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ASIAN CARP

HEARING

BEFORE THE

SUBCOMMITTEE ON WATER AND POWER

OF THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

TO

EXAMINE THE SCIENCE AND POLICY BEHIND THE FEDERAL FRAMEWORK AND NONFEDERAL EFFORTS TO PREVENT INTRODUCTION OF THE AQUATIC INVASIVE ASIAN CARP INTO THE GREAT LAKES

FEBRUARY 25, 2010



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ASIAN CARP

THURSDAY, FEBRUARY 25, 2010

U.S. SENATE,
SUBCOMMITTEE ON WATER AND POWER,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:33 a.m. in room SD–366, Dirksen Senate Office Building, Hon. Debbie Stabenow presiding.

OPENING STATEMENT OF HON. DEBBIE STABENOW, U.S. SENATOR FROM MICHIGAN

Senator STABENOW. Good morning. I'd like to call to order this Water and Power Subcommittee hearing. Very much appreciate all of the witnesses and everyone who has traveled here today.

We do have an exhibition, I understand, of what would be viewed as the more baby, smaller, Asian carp. If they do start to smell too much, please let us know and we will—you know, if the—if we need to move them, we will. But, we appreciate the fact that they've been brought in to just demonstrate—even with these smaller ones, not yet grown—what we are up against, in terms of the fish, the size, and so on, that we'll be talking about.

It's my pleasure to welcome you, and I know that my ranking member, Senator Brownback, will be joining us this morning. We appreciate having one of his constituents from Kansas joining us on the panel today, as well.

The purpose of the hearing is to examine the science and policy behind the Federal framework and the non-Federal efforts to prevent introduction of the aquatic invasive Asian carp into the Great Lakes.

In 2003—I want to give you an example of what we have been hearing, in terms of the threat to the carp on individuals, as well as on the Great Lakes—in 2003, a woman named Mary Poplett, from Peoria, Illinois, decided to enjoy some unreasonably warm October weather with a little jet skiing in the Illinois River. As she cruised the waves, the sound of her ski's motor excited a 30-pound Asian carp swimming under the water, which leapt out and crashed into her. Image being hit in the face by a bowling ball, which is what she said it felt like. She broke her nose and fractured a vertebrae, knocking her unconscious. She would have drowned if other boaters hadn't stepped in and saved her life.

Mary's not alone. Since Asian carp were introduced to control algae in catfish ponds down south in the 1970s, the carp have spread at a rapid pace, causing injuries, destroying ecosystems, and

threatening entire industries. They are a very, very serious threat to our Great Lakes.

As you can see, these fish like to eat. The two that are in front of us are viewed as "baby fish." The Bighead Carp killed in Illinois weighed 92 and a half pounds.

Because Asian carp don't have a true stomach, they can't store food between meals, so they are constantly eating. Every day they eat 40 percent of their bodyweight in plankton. Their incredible appetites mean that other fish are left to starve. You can see the effect on other fish species in areas where infestation is greatest. Asian carp now make up 90 percent of the fish in the water, which should be an alarm to all of us.

Now these fish are on the verge of invading the Great Lakes. If they do, they could easily destroy our $7-billion fishing industry and our $16-million recreational boating industry, among other things, including what we view our way of life in the Great Lakes.

Invasive species in the Great Lakes have already contributed to significant decline in fish populations. Asian carp could completely unwind the food web, with devastating effects for our existing fish populations.

Today's hearing will explore solutions to this very serious threat. The Asian Carp Working Group, made up of State and Federal agencies, has developed a framework for Asian carp control, which will be the focus of our hearings today. That framework call for short-term and long-term actions to stop the spread of the Asian carp and protect the Great Lakes.

I've introduces S. 2946, the CARP Act, along with Senators Brown, Schumer, Gillibrand, Franken, and Feingold—and this is a companion to a House bill introduced by Congressman Dave Camp—that includes many of the short-term actions included in the framework, with one notable exception. Our bill calls for the immediate closure of the Chicago Canal locks until a permanent strategy is developed. For thousands of years, the Great Lakes and Mississippi River ecosystems were separated, until the construction of artificial canals and locks connecting them. Continuing threats of invasive species, especially the Asian carp, make it clear that we need to return to some kind of permanent separation of the two ecosystems.

This strategy was endorsed on Monday by the Great Lakes Commission, a group made up of 8 States and 2 Canadian provinces that border the Great Lakes. We want to talk about that today, as well.

So, I'm very pleased that all of you are here. I look forward to the testimony. When Senator Brownback joins us, I will turn to him for opening comments.

But, let me proceed with our first panel, and we welcome The Honorable Nancy Sutley, chair, White House Council on Environmental Quality. We very much appreciate your leadership and participation.

Dr. Leanne Carl, director of the Great Lakes Science Center in the U.S. Geological Survey, from Ann Arbor Michigan.

So, we welcome both of you, and I would ask that The Honorable Nancy Sutley proceed.

Thank you.

STATEMENT OF HON. NANCY H. SUTLEY, CHAIR, WHITE HOUSE COUNCIL ON ENVIRONMENTAL QUALITY

Ms. SUTLEY. Thank you, Chairwoman Stabenow. Thank you for holding this hearing, and for your leadership on this issue.

Invasive species, as you said, have been—long been a serious threat to many of our great ecosystems around the United States. The Great Lakes, in particular, has been attacked by invaders such as the zebra mussel and the round goby. For this reason, the Great Lakes Restoration Initiative identified combating invasive species as one of its areas of focus.

As you noted, the Great Lakes face perhaps their most serious threat from an invasive species yet, from the Asian carp. We think, however, there's a chance to stop this invasive species before it becomes established in the Great Lakes. This will require urgent coordinated action across all levels of government—Federal, binational, State, and local—pursuing immediate-term and long-term actions.

The Obama administration is engaging in this approach and working urgently to prevent these fish from establishing themselves in the Great Lakes.

We have a unique opportunity to prevent the environmental and economic harm that this invasive species could cause. Earlier this month, 4 Federal agencies—the Army Corps of Engineers, the Environmental Protection Agency, the Department of the Interior, and the U.S. Coast Guard—in cooperation with State and local agencies, developed the draft Asian Carp Control Strategy Framework.

The framework encompasses more than 25 short- and long-term actions, at an estimated cost of $78.5 million, to keep the Asian carp from becoming self-sustaining in the Great Lakes. The scale of this effort is unprecedented for invasive species control. Agencies are currently taking action and have outlined several short-term actions for the spring.

Operationally, agencies have already deployed field crews for electroshocking and netting operations within the waterway. Work is underway to reduce the turnaround times for the eDNA verification efforts that will give us a more accurate and timely picture of the movement of Asian carp.

A contract will be awarded this spring for construction of structures to block passages between the Chicago Sanitary and Ship Canal and the Des Plaines River, which will prevent fish movement around the electric barriers in the event of flooding. Construction and operation of a third electric barrier will be funded from Recovery Act in 2010 appropriations.

Also, the Army Corps, the Coast Guard, and the Fish and Wildlife Service are looking at ways to use Chicago's navigational locks to impede carp movement. In the near term, that means looking at how they can be kept closed more frequently and, in the long-term, evaluating what it would mean to permanently close them. A plan is being developed right now which will modify lock operations, as appropriate, this spring. A final recommendation, following the assessment, will be presented to the Assistant Secretary of the Army for Civil Works in the next couple of weeks.

Before any decision is made about the locks, we need to consider and understand the increased flood risk to northeastern Illinois

and northwestern Indiana, reduction in the flow of commerce into the Chicago area, and slower local and Coast Guard emergency response on the waterway.

The framework also identifies several long-term research efforts to provide significant tools for Asian carp management. This includes the development of control methods by USGS—and I'm sure my colleague will address those—where researchers are looking at carp-specific poisons and pheromones, and methods to disrupt spawning and egg viability.

The framework also includes the Army Corps of Engineers Inter-Basin Transfer Study, which examines the technologies and techniques to reduce invasive species transfer between the Mississippi River and the Great Lakes aquatic basins. The Chicago Area Waterway portion of this study, which includes an analysis of permanent lock closure and of ecological separation, is expected to be completed in 2012.

Because regional coordination is critical to this effort, Federal, binational, State, and local partners held public meetings this month to seek feedback on the draft framework, and, in addition, Federal agencies recently met a number of the Great Lakes Governors at the White House to discuss coordination and the most effective response to this threat.

Let me close with this: We are making progress in this very daunting challenge that lies before us. The Congress has made a commitment to the Great Lakes Restoration Initiative and provided $475 million to meet the initiative's goals, including fighting invasive species and preventing the introduction of new species. The Obama administration is committed to working in partnership with Congress in this regard, and we are also taking immediate, aggressive, and coordinated efforts to manage and control the Asian carp threat. While we have a long path ahead, what I understand the scientists are saying, we can be successful in this effort.

I welcome the ongoing dialog on this issue and thank you again for the opportunity to testify, and for your leadership on this issue.

Thank you.

[The prepared statement of Ms. Sutley follows:]

PREPARED STATEMENT OF HON. NANCY H. SUTLEY CHAIR, WHITE HOUSE COUNCIL ON ENVIRONMENTAL QUALITY

Thank you Chairwoman Stabenow and Ranking Member Brownback for holding this hearing.

Invasive species have long been one of the most serious threats to our ecosystems. The Great Lakes in particular have been devastated by invaders such as the zebra mussel and the round goby. For this reason the Great Lakes Restoration Initiative (GLRI) identified combating invasive species as one of its five areas of focus. The Great Lakes now face perhaps their most serious invasive species threat yet from the Asian carp. This time however, we have a chance to stop an invasive species before it becomes established in this important ecosystem. This will require an urgent and coordinated approach across all levels of government—Federal, State, and local—in pursuit of immediate and long-term actions. Federal officials within the Obama Administration are engaging in such an approach and are working urgently toward a single goal—to prevent these fish from establishing in the Great Lakes.

Today we have a unique opportunity to prevent the environmental and economic harm that this invasive species could cause. Recognizing this, earlier this month, four Federal Agencies, including the U.S. Army Corps of Engineers, the Environmental Protection Agency, the Department of the Interior, and the U.S. Coast Guard, in cooperation with state and local agencies, developed the draft Asian Carp Control Strategy Framework (Framework).

The Framework, guided by the latest scientific research, encompasses more than 25 short and long-term actions at an estimated cost of $78.5 million to keep Asian carp from becoming self-sustaining in the Great Lakes. The scale of the effort described in the Framework is unprecedented for invasive species control, unifying Federal, State, and local action and introducing a multi-tiered defense of the Great Lakes to immediately prevent Asian carp from developing self-sustaining populations in the Great Lakes while longer term control methods are developed.

Federal and State Agencies are taking action right now on netting and fishing Asian carp in the rivers and channels that connect the Mississippi Basin to the Great Lakes. A set of actions are being planned for this spring and summer when fish begin moving again, and long-term planning to deal with Asian carp and other invasive species is underway.

SHORT-TERM ACTIONS TO COMBAT ASIAN CARP

Agencies have outlined several short-term actions for this spring. Operationally, Agencies have already deployed field crews for electro-shocking and netting operations within the waterway, particularly around warm-water discharges where Asian carp may be wintering. Work is also underway to reduce turnaround times for eDNA verification efforts and to double testing capacity to 120 samples per week, which will provide a more accurate and timely picture of Asian carp migration.

Using GLRI funds from an interagency transfer between EPA and the Corps, a contract will be awarded this spring for construction of structures to block passages between the Chicago Sanitary and Ship Canal and the Des Plaines River, which will prevent fish movement around the electric barrier in the event of flooding, when the two water bodies mix. Construction and operation of a third electric barrier (IIB) will be funded from both the American Recovery and Reinvestment Act (ARRA) and appropriations from the 2010 Energy and Water Bill. The electric barriers remain our best defense and these efforts will fortify them.

Also, the Army Corps, Coast Guard, and the Fish and Wildlife Service are looking at ways to use Chicago's navigational locks to impede carp movement. In the near term, that means looking at how they can be kept closed more frequently, and in the longer term, developing an evaluation of what it would mean to permanently close them. A plan is being developed which will modify lock operations, as appropriate, this spring, and a final recommendation following this assessment process should be presented to the Assistant Secretary of the Army for Civil Works in the next several weeks.

As you know, lock closure is a complicated issue. Before any decision is made we need to consider and understand the increased flood risk to northeastern Illinois and northwestern Indiana, reduction in the flow of critical commerce in the Chicago area, and slower local and Coast Guard emergency response on the waterway. While fish movement is limited this winter, agencies are considering all these issues and are developing a recommendation for modified lock operations as quickly as possible. In addition, it is critical to note that even a complete closure of the Chicago and O'Brian locks would not serve as an absolute barrier to fish movement. Alternate river paths to Lake Michigan exist, which are not blocked by locks, and separately the locks are not watertight, which may allow fish passage even when closed.

LONG-TERM ACTIONS TO COMBAT ASIAN CARP

The Framework identifies several long-term research efforts that, used individually or in concert, will inform decision makers and provide significant tools for Asian carp management.

What is likely to be the most important long-term research involves the development of control methods by the United States Geological Survey at the Department of the Interior. Researchers are looking at Asian carp-specific poisons and pheromones—as well as methods to disrupt spawning and egg viability using sonic and light barriers.

The Framework also includes the Army Corps Inter-Basin Transfer Study, which examines technologies to reduce invasive species transfer between the Mississippi River and Great Lakes aquatic basins. The Chicago-Area Waterway portion of this study, which includes an analysis of permanent lock closure and of ecologic separation, has been expedited and is expected to be completed in 2012. The Framework also identifies activities to reduce downstream populations of the carp. It calls for educational and enforcement tools to prevent Asian carp from being sold or purposefully transferred, an investigation of Asian carp transfer in ballast and bilge water, and other Asian carp research.

FEDERAL, STATE AND REGIONAL PARTNERSHIPS

Because regional coordination is critical to this effort, and to the overall health of the Great Lakes, Federal, bi-national, state, and local partners held two public hearings earlier this month in Illinois and Michigan to seek feedback on the draft Framework. In addition, Federal agencies recently met with Great Lakes Governors at the White House to discuss the strategy to constrain the spread of Asian carp and ensure coordination and the most effective response to this potential threat across all levels of government. Finally, efforts to stop Asian carp migration will be strengthened with participation from water users including the commercial and recreational fishing and navigation industries and environmental groups, and their input is being solicited.

CONCLUSION

Let me close with this: we are making true progress on the challenge that lies before us. Six months ago, Congress made a commitment to the Great Lakes Restoration Initiative and provided $475 million to meet the Initiative's goals. An additional $300 million is requested for FY 2011. One of the focus areas in the Great Lakes Restoration Initiative is the management and control of invasive species in the Great Lakes, including preventing the introductions of new invasive species. The Obama Administration is working in partnership with Congress in this regard and has taken an immediate, aggressive, and coordinated approach to manage and control the Asian carp threat. And, moving forward, while we have a long path ahead, the best scientists have said that we can be successful in this effort and prevent Asian Carp from invading the Great Lakes.

We welcome any input the committee, its members, or your colleagues in Congress would like to provide as we continue to work together and in collaboration with state and local agencies to fight the spread of Asian carp into the Great Lakes.

Thank you for the opportunity to testify this morning and I look forward to your questions.

Senator STABENOW. Thank you very much.

Dr. Carl.

STATEMENT OF LEON CARL, DIRECTOR, MIDWEST AREA REGIONAL EXECUTIVE, UNITED STATES GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

Mr. CARL. Thank you, Chairman Stabenow. I thank you again for the opportunity to discuss the U.S. Geological Survey research on Asian carps in support of efforts to prevent their establishment in the Great Lakes.

My name, again, is Leon Carl. I'm the regional exec for the Midwest area for the USGS.

Today, I will briefly describe the USGS efforts to understand the biology and distribution of Asian carp in the U.S., as well as new and ongoing USGS research in the Federal Asian Carp Control Strategy Framework.

The mission of USGS is to provide reliable, impartial, and timely scientific information. This information is used by resource managers and policymakers at the Federal, State, and local levels to make sound, science-based decisions.

USGS scientists have assisted in developing the National Asian Carp Management and Control Plan, participated in the Interagency Asian Carp Rapid Response Team, organized research symposia, and have been involved in local and regional research and control planning efforts. USGS has been the primary Federal agency conducting ecological research on Asian carp for the past decade.

The 2 primary science roles for USGS related to Bighead and Silver carp, collectively referred to as Asian carp, include tracking and reporting the geographic distribution of these and other invasive

species in the U.S., and providing research and data to better understand the biology and manage populations effectively.

USGS has provided information on the geographic distribution of Asian carp populations since they became abundant in the Mississippi River drainage. These data are delivered online to the USGS Nonindigenous Aquatic Species data base.

USGS has synthesized and interpreted data and literature on the basic biology, life history, uses, and consequences of the introduction of Asian carp around the world, and developed a risk assessment for the U.S. The synthesis serves as an important information resource for researchers and natural resource managers, including the Fish and Wildlife service in its determination regarding the addition of Asian carp as injurious wildlife under the Lacey Act.

Early ecological research conducted by USGS on Asian carp focused on understanding their basic biology and life history requirements in the U.S. This information underpins nearly all areas of the potential research to manage and control these species. Field data demonstrate that Asian carp are affecting some of our native filter-feeding fishes. Additional details on the USGS research were submitted in our written testimony. Most current and planned USGS research on Asian carp has progressed to the—to focusing on more complex ecological interactions and more specific methods to control Asian carps.

USGS is identified as the lead agency to address nine action items in the Asian Carp Framework. These include projects on Asian carp prevention, detection, and control. The primary chemical control project will investigate the feasibility of incorporating toxins or bioactive compounds into an oral delivery system to target Asian carp without harming other species. Using this technology, toxins, identified through collaborations with pharmaceutical and agrochemical companies, would be encapsulated into a molecule that would be filtered by Asian carp as they feed. Once ingested, the toxin would be activated and the fish would die. This technology could also be used to target other invasive species, such as quagga or zebra mussels, and would reduce the amount of chemicals released into the environment.

Building on completed preliminary research under other USGS projects, we are looking at pursuing the feasibility of using carp pheromones to improve control efforts. Releasing pheromones may help us to attract or repel Asian carp and enhance the effectiveness of more effective—or more traditional control methods, such as netting or electro-fishing.

Another control project under USGS will evaluate the possibility of disrupting spawning behavior, as well as repelling or killing Asian carp using sound waves. If successful, this technique would be implemented quickly to limit the distribution and abundance of Asian carp.

In conclusion, the USGS science has provided significant contributions to our understanding of Asian carp biology and their impact on U.S. rivers. This information has proved valuable for our partners as they develop plans to prevent and control the expansion of Asian carp populations. However, there is still much to learn as Asian carps threaten new ecosystems.

The USGS is committed to continuing our research and new efforts to develop control methods. We look forward to continuing our collaboration with our local, State, and Federal partners.

Thank you very much, Chairman Stabenow, for this opportunity to testify. I would be happy to take any questions you or other members might have.

[The prepared statement of Mr. Carl follows:]

PREPARED STATEMENT OF LEON CARL, MIDWEST AREA REGIONAL EXECUTIVE, UNITED STATES GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

Chairwoman Stabenow and members of the Subcommittee, I am Leon Carl, Regional Executive of the U.S. Geological Survey (USGS) Midwest Area. Thank you for the opportunity to testify on the Department of the Interior's (Department) efforts regarding the science and research on Asian carps in support of the Federal Asian Carp Control Strategy Framework (Framework) to prevent the establishment of Asian carps in the Great Lakes. Also included in this statement is a summary of on-going Department efforts to address other aquatic invasive species in the Western United States (U.S.).

The USGS, the science arm of the Department, conducts research to understand the interrelationships among earth surface processes, ecological and biological systems, and human activities. In support of the science, the USGS partners with other Federal and State agencies, tribal governments, and non-governmental organizations to provide the science needed to help resource managers address critical and complex natural resource issues.

Today, my testimony will provide background on the biology of Asian carps, explain the Department's response to growing threats from bighead and silver carps, and describe what we are learning about these fishes as they became established and abundant in the great rivers of the central U.S. I will end by describing on-going and new USGS research efforts to address the threat of Asian carps to the Great Lakes using the newly drafted Framework.

BACKGROUND

Bighead and silver carp (collectively referred to as "Asian carps") filter bacteria, algae, and zooplankton from the water column—elements at the base of aquatic food webs. Asian carps were imported into the U.S. in the early 1970s as biological control agents for nuisance algal blooms in wastewater treatment plants and aquaculture ponds, as well as for human food. They escaped from those uses, were first captured in the wild in the 1980's, and quickly became the most abundant large fishes in parts of the Missouri, Illinois, and Mississippi rivers. Both bighead and silver carps grow quickly and become large as adults, often averaging about 10 pounds in U.S. rivers. Records for both species approach 100 pounds, but in the U.S. silver carp over 20 pounds and bighead carp over 30 pounds are uncommon. Schools of silver carp often jump from the water, particularly in response to passing motorboats, sometimes reaching heights of 10 feet in the air. When jumping silver carp intersect with boaters or boat equipment, serious injuries or damage can result.

Through time, Asian carps have steadily moved upstream through the Illinois and Des Plaines rivers into the Chicago Area Waterway System (CAWS). Because of the propensity of these fishes to outcompete native fish species in ecosystems they invade, great concern exists over the possibility of Asian carps colonizing the Great Lakes. Their establishment could threaten an important recreational and commercial fishery (valued at over $7 billion dollars annually) and the well-being of native species.

GROWING ASIAN CARP CONCERNS

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 established the Aquatic Nuisance Species Task Force (ANSTF), an intergovernmental entity including the U.S. Fish and Wildlife Service (Service), USGS, National Park Service, Bureau of Land Management, and Bureau of Reclamation within the Department, five other Federal agencies, and 12 Ex-officio members. The ANSTF is co-chaired by the Service and the National Oceanic and Atmospheric Administration and encourages Federal and State agencies to establish partnerships to augment work with partners to enhance collective efforts to address aquatic invasive species issues.

In response to threats from Asian carps, the ANSTF established an Asian Carp Working Group in 2003. Led by the Service, this stakeholder group of private and

public sector fisheries professionals, aquaculturists, and aquatic ecologists developed a comprehensive national Asian carp management and control plan. The final plan, Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States, was approved in 2007 and included input and authorship from several USGS scientists. Most USGS research on Asian carps has focused on national goals to reduce feral populations, conduct research to provide accurate and scientifically valid information for effective management and control, and to effectively plan, implement and evaluate the management and control of bighead and silver carps.

ROLE OF THE U.S. GEOLOGICAL SURVEY

The USGS has been the primary Federal agency conducting ecological research on Asian carps for the past decade. USGS scientists have participated in various interagency efforts during this time including assisting in the development and writing of the national Asian carp management and control plan, participating in the interagency Asian Carp Rapid Response Team, organizing research symposia focused on Asian carps, and have been involved in local and regional research and control planning efforts. The two main USGS science roles in regard to Asian carps have been to track and report their geographic distribution in the U.S. and to provide research to improve understanding of the biology of these fishes in U.S. ecosystems to better manage populations.

MONITORING THE DISTRIBUTIONS OF ASIAN CARPS IN THE U.S.

The USGS has been involved in monitoring the geographic distribution of Asian carps since they became abundant in the Mississippi River drainage. The primary means of delivering distributional data on invasive aquatic species is the USGS Nonindigenous Aquatic Species database (http://nas.er.usgs.gov). The database was created by the ANSTF with the goal of providing timely, reliable data about the presence and distribution of nonindigenous aquatic species using a National Nonindigenous Aquatic Species Information Center with: (1) a data repository and geographic information system; (2) a mechanism to allow sources such as researchers, field biologists, anglers, and others to report detection and occurrences of nonindigenous aquatic species; (3) transfer of information to interested parties; and (4) rapid communication of oral and written information. Real-time maps can be produced by users with the most recent distributional data reported. These maps are widely used by our partners and are frequently used by various media. The NAS database is perceived as a valuable resource by our partners and reporting distributional information on Asian carps to the NAS database is an objective in the Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States.

The USGS continues to collect valuable distributional data on Asian carps as part of the Long Term Resource Monitoring Program (LTRMP), which is implemented by USGS in cooperation with the five Upper Mississippi River System (UMRS) States (Illinois, Iowa, Minnesota, Missouri, and Wisconsin), and with guidance from the U.S. Army Corps of Engineers. LTRMP personnel collect data on water quality, aquatic plants, macroinvertebrates (e.g., larval insects, worms, crayfish), and fisheries throughout the year using standardized protocols across six study reaches in the UMRS. The objective of the LTRMP Fisheries Component relates to collecting quantitative data on the distribution and abundances of all fishes and communities in the UMRS. Therefore, protocols are not specific to Asian carps. Much useful data on the presence and abundance of these fishes has been collected, however, and these data continue to be reported to the NAS database and used by partners.

HIGHLIGHTED USGS RESEARCH ON ASIAN CARPS IN U.S. WATERS

In 2002, Congress petitioned the Service to list black, bighead, and silver carps as Injurious Wildlife under the Lacey Act. To help the Service address the petition, USGS collected and interpreted publications on the basic biology, life history, uses, and history and consequences of their introductions around the world, and developed an environmental risk assessment for the U.S. that led to the publication of Bigheaded Carps: A Biological Synopsis and Environmental Risk Assessment. This report, later published as a book, synthesized and interpreted information and data on bighead and silver carps from scientific literature from around the world and made it more accessible, and is seen as a foundation for understanding the biology of these fishes both in their native ranges and as invaders in U.S. rivers.

When USGS researchers began studying Asian carps in U.S. waters, not enough was known about their basic biology to use traditional fisheries management tools. For instance, a basic tool of fisheries management is to model population growth. To develop a population model, some basic parameters must be known, such as body

length of the species at known ages and the number of offspring produced. In the case of Asian carps, these parameters could not be estimated because not enough was known about Asian carps to even collect these data. Throughout the world many different anatomical structures of bighead and silver carps have been used for aging individual fish but there had not been a comparison of methods to determine the most reliable. USGS researchers collected a wide variety of aging structures from known-age fish and conducted such a comparison. Data analysis is still ongoing in this study, but it is clear that some structures provide more reliable age estimates than others. In gathering data from sources around the world, it became apparent that the timing and frequency of spawning of bighead and silver carps varied widely. Estimating the number of offspring an individual female could produce for population modeling requires data on the timing and frequency of spawning. USGS researchers completed such a study on Asian carps in the Missouri River and found that the spawning time of these fishes was much longer in their introduced ranges than in their native ranges and that individual females can have multiple spawns of portions of their eggs over that extended period of time.

A fundamental understanding of Asian carp biology and life history requirements in U.S. waters underpins nearly all other areas of potential research to manage and control these species and completing key basic biological studies on Asian carps has been an early research focus of USGS. For example, one study examined the diet and diet selectivity of bighead and silver carps in the Missouri River and one of its tributaries. Another, a 2-year telemetry study examined the movements and habitat selection of bighead and silver carp captured from the Missouri River and a prominent tributary. As part of this study, side-scan sonar was used to image and map available habitats of the tributary.

Predicting the potential range of an invading species can help guide monitoring efforts of natural resource agencies. Therefore, gaining an understanding of factors limiting distribution can prove valuable for natural resource managers. Water hardness has been proposed as a factor potentially limiting the distribution of Asian carps. If true, water hardness could be used to predict areas in which Asian carps could and could not survive. However, studies by USGS scientists have shown that bighead and silver carp egg survivorship is not substantially affected by water hardness suggesting that this factor would not be helpful in predicting potential distribution.

Results from diet studies indicate that excessive filtering by Asian carps can affect native fishes. In a collaborative study between Florida State University and USGS examining diets of Asian carps and native filter feeding fishes found substantial dietary overlap between bighead carp and both bigmouth buffalo and paddlefish. Similar dietary overlap was found between silver carp and gizzard shad, suggesting competition between these species could occur when food resources are limiting. Preliminary results from a study in which USGS is a participant with many partners indicate that excessive filtering by Asian carps can even affect Asian carps. Data from this study indicate that Asian carps are quite robust when they first invade an area, but that they become thinner after they have been established for a few years.

While conducting initial field research on Asian carps to understand their fundamental biology, USGS researchers also initiated two studies to assess efficacy of traditional fisheries management chemicals on controlling Asian carps. Both studies found that the susceptibility of Asian carps to rotenone and antimycin were similar to those of native fishes. Results of these studies helped inform development of the Asian Carp Rapid Response Plan, which was implemented in December 2009 to poison a 5.7-mile stretch of the CAWS when the electrical barrier (Barrier IIA) in Romeoville, Illinois, was de-electrified for scheduled maintenance.

The USGS also completed initial experiments to determine whether naturally-produced Asian carp pheromones could be used to better control the distribution or reduce the population sizes of these fishes. For instance, many members of the minnow and carp family are known to have alarm pheromones that are released from traumatized skin and cause an alarm reaction in members of the same or closely-related species. In preliminary laboratory studies, juvenile bighead and silver carps exhibited a significant avoidance of skin extracts from members of their own species. Alarm pheromones could potentially be introduced into areas near locks to keep Asian carps from entering into these structures and gaining access to additional areas to colonize.

The USGS researchers also conducted a study to support an objective of the Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States that encourages the development of markets for bighead and silver carp flesh. Ensuring safety of consuming flesh of Asian carps is paramount to this objective. USGS collaborated with the Saint Louis Zoo to collect bighead and silver carps from the Missouri River and to analyze tissues for organic and inorganic con-

taminant concentrations. Data analysis revealed contaminant concentrations lower than in native fish from the same area and acceptable for human and animal consumption.

NEW USGS PROJECTS ON ECOLOGICAL EFFECTS OF ASIAN CARPS IN THE MISSISSIPPI RIVER DRAINAGE

As research on Asian carps in the Mississippi River drainage has progressed from basic to more complex research questions, additional effort has been placed on examining ecosystem level effects of these fishes. In FY10, USGS has two new studies looking at more complex ecological interactions of bighead and silver carp on large river ecosystems.

The first study will examine whether excessive filtering of planktonic resources by Asian carps has altered the flow of essential fatty acids in the Upper Mississippi River System to such an extent that these effects are cascading through different trophic levels of the ecosystem. Specifically, this pilot study will determine if the abundance and quality of food resources for aquatic waterfowl have been affected by filter feeding by Asian carps.

A second study will seek to determine the mechanism by which Asian carps negatively affect fishes with larvae that share open water areas with feeding Asian carps. It is unclear if the observed negative effects are due to competition for food resources or if the Asian carps are actually eating larval fishes. To examine this phenomenon further, USGS researchers will determine whether bighead carp can prey effectively on larval fish when the larvae of native fishes are present in relative abundance using genetic barcodes.

USGS AND THE ASIAN CARP CONTROL STRATEGY FRAMEWORK

The USGS is identified as the lead agency to address nine of the 31 action items in the Framework. One action focuses on preventing further spread of Asian carps; two more actions will aid in Asian carp early detection and rapid response efforts; another will assess the effects of bighead and silver carps on plankton resources in the Great Lakes, and five additional actions will focus on developing control strategies for Asian carps.

Short-term Action 2.2.7 addresses preventing further spread of Asian carps in the U.S. This research project will identify other pathways in addition to the CAWS that could allow even intermittent water flow between the Mississippi River watershed and the Great Lakes resulting in the exchange of species between basins. The USGS will work with the U.S. Army Corps of Engineers and other partners to help identify these places and the hydrologic conditions during which invasive species could be transferred.

Two USGS action items in the Framework address Early Detection and Rapid Assessment (EDRA) of Asian carps. Short-term Action 2.1.11 will build on preliminary screening of tributaries of the Great Lakes identified in earlier USGS research as potentially supporting spawning of Asian carps. This research project will further refine predictions about suitable spawning locations in the Great Lakes for these fishes. Speculation exists as to whether adequate plankton resources are available in the Great Lakes to sustain Asian carps. Anecdotal evidence suggests that these fishes are more flexible in their feeding methods than previously believed and understanding their ability to use a variety of food resources is important in understanding where these fishes may be able to survive in the Great Lakes. Short-term Action 2.1.12 will examine the ability of bighead and silver carps to use food resources in addition to plankton.

Intensive filtering of planktonic resources by bighead and silver carps can lead to dramatic changes in those communities. One potential outcome observed in the literature is an increase in toxic bluegreen algae blooms. Long-term Action 2.2.14 will examine the potential ecosystem-level effects of bighead and silver carps on toxic algal blooms in the Great Lakes.

Three of the USGS action items in the Framework involve developing species-specific chemical control methods for Asian carps. The primary chemical control project is Short-term Action 2.1.6. No method currently exists to control Asian carps or quagga and zebra mussels without treating the entire water column and euthanizing all fish and likely all mussels in the area treated. In this project, USGS will investigate the feasibility of using recent advances to incorporate toxins or bioactive compounds into a targeted oral delivery platform to achieve species-specific control. USGS researchers have developed a Cooperative Research and Development Agreement with a private company, Advanced Bionutrition Corporation, to use their patented oral delivery platform. Using this technology, fish toxins, perhaps rotenone, would be encapsulated into a neutrally-buoyant molecule of the preferred size

filtered by bighead and silver carps. The molecule would remain safe and stable until the toxicity is triggered by something unique in the physiology of the targeted species, perhaps mucous on the gill rakers or the pH of the gut of bighead and silver carps. Delivering toxic doses of chemicals to Asian carps or zebra and quagga mussels in this manner would not only allow for species-specific control, but would require the release of lesser amounts of chemicals into the environment. This project is supported by Short-term Action 2.1.10. In one additional action item, Short-term Action 2.1.8, USGS researchers will work with a pharmaceutical or agrochemical company to identify chemical toxicants that may be specifically toxic to bighead and silver carps. Once identified, these chemicals would be tested on Asian carps as well as native fishes to examine selectivity.

Preliminary research completed by USGS researchers on Asian carp pheromones showed promise in using these compounds to either attract or repel bighead and silver carp from specific areas. Using pheromones in combination with other control methods may provide substantial efficiency and efficacy in achieving population control. Short-term Action 2.1.7 will allow USGS to further pursue the feasibility of exploiting Asian carp pheromones to enhance containment or control efforts.

The last USGS action item identified in the Framework is Action 2.1.9. This research project evaluates whether it is possible to disrupt spawning behaviors of bighead and silver carps using sound waves. Sound waves of particular amplitudes and frequencies can alter fish behavior. This project will identify sound wave amplitude and frequency that elicit silver carp avoidance behavior to disrupt spawning aggregations and limit recruitment.

HIGHLIGHTS—BUREAU OF RECLAMATION INVASIVE SPECIES PROGRAM

Reclamation has been active in a wide-range of efforts to combat invasive species that impact the management of our facilities or cause damage to habitats. Reclamation is concentrating on ways to prevent invasive species infestation, develop early detection/rapid response measures, support control and management actions, conduct targeted research, restore habitats damaged by invasive species, extend outreach to the public, and strengthen coordination with our managing partners.

For example, in Arizona and California, Reclamation partners with the U.S. Fish and Wildlife Service, other federal and state agencies, and the Palo Verde Irrigation District to control invasive aquatic weeds such as giant salvinia and parrotfeather. In California, Reclamation cooperates with the State agencies on hydrilla control. Approximately 450 acres of hydrilla have been controlled, and over 3,000 acres of ponds, canals, and rivers have been surveyed. In New Mexico and Arizona, Reclamation participates in the Multi-Species Conservation Program by controlling nonnative fish to benefit threatened and endangered native species. In several states and in collaboration with other agencies, Reclamation is performing research and demonstrating control and habitat restoration of salt cedar infested areas. In Washington State, Reclamation is conducting habitat restoration along the Yakima River.

Reclamation's greatest invasive species challenge is limiting zebra and quagga mussel introductions into the western states. These mussels arrived in the United States from Europe in the 1980s and spread to many Eastern state waterways. They have now spread into the Western states and as a result, Reclamation is concentrating on proactive measures, in close coordination with other Federal, state, and local entities, to help reduce the post-introduction spread and impacts of mussels at Reclamation facilities. An invasive mussel corporate task force has been established across Reclamation to focus on the development and implementation of a four-part strategy both on a regional and a Reclamation-wide basis. Reclamation has continued investigations to develop and implement facilities protection technologies (filtration for cooling water systems, biologically based pesticide product, and coating systems to minimize or prevent mussel attachment to critical infrastructure).

Reclamation received funding through the American Recovery and Reinvestment Act (ARRA) of 2009 which will be expended for monitoring and detection at high priority water bodies in the western U.S. Nearly 200 reservoirs will be studied. Early detection of mussels enables facilities protection actions before impacts to infrastructure and water resources are realized.

Reclamation has developed an Equipment Inspection and Cleaning Manual which emphasizes prevention through inspection and cleaning of various types of equipment. Reclamation has also developed a comprehensive Integrated Pest Management Manual to assist field personnel in diagnosing and treating pest and invasive species problems. Reclamation has provided leadership to develop the Quagga-Zebra Action Plan (QZAP) for the Aquatic Nuisance Species Task Force. Reclamation is also an active participant in the Western Regional Panel for Aquatic Nuisances Spe-

cies and assisted in the development of the Columbia River Basin Rapid Response Plan. Reclamation has held numerous training sessions, and hosted a Western Invasive Mussel Management Workshop in May, 2009. Further information has also been posted on Reclamation's mussel website http://www.usbr.gov/mussels/

CONCLUSION

In conclusion, USGS science has made significant advances to understand both the biology and the impacts of Asian carps on river systems. This information has proven critical for our partners as they develop prevention and control efforts. However, there is still much to learn as the Asian carps have the potential to enter new ecosystems. USGS is committed to continuing our ongoing efforts and to assisting in new efforts, aimed at developing control methods. We look forward to continuing our collaborative efforts with our local, State, and Federal partners.

Thank you, Chairwoman Stabenow, for the opportunity to submit this testimony on USGS research to address the expansion of Asian carps in U.S. waters. I will be pleased to answer questions you and other Members of the Subcommittee might have.

Senator STABENOW. Thank you, Dr. Carl.

I've been joined by our ranking member. Senator Brownback, welcome. Thank you——

Senator BROWNBACK. Thanks very much.

Senator STABENOW [continuing]. So much, for coming.

Senator BROWNBACK. Sure.

Senator STABENOW. We're to have you make any comments.

Senator BROWNBACK. I don't have an opening statement that I want to make orally. I do have one that I want to submit for the record.

[The prepared statement of Senator Brownback follows:]

PREPARED STATEMENT OF HON. SAM BROWNBACK, U.S. SENATOR FROM KANSAS

Senator Stabenow, it's a pleasure to be here today, and I thank you for chairing this important hearing.

I am pleased to join you in welcoming the witnesses and members of the public. Particularly, I would like to note the presence of Mike Hayden, former governor of Kansas and current Secretary of the Kansas Department of Wildfire and Parks.

The issue of aquatic invasive species has been a growing threat to the environmental, economic, and overall health of our national lakes and waterways. One such species, and the topic of today's hearing, is threatening the viability of one of our nation's most precious bodies of water.

While Asian carp were initially introduced in the United States as both a commercial food source and as a mechanism for cleaning bodies of water, the ability to control their migration and dominance of local ecosystems has proven a monumental task for state and federal wildlife groups.

In Kansas, as Secretary Hayden can attest to, we have had extensive experience dealing with invasive species. While I understand the Great Lake states have a unique situation in managing shared bodies of water, it is my hope that by examining our successes and failures, we can provide some guidance on what is the best approach for mitigating further damage these species cause to local communities and ecosystems.

As a government we share the critical goal of providing all people within the United States access to a reliable, safe and secure water supply. It is essential, though, to balance this need in a manner that considers the dire economic climate our nation currently faces.

I say this hopefully as a guide for Michigan and Illinois as they work to find an appropriate solution that will balance the need to prevent the spread of Asian Carp while maintaining the robust movement of goods throughout this region.

Once again, I thank the witnesses for your presence and thank you, Senator Stabenow, for conducting this hearing.

Senator BROWNBACK. I do appreciate the panel that is here. Particularly, the next panel up has a dear friend of mine, Governor Mike Hayden, that's now secretary of wildlife and parks for State

of Kansas. Very knowledgeable. So, I'm looking forward to his testimony, and others.

I do note that this is quite an extraordinary issue, and I've seen a lot of press on it. So, I'm really looking forward to learning more of the technical issues on it and then how best it is that we might be able to address it. So, this is certainly good information for me for policy formation. I appreciate you holding the hearing.

Senator STABENOW. Thank you very much. As you will see, that we have 2, what are referred to as "baby carp." We understand that there was one that attacked a woman in the Illinois River that was up to 92 and a half pounds and jumping out of the water, causing her to be unconscious, so—but this gives you some example of—at their—at the small end, what it looks like. So——

Let me first, Dr. Carl, ask you to talk a little bit more—there's been some debate about whether or not the Asian carp would find the Great Lakes suitable as a habitat. Of course, again, looking at a $7-billion sport fishing industry and a $16-billion-a-year recreational boating industry, I mean, this is a—is important question for us. I wonder if you might describe a little bit more, in terms of your answer, as it relates to whether or not they would find the lakes suitable as a habitat, and what effect they have on our ecosystems as a whole. What areas of the Great Lakes are more likely to be affected by the Asian carp were they to sustain themselves?

Mr. CARL. Thank you. That's quite a question.

I think we already know that we've captured fish that have grown—the Bighead carp in Lake Erie—so I think the answer to the first part of that is: It is likely that they would be able to grow and mature in quite a few parts of the lake—the lakes.

The key question might be, Can they reproduce in the Lakes? One of the very restrictive requirements that they have is, it seems to be 100 kilometers of stream—of large flowing turbulent water is needed at this point. What we base that on is—a lot of literature indicates that they haven't been successful if that amount of fast-flowing, large river is available.

We have concerns about that. The principle, I think, limiting factor may be that the eggs, when they first come out of the female, are very dense and very small, and they go—they grow very much, they take on water, and they harden. At that time, they would sink to the bottom, and they probably would smother. It takes about an hour for that process to be completed, so that high velocity, turbulent water would be necessary.

We're concerned that it may not be necessary to have a full 100 kilometers of stream. Even if it is 100 kilometers of stream, USGS has identified 22 rivers in the Great Lakes where they would be—on the U.S. side only—be possible for them to spawn. They may not be large enough or turbulent enough.

However, one of the concerns I have—and it gets to your question about where they might do well—are the connecting channels. If you look at the connecting channels, the St. Mary's has 120 kilometers of stream, the Niagara River is 58 kilometers, St. Clair is 58, and the—the Detroit River is 56 kilometers. So, there may be enough for them to spawn there. If they are successful in spawning—particularly, let's say, the St. Clair River; immediately downstream you have—Lake St. Clair would be a good place for larval

fish to grow. So, that might be an area that they'd concentrate on. They do like concentrations of plankton, they are filter feeders most of the time, so that the areas—large embayments, such as Lake St. Clair, that the larvae would do well; the western basin of Lake Erie, I think, would also be an area; perhaps Saginaw Bay, Green Bay, and some of the larger embayments; and Lake Ontario, as well. So, those would be areas that they would likely concentrate on.

We do have concerns—and it's in part of our control strategy—looking at other methods of feeding. We know that the Bighead carp will feed on detritus. That's the muck, essentially, on the bottom. So that there's real opportunity for them to eat on that, even where the plankton may be sparse caused by our quagga and zebra mussels. The silver carp apparently will eat algae mats. We have cladophora mats throughout the Great Lakes, so there is a good opportunity for these fish to grow in other places, as well.

I'm not sure I've completely answered your question, but there—areas would be—that they would concentrate would be in the—some of those large embayments.

Senator STABENOW. Basically, for anyone not knowing Michigan, you're talking about large population centers—Detroit River, St. Clair River, St. Clair—Lake St. Clair, or Saginaw Bay—a lot of people. A lot of people involved in recreation or fishing activity or commercial activity.

I'm wondering, though, based on what you're saying, if we should be monitoring other Great Lakes tributaries this spring.

Mr. CARL. I have had discussions with Charlie Wooley, who's the deputy director of the—one of the east—of the Fish and Wildlife areas that's involved with this. I think we're going to be looking at, with the EPA and the Corps, a surveillance plan as we move forward. We have been looking at these control measures and—so much concentrated on the canal right now, but eventually I think we're going to do that.

One of the projects that we have put—proposed and has been funded is to look at modeling to try to predict where we would find the fish spawning. That's probably the place—the best place to try to detect them, because they'd be concentrated. So, we would be looking at that. I would think we would use a tool like the eDNA to try to detect them in river systems and surveil the ones that we think are the most likely to have them. That we might be able to put into effect this summer. I can't predict that, because that's a management action. But, we would certainly be working with the Fish and Wildlife Service, and the State and tribal agencies, to try put that in place as quickly as possible.

Senator STABENOW. Thank you.

To Ms. Sutley, we thank you for your leadership, and for the resources that you've put together, and the efforts that have been made. We see a tremendous difference having a Great Lakes President with the resources that have been available to the Great Lakes. We want to continue to move forward, not only on this critical issue, but on other issues that are absolutely critical to 20 percent of the world's fresh water, called the Great Lakes.

I wonder if you would speak to the fact—again, there's a difference when we look at legislation that has been introduced versus

the plans that have been put together. Short-term efforts are similar. But, the—one big area relates to whether or not to temporarily close the locks until there is a permanent plan put in place.

I'm wondering if you might explain the administration's position on the locks, and a little bit more of how we do an intermittent lock closure. From a layperson's standpoint, you know, the fish are moving all the time. So, it's hard to explain why we would choose to close the locks part of the time, when we know these fish—again, who are eating continually and moving continually—are not going to read the signs and know, "Monday, Wednesday, Friday"—you know, I mean it—it's—so, there's a concern that I have about whether or not we are acting with a sense of urgency. I know people feel a sense of urgency, but are we acting with a sense of urgency about the reality of what is happening, what we have seen on the other side of the locks, from the eDNA, and what we know to be coming? I mean, time is of the essence. So, I'm wondering if you might just speak to the issue of the locks.

Ms. SUTLEY. Certainly. Thank you, Senator.

As I've said, we share the sense of urgency. As I understand, we have crews from the Fish and Wildlife Service, and from the Illinois DNR, who are out on the water right now—they have been all winter—doing sampling and electro-fishing and netting, and trying to make sure that, while there's not a lot of movement, because of the winter, they're still keeping an eye, looking in the areas where the eDNA has been found, looking at where there are warm water discharges, to just—to ensure that we're keeping an eye on things and really focused on getting some answers by the springtime, with respect to the operation of the locks.

So, the Army Corps of Engineers will make a—an—a recommendation, as I said, within a few weeks, to the Assistant Secretary of the Army for Civil Works, about lock operations for the spring and for the foreseeable future.

I think that the questions are complicated. I think—I know everybody would like a simple answer, but it is a little bit of a complicated situation. First of all, the locks were not designed to be waterproof, so it's not entirely clear—and, again, something that the Corps is looking at—whether closing the locks would prevent—entirely prevent fish passage. The second set of issues are that we do need to understand the impact—the potential impact of lock closures on flooding in, not only the Chicago area, but throughout northeastern Illinois and northwestern Indiana—what happens to the commerce that's moving there currently, how to deal with the wastewater discharges into—the treated wastewater discharges into the canal, and also that it's used for emergencies by the Coast Guard and others. So, those are things that are being discussed.

With respect to whether modified lock operations, as opposed to closing it off entirely—how—and I think it's a fair question to ask—the fish, they may be big, but I don't think they're that smart——

Senator SHABENOW. Right.

Ms. SUTLEY [continuing]. That, really, right now the situation is that the—as I understand it, the canals are operated—the locks are operated on the show-and-go, so anybody who shows up with a boat, the locks are opened. So, one thing that the Corps is looking

at is restricting the time that the locks will be open, so that it isn't on demand, that it would be some period of time, and then also looking at other things that they would be doing while the locks were open. So, whether further application of rotenone or other chemicals, also surveillance and netting and electro-fishing, and other things that they would be doing while the locks were open.

So, that's all under consideration. As I said, we expect a recommendation, shortly, to be given to the Assistant Secretary of the Army for Civil Works.

Senator STABENOW. I'll turn to my colleague here in a moment, but let me just ask, at this point, though, one other thing that—I realize this is the Army Corps, so you can't answer directly, but it is of great concern to me when we hear about—that a study that will be completed in 2012 regarding options. Again, very hard to listen to when we know that these fish are on the move and that we have an immediate situation happening. So, I'm hopeful that you will join us in developing a strategy to be able to move much more quickly and not have just a study on what could be done, but, given the Great Lakes Commission recommendation and the Governors coming together, and others, that we would zero in on and really focus on the ecological separation that they recommended, and be more focused on how to do that.

I very much appreciate—I'm not at all insensitive to what the current situation means to Chicago, in terms of flooding or commerce, and that those are not insignificant, and that we need to address those, that—certainly. But, we can do that in a way that is—a way that allows us to protect the Great Lakes and address those issues. My concern is when we talk about timetables and we have the Army Corps looking at 2012. You might as well just, you know, start looking out for the carp, because I—that's too late. We have to create a much quicker turnaround, I think, to do this. So——

Senator BROWNBACK. Thanks, Senator Stabenow. I appreciate that.

Dr. Carl, I was looking through your testimony, and you were going to talk, as well, about other invasive species. Obviously, this is a big fish to deal with, and a huge problem, and I want to hear more about this, as well, but zebra mussels are ones that are hitting more of the west United States and places in my State, and I wondered if you had any, just, thoughts of how we're doing on those control efforts or what needs—what more needs to take place.

Mr. CARL. A couple things, I think. One, since their discovery in January 2007 in the lower Colorado River, the quagga mussel has spread to additional waters in the western U.S. Early detection provides the greatest potential for implementing effective and rapid response and management actions to—designed to minimize that impact.

The USGS, through our Western Fisheries Research Center, is conducting a project, in collaboration with Washington State University, to develop and implement comprehensive approach for monitoring and evaluating capabilities—looking at evaluating capabilities essential to managing these invasive species in the Colorado River system, and I think that can then be brought to other ones.

A second point that I would make is the biomatrix that we're discussing for the Asian carp, we're also proposing to use that with the quagga or zebra mussel, depending on what infestation you have. In that case, we do know there is a bacterium, called pseudomonas, that is toxic to the—both species. What we're looking at is packaging that—again, in a bio-matrix—encapsulating it in a molecule, and then being able to distribute that over the bottom, and basically treating and controlling them that way. I think that might have good, strong applications in the West, as well as the Great Lakes.

We us a strategy, with the Great Lakes Fish Commission and the Fish and Wildlife Service, with the sea lamprey control, and we might envision something similar to that with both of those species to try to control those. It's not a solution that would eradicate them, but it was something that you could reduce their population numbers to the point where they wouldn't have the impact that they currently have, both in the Great Lakes and some of the western reservoirs that we're seeing now.

Senator BROWNBACK. Now, when you say doing—you're looking at doing this, or are you doing this in places now?

Mr. CARL. The first priority, with the Great Lakes Restoration money, is the work on the Asian carp and finding a toxin for the Asian carp. We are also starting to develop that. We have—with the resources we have, we can work on the Asian carp first. Then the second priority would be to work on the quagga and the zebra mussel control, as well.

Senator BROWNBACK. So, you are researching this, at this point in time, but you're not using it anywhere? Is that what you're saying?

Mr. CARL. That is correct.

Senator BROWNBACK. But, you think this same biomatrix that works on the Asian carp can work on the zebra mussel?

Mr. CARL. It would be different in formulation, because, with the Asian carp, they're filter feeders, and we want something that's buoyant, that they would capture in their gill structure and then ingest, and then the toxin would dissolve in their gut. That's what we're thinking right now.

With the mussels, they are on the bottom, so it would be something that would sink to the bottom. It would encapsulate a specific toxin that we already have—that have—we have identified, and put that on the bottom. So, it would be slightly different, but it's the same—we're working with a private company that has a patent on it, and we have an agreement with them, and we would be looking at the same kind of work. Potentially, you could use this for other species, as well.

But, I mean, we're looking for field trials, we're—our estimate is, we'd be in field trials with the Asian carp in 18 months. I can't predict where we would be with the—with the current resources, I can't predict where we would be with the other—this other species, zebra and mussel—zebra and quagga mussels.

Senator BROWNBACK. Some frame beyond 18 months.

Mr. CARL. Yes. That's correct.

Senator BROWNBACK. Do you think you're moving fast enough on these things?

Mr. CARL. I think there's a tremendous urgency to these—both of those issues, both the zebra mussel, and quagga mussel, and the Asian carp. I think we are doing what we can with the resources that we have, at this point.

Senator BROWNBACK. So, I take it you don't think you're moving fast enough.

Mr. CARL. I think that we are doing what we can. I guess I would repeat what we have said before. I think—is there room for improvement? Potentially, there is.

Senator BROWNBACK. In my—years ago I was secretary of agriculture in Kansas, and loved the job. It was a great job. I would see we'd—at times, we'd introduce things, or plants, into the State to do one thing, and it ended up taking over and doing something else, which we hadn't counted on at the time, but weren't smart enough, or didn't have enough study, to see. It was sure my experience. But, boy, the—you know, to get out there ahead of something, you've just got—your options get much better, and your dollar amounts are much less, and your possibilities for success are much higher, that speed does have an impact on these things. Or if you even want to try to biological control systems. I don't know—I didn't hear you say any sort of biological-type control system—I don't know if those are even possibilities on something like this. But, my experience with these has been, you're much better off getting out there faster, even if you—even if you don't have the resources you really would like to have, you get out there with what you've got, faster rather than later, and you're going to be a lot more effective with it. Because once they get established, as you know, it's just—it becomes much more of a task to get on top of them.

Mr. CARL. I agree.

Senator BROWNBACK. Thank you. This is interesting. I'll look forward to the next panel, too.

Senator STABENOW. Thank you very much, Senator Brownback.

We're very pleased to be joined by Senator Bayh. Welcome. We would encourage you to ask questions.

Senator BAYH. Thank you, Madam chairman. I apologize for being late. As both you and Senator Brownback are well aware, I've—or are very familiar with—I found myself trying to accomplish the impossible by being in two places at the same time. We are, on the Banking Committee, hearing from the chairman of the Federal Reserve today about the state of the economy. So, I needed to complete my time there.

So, for the members of the audience who don't follow these things, that's why I'm late, and I apologize. It was not out of a lack of interest. On the contrary——

Senator BROWNBACK. You've got the Fed or the Asian carp?

[Laughter.]

Senator BAYH. I was interested, chairman. Did the committee provide the Asian carp here today?

Senator STABENOW. Yes.

Senator BAYH. I can't wait to see how this is reported in the press tomorrow, that this was a "fishing expedition," "there was something fishy in the committee," "we were sleeping with the fishes." I can't wait to see——

Senator STABENOW. You know, this——
Senator BAYH [continuing]. What the——
Senator STABENOW [continuing]. This is——
Senator BAYH [continuing]. Press will——
Senator STABENOW [continuing]. This is lunch.
Senator BAYH. Oh.
[Laughter.]
Senator BAYH. Asian carp as sushi, huh? That's—OK. I think I may stick with the cheeseburger.
[Laughter.]
Senator BAYH. In any event, it's interesting. I've been here a while, and I've not seen a prop quite that interesting. Fortunately, they are on ice.

I didn't have the benefit of hearing the testimonies, so I apologize for that. But, it seems to me that what we need to try and do here is strike the appropriate balance. Anyone who's seen the Great Lakes, Chairman, as have I—and obviously your State is so familiar—knows that they are a tremendous natural resource and something truly unique. Many people in other parts of the country can't really understand how immense they are, and just how special they are. At the same time, we do have business and commercial interests, and this is a difficult time for our economy.

So, my question is going to be, How do we go about protecting the Great Lakes while at the same time minimizing the threat to commerce and disrupting job creation and that sort of thing? So, that's what I'm going to be looking forward to. I won't ask either of you questions, because I didn't have the benefit of hearing you. I'm looking forward to reviewing your testimony. But, for our other witnesses, that's where I'm coming from. We've got to protect the Great Lakes, obviously, but don't want to—we have to do it in the most prudent way possible.

So, thank you for your presence. I apologize for my tardiness, but I do look forward to having the benefit of your thoughts.

Senator STABENOW. Thank you very much.

I have just a couple more questions, and then certainly we'll throw it open to any Senators that want to follow up. But, let me follow up on Senator Brownback's question, really about budget and resources, which are obviously very important.

So, first I would ask, Are we properly budgeting to carry out the activities that we've been talking about today, and other things that need to happen, so that we can monitor the locations that need to be monitored, that we can act, that we can move as quickly as possible to turn around and get results? I would ask both of you to respond.

Ms. SUTLEY. Thank you, Senator.

Senator STABENOW. Yes.

Ms. SUTLEY. First, we've identified, in the framework, a resource need of about $78 million to fund the activities that are identified in the framework. We certainly thank you for your great assistance in helping us to get the $13 million in December, and that both the Army Corps of Engineers, in its FY–10 appropriations and Recovery Act money, is going toward some of these immediate-term actions.

We're very fortunate that the administration, the Congress, have funded the Great Lakes Restoration Initiative this fiscal year at $475 million and that, as part of the Great Lakes Restoration Initiative, as I said in my testimony, the—one of its priorities is to address invasive species. So, it is part of that effort.

So, I think, in terms of resources for the things that have been identified in the framework, I think we—we feel like we're in pretty good shape there.

I would say that the—we view the framework as a living document. As we identify other actions and other activities that may be necessary here, that's something that the working group and the folks who are spending all their time on this will discuss and make sure are coordinated. If they need additional resources, certainly we'll look at that, and look to Congress to help us secure those.

Senator STABENOW. Dr. Carl, in answering that, I wonder if you might also distinguish between the activities that we can do right now and in the spring compared to activities that are experimental. Is there enough money, in—within the framework budgeted for these activities? Is the USGS leveraging all its expertise and partners? Because we really—I mean, we need to know—we need to know—and I realize that you are working, both of you, within a framework, within an administration, and decisions are made at various levels, but there is a great sense of urgency, that we have, and we need to know what you need, how soon you need it, and what it's going to take to be able move as quickly as possible right now and into the spring, as well as long-term.

Mr. CARL. I've got——

Senator STABENOW. Doctor.

Mr. CARL [continuing]. Several parts to that. That's a——

Senator STABENOW. Yes.

Mr. CARL [continuing]. Good question. I think I would start out by saying that we have several scientists that have been working on Asian carp and been thinking about Asian carp and have had projects to do on Asian carp for several years. We brought those forward now that possibly didn't get as much attention before. So, what the Great Lakes Restoration Initiative—as I said, there were nine projects. I think they were all really good signs for managers. All were approved by the EPA, and they've all been funded at the level that we requested for this year.

Now, my next concern, when I talked with EPA, was that this was an annual budget and it was approved for this year, and they are very much aware that many of these are long-term commitments. So, I think that what we have received so far is quite adequate for the first year in the study that we're looking at. So, I'm—I was astounded that we were able to put forward those projects and have them funded. I think we're going to do some really exciting research with that.

In terms of leveraging, one thing I will say is that the USGS scientists—and there are quite a few at several centers—are all working under a single manager, and that's me; and I think that is very helpful. We're very closely tied with our partners, which I think is also important. We have also started a consortium, which is looking at 4 primary USGS aquatic centers that work on control issues; and we're sharing knowledge, resources, and facilities; and bring-

ing together a steering committee of partners to do partner-driven research. The focus is on partner-driven research. I think that's a—kind of a general answer.

If I look to the question—the second part of your question, where you ask what we doing now, and what are we doing longer-term, I think most of the work that we are doing is longer-term. As I mentioned to Senator Brownback, the Asian carp, we're looking at field testing in 18 months. There are permits that we have to have from EPA and a lot of different things that have to occur in that timeframe, and the pressure is on our scientists.

The shorter-term things, we had proposed and had accepted the idea of sonic disruption of spawning areas. In talking with one of my scientists, who had already been working on that, he had found a patented hydrocanon, coming out of the East Coast, that we're looking at taking over—rather than looking at sonic disruption of spawning grounds, we're actually looking at that for targeting carp that might be in the canal.

So, we're looking at accelerating that program. I've already talked to the Illinois Department of Natural Resources, the EPA, the Army Corps, and Fish and Wildlife and we've gotten a green light from everyone to go for it. When the ice comes out, we plan on being at one of our centers, looking at Asian carp that we have—they're—within the watershed that they're already in, they're not in the Great Lakes—and looking at whether these are effective in either moving the fish out or killing them. After we're done with that, we would be looking at field testing—potentially on either the Illinois River or in the canal—and it could be this summer, depending on the results. There is risks to that strategy, but I think it's well worth it—the urgency that we have.

If you then look at the longer-term things—what we're trying to do as a science agency—our goal is to increase the management tools for control. So, we're looking at selective toxin; we're looking at attracting them with pheromones; we are looking at sonically herding them and eliminating them; and we're looking at whether we can predict where they are through some modeling efforts with our water science centers. We also would like to see the eDNA technique developed better, so that we can use that as part of a surveillance plan. So there's a whole suite of potential management tools that we coming—potentially could be coming on in the next few years, as we move forward.

Senator STABENOW. Thank you.

I think, at this point, we will move to our next panel, unless——

Did you have any question Senator Bayh?

Senator BAYH. Just one brief question.

I see some of the steps you've taken, whether its electronic fencing or poisoning or other things. How have the fish managed to frustrate the steps that have been taken, to date?

Mr. CARL. We do have positive DNA above the weir. It's not clear right now how the fish got there. I think people presume that they came up over the weir. I'm not sure that they can, or not, because the weir is a fairly—is a pretty effective tool for that. There are other ways. One of the things that I didn't mention is that we're looking at subterranean methods for the fish to move from the Des Plains River to the canal system. Then that's one of the projects

that we're going to look at. We think there's fractured bedrock and there may be——

Senator BAYH. Or underground streams——

Mr. CARL [continuing]. Underground streams.

Senator BAYH [continuing]. Something like that?

Mr. CARL. We'll be looking at that, beginning this spring. Again, we have to wait til the ground thaws——

Senator BAYH. In terms——

Mr. CARL [continuing]. To try——

Senator BAYH. Forgive me——

Mr. CARL [continuing]. That.

Senator BAYH [continuing]. My chemistry is not what it once was. Pheromones?

Mr. CARL. Pheromones. We haven't used those yet, but we're——

Senator BAYH. What are——

Mr. CARL [continuing]. Certainly——

Senator BAYH [continuing]. What are pheromones.

Mr. CARL. Pheromones are something that a animal gives off that either attracts of repels others. So, there's a fright pheromone, that we know that we've seen in the Asian carp, that will tell other Asian carp to go away. They may go away for 2 or 3 days. Attractings pheromone often is a sex pheromone. A lot of work has been done on that with sea lamprey. They're very effective in bringing sea lamprey in.

Senator BAYH. I'm not even going to touch that. But——

[Laughter.]

Senator BAYH. Just interested. Thank you.

Senator STABENOW. Thank you, and that's a very important question.

Again, thank you, to both of you. I realize that you are focused. We appreciate your leadership. But, we will continue to follow up with you, because we have a great sense of urgency. There is a strong bipartisan support for moving quickly and having the resources available, and being focused on what I view, as a crisis. So, thank you very much for being here.

Thank you.

We would ask our second panel to join us.

Senator STABENOW. Welcome. We are very glad to have you with us.

First let me say that Senator Durbin has submitted testimony for the record today, as well, which we welcome. We thank his leadership on appropriations and really championing the electric fences and the other resources that have been made available up to this point. So, we look forward to continuing to partner with him, as well.

[The prepared statement of Senator Durbin follows:]

PREPARED STATEMENT OF HON. RICHARD DURBIN, U.S. SENATOR FROM ILLINOIS

Let me start by thanking Chairman Stabenow for holding this hearing. Asian carp pose a serious environmental threat to the Great Lakes. I know that the Chairwoman, like all of us representing Great Lakes states, is very concerned about this threat. Today's hearing is another opportunity for us to hear from agencies and private sector stakeholders who are working with Congress to contain this aggressive, invasive species.

The Great Lakes are a national treasure. They represent one fifth of the world's fresh surface water, provide endless boating and beach recreation activities and are used as a major mode of transport for bulk goods.

While the threat of an Asian carp invasion are real and imminent, this Administration, Members of Congress, state and local agencies, and environmental advocates are engaged and are working together to meet this collective challenge.

The White House has identified the protection and restoration of the Great Lakes as a high priority, and Congress has concurred with full funding in FY10 for the $475 million Great Lakes Restoration Initiative. The agencies participating in this Initiative recognize that protecting the Lakes from an advancing invasive species is a priority we must address. And we must address it now.

Asian carp present a complex challenge. They are deemed "invasive" because there is no natural predator for the species in the Midwest. Asian carp reproduce quickly, out-compete other species and spread rapidly. Several federal agencies, along with the Illinois Department of Natural Resources, have been working together to implement rapid response measures to combat the Asian carp in Illinois waterways. These efforts are having an effect. But to contain these fish, we need a full arsenal of management options.

On Feb 8th, the Administration released a $78 million Draft Asian Carp Control Framework . This plan to contain Asian carp lays out short-term and long-term actions, with an overarching goal of preventing the species from establishing in the Great Lakes. While individual components of the plan may invite further scrutiny and spirited debate, the Framework as a whole includes a mix of science, engineering and management options.

The Framework calls for a longer term inter-basin study that determines all invasive access points into the Great Lakes, and considers more than just the Asian carp. Chicago is the current hotspot for invasive species to enter Lake Michigan, but the Great Lakes have multiple access points. With a better understanding of all our vulnerable locations, we will be better prepared to manage the threat from this and, as yet unknown, invasive species.

The U.S. Geological Service found that an Asian carp can move 200 miles in one year, so we can't afford to slow down. Thank you for your leadership, Chairman Stabenow, and for convening this important hearing. I look forward to hearing from our witnesses.

Senator STABENOW. Let me just briefly introduce our second panel. Senator Brownback has introduced the Honorable Mike Hayden—Secretary Hayden—with the Kansas Department of Wildlife and Parks.

Senator Brownback, did you wish to make any other comments?

Senator BROWNBACK. Only that Secretary Hayden was Governor Hayden, was also head of Fish and Wildlife, nationally, and, I found, just has an extraordinary knowledge of natural species and habitat and issues, and, I think, can be a great resource for us, and, on top of that, is a good friend and understands these systems and the processes, both politically and biologically.

Welcome, Governor Hayden.

Senator STABENOW. Great. We're very glad to have you. I want, personally, to welcome Ken DeBeaussaert, the director of the Office of the Great Lakes of the Michigan Department of Natural Resources and Environment, and a longtime friend. We served together in the State House of Representatives.

So, it's wonderful to have you, Ken, and thank you for your leadership, as well.

Marc Miller, the director of the Illinois Department of Natural Resources, is a very important partner in all of this as we proceed, and we very much appreciate your leadership.

Jim Farrell, the executive director of Infrastructure Council for the Illinois Chamber of Commerce, a very important perspective as we move forward on how we solve this problem.

Dr. John Taylor, it's great to have you, an associate professor, director of supply chain management programs, at Wayne State University, in Detroit Michigan.

Mr. Taylor, we thank you.

Mr. Andy Buchsbaum, regional executive director for the Great Lakes Regional Center, the National Wildlife Federation.

We thank you so much for being here, as well.

We'll ask each of you, because we appreciate having all of you, and because the number of guests that we have testifying—we would ask each of you to speak for 5 minutes. You should have a clock in front of you, and a red light that will go off. We will then open it up from—questions, from there.

So, Secretary Hayden, welcome.

STATEMENT OF J. MICHAEL HAYDEN, SECRETARY, KANSAS DEPARTMENT OF WILDLIFE AND PARKS, TOPEKA, KS

Mr. HAYDEN. Thank you, Senator Stabenow and members of the committee. First of all, thank you for the opportunity to share our perspectives and experiences with the growing problem of invasive species. I want to emphasize that it is a growing problem. Every week, every month, every year, we're faced with new invasive species throughout the Nation, and, unfortunately, Kansas, even though it's in the heart of the country, is no exception.

The focus of what you will hear today, several invasive species of fish collectively known as the Asian carp, is very important. The threat these fish pose to the Great Lakes is very real. Asian carp will impact commercial fisheries, tourism, recreational fisheries, and the ecosystem. We urge you to consider this carefully, and, most importantly, to act to prevent the further spread of these species.

Asian carp have spread throughout the Mississippi River basin and, at this time, are only being stopped where there are obstructions, such as large dams big enough to prevent their passage. They have and continue to impact native fisheries throughout the heart of the Nation, and their numbers continue to increase, and actually increase very rapidly. In addition, they are a threat to public safety, as you've already heard, because of their ability and habit of jumping out of the water when boats pass. Imagine an entire school of fish, that may weigh 60 pounds or more, jumping 6 or 8 feet into the air when a motorboat passes, or waterskiers, or jet skis. People have been injured, and, unfortunately, they'll continue to be injured in the future, from the spread of these species. Again, we act you—we urge you to act now.

But just as the Great Lakes are only part of the problem with the spread of Asian carp, Asian carp are only part of the invasive species problem. Invasive fish, plants, mussels, snakes, crustaceans, and other invertebrates, and diseases, are all a part of the problem. Invasive species impact every American and the American way of life. We're talking about the Asian carp today, as we should be, but what will it be tomorrow? You can build electric barriers, you can install fences along the flood areas, as outlined in the Federal Framework, but these measures only address one small component of the invasive species problem, and, in all honesty, their successes may well be limited.

We have heard discussion about the potential Asian carp impact on native species in the Great Lakes, but we're ignoring the non-native interchange of water, waste, and species between the Great Lakes and the Mississippi River through the Chicago Sanitary and Ship Canal. Sources indicate that there are roughly 180 non-native species currently in the Great Lakes. There are several of these invasive species, such as the snakehead fish, in the Mississippi River who are moving northward. So we've got invasive species coming from the Great Lakes and threatening to enter the Great Lakes at the same time. Which one of these will be the next to invade the Mississippi Basin or the Great Lakes, or where else in this Nation?

Abraham Lincoln once said, "If I were to go west, I'd go to Kansas." Unfortunately, Lincoln never took up residence in Kansas, but a number of invasive species have.

[Laughter.]

Mr. HAYDEN. Coincidentally, one of them, the zebra mussel, was transported in ballast water of a ship and became established in the Great Lakes in the 1980s, and, since that time, has spread across the Nation and has become a very large problem. Zebra mussels now inhabit 6 Federal reservoirs in Kansas, and many other smaller lakes and streams. Similar to Asian carp, they pose a threat economically, environmentally, and to human health. They clog water intakes; they kill our native mussels, many of whom are threatened or endangered; they damage boats; and they cut the feet of swimmers.

One example of Asian clams, for example, in Kansas. Recently, we have a local fire department—rural fire department hook up to a dry hydrant at a lake to fight a fire. The firetruck intake became completely clogged with these small clams, effectively rendering it useless against the fire. This is just one. We have hundreds of these small lakes with dry hydrants that we use to fight fires in the rural areas. If they continue to clog those up, it really, of course, renders us almost helpless against these fires.

The opportunity for new invasive species seems almost endless. However, there are some solutions. First and foremost, preventing the introduction is always the cheapest and the easiest. In fact, getting rid of them is almost impossible once they become established. The zebra mussel is a very good example of that. Current laws make it too easy to bring non-native species to the United States, and we often end up chasing one species after another, after they become established. National policy needs to move toward providing—proving a species will not become a problem, before it is imported.

Further management of invasive species already present is extremely difficult with the current level of Federal funding. Last year, Kansas got $37,000 from the Federal Government to fight invasive species, and that $37,000 is a reduction from the previous year. We don't have near the tools at either the Federal or the State level right now. We have not marshaled adequate resources to address this problem.

We need your help, Madam Chair. The Asian carp and hundreds of other invasive species will continue to damage our fisheries, our water supplies, our tourism, and our economy, not only of the

Great Lakes, but of the Nation as a whole. National policies need to make it harder for invasive species to come to this country, and more needs to be done to implement existing programs to prevent their spread.

Thank you very much, Madam chairman.

[The prepared statement of Mr. Hayden follows:]

PREPARED STATEMENT OF J. MICHAEL HAYDEN, SECRETARY, KANSAS DEPARTMENT OF WILDLIFE AND PARKS, TOPEKA, KS

Chair Stabenow and members of the committee, thank you for the opportunity to share our perspective and experience with the growing problem of invasive species. I want to emphasize this is growing problem. Every week, every month, every year, we are faced with new invasive species throughout this nation and unfortunately, Kansas is no exception.

The focus of what you will hear today, several invasive species of fish collectively known as "Asian Carp", is important. The threat these fish pose to the Great Lakes is real. Asian Carp will impact commercial fisheries, tourism, the ecosystem associated with the Great Lakes and the associated local and regional economies. We urge you to consider this carefully and act to prevent the further spread of these species.

Asian carp have spread throughout the Mississippi River basin and at this time only being stopped where there are obstructions such as dams large enough to prevent them from passing. They have and continue to impact native fisheries throughout the heart of the nation and their numbers continue to increase. In addition, they are a threat to public safety because of the silver carp's habit of jumping out of the water when boats pass. Imagine an entire school of fish that may weigh 60 pounds jumping six or eight feet in the air when a motorboat, water skier or jet ski passes. People have been injured and unfortunately, more will be in the future.

Again, we urge you to act now to prevent the spread of Asian Carp into the Great Lakes. But, just as the Great Lakes are only part of the problem with the spread of Asian Carp, Asian Carp are only part of the invasive species problem. Invasive Fish, Plants, Mussels, Snakes, Crustaceans, other Invertebrates and diseases are all part of the problem. Invasive species impact every American and the American way of life. We are talking about Asian carp today, but what will it be tomorrow? You can build electric barriers or install fences along the flood areas as outlined in the Federal Framework but these are measures that address one small component of the invasive species problem and successes may be limited.

We have heard discussions about the potential Asian carp impacts on native species in the Great Lakes but we are ignoring the non-native interchange of water, waste, and species between the Great Lakes and the Mississippi River Basin through the Chicago Sanitary and Ship Canal. Sources indicate there are roughly 180 non-native species currently in the Great Lakes. There are several invasive species such as the snakehead fish in the Mississippi River Basin moving upstream. Which one will be the next species to invade the Mississippi River Basin, Great Lakes or somewhere else in the nation? As long as there is a direct connection between these two large basins we will continually be fighting this battle.

Abraham Lincoln once said, "If I were to go west, I would go to Kansas". While Lincoln never took residence in Kansas, several invasive species have. Coincidentally, one of them, the Zebra Mussel, was transported in the ballast water of a ship and became established in the Great Lakes in the 1980's. It has since spread across the nation, including Kansas, and has become a very large problem. Zebra Mussels now inhabit 6 federal reservoirs in Kansas and many other smaller lakes and streams. Simalarly to Asian carp, they pose a threat economically, environmentally, and directly to human health. They clog water intakes, kill native mussel species, damage boats and cut the feet of swimmers. Asiatic Clams, or Corbicula, are another problem invasive. One example is a local fire department attempted to use a "dry hydrant" at a lake to replenish their water supply on the fire truck. The fire trucks intake became completely clogged with these small clams or mussels effectively making the truck unusable to fight fire and protect the public.

The opportunity for new invasive species seems almost endless and the different ways these organisms are spread is almost as big a problem. However, there are some solutions. First and foremost, preventing the introduction of invasive species is always cheaper and easier than removing them. In fact, getting rid of them is often impossible once they become established. Zebra Mussels are a good example. Once they are established, removing them from a large lake such as a federal reservoir would require measures so extreme that it just isn't practical. We must do more to prevent Invasive Species from coming to the nation. Current law makes it

too easy to bring non-native species to the U.S. and we often end up chasing one species after another after they have become established. We lose the opportunity to prevent invasive species from becoming established by banning species AFTER they have become a problem rather than BEFORE. National policy needs to move toward proving a species will not become a problem BEFORE it is imported. Further, management of invasive species already present in U.S. waters is extremely difficult with the current level of federal funding support. Resources need to be directed to current management efforts such as the Asian Carp Management and Control Plan or the Quagga/Zebra Mussel Action Plan.

Chair Stabenow, we need the Committee's help. Asian Carp and the hundreds of other Invasive Species will damage our native fisheries, water supplies, tourism and economy of the Great Lakes and resources across the nation unless more is done. National policies need to change to make it harder for Invasive Species to come here. And more needs to be done to implement existing programs to prevent the spread of Invasive Species.

Senator STABENOW. Thank you, Secretary Hayden. Thank you for bringing a broader perspective to this, in terms of not only the Great Lakes and Asian carp, but what is happening in Kansas and across the country. Thank you.

Mr. HAYDEN. Right.

Senator STABENOW. Mr. DeBeaussaert.

STATEMENT OF KEN DEBEAUSSAERT, DIRECTOR, MICHIGAN OFFICE OF THE GREAT LAKES, DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT, LANSING, MI

Mr. DEBEAUSSAERT. Thank you, Madam Chair and members of the committee.

First, Madam Chair, let me thank you for the leadership that you've shown, not only on this issue, but on other Great Lakes issues throughout your distinguished record of service to the people of the State of Michigan.

My name is Ken DeBeaussaert, and I am director of the Michigan Office of the Great Lakes. I appreciate the opportunity to be with you today to talk about the policy of—related to efforts to avert the looming catastrophe that we face if Asian carp become established in the Great Lakes.

Allowing those carp to populate our waters will destroy the resource as well as the recreational opportunities. The Chair has indicated the economic impact there. So, we must act swiftly and collaboratively and wisely to address this crisis.

As the Secretary noted, invasive species have already created havoc for the natural resources and economy, not only of the Great Lakes, but across the country. Invasive species have profoundly changed the ecosystem of the Great Lakes.

Michigan has taken some specific actions to try to address this question, including enacting legislation requiring all oceangoing ships to obtain a permit for ballast water discharges in our State and taking legal actions to address ballast water issues, not only defending our State law, but also trying to seek some action to force the Federal agencies to act in areas where we think they—that they need to. We administer our own State regulatory programs to control aquatic and nuisance species, including restrictions on the transport of certain invasives—invasive species, and the establishment of a list of invasive species prohibited in Michigan.

Specifically related to the question of Asian carp, Michigan has been involved over a long period of time. We've contributed finan-

cially to the construction of the electrical barrier in the Chicago Sanitary and Ship Canal system; we have, in Michigan, prohibited the possession of live Asian carp; we've participated in the rapid response activities, that I think we'll be hearing about in a moment, that occurred in December; we have consistently communicated. On our written testimony we have some attachment of communications to our Federal partners about the importance of actions, and some suggestion on how we might be able to move forward more quickly, including letters from our Lieutenant Governor to the Secretary—Assistant Secretary of the Army and the Governors; of course, correspondence with the White House.

As others have said, I can't stress the following strongly enough: Once an invasive species gets established in the Lakes, we cannot eradicate it, fully control it, its spread, or the damage that it causes. In order to solve the problem, though, the threat of Asian carp must be treated as the crisis that we think it is, and steps must be implemented immediately to address it.

As long ago as 2003, there was a—scientists and government officials and stakeholders were calling for the ecological separation of the Great Lakes and the Mississippi River Basin to prevent spread of invasives between those two bodies. We did not see action occur quickly enough, in our view. Short-term actions become long-term projects. For example, the installation of the second electrical barrier took over 6 years, and it's still not fully operational; and it took several years to ban the importation of black carp and silver carp under the Lacey Act; and Bighead carp are not yet listed under that Act.

So, we appreciate the efforts by the administration now to try to assemble all the Federal agency positions and actions in one place through the draft framework. There are, as—in my testimony, a number of areas where we are supportive of that document. But, overall, we're concerned that it does not provide the full comprehensive approach that's necessary in the short-term, and doesn't provide the kind of a long-term focus on the solutions that we need to achieve the prevention of this introduction. That, again, is that ecological separation that I mentioned.

So, if we're really to embrace the new standard of care that was outlined by the EPA administrator, earlier this week, the draft framework, we think, needs to be revised and improved and strengthened, using that sense of urgency that's talked about in the regional—Great Lakes Regional—or Restoration Initiative plan of action.

We have some specific recommendations that I have laid out in the testimony. I'll just touch on a few of them. First is, of course, developing and implementing plans for the permanent solution to the problem, that would ecologically and physically separate the systems. I would note that—as you have, that the Great Lakes Commission unanimously adopted that as a position earlier this week.

In Michigan, we believe that closing the O'Brien and the Chicago locks until a permanent ecological barrier is constructed, consistent with protection of public health and safety, is important. We do support the need for additional studies, but need, as you've said, Madam Chair, to conduct them on a much faster timeline to get

the kind of action that we think is necessary. There are a series of operational measures related to some of the other control structures that we've mentioned, and we support the additional interim barriers at other locations. We support the efforts to do additional studies on the biology and ecology of the carp, and predictive models to determine the areas at highest risk. We obviously need to provide the additional support for monitoring and to provide the reserve for chemical treatments, if necessary in the future, for rapid response activities.

But, I would note that—and I think the—that the Congress may also be able to be—you know, help provide additional support, not only in the authorizations and appropriations, but also provide some clear direction about the timelines and activities that the Federal agencies must adopt to try to address this issue with the seriousness that we think it deserves.

So, I thank you again for your interest in holding this hearing today, the urgency that I sense from you, that we have in the State of Michigan, and look forward to the rest of the presentations.

[The prepared statement of Mr. DeBeaussaert follows:]

PREPARED STATEMENT OF KEN DEBEAUSSAERT, DIRECTOR, MICHIGAN OFFICE OF THE GREAT LAKES, DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT, LANSING, MI

Madame Chair and Members of the Subcommittee: My name is Ken DeBeaussaert, and I am the Director of the Michigan Office of the Great Lakes. I appreciate the opportunity to testify today about the policy behind the efforts to avert the looming catastrophe that we face if Asian carp become established in the Great Lakes.

My role within the Michigan Office of the Great Lakes is to develop Great Lakes policy for issues critical to our state. Invasive species such as the Asian carp are certainly a critical issue. Allowing Asian carp to populate our Great Lakes will destroy the resource as well as recreational opportunities. We must act swiftly, collaboratively, and wisely to address this crisis.

Invasive species have already created havoc for the natural resources and economy of the Great Lakes. Invasive species have profoundly changed the ecosystem of the Great Lakes, significantly impacted the Great Lakes sport and commercial fisheries, have hampered recreation, and caused many millions of dollars in damages to infrastructure all of which have a negative effect on Michigan's economy.

Let me give you an example. Lake Huron once had a vibrant salmon sport fishery, with hundreds of charter boats attracting thousands of anglers each year to ports up and down its long coastline. Fishing derbies attracted additional anglers who launched their boats or kept their boats at local marinas. But invasive zebra and quagga mussels (Eurasian invaders) have caused the collapse of the salmon population, and thus the sport fishery. Gone are the fishing derbies, charter boaters have left the ports, and anglers have moved elsewhere. This was a several hundred million dollar industry, and it is gone.

Michigan has taken aggressive steps to stop the further spread of these foreign invaders, including:

- Requiring that Great Lakes ships to report on ballast water management practices established by the shipping industry,
- Enacting legislation requiring all ocean-going ships to obtain a permit for ballast water discharges. The permit specifies the use of an approved treatment system to prevent release of invasive species via ballast water,
- Taking legal action to address ballast water issues, including successfully defending our state laws in federal court and challenging federal agencies for their failure to appropriately use existing regulatory authority to act, and
- Administering state regulatory programs control aquatic nuisance species in our lakes and rivers. These programs include restrictions on transport of invasive species of fish, establishment of a list of invasive species prohibited in Michigan, and participation in actions to control sea lamprey in Great Lakes tributaries.

Specifically with regard to Asian carp, Michigan has:

- Contributed financially to construction of the electrical barrier in the Chicago Sanitary and Ship Canal; and
- Prohibited possession of live Asian carp in the state; and
- Participated in the response actions in December 2009 that treated the Canal to remove Asian carp prior to maintenance of the electrical barrier; and
- Consistently communicated our concern and recommendations for actions to federal agencies, most recently through a letter from Lt. Governor John Cherry to the U.S. Army Corps of Engineers in November, 2009.

I cannot stress the following strongly enough: Once an invasive species gets established in the lakes, we cannot eradicate it, fully control its spread, or the damage it causes.

The story of Asian carp does not need to be a legacy of destruction for future generations. The Great Lakes community, including Governors, congressional delegations, local government officials, and citizens has proven that they can work together on difficult challenges. This is a formidable challenge, but together we can and must solve it.

But in order to solve the problem, the threat of Asian carp must be treated as a crisis and steps must be implemented immediately to address it. As early as 2003, scientists, governmental officials, and stakeholders were calling for ecological separation of the Great Lakes and the Mississippi Rover basins but we did not see action occur quickly enough. Short-terms fixes have become long-term projects. For example, the installation of the second electrical barrier took over six years, and it is still not fully operational. It took several years to ban the importation of Black Carp and Silver Carp under the Lacey Act. Bighead Carp are still not covered under that Act.

We appreciate the efforts by the Administration to assemble all federal agency positions and actions in one place but the draft Asian Carp Control Strategy Framework proposed by federal agencies falls well short of a comprehensive approach to prevent Asian carp from entering the Great Lakes. In our view, the draft Framework fails to include necessary short term actions and fails to focus on ultimate solutions which we believe are achievable.

The recently released Great Lakes Restoration Initiative Action Plan cites Asian carp as an Action Illustration for application of the Initiative. If the carp are allowed to get into Lake Michigan, the illustration will take a bad turn and it will be sorry day for the Great Lakes. From a state perspective, it is critical for the federal agencies to heed the three main operating principles in the Action Plan: accountability, action, and urgency.

I started by saying that we must act swiftly, collaboratively, and wisely to address the threat posed by Asian carp. Here are my recommendations to meet those objectives.

Federal and non-federal efforts consistent with protection of public health and safety must immediately be taken to prevent the migration of Bighead and Silver Carp into Lake Michigan. These actions include:

- Developing and implementing plans for a permanent solution to the problems that would ecologically and physically separate the carp-infected waters of the Mississippi River basin from the Great Lakes;
- Communicating on actions and data in a timely manner;
- Closing and ceasing operation of the O'Brien Lock and the Chicago Lock until a permanent ecological barrier is constructed between the Great Lakes and the Mississippi watershed;
- Initiating studies to be completed by the end of this year to examine the feasibility of transferring cargo via other transportation systems;
- Operating other water control structures near Lake Michigan—at the O'Brien Lock, the Chicago Controlling Works, and the Wilmette Pumping Station in a manner that will not allow fish to pass into the Lake;
- Installing interim barriers at other locations this year, including barriers between the Des Plaines River and the Canal and in Indiana Harbor and Burns Ditch from the Grand Calumet and Little Calumet Rivers to eliminate the potential for flooding between the two watersheds;
- Completing additional studies related to the biology/ecology of the carp and predictive models to determine the areas at highest risk for colonization in the Great Lakes, including estuaries and bays, drowned river mouths, and river systems;
- Providing additional dollars for continuous monitoring of carp based on risk analyses, with funding on reserve for chemical treatment used as a rapid response mechanism as warranted;
- Completing electrical barrier 2b this year;

- Developing a proactive campaign to educate the public about the risks, dangers of Asian carp so that they do not get hurt or unknowingly (or knowingly) spread these dangerous fish into inland waters; and
- The Corps of Engineers must be given necessary authorities and appropriations and may need additional direction from Congress on the authorities that already exist in order to see action occur more expeditiously.

We all treasure the Great Lakes and share a commitment to their continued vitality. We must now all share a similar commitment to move aggressively forward to stop the spread of Asian carp. The Great Lakes states may have challenging discussions on specific actions, but that should not stop us from moving forward. Allowing Asian carp to populate our Great Lakes will destroy the resource and the recreational opportunities they provide us.

My submitted testimony has additional attachments.*

Thank you for your time. I appreciate the Committee's attention to this matter.

Senator STABENOW. Thank you very much for your leadership.

Mr. Marc Miller, we are very appreciative of your efforts, as well, in Illinois.

STATEMENT OF MARC MILLER, DIRECTOR, ILLINOIS DEPARTMENT OF NATURAL RESOURCES, SPRINGFIELD, ILLINOIS

Mr. MILLER. Thank you, Madam Chair. Thank you, members of the subcommittee, for this opportunity to testify on the role of the Illinois Department of Natural Resources in battling the Asian carp invasion.

Since the early 1990s, we have been fully engaged in this effort. I will first mention a couple of recent actions that we have taken and then outline our action plans for the immediate future as we work with our Federal, State, and local partners to prevent the spread of Asian carp into the Great Lakes.

First, I want to be absolutely clear on one very important point. Our commitment to this task is—has been and remains unwavering. We have been working closely with our partners—partner States, including Michigan and Wisconsin—and the Federal agencies to develop effective control strategies.

Illinois has also contributed significant resources to controlling Asian carp. One example of this is supporting, as a cost-share partner, $1.8 million for the creation of the electric barriers.

Most recently, Illinois DNR has served as the lead agency for the successful rapid-response effort, an effort last December to prevent the upstream movement of Asian carp when the electric barrier system was shut down for maintenance. We laid down a chemical barrier while that barrier was shut down. The unified response of the Great Lakes States and Provinces was a shining leadership moment for our region, and a prime example of how a small group of committed people can make a difference.

This unparalleled effort demonstrated that Federal, provincial, State, and local partners can work together to help ensure that this invasive species does not establish a sustainable population in the Great Lakes and threaten this globally important ecosystem. Over 400 people worked together, with contributions of supplies, equipment crews, and partners throughout the Basin. The Rapid Response team safely applied rotenone, a fish toxicant, to a 6-mile stretch of the Ship and Sanitary Canal. The Corps of Engineers performed critical maintenance on the electric barrier, and we led

*Additional documents have been retained in subcommittee files.

the cleanup and removal of over 18,000 fish including one Bighead carp. That one fish documented that the Asian carp were at the barrier and could have moved past the barrier in a potentially large number if we had not conducted that action.

It is important to note that, as we consider additional operations, the cost of this one single action was over $3 million and would not have been possible without the substantial donations of equipment and labor from the States and Provinces, and financial support from our Federal partners. We'd like thank all of those who were involved in this critical effort.

There are several lessons that we've learned from this experience that I would like to share with the committee:

First, meeting this challenge will require even greater collaboration and levels of partnership. We must enlist the scientific and communication resources, as well as the political leadership, of every State and Province in the Basin to join this effort.

Second, early and sustained outreach to key stakeholders, proactive communication strategies, and operational transparency must continue to be maintained as we move forward with our framework strategy and operations.

Finally, the collaborative approach that has been developed with our local, State, and Federal partners is working very well, and we believe it represents the best model for our future efforts.

I now wish to outline actions to control Asian carp that IDNR is undertaking. These actions will be conducted as part of the Asian carp framework strategy that was announced recently.

We will conduct Asian carp removal throughout the entire Chicago Area Waterway System. This includes identification, containment, and removal of carp using standard fisheries gear, including netting, electrofishing, contract commercial fishing, and toxicants such as rotenone. These priority actions will be focused above the barrier in locations most likely to hold carp. We have been working for the past several weeks to use these efforts—use these techniques to try to identify, and, as of yet, we have not found any carp.

IDNR will also contract with commercial fishermen to operate below the barrier system, that front line of defense, to reduce populations and propagule pressure, or pressure for a invading specie, on the barrier system.

Informed by Corps of Engineers eDNA—environmental DNA—monitoring, we will conduct sampling and removal in hotspots of the Cal Sag Channel. This includes the entire length of the Cal Sag below O'Brien lock and dam, as well as the North Shore Channel, and the Wilmette pumping station.

We will also participate with the Corps of Engineers efforts to refine environmental DNA technology so it is a better predictor of location and population size. Those questions are not answered today when we have that for management techniques.

Also in the next 90 days, we will conduct a survey of all retail live bait locations to ensure that live Asian carp minnows are not being sold in Chicago area bait shops, something that is currently unlawful in Illinois. This effort is already underway.

Included in my written testimony are some long-term actions that we will be taking, but we—as we look forward to working on

this issue, all of our partners are very important, and we look forward to working with them.

Aagain, thank you for the opportunity to be heard, today.

[The prepared statement of Mr. Miller follows:]

PREPARED STATEMENT OF MARC MILLER, DIRECTOR, ILLINOIS DEPARTMENT OF NATURAL RESOURCES, SPRINGFIELD, IL

Thank you, Madam Chair and members of the subcommittee, for this opportunity to testify on the role of the Illinois Department of Natural Resources in battling the Asian carp invasion. Since the early 1990's we have been fully engaged in this effort. I will first mention a couple of the recent actions we have taken and then outline our action plans for the immediate future as we work with our Federal, State and local partners to prevent the spread of Asian carp into the Great Lakes.

First I want to be absolutely clear on one point. Our commitment to this task has been and remains unwavering. We have been working closely with our partner states, including Michigan and Wisconsin, and the federal agencies to develop effective control strategies. Illinois has also contributed significant resources to controlling Asian carp. One example is that we served as the local sponsor for the Corps of Engineers' electric barrier system, contributing $1.8 million to this effort.

Most recently Illinois DNR served as the lead agency for the successful Rapid Response effort last December to prevent the upstream movement of Asian carp when the electric barrier system was shut down for maintenance. The unified response of the Great Lakes States and Provinces was a shining leadership moment for our region, and a prime example of how a small group of committed people can make a difference.

This unparalleled effort demonstrated that Federal, Provincial, State, and Local partners can work together to help ensure that this invasive species does not establish sustainable populations in the Great Lakes and threaten this globally important ecosystem. Over 400 people worked together with contributions of supplies, equipment and crews from partners throughout the Basin. The Rapid Response team safely applied rotenone to a six mile stretch of the Chicago Sanitary and Ship Canal. The Corps of Engineers performed critical maintenance on the electric barrier system, and we led the cleanup and removal of 18,000 fish including one Big Head carp. That one fish documented that Asian carp were at the barrier and could have moved past the barrier in potentially large numbers had we not conducted the action.

It is important to note that as we consider additional operations, the cost of this single action was over $3,000,000 and would not have been possible without the substantial donations of equipment and labor from the states and provinces and financial support of our federal partners. Thank to all for this critical support.

There are several lessons that we learned from this experience that I would like to share with the committee: first, meeting this challenge will require even greater collaboration and levels of partnership. We must enlist the scientific and communication resources as well as the political leadership of every state and province in the basin to join in this effort.

Second, early and sustained outreach to key stakeholders, proactive communication strategies and operational transparency must continue to be maintained as we move forward with our framework strategy and operations.

Finally the collaborative approach that has been developed with our local, state, and federal partners is working very well and we believe represents the best model for future efforts.

I now wish to now outline the actions to control Asian carp that IDNR is undertaking. These actions will be conducted as part of the Asian carp framework strategy that was announced recently.

- We will conduct a targeted Asian carp removal operation throughout the entire Chicago Area Waterways System. This includes identification, containment and removal of carp using standard fisheries gear including netting, electro fishing, contract commercial fishing, and toxicants such as rotenone. These priority actions will be focused above the barrier in locations most likely to hold carp. This operation began last week.
- IDNR will contract with commercial fisherman to operate below the barrier system to reduce populations and propagule pressure on the barrier system.
- Informed by Corps of Engineers' eDNA monitoring, we will conduct sampling and removal in hotspots of the Cal Sag Channel. This includes the entire length of the Cal Sag below O'Brien Lock & Dam as well as the North Shore Channel below the Wilmette pumping station.

- We will participate with the Corps of Engineers' efforts to refine the E-DNA technology so that it is a better predictor of location and population size.
- In the next 90 days IDNR will conduct a survey of all retail live bait locations to ensure that live Asian carp minnows are not being sold in Chicago area bait shops, something that is currently unlawful in Illinois. This effort is already underway.

We have also identified several longer term actions that we are proposing:

- We will prepare for Rapid Response contingency operations, including training, advance procurement of supplies and necessary equipment.
- We will lead the Asian Carp Management and Control Implementation Task Force along with the U.S. Fish and Wildlife Service. This plan outlines 133 different actions that will be deployed nationally in all watersheds where Asian Carp are a problem.
- We will participate in additional research into barrier effectiveness using tagged fish and advanced sonar technology.
- Finally, we will work with our sister state agency, the Department of Commerce and Economic Opportunity, to enhance commercial markets for Asian carp and investigate requirements for use of Asian carp products for humanitarian relief purposes. These efforts will promote commercial fishing on the Illinois and Mississippi Rivers and help reduce population pressures on the electric barrier system.

This is a problem that is not going to be solved by one state, or one agency. As a region we have a long and established history of using a proactive and collaborative approach. When we are divided, solutions to our problems can remain elusive. We believe our Great Lakes Region is stronger when we work together in partnership to solve common problems, and Asian carp is not an exception to this.

The Illinois DNR looks forward to working with the other Great Lakes States and Federal Agencies in preventing Asian carp from establishing sustainable populations in the Great Lakes and in the larger problem of the exchange of invasives between the Great Lakes and Mississippi basins.

Thank you for the opportunity to share our views.

Senator STABENOW. Thank you very much. We appreciate your being here today, and your efforts.

Mr. Jim Farrell, welcome. We realize that you have other challenges and perspectives, from your position, and we very much appreciate your being here as a part of the discussion.

STATEMENT OF JIM FARRELL, EXECUTIVE DIRECTOR, INFRASTRUCTURE COUNCIL, ILLINOIS CHAMBER INFRASTRUCTURE COUNCIL WATERWAY COMMITTEE, CHICAGO, IL

Mr. FARRELL. Thank you. Thank you very much.

The Illinois Chamber would like to thank Senator Stabenow for inviting us to appear and contribute toward the resolution of this important matter. I'd also personally like to thank Senator Bayh and Senator Brownback for spending their time—valuable time with us.

We share the concern of the State of Michigan and others who want this invasive species stopped before it can enter the Great Lakes. We offer recommendations we believe can protect Lake Michigan from an invasion of Asian carp and simultaneously provide for commerce to continue uninterrupted.

This discussion needs to move from the courtroom to conference rooms like this. The common objective is to stop the carp. Solutions should not pit Illinois towboat operators, like John and Jacque Kindra, of Kindra Lake Towing, against Michigan fishermen and charter boat captains, like Paul Jensen.

Furthermore, we believe that out concern for the environment should give us cause to recognize commercial navigation as the most environmentally friendly and safest mode of freight transit.

Depending upon the commodity being transported, a single barge carries the equivalent between 60 and 120 truckloads of cargo. The Chamber has consistently used 80 truckloads as an average in all examples.

Further, we're encouraged that the Asian Carp Control Strategy Framework includes, in principle, 6 of the 8 suggestions we present, and that the framework notes the historical perspective of when invasive species from the Mississippi Basin became an issue for the region. There is a precedent for an aquatic barrier, and that's what we're recommending.

It is our goal that this testimony will bring to light the fact that lock closures are not the answer. Though it is convenient and simple to suggest the dramatic and easily visualized act of closing a lock, we submit that halting the migration of Asian carp should be, and can be, executed 20 miles or more west of the Chicago and O'Brien locks without interrupting commercial navigation.

Much, if not all, the recent alarm regarding Asian carp stems from eDNA. It must be emphasized that a positive eDNA test does not correlate to sighting an Asian carp, but rather to finding Asian carp DNA. We at the Chamber have stated, publicly and consistently, that this new technology has indicated the presence of DNA, yet has not produced a live Asian carp or even an Asian carp carcass upstream of the electronic fish barrier. Therefore, at best eDNA should be considered a warning, not an alarm.

Commercial navigation cannot supply the needs of the region without consistent, continually available, operating locks. In the Chicago region the equivalent of well over a half a million truckloads of cargo enters and leaves annually by barge, with an additional tens of thousands of truckloads worth of cargo moved by barge within the region. That's the equivalent of truck lined up end to end from New York City to Los Angeles and back again.

In addition, at the Chicago lock, tens of millions of dollars are at stake in accommodating recreational boating, commercial—and commercial passenger vessels. Chicago's Navy Pier is the largest tourist attraction in the Midwest and would be severely impacted without navigation being able to traverse the lock. This impact would be felt in retail; recreational boating; the entire convention, restaurant, and hotel trade. Passenger vessels made at least 7,790 transits of the Chicago lock just in 2009.

Probably more importantly, we need to recognize, in this economy, that, if we're to create jobs, we must give businesses a commitment that lock closure is not an option. Certainty is required. Banks will not finance, businesses will not invest in the—in regions where businesses need the waterways.

Now, we have produced a list of 8 suggestions for action. Today, in the interest of time, I'd like to focus on just items 6 and 7. If the committee's interested—subcommittee's interested, they're items 6 and seven on our—on our list.

We suggest that the blockage of fish of all types, by executive order or congressional mandate, be done through the EPA requiring adjusted standards which maintain oxygen levels that will not support aquatic ecosystems in the 15-mile section of the Sanitary and Ship Canal and the Cal Sag Channel upstream from Lockport. This is a manmade channel which is currently 70-percent treated

effluent, and this would create an aquatic dead zone between Lockport and the subcontinental divide.

Further, since we wish to protect the environment, we would recommend the installation of remedial oxygenation to enhance water quality south of the Lockport lock, so that those downstream would not suffer from any reduced water quality. I've brought a map. I'll be happy discuss these in detail if they are of interest to the committee.

[The prepared statement of Mr. Farrell follows:]

PREPARED STATEMENT OF JIM FARRELL, EXECUTIVE DIRECTOR, INFRASTRUCTURE COUNCIL, ILLINOIS CHAMBER INFRASTRUCTURE COUNCIL WATERWAY COMMITTEE, CHICAGO, IL

Illinois Chamber Infrastructure Council Waterway Committee Jim Farrell Executive Director, Infrastructure Council Suggested Asian Carp Strategy February 25, 2010 The Illinois Chamber of Commerce and its Infrastructure Council appreciate the opportunity to contribute to the effort to protect Lake Michigan and the Great Lakes Basin from the Asian Carp and other invasive species. The Illinois Chamber would like to thank Senator Stabenow for inviting us to appear and contribute towards resolution of this important matter.

The Illinois Chamber of Commerce shares the concern of the State of Michigan and others who want this invasive species stopped before it can enter the Great Lakes. We offer recommendations, which have been submitted to the United States Environmental Protection Agency andthe Asian Carp Workgroup, for action to stop the Asian Carp. We believe these suggestions can protect Lake Michigan from an invasion of Asian Carp via Illinois waterways and simultaneously provide for commerce to continue uninterrupted.

Separate and apart for our concern for a balanced and thoughtful approach to the problem of preventing the Asian Carp from reaching Lake Michigan is our concern for the creation and retention of jobs in the region. This discussion needs to move from the courtroom to the conference room. The common objective is to stop the carp. However, in the process we do not believe the Solutions should pit Illinois Tow Boat operators like John and Jacque Kindra of Kindra Lake Towing of South Chicago against Michigan fisherman and Charter Boat Captains like Paul Jensen of Muskegon.

Furthermore, we believe that our concern for the environment should give us cause to recognize commercial navigation as the most environmentally friendly and safest mode of freight transit. Depending on the commodity being transported a single barge carries the equivalent of between 60 and 120 truckloads of cargo. (The Chamber consistently uses 80 truckloads as an average in all examples.) The Illinois Chamber is encouraged that the Asian Carp Control Strategy Framework, which we were unaware of at the time we created our plan, includes six of the eight suggestions we present. Further we are encouraged that the Framework notes the historical perspective of when invasive species from the Mississippi Basin to the Great Lakes Basin became an issue for the region. "Historically, poor water quality in Chicago's urban waterways had controlled the transfer of invasive species between the Great Lakes and Mississippi River watersheds."[Framework 1.2, page 4]

There is precedent of on impenetrable aquatic barrier.

It is our goal that this testimony will bring to light the fact that lock closures are not the answer. Though it is convenient and simple to suggest the dramatic and easily visualized act of closing the locks, we submit that halting the migration of Asian Carp should be, and can be executed twenty miles west of the Chicago and O'Brien Locks without interrupting commercial navigation.

Just this week the Illinois Department of Natural Resources (IDNR) conducted electro fishing expeditions both in the Chicago Sanitary and Ship Canal and further down stream in the area of Peru, Illinois. Once again there were no Asian Carp found above the existing electric barrier at Romeoville. Asian Carp were found down stream roughly fifty miles from Lake Michigan. We respectfully submit that this most recent result from electro fishing affirms the Chamber's position that we can address this problem many miles downstream and west of Lake Michigan.

Much, if not all, of the recent alarm regarding Asian Carp stems from eDNA testing performed by the University of Notre Dame. It must be emphasized that a positive eDNA test does not correlate to a sighting of Asian Carp, but rather to a finding of Asian Carp DNA. The Framework references the term "vector" as a delivery mechanism of Asian Carp. Many vectors have been discussed: cultural releases, bait,

and the barges themselves. In fact Dr. Lodge whose research team is partnering with the United States Army Corps of Engineers on this technology acknowledged as recently as this month ;www.nd.edu' that "These biological materials degrade in the environment, but this process is not instantaneous, and DNA can be held in suspension and transported." We at the Chamber have stated publicly and consistently that this new technology, which has indicated the presence of DNA has yet to produce a live Asian Carp or even an Asian Carp carcass upstream of the electronic fish barrier. Therefore, at best, eDNA should be considered a warning—not an alarm.

As part of our testimony we have submitted my Sworn Affidavit which was a part of the Illinois Solicitor General's' response to the State of Michigan's Supreme Court filing which requested lock closures. And we have included a copy of our Public Comment prepared for the EPA Public Hearing held February 12, 2010.

Below is the enclosure of both documents.*

Senator STABENOW. Thank you very much.

Dr. John Taylor, welcome.

STATEMENT OF JOHN C. TAYLOR, ASSOCIATE PROFESSOR AND DIRECTOR OF SUPPLY CHAIN MANAGEMENT PROGRAMS, SCHOOL OF BUSINESS ADMINISTRATION, WAYNE STATE UNIVERSITY, DETROIT, MI

Mr. TAYLOR. Thank you.

Madam Chair and members of the committee, today I am providing testimony on research that former Michigan Department of Transportation manager James L. Roach and I conducted in our roles as expert witnesses for the Michigan attorney general's case on Asian carp control. I should note, however, that this testimony is my own and is not on behalf of the Michigan attorney general's office.

The research and report that I am testifying about examines the freight transportation and handling cost impacts of establishing physical barriers at the Chicago lock in downtown Chicago and at the O'Brien lock and dam located south of Lake Calumet. Our analysis determined that closure of the locks in question would affect some 7 million tons of cargo at the O'Brien and Chicago locks, 98 percent of that being at the O'Brien lock. These are the Army Corps of Engineer numbers on this matter.

We highlight this number because there has been much confusion about the volume of commerce that would be affected by lock closures. Numerous news articles have referenced much higher tonnages, in the range of 16 million tons. However, these sighted tonnages, in many cases, involve goods moving through all portions of the Illinois Waterway System or the unaffected Lockport lock, downriver. The sighted figures could also be due to some misunderstandings that assumed the Lockport lock could be closed, even though Michigan has not requested this. We believe it is important to understand that the actual freight volume affected by a lock closure is 7 million tons.

While that may seem like a lot of tonnage, let's put that in perspective: The 7 million tons represents about 1 percent of freight originations and terminations in the Chicago region. In 2007, a total of 4475 loaded barges moved through the O'Brien lock, or 18 per day for a 250-day year. There were 50 loaded barges in 2007 at the Chicago lock.

Documents have been retained in subcommittee files.

The volume is about the same amount of cargo that moves in two daily loaded rail unit trains. What's that mean? The Chicago region has 500 freight trains a day.

In order to estimate the cost impact of closing the lock, we examined alternative means of accommodating the cargo affected by the closures. Common to all of them was the likelihood that most of the cargo would continue to move by barge to transload terminals downstream of the O'Brien lock, with subsequent movement via truck, rail, or pipeline to existing users.

That being said, some of the cargo should—could shift to rail for the entire move. It is very important to understand that the use of multiple modes for one move is common today. For instance grain moves by truck, then by rail, and then by barge. Likewise, in a move that would unaffected—and I say "unaffected"—by the lock closure, coals moves first, from out West, by rail to Romeoville, down on the southern end of the system, and then is barged about 10 miles to powerplants on the Chicago Sanitary and Ship Canal. Similarly, construction sand is barged to a terminal and then trucked to its usage point.

It is also important to understand that other modes, such as rail, currently carry the greatest percentage of many of these commodities' total tonnage moving in the region. For instance, only 6.8 percent of the cargo handled by water at the northwest Indiana Lake Michigan ports moves by barge, and mostly then on through the O'Brien lock.

These ports also handle a large volume of goods that use other modes than water. For instance, the Burns Harbor port Web page states that it annually handle—annually handles 10,000 railcars, 500,000 trucks, 250 barges, and 100 ships. The 250 barges is the equivalent of 15,000 trucks, or 3 percent of the current truck movements happening at that port.

A total of a half million tons of steel moved outbound by barge at the 3 Lake Michigan steel ports, per Army Corps of Engineers numbers, were just 1.9 percent of the Chicago region's 2007 production of 27.3 million tons of steel, so 1.9 percent.

For the 3 steel mills on Lake Michigan, their respective ports received, per the Army Corps of Engineers numbers, 232,000 tons of coal coke by barge, compared to some 4 million tons moving to these plants by rail, of coal coke specifically.

Our conclusion is that the 7 million tons could be moved for an additional cost of $70 million per year if the O'Brien and Chicago locks were closed. On a weighted average basis, we believe the extra handling and transportation costs to move the freight would be $10 a ton.

Similar figures have been reported elsewhere. The Texas Transportation Institute says barge shippers—says barge shippers nationally save $11 a ton. At the Burns Harbor port Web page I mentioned, they indicate that their port saves shippers $10 per ton over other locations.

So, in just a couple of quick last points: If barriers were established at the O'Brien lock, the annual cost increase of $70 million would equal 13 one-thousandth of 1 percent of the 521-billion Chicago area economy.

I've got a couple other points here. The truck traffic in the Chicago region would increase by one-tenth of 1 percent. We have a few other points.

But, just to close, let me say that—let me summarize, a conservatively estimated additional transportation and handling costs of shifting the existing barge traffic to other modes of transportation would be $70 million a year.

[The prepared statement of Mr. Taylor follows:]

PREPARED STATEMENT OF JOHN C. TAYLOR, ASSOCIATE PROFESSOR AND DIRECTOR OF SUPPLY CHAIN PROGRAMS, SCHOOL OF BUSINESS ADMINISTRATION, WAYNE STATE UNIVERSITY, DETROIT, MICHIGAN

Senator Stabenow, and Members of the Committee on Public Works and the Environment: My name is Dr. John C. Taylor and I am an Associate Professor of Supply Chain Management and Director of Supply Chain Programs in the School of Business at Wayne State University in Detroit, Michigan. Today I am providing testimony on research that former Michigan DOT Manager James L. Roach and I conducted in our roles as expert witnesses for the Michigan Attorney General's case on Asian Carp control. I should note, however, that this testimony is my own, and is not on behalf of the Michigan Attorney General's Office.

My expertise is in the areas of logistics and transportation. I hold a Ph.D. in logistics from Michigan State University's School of Business. I am a past member of the Congress and President's National Commission on Intermodal Transportation, and several other transportation advisory committees. I am also Editor of the Journal of Transportation Management.

The research and report that I am testifying about today examines the freight transportation and handling cost impacts of establishing physical barriers at the Chicago Lock in downtown Chicago, and at the the O'Brien Lock and Dam located south of Lake Calumet. A copy of the report* has been provided for the record. A look at the chart on the easel and attached to our testimony here may help clarify the geography . . . . . .

Our analysis determined that closure of the locks in question would affect some 7 million tons of cargo at the O'Brien Lock on the Calumet River, and some 100,000 plus tons at the Chicago Lock. These figures represent averages from 2007 and 2008 and are referred to in more detail in our report. Our volume findings are consistent with the Army Corps reported figures.

We highlight this number because there has been much confusion about the volume of commerce that would be affected by lock closures. Numerous news articles have referenced much higher tonnages in the range of 16 million tons. However, these cited tonnages in many cases involve goods moving through all portions of the Illinois Waterway System or the unaffected Lockport Lock downriver. The cited figures could also be due to some misunderstandings that assumed the Lockport Lock could be closed, even though Michigan has not requested this. We believe it is important to understand that the actual freight volume affected by a lock closure is primarily the 7 million tons at the O'Brien Lock.

While 7 million tons may seem like a lot of freight it is important to put the volume into perspective. For instance:

- The 7 million tons represents about 1 % of freight originations and terminations in the Chicago region.
- In 2007 a total of 4475 loaded barges moved through the O'Brien Lock, or 18/day for a 250 day year. There were 50 loaded barges in 2007 at the Chicago Lock.
- The volume is about the same amount of cargo that moves in two daily loaded rail unit trains. And the Chicago region has 500 freight trains each day.

In order to estimate the cost impact of closing the lock, we examined alternative means of accommodating the cargo affected by the closures. Common to all of them was the likelihood that most of the cargo would continue to move by barge to transload terminals downstream of the O'Brien Lock with subsequent movement via truck, rail, or pipeline to existing users. That being said some cargo could shift to rail for the entire move. It is very important to understand that use of multiple modes for one move is common today. For instance grain moves by truck and then by rail. Likewise, in a move that would be unaffected by the Lock closure, coal

*The report has been retained in subcommittee files.

moves by rail to Romeoville and then is barged about 10 miles to power plants on the Chicago Sanitary and Ship Canal (CSSC). Similarly, construction sand is barged to a terminal and then trucked to its usage point.

It is also important to understand that other modes such as rail currently carry the greatest percentage of many of these commodities total tonnage moving in the region. For instance:

- Only 6.8% of the cargo handled by water at the NW Indiana Lake Michigan ports moves by barge.
- These ports also handle a large volume of goods that use other modes than water. For instance the Burns Harbor web page states that it annually handles 10,000 railcars, 500,000 trucks, 250 barges, and 100 ships. The 250 barges is the equivalent of 15,000 trucks, or 3% of current truck movements.
- A total of .52 million tons of steel moved outbound by barge at the three Lake Michigan ports, or just 1.9% of the Chicago Region's 2007 production of 27.3 million tons of steel.
- For the three steel mills on Lake Michigan, their respective ports received just 232,000 tons of coal coke by barge, compared to some 4 million tons moving to these plants by rail.

Our conclusion is that the 7 million tons could be moved for an additional cost of $70 million dollars per year if the O'Brien Lock was closed. On a weighted average basis we believe the extra handling and transportation costs to move the freight would be$10/ton. Similar figures have been reported elsewhere. The Texas Transportation Institute says barge shippers nationally save $11/ton. And, the Burns Harbor port web page indicates that their port saves shippers $10/ton over other locations.

Following are some key points about the impact:

- If barriers are established at the O'Brien Lock, the annual cost increase of $70 million would equal 13/1000ths of 1 percent of the $521 billion Chicago area economy.
- Great Lakes ship traffic would still be able to reach their docks in the Calumet River, and 3 NW Indiana Lake Michigan ports. These ships do not pass through the O'Brien Lock.
- Truck traffic in the Chicago region would increase by less than 1/10th of 1 percent. If all the freight transferred to truck at transload points, an extra 1000 daily truck trips would be required in a region with several hundred thousand trips per day.
- Almost all significant shippers have direct or proximity access to rail. There is also more than sufficient rail and truck capacity and it could readily be provided.
- Most of the claimed environmental, air quality, safety and energy benefits associated with barge transportation would continue.

We do acknowledge in the report that there would be negative impacts on the barge industry and that some businesses and terminals would be adversely affected by the closures. That said, barge volumes at the O'Brien have been dropping for many years. For instance, using the average volumes in 1993-95, and comparing to average tonnages in 2006-08, volume dropped 30.5%. We also note that inland waterway traffic in general has been declining as other modes such as rail and truck have shown significant increases. This despite a 1992 CBO study that found that barge is the most heavily subsidized mode.

In conclusion, waterway closure at the Chicago and O'Brien Locks would have a localized impact on already declining commercial cargo traffic that comprises only a tiny fraction of economic activity in the metropolitan Chicago area. The conservatively estimated additional transportation and handling costs of shifting the existing barge traffic to other modes of transportation for portions of the trip is $70 million/year. While there have been several stories indicating that lock closure would devastate the local economy and Illinois' role in the regional, national and global economy, our report does not justify this conclusion.

Senator STABENOW. Thank you very much.

Mr. Andy Buchsbaum, thank you so much for being here.

STATEMENT OF ANDY BUCHSBAUM, DIRECTOR, GREAT LAKES REGIONAL CENTER, NATIONAL WILDLIFE FEDERATION, CO-CHAIR, HEALING OUR WATERS®—GREAT LAKES COALITION, ANN ARBOR, MI

Mr. BUCHSBAUM. Madam Chairwoman, Senator Bayh, thank you for the opportunity to testify here today about the worst—one of the worst crises ever facing the Great Lakes.

In addition to my position with the National Wildlife Federation, I'm also the cochair of the Healing Our Waters Coalition, a 11-member organization that is dedicated to protecting and restoring the Great Lakes.

As you well know, the Asian carp are a enormous threat to the ecology and the economy of the Great Lakes. But, they're more than that. They also pose a threat to the unity of the Great Lakes and Great Lakes leadership. That's important, because you all have shown that, when the Great Lakes comes together, that we can do amazing things, like the Great Lakes Restoration Initiative, like the Great Lakes Water Resources Compact. So, this issue—this Asian carp issue has not only threatened our ecosystem, but it's also threatened our effectiveness and our ability to get things done together.

Let me suggest a way—and you've heard a little bit about—already here—let me suggest a way to solve both of these problems, and that is to reverse the way that we're looking at this problem. Until now, we have been focused on what to do tomorrow, what to do the next day to stop these carp from getting into the Great Lakes. We've been on an emergency basis. We've been doing that for 3 months.

I guess I suggest now it's time to look at what we actually ultimately want to happen, and that's ecological separation. I don't think there's a disagreement that, ultimately, the only solution is to stop the movement of live organisms between the Mississippi River system and the Lake Michigan basin. I don't think there's disagreement that we can't save the Great Lakes unless that happens.

What does that mean? It doesn't have to mean closing the locks at Chicago and O'Brien and Wilmette. It may mean that, but you can separate the ecosystem—there's a map at the side there—you can separate the ecosystem at several different points. At Lockport, you can separate in between those at Lockport and the other locks. That's important, because that means that there's flexibility. That means that there are costs and benefits associated with each of those, and you can maximize safeguarding the Lakes while minimizing economic disruption.

There is a gentleman in the room, Joel Brammeier, from the Alliance for the Great Lakes, who has done a study with the Great Lakes Fishery Commission that suggests different points of doing that type of separation.

That's the reason—the flexibility is the reason the Great Lakes Commission came out with its resolution saying, "Yes, ecological separation is something we all agree on." When I say "we all agree on," that included the States of Illinois, it included the States of Indiana.

So, how do we get to that endpoint? No. 1 is, there has to be a directive, an objective that every—that is actually—the agencies are directed to do. The Army Corps of Engineers and the other agencies, they need a mission that says ecological separation is the permanent solution that we need to get to. Second, there needs to be funding. Third, there needs to be an accelerated timeframe; we need to do this quickly. Fourth, we have to make sure that we buy enough time for this solution to occur, and that's where the emergency measures come into play.

Unfortunately, the focus on the emergency measures alone has split the community. Those emergency measures pose special problems, and that's—there are legitimate disagreements on what to do with those. What one can say about the emergency measures right up front, though, is that none of them is 100-percent effective. The electric fence, no, not 100-percent effective. Lock closures—two of the 5 openings to Lake Michigan are not covered by locks; those are not 100-percent effective. Poisoning is not 100-percent effective. Electrofishing is way less than 100-percent effective.

So, the issue isn't whether to do all of them. Certainly we need to do them all. The issue is, How do we sequence them, how do we pull them together in a plan that maximizes the protection of the Great Lakes, even if we can't guarantee their protection because we simply don't have the technology to guarantee their protection right now?

So, where does the framework—how does the framework line up with that? The framework has some very, very good points that I've provided in detail in my written testimony, but it has two major gaps:

No. 1 is, it doesn't specify what the long-term solution is. It doesn't specify a permanent solution. It has a study to study what a permanent solution might be, and that study takes to long to do, but it doesn't tell—the Army Corps of Engineers does not say, "Let's figure out how to do ecological separation," it asks, actually, whether to do ecological separation or something else. That needs to be fixed, and that's a—that's something that is all in your power to do.

The second thing is that the framework has a number of good possible potential actions, but it doesn't sequence them; it doesn't have a true contingency plan; it doesn't have a channel-by-channel plan on how you minimize a chance that Asian carp are going to get to the Great Lakes. It's essential that it do that, and that it do that quickly.

So, I just would like to conclude by encouraging you all to help this process along by providing the Army Corps of Engineers and the Federal agencies with the mission they need to get this done, and to do it quickly, and thereby reestablish the potential for unity among our Great Lakes leadership, which is going to be so important to solving this crisis.

Thank you.

[The prepared statement of Mr. Buchsbaum follows:]

PREPARED STATEMENT OF ANDY BUCHSBAUM, DIRECTOR, GREAT LAKES REGIONAL CENTER, NATIONAL WILDLIFE FEDERATION, CO-CHAIR, HEALING OUR WATERS®—GREAT LAKES COALITION, ANN ARBOR, MI

Madame Chairwoman, members of the Committee, good morning. My name is Andy Buchsbaum. I'm here today wearing two hats: one as the director of the National Wildlife Federation's Great Lakes Regional Center, and the other as the co-chair of the Healing Our Waters®—Great Lakes Coalition. The National Wildlife Federation is America's conservation organization, inspiring Americans to protect wildlife and the habitat they depend on, like the Great Lakes, for our children's future. The HOW Coalition is a partnership of 114 national, regional, state and local organizations dedicated to protecting and restoring the Great Lakes.

Thank you for the opportunity to testify before you today about the worst crisis to face the Great Lakes since the colonization of the lakes by zebra and quagga mussels. Of course, I am talking about the potential invasion of two species of Asian carp, the bighead and silver carp. Your hearing today is most welcome because we have very little time to stop these species before immense and irrevocable damage is done to the Great Lakes. Madame Chairwoman, I was present when you spoke at the Asian carp public meeting in Ypsilanti, Michigan, last week, and your words perfectly describe the challenges we all face. The task of preventing Asian carp from invading the Great Lakes is a hard one: between the technical challenges, the difficulties of finding effective deterrents, and the desire to reduce the impacts of control measures on jobs and the economy, there are some very tough choices to be made. But the task of protecting the Great Lakes once Asian carp establish breeding populations is far harder—in fact, it is impossible. Once the invasive carp colonize the lakes, there is no turning back; the damage will be done. So as tough as our job is to prevent the invasion of these carp, the alternative is far worse. We have no choice; we have to do whatever is necessary to stop the Great Lakes' colonization by Asian carp. And we have to take action quickly, while there is still time to save the lakes.

As you know, over the past three months, federal and state agencies have been working in crisis mode to stop the Asian carp. Many dedicated people in those agencies have worked night and day, through weekends and holidays, to combat the carp. And I believe they have made progress. But because of institutional and political barriers, that progress has been uneven, often incomplete, and too slow. That description unfortunately also describes the agencies' most recent effort, the Draft Asian Carp Control Strategy Framework (Environmental Protection Agency, 2010; hereinafter, "Framework"). Unless that Framework is significantly upgraded, the Great Lakes remain highly vulnerable to invasion by Asian carp. With today's testimony, I would like to share with you our analysis of the Framework—its strengths and weaknesses—and our recommendations for improvements and action.

ASIAN CARP AND THE GREAT LAKES

The Great Lakes are a phenomenal natural resource, a network of five inland seas that span 94,000-square miles of surface area, contain 20 percent of all surface freshwater on the planet and comprise the world's largest freshwater ecosystem. The five lakes—Superior, Michigan, Huron, Erie and Ontario—provide drinking water for 25 million people, support a $7 billion fishery, a $16 billion tourism industry (Great Lakes Commission, 2007), and are an integral part of North America's cultural and economic heritage.

But the lakes are under siege from more than 180 invasive species—nonnative fish, mussels and other creatures that entered via manmade canals and ocean freighters (Framework, p. 4). Asian carp is the latest threat and it could be the worst invader of all time if it establishes breeding populations in the lakes (Framework, p. 5).

Asian carp were imported to Arkansas in the 1970s to control algae in commercial catfish farms. The fish escaped into the Mississippi River during a 1993 flood and spread to the Illinois River and the Chicago Waterway System, a series of manmade canals that carries Chicago's sewage to the Mississippi River. Those canals link the Great Lakes and Mississippi River watersheds, creating an artificial superhighway for Asian carp to reach Lake Michigan.

The Asian carp have taken over the waterways they invade. They are large fish, up to 5 feet long and 100 pounds. They are voracious filter feeders, eating up to 20% of their body weight in algae and zooplankton every day (Framework p. 4). And they reproduce rapidly. Where they have invaded in the Mississippi River basin, they have become established in great numbers and outcompeted native fish (Chapman 2003). One species, the silver carp, panics when it hears a boat engine and flings itself out of the water, sometimes causing injuries to boaters, anglers, and

water-skiers. Their presence has depressed fishing and recreation in the Mississippi River (Framework, p. 5).

If Asian carp colonize the Great Lakes, their impact is likely to be immense. Scientists from the U.S. (Kolar et al 2005) and Canada (Mandrak and Cudmore 2004) have conducted risk assessments indicating that the Great Lakes have multiple carp-friendly habitats, including Green Bay, west Michigan, Saginaw Bay, Lake St. Clair, and western Lake Erie. The Great Lakes Restoration Initiative Action Plan published this week identifies precisely those nearshore areas as needing special protection (White House Council on Environmental Quality, et al., pages 26-27). Not only are these some of the most popular boating and fishing spots in the region; they also are the most biologically productive and sensitive areas in the Great Lakes system. These areas are most important for the overall health of the Great Lakes. According to an assessment by the region's top scientists, the Great Lakes' self-regulating mechanisms—their ability to recover from insults and damage from a variety of sources—is based in the near-shore communities and major tributaries of the lakes (Bails, et al., 2005). Those are exactly the areas most likely to be damaged by the establishment of Asian carp in the lakes.

Scientists, resource managers, Congress and the public have known about the threat of Asian carp to the lakes for almost a decade. Concern about an Asian carp invasion prompted Congress in 2007 to fund the Army Corps of Engineers construction of a new electric fence in the Chicago Sanitary Ship Canal, about 20 miles from Lake Michigan, to stop the carp's passage through the canals. But due to construction delays and operational disagreements among federal agencies, the new barrier did not become fully operational until 2009.

The hope that the electric fence would stop the Asian carp from reaching Lake Michigan was shattered late last year. In November, the Corps released the results of a new type of eDNA testing conducted by a team of scientists led by Dr. David Lodge at the University of Notre Dame. These tests sample the waters where fish swim for minute traces of Asian carp DNA. Some of the eDNA samples tested positive for Asian Carp in areas past the electric fence—that is, beyond the last barrier protecting Lake Michigan. Most recently, the positive eDNA tests indicate Asian carp DNA at multiple points beyond the electric fence: in the Calumet Sag Channel; near the O'Brien Lock; near the Wilmette Pumping Station; and in Calumet Harbor, which is in Lake Michigan itself. See Figure 1 (Framework p. ES 1).* At the Asian Carp public meetings this month in Chicago and Ypsilanti, Dr. Lodge and his colleague, Dr. Lindsay Chatterton, noted that these eDNA tests do not necessarily mean that live Asian carp are present, but that the likelihood of live fish being in these locations is very high based on the frequency and pattern of the positive DNA samples.

Despite that bad news, there is reason for hope if we act quickly. No one has seen live or dead Asian carp beyond the electric fence. The Illinois DNR has conducted extensive electrofishing and netting beyond the fence in the past three months and caught hundreds of common carp, but no bighead or silver carp. Fisheries managers and scientists believe the lack of live or dead fish means that the positive eDNA tests are due to isolated Asian carp in the areas beyond the electric fence. That is good news because it means that the Asian carp probably have not yet established breeding populations in the Great Lakes. Quoting Dr. David Lodge, the "establishment of a self-sustaining population of either silver carp or bighead carp in Lake Michigan—what biologists would refer to as an invasion—is not a foregone conclusion." Framework p. ES 2.

No one can say what would constitute a self-sustaining population of Asian carp in Lake Michigan—whether it would be two fish or two hundred fish. But there is universal agreement that lower the number, the better. That mandates a dual approach: stop any more Asian carp from reaching Lake Michigan, and kill any Asian carp that are already present in or might soon reach the lake.

THE FRAMEWORK

This month, the federal and Illinois agencies released their strategy to combat Asian carp, the Draft Asian Carp Control Strategy Framework. (Environmental Protection Agency, 2010). Although it has many useful and potentially effective elements, it is not nearly enough to protect the Great Lakes. Most fundamentally, it does not shut the door on additional Asian carp reaching Lake Michigan.

As Senator Stabenow noted, the challenge the Framework attempts to meet is not easy. Over the past 100 years, the Chicago canal system has grown and created interconnections with five different outlets to Lake Michigan (Figure 1 above de-

*Graph has been retained in subcommittee files.

scribes the five outlets). Three of those outlets have control structures—locks—before they empty into the lake; two do not. Water flows from the lake through the outlets into canals and then to the Chicago Sanitary Ship Canal, southwest through the electric fence and the Lockport Lock into the Illinois River. But this system of waterways does not always remain intact. The DesPlaines River runs next to the Chicago Sanitary Ship Canal for several miles northeast of (beyond) the electric fence. During large storms, the DesPlaines River sometimes floods into the canals—carrying live organisms into the canal system well beyond the where the electric fence is designed to stop the movement of Asian carp. Because eDNA samples from the DesPlaines River also have tested positive for Asian carp, flooding of the DesPlaines could send additional invaders into the canal system without the protection of the electric fence.

The Framework appropriately attempts to plug these invasion vectors through several dozen short- and long-term actions. Some are likely to be effective and represent real progress, including:

- The Framework addresses the critical problem of flooding from the DesPlaines River, committing to the construction of barriers and fences by October, 2010 to contain flooding from the DesPlaines and to keep Asian carp from being carried from the DesPlaines to the canal system. This is essential in the short-term. Framework 2.1.5, p. 17.
- For the first time, the agencies commit to using all possible measures for short-term Asian carp control: chemical treatment (poison), electrofishing, netting, and temporary lock closures. Although it is still unclear how such measures would work together, this is the first time that modified operations of the O'Brien, Chicago River, and Wilmette locks have been included as action measures in a plan. Framework 2.1.4, pp. 15-16.
- The Framework includes enhanced and accelerated actions at Asian carp hotspots—particularly increased testing and targeted removals using chemical and physical measures. Framework 2.1.1 and 2.1.2, pages 13-14. These measures are important to reduce and eliminate Asian carp that have gone beyond the electric fence and to minimize the chance they can move into Lake Michigan.
- The Framework also expands the scope and scale of eDNA sampling and accelerates the capacity to analyze those eDNA samples so they can be used for rapid response.
- The Framework includes important research to find biological means of killing and controlling Asian carp. That research, if successful, may be helpful for long-term solutions but is not likely to be completed soon enough to incorporate into short-term plans.

Despite these positive features, the Framework has some major flaws that make it ineffective in protecting the Great Lakes from Asian carp:

- In the short term, there is not enough detail on how or when the various measure will be used together to impede the movement of Asian carp. Those measures have to be used in sequence at specific locations over specific time frames to be effective. The Framework now is like a list of ingredients without a recipe. Unless you combine the ingredients in the right proportions and sequence, you will have a disastrous meal. We cannot afford that for the Great Lakes. What we need is a true contingency plan of triggers and timelines, with channel-by-channel and lock-by-lock actions sequenced for maximum protection of the Great Lakes.
- The short-term actions do not lead to a long term solution. The Framework's long-term strategy is a series of studies, none of them committed to a course of action. The most important study for the long-term—the Corps' Inter-Basin Feasibility Study on ecological separation—only considers ecological separation; it does not commit to it. As discussed below, that is a fatal flaw. The only way to protect the Great Lakes from Asian carp is to stop the movement of live organisms between the Mississippi River system and the Lake Michigan basin—to separate the two ecologically. Unless that is the goal of the Framework, it is doomed to failure.
- The agencies are taking too long to develop an effective plan. They have had three months to develop contingency plans with triggers and timetables and a path toward a long-term solution. After all that time, they have produced an incomplete and flawed Framework, promising more details later. Every day we wait, the chances increase that Asian carp will establish a breeding population in Lake Michigan. The agencies need to act faster.

CONCLUSIONS AND RECOMMENDATIONS

I attended both of the Asian carp Framework public meetings this month in Chicago and Ypsilanti and was impressed by the passion exhibited at each. There was a surprising consensus around the need to protect the Great Lakes from Asian carp, shared even by those most concerned that their jobs and livelihoods could be jeopardized by some of the remedial measures. Where the greatest polarization occurred was over one measure: closure of the O'Brien and Chicago Locks. That polarization is also reflected by the positions that different states have taken in the litigation before the U.S. Supreme Court.

The focus on lock closures can obscure the larger issues that we might get agreement on if we could get everyone to focus on them. We need a larger plan for short-term measures and how lock closure or modification might fit into that strategy. What gets lost is the concept that no single measure is effective by itself. The electric fence is certainly not 100 percent effective. Nor is poisoning, or electrofishing, or commercial fishing, or lock closure. The real issue is how to put all those measures together to stop movement of Asian carp into Lake Michigan.

The emphasis on lock closure also leads to confusion about the long-term goal of ecological separation—that is, stopping the movement of live organisms between the Mississippi River system and Lake Michigan. Ecological separation is essential for the Great Lakes. It is the only way of safeguarding the lakes from Asian carp. Anything short of complete separation will fail sooner or later, and if experience over the past few months is any guide, that failure is likely to be sooner. Unfortunately, many equate such separation with closure of the Chicago and O'Brien locks when in fact there are many other options. The system can be separated at other points in the canals that would leave the locks open (and could actually enhance passenger boat traffic and tourism). Those options are what we hope the Army Corps of Engineers is exploring in their Interbasin Feasibility Study. My colleague Joel Brammeier from the Alliance for the Great Lakes has done a study of several of those options (Brammeier, et al., 2008), and additional possibilities may also be feasible.

The other conclusion I drew from the Framework meetings is that the federal agencies, and particularly the Army Corps of Engineers, need additional direction from Congress. The Corps is the key decisionmaker here, and it is unclear as to whether the Corps is equipped to make good decisions. All the other agencies have roles in the Asian carp task force, but when it comes to long-term separation, canal modification, and lock modification and/or closure, the Corps decides. In Ypsilanti, the Corp's chief, Assistant Secretary to the Army Jo Ellen Darcy, repeatedly said the Corps would "balance all interests" in making its decision. "Balancing" is not a good standard for an agency whose historic mission is navigation and whose record overwhelmingly favors commerce over ecological protection. The Corps needs a new mission: in order to protect the Great Lakes from Asian carp, stop the movement of live organisms between Mississippi River system and Lake Michigan. That should be their priority.

These conclusions lead to the following recommendations:

- We recommend that Congress give the Corps a new mission to stop the movement of live organisms between the Mississippi River system and the Great Lakes. As part of that mission, Congress should direct the Corps to conduct its Inter-Basin Feasibility Study to determine how to best separate the Mississippi River system and the Great Lakes—not whether to separate them, as the Corps seems to be interpreting its mission now. Congress should also direct the Corps to complete the study in one year—by mid-2011-—and then to implement the conclusions.
- We also recommend that Congress declare Asian carp to be an imminent and substantial threat to the Great Lakes and that stopping their movement into the Great Lakes be given the highest priority and urgency by the Corps and the other federal agencies as they design and implement short-term and long-term measures to combat the carp. Such a declaration will set the right parameters and timeframe for how the agencies balance different interests as they refine and implement the Framework.
- We support the agencies' plans to implement many of the short-term measures in the Framework: the flooding protections, optimizing the operation of the Barrier IIA (the electric fence), bringing Barrier IIB (the second electric fence) on line, expanding and enhancing eDNA and other monitoring, targeting hotspots for Asian carp eradication, and installing temporary barriers on the two channels into Lake Michigan that have no locks. We also support the search for methods to interfere with Asian carp spawning and to suppress existing populations.

- We recommend that Congress demand from the agencies a true contingency plan, with triggers and timelines and a channel-by-channel, lock-by-lock strategy for stopping the movement of Asian carp into Lake Michigan. While it is encouraging that the Framework contemplates partial lock closures as part of its "modified lock operations" plan, it needs to incorporate much more aggressive closures much more quickly and integrate them with other activities, such as chemical treatment and other removal measures.
- The implementation of these measures will require funding. We are fortunate that the Great Lakes Restoration Initiative funds are available for short-term and emergency measures. For longer term measures that will be more costly, additional funding will be required. It would be unwise to drain the GLRI funds to combat a single threat, no matter how urgent that threat might be.

Despite the weekly and sometimes daily drumbeat of alarming news about Asian carp, I am still optimistic that we can stop these invaders before they colonize Lake Michigan. I believe our biggest challenge is not technical, but political. Our region's leadership and people are in conflict over how to respond to this menace, and it is slowing and stalling the search for solutions. Our region has shown that we can do amazing things if we work together. Just in the past 18 months, Congress has enacted and the White House has signed two historic, unprecedented major initiatives for the Great Lakes, the Great Lakes-St. Lawrence Water Resources Compact and the Great Lake Restoration Initiative. These measures were possible because Congressional members, governors, municipal leaders, tribes, businesses, and the public in our region were united in favor of them. We need that same unity if we hope to do the hard work needed to protect the Great Lakes from Asian carp.

Senator STABENOW. Thank you very much.

Thank you, to all of you.

Let me followup, Mr. Buchsbaum, by asking you to talk a little bit more about what it means when we say "ecological separation." This is something that I'm learning more and more about, and have now seen pictures of boatlifts that have been used in other countries so that, essentially, commerce could be conducted with barriers, in terms of the water and so on, and species. But, I wonder if you might just describe more what you're talking about, for those of us who are still learning about how this would work.

Mr. BUCHSBAUM. That's a great question, Senator. The—it's important to define what we mean by "ecological separation," and I think the definition that I just mentioned earlier, in passing, is probably the one we want to stick with, and it's something that the Great Lakes Commission has in their resolution, as well, and that is stopping the movement of live organisms between the Mississippi River system and Lake Michigan.

There's a great deal of flexibility in how you do that. It's—to guarantee the cessation of that movement, you actually have to physically separate those two systems, and—which means putting a barrier in somewhere along the Chicago Waterway System, one or multiple places, depending on where it's optimal, from both an ecological and economic standpoint.

Those barriers—you could have a barrier that was a berm; you could have barriers that were pipes; you could have barriers that were different canal systems. There are—you could, kind of, change the canal system—there's all sorts of options that are possible now, which is why it's so important for the Army Corps of Engineers study to look at how to do that separation.

As you point out, there are many mitigation mechanisms that are available to—once ecological separation is achieved. Boatlifts is one, certainly, that's being used other places. Tim Eder, the director of the Great Lakes Commission, actually has pictures of that, if you're interested.

Others, though—others are going to involve multimodal transportation, like Dr. Taylor talked about. One things that Dr. Taylor has in his report, that I've seen before, is that the opportunity to do multimodal transportation is a job growth opportunity. It takes people, not just to build those offloading stations, those uploading stations, but also to operate them. Dr. Taylor had concluded that, if multimodal transportation—I don't want to put words in his mouth—but if it's done correctly, there could be a net job growth for the Chicago area. It makes sense. That $70 million in extra costs isn't going up in smoke, that's going to go to something. It's going to go to the—those extra transportation costs will go to jobs to make that transportation happen.

Senator STABENOW. Thank you. At this point, just to followup as you were talking about the fact there's no silver bullet, unfortunately—we wish there was, in the short run—but, could you talk a little but more, though, about our ability to mitigate the carp moving into the Great Lakes while we are focused on this longer-term goal?

Obviously, we have to have a longer-term goal, a solution—and not that long; when I say "long-term," I mean that we need to do this as quickly as possible—but, what about the immediate, in terms of what we know about the carp?

Mr. BUCHSBAUM. Again, it's a—that's a—it's a very vexing question. We need a channel-by-channel—there's 5 different channels—we need a channel-by-channel control strategy that minimizes the chance that the carp are going to move through the system. That strategy needs to include sequenced, timed measures like poisoning, combined with electro-fishing, combined with herding, combined with testing, combined with lock closures in the channels which have locks, combined with, also, very rapid installation of other barriers in the two channels where there are no barriers now.

Lock closures is important. We support, as Michigan does, the closures of the locks until other things can happen, but lock closures, by themselves, are not 100-percent effective. We have other criticisms of the framework that have nothing to do with lock closures. We believe the framework can be strengthened in multiple ways, lock closures being one of them.

I guess I would suggest that the more we focus on lock closures as the lead thing to happen, the more it's difficult to get the focus on—where it needs to be, on this channel-by-channel plan.

One of the encouraging things in the framework was that it talked about, for the first time, modifying lock operations. Those partial lock closures, in conjunction with poisoning at the right time, could be done like the lock was closed in Lockport, with the poisoning done with the—when the electric fence maintenance happened. So, you poison an entire stretch where the lock is closed. You can open the lock, because there's no—they're—you've eradicated the fish nearby.

Those are the kinds of the flexible and innovative things that we need to look at.

Senator STABENOW. Thank you. Let me ask Mr. Miller for your thoughts, as it relates to what Mr. Buchsbaum has said. I know that Illinois is part of the Great Lakes Commission that is now recommending the long-term solution of the ecological separation. I

wonder if you might expand on that, in terms of—from the Illinois perspective.

Mr. MILLER. I'd be happy to. Madam chair, just for the record, not only is Illinois a part of the Great Lakes Commission, Governor Pat Quinn, my boss, is the chairman——

Senator STABENOW. Thank you for——

Mr. MILLER [continuing]. Of the Great Lakes Commission.

Senator STABENOW [continuing]. Correcting me. Yes.

Mr. MILLER. As he was here this week to participate, we did discuss what "ecological separation" meant. It—from our perspective, it means, exactly as Andy said, that we do not want to have organisms going back and forth between the two basins—the Mississippi and the Great Lakes. But, it does not mean that we cannot move commerce and have navigation or other kinds of traffic in between.

The same type of vision and engineering feat that it took to reverse the Chicago River will be needed in order to deal with this challenge for the next century. Governor Quinn has seen the potential here, not only to create jobs, but create a better infrastructure, but this is something that we must do in the long run. It is the long-term solution to keep invasive species from traveling between the two very important basins, and something that we need to do.

What it does not mean, though, to us, is that we should close the locks. The locks themselves are leaky, as Nancy Sutley said this morning. There are two avenues to get into the Great Lakes that do not possess locks. The map over here to my right does not include the whole system, but the Grand Calumet River and the Little Calumet River both go into Indiana and then into Lake Michigan without an obstruction, such as a lock. We need to address all of these things in a very thoughtful way.

Sewage treatment in Chicago, storm water in Chicago, are going to be challenges to ecological separation. We will not have an—a very easy fix for this, but we need to do it in a thoughtful manner and move forward so that we can have what is really a every–100–year conversation about how to deal with the water in Chicago, Illinois.

Senator STABENOW. Thank you. I wonder—I'd like to ask you and Mr. DeBeaussaert more specifically—you've talked about the emergency actions that were taken—and thank you, to both of you—and the efforts there. But, after the efforts that you were involved in, looking back on it now, is there more that can or should have been done? Are there things that we should be doing? Are there other resources that should've been available at the time, any limits that you felt, in terms of doing what it was that you felt should be done?

Mr. Miller, why don't you go ahead.

Mr. MILLER. In terms of the—the Rapid Response Plan in December, I think that we performed an unprecedented feat, and pulled it off with professionalism and results, and I'm very proud of our staff and the partners for that.

I will say that we do need to get resources to the States faster. We need to make that commitment to make sure that we have the resources to do those types of actions. The Great Lakes Restoration Initiative is a great example of how we can do that, but we need

to make sure that in—when we have these emergency situations, that the money will flow quickly.

As other States deal with this issue, they're going to also need to have resources quickly, because we don't have it at the State level. Illinois DNR took a great leap of faith using what we had in our budget to address this issue, and, fortunately for us, other partners, other States came through with money on that $3.1 llion operation.

In terms of what we need to do to make it better, I think that we need to continue to define what environmental DNA means for adaptive management. We don't have a lot of answers. We need to have that information more quickly so that we can send crews in where we know the hotspots are, and get to them with our techniques.

I think it is efficient when we pair commercial netting with electrofishing. We're able to get to the fish and get them. We need to have better response time there.

Senator STABENOW. OK.

Mr. DeBeaussaert.

Mr. DEBEAUSSAERT. Thank you, Madam Chair. The State of Michigan, as I noted, did participate, upon the request of Illinois and the other agencies, as did, I think, most of the States and Provinces as part of that team effort. We were not actually part of the overall planning exercise, so it's hard for us to provide some detailed comments on it in that regard. What I would say, though, is that it—moving on go-forward basis, a couple of things that would be helpful is—one is to recognize that the massive effort that was undertaken there is not sustainable on a long-term basis, that we need these long-term solutions of—that we've been talking about here. The State of Michigan provided, you know, staff time and chemicals and equipment, but, you know, a rotenone application on a regular basis for maintenance isn't sufficient and—or sustainable. I—our DNRE director, you know, commented on that when she testified before the House committee.

The other area I think that we could improve on is that of communications. I think that the framework talks about the need to do additional outreach. I think that having all the States involved in a more direct way in these planning activities might lead to better communication and of understanding of the overall process. Recognizing that this was an emergency—rapid-response activities—there wasn't the luxury of doing all the things that, in hindsight, people might have wanted to do, I think that is an area where we could improve.

The only other thing I would comment on—and we've—in terms of the other—if I could, the questions that we've heard about, in terms of the long-term planning and the concerns about the need to take some short-term actions while we wait for that long-term—just, as I said earlier, based on our past experience with the delays; you know, when we talk about the delays in the electrical barrier, when the Governor went to her meeting at the White House, she carried with her a yellowed copy of a newspaper from 2004 that talked about the need for the electrical—2003 perhaps—about the need for the electrical barrier to prevent the gobies from getting into the Mississippi. I mean, the line of defense was really, in some

respects, first seen as protecting the Mississippi from the invasives in the Great Lakes. Obviously, it didn't get put in place in time for that to occur. So, it just is one example, I think, of why we need to take short-term measures, where we may have some disagreements, but we need to continue to work through those while we wait for this real goal of the ecological separation.

Senator STABENOW. Thank you.

Yes, I know. Senator Bayh, I'll turn to you.

Senator BAYH. Thank you. Thank you, Madam Chairman.

Those of you who favor the closure of the locks, I'd like to ask a question. My Governor is very concerned about that, and the Congressman who represents that part of my State is very concerned about that, because they feel that it's going to—we have a flooding problem there that is—can be quite substantial, in terms of, you know, hardship to the families that—who are displaced from their homes, and the economic loss that comes with that. For those of you who favor the closure of the locks, what can be done about this flooding issue?

Mr. DEBEAUSSAERT. Senator, I would just note that, in the actions that Michigan undertook, in terms of the court filings, as we made that request related to lock closure, we did note that it would have to be done in a way that was protective of public health and safety, recognizing that there are circumstances where flooding issues might come into play——

Senator BAYH. How would you——

Mr. DEBEAUSSAERT.——where——

Senator BAYH [continuing]. How would you do that?

Mr. DEBEAUSSAERT. If——

Senator BAYH. They think closing the locks is going to cause the flooding. So, I mean, just saying, in a court filing, "don't cause, you know, collateral damage" doesn't keep the flooding from taking place. So, if you close the lock, how do you keep the flooding from happening?

Mr. DEBEAUSSAERT. In an emergency situation where flooding might occur, you could operate the locks in a way that might mitigate that concern. But, on a—the normal period of time when that flooding issue—and I—over a period of years, I think there were about 8 times where that flooding situation arose over a period——

Senator BAYH. This last——

Mr. DEBEAUSSAERT.—of time. So, it's not——

Senator BAYH. This last year was quite bad.

Mr. DEBEAUSSAERT. Yes. I—and I don't know—I can't predict the future activities, but on a go-forward basis until those situations arise, we think that taking the actions that would be protective are appropriate, recognizing that there are situations that would arise, where you might have to, you know, adjust accordingly.

Senator BAYH. Right. From our State's point of view, I mean, any action like that is going to have to have some guarantee that—not just kind of a hope and a prayer, that our—you know, hundreds of people aren't going to be flooded out of their houses, but, in fact, they're going to be protected when the need arises. So, I just kind of recommend that to your thinking, because it's a legitimate issue that has to be addressed.

Mr. DEBEAUSSAERT. We understand that. That's why I think it was, in fact, acknowledged, but——

Senator BAYH. It was acknowledged, but we need more than just kind of a vague assertion that, "Don't worry. Trust us, it'll be taken care of." We need to have something a little more concrete than that.

The second thing I would ask—Mr. Taylor, your $70-million figure, the increased costs, was that for the entire Chicago metropolitan area, including northwest Indiana, or how—what area did that cover?

Mr. TAYLOR. That's for the volume that goes through the locks, the 7 million tons that goes through the 2 locks, with 98 percent of that being at the O'Brien lock.

Senator BAYH. So——

Mr. TAYLOR. That's extra transportation and handling costs——

Senator BAYH. So, customers in Indiana that are paying—the extra costs—the $70-million figure, reflects the extra amount they'd have to pay for—you know, for shipping around, or however they'd get around this thing

Mr. TAYLOR [continuing]. Just keep in mind this is——

Senator BAYH. Because some of them——

Mr. TAYLOR [continuing]. It's basic commodities. So, those—the costs of moving those basic commodities that move through the system would go up by the—the transportation costs would go up by $70 million. Now, the transportation cost is a percentage of their overall cost.

Senator BAYH. Right.

Mr. TAYLOR. On average, $10 a ton. Steel sells, you know, for multiples—hundreds of dollars-plus per ton.

Senator BAYH. Right.

Mr. TAYLOR. So, it's not a one-to-one correlation.

Senator BAYH. You can imagine they're a little concerned about this, because the steel industry's doing a little better right now, but, if you look over the last 10 years, I mean, they've contracted substantially, and thousands of jobs have been lost. So, they're a little concerned about increasing their costs at a moment like this. But I just wanted to——

Mr. TAYLOR. Right.

Senator BAYH. The reason I asked the first panel about the previous mitigation strategy is, I think somebody had indicated—maybe one of you—maybe Mr. Miller, it was you; I can't remember—it was about $3 million to do the fish kill. You could have 23 fish kills in a year, for the $70-million figure. That's why I was, kind of, curious—I mean, is that a—Mr. Buchsbaum indicated—nothing's perfect, and, of course—you know, other than ecological separation, I understand that. But, I was just try and do sort of a cost-benefit analysis here. I mean, how effective, you know, are these fish kills? If you did one every 3 weeks, how certain could you be that you were keeping the carp from getting upstream? Unless they were using the underground waterway that, I think, one of the first panelists indicated.

Mr. MILLER. The use of fish toxicants, as we planned for in December, was very effective. We used hard structures to make sure that there was a acute dose delivered to every fish; it could not es-

cape. We would use nets and other things to make sure that fish were—had the residence time to receive that.

So, I think that using rotenone is a highly effective tool. We want to be careful about how we use it and how much we use it. We would like to move into a paradigm where we can find out where the fish are, identify where they are, and then possibly use rotenone as a sampling technique to understand what kind of abundance they have. What we don't know is how many fish are actually above that—or above that barrier, or behind our enemy—you know, behind our lines. We don't know. We're using environmental DNA as a—in a precautionary way to inform our decision. We're using every possible technique that we can, knowing that we must find them. But, we don't know how many are there. We—there may not be many at all. We're trying to find out, through environmental DNA, what that—

Senator BAYH. I think that was Mr. Farrell's point. Mr. Farrell, I'd like to ask you—you had a number of recommendations here. I guess I'd like to focus on No. 5 and No. 6, maybe starting with No. 6. I mean, is there some way to reduce the oxygen levels in the water so it just doesn't sustain aquatic life? Is that——

Senator BAYH. Can you tell us a little about that?

Mr. FARRELL. Certainly. Senator, thank you for the question.

I made the point that our suggestions were done separate from the framework, so it's not like we were working in concert. But, the Metropolitan Water Reclamation District recognizes this as—one of their suggestions is to create some type of "dead zone." Historically, they note that this problem didn't exist back when we were in the unfortunate situation of the 1970s, with high pollution in the Chicago Waterways. Nothing got through.

Far be it from us to ever suggest that—returning to that point, but, on a daily basis, to reach the attainment levels mandated by EPA, the Water Reclamation District is monitoring and adding oxygen, as needed. In fact, part of the problem they have with this lock closure is that they're mandated, in certain weather conditions, to open the locks to bring freshwater in from Lake Michigan to maintain these oxygen levels.

So, what we were trying to do is agree that—separation is a tremendous idea. We'd just like to see it happen away from the lakefront and away from these locks. The point that we picked to begin the discussion—we don't think this is a panacea, but the point we picked to begin this discussion was the subcontinental divide, which means that anything we do would have a propensity to go downstream, as opposed to the Lakes.

Senator BAYH. Your point No. 5, that was, I guess, the same——

Mr. FARRELL. I——

Senator BAYH [continuing]. Same thing.

Mr. FARRELL. I think this is an interesting point, in that locks—it's—locks might be considered as an ally in this battle, as opposed to an enemy. In fact the Corps' use of moderated lock operations includes activities which would jeopardize the industry that—when folks don't realize it, because they're intending to tab activities in the river while they close the locks, which means—it's not as if things can happen on one side versus the other, they're going to close the locks as a tool to help them do something else.

But, this suggestion recognizes the point that Lockport, in foreign policy terms, is like Checkpoint Charlie in the Berlin Wall; it's where everything comes into the region. You have at your disposal a 600-foot chamber that's roughly 100 feet wide, and, when full, is 50 feet high. All the Chamber is saying is that this is, basically, an aquarium in which to work while boats are navigating. We're—don't stop the operation to solve the problem at the locks, but recognize the value of this contained environment in which you can do chemical injection on a much smaller scale. I'm certain that everyone here wants to make sure that we don't have too many chemicals in too large a quantity.

Senator BAYH. I'm done, Madam Chairman. Just so that people don't misconstrue my comments, I'm pretty alarmed about the prospect of these things getting in the Great Lakes. That would be a very bad thing. There's no going back once they get in there. But, I am saying that this flooding issue is a real one, and it's causing great distress. I think we ought to vigorously explore all the options. You know, if there are some things that we have a very high degree of confidence will be effective, that don't cause some disruption, well, they deserve some serious consideration. You know, if the only way to go is just, you know, "pftt," well, then you do what you've got do. But, I think we've got to look at some of these issues, like you put on the table, and the fish kill and other things, to kind of assess just how effective they would be. So, that's the point I'm making.

I think the oxygen thing was kind of intriguing, you create a mini "dead zone," and maybe that's enough to get the job done.

So, in any event, thank you for your time. I do appreciate it.

Madam Chairman, thank you.

Senator STABENOW. Thank you. Thank you very much, Senator Bayh. I think we all want to create a situation that has the least amount of disruption, whether it's commerce or to communities. But, I would just emphasize, again, that when we're debating environmental DNA and, you know, "What does that mean?" and "It's above the barriers"—I mean, we're past, sort of, just theoretical discussions. I mean, we—this is serious. This is—and I'm sure you share that.

Senator BAYH. Yes. No, we've got to act. There's a——

Senator STABENOW. Yes.

Senator BAYH [continuing]. Real sense of——

Senator STABENOW. Yes.

Senator BAYH [continuing]. Urgency here. I——

Senator STABENOW. Yes.

Senator BAYH [continuing]. Share that.

Senator STABENOW. Yes.

Senator BAYH. I think we're all on the same page.

Senator STABENOW. I think we are.

Senator BAYH. We've got to act. It's just a question of——

Senator STABENOW. Right.

Senator BAYH [continuing]. What's the best course of action.

Senator STABENOW. Right. One of the things that I think has come forward this week, that's been very positive, is the unifying effort of looking at the ecological separation where the—what the Chamber is talking about, from a commerce standpoint; what the

Governors are talking about; the environmental community, and so on. So, it's a—I think one of the big questions for me is, How do we move much more quickly and much more focused on that as a long-term solution?

The Army Corps, at this point, is doing a study on possible suggestions, and the—before they would even look at how to do it. So, I—from—one of the takeaways, for me today, is that we need to shorten that and move that into a study on how do we do it, and how do we do it as quickly as possible, so that we can get to that long-term solution that appears to have the ability to bring people together.

So, I think—and at the same time, knowing that we have short-term issues right now—they're very serious—that we have to address. We have to be deploying everything. Nothing's perfect, but we have to deploy every tool that we have available.

So, I want to thank all of you.

Dr. Taylor, I want to thank you, as well, for your comments, in terms of how we look at transportation, and the jobs created from looking at this from a multimodal perspective, and making sure that we are looking at those costs and how do we, in fact, reconstruct a transportation system so that commerce and jobs can thrive and we can protect the Great Lakes. I know that was your message to us. So, I thank you for that.

I think we have run out of our allotted time. I wanted to thank—and, Secretary Hayden, thank you very much for bringing a broader perspective to this. We don't want to be sending the carp your way, and we share the zebra mussels and have the same stories that you can tell about what has happened in the Great Lakes. We certainly want to be protecting our waterways and tackling, with a sense of urgency, what is happening on invasive species.

So, thank you very much. The hearing is adjourned.

[Whereupon, at 12:25 p.m., the hearing was adjourned.]

APPENDIXES

APPENDIX I

Responses to Additional Questions

RESPONSE OF LEON CARL TO QUESTION FROM SENATOR BROWNBACK

Question 1. Addressing Asian carp in the Great Lakes is of great importance and deserves the Committee's attention. However, it is one part of a national problem. Do you plan to turn your attention to implementation of existing federal authorizations and crucial policy changes needed to protect the economy and natural resources of the nation from invasive species on a long term basis?

Answer. The USGS is committed to assisting DOI managers and the nation by responding rapidly and effectively to growing threats from invasive species in U.S. ecosystems. The USGS Invasive Species Program provides methodologies and information to address impacts to ecological systems and native species due to the introduction and spread of invasive species. This research includes cooperative efforts to document and monitor the introduction and spread of invasive species, study the ecology of invaders and the ability of habitats to resist invasion, forecast probabilities and locations of future invasions, provide methods and information to assess and manage risks, and develop methods to prevent and control invasive species to minimize their environmental and economic impacts. In addition to Asian Carp, USGS researchers are providing technical assistance on numerous other invasive plant and animal species including tamarisk, Zebra/Quagga mussels, Brown Tree snakes, python (and other large constrictor snakes), leafy spurge, nutria, cactus moth, feral pigs and buffelgrass. The USGS works in cooperation with the National Invasive Species Council, the Aquatic Nuisance Species Task Force and other entities to ensure that research efforts are coordinated and implemented in a strategic manner.

RESPONSE OF JOHN C. TAYLOR TO QUESTION FROM SENATOR BROWNBACK

Question 1. Have you been able to estimate, in dollar amounts, the possible loss in state revenue that would result if Asian Carp were introduced into Lake Michigan?

Answer. This question falls outside our area of expertise. My colleague and I are experts on the logistics cost impacts on industry of closing the locks in the Chicago area. These costs would relate to moving the goods by other modes of transportation plus extra handling. We estimate these costs at $70 million per year.

Other economists have studied the question of costs to the Lakes economy (or lost tourism, and related fisheries revenues, if carp get in and established. David Lodge at Notre Dame and colleagues of his would be closer to this question. You see estimates in the $4-7 billion range but we are not experts in this area.

RESPONSE OF MARC MILLER TO QUESTION FROM SENATOR BROWNBACK

Question 1. What studies have been conducted to examine the negative effects toxicants as a method for controlling the spread of Asian carp have on native species?

Answer. Rotenone was the toxicant Illinois Department of Natural Resources (IDNR) used in the December Rapid Response effort. It is a natural substance derived from the roots of several tropical and subtropical plants in the bean family. Use of this toxicant in North America began in the 1930s in ponds and lakes as

a tool to sample fish populations or to completely eradicate undesirable fish populations.

In 2007 the U.S. EPA completed a thorough evaluation of the human health and ecological risks associated with rotenone. For more information on the EPA evaluation, you can visit the following website: http://www.epa.gov/oppsrrd1/REDs/rotenone_red.pdf.

In that evaluation, EPA concluded that rotenone could be used safely for fish management if used properly with the following conditions:

- In situations where treated water is likely to move outside of the direct area of application, rotenone must be deactivated with a chemical agent (typically potassium permanganate) to ensure that fish and aquatic life outside the treatment area will not be adversely affected.
- Applicators must post signs at access points to the affected area to prohibit recreational access during treatment, prohibit swimming for at least three days following treatment, and prohibit consumption of dead fish taken from the treated area.

Many options were considered as control strategies including heating the water, capturing the fish with nets, herding the fish with noise or lights and trapping them, using explosives, removing oxygen from the water, increasing the flow at the lock, and sonic disruption.

However the scientific literature is clear that rotenone is the best option to control Asian carp populations. Rotenone affects all species of fish, although susceptibility to the chemical varies between species. The chemical inhibits a biochemical process at the cellular level making it impossible for fish to use oxygen in the release of energy needed for body processes. For more information on this study you can visit the following website: http://www.cerc.usgs.gov/pubs/center/pdfDocs/carp_rotenone.pdf.

Rotenone is used annually in Illinois on an average of 65 lakes totaling 475 acres of water. IDNR fisheries biologists have over 40 years experience using rotenone in various aquatic environments to control nuisance populations and improve fisheries habitat.

Rotenone is non-persistent, so there is no accumulation in the water, soil, plants or surviving animals. The breakdown process is very rapid. Ultimately, rotenone breaks down into carbon dioxide and water.

In an effort to mitigate possible effects on other fish and wildlife, the Illinois Department of Natural Resources (IDNR) conducted electro-fishing operations in the treatment area prior to the rotenone application to remove any sport fish that were present before application. Desirable fish caught were relocated outside the treatment area, and the area will be restocked with more desirable fish in the future, improving the overall quality of fish in the area.

Secondly IDNR accelerated the natural detoxification process by adding potassium permanganate to the water once treatment was completed.

I would like to thank the subcommittee for the opportunity to answer these questions and explain IDNR's history and commitment on this issue. I also wish to reaffirm our desire to continue the successful working relationship we have established with our federal, state and local partners to protect the Great Lakes from this invasive species.

RESPONSE OF JIM FARRELL TO QUESTION FROM SENATOR BROWNBACK

Question 1. You indicate that the results from eDNA testing performed on waters upstream of the electronic fish barrier have yet to produce definitive evidence of live or dead Asian carp, and should instead only be looked at as a warning sign and not an alarm to the potential threat this species poses. Why would a warning sign not warrant the type of remedial measure sought by the state of Michigan? I say this because as many of you already know, and what we've experienced in Kansas, is that once this species infiltrates a water system it's too late.

Answer. Senator Brownback, thank you for the question regarding eDNA. The Illinois Chamber of Commerce Infrastructure Council points out the distinction between a warning and an alarm for two reasons. First, the confusion created in the media has caused the public and, more importantly, policy makers to believe there is proof that the Asian Carp is already in or near Lake Michigan—which is not the case. The Asian Carp certainly is not in the Lake or above the electronic fish barrier in any sustainable or established population. Second, the request of Michigan to close the Locks—though dramatic and simplistic—is an ineffective response that

does nothing to halt the migration of Asian Carp while devastating commercial navigation which plays a vitally important role in the regional economy.

Further, as stated in the United States Solicitor General's Response to Michigan: "In August of 2009 the Corps entered into a cooperative agreement with Dr. David Lodge of the University of Notre Dame to use an experimental technique [bold for emphasis] known as environmental DNA (eDNA) testing." We have yet to find any peer reviewed publication regarding this experimental technique. Additionally over 30,000 fish were killed and found in December 2009 with only a single Asian Carp found which was down stream of the electronic fish barrier.

The Chamber applauds the effort to stop this invasive species and believes that the efforts should be focused many miles downstream and far from Lake Michigan and the Chicago and O'Brien Locks.

The Chamber has put forth eight Suggestions for Action, which I have listed below.

SUGGESTIONS FOR ACTION

1. Conduct a study of the ability of Asian Carp to survive and/or thrive in Lake Michigan. This is a bottom feeding river fish that seems to have entered Lake Erie in a very limited way without doing harm. [In Framework]
2. Study the efficacy of eDNA testing. This newly developed test seems to have received much of its approval by its implied endorsement from the US Army Corps of Engineers' decision to try what was thought to be the best available test when no other technology was available. If the test is not going to be halted, then it should be considered merely a warning not an alarm. [In Framework]
3. Expand as planned the fish barrier system. This system appears to be working—no live Asian Carp or Asian Carp carcass has been found above the fish barrier. [In Framework]
4. Utilize the five miles between the Lockport Lock and the fish barrier at Romeoville as a designated "Kill Zone". These kills can be implemented on an as needed basis. [In Framework]
5. Install chemical kills and/or acoustical barriers in, and adjacent to, the 600-foot lock chamber at Lockport to be used as commercial and recreational traffic are locked through the chamber. Lockport is the "Check-Point" of the region.
6. Block the passage of fish of all types by issuing an Executive Order and/or Congressional Mandate charging the United States Environmental Protection Agency to mandate adjusted standards which maintain oxygen levels that will not support an aquatic ecosystem in the 15-mile section of the Sanitary and Ship Canal as well as the Cal Sag Channel upstream from Lockport Lock. This is a man-made channel, which is currently 70% treated effluent. This would create an "Aquatic Dead Zone" between Lockport and the Sub Continental Divide. [In Framework]
7. Install south of Lockport a remedial oxygenation program to enhance water quality south of the Chicago Area Waterways and protect the ecosystem in the balance of the Illinois Waterways and the Mississippi River Basin.
8. Provide incentives and support commercial harvesting of Asian Carp from Peoria to Lockport and in the southern end of the Des Plaines River. [In Framework]

All of these suggestions focus on preserving and protecting the quality of the Great Lakes while accommodating the use of the locks on a consistent and continually operating basis. Six of these eight suggestions are in principle found in the Asian Carp Strategy Framework published recently by the Asian Carp Rapid Response Group. We believe Michigan's action is unnecessary and counterproductive to a constructive effort to stop Asian Carp.

RESPONSE OF JIM FARRELL TO QUESTION FROM SENATOR SESSIONS

Question 1. Can we find a more balanced solution to closing the locks or ecologically separating the inland river system from the Great Lakes? One that protects the jobs and economy that depend on the goods moved by the barge industry, the most environmentally-friendly mode of freight transportation, while still preventing invasive species from traveling into the Great Lakes?

Answer. Senator Sessions, thank you for the question about a balanced solution. The Illinois Chamber of Commerce Infrastructure Council believes lock closures are largely symbolic and should be removed from any list of solutions. In regards to ecological separation, we believe that it can be accomplished without impacting com-

mercial navigation which we agree is the most environmentally-friendly mode of freight transportation.

From a short-term perspective we must all agree that stopping the Asian Carp is the priority. We have put forth eight suggestions for action which are listed below:

SUGGESTIONS FOR ACTION

1. Conduct a study of the ability of Asian Carp to survive and/or thrive in Lake Michigan. This is a bottom feeding river fish that seems to have entered Lake Erie in a very limited way without doing harm. [In Framework]
2. Study the efficacy of eDNA testing. This newly developed test seems to have received much of its approval by its implied endorsement from the US Army Corps of Engineers' decision to try what was thought to be the best available test when no other technology was available. If the test is not going to be halted, then it should be considered merely a warning not an alarm. [In Framework]
3. Expand as planned the fish barrier system. This system appears to be working—no live Asian Carp or Asian Carp carcass has been found above the fish barrier. [In Framework]
4. Utilize the five miles between the Lockport Lock and the fish barrier at Romeoville as a designated "Kill Zone". These kills can be implemented on an as needed basis. [In Framework]
5. Install chemical kills and/or acoustical barriers in, and adjacent to, the 600-foot lock chamber at Lockport to be used as commercial and recreational traffic are locked through the chamber. Lockport is the "Check-Point" of the region.
6. Block the passage of fish of all types by issuing an Executive Order and/or Congressional Mandate charging the United States Environmental Protection Agency to mandate adjusted standards which maintain oxygen levels that will not support an aquatic ecosystem in the 15-mile section of the Sanitary and Ship Canal as well as the Cal Sag Channel upstream from Lockport Lock. This is a man-made channel, which is currently 70% treated effluent. This would create an "Aquatic Dead Zone" between Lockport and the Sub Continental Divide. [In Framework]
7. Install south of Lockport a remedial oxygenation program to enhance water quality south of the Chicago Area Waterways and protect the ecosystem in the balance of the Illinois Waterways and the Mississippi River Basin.
8. Provide incentives and support commercial harvesting of Asian Carp from Peoria to Lockport and in the southern end of the Des Plaines River. [In Framework]

From a long-term prospective ecological separation is a worthy goal, which we believe can be accomplished without impacting commercial navigation.

Suggestion number 3 (Expand as planned the fish barrier system) is pertinent because the electronic fish barrier is working and is about to be expanded.

Suggestion number 6 (Create an "Aquatic Dead Zone" between Lockport and the Sub Continental Divide) is the only solution that has any precedent of success. As noted in the Asian Carp Work Group Framework, "Historically, poor water quality in Chicago's urban waterways had controlled the transfer of invasive species between the Great Lakes and Mississippi River watersheds."[Framework 1.2, page 4] Though we would never suggest returning to the poor water quality of the 1950's and 60's, we know that the Metropolitan Water Reclamation District in Chicago is continually adding oxygen to reach and maintain mandated levels of oxygen. Logic says that we should be able to manage oxygen levels marginally below the level required to support aquatic life and still have reasonable water quality. Suggestion number 7 (Install south of Lockport a remedial oxygenation program to enhance water quality south of the Chicago Area Waterways) would re-establish water quality for the benefit of those downstream.

RESPONSES OF HON. NANCY H. SUTLEY TO QUESTIONS FROM SENATOR STABENOW

Please consult as needed with the U.S. Army Corps of Engineers and/or the Environmental Protection Agency.

SHORT TERM MONITORING

Question 1. Testimony made it clear that there is not one single solution to prevent carp from entering the Lakes in the short-term; therefore there is a significant importance to adequately coordinate all possible short-term management activities

and ensure that we are conducting all of them as sufficiently as possible. As federal agencies and partners continue to review the Asian Carp Control Strategy Framework and comments made to it, can you assure me that we will spare no resources and ensure that the entire litany of activities to prevent carp from reaching the Lakes are properly budgeted for?

Answer. The Administration takes very seriously the threat Asian carp may pose and is responding to this threat with a high level of focus and attention. Officials are working in an urgent, coordinated manner toward a single goal—to prevent Asian carp from establishing in the Great Lakes.

Restoring the Great Lakes has received unprecedented support under the Obama Administration. The FY 2011 Budget requests $300 million for the Great Lakes Restoration Initiative (GLRI) in addition to $475 million from FY 2010 enacted, yielding a total Federal investment of $775 million over two years to significantly advance Great Lakes protection.

In February 2010, a draft Asian Carp Control Strategy Framework was released which reflected the collaboration of Federal, State, and local partners. The draft Framework presents a multi-tiered strategy to combat the spread of Asian carp into the Great Lakes and to ensure coordination and the most effective response across all levels of government. The Asian Carp Regional Coordinating Committee (ACRCC), composed of the same Federal, State, and local partners who drafted the Framework, is now implementing this plan, one of the most comprehensive plans ever undertaken to control invasive species. GLRI and other FY 2010 funding will be directed to the short-term actions listed in the Framework. Within the totals requested for FY 2010 and 2011 for Great Lakes restoration, sufficient funding will be available for actions necessary to reduce the threat of Asian carp.

Question 2. Are there any activities identified in the Framework that could receive more funds to do more preventative work? For example, I am concerned that the monitoring activities such as EDNA testing, including in other Lake Michigan tributaries this spring, could be expanded with more resources than are listed in the Framework. Can we expedite and perform additional EDNA monitoring?

Answer. Monitoring efforts using eDNA to detect Asian carp are being led by the Army Corps of Engineers (USACE) and Notre Dame University. These eDNA field sampling plans are being coordinated between the U.S. Fish and Wildlife Service (FWS) and Illinois Department of Natural Resources (IDNR), the Agencies that have responsibility for "standard" fish monitoring (electro-fishing and gill netting).

The current geographic scope of eDNA testing is the Chicago Area Waterway System (CAWS). The ACRCC is in the process of expanding eDNA processing capability for more sampling within the CAWS. They also are developing a multi-agency monitoring strategy to include electro-fishing, netting and eDNA sampling within the CAWS. Monitoring activities are adequately funded and are being conducted at the necessary level. As more is learned from field efforts, we will assess the potential need for expanded activity.

LONG TERM SEPARATION

Question 1a. The issue of ecological separation, as discussed in the hearing, is receiving more and more attention for being the only certain measure which can keep Asian carp and other aquatic invasive species from entering the Lakes or leaving the Lakes to infiltrate other parts of the country. Both aspects make this a national issue, not merely an issue for Illinois or Michigan. Can you describe to me the current parameters of the Army Corps study on ecological separation of the Chicago waterway from Lake Michigan?

Answer. WRDA 2007 authorized the Great Lakes and Mississippi River Interbasin Study (GLMRIS) to: (1) identify the hydraulic connections between the basins, including episodic pathways, (2) identify current and potential future invasive species, including Asian carp in these basins, and (3) investigate potential options and controls for reduction of transfer risk of these aquatic invasive species (AIS). Ecological separation will be considered as an alternative for reducing transfer risk. The GLMRIS will focus on all relevant hydraulic connections, although the effort will begin with consideration of the CAWS and the threat of Asian carp specifically.

Question 1b. Can we budget more for this part of the Interbasin Feasibility Study than the $1 million currently suggested in the Framework to expedite the process so that Congress can review the options that may be implemented?

Answer. The Great Lakes and Mississippi River Interbasin Study (GLMRIS) is authorized through 2014 under WRDA 2007. The portion of the GLMRIS focusing on CAWS and Asian carp has been expedited and an interim report will be released prior to the completion of the full study; the Corps anticipates completing this re-

port in 2011. In addition to the FY 2010 enacted level, GLRI funds are being used to support the expedited portion of this study. The President's FY 2011 Budget would provide another $400,000, but the U.S. Army Corps of Engineers (USACE) has the capacity for this study to be funded at $2.5 million.

Please note that the capability estimate for each study or project is the USACE estimate for the most that it could obligate efficiently during the fiscal year for that study or project. However, each capability estimate is made without reference to the availability of manpower, equipment, and other resources across the Army Civil Works program, so the sum of the capability estimates exceeds the amount that the Corps actually could obligate in a single fiscal year. The Budget allocates funding among studies and projects on a performance basis in a manner that will enable the Corps to use that funding effectively. Furthermore, the overall funding level proposed in the Budget for the Army Civil Works program reflects the Administration's assessment of national priorities in view of the range of potential private and public uses of funds. Consequently, while the Corps could obligate additional funds for some studies and projects, offsetting reductions within the Army Civil Works program would be required to maintain overall budgetary objectives.

Question 1c. Does the Army Corps need additional direction from Congress to fully analyze how to implement such ecological separation?

Answer. No additional authority is needed to study ecological separation as a part of the Great Lakes and Mississippi River Interbasin Study (GLMRIS). USACE intends to evaluate multiple alternatives that may effectively address AIS transfer between the two basins. The study includes efforts to identify: all potential AIS pathways and vectors, current and future AIS of concern, and technologies, capabilities and methods for preventing AIS transfer. USACE will examine the concept of ecological separation as part of these efforts. However, since the outcomes of the study are not predetermined, implementation of ecological separation of the Great Lakes and Mississippi River basin is not a legislatively mandated goal of this study.

RESPONSES OF HON. NANCY H. SUTLEY TO QUESTIONS FROM SENATOR BROWNBACK

Question 1. In developing the Control Strategy Framework, did the agencies involved examine other states' efforts in combating aquatic invasive species and, if so, what are some examples of areas in the United States that have experienced significant success?

Answer. Parts of the Asian Carp Control Strategy Framework draw upon other existing aquatic nuisance species management plans and control efforts. For example, the Framework included components from the Management and Control Plan for Bighead, Black, Grass, and Silver Carps in the United States[1], a nationwide strategy for controlling Asian carp that was completed in 2007 at the request of the Aquatic Nuisance Species Task Force. This plan identified 133 recommendations for blocking or controlling Asian carp expansion, and was developed with input from States and Federal agencies, industry, and other groups with experience in managing Asian carp and other AIS in the United States.

A fundamental component of the Framework is the development and support of a "rapid response" capability so that partner agencies can quickly deploy assets to key locations when there is a high risk of species introduction or movement. This "rapid response" approach has been used in efforts to eradicate or control other AIS in the United States and elsewhere.

The Framework also incorporates a multi-pronged "integrated pest management" approach, a model used through a U.S./Canadian Federal partnership to successfully control the invasive sea lamprey in the Great Lakes.

Question 2. Addressing Asian carp in the Great Lakes is of great importance and deserves the Committee's attention. However, it is one part of a national problem. Do you plan to turn your attention to implementation of existing federal authorizations and crucial policy changes needed to protect the economy and natural resources of the nation from invasive species on a long term basis?

Answer. Invasive species are one of the primary threats to native fish and wildlife resources in the Unites States. The Federal Government continues to work diligently with States, Tribes, non-governmental organizations, and others to identify potential threats from invasive species before they become established, and to control or (where possible) eradicate species already introduced.

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[1] Conover, G., R. Simmonds, and M. Whalen, editors. 2007. Management and control plan for bighead, black, grass, and silver carps in the United States. Asian Carp Working Group, Aquatic Nuisance Species Task Force, Washington, D.C. 223 pp.

RESPONSES OF HON. NANCY H. SUTLEY TO QUESTIONS FROM SENATOR BINGAMAN

Question 1. The Asian Carp Control Strategy Framework is a great start at combating Asian carp. There are numerous management and scientific measures in the plan. Given that we are spending a significant amount of tax payer dollars, Congress would like to see prioritized items with their respective price tag. How are you prioritizing your efforts?

Answer. The goal of this multi-tiered defense is to prevent Asian carp from becoming established in the Great Lakes. Federal, State, and local partners are taking advantage of this unique opportunity to prevent economic and ecological harm before it occurs. While the Framework identifies short and longer term actions to prevent the spread of this invasive species, all of the steps outlined in the Framework are considered important.

Last month, FWS and IDNR crews began breaking ice on the waterways to fish, net, and electroshock potential Asian carp wintering grounds near warm water discharges and in areas that eDNA analysis signaled carp may be. As waters are warming, crews continue their intense efforts to locate Asian carp in the CAWS. No Asian carp have been found past the electrical barriers. At the same time, USACE is increasing eDNA sampling capacity, constructing a third electrical barrier, and acquiring land to build mesh screens and erect jersey barriers to prevent the fish from bypassing the electrical barriers in flooding events. The last activities—constructing mesh screens and jersey barriers—were recommendations made in Interim Report I of the Congressionally-authorized Efficacy Study. The near-term actions identified as part of this study are intended to provide interim protection as additional measures are either studied or are ongoing.

USACE is also developing a recommendation for modified structural operations, and continuing to work on the Great Lakes and Mississippi River Interbasin Study, which is considering ecological separation as one potential method among others to reduce movement of invasive species from one basin to another.

Question 2. The Framework has budgeted $300,000 for commercial fishing below the Lockport pool where the population of Asian carp is very high. This number seems very low compared to the other action items-for example you have $5 million budgeted for rotenone treatments during barrier maintenance shutdowns. It would seem to me that reducing the population of Asian carp downstream is one of the best ways to slow their movement. Can you please comment on this action item?

Answer. With Asian carp, our objective in including commercial fishing is to decrease carp numbers downstream and reduce pressure on the barrier system.

This action will employ commercial fishermen in the pools below the barrier to use traditional methods in a sustained program of catch and removal. The Framework budget for this is calculated based on current rates for commercial fishermen and the scope of work the ACRCC anticipates.

This action is designed to blunt the leading edge of the Asian carp advance, which biologists believe to be in the stretch of river between the electrical barrier and the Brandon Road Lock and Dam, based on eDNA sampling.

Commercial fishing crews will operate from March through October 2010 for a total of 33 weeks. These crews will report weekly on species and number of fish removed. Based on positive results (actual capture of Asian carp), this area may be extended downstream to include the stretch between the Dresden Island Lock and Dam and the Brandon Road Lock and Dam.

Further eDNA testing in conjunction with these commercial fishing efforts will allow us to clearly define the leading edge of the Asian carp migration. This is an important component in developing and enhancing future control options.

Question 3. In the Framework, $3 million is allocated towards commercial market enhancement ideas. Can you explain your idea of commercial market enhancement?

Answer. As intensive commercial fishing begins this spring to reduce population pressure below the electrical barrier, Illinois Department of Natural Resources (IDNR), is leading efforts to determine how carp remains can be used. IDNR is working with the Illinois Department of Commerce and Economic Opportunity and the Illinois Department of Agriculture to determine if carp can be used in products such as animal feed, organic fertilizers, or Omega 3 oils.

RESPONSE OF HON. NANCY H. SUTLEY TO QUESTION FROM SENATOR SESSIONS

Question 1. We understand that the Corps is planning intermittent lock closure. Can you explain to the Committee how lock closures will stop the Asian carp from entering the Great Lakes?

Answer. Currently, the locks operate on a "show and go" system, which allows any boat to request lock passage at any time. The purpose of intermittent lock closure is to restrict the time the locks are open to certain, pre-determined periods. This

would allow control measures to be taken to restrict carp movement through the locks while they are open. It is also important to note that even when locks are closed, there are alternate, uncontrolled paths to Lake Michigan, around Chicago's locks. USACE is studying the ability of intermittent lock closure to impede carp movement. USACE intends to submit this report (Interim Report III of the Congressionally-Authorized Efficacy Study) with recommendations to the Assistant Secretary of the Army for Civil Works by the end of April.

RESPONSE OF ANDY BUCHSBAUM TO QUESTION FROM SENATOR BROWNBACK

Question 1. In addition to the funds spent from the Great Lakes Restoration Initiative, how much federal funding do you anticipate will be necessary to prevent introduction of Asian Carp into the Great Lakes? Now I understand how vitally important these bodies of water are to the economic stability of your state, but it's also important to keep in mind that states like Kansas receive almost no federal funds to combat invasive species. In fact, last year the Kansas Department of Wildlife and Parks received only $37,000 to combat aquatic invasive species.

Answer. We agree that it is important to increase federal investment in combating invasive species in every region of the country. But we also note that the Great Lakes have long been recognized as being a national priority transcending any single state's interest.

The Great Lakes are vital to the economy and quality of life to the 35 million people who live in the eight states that border them—and also to the nation as a whole [3]. The Great Lakes are the economic engine for an eight state region from New York through Minnesota that comprises 28 percent of the nation's the GDP [5]. They provide the clean, usable water that powers the nation's manufacturing heartland, including the steel, automobile, and manufacturing industries. They support a $7 billion a year fishing industry and a $16 billion tourism industry [6]. The Great Lakes are the source of drinking water for approximately 26 million people in the U.S [6a]. These lakes contain 20% of the world's surface fresh water and 95% of the nation's [6]. The Great Lakes make the United States the Saudi Arabia of fresh water. Protecting their health from threats like invasive species is not an issue for a single state; it is a national imperative.

The federal government has repeatedly recognized this imperative for over a century. The U.S. and Canada in 1909 entered into the Boundary Waters Treat which led to the Great Lakes Water Quality Agreement and then to a special amendment to the federal Clean Water Act to protect Great Lakes water quality (Great Lakes Critical Programs Act, 33 U.S.C. sections 1268 et seq). More recently, former President Bush issued an Executive Order in 2004 that designated the Great Lakes as an area of "national significance" and established a multi-federal agency task force to protect them [2]. The Executive Order also created a multi-stakeholder collaboration that resulted in EPA publishing a comprehensive restoration plan, the Great Lakes Regional Collaboration Strategy to Protect and Restore the Great Lakes, in 2005 [3]. President Obama used this Strategy as the blueprint for his Great Lakes Restoration Initiative Action Plan published last month [6].

As detailed in my February testimony and the testimony of the other panelists, an invasion of the Great Lakes by Asian carp would permanently and significantly damage the ecology of the lakes and the economy of the region. In addition to the direct effects on the $7 billion fishery and the $16 billion tourism industry, an Asian carp infestation could threaten drinking water supplies and the clean water that industry needs to prosper. Avoiding those impacts is the reason that there is an emerging consensus on the need to ecologically separate the Mississippi River system from the Great Lakes basin.

There is a second reason that federal investment in separating the Mississippi River system from the Great Lakes basin is a national priority. Although the February 25 hearing focused on stopping a particular invasive species, Asian carp, from moving via the Chicago canals from the Mississippi River system into the Great Lakes, it is equally important to stop invasive species in the Great Lakes from moving into the Mississippi River basin and across the country. Several invasive species—zebra mussels, quagga mussels, and round gobies—have jumped from the Great Lakes to the Mississippi and Missouri Rivers, their tributaries, and inland lakes using the same canals that are now transporting the Asian carp [7, 8, 9]. As J. Michael Hayden, Secretary, Kansas Department of Wildlife and Parks, testified before the Subcommittee on February 25:

> We have heard discussions about the potential Asian carp impacts on native species in the Great Lakes but we are ignoring the non-native interchange of water, waste, and species between the Great Lakes and the Mis-

sissippi River Basin through the Chicago Sanitary and Ship Canal. Sources indicate there are roughly 180 non-native species currently in the Great Lakes. There are several invasive species such as the snakehead fish in the Mississippi River Basin moving upstream. Which one will be the next species to invade the Mississippi River Basin, Great Lakes or somewhere else in the nation? As long as there is a direct connection between these two large basins we will continually be fighting this battle.

Abraham Lincoln once said, "If I were to go west, I would go to Kansas". While Lincoln never took residence in Kansas, several invasive species have. Coincidentally, one of them, the Zebra Mussel, was transported in the ballast water of a ship and became established in the Great Lakes in the 1980's. It has since spread across the nation, including Kansas, and has become a very large problem. Zebra Mussels now inhabit 6 federal reservoirs in Kansas and many other smaller lakes and streams. Similarly to Asian carp, they pose a threat economically, environmentally, and directly to human health. They clog water intakes, kill native mussel species, damage boats and cut the feet of swimmers. . .[4]

Ecological separation of the Mississippi River and Great Lakes basins is important to Kansas and other states threatened by invasive species that now reside only in the Great Lakes. This separation is necessary to protect all of the nation's waterways from invasive species in the Great Lakes, and federal funding and support of that separation is essential.

As to how much federal funding will be needed on an annual basis to prevent the invasion of Asian carp in the Great Lakes (and to stop Great Lakes species from invading the Mississippi River system), the answer depends on the strategy the federal government chooses to implement to prevent an invasion. Presently, the Draft Asian Carp Control Strategy Framework [1] is the best indicator of the federal strategy, but it is preliminary and incomplete. The Framework has identified 13 short-term actions that would be funded mostly from the GLRI. Non-GLRI funding of $2.3 million for these actions has already been appropriated. The Framework also identifies 16 long-term actions primarily funded by the GLRI; the non-GLRI funding (already appropriated) totals $4.3 million for these actions. One long-term action (additional rotenone treatment) at a cost of $5 million is unfunded; it is unclear whether this cost would be funded by the GLRI or another source. Finally, the Framework identifies two ongoing actions by the Army Corps of Engineers (barrier maintenance and construction) totaling $16.75 million. Both have been appropriated from non-GLRI sources. The total spending project from all these projects is $55,226,000 from the GLRI; $23,350,000 from non-GLRI funds (all of them already appropriated); and $5,000,000 from either or both sources.

Additional funding from GLRI and non-GLRI sources for ongoing and long-term actions will also be required. The Framework identifies several actions that already have appropriations but which might require future appropriations because they are ongoing, including barrier maintenance and more eDNA testing, but we do not know what the cost of those activities will be in the future and how much will be funded by the GLRI. More significantly, the Framework includes a feasibility study by the Corps on ecological separation and other measures to prevent the spread of invasive species between the Mississippi River system and Lake Michigan. Implementing those recommendations is likely to require substantial resources, but it is impossible to say what the costs of those measures will be until the study has been completed and the response actions have been chosen.

The Great Lakes are a national resource vital to the country's economy and security. We urge Congress and the Administration to protect them from an invasion by Asian carp, one of the worst threats to their ecology and our economy, by authorizing and funding the ecological separation of the Mississippi River system from Lake Michigan. That separation will both prevent invasive species from entering the Great Lakes from the west and also stop invasive species from leaving the Great Lakes and contaminating the Mississippi River system and its neighboring states, including Kansas.

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RESPONSE OF KEN DEBEAUSSAERT TO QUESTION FROM SENATOR BROWNBACK

I appreciated the opportunity to testify at the hearing regarding Asian Carp and the Great Lakes before the subcommittee on Water and Power of the Senate Energy and Natural Resources Committee on February 25, 2010. I am responding to your important follow-up questions concerning the closing of locks in the Chicago Area Waterways (CAW) to control dispersal of the Asian Carp into Lake Michigan; and to your question about attacking the potential threat further downstream where Asian Carp are already present. I am pleased with the attention of the subcommittee to the issue of Asian Carp. Michigan has a lot to lose if Asian Carp get into the Great Lakes and we believe that all emergency actions to prevent that should be considered and implemented.

In response to your first question, there are a number of reasons why closing of the Chicago Lock and the O'Brien Lock in the CAW until a permanent ecological barrier is constructed between the Mississippi River Basin and the Great Lakes Basin is critical and must be undertaken immediately.

The discovery of Asian Carp DNA is a clear indication that they are in the CAW. This is not just the view of the state of Michigan; it is confirmed by the testimony before the House Transportation and Infrastructure Committee by Dr. David Lodge, the federal government's expert witness in their brief before the Supreme Court. Dr. Lodge noted that a Quality Assurance audit team, led by the U.S. Environmental Protection Agency, reviewed his team's environmental DNA (eDNA) protocols and concluded that "the eDNA method you are using is sufficiently reliable and robust in reporting a pattern of detection that should be considered actionable in a management context" (cite testimony @ http://transportation.house.gov/Media/file/water/20100209/Lodge%20Testimony.pdf).

Even though a live Asian Carp has not been found to-date on the Lake Michigan side of the electrical barrier in the Chicago Sanitary and Ship Canal, the finding of eDNA is sufficient evidence for emergency actions. Waiting until a live Asian Carp is found, or waiting until extensive feasibility studies can be completed, may delay action until it is too late. Of special concern to Michigan is that Asian Carp eDNA was found in Calumet Harbor on Lake Michigan. Asian Carp present in this location would pose special challenges for rapid response and everyone hopes there is not an established population in that area.

Asian Carp passage through the O'Brien Lock is the most immediate threat as it lies between the areas where eDNA testing has determined the presence of Asian Carp in the Calumet-Sag Channel and Calumet Harbor. If this lock is allowed to continue to operate and enable passage of boats to and from Lake Michigan, it will permit the Asian Carp to get into that lake. There is currently no mechanism in place that prohibits any fish from swimming into the lock when it is opened to allow a boat to enter, or to stop the fish from escaping the lock when it opens to allow a boat to exit the lock on its way to Lake Michigan. The U.S. Army Corps of Engineers and U.S. Coast Guard recognized this danger when they shut down the Calumet-Sag Channel to boat traffic, and closed the O'Brien Lock for several days in

December based on the discovery of the eDNA evidence. Similarly, there is nothing in their path to stop the Asian Carp from eventually entering Lake Michigan through the Chicago Locks in downtown Chicago.

Although no one can predict with certainty how long it will be before the Asian Carp establish populations in Lake Michigan, if they are present in the areas where the eDNA evidence shows they are, and given the track record of the Asian Carp and its ability to swim 10 to 15 kilometers a day, there is no reason to believe that the danger is not imminent. Given the unimaginable devastation to the Great Lakes ecosystems and economies if no action is taken, there is no real choice but to immediately take whatever measures are necessary and possible to stop the Asian Carp from passing from the CAW into the Great Lakes.

The answer to your second question is straightforward. When actions are taken to stop dispersal of an invasive species, those actions must be taken in front of the leading edge of the invasion. Actions taken after a species has established populations are too late. There are extremely few examples of invasive species that have been successfully eradicated so the effort must be on prevention in the case of Asian Carp and the Great Lakes.

Michigan recognizes that no one action by itself may be enough to prevent Asian Carp dispersal to Lake Michigan, but collectively action that can be taken will significantly reduce that risk. The full suite of actions I put forward in my testimony are required and will reduce the risk for Asian Carp dispersal into the Great Lakes. If you have further questions about Michigan's positions regarding Asian Carp in the Great Lakes, please feel free to contact me. Thank you again for your interest and attention to the issue.

RESPONSES OF J. MICHAEL HAYDEN TO QUESTIONS FROM SENATOR BROWNBACK

Question 1. What has been the biggest obstacle for the Kansas Department of Wildlife & Parks in dealing with our state's invasive species problem?

Answer. Financial shortfalls have been the biggest obstacle for invasive species management in Kansas. Approved by Governor Kathleen Sebelius in 2005, the Kansas Aquatic Nuisance Species Management Plan (Plan) established a program to specifically address the issue of aquatic invasive species in Kansas. The effort to develop the Plan was led by the Department of Wildlife and Parks in conjunction with personnel from other government agencies and private organizations. Identified as the coordinating agency for the Plan, the Department of Wildlife and Parks has been increasing and improving their capacity to prevent, control, contain, and eradicate invasive species in Kansas. Utilizing state funds, federal grant assistance through the National Invasive Species Act of 1996, and private donations as the primary funding mechanism for implementation of the plan, it is apparent these funding sources are limited and have made successful management difficult. We do have a well developed management plan, but without the financial resources to properly implement the identified objectives, it is largely ineffective. A budget enhancement would allow for us to hire the necessary staff to contain current infestations (physical containment at infested waters as well as an effective education program), monitor for future issues, address introduction vectors such as aquatic imports, and eradicate invading populations where feasible.

Question 2. What has Kansas done to help mitigate the spread of Asian Carp throughout the state?

Answer. The aforementioned invasive species management plan addresses all aquatic invasive species, including Asian carp in a broad sense. Actions specific to Asian carp include the listing of four Asian carp as prohibited species under Kansas Administrative Rule 115-18-10. Further, we have supported the listing of species as injurious wildlife by the U.S. Fish and Wildlife Service by submitting comments through the Federal Register. In addition to regulatory actions, we rely heavily on outreach and education activities. Educational videos, high profile news reports (front page of Wichita Eagle), print materials for distribution, an online education and certification course, and appropriate signage at infested waters are all tools employed across the state to inform aquatic users of the risk Asian carp pose and what precautions need to be taken to prevent further spread. We have conducted research to identify various vectors for spread, but recommendations have not yet been implemented. To directly address human/Asian carp interactions, the U.S. Army Corp of Engineers routinely increases water discharges to flush the carp out of public access areas below the dam to limit the possibility of human/fish interaction. Fortunately, physical barriers exist to limit natural dispersal upstream where established in Kansas. However, if we were to have a major flood or an uninformed water user

accidentally moved them above a barrier, Asian carp would spread throughout a much greater portion of the state.

We sincerely hope the comments provided address the concerns of the committee and Senator Brownback. If further clarification is necessary, please contact us again.

APPENDIX II

Additional Material Submitted for the Record

STATEMENT OF DUCKS UNLIMITED, ANN ARBOR, MI

Ducks Unlimited is non-profit wetlands conservation organization with more than 650,000 members nationwide, and approximately 200,000 members in the Great Lakes states. Our mission is to conserve wetlands and associated habitats for the benefit of waterfowl, people and other wildlife.

Non-native invasive plants and animals have a long history of negatively impacting ecosystems. The Great Lakes have been particularly vulnerable due to the many vectors leading into, and out of, the lakes. Exotic plants such as purple loosestrife, flowering rush and common reed (Phragmites australis) are recent invaders that have reduced wetland productivity for wildlife and people. Exotic animals that have impacted wetlands have been minimal, but the common carp, introduced in the late 1800s to the US, has had a major negative impact on wetlands. Common carp thrive in shallow wetlands where their activity uproots native vegetation and increases turbidly, thereby decreasing productivity and quality of the wetlands.

Four species of recently-introduced carp are now on the verge of invading the Great Lakes through man-made connections between the Great Lakes and Mississippi River basins. Already known to have devastating impacts on the Mississippi River ecosystem, these fish species now threaten the Great Lakes. DU is especially concerned about two of those four species that have received little attention. Grass carp (white amur) and black carp are quite different from the silver and bighead carp that have received most of the notoriety. Grass carp are herbivores and eat their weight in vegetation daily. They are long-lived and have great potential to cause further degradation to the shallow water bays/wetlands in the Great Lakes. These shallow bays and coastal wetlands provide important feeding areas for waterfowl and nursery areas for fishes. For example, submersed aquatic vegetation (SAV) in Lake St. Clair provides key food resources for approximately 150,000 canvasbacks and tens of thousands of redheads, scaup and other diving ducks each fall and spring. If SAV abundance further declines due to grass carp, one of the most important mid-migration areas for waterfowl in North America will be lost.

Black carp feed on mollusks and snails and therefore also compete with waterfowl for food resources. They also have the potential to negatively impact populations of native mussels, already stressed by other exotic competitors such as zebra and quagga mussels.

DU encourages federal, state and local agencies and public groups to work together to immediately implement a short term strategy to prevent Asian carp migration into the Great Lakes, and develop a long term solution that would prevent exotic invasive species from traveling between two of the nations key watersheds: the Great Lakes and the Mississippi River systems. If carp are successful in invading the Great Lakes system, considerable resources currently dedicated to natural resource conservation stand to be diverted to strategies needed to mitigate impacts on fisheries and water recreation. Eliminating the impacts of exotic invasive species is a key strategy to protect and restore the Great Lakes, as stated in the Great Lakes Regional Collaboration's Restoration Strategy that DU contributed greatly to and supports.

STATEMENT OF CAPT. MIKE MCELROY

Honorable Ladies and Gentlemen, I wish to call to your attention what I believe to be a series of mistakes and unfortunate assumptions that have led the USACE to the brink of making a very serious mistake.

Today as this distinguished Sub Committee meets to discuss the progress and science behind the Control Strategy Framework many Americans in Chicago are in

fear of losing thier Jobs. They are afraid because they have been told that in haste a decision has been made by the USACE to cut our employers operations in half. This will be done because of a fish. This fish has not been seen, we are not sure if it can live here and the best science around cannot tell us any more than that. Our employer also cannot tell us when this will occur because he also does not know. People watching the news are cancelling boat rides, they are not sure if we can leave our dock let alone through the lock. Daily we lose business, daily anxiety grows with the crew yet still no actual real fish.

The Locks are not actually what the name implies. They are not water tight. Not even close. Closing them does nothing except ensure businesses go under. Then ,should the fish arrive, they will swim right through the lock gates right past our deserted ships.

What will do something is actually doing something very well right now. The barriers. A very large concrete wall at the narrowest part of the CSSC in Lamont would also do many things, including satisfy Michigan, Chicago and the fish.

Bypass Chicago flood water could be pumped past the wall, barges could be lifted over the wall and if the fish ever leave we could take the wall down. It is Cheap, quick and involves no loss of jobs. For once it will actually create them. No controversial experimental unproven science required.

After reading your recently posted memorandum on Establishing and Applying Categorical Exclusions under the NEPA, Mrs. Sutly, as the protector of NEPA,I ask that you reconsider giving the USACE a categorical Exclusion for this project. now more than ever NEPA is needed now to protect our rights and our environment. A full EIS is warrented based on the massive impacts related to this action,this is clear to see.

STATEMENT OF MICHAEL BORGSTROM, PRESIDENT, WENDELLA SIGHTSEEING BOATS, CHICAGO, IL

Please consider the following facts:

- Despite the media hype, Asian carp are not an imminent threat to enter Lake Michigan. "To date there has been no physical carp seen or captured above the electric barrier." Colonel Vincent Quarles. USAGE Chicago District Commander
- According to the Asian Carp Workgroup Framework "Even if the United States Army Corps of Engineers (USAGE} were to close the Chicago Lock and take measures to make it watertight, fish can get into the lake through the lock and other, unregulated access points."
- Dr. John Taylor's Logistics and Transportation Study, cited below, did not include the commercial passenger vessel industry or the effect that closing the Looks will have on Chicago's $12 billion tourism industry..
- eDNA is an untested, unpublished research project that does not provide solid confirmation of the presence of Asian Carp and has not been tested or used in any marine environment other than a laboratory or the Chicago Area Waterway System.
- The economic effects of closing the Chicago Lock, the second busiest lock in the nation on a permanent, temporary or modified operational basis will be devastating and immediate.

My name is Michael Borgstrom. I am president of Wendella Sightseeing Co. Inc. (Wendella) in Chicago. I am the third generation of this locally owned, family business that has provided a variety of guided boat tours, private charters and Chicago WaterTaxi service on the Chicago River and Lake Michigan. My businesses have been built around the Chicago Lock. In fact, Wendetla has been a user of the Chicago Lock since it opened in 1938. Any closure of the Chicago Lock and Chicago River to commercial passenger vessels on a permanent, temporary or modified operational basis would be devastating if not catastrophic to my business and the entire industry.

As Chairwoman of the hearing to examine the science and policy behind the Federal response to Asian carp, l urge you to keep the above bulleted facts in mind when listening to and/or questioning the witnesses appearing before you on Thursday.

Dr. John Taylor, an Associate Professor at Wayne State University, in his written affidavit for the Supreme Court in connection with the State of Michigan lawsuit requesting immediate lock closure, that the "documents submitted by the United States and Illinois to this Court, have seriously exaggerated the economic and transportation impacts associated with closure of portions of the Chicago Waterway System at the Chicago and O'Brien Looks..." He made this statement, despite the ad-

mission, in a conference call last week with members of the media, that he "did not study any effects on tourism or the passenger vcooel industry in Chicago." Dr. Taylor's Study was commissioned and financed by the State of Michigan.

As stated by Dr. Taylor, in his affidavit to the Supreme Court, his conclusions and resulting report were based on the following:

1. A boat tour he took with Metropolitan Water Reclamation District of Greater Chicago in 2006.
2. (He) observed portions of the study area by land in January 2010 (when commerce and river usage is at its lowest.)
3 (He) reviewed publicly available aerial photographs, as well as Illinois Waterway Navigation Charts.
4. (He) researched publicly available information concerning waterway traffic.

This does not qualify as a complete and comprehensive study of a large, complex industry. Obviously, no due diligence was performed.

The proposed decision to close the Chicago Lock is being made based on results from Dr. David Lodge's research project on eDNA. However, what is actually known about eDNA?

- General John Peabody of the USAGE in his testimony before Congress stated, "ft (eDNA) has not been peer-reviewed, nor has it been independently tested for its validity,"
- In its Laboratory Audit Report of February 5m, the Environmental Protection Agency only concluded that the test detects eDNA. They wrote "the protocols utilized by the Lodge laboratory group to detect environmental eDNAdie reliable." The audit "did not address Interpretation of tine eDNA results in regards to the presence or absence, proximity, or abundance of silver or bighead carp, the presumed source of eDNA."
- Dr. Lodge agrees. In a January 19th press release put out by the USAGE he said "It (eDNA) does not yet provide information about Asian carp quantity that may be present, age, size, how they got there or how long they've been there."

In short, eDNA does not and cannot explain how the eDNA ended up in a particular location. it could have been present in the testing locations long before hand. It could have been carried by birds or other fish or on the bottom of a boat or barge that has transited through a waterway where the presence of live Asian carp has been documented.

Based on the use of eDNA and its findings, closure of the Chicago Lock, the second busiest in the nation, would be arbitrary and capricious.

In fact, late last year, eDNA testing indicated the presence of carp near the O'Brien Lock. The USAGE in conjunction with the illinois Department of Natural Resources (IDNR) and the Metropolitan Water Reclamation District (MWRD) conducted one of the largest fish kills in US history. More than fifty thousand pounds of dead fish were recovered; not one Asian carp was found. In another test a few weeks ago, crews from the IDNR and the U.S. Fish and Wildlife Service conducted netting operations in a warm water outflow of the river, again not one Asian carp was found. In fact, according to Colonel Vincent Quarles, USACE Chicago District Commander, "To date there has been no physical carp seen or captured about our barrier system."

There is no science or evidence that would indicate an imminent threat to the Great Lakes from Asian carp. However, the catastrophic consequences of its closure of the Chicago Lock, whether permanent, temporary or on a modified operational basis are quite clear to our industry.

I urge you to look past the hype and hysteria that has been created and actively support other more effective, less destructive and proven measures to prevent the migration of the Asian carp.

STATEMENT OF CAPTAIN MICHAEL STRAIN, MUNSTER, IN

My name is Michael Strain. I am the owner and Captain of a 200 passenger charter boat that docks on the Chicago River and cruises on Lake Michigan. Our company is a small family owned business. I am the Captain. My wife is the bartender and handles foodservice. My son is a crew member. And my sister handles sales.

If the Chicago lock is closed we will be forced to shut down our business and will go bankrupt. We have worked extremely hard to start and build this business and it seems utterly impossible that the Chicago Lock may be closed because edna suggest the possibility of Asian carp beyond the fish barrier.

Nobody wants to see Asian carp in the Great Lakes. Rut as you examine the issue remember that no live Asian carp have been found in or near Lake Michigan The existing barriers are working.

STATEMENT OF CAPT. JENNIFER PERRY

The progression of the concern over Asian carp is disappointing. The people and agencies allowing the issue of Asian carp to evolve into a debate causing hysteria and panic are irresponsible.

It's unacceptable that those urging the closing of two major locks have disseminated misleading information. Many people, including the news media, are being falsely led to believe that Asian carp are bouncing off the lock gates, ready to charge into Lake Michigan to seek and destroy. They are neglecting to do their homework.

The draft of the Asian Carp Control Strategy Framework is filled with inadequacies and contradictions that recklessly promote panic of an invasion. The factual statements are found on page 8 of the ACCSF regarding "Risks and cost associated with closure". The ACCSF group is prepared to spend $84,516,000 on speculation and inconclusive research. Again, irresponsible. Furthermore, the panel of experts at the two ACCSF meetings I attended, seemed bewildered by the technical questions and comments by the represented commercial vessel industries. It was discouraging to hear the facilitator tell many of us; "time's up", "wrap it up", "it's not technical enough", "that's a comment, not a question", when companies are in jeopardy of losing their businesses, jobs lost, families devastated, and the dreadful ripple effect of even more crippling of our already struggling economy,

Is urgent action required to abate a threat of Asian carp migrating into Lake Michigan? Yes. Take the urgent action to where the Asian carp are, which is 33 miles from Lake Michigan, not where they aren't. It is incumbent upon the ACCSF group to do better, be guided by the facts, and be more responsible. www.aisiancarpfacts.com

"To date there has been no physical carp seen or captured above our barrier system...33 miles from Lake Michigan, south." Colonel Quarles, Commander, Chicago District, United States Army Corps of Engineers.

STATEMENT OF EDMUND B. WELCH, LEGISLATIVE DIRECTOR, PASSENGER VESSEL ASSOCIATION, ALEXANDRIA, VA

The Passenger Vessel Association (PVA) wishes to emphasize that the thriving commercial passenger vessel industry in Chicago, so integral to the city's tourism economy, will be jeopardized if there is a closure of the Chicago River waterway and the federally-operated lock in downtown Chicago connecting the river with Lake Michigan.

On behalf of its Chicago-area members, PVA urges you to actively resist efforts to close the river and lock and instead support other more effective, less destructive measures to prevent the Asian carp from entering Lake Michigan.

The Passenger Vessel Association (PVA) is the national trade association for U.S.-flagged passenger vessels of all types. PVA members in the Chicago area that operate vessel tours and charters that move through the Chicago River Controlling Works lock connecting Lake Michigan and the Chicago River include:

- Chicago Cruises (Great Lakes Development LLC) (www.chicagocruises.com)
- Chicago's First Lady Cruises (www.cruisechicago.com)
- Chicago from the Lake, Ltd. (www.chicagoline.com)
- Mercury Sightseeing Boats (www.cruisechicago.com)
- Shoreline Marine Company (www.shorelinesightseeing.com)
- Wendella Sightseeing Boats (www.wendellaboats.com)

Most operators offer the famous boat tours to showcase Chicago's architecture. Should the lock be closed, each would be prevented from providing lake-to-river and river-to-lake excursions, upon which their businesses rely. For Chicago vessel companies and their hundreds of employees, lock closure would be economically injurious or completely crippling. A vibrant, successful part of Chicago's tourism industry would be tossed aside.

PVA member companies operate at least 36 vessels with a combined passenger capacity of 4,115 that must pass through the Chicago River lock. Their vessels carried at least 691,674 passengers and made at least 7,790 transits through the lock in 2009. These PVA members employ at least 604 workers in high-quality, good-paying jobs and have an annual payroll of at least $7,033,396. Tens of millions of dol-

lars of investment assets and resources are at risk if the passenger vessels cannot be employed in their normal income-producing activity.

In addition, another PVA company—American Canadian Caribbean Line of Warren, RI—operates the U.S.-flagged Niagara Prince, a small-ship overnight cruise vessel, on a route between New Orleans and Chicago. That vessel must transit the O'Brien Lock twice in May and June of this year.

Recently, the U.S. Army Corps of Engineers distributed a document describing several different possible modifications in lock and waterway navigation operations. While PVA understands that the Army Corps of Engineers put forward the alternate scenarios in good faith, and while PVA acknowledges that there is intense public pressure on the Corps to make changes in waterway management to impede the spread of the Asian Carp toward the Great Lakes, PVA must report frankly that the alternatives presented, including Alternative 2, will cause grievous economic harm to the Chicago-area passenger vessel operators. This is because continued operation of the Chicago Harbor Lock and the nearby Chicago River are essential to the thriving passenger vessel industry in Chicago. Because of this industry's integral role in Chicago's tourism industry, jeopardizing passenger vessel operations, including the famous Chicago Architectural Tours, will eliminate jobs, cause widespread economic harm as "ripple effects" engulf businesses that service, support, and supply the passenger vessel operators, and deprive Chicago of a unique attraction to visitors and tourists.

Rather than closing (in full or in part) the Chicago Harbor Lock and restricting navigation on the nearby Chicago River during the operating season of the commercial passenger vessels, PVA urges the Corps to adopt countermeasures against the Asian Carp that are more effective and less destructive economically. PVA stands ready to assist the Corps and federal agencies in identifying such measures.

Federal policymakers must understand the business operating model of the passenger vessel companies. Most of them use the same vessels to provide two services, often on the same day: scheduled ticketed tours open to the public at large and private chartered events. One operator confines itself to charters only.

Despite being "small businesses," the Chicago passenger vessel companies employ more than 600 individuals each year. In responding to a PVA inquiry in December, the operators declared that they provide at least 604 workers in high-quality, good paying jobs. The combined payroll for these workers exceeds $7 million.

At a meeting hosted by the Army Corps of Engineers in Chicago earlier this month, several of those employees spoke publicly of their fears about their jobs. The harm that will be inflicted on them if the passenger vessel operators cannot maintain these jobs is real. We know what will happen if the operators cannot sail because of closures of the lock and river; these jobs will go away and will do so this very year. With respect to the captains and other maritime workers on the vessels, it will be difficult if not impossible to locate replacement jobs in the maritime sector without leaving Chicago. PVA does not wish to denigrate the predictions of economic harm that might occur if Asian Carp reach the Great Lakes and establish a destructive population there; nevertheless, predictions of that harm are just that—predictions. In PVA's view, the Corps should give greater weight to the foreseeable, immediate loss of existing jobs in Chicago.

It would be ironic if, at the same time that the Congress of the United States is on the verge of enacting multi-billion dollar legislation to create jobs, federal agencies adopted an Asian Carp prevention strategy that would cause substantial jobs loss this year!

Alternative 2 will prevent the passenger vessel operators from conducting their tours at least half of the time during their restricted business season; no small entity can absorb such a blow and still survive. It is essential for the Corps to understand that these businesses don't conduct their vessel tours year-round but instead do so in the months between spring and fall. Their operating seasons differ somewhat, but most have a business season of seven months or so. However, their peak revenue periods are concentrated in just a few weeks in mid-and late summer.

At its meeting in Chicago, the Corps made clear that operators should expect that additional preventive measures would take place in conjunction with closures of the Chicago Harbor Lock. Therefore, the passenger vessel industry is to assume that commercial navigation on the Chicago River would be shut down at the same time the lock is closed. As a result, under Alternative 2, at the same time lake-to-river and riverto-lake vessel tours would be blocked by the closed locks, all-river tours would also be shut down because of the complementary preventive measures. In essence, under Alternative 2, nearly all passenger vessel operations would have to cease from 3-4 days each week during the vessel operating season, including the peak revenue periods.

The economic damage to the passenger vessel operators cannot be calculated by simply using a "straight-line" method (that is, shutting down navigation for three days out of seven would result in loss of 3/7 of expected revenue). A business that caters to tourists and visitors must be available when they wish to enjoy it. The scheduling uncertainty and unreliability that would be introduced under Alternative 2 would deter and repel customers, especially the many that make relatively "spur of the moment" decisions to take advantage of the tours.

Passenger vessels compete for charter business against shoreside venues; moreover, advance contracting is common. At the Chicago meeting, one operator told the Corps of how many charters she has already booked for the coming summer season. The Corps must reasonably expect that implementation of Alternative 2 under any configuration will inevitably mean that many of those contracted-for charters will fall on days when the lock and river will be shut down. The Corps must also understand that it will be extremely hard, if not impossible, for the vessel operators to reschedule those weddings, prom dinners, and other date-sensitive events to times and days when vessel operations will be achievable. The result will be the loss of those contracts as the chartering parties make arrangements for other venues. Furthermore, the loss of good will and reputation, and the perception that the vessel operator is an unreliable business that is unable to perform a contracted-for service will impede the ability to attract and contract for other charters.

Customers, especially those who charter vessels, want river-to-lake and laketo-river vessels tours. A vessel operator who cannot provide this risks losing the charter altogether. The vessels of tour companies are usually based entirely at river facilities or based entirely on Lake Michigan. They don't have some vessels at one location and more at the other (although one company does have boats so located). Thus, it is not possible, as Michigan's Attorney General recently suggested, that a single company can offer lake tours with its lake-based. vessels and river tours with its river-based vessels. To provide its customers with both lake and river experiences on the same cruise, the vessel operator must transit the Chicago Harbor Lock. If it is closed for 3-4 days each week, the customer will not receive the desired experience and the likelihood of the charter goes down immensely.

Alternative 2 will jeopardize the world-famous Chicago Architecture Vessel Tours. One might be tempted to conclude that these tours, so much a part of the city's tourism draw, would be unaffected by closures of the Chicago Harbor Lock. This is not the case. Other preventive measures will render the nearby Chicago River unavailable to commercial navigation when the lock is closed. Thus, for 3 or 4 days per week, the Chicago Architecture tours could not be performed. Also, there is great concern about the water level and quality of the Chicago River. Would closure of the lock and other associated measures alter the river's water levels? Would it make the river stagnant, or dirty, or smelly? Anything that might make the river experience less appealing to someone on the passenger vessel will jeopardize this tour. In its Architecture Tour, Chicago can offer a visitor an experience unlike anything available in any other American city. The federal government must do everything it can to ensure that this experience is preserved.

PVA takes seriously any credibly-demonstrated harm that could ensue to the ecology of the Great Lakes should the Asian Carp establish a presence there. Maintenance of healthy natural aquatic communities is critical to PVA's vessel members wherever they operate, and PVA members operate throughout the Great Lakes in addition to Chicago. Nevertheless, PVA believes that the federal government can prevent the migration of the Asian Carp into the Great Lakes by employing a range of concerted actions other than closure of the Chicago River and Chicago Harbor Lock pursuant to the alternatives presented (including Alternative 2).

Cannot the Corps concentrate its "defense in depth" strategies in locations further down the South Branch of the Chicago River below the area of navigation for Chicago's passenger vessels? Could not the Corps also employ defensive measures in the 15-mile downriver zone discussed by several speakers at the Chicago meeting? Would it not make sense to employ the anti-Carp techniques in spots that inflict the least economic harm on existing going concerns, including the Chicago passenger vessel operators? PVA encourages the Army Corps of Engineers to rethink its strategies along these lines and not confine itself to the economically damaging alternatives recently presented, especially Alternative 2.

Thank you for the opportunity to provide these observations. PVA stands ready to provide this subcommittee with more information about the Chicago-area passenger vessel industry and to work with all federal agencies on a viable, effective, and economically constructive strategy to fight the Asian Carp.

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