal legislation should support and advance the SOLEC indicators effort.

*Question 3.* Please provide an inventory of all of the strategic plans for the restoration of the Great Lakes that you are aware of that are completed, underway or planned Identify which, from your perspective, provide the most comprehensive approach to restoration.

Response. The Great Lakes Commission is in the process of assembling and reviewing existing restoration plans that range from local, topic-specific initiatives to ecosystemwidc, broad-based efforts. The following descriptive listing is illustrative of the rich information base from which to assemble an overarching plan or strategy:

- The Great Lakes Commission has developed, on behalf of its member States and provinces, a Five Year Strategic Plan (2000) that presents a vision statement, goals, objectives and strategic actions. Its annual U.S. Federal legislative and appropriations priorities statement (The Great Lakes Program to Ensure Environmental and Economic Prosperity), includes several dozen recommendations organized around seven themes. And, previously, the Commission coordinated the development of the Ecosystem Charter for the Great Lakes-St. Lawrence Basin in 1995.
- State and province level initiatives exist as well. Among others, New York has developed a 25 year Great Lakes Management Plan; Ohio has developed a restora-

tion plan for Lake Erie; and Michigan's Office of the Great Lakes has issued strategic planning documents, including a Lake Huron Initiative. Literally every Great Lakes State and province has some type of Great Lakes strategy, whether it be statewide, agency-specific or topic-specific. Among others, States/provinces have plans that address one or more of the following: aquatic nuisance species prevention and control; coastal management; nonpoint source pollution; water use/conservation; spill prevention and response; land use and air quality management. Further, the Congress is presently providing substantial restoration grants to individual Great Lakes States.

- The U.S. Policy Committee, with staff support from the U.S. Environmental Protection Agency (Great Lakes National Program Office) has developed a Great Lakes Strategy. The, U.S. Policy Committee is a consortium of U.S. Federal, State and regional agencies with responsibilities related to implementation of the Canada-U.S. Great Lakes Water Quality Agreement.
- Lakewide Management Plans (LaMPs) for each of the Great Lakes, and Remedial Action Plans (RAPS) which provide restoration plans to restore Areas of Concern specific to Great Lakes tributaries, have been developed.
- The National Sea Grant Program maintains a Sea Grant Network Plan that highlights the agency's role in economic leadership; coastal ecosystem health and public safety; and education and human resources. Complementing this are strategic plans specific to each Great Lakes Sea Grant Program.
- The Great Lakes Fishery Commission maintains a Joint Strategic Plan for Management of Great Lakes Fisheries which was developed and endorsed by Federal, State and tribal governments. It provides the agency and its many partners with a framework for individual and collective fisheries management activities.
- The International Joint Commission has developed a strategic plan to guide its efforts—and those of its boards—under the terms of the Boundary Watery Treaty of 1909 and the Canada U.S. Great Lakes Water Qualiy Agreement of 1972 (as amended by Protocol in 1987).
- The U.S. Army Corps of Engineers (Great Lakes and Ohio River Division) recently initiated a strategic planning process under provisions of the John Glenn Great Lakes Basin Program authorized in the Water Resources Development Act of 1999. The objective is to define Corps authorities, inventory current activities, and document unmet needs and partnership opportunities. The Corps has also initiated—per congressional directive—a Great Lakes System Review Study that will examine issues, unmet needs and opportunities associated with the Great Lakes-St. Lawrence maritime transportation system. Also, the Corps is partnering with the Great Lakes Commission—and multiple U.S. and Canadian agencies from the local to Federal level—on development of a comprehensive management plan for the St. Clair River and Lake St. Clair watershed.
- The Great Lakes Environmental Research Laboratory (NOAA) crafted a strategic plan in 2000 that presents a mission statement and a series of associated goals, related activities, products and strategic actions. As with the other selected plans identified above, interagency' collaboration and partnership are prominently featured.
- Canadian Commissioner of the Environment and Sustainable Development. A Legacy Worth Protecting, released in 2001.
- Great Lakes United, Canadian Environmental Law Association, National Wildlife Federation, Lake Michigan Federation and Strategies St. Laurent. Water Use and Ecosystem Restoration: An Agenda for the Great Lakes and St. Lawrence River Basin, December 2000.
- The Nature Conservancy. Toward a New Conservation Vision for the Great Lakes Region: A Second Iteration, revised September 2000.
- Northeast-Midwest Institute. Northeast-Midwest Institute Survey of Ecosystem Restoration Efforts, February 2002.
- U.S. EPA and Environment Canada. State of the Great Lakes 2001.
- U.S. EPA Great Lakes National Program Office. Great Lakes Ecosystem Report, December 2000.
- U.S. Geological Survey. Strategic Vision for the U.S. Geological Survey in the Great LakesSt. Lawrence Region, 2001–2010, released in 2002.

Complementing these activities are issue-specific strategies at the regional level that have restoration plan relevance. Among many others are the elements of Annex 2001 of the Great Lakes Charter signed by the Great Lakes Governors and premiers; the strategic plans of the Great Lakes Commission-coordinated Great Lakes Panell on Aquatic Species; and the binational Waterways Management Forum (coordinated by the U.S. Coast Guard).

It is essential to note that the building blocks for a large scale restoration plan are already in place, as indicated by just the partial list identified above. Numerous

agencies at all levels of government, as well as nongovernmental interests, maintain (or are in the process of developing) strategic plans that can contribute to a large scale planning effort. Duplicating past work should be avoided at all costs; validation and enhancement of such work, where relevant, is critical. Also needed is an effort to "assemble, package and sell" the excellent work already completed.

As noted above, three existing (and complementary) documents provide an excellent basis for a comprehensive plan: the Great Takes Program to Ennurr Environmental and Economic Pro. perity (Great Lakes Commission); the Council of Great Lakes Governors' restoration priorities (as articulated in an October 1, 2003 letter to Congress); and the Great Lakes Strategy developed by the U.S. Policy Committee (coordinated by U.S. EPA.)

*Question 4.* What coordination takes place between the Great Lakes sea lam prxy control pro ram and sea lae'njir y control pmgr-amr throughout the nation?

Response. The Great Lakes sea lamprey control program is managed by the Great Lakes Fishery Commission under the authority of the Convention on Great Lakes Fisheries, negotiated and ratified in 1955. The Fishery Commission has had a history of successful coordination with the Lake Champlain Fish and Wildlife Management Cooperative. Among others, this has included information exchange; technology transfer; cooperative research; joint development of Standard Operating Procedures; and collaboration in developing and testing alternative control technologies.

Acting in its advocacy role on behalf of its eight member States, the Great Lakes Commission has been an ardent supporter of the Fishery Commission's sea lamprey control program and, more generally, of federally funded efforts in the prevention and control of aquatic nuisance species. Among-others, support has been vocalized for enhancing the sea lamprey control program; passage of the National Aquatic Invasive Species Act; funding for comprehensive State management plans and the Great Lakes Pastel on Aquatic Nuisance Species; and installation of best available technology on commercial vessels to reduce/eliminate infestations and spread via ballast water.

The Great Lakes Fishery Commission has prepared a detailed response to this question, and will be providing it under separate cover.

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STATEMENT OF JEFFREY M. REUTTER, PH.D., DIRECTOR, OHIO SEA GRANT COLLEGE PROGRAM, F.T. STONE LABORATORY, CENTER FOR LAKE ERIE AREA RESEARCH (CLEAR), AND GREAT LAKES AQUATIC ECOSYSTEM RESEARCH CONSORTIUM, OHIO STATE UNIVERSITY

"THE DEAD ZONE IN LAKE ERIE: A BRIEF HISTORY, THE CURRENT STATUS, AND RECOMMENDATIONS FOR THE FUTURE"

*Introduction*

My name is Jeffrey M. Reutter. I have been doing research on Lake Erie, studying this wonderful resource, and teaching about it since 1971. I am the Director of the Ohio Sea Grant College Program (part of NOAA), the F.T. Stone Laboratory (the oldest freshwater biological field station in the country), the Center for Lake Erie Area Research (CLEAR), and the Great Lakes Aquatic Ecosystem Research Consortium (GLAERC). I have held these positions since 1987. I am here today to speak to you about the area of hypoxia or anoxia in the middle of Lake Erie, the so-called "Dead Zone," to discuss its history, the current status of the lake, and to make a few recommendations for future action. To do this I need to tell you a little about all of the Great Lakes, how Lake Erie differs from the other Great Lakes, and a little basic limnology so you can understand the problem. I will build on my testimony before this committee in July 2002 and discuss current efforts and needs. We have also developed a poster describing this problem with I will leave with Senator Voinovich.

*Take–Home Message*

While this is a very complex issue, the take-home message from my testimony is simple. Due in part to changes brought about by invading species, zebra and quagga mussels, reduced water levels, and global warming, I am concerned that we are seeing indications that Lake Erie is heading back to the conditions of the "dead lake" years in the 1960's and early 70's. We must determine if that assessment is accurate, and if accurate, we must identify actions and management strategies to minimize the damage. Finally, we must recognize that the Central Basin of Lake Erie, because of its very unique morphometry, is the best indicator in all of the Great Lakes of larger stresses and problems.

Solving these problems will require coordination and collaboration on the research front, the management front, and the outreach front. Consequently, I am a strong supporter of recent funding from NOAA Sea Grant to the Great Lakes Commission and the Northeast–Midwest Institute to develop a Great Lakes Restoration Plan. I also strongly support Senator Voinovich's efforts to sponsor the Great Lakes Environmental Restoration Act and an amendment to include the Great Lakes in the Harmful Algal Bloom and Hypoxia Act. I have also recently been appointed to the Steering Committee for the Global Ocean Observing System (GOOS) and strongly encourage everyone to support the development of an Integrated Ocean Observing System (IOOS) that includes the Great Lakes. We need a string of monitoring buoys around all of the Great Lakes.

*Background and History*

The Great Lakes hold 20 percent of all the freshwater in the world and 95 percent of the freshwater in the United States. The US shoreline of the lakes is longer than the Atlantic Coast, Gulf Coast and Pacific Coast, if we leave out Alaska. Approximately 30 percent of the US population lives around these lakes.

Lake Erie is the southernmost and shallowest of the Great Lakes. As a result, it is also the warmest. It also provides drinking water to 11 million people each day. The other Great Lakes are all in excess of 750 feet deep, and Lake Superior is 1,333 feet deep. The deepest point of Lake Erie is about 210 feet in the eastern basin, off Long Point. As a result, Lake Erie is the smallest of the lakes by volume, and Lake Superior is 20 times larger than Lake Erie. The watersheds around the other four Great Lakes are all dominated by forest ecosystems. The watershed around Lake Erie is the home to 14 million people and is dominated by an agricultural and urban ecosystem. As a result Lake Erie receives more sediment and more nutrients than the other Great Lakes. Now, if Lake Erie is the southernmost, shallowest, warmest, and most nutrient enriched of the lakes, we should expect it to be the most productive of the Great Lakes. It is. In fact, we often produce more fish for human consumption from Lake Erie than from the other four lakes combined.

Lake Erie has gone from being the poster child for pollution problems in this country to being one of the best examples in the world of ecosystem recovery. A little over 30 years ago, 1969, the Cuyahoga River burned and Lake Erie was labeled a dead lake. Nothing could have been further from the truth. In reality the Lake was too alive. We had put too many nutrients into the Lake from sewage and agricultural runoff. These nutrients had allowed too much algae to grow, and that algae, when it died and sank to the bottom, had used up the dissolved oxygen in the water as the algae was decomposed by bacteria. This sequence is a natural aging process in lakes called eutrophication, but man had accelerated the process by 300 years by putting in too much phosphorus. It is very similar to what we are seeing today in the Gulf of Mexico, but the problem in salt water is nitrogen.

Scientists divide Lake Erie into three basins based on significant differences in shape and depth. The Western Basin is the area west of Sandusky and has an average depth on only 24 feet. The Eastern Basin is the area east of Erie, Pennsylvania and contains the deepest point in the Lake. The Western and Eastern Basins have irregular bottoms with a lot of variation in depth. The Central Basin is the large area between Sandusky and Erie. The average depth of this basin is about 60 feet and the bottom is quite flat. Unfortunately, it is this shape that causes this basin to be the home of the Dead Zones.

Many of you have probably experienced swimming in a pond and noticed that the deep water was much colder than the surface water. This layering with warm water on top because it is less dense and lighter, and cold water on the bottom because it is heavier, is very common in the Great Lakes. The warm surface layer is called the epilimnion. The cold bottom layer is called the hypolimnion. The line of rapid temperature change between the layers is called the thermocline. In Lake Erie, these layers form in the late spring and break up in the fall when the surface layer cools to the temperature of the bottom layer normally in September or October.

In Lake Erie, the thermocline usually forms around 50 feet. Based on the depths of the three basins, this means the Western Basin is too shallow to have a thermocline except on rare occasions, the Eastern Basin will have a thermocline and there will be a lot of water below it in the cold hypolimnion, and the Central Basin will have a thermocline but there will be a very thin layer of cold water under it in the hypolimnion.

At the time the thermocline forms, there is plenty of dissolved oxygen in the hypolimnion. However, due to its depth, there is often no way to add oxygen to the water in the hypolimnion until the thermocline disappears in the fall. Therefore, throughout the summer the oxygen that was present when the thermocline formed is used by organisms living in this area, including bacteria, which are decomposing

algae as it dies and sinks to the bottom. If large amounts of algae are dieing and sinking, then large amounts of oxygen will be required for the decomposition process. It should then seem logical that if we could reduce the amount of algae, we could reduce the amount of oxygen that would be required to decompose the algae. It should also seem logical that if the hypolimniom was thicker (if the lake was deeper) it would have a larger reservoir of dissolved oxygen.

Because the Western Basin seldom has a thermocline, this is not a problem there. And, because the Eastern Basin is so deep, there is a large reservoir of oxygen in the hypolimnion enough to last through the summer until the thermocline disappears in the fall. The Central Basin, however, does not have a large reservoir of water or oxygen in the hypolimnion because the basin is not deep enough. As a result, loss of all the oxygen, or hypoxia (levels below 2.0 ppm) or anoxia (no oxygen), can be a serious problem in the bottom waters of the Central Basin. Areas of anoxia were first observed as early as 1930, and by the 1960's and 1970's, as much as 90 percent or the hypolimnion in the Central Basin was becoming anoxic each year. This is why Lake Erie was labeled a "dead lake." When an area becomes anoxic, nothing but anaerobic bacteria can live there. Also, this water creates severe taste and odor problems if it is drawn in by water treatment plants servicing the population surrounding the Lake.

To reduce the amount of algae in the Lake, we needed to reduce the amount of the limiting nutrient. By "limiting nutrient," I mean the essential nutrient that is in the shortest supply. Without this nutrient algae cannot grow and reproduce. In freshwater this nutrient is phosphorus. In 1969, we were loading about 29,000 metric tons of phosphorus into Lake Erie each year. Our models told us that in order to keep dissolved oxygen in the Central Basin, we needed to reduce the annual loading of phosphorus to 11,000 metric tons. This was accomplished and the recovery of the Lake has been truly remarkable. The walleye harvest from the Ohio waters jumped from 112,000 in 1976 to 5 million in 1988 and the value of this fishery exceeds the value of the lobster fishery in the Gulf of Maine. Small businesses associated with charter fishing increased from 34 in 1975 to about 900 today, and Lake Erie became the "Walleye Capital of the World."

Then on 15 October 1988, we documented the first zebra mussel in Lake Erie. Recognizing the significance of this discovery, Ohio Sea Grant initiated a research project on 15 November to document the expansion of the mussels. One year later, the densities in the Western Basin had reached 30,000 per square meter. Their impact was so great that in 1993 I addressed the International Joint Commission and asked them to create a special task force to try to understand the huge changes that were occurring in Lake Erie. I was asked to be US Co–Chair of the Lake Erie Task Force for the International Joint Commission from 1994–1997 as we developed models to better understand the impact of the zebra mussel on the ecosystem of the Lake.

In 1998 I formed the Phosphorus Group, a group of about 50 scientists from the US and Canada to discuss phosphorus levels to determine if they might have gotten too low and were harming the fishery at that point the walleye fishery had been reduced by about 60 percent and the smelt population had been decimated. This group concluded that based on changes in the system caused by zebra mussels, adding more phosphorus would create more zebra mussels and more inedible, blue-green algae.

At the end of 1998, Drs. Jan Ciborowski (University of Windsor), Murray Charlton (National Water Research Institute of Canada), Russ Kreis (US EPA) and I formed the Lake Erie at the Millennium Program to continue to lead discussions and focus attention on the huge changes that were occurring in Lake Erie. We have documented a number of new invaders to the Lake, including the round goby, and have observed the gradual transition from zebra mussels to quagga mussels, a relative of the zebra mussel, but a species we know much less about.

In the mid–1990's, US EPA's Great Lakes National Program Office (GLNPO) observed an increase in phosphorus levels in Lake Erie and the increasing trend has continued. They also observed areas of anoxia in the Central Basin that showed indications of growth. In 1996 we observed a bloom of blue-green algae in the Western Basin an indication that phosphorus levels were high. In 2001 we saw more indications that dissolved oxygen levels were critically low, and we observed that mayfly larvae had been eradicated from several regions a clear indication that oxygen had been eliminated. We also observed reduced water transparency over the artificial reefs we had worked with the city of Cleveland to produce from old Brown's Stadium another indication of an anoxic hypolimnion.

The above information was shared with the GLNPO and they asked me to bring together a group of Lake Erie experts for a meeting in their Chicago offices on 13 December 2001 to discuss the problems we were observing in Lake Erie and

strategize about solutions. As a result of this meeting, GLNPO issued a call for research proposals in January 2002 and fund a 1-year project lead by Dr. Gerry Matisoff, Case Western Reserve University, and the four scientists mentioned above from the Millennium Program, to attempt to better understand the dissolved oxygen problem in Lake Erie. This project included many scientists on both sides of the border and results have been presented in May 2003 at the Millennium Conference and at IAGLR.

*Current State of the Lake*

GLNPO recently completed another science cruise aboard the Lake Guardian from 14–19 August. Preliminary results from this cruise indicate that hypoxia was evident at half of the stations and only 20 percent of the stations showed dissolved oxygen levels about 4 ppm, the minimum level for most fish species. In June of this year, Ohio Sea Grant and Stone Laboratory placed a monitoring instrument one foot above the bottom at a station approximately seven miles north of Huron, Ohio in an area we call the Sandusky Sub-basin. This instrument, a YSI 6600, makes hourly readings of dissolved oxygen and five other parameters. This site was chosen because it is among the most productive sites in the entire lake and it was the first area to exhibit anoxia as early as 1930. This year hypoxia was first observed at this site on 4 August, and a low value of 0.2 ppm was observed on 8 August. Oxygen is not likely to return to these stations until the lake turns over during a storm this fall when the upper warm layer cools to a temperature almost equal to the cold bottom layer. It is also important to note the Microcystis sp., a harmful form of algae that produces the toxin microcystin, has been increasing in density in the Western Basin for the past 2 weeks and is nearing bloom levels.

I believe the oxygen problem is real and that it is growing. There are clearly a number of exacerbating conditions that are causing this. It now appears clear that Lake Erie has been gradually warming for the past 100 years, that phosphorus concentrations having been increasing since 1995, and that the water level has fallen sharply since 1997. Together, these conditions reduce the amount of oxygen available in the hypolimnion of the Central Basin and accelerate the use of the oxygen that is available. It also appears likely that zebra mussels and quagga mussels are exacerbating the problem by releasing phosphorus and allowing it to cycle more frequently through the system.

*Recommendations*

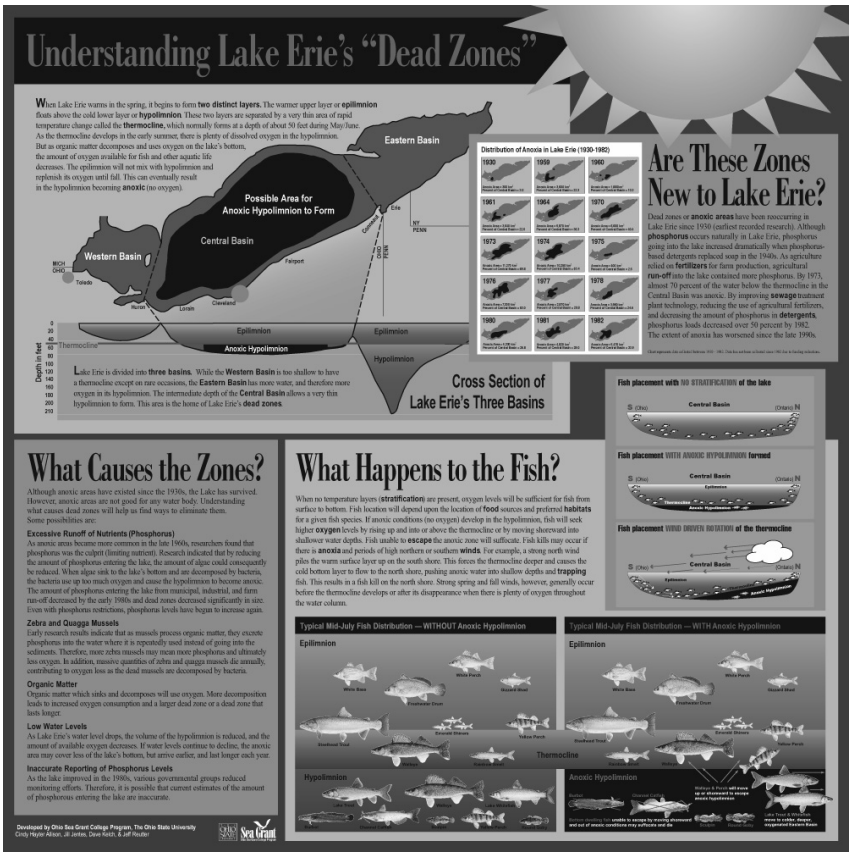
Needs:

- Reduce the amount of phosphorus entering Lake Erie difficult, but possible.
- Eliminate zebra and quagga mussels difficult and probably not possible.
- Eliminate global warming difficult and most people don't even realize it is a very serious problem.
- Increase the water level of Lake Erie currently Mother Nature holds all of the cards and models of how global warming will affect this indicate that levels are likely to go down.

The dead zone problem in the Central Basin of Lake Erie should be a wake-up call for all of us. The ecosystem in the Great Lakes cannot be taken for granted. We badly need a huge influx of Federal funding on the scale of that used for the Florida Everglades to address the recovery of the Great Lakes Ecosystem from the dissolved oxygen problems to contaminated sediment and harmful algal blooms. We should all support Senator Voinovich's efforts to sponsor the Great Lakes Environmental Restoration Act and an amendment to include the Great Lakes in the Harmful Algal Bloom and Hypoxia Act. The Senator has lead efforts in the past to improve sewage treatment capabilities. We must get behind him again to eliminate combined sewers and problems like those that occurred here in Cleveland at the sewage treatment plants during the 14 August blackout.

We badly need a coordinated plan that includes and coordinates that activities of all agencies. Some of us will be leaders and some of us must accept roles as team players. Currently, there are too many cooks in the kitchen when it comes to managing the Great Lakes Ecosystem. We need better coordination. We should all support the recent funding from NOAA Sea Grant to the Great Lakes Commission and the Northeast–Midwest Institute to develop a Great Lakes Restoration Plan.

Finally, I have also recently been appointed to the Steering Committee for the Global Ocean Observing System (GOOS) and strongly encourage everyone to support the development of an Integrated Ocean Observing System (IOOS) that includes the Great Lakes. We need a string of monitoring buoys around all of the Great Lakes so we are never caught off guard.

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STATEMENT OF ELAINE MARSH, OHIO GREENWAYS

I am deeply grateful for the opportunity to speak with you this morning about my experiences working on two collaborative efforts. I am Elaine Marsh, Project Director of Ohio Greenways. For the past 6 years, I have served as Lake Erie Director on the Board of Trustees for Great Lakes United. I would like to express my gratitude to Senator Voinovich for holding these hearings, for his consistent efforts on behalf of the Great Lakes and for his support a Great Lakes Restoration Plan.

Great Lakes United is an international coalition of individuals and over 170 organizations representing hundreds of thousands of citizens from the eight Great Lakes States, two Canadian provinces and tribal territories within the Great Lakes region. Our main constituents are environmental organizations like National Wildlife Federation, Sierra Club, the Ohio Environmental, the Kent Environmental Council and EcoCity Cleveland; conservation organizations like Trout Unlimited; and labor groups and civic organizations like United Auto Workers and the Great Lakes Chapter of the League of Women Voters. We work at the local, regional and international level on projects, programs and policies to protect and restore the Great Lakes—St Lawrence River ecosystem.

To that end, we developed A Citizens' Action Agenda for Restoring the Great Lakes—St. Lawrence River Ecosystem. Two years ago, we at Great Lakes United became convinced that expanded Federal action to protect the Great Lakes might be a real possibility. During the 2001 annual spring get-togethers organized separately by the Northeast–Midwest Institute and the Great Lakes Commission, we had occasion to talk to Members of Congress and their staff. Those conversations suggested that there was growing frustration with the existing approach of dealing

with Great Lakes issues on a project-by-project basis within a convoluted and uncoordinated framework.

We concluded from those meetings that the region needed a comprehensive approach that could be broadly supported by the States and their publics. We at Great Lakes United thought that both State and Federal Great Lakes officials might be considering comprehensive Great Lakes action. We thought it was imperative that the Great Lakes public be in on the ground floor of any new protection effort. We also thought it would be ideal for the public to approach restoration both collectively and comprehensively, and to address any new Federal effort with as unified a voice as possible.

For the next 18 months, we worked on what evolved into the Great Lakes Green Book that you have before you. Our first objective was to involve every major organization in the Great Lakes basin, on both sides of the U.S.–Canada border. We included all interest parties, members and non-members alike. We wanted to construct an agenda that addressed all of the major issue areas impacting the Great Lakes ecosystem. We wanted to include both project-oriented and policy-type solutions. Finally, we wanted to make sure that the resulting document was not just the work of Great Lakes "insiders," but a representative statement by all those with an interest in regional environmental issues.

We started by dividing the problems besetting the Great Lakes ecosystem into seven general restoration issue areas:

1. Toxic Clean Up
2. Clean Production
3. Green Energy
4. Sustaining and Restoring Water Quantities and Flows
5. Protecting and Restoring Species
6. Protecting and Restoring Habitat
7. Water and Air Quality Standards

Next, we established self-selected working groups to draft plans for each of these areas. Each of the seven draft plans was circulated to all organizations and individuals interested in the relevant issue area. After rewrites based on resulting comments, the whole plan, including all seven issue areas and an introduction, was sent out by surface as well as electronic mail to general announcement lists and all members of the public we thought might be interested. Each section was rewritten again based on the resulting comment, and the whole plan was sent out one last time to the Great Lakes community for final comment. Great Lakes United released the Citizens' Action Agenda for Restoring the Great Lakes—St. Lawrence River Ecosystem this past June at our annual meeting. I have brought a couple copies of the agenda in its entirety.

The Green Book you have before you is the executive summary of the agenda. The Green Book begins with a statement of our purpose and a statement of the critical condition of the Great Lakes. Next, each of the seven sections begins with a brief discussion of the problem and a list of recommended actions, including timetables. For example, in the Toxic Cleanup section, the first category of actions, very relevant to today's proceedings, is "Provide adequate funding for cleanup of Areas of Concern." Several action items relating to AOC's follow. Other categories in this section are Building and Engage Healthy Communities with actions related to public education on health issues, Coordinating Toxic Cleanup Efforts, Treating Contaminants, and Contaminated Land and Groundwater Sites. Likewise, the six remaining issue areas are divided categories and related actions. If you would like, I could walk you through particular sections.

Senator, I know that you are interested in hearing about how collaborative efforts might support the pending legislation on Great Lakes restoration. I would like to give another example of my experiences here in Ohio. As Project Director of Ohio Greenways, I worked with the Ohio Conservation and

Environmental Forum to inform the legislative process and support the Clean Ohio Fund. The $400 million bound fund was initiated in 2000 by Governor Taft to finance brownfield revitalization, natural resource projects, and farmland preservation projects. Coordinated by the Ohio League of Conservation Voters, more than thirty organizations put their resources and expertise together and, over a twelve-month period, drafted the "Blueprint for the Clean Ohio Fund." Several copies are circulating. This document clearly stated our priorities for funding projects, identified desired administrative procedures, and defined criteria both for the selection and exclusion of projects. The document was released to the media and distributed to the legislature. It was the central focus of our educational efforts with the public. It served as point and counter-point to the treatises produced by members of the administration and other interested parities.

I believe that I can unequivocally state that Blueprint had a profound and positive effect on the outcome of the Clean Ohio Fund. It is a possible approach for a Great Lakes Restoration Plan.

I would like to conclude by examining the remarkable capacity of the Great Lakes public as demonstrated by the Citizens' Action Agenda. It is comprehensive in scope and specific in recommendations. The power of the document and its broad support is derived from the inclusive process used in its production. Likewise, we think extensive public involvement in any comprehensive restoration effort will greatly strengthen that effort. The production of the Green Book clearly demonstrates that the Great Lake public has the capacity to play a constructive role in any comprehensive restoration effort. We encourage you to engage the public, early and often, and we offer our assistance in that effort. And, while we are not prepared to discuss priorities at this time, using the Green Book as a basis, we could help the basin public come to consensus in prioritizing Great Lake restoration projects as they might relate to legislated funding.

We laud you for your efforts on behalf of our Great Lakes, and we thank you for the opportunity to talk about our Citizen's Agenda.

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RESPONSES OF ELAINE MARSH TO AN ADDITIONAL QUESTION FROM SENATOR INHOFE

*Question.* I was very impressed when reading about the local effort that resulted in The Green Book for Great Lakes restoration efforts. Such local public enthusiasm and nearly 200 programs identified by the General Accounting Office in its report A Coordinated Strategic Plan and Monitoring System Are Needed to Achieve Restoration Goals is not indicative of a need for more Federal involvement but rather help with coordination. The Great Lakes are fortunate in that they appear to have an active citizenry, active community groups and concerned State and local governments already engaged and eager to help.

With so many citizen groups involved as well as State and local organizations, could one of these organizations coordinate the broader effort with Federal guidance but not necessarily Federal leadership, which has thus far failed to result in a comprehensive approach?

Response. Great Lakes United and other regional non-governmental organizations are prepared to partner in restoration with leaders in our Great Lakes city, State, and Federal Governments, and other basin government entities such as Ontario, Quebec, First Nations and tribes. However, as a non-governmental organization, our capacity to act as coordinator of all these actors is limited.

While some progress in Great Lakes restoration and protection has been made in the last three decades, the Federal role in Great Lakes environmental affairs has so far not resulted in as rapid or as comprehensive an approach to protection and restoration as either the States or the regional public would have liked. We believe this state of affairs has two causes. First, no Federal agency was ever tasked to coordinate basin environmental programs. Second, basin States have had a predominant say in how Federal environmental programs in the region have been carried out, but until recently chosen not to exercise that say in a unified manner.

The current initiative comes in the context of a declared interest by the region in a unified, comprehensive, coordinated approach to restoration, most recently expressed last week by the Council of Great Lakes Governors in their release of "priorities" for basin environmental restoration.

The restoration bills introduced in the Congress reflect the new reality of regional interest in unified, coordinated, comprehensive restoration and a substantial Federal role in that restoration. The House and Senate bills have substantial differences, but both propose a central role for State leadership in decisionmaking, in the context of Federal resources and coordination.

We think the bills' various ideas for a Great Lakes advisory board led by the States and a Great Lakes Federal coordinating council led by the Environmental Protection Agency's Great Lakes National Program Office are the beginning of a plan for a comprehensive approach that could effectively protect and restore the largest freshwater ecosystem on earth.

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RESPONSES OF ELAINE MARSH TO ADDITIONAL QUESTIONS FROM SENATOR VOINOVICH

*Question 1.* What groups does Great Lakes United recommend be at the table as we start to develop an overall Great Lakes restoration strategic plan?

Response. We think the regional environmental groups should be at the table, including the National Wildlife Federation's Great Lakes office, the Sierra Club's Great Lakes Program, the Lake Michigan Federation, the Great Lakes Aquatic

Habitat Network and Fund, and Great Lakes United. Perhaps there should also be a role for one or two basin environmental "practitioners"—organizations actually carrying out restoration activities already. Two or three seats could be rotated among all these groups to keep the table small enough to be workable and also so as not to overtax the capacity of any one group. Basin environmental groups in turn would continue to share information with each other, with our associated or member groups, and with our State, provincial, and local partners in restoration.

We also think there should be an observer role for a nongovernmental organization from Canada, just as governmental direction of any plan or effort should include incorporate consultation with basin Tribes and the governments of Canada, Ontario, and Quebec.

*Question 2.* How do you recommend we develop a comprehensive restoration plan while continuing programs that are currently successful and not delaying progress?

Response. We answer this question on the basis of a universal point agreed to by all regional stakeholders: funding and resources are needed now to address the broad range of ecological threats already known to exist. A vast body of evidence shows that invasive species, sewage overflows, pollution, habitat destruction, and wasteful water uses, among other problems, continue to put the Great Lakes and its basin ecosystem at risk. Our first concern is that short-term action and longer-term prioritization and planning take place at the same time.

We believe that both short-term actions and long-term planning require regional leadership and extensive public involvement. As a result, we do not think that either element of Great Lakes restoration should be directed by the U.S. Army Corps of Engineers, although the agency doubtless must play a significant role in carrying out restoration activities.

In the short term, the bodies proposed in the bills, the State advisory board and Federal coordinating committee, or their equivalent, with significant public representation, should agree annually upon a set of priority projects to be funded in fiscal years 2004, 2005, and 2006. In later fiscal years, the priorities outlined in a long-term planning document would guide funding.

For the longer term, we believe that a comprehensive restoration plan should be created, but we do not recommend that it be developed from scratch. Rather, we recommend that Federal, State, local, and other interests draw from the myriad existing plans that already exist to come up with long-term restoration priorities. Among such existing plans are the Bush Administration's Great Lakes Strategy 2002, the Lakewide-Area Management Plans, the Great Lakes Water Quality Agreement, Great Lakes United's Green Book, and many others. Years, and in some cases decades, of work by agencies and stakeholders have gone into these plans to identify threats and identify ways to address them. The express and implied priorities outlined in the Great Lakes Water Quality Agreement should be paid special attention, as they are a solemn commitment of the United States to Canada.

To carry out this longer-term planning, we recommend the creation of an independent task force that would distill priorities from existing plans and identify emerging issues within 2 years of passage of restoration legislation. The independent task force could be directed by bipartisan figures appointed by the Governors of the eight Great Lakes States in consultation with the region's mayors. The task force should engage significant interested sectors of basin society, including tribes; it should submit a draft proposed plan after 1 year for wide public comment; and it should deliver a final product to Congress after one more year.

Great Lakes regional environmental groups are prepared to convene a first meeting early next year, with your help as appropriate, to bring the region's major stakeholders together to determine criteria for selecting the first set of commonly agreed-upon projects.

*Question 3.* Including the bill that I cosponsored (S. 1398), I have seen different mechanisms proposed to coordinate Great Lakes programs, such as a task force. What do you think would work best?

Response. With respect to ongoing coordination of Great Lakes programs, the model proposed in the Senate bill appears the most effective. However, we think final restoration legislation should have stronger basic restoration principles and mechanisms for accountability and public participation than are currently found in either the House or Senate bills.

We are meeting with the regional environmental groups mentioned above to develop specific recommendations as to how this might be done. Regional environmental groups will provide a coordinated response to House and Senate staff by the end of October.

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