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S. HRG. 111–704

INVASIVE SPECIES

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 FEDERAL RESPONSE TO THE DISCOVERY OF THE AQUATIC INVASIVE SPECIES ASIAN CARP IN LAKE CALUMET, ILLINOIS

JULY 14, 2010

Printed for the use of the
Committee on Energy and Natural Resources

U.S. GOVERNMENT PRINTING OFFICE

62–181 PDF WASHINGTON : 2010

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INVASIVE SPECIES

WEDNESDAY, JULY 14, 2010

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

The subcommittee met, pursuant to notice, at 3:32 p.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. Call to order the Water and Power Subcommittee. It's my pleasure to welcome all of you here today.

We know we have a number of people listening, through streaming on the Internet, as well, who are extremely interested, in Michigan and around the country. So, we welcome people who are listening this afternoon.

As I start—and I expect that Senator Brownback will be joining me as my ranking member very shortly, and we'll certainly turn to him for his comments—I also want to put into the record a statement from Senator Durbin, who is cosponsoring the Permanent Prevention of Asian Carp Act with me in the Senate, along with a number of cosponsors. Congressman Dave Camp also has a statement that will go into the record. Congressmen Camp and I are working together on both pieces of legislation, the Carp Act, that addresses the closing of the locks, as well as the Permanent Prevention of Asian Carp Act. So, I will place those into the permanent record, as well as any other comments from colleagues.

[The prepared statements of Senator Durbin and Representative Camp follow:]

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

Thank you, Chairwoman Stabenow, for holding this hearing today. I share your commitment to take all necessary action to prevent Asian carp from establishing in the Great Lakes and commend your leadership on this issue.

Lake Michigan is of enormous environmental, recreational and economic value to the state of Illinois. The Great Lakes are a national treasure that must be protected.

Since 2003, we have been working with local and state agencies in Illinois and with federal agencies, primarily the U.S. Army Corps of Engineers, to stop the progress of the Asian carp in Illinois waterways. We have had some success. The Corps has completed construction of an electric carp barrier in the Chicago Sanitary and Shipping Canal. The barrier has effectively slowed the migration of the fish north to Lake Michigan, buying us time to look at other, longer-term options.

But on June 22, 2010, our worst fears were confirmed. An Asian Carp was caught in Lake Calumet, just miles from Lake Michigan. The Illinois Department of Natural Resources reports the 19-pound male fish likely was not in spawning condition,

but that capture cannot be taken lightly. A live fish on the wrong side of the electric barrier means we need to redouble our efforts and do everything in our power to stop this invasive species from entering Lake Michigan.

Recently, the Chairwoman and I, along with other senators representing Great Lakes states, asked this Administration to take immediate action and to appoint a coordinated response commander for Asian carp.

The Obama Administration has developed an Asian Carp Control Framework that includes several meaningful measures to prevent the spread of Asian carp. One strategy for containment involves bringing in commercial fisherman to limit the spread of the fish, and in fact, it was a commercial fisherman who captured the live Asian carp last month. Several local, state and federal agencies already are working together in the effort to contain the Asian carp, and the coordinated effort of the agencies is commendable. With the discovery of a live fish on the wrong side of the carp barrier and Asian carp eggs in Indiana and Ohio, it is clear that a coordinated effort alone is not sufficient.

A coordinated response commander for Asian carp would provide the insistent, hands-on leadership that prevents the Asian carp from establishing itself in Lake Michigan and the Great Lakes. This commander would coordinate federal, state and local agencies to implement immediate, emergency actions in the next few months while we continue to determine effective long-term solutions. I am encouraged that the Administration is considering this request.

A few weeks ago, Chairwoman Stabenow and I introduced a bill directing the US Army Corps of Engineers to undertake an expedited study of hydrological separation. The idea behind a hydrological separation is to create a physical separation between the Great Lakes and the Mississippi water basins. This may offer the best hope for a long-term solution for containing not only this, but other invasive species.

Hydrological separation is a complex feat of engineering. While the Army Corps of Engineers has already started a broad examination of methods to control the spread of invasive species, we cannot wait for that comprehensive study. Our bill would create a separate, expedited study of how hydro separation could work, its environmental impact, and an estimate for construction time.

Finally, I have asked the federal agencies working with us in this effort to use everything at their disposal to step up the fight, including a Rotenone application in the area where the live carp was caught in Lake Calumet. I look forward to hearing more about their emergency plans.

The Great Lakes are a national treasure, a significant economic resource and an invaluable recreational ecosystem. The Asian carp have the potential to debilitate a multi-billion dollar fishing industry and significantly impair the tourism industry. Of far more significance, though, is the threat this invasive species poses to the ecological viability of the Great Lakes. Preventing the Asian carp from entering Lake Michigan should be a national priority.

I am committed to fighting this aggressive species and look forward to working with my colleagues representing the Great Lakes, the Administration, and federal and state agencies to ensure that efforts to contain Asian carp are coordinated, comprehensive and effective.

PREPARED STATEMENT OF HON. DAVE CAMP, U.S. REPRESENTATIVE FROM MICHIGAN

Madame Chairman, I am pleased you are holding this hearing today, and appreciate the opportunity to submit my comments for the record on this very important topic.

The Great Lakes are facing a dire and immediate threat, one poised to destroy the Great Lakes' $7.5 billion fishing industry and the 800,000 jobs it supports—and this region cannot afford to lose—along with its vitally important ecosystem.

The threat: Asian Carp. These four foot long, 100-pound carp eat half their body weight daily and are extremely prolific, crowding out native species and decimating habitats as they spread. They are better-suited to the climate of the Great Lakes region than the Mississippi River, making the Lakes all the more vulnerable to their devastation.

The invasive carp have been descending upon our Lakes faster than anyone thought. Despite our efforts to stop Asian Carp from entering the Great Lakes, on June 22, 2010, a live Bighead Asian Carp was captured less than six miles from Lake Michigan in Lake Calumet. This fish had direct access to the Great Lakes and was north of all barriers to stop its spread. It is clear we must do more immediately.

We must act with the utmost urgency and immediacy to prevent other Asian Carp from reaching the Great Lakes. It is important that we come together to make President Obama's promise of a "zero-tolerance" policy on invasive species a reality.

It is my hope that this hearing will spur the kind of swift action that is needed to protect the environment, beauty, industry, and economy of the Great Lakes. First, that means closing the locks temporarily to halt the entry of Asian Carp into the Great Lakes. I was pleased to introduce with Senator Stabenow the CARP ACT, Close All Routes and Prevent Asian Carp Today Act, to meet this goal.

But now that a carp has been found past all electronic barriers, I believe we must move swiftly to build on the CARP ACT to put in place a permanent solution to prevent Asian Carp from establishing populations in the Great Lakes.

Senator Stabenow and I have also introduced new legislation, the Permanent Prevention of Asian Carp Act, that requires the Army Corps of Engineers to develop a plan ensuring permanent hydrological separation between the Mississippi River and Great Lakes basins. Attorney General Mike Cox has also announced he is renewing legal challenges to immediately close the locks.

It is my sincerest hope that Congress take the necessary steps to prevent a viable population of Asian Carp from destroying our Great Lakes. The Lakes are too vitally important to the region and country. I hope that today's hearings will compel Congress and this Administration to act with the utmost urgency, pass the CARP ACT and the Permanent Prevention of Asian Carp Act, and ensure the future of the Great Lakes.

Thank you.

Senator STABENOW. There's certainly tremendous concern about this issue, as there should be, in Michigan and around the country.

In 2008, a 15-year-old boy named Seth Russell was out tubing on Lake Chicot, in Arkansas. Like many folks in the State of Michigan, he was riding on an inner-tube being pulled along by a motor boat when an Asian carp jumped out of the water and hit him directly in the face.

We have a couple of posters here today, but one—if you can imagine—I can't really imagine—and, as much as I love swimming in the Great Lakes, and having grown up in Michigan, and how important the Great Lakes are to us—but, imagine trying to go out and boat or tube or ski or swim, with the Asian carp jumping, as they are in this picture. It's actually a very frightening thing to think about.

In this case, the fish hit Seth so hard it killed the fish. Seth was knocked unconscious. He was rushed to the hospital with a broken jaw and whiplash.

This—these species of Asian carp, called the silver carp, can weigh up to 40 pounds. There are others that can get up to 100 pounds. Getting hit in the face by one of these is like getting hit by a bowling ball, according to people who, in fact, have been hit by these fish.

As we established at our previous hearing in February, Asian carp were introduced in the United States in the 1970s, when they were used to control algae growth in catfish farms down south. Floods allowed them to escape from the ponds and reach the Mississippi River, where they have left a trail of destruction on their way north.

As we know, Asian carp feed on plankton, the foundation of the food chain, and often eliminate the ability of native fish species to find food.

The 40-pound silver carp, which jumps out of the water at people, is the small variety of Asian carp, as I mentioned. The larger bighead carp grows to be about 110 pounds.

If these fish establish populations in the Great Lakes, it would devastating for our $7-billion fishing industry and our $16-billion recreational boating industry, and it would cause irreversible eco-

logical harm. That's the reason that we are so focused on doing whatever we can to prevent that from happening.

In February of this year, the subcommittee received testimony related to the Asian Carp Control Strategy Framework. We appreciate very much Chairwoman Nancy Sutley being with us today, as well as Dr. Leon Carl, for joining us again—for both of you being here.

Since that hearing, both Federal and non-Federal efforts have continued to address this very serious threat to the Great Lakes. Since then, Asian carp have been found in Lake Calumet, Illinois, and in the Wabash River in Indiana. The purpose of this hearing is to examine the Federal response to these discoveries, and to get an update on the ongoing activities of the Federal Government to address this urgent issue.

The threat from the Wabash River is of particular concern, as a new issue to us. As we heard in the February hearing, the threat of Asian carps entering into the Great Lakes is not limited to the Chicago-area waterways. Asian carp are also located in other stream systems, and can migrate to the Great Lakes through those avenues.

Normally, the Wabash and Maumee Rivers are not connected. But, ever so often, about once a year, there's flooding in the rivers that creates a brief connection. Of concern, in May a spawning event of Asian carp was detected about 100 miles downstream from this connection. If Asian carp were able to cross from the Wabash into the Maumee River, they would have a clear and uninhibited path to Lake Erie.

Both Federal and non-Federal efforts have been underway to stop this from happening. Today, we will receive an update on those efforts and talk further about what can be done. Obviously, I feel—we feel—a tremendous sense of urgency to continue doing what is being done in the short run, but to address this in the long run.

The Great Lakes really are about our way of life for those of us who represent States around the Great Lakes, as well as providing 20 percent of the world's fresh water and a tremendous, tremendous natural resource—drinking water, as well as in tourism and fishing and boating and, basically, the beauty that I would all invite you to. On a summer day, when you are in a 100 degrees in DC, and 100-percent humidity, come to the Great Lakes. We will give you low humidity and 80 degrees and a beautiful opportunity to express—to enjoy the fresh water that makes up the Great Lakes and, frankly, gives us a tremendous sense of urgency about what is happening today.

Let's start, first, with the honorable Nancy Sutley, who is chair of the White House Council on Environmental Quality. We welcome you, again, and appreciate your focus and your intensity on this issue.

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

Ms. SUTLEY. Thank you, Madam Chair. Thank you for holding this hearing, and for your continuing interest and efforts in this very important subject.

As you said, the Great Lakes face perhaps their most significant threat from an invasive species yet from the Asian carp. Today I'll talk about the immediate and long-term actions that are underway to prevent the environmental and economic harm that this invasive species could cause.

The Obama administration is executing a robust, coordinated, and proactive Asian Carp Control Strategy Framework that unifies the Federal, State, and local actions to combat this invasive species with a multi-tiered defense of the Great Lakes while we are working on longer-term biological controls.

Since I last testified before this committee in February, the administration has updated the framework, and has accomplished, or is on track to meet, all the milestones that were laid out in the plan. The goal of this strategy, of all of the short-and long-term actions, is to prevent Asian carp from establishing self-sustaining populations in the Great Lakes.

As part of the framework, Federal and Illinois State officials have been conducting intensive fishing operations to locate Asian carp along the Chicago Area Waterway System, or CAWS, since February. On May 25, the Asian Carp Regional Coordinating Committee completed a weeklong sampling and data-collection operation on the Little Calumet River in South Chicago, and used rotenone, a fish toxicant. This operation yielded more than 130,000 pounds of fish, including more than 40 species. At that point, no bighead or silver Asian carp were found among them.

On June 22, as you're aware, a routine sampling that's conducted under the framework led to the first capture of a live bighead Asian carp above the electric barrier system. The framework that we have in place allowed us to both identify and capture the carp in the waterway, and to respond quickly, and in a coordinated way, to intensify actions to detect and capture and additional Asian carp. To date, no additional carp have been found.

We believe that the capture of this live carp, as part of our monitoring plan, shows that the framework is accomplishing what it intends. The plan was designed to pinpoint and remove any carp that may already be in the Chicago Area Waterway System. You'll hear more from John Rogner, of the Illinois Department of Natural Resources, who is chair of the Asian Carp Regional Coordinating Committee, about specific actions taken in the—in CAWS since February, and the immediate increase in actions taken in Lake Calumet, once the carp was captured there.

The Army Corps of Engineers has also undertaken the actions laid out in the framework. In April, using the authority from Congress, under section 126 of the Energy and Water Development and Related Agencies Appropriations Act, the Corps awarded a multimillion-dollar contract for construction of a concrete barrier and fencing between the Chicago Sanitary and Ship Canal and the Des Plaines River. This is designed to prevent fish passage around the electric barrier in flooding events where the 2 water bodies mix.

We urge Congress to extend, in time and in geography, the Corps' 126 authority, which expires in October 2010 and appears to be only limited to CAWS, so that we can continue the emergency actions to battle the Asian carp.

In addition to the concrete barrier and fencing, construction and operation of a third electric barrier is underway and on schedule to be completed in October of this year. These efforts are meant to keep the carp at bay in the short term. You will hear more from Dr. Leon Carl about research into long-term biological controls being developed by USGS.

In other long—longer-term actions, the Army Corps is collaborating with Federal, State, regional, and local agencies and nongovernmental organizations on an interbasin transfer study to explore all options and technologies for reducing the risk of Asian carp transfer between the Mississippi River and the Great Lakes. This includes an analysis of hydrological separation of the Mississippi River from Lake Michigan.

As the administration indicated in February, we're committed to proactively investigating areas outside of the CAWS that may be vulnerable to Asian carp. As you mentioned, a new area of focus is the connection between the Wabash and Maumee Rivers, near Fort Wayne, Indiana. Currently, USGS, the Fish and Wildlife Service, the Corps, and the Indiana Department of Natural Resources are studying the area to better understand the risk and to detail some next steps.

The administration has received a letter from you, and other Great Lakes representatives, requesting that we name a response commander for Asian carp to oversee diverse actions underway to contain the spread of carp in the region. We're looking at the request and moving forward.

In conclusion, we share your great concern about this issue, and we're committed to preventing the spread of Asian carp into the Great Lakes. We believe our management actions to control the Asian carp are robust, and that Federal, State, and local agencies are effectively coordinating with each other. We believe we're succeeding in our aim to keep Asian carp from establishing themselves in the Great Lakes.

Finally, I want to thank Congress for fully funding the President's FY 10 request for the Great Lakes Restoration Initiative, without which many of these actions would not be possible.

Thank you for the opportunity to appear today. I look forward to your questions. Thank you.

[The prepared statement of Ms. Sutley follows:]

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

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

Invasive species pose serious threats to our ecosystems. The Great Lakes in particular have been devastated by invaders such as the sea lamprey, zebra mussel and the round goby. The Great Lakes now face perhaps their most significant invasive species threat yet from Asian carp. This time, however, we have an opportunity to prevent the environmental and economic harm that this invasive species could cause, and are working urgently to do so.

The Obama Administration is executing a robust, coordinated and proactive Asian Carp Control Strategy Framework (Framework), developed in February and updated in May 2010 by the U.S. Army Corps of Engineers (USACE), Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (FWS), U.S. Geological Survey (USGS), the U.S. Coast Guard (USCG), and the Great Lakes Fisheries Commission (GLFC) in cooperation with state and local agencies. This Framework unifies Federal, state and local actions to combat invasive species with a multi-tiered defense

of the Great Lakes from Asian carp while longer-term biological controls are developed. Since I last testified before this Committee in February, the Administration has updated the Framework and has accomplished or is on track to meet the milestones it laid out.

OVERVIEW OF THE ASIAN CARP CONTROL STRATEGY FRAMEWORK

The goal of the Administration's strategy of 32 short-and long-term actions is to prevent Asian carp from establishing self-sustaining populations in the Great Lakes. In the near term, the Framework focuses on keeping Asian carp out of the Chicago Area Waterway System (CAWS) and Great Lakes, and on removal of Asian carp in the CAWS. Measures to accomplish this include environmental DNA (eDNA) monitoring, contract commercial fishing, and conventional techniques such as electrofishing and netting.

As part of the Framework, Federal and Illinois State officials have been conducting intensive fishing operations to locate Asian carp along the CAWS since February 17, 2010. On May 25, the Asian Carp Regional Coordinating Committee (ACRCC) completed a week-long sampling and data collection operation on the Little Calumet River in South Chicago that utilized rotenone, a fish toxicant. This operation yielded more than 130,000 pounds of fish, including more than 40 species. No bighead or silver Asian carp were found among them.

FRAMEWORK PROGRESS AND INTENSIFIED RESPONSE

On June 22, as you are aware, routine sampling under the Framework led to the discovery of a live bighead Asian carp above the electric barrier system for the first time. The aggressive Framework the Administration has in place allowed us to both identify and capture Asian carp in the waterway and to respond quickly and in a coordinated manner to intensify actions to detect and capture any additional Asian carp, if present. The ACRCC's member agencies[1] and contractors immediately increased sampling in Lake Calumet, where the Bighead carp was discovered, and the surrounding area. To date, no additional Asian carp have been found.

We believe that the capture of this live carp as part of our monitoring plan shows that the Framework is working. The plan assumes that a small number of Asian carp may exist in the CAWS, and was designed to pinpoint and remove them. You will hear more today from John Rogner of the Illinois Department of Natural Resources about our actions undertaken in the CAWS since February and the immediate increase in actions taken in Lake Calumet once the carp was captured there. The Illinois DNR has worked seamlessly with FWS and other Federal partners to implement monitoring and control actions for Asian carp in the CAWS.

The U.S. Army Corps of Engineers has also undertaken actions pursuant to the Framework. In April, using authority Congress granted under Section 126 of the Energy and Water Development and Related Agencies Appropriations Act of 2010, and funding provided through the Great Lakes Restoration Initiative (GLRI), USACE awarded a multi-million dollar contract for construction of concrete and fencing between the Chicago Sanitary and Ship Canal and Des Plaines River. This is designed to prevent fish passage around the electric barrier in flooding events where the two water bodies mix. We urge Congress to extend in time and geography the USACE's Section 126 authority, which expires in Oct 2010 and appears to be limited only to the CAWS, so that emergency actions to battle invasive carp can continue as needed.

In addition, construction and operation of a third electric barrier is underway and on schedule to be completed in October 2010.

All of these efforts are meant to keep the carp at bay in the short term. However, it is biological controls such as the ones being developed by the USGS that are likely to prevent Asian carp migration over the long-term. As Dr. Leon Carl will describe, USGS is conducting scientific research into additional methods for controlling Asian carp, including Asian carp-specific poisons, methods to disrupt spawning and egg viability, seismic technology, and assessment of Asian carp food sources and potential habitats.

In other longer-term actions, USACE is collaborating with Federal, state, regional, and local agencies and non-governmental organizations on an Inter-Basin Transfer Study to explore all options and technologies for reducing the risk of Asian carp transfer between the Great Lakes and Mississippi River basins. This includes

[1] ACRCC members include IL DNR, IN DNR, OH DNR, USFWS, USACE, USEPA, USCG, Great Lakes Fisheries Commission, Metropolitan Water Reclamation District of Greater Chicago and city of Chicago.

a comprehensive analysis of Asian carp control technologies, including physical or hydrologic separation of the Lake Michigan from the Mississippi River basin.

ASIAN CARP IN OTHER VECTORS

As the Administration indicated in February, we are committed to proactively investigating areas outside of the CAWS that may be vulnerable to Asian carp. A new area of focus is the connection between the Wabash and Maumee Rivers near Fort Wayne, Indiana. In flood events, the Wabash River can hydrologically connect with the Maumee River, which runs into Lake Erie, making Asian carp in this area another potential threat to the Great Lakes. Currently USGS, FWS, USACE, and Indiana DNR are studying the area to better understand the risk and what next steps should be. We have expanded the ACRCC to include representatives from the States of Indiana and Ohio to ensure an effective and coordinated response on a larger front. In addition, we continue to provide information to and seek input from other Great Lakes states that are not part of the ARCC.

The Administration received a letter from Chairwoman Stabenow and other Great Lakes representatives requesting we name a Federal Coordinated Response Commander for Asian carp to oversee the diverse actions underway to contain the spread of the carp in the region. We are currently evaluating this request.

CONCLUSION

In conclusion, the Administration shares the great concern about this issue and is committed to preventing the spread of Asian carp into the Great Lakes. I would like to reiterate that our management actions to control Asian carp are robust, that Federal, state, and local agencies are effectively coordinating with each other, and that we believe we are succeeding in our aim to keep Asian Carp from establishing themselves in the Great Lakes.

In addition, I want to thank Congress for fully funding the President's FY 2010 request for the Great Lakes Restoration Initiative, without which many of these actions would not be possible.

Thank you for the opportunity to testify today, and I look forward to your questions.

Senator STABENOW. Thank you very much.

Dr. Leon Carl, we want to welcome you back as director of Great Lakes Science Center, the United States Geological Survey, in Ann Arbor, Michigan. We want to welcome you back.

STATEMENT OF LEON CARL, MIDWEST AREA REGIONAL DIRECTOR, U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR, ANN ARBOR, MI

Mr. CARL. Chairman Stabenow, thank you for the opportunity to testify about or efforts to implement the Federal Asian Carp Control Strategy Framework to prevent the establishment of Asian carp in the Great Lakes.

As you indicated, I'm Leon Carl. I'm with the USGS Midwest area office. I am accompanied today by Charles Wooley, the Region 3 deputy director for the U.S. Fish and Wildlife Service.

The spread of Asian carp into the Great Lakes poses a serious ecological and economic threat. The USGS is providing biological and hydrological research and expertise to assist in the management and control of these fish, and to support activities under the auspices of the multi-agency Asian Carp Regional Coordinating Committee.

In light of the recent finding of the bighead carp in Lake Calumet, I will update progress made by the USGS and the Fish and Wildlife Service to implement the framework and other relevant activities.

The collaboration behind the framework is built upon the broad partnership of the Great Lakes Restoration Initiative, or GLRI. The

GLRI action plan incorporates recommendations of hundreds of Great Lakes stakeholders, and targets the most significant environmental problems in the Great Lakes, including invasive species. It is because of this coordinated, multi-agency effort that the Coordinating Committee for Asian Carp was able to act immediately to the recent discovery of bighead carp in Lake Calumet. As a member of the coordinating committee, I assure you that the partners involved realize the seriousness of the carp threat, and are committed to preventing their establishment in the Great Lakes.

The Chicago Area Waterway System is only one potential Asian carp entry point to the Great Lakes. Other hydraulic connections between the Great Lakes and the Mississippi River Basin could also provide access for carp eggs, larvae, juvenile fish, and adults. The recent observation of Asian carps spawning in the Wabash River in Northern Indiana motivated the Coordinating Committee to more immediately consider other possible pathways for Asian carp to reach the Great Lakes. These include the movement of fish from waters inhabited by Asian carp, such as the Wabash River, to waters connecting directly to the Great Lakes, such as the Maumee River Watershed in Ohio. This occurrence is particularly likely during high water events, and the area of concern has been identified on the map, on my right there, as a red circle. During the past 6 years, localized flooding has been high enough on at least 6—or, 4 occasions to connect these 2 watersheds.

I will now focus on the USGS and Fish and Wildlife Service efforts to implement the framework. The Fish and Wildlife Service contributed significant resources and personnel during the May 10, 2000—during May 2010 rotenone application to the Chicago Area Waterway System to support the recovery and identification of fish. The USGS conducted dye studies to help determine boundaries of the treatment and surface water flows, and conducted groundwater monitoring of nearby wetlands. The Fish and Wildlife Service also helped produce a draft monitoring and rapid response plan, which incorporates many of the short-and long-term sampling actions identified in the framework. The plan uses an adaptive management approach and builds on the growing knowledge of—growing knowledge on Asian carp detection, monitoring, behavior, and ecology.

From February through June 2010, Survey and Service staff led and assisted partners with netting and electrofishing efforts in the Chicago Area Waterway System, using sampling methods outlined in the plan, including intensive localized sampling in response to the finding of a bighead carp in Lake Calumet. I believe John Rogner will cover this further in his testimony.

As a part of the Feasibility Assessment of Inter-Basin Transfer of Aquatic Invasive Species, USGS completed geophysical surveys in mid-June along the Chicago Sanitary and Ship Canal in the Des Plaines River. These ground-penetrating radars, along with other data, will be used to site monitoring wells to assess the movement of eggs and larvae of Asian carp through the fractured bedrock between the 2 systems.

USGS is also conducting research to estimate the minimum river length and water temperature needed for successful Asian carp spawning in the Great Lakes. Toward this end, bighead carp were

recently spawned in the lab, and their young were raised and observed to document the developmental time needed for the larvae to be able to swim sufficiently that they can disperse into larval fish habitat. This information will be used to model habitat requirements and identify rivers in the Great Lakes Watershed that may require monitoring and surveillance for Asian carp.

USGS is also working with partners to test the efficacy of seismic technology to control nonnative fish. In these experiments, we use caged fish that were exposed to a—seismic waves from a hydrogun. Exposure was then monitored with hydrophones. The initial conduct—trials were conducted during the past 5 weeks, and resulted in direct mortality of some of the fish exposed to the blast. We are planning field tests for this that will target Asian carp, this fall.

Last, another project at USGS is determining the method of oral delivery of chemicals to better target toxins at Asian carp. Methods are currently being developed to orally deliver a specific dose of registered fish toxicant to different-sized Asian carp. This technology may also be used to exploit the immune response of Asian carp to further increase the species specificity.

In conclusion, the USGS and the Service will continue to work with our Coordination Committee partners, and in the broader context of the GLRI collaboration, to prevent the establishment of Asian carp in the Great Lakes. USGS will continue to provide the science support required for this vital effort, in collaboration with our partners.

Thank you, Chairman Stabenow, for the opportunity to submit this testimony. I will be pleased to answer any questions from you at this time.

[The prepared statement of Mr. Carl follows:]

PREPARED STATEMENT OF LEON CARL, MIDWEST AREA REGIONAL DIRECTOR, U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR, ANN ARBOR, MI

Chairwoman Stabenow and Members of the Subcommittee, my name is Leon Carl, and I am the Regional Executive of the U.S. Geological Survey (USGS) Midwest Area. Thank you for the opportunity to testify about efforts in support of the Federal Asian Carp Control Strategy Framework (Framework) to prevent the establishment of Asian carp in the Great Lakes. I am accompanied by Charles Wooley, Region 3 Deputy Regional Director of the U.S. Fish and Wildlife Service (FWS).

The USGS, a bureau of the Department of the Interior, conducts research to understand the interrelationships among ecological and biological systems, Earth processes, and human activities. Our role is to provide biological and hydrological scientific expertise and new research to assist in the management and control of Asian carp and to support activities under the auspices of the multi-agency Asian Carp Regional Coordinating Committee (RCC). I will discuss the USGS role in more detail later in my testimony.

On June 22, 2010, a bighead carp was caught in Lake Calumet during a strategic sampling effort coordinated by the RCC under the Framework. The spread of Asian carp into the Great Lakes poses a very serious ecological and economic threat to that ecosystem. The RCC is committed to strategically utilizing all available resources and knowledge to prevent Asian carp from becoming established in the Great Lakes.

In light of this recent finding, my testimony today will provide information on the RCC collaboration and the Framework. I will also highlight the RCC response to the capture of an invasive Asian carp in Lake Calumet as well as important progress made by the USGS, the FWS, and other RCC agencies on Asian carp research and control projects under the Framework since the February 2010 Senate Energy Subcommittee on Water and Power hearing on Asian carp.

FRAMEWORK BACKGROUND AND STRATEGY

At this point I would like to speak to the Federal Asian Carp Control Strategy Framework. One of the major strengths of the Framework is the collaboration behind it. This collaboration builds upon the broader partnership of the Great Lakes Restoration Initiative (GLRI). The GLRI Action Plan incorporates the recommendations of hundreds of Great Lakes stakeholders. It targets the most significant environmental problems in the Great Lakes, including invasive species. It is because of this coordinated multi-agency effort and the funding to support it that the RCC was able to act immediately when the Asian carp threat to the Great Lakes became increasingly evident.

Federal, State, and local agencies, working together as the RCC, developed the Framework to outline the actions that are being implemented to prevent Asian carp from becoming established in the Great Lakes. The agencies are united in this singular goal and the Framework establishes this as the official policy of the participating agencies. The Framework is a multi-tiered, multi-dimensional strategy that provides a strong defense against invasive Asian carp and includes both short and long-term strategies to stop the movement of Asian carp into the Great Lakes. No single line of defense (structural, chemical, biological, etc.) is adequate to keep Asian carps from becoming established in the Great Lakes; therefore the Framework strategy supports a comprehensive array of projects to more effectively address this critical issue. Funded in FY 2010 through the GLRI and through Agency base programs, the Framework is a dynamic document, reflecting an ever-increasing body of knowledge gathered from ongoing research and monitoring. The flexibility of the Framework enables us to be adaptive so that we can build on what we learn and adjust the strategy accordingly. For example, comments and suggestions from Federal and State partners, other organizations and groups, and the public were incorporated into a revised Framework released in May 2010. The revised Framework updates milestones on previous projects and adds several new research projects to address identified science and information gaps.

Current participants in the Framework include the City of Chicago, Great Lakes Fishery Commission, Illinois Department of Natural Resources, Metropolitan Water Reclamation District of Greater Chicago, the University of Notre Dame, U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Environmental Protection Agency, FWS, USGS, and the White House Council on Environmental Quality. To better coordinate the activities of the RCC and the Framework projects and to be as effective as possible, the RCC formed three workgroups that were tasked to address specific Asian carp control issues—Monitoring and Rapid Response, Invasion Prevention, and Communication and Outreach. As a member of the RCC, I would like to personally state that the partners involved in this collaboration realize the seriousness of the Asian carp threat and are committed to preventing them from becoming established in the Great Lakes through the implementation of the Framework and other appropriate actions.

CURRENT ISSUES

The recent capture of a single bighead carp in Lake Calumet has understandably caused great concern in the Great Lakes region. The RCC and other stakeholders recognize the urgency of this situation and, based on the Framework, are taking steps to address it. It is prudent that we continue on a carefully planned path that, based on foundational knowledge of all of the agencies and stakeholders, will guide and direct our actions and ultimately help us to achieve our goal of preventing Asian carp from becoming established in the Great Lakes. It is important to note that the finding of a single Asian carp in Lake Calumet does not indicate an imminent threat of establishment of a sustainable population either in the Chicago Area Waterway System (CAWS) or Lake Michigan.

The bighead carp found in the northwest corner of Lake Calumet was 34.6 inches long and weighed 19.6 pounds. It was caught by a commercial fisherman contracted to conduct more intensive Asian carp sampling efforts in the area. It represents the first Asian carp physically collected above the aquatic invasive species electric barrier dispersal system, although DNA from both bighead and silver carps has been collected above the barriers. The RCC agencies are enacting immediate measures to capture and remove any possible additional Asian carp through ongoing sampling efforts. Commercial fishing nets and electrofishing gear will continue to be used in Lake Calumet and additional resources will be deployed to begin sampling up the Calumet River leading to Lake Michigan. Electrofishing and sampling efforts in Lake Calumet and the Calumet River will continue throughout the next several weeks. The sampling effort is an identified component within the Framework, and

is recognized as an important tool for monitoring for Asian carp within the CAWS and surrounding waters.

In addition, the RCC is considering other possible vectors for Asian carp introduction into the Great Lakes, including the movement of fish through inhabited waters such as the Wabash River in Indiana to waters connecting directly to the Great Lakes, such as the Maumee River watershed in Ohio, particularly during high-water or flood events. Over the past six years, localized flooding has been high enough to connect the watersheds on four occaisions. The CAWS is only one potential Asian carp entry point to the Great Lakes. Hydraulic connections between the Great Lakes and Mississippi River Basins could also provide access points for carp eggs, larvae, juvenile fish and adults. The Great Lakes and Mississippi River Interbasin Study, a feasibility study being undertaken by the U.S. Army Corps of Engineers in collaboration with other Federal, State, and local agencies, as well as nongovernmental entities is examining this issue.

PROGRESS ON FRAMEWORK EFFORTS

As requested, I will now provide key highlights on the progress of Framework actions since the February 2010 Senate subcommittee hearing. I will include some broader RCC and FWS updates, as well as a more detailed description of the USGS Asian carp control research efforts.

As part of the multi-agency effort, a second rotenone application took place the week of May 17, 2010 (the first was in December 2009). It was very well-coordinated with numerous agencies and stakeholders contributing to the effort. The FWS contributed significant resources toward this activity. A media event was also organized in conjunction with the rotenone application activity and was well attended by media and other stakeholders.

Extensive fish sampling of five sites in the CAWS began in June 2010 which resulted in the capture of the bighead carp in Lake Calumet. Sampling will continue for 3 more weeks and scientists will determine if using rotenone may be used as a viable sampling tool for Asian carp in this area. Electrofishing and commercial fishing will be expanded between Lake Calumet and Lake Michigan. Environmental DNA (eDNA) processing and sampling is continuing.

The FWS, as part of the Monitoring and Rapid Response Work Group of the RCC, helped produce a draft "Plan for Monitoring and Rapid Response Plan for Asian Carp in the Upper Illinois River and Chicago Area Waterway System" (Plan), which incorporates many of the short and long-term sampling actions identified in the Framework. The Plan uses an adaptive management approach, building upon the growing body of knowledge on Asian carp detection, monitoring, behavior, and ecology.

From February through June 2010, FWS staff from Wisconsin, Illinois, and Missouri led and assisted partner agencies with netting and electrofishing efforts in the CAWS. This included sampling warm water discharges and other effluent locations, areas which may attract Asian carp based on nutrient and thermal availability; sampling routine fixed sites and reach wide monitoring as prescribed by the Plan; intensive sampling in localized areas in response to positive eDNA results; and intensive localized sampling in response to the finding of the bighead carp in Lake Calumet.

USGS ASIAN CARP CONTROL SCIENCE AND SUPPORT

The USGS has a number of Asian carp control research projects in the Framework with funding of over $3 million. Our strategy for this research is to employ the same integrated, comprehensive, and systematic approach that the USGS uses for all of its invasive species research. We are working on development of species specific chemical controls and investigating the best methodologies to deliver those chemicals into invasive species such as Asian carp. As a result of our extensive experience in Asian carp biology, we are able to look at whether the Asian carp could maintain a population in the Great Lakes based on their feeding habits, their preferred spawning habitats, and other aspects of their life history. Our expertise in water resources research enables us to examine the potential for inter-basin transfer of Asian carp into the Great Lakes through, for example, overland flow during flood events. In addition, we provided support for the RCC rotenone applications by conducting dye studies that helped determine water flow and where the rotenone should be applied. We are also conducting experiments on Asian carp eradication and herding strategies using seismic technology. I will now describe specific progress on some of these projects.

USGS SCIENCE PROGRESS

Feasibility Assessment of Inter-Basin transfer of AIS (Long-term Action 2.2.7)—The USGS Illinois Water Science Center completed geophysical surveys during the weeks of June 14 and 21 along the Chicago Sanitary and Ship Canal and the Des Plaines River. These resistivity and ground-penetrating radar surveys, along with other information being collected, will be used to site monitoring wells to assess the movement of Asian carp eggs and small fry through the fractured carbonate bedrock. This pathway may be a transport vector not protected by the electric fish barrier.

In addition, the USGS Illinois and Ohio Water Science Centers provided support for the December 2009 and May 2010 rotenone treatments using a dye tracer to define the boundaries of the treatment, surface-water flow monitoring using acoustic doppler current profilers to define the flow conditions for adequate dispersion of the fish toxin and associated neutralization upon completion of the treatment, as well as some groundwater monitoring by nearby wetlands.

Understanding Asian Carp and Bluegreen Algae Dynamics (Long-term Action 2.2.17)—Bluegreen algae are common in freshwaters, including Great Lakes. Bluegreen algae are rarely consumed by native species and noxious blooms of these algae can have negative ecosystem impacts. Asian carp, however, are known to consume these algae, but the extent to which they do so remains unknown. If they readily utilize bluegreen algae, however, Asian carp may be able to survive in waters such as the Great Lakes that have fewer plankton resources available than currently believed to be required for these fishes. Scientists are currently culturing algae and rearing larval Asian carp from the Missouri River in research ponds in order to determine the extent to which Asian carp consume bluegreen algae. Either pond-reared or wild-caught juvenile Asian carp will be used when those recently spawned have grown to sufficient sizes.

Use of Seismic Technology to Divert or Eradicate Invasive Asian Carp (Long-term Action 2.2.8)—In this project, USGS is working with the U.S. Navy to test the efficacy of using seismic technology to control nonnative fishes. In these experiments, Navy personnel are exposing caged fish to seismic waves using hydro-guns. The exposure is monitored using hydrophones and the effects of the exposure are monitored in the test animals. Initial experimental trials were conducted in Colorado during the past few weeks. Results from these trials resulted in direct mortality in some fish exposed to seismic blasts. Necropsies of dead fish indicated punctured swim bladders, damage to other organs, and spinal and brain injuries.

Characterization of Organism-Level Target Delivery Sites in Native Aquatic Animals (Long-term Action 2.2.22)—Scientists have identified native fishes with similar feeding strategies to those of Asian carp that would have the greatest risk of being affected by control methods that target the filtering ability of Asian carp. Knowing the identity of these native fishes will allow development and testing of Asian carp control methods to minimize non-target effects.

Great Lakes Tributary Assessment for Asian Carp Habitat Suitability (Long-term Action 2.2.23)—In this project, USGS scientists are conducting research to better estimate the minimum river length and water temperature needed for successful spawning of Asian carp. This information will be used to determine whether any rivers in the Great Lakes watershed meet these requirements. Bighead carp have been spawned in the laboratory and their young were raised at two different water temperatures to document the time needed for development and the swimming behavior of larval fish.

Technologies Using Oral Delivery Platforms for Species-Specific Control (Long-term Action 2.2.25)—Methods of orally delivering doses of toxins to Asian carp are being developed. Scientists are currently working on methods to orally deliver specific doses of rotenone or antimycin (registered toxins) to different sizes of Asian carps. This information is needed to properly dose the oral delivery system with encapsulated toxins. Another application of this technology that would exploit the immune response of Asian carp is being explored to increase species-specificity. Early juvenile Asian carp have been collected and are being reared in the laboratory for this research.

CONCLUSION

In conclusion, keeping Asian carp from becoming established in the Great Lakes is the primary goal of the RCC through the implementation of the Framework. RCC partner agencies will continue to work together and in concert with the broader GLRI collaboration, to do everything within our authorities to meet this goal and wisely use the funds entrusted to us. The USGS will continue to provide the science

support required for this vital effort in collaboration with other agencies and stakeholders in the Great Lakes.

Thank you, Chairwoman Stabenow, for the opportunity to submit this testimony on progress being made on implementing the Federal Asian Carp Control Strategy. I will be pleased to answer questions from you or other Members of the Subcommittee.

Senator STABENOW. Thank you very much. Obviously, we are deeply concerned and interested in all of the efforts that you are involved in right now, as it relates to the science behind this, and the different methods for us to be able to focus on—for all of us to focus on, as it relates to identifying and stopping the carp. So, thank you very much for your leadership.

Chairwoman Sutley, let me start with you and ask a few questions. First, let me talk about the locks for a moment, because this is an ongoing concern for us, knowing that, obviously, there are many things that you are doing. The good-news/bad-news of finding the carp in Lake Calumet is that, on the one hand, it was because of the intensive monitoring and the efforts that are going on to very closely monitor and be able to identify if there is a fish there. The bad news is that there was a fish there, and that it was above the locks, and that it was only a few miles from Lake Michigan. So, we very much appreciate the intensity of what is happening, in terms of the monitoring and the work that's going on, and the electric barriers, and the poisoning, and the netting, and all of the other things.

But, the big question—and this is something that—looking at this from Michigan, that's hard for us to understand—is why the administration would make a decision not to close the locks after finding the carp in Lake Calumet, which is between the O'Brien Lock and Lake Michigan. In theory, this fish could have passed from downstream through the lock; we don't know. I don't know if you have information about that. But, could you describe the process and the reasons for not closing the locks, at least temporarily?

Ms. SUTLEY. Thank you, Madam Chair. The—when the bighead carp was captured, the Coordinating Committee, as part of its routine sampling, captured this carp, and, after that, they went back and thoroughly fished Lake Calumet. There was more than 3,000 hours of netting and electrofishing that went on. They didn't find any additional carp. So, the framework, you know, relies on these kinds of management actions, including use of closing the locks, when—to accommodate management action. So, there's been no decision not to close the locks, but to close them as part of overall management actions. So, I think the answer is that the management actions, the fishing and the netting, was very intensive on Lake Calumet. As mentioned, the folks fishing were starting to recognize some of the fish they were seeing. So, they were very intensely in there.

But, we continue to execute all parts of the plan, and to maintain all of these as options, including closing the locks to accommodate management actions, the application of rotenone, this fish toxicant, when it makes sense, the netting, and the continued fishing, as well as the construction of the barriers and the other parts of the plan. John Rogner, who's on the next panel, I think, can go into a little more detail about the actual decisionmaking process.

Senator STABENOW. Was rotenone, the fish poison, used in Lake Calumet after the carp was identified?

Ms. SUTLEY. It was not used in this case because, again, I think the Committee felt that the actions that they were taking, of the intensive fishing, were sufficient. It was used on a section of the ship canal earlier in the year.

As I said in my testimony, it yielded a lot dead fish, and fortunately, no Asian carp. Rotenone's an important part of the toolbox. But, it is a fish poison and needs to be used in the right circumstances. I think the Committee felt that that—that the actions that they were undertaking would be sufficient to ensure—to know whether there were any more carp in Lake Calumet. So far, they haven't found any. But, I—but, as I said, rotenone is an important part of the toolbox, got to be used in the right way, and is available, when appropriate.

Senator STABENOW. Do you have, at this point, a—or, has the—have those looked—looking at this come to a theory on how the fish was able to get into Lake Calumet, or how long it had been there, or any information? I know that there was an analysis of the fish, once it had been removed. Any further information about the fish, or theories as to how it got there?

Ms. SUTLEY. I might defer to Dr. Carl or to Mr. Rogner on those theories. But, I know they've been looking at it. The question of—I think the—that there's a general belief that's hard for us—fish that large to bypass the barriers. So, there may have been—there may be other ways, such as introduction, either accidentally or on purpose, that it might have gotten in there. But, I would defer to Dr. Carl——

Senator STABENOW. Dr. Carl.

Ms. SUTLEY [continuing]. For any additional information.

Mr. CARL. My understanding was that the fish was aged by the Illinois Natural History Survey, and it was 6 years old. So, roughly 2004. So, as to its origin, there are techniques for looking at the early life history, looking at the aging structure. I believe that that will be investigated to see that, because we can oftentimes detect—I know, with the Lake Erie fish, there were 2 of the bighead carp that were found in Lake Erie, and they were able to look at that, and indicated that these fish were reared in a hatchery system, or they had the appearance of doing that. So, we may be able to detect that. At this point, that information's not—that—there, and it's very difficult to speculate.

That timeframe, 2004, 2003, is right when the ban on carp—movement of carp, in Illinois and other States, occurred. So, that fish may have been a hatchery fish, or it may not have been. We can't tell at this time. If it had been, it is possible that it was a culture release, or some other release, accidental, for some other reason. But, we don't have enough information to say, firmly, what happened at this time.

Senator STABENOW. OK. Thank you.

Let me talk for a moment about the Regional Coordinating Committee. I understand that, in additional to Illinois, the State of Indiana has just been added to the Regional Coordinating Committee to oversee the management activities of the Asian carp. It makes sense to do that, certainly. But, I wasn't aware, until recently, that

Michigan was not a part of that committee. So, Michigan has requested, through a July 12 letter, to become a member, as you know. I'd like to know if this is under consideration, because it certainly seems, given the impact on Michigan, that Michigan should be a part of that Committee.

Ms. SUTLEY. Thank you. The Coordinating Committee, as you noted, is made up of Federal agencies and the States of Illinois and Indiana, Department of Natural Resources. It is a sort of an operational—day-to-day operational committee. So, as there are—as there's a need to expand operations, certainly would consider adding other States. I believe Ohio is now a part of the Committee, as well. We'll certainly consider and—consider how to—whether adding other States to this operational committee makes sense, or are there other ways that we can make sure that we're having—that we're coordinating closely with the other States. So, we are committed to looking at that, and to looking at Michigan's request. We certainly understand how important this issue is around the Great Lakes, and want to assure both the Members of Congress and the Governors and administrations in those States that we're committed to working closely with them, and in partnership with them. Exactly how and when and who sits on what committee, that's something we are looking at, and certainly would consider that request.

Senator STABENOW. Obviously, we have a huge stake in Michigan. While various States have interests in one of the lakes, we obviously are impacted by all of the lakes. So, I would strongly urge you to make sure that Michigan is incorporated into that.

Along that line, I know that the administration met with the Great Lakes Governors last month, and I'm wondering if there were any new developments, in terms of the administration's Asian Carp Control Strategy Framework.

Ms. SUTLEY. We did have an opportunity, by phone, to talk to a number of the Governors, and have had a number of discussions with the staffs from the Governors' office—offices around the Great Lakes and their resource management agencies. The plan was updated in May, with the addition of some timelines, as well. The Army Corps of Engineers has finished a couple of the studies that they were working on, looking at the operation of the locks, looking at whether there's some additional physical things they can do. So, those reports are now completed.

So, as I said in my testimony, we're—the committee is meeting all the milestones that were outlined in the framework strategy and, I think, committed to sort of dynamically responding as circumstances change, as we've seen with the discovery of carp in the Wabash/Maumee system, and the response to that. So, we will treat—continue to treat this as a living document, and continue to reach out and make sure we're working in partnership with the States and all of the agencies involved.

Senator STABENOW. Thank you.

I know you're not from the Army Corps, but I know you're also aware—and we've all been talking—the Great Lakes Commission has recommended the permanent hydrological separation from the Mississippi River into Illinois River into Lake Michigan. That's something, as you know, that we have come together on, those of

us from Michigan, Illinois, and around the Great Lakes region, to really focus the Army Corps of Engineers in a shorter timeframe and a more focused way to be able to give us answers on what it would take to do that. We know that that would not be simple, that there certainly are engineering issues. But, right now we're in a situation where we are having to continue intensive monitoring, which you're doing, and these other things, when, at some point, we have to have a permanent solution to this as best as we can. So, we look forward to working with you as we move—the Army Corps of Engineers—as quickly as possible to give us the answers on what that means—how to do that, what that would cost—and we can develop a long-term plan for doing that.

Thank you.

Dr. Carl, I'd like to talk with you a bit about the electric barriers, because for a long time we have focused on adding the electric fences—funding the electric fences as the answer, in terms of Asian carp moving into the Great Lakes. I know you're not an engineer, again, with the Army Corps, but could you explain to me, as a scientist, is it possible for fish to pass through the electric barriers when they are operational?

Dr. CARL. Right now, the barrier that—the permanent barrier—I think it's 2A—is operating at 2 volts per inch, at a frequency of 15 hertz, at a pulse rate of 6.5 milliseconds. It's very unlikely that fish would be able to pass through that, especially since there are 2 barriers going at the same time.

What happens is, with a direct current electrofisher, as this is, is electrotaxis, which is forced swimming, followed by electronarcosis, which is essentially—the fish freezes up and dies. So, it's very unlikely that those fish would be able to move through a system like that, particularly upstream through a system as that. So, I would have to say that the Army Corps did examine this, and they did testing at different voltages and frequencies, and found that this was an optimal one for the fish that they're trying to discourage. Again, I would stress that it's very unlikely that they could move up the system, through that, when it's in operation.

Senator STABENOW. So, at this point, in looking at Lake Calumet, what does that mean, in—you're—are you indicating that the fish would not have swam through the barriers—the electric fences?

Mr. CARL. I can't predict—I mean, the fish is at least 6 years old—how that fish got there. I think it's unlikely that it swam through the fish barrier to get there. But, beyond that, it's—I can't really speculate on.

Senator STABENOW. How critical do you think it is that we complete construction on the third barrier and the flood controls along the Des Plaines River to prevent the fish from moving closer to the lakes?

Mr. CARL. I think it's very critical. I think the administration's policy of a tiered defense against the Asian carp threat is a good one, and part of that would be having more than one electrofishing array in that. That—it will now have 3, when that barrier is complete, in a few months' time. So, that if there are any problems, if one of the barriers needs to be put down for maintenance or something along those lines, or a freak accident, you still have the backup system in place. I think that's critical.

In regards to the—I believe, the Wabash connection—the Wabash and the Maumee connection—I think that also is very, very important. I think it's serious, and we should avoid having the fish get into Lake Michigan. I think the fish getting into Lake Erie is even worse to have happen. They—the carp habitat in Lake Erie—as much as we know, and we can't really predict that, it would be exceptional habitat for them, if there is any in the Great Lakes. The western basin of Lake Erie is shallow, productive water with a—large blooms of plankton. This is something that the carp would be very well adapted to.

There's also spawning habitat. If they can't spawn in the Maumee—and there are 3 main stem dams on the Maumee, so it's likely they cannot—they certainly would have an opportunity to spawn in the St. Claire/Detroit River system. So, I think there's a good chance for that. So, I think that it is important to have those systems separated.

My understanding, that the Indiana DNR today put out a press release that indicates that they expect to have a mesh—a temporary barrier in place before the end of the summer. So, I think that's really good news, to see that happening.

My understanding, as well, is that the Corps has plans that they are looking at that they could have a permanent barrier in place within a year. So, I think that is a really a very rapid response by the RCC to move forward on that, using our partners, the Illinois or the Indiana DNRs, working with us, in conjunction with the local agencies in those areas, to move forward with it. So, I think both of those actions really speak strongly for a pretty good defense against the Asian carp invasion.

Senator STABENOW. That's good to hear, that they're moving quickly. It sounds like they need to, if you're saying that that's even a more favorable place for Asian carp to spawn and to be able to move forward.

Do you think—are they looking at things, such as dams, as permanent ways to—again, to stop the waters? Or, what kinds of things are they looking at, at this point?

Mr. CARL. I think that's being developed as we speak. So, I can talk to that, but it may change. There are—they are looking at using a berm along part of the ditch on the Wabash side, and then using fencing to block the fish, in the short term. They are looking at several berms and, potentially, also some movement of water, some pumping systems, to keep the water from the Wabash from going into the Maumee system. So, I don't have definitive answer at this time, because that's still under discussion.

But, the Army Corps was there with the—our agency and several other agencies, the EPA and the Indiana DNR, looking at the system, and actually sat down with some of the stakeholders in the area, and there is actually a report out, right now, of that meeting, that talks about some of the solutions. There's very good buy-in, locally, as well as with the State and the Federal agency. It looks like it's moving forward very rapidly for a very good solution.

Senator STABENOW. From what you're saying, it sounds like it's less complicated than what we're dealing with in Chicago, with the canals and the locks and so on. Is that a fair statement, in terms of being able to get broader buy-in? I know that what one of the

challenges and the responses that we get to permanently closing the locks in Chicago relate to flooding and relate to commercial use of the waterways, and so on, that—where there's been concern, locally. Are you suggesting that there isn't that—the same kinds of concerns or problems that relate to putting up a permanent barrier?

Mr. CARL. I think, given one meeting, that we had good buy-in. So, I don't know that we have enough to state something as firm as that. But, it does appear that we have good buy-in at that level. That could change, I suspect, as a lot of things are changing.

It would appear to be a fairly simple hydrological connection between these 2 systems, as opposed to the one in the Chicago area. As you know, I'm not from the Corps, so I don't have a lot of knowledge about all the implications of trying to do that, both the economic and social, as well as just the hydraulic information that we'd need for that.

Senator STABENOW. Was the Federal Government—and this is to either of you—or its partners actively looking for new Asian carp populations in the Wabash River when this happened? Second, where else should we be looking? I mean, at this point, one of my concerns is, as we go forward—and, Dr. Carl, you're talking about other possible entryways into the Great Lakes—I mean, how far should we be looking? What else should we be doing?

Mr. CARL. To one part of your question, the Great Lakes/Mississippi River Interbasin Study—they're splitting off a portion of that to look immediately at the 12 areas where we think there may be a connection in the Great Lakes, between the Mississippi River and the Great Lakes Watershed. My understanding is that the Corps expects to have a report on that back by September 15 of this year. I just found that information out.

So, I think that the—that we're taking this very seriously. The partners will be moving forward, on that portion, to identify where there are any connections that we need to be looking at, just as seriously as we're looking at the Wabash and the Maumee, as well as the Chicago area.

Senator STABENOW. Thank you.

Ms. SUTLEY. I would just add——

Senator STABENOW. Yes.

Ms. SUTLEY [continuing]. That—I think Mr. Rogner can speak to, sort of, the exact chain of events—but, I think I would just make the point that, I think this—both the Coordinating Committee and the visibility of this issue has, I think, led to States being vigilant in their surveillance, and that, you know, we'd certainly encourage that to continue for all of the States around the Great Lakes, and all the Federal agencies that are involved, to keep their eyes and ears open. In a sense, the States have more boots on the ground and people who know the systems well. So, I think it's encouraging that Indiana—the State of Indiana contacted the Coordinating Committee as soon as they became aware of this issue. I would just encourage that that kind of partnership is a good thing, and continue.

Senator STABENOW. I would agree. I mean, I think the effort that's going on—and I think the only thing that I would continue to strongly urge you to do is to continue to look at the closure of

the locks until we can figure this out, in Chicago. That's the only difference I would have. I appreciate the fact they have been closed at various points, and various testing and poisoning going on.

But, I do very much appreciate the intensity of all the work that is being done. It's clear that the monitoring is, in fact, doing what we needed, even though we don't like the results of having found a fish in Lake Calumet, or what's happening in the area around the Wabash River, and so on. But, at least we have information on which we can act.

Then, knowing that things are happening quickly is also very, very important. Obviously, the fish are not going to wait for us. So, you know, this is something where we have to act as quickly as humanly possible to be able to address this.

Finally, I would just like to ask Dr. Carl—you talked about the new tools, testing various controls, and so on. You mentioned the sound gun that—the effort which sounds very interesting to me, and I'm wondering if you have—you could talk a little bit more about updates from your research. Last time you were here, you talked about the research that you were being done—doing, in terms of various new controls. You just mentioned it now. But, anything that looks particularly promising that we might be able to do right away, that—you know, that we should be looking to implement—implement as soon as possible?

Mr. CARL. Thank you. There are several things that we're developing, like the micromatrix, which would allow us a selective toxin. But that—we predict that our field trials are 18 to 24 months out to do that. So, that's got a long way to go, including approval by the EPA. So, there's a lot to do with that. Pheromone work, as well. Some of the things that we're looking at are disruption of spawning habitat, when the eggs are laid down, using sonic waves. We actually deferred that one til next year.

But, the one that I think has some promise is the whole idea of using sonic disruption of carp. I mentioned that we'd used caged trout to look at this. We found serious injuries, which was unfortunate. But, looking at the seriousness of the problem, they were a good test animal, and I think we can move forward with that.

When we use these water guns on maximum power, what we found was that, at 130 feet away from the gun, in the water, we were measuring 210 decibels of energy. For example, when you shoot a gun off next to your—near your head, you would be subject to about 140 decibels of sound wave. So, the energy involved at 130 feet is much larger than the energy at, say, 2 feet away from your head. So, we feel that that has real interest.

You showed the carp jumping. Typically, they're jumping because they're annoyed by a sound—the motor. So, this is a very annoying sound, 210 decibels, and our plan is to try to get that in place as quickly as possible. I've been in contact with John Rogner, from the Illinois DNR, and we're talking about field trails, even this September, to see whether or not this will work on the Illinois River.

We could be using this to discourage fish from entering a lock chamber, whether it's at the Chicago system, or it might be somewhere on the Mississippi River. So, there may be real applications for this, in terms of control technology.

As I said, we're really interested in moving this forward. The private company we're working with, Bolt Technology, is ready to build us new hydroguns, if we want to. They're not particularly complicated. So, it is something that, if we are reasonably sure that it works, that we could deploy, I would think, very rapidly.

Senator STABENOW. So, you're saying you can begin to test them possibly in September? Is that what I heard you say?

Mr. CARL. That's what we expect to do, is to be somewhere on the Illinois, probably a back-river area, looking at it with side-scan sonar to observe the carp behavior and to see what will happen, both with them. We'd like to see them in dense formations, and then look at that after we've shot the gun off, and see if there are any fish in the area, or not. So, we're not necessarily trying to be lethal toward the fish, but we certainly want them to move from that area. So, that—I think there's some real possibility there. The fish are much more sensitive to sound in water than we are, and 210 decibel is a lot of energy at that distance from a cannon.

Senator STABENOW. Thank you very much.

Finally, just to either of you, What else should we be doing to help you? What do you need from us to be able to do what needs to be done to keep the Asian carp out of the Great Lakes?

Ms. SUTLEY. Thank you, Senator. First of all, I appreciate all your support and continuing interest and efforts on this. We certainly encourage you to keep that up. But, I think the most important thing we want to be sure is that the Army Corps' emergency authority continues past the end of this fiscal year. So——

Senator STABENOW. The 126?

Ms. SUTLEY. The 126 authority. So, in terms of things that we need from Congress immediately, to—just to ensure that that remains in place so they can continue to do that work.

We appreciate Congress's support for the Great Lakes Restoration Initiative funding. That's been very important to getting all these actions in place, and look forward to that continued support.

Thank you.

Senator STABENOW. Thank you.

Mr. Carl, is there anything that you're needing from us, or asking for, at this point, that would help move what you're doing forward?

Mr. CARL. I just would like to thank you for the opportunity to testify before you. I appreciate your interest. Any continued interest in our work would be very valuable to us.

Thank you.

Senator STABENOW. Thank you very much.

Excuse you and ask our next panel of witnesses to come forward.

[Pause.]

Senator STABENOW. Good afternoon. Welcome.

Dr.—or, Mr. Rogner and Mr. Eder, thank you very much, for your time, for being here with us today.

Start with you, Mr. John Rogner, the assistant director of the Illinois Department of Natural Resources. Welcome.

STATEMENT OF JOHN ROGNER, ASSISTANT DIRECTOR, ILLINOIS DEPARTMENT OF NATURAL RESOURCES, SPRINGFIELD, IL

Mr. ROGNER. Good afternoon, Senator Stabenow. Thank you and other members of the subcommittee for this opportunity to update you on the role of the Illinois Department of Natural Resources is playing in this battle to keep Asian carp from establishing in the Great Lakes.

I'd first like to assure the subcommittee that the Illinois DNR has maintained its vigilance, and remains fully engaged in this effort. In fact, with the financial support of the Great Lakes Restoration Initiative, we've dramatically expanded our efforts.

In my testimony today, I'd like to quickly review the action steps we've taken above the electric barrier, outline some of our plans below the barrier, and then discuss what lessons that we have learned. If there's a bottom line to my testimony, it's to impress upon you that we, as the Illinois DNR, are deadly serious in doing our part to undertake the actions that we've agreed to do under the Asian Carp Control Framework Strategy.

So, I'll start with the actions above the electric barrier. This will begin where our rapid response action, last fall, in defense of the barrier, left off. Beginning in early February and continuing through April, we conducted an extensive monitoring operation of warm-water discharges from powerplants and water treatment facilities.

With low water temperatures, we determined that these would be the areas that would have the greatest potential for harboring Asian carp. In areas downstream of the electric barrier with documented Asian carp populations, this strategy proved to be very successful. So, while we collected many fish above the barrier, in the vicinity of these discharges, the effort produced no Asian carp above the barrier.

In March, we began developing a comprehensive monitoring and rapid response plan for the Chicago area Waterway System and the upper Illinois River. This plan was designed to systematically determine the distribution and abundance of Asian carp in those waterways, remove any Asian carp in the system, define the location of the leading edge and reproduction of those populations, and also identify e-DNA triggers for specific response actions in portions of the Chicago Area Waterway System.

On April 9, we were notified that e-DNA for silver carp was again detected in the Little Calumet River, where 2009 monitoring had previously detected multiple positive samples. So, we began developing plans for a sampling operation, including the application of rotenone to a 2-and-a-half mile stretch of the river in south Chicago, and then commercial netting in an adjacent 2-and-a-half-mile stretch.

On April 30, we were notified that e-DNA for silver carp was detected in the North Shore Channel, downstream from Wilmette. It was decided that, given this waterway's shallow depth and narrow channel, that instead of rotenone, we would use conventional elecrofishing, combined with commercial fishing gear, as the appropriate response. Crews were deployed May 11th through the 13th,

and fished intensively and, they believed, very effectively. We recovered many fish, but no Asian carp.

On May 20, the Little Calumet River was closed to all water traffic, and we initiated what we called Operation Pelican. This was the rotenone application. This effort was designed to better assess the monitoring data that we had available to us, and was the second time we applied the toxicant rotenone to the—in the Chicago area waterways. The operation involved participation from all of our Federal partners, including USEPA, U.S. Coast Guard, Corps of Engineers, U.S. Geological Survey, Fish and Wildlife Service, as well as many State and local partners. The direct cost of this operation was approximately 1.7 million, with over 300 individuals participating. We recovered 134,000 pounds of fish from 40 species, but no bighead or silver carp.

On June 4, we were notified that e-DNA for silver carp was detected in the Chicago River, near a tributary called Bubbly Creek. That's just a short distance south of downtown Chicago. We immediately developed rapid response plans to increase monitoring and sampling operations in this zone. Electrofishing crews and commercial netters were deployed over 2 days, on June 15 and 16. Again, we recovered no Asian carp.

Then, on June 22, commercial fishing crews, working as part of our comprehensive monitoring plan, recovered one bighead carp in the northwest corner of Lake Calumet. In response, we immediately increased our electrofishing and commercial netting efforts in both Lake Calumet and the Calumet River. To aid in our efforts, we incorporated small mesh seins and the used of side-scan sonar, which provides valuable information on fish distribution in the river channels.

In an effort to use the full range of sampling gear available to us, on July 1st our sampling crews worked Lake Calumet near where we recovered the bighead, and we used a half-mile-long sein. Using this very effective technique, they recovered over 40,000 pounds of fish in one single sein haul, but, again, no additional Asian carp.

In the Calumet River, we've spent several days focused on the slips and back channels, have recovered several thousand fish, including ones that our biologists have visually identified several times—so, these are repeat catches—indicating that we're sampling very effectively.

We've recovered no additional Asian carp.

You may have heard about the bighead carp caught last week in a Chicago Park District lagoon. While his fish had no access to the Chicago Area Water—Waterway System or the Great Lakes, it underscores the need for continued outreach to prevent the unintentional introduction of these fish into new waters. IDNR began a surveillance program directed at bait shops, last winter. Continue with this program into the future.

I'll say a quick word about action steps below the electric barrier, where we know we have big Asian carp populations. It's one of the tactics outlined in the Asian Carp Control Strategy Framework. An initiative that we believe will significantly reduce these populations was announced yesterday in Chicago by Governor Pat Quinn. Currently, Asian carp is on the menu at some of Chicago's finest res-

taurants, and this agreement to purchase up to 30 million pounds of Illinois River Asian carp annually, for consumption in China, will greatly reduce, over time, the large numbers of carp downriver that create pressure on the electric barrier. It will also create 61 direct and 120 indirect jobs.

Illinois DNR has partnered with the Department of Commerce and Economic Opportunity, who agreed to make the strategic investments necessary to upgrade Illinois fish processing facilities to improve their capacity.

Working with resources available to us from the Great Lakes Restoration Initiative, we've developed an incentive program for commercial fisherman. This is a critical piece of our strategy, because these areas currently will not support a commercial fishery, yet are an important component in reducing propagule pressures on the electric barrier system. These crews started operations a couple of weeks ago, and, on their first day, they removed 2600 pounds of Asian carp.

So, in terms of lessons learned, we're still analyzing all of the monitoring and sampling data we've collected over the past year. But, one trend in the data has clearly emerged. If an Asian carp population exists above the electrical barrier, it is very small. Every time we sample, it reinforces that conclusion.

Since February 2010, we've deployed 3200 hours of labor, monitoring, and sampling the waters above the electric barrier for carp. We intend to remain vigilant in these sampling efforts.

Second lesson we have learned is that the multi-agency coalition that's come together in response to this crisis is working extremely well. We believe that this is a model that should be continued, as it has developed an unprecedented level of cooperation, communication, transparency, and flexibility to respond quickly to changing circumstances. We believe this collaborative approach is a hallmark of the way we've traditionally done business with the other Great Lakes States. We believe it's working here, as well.

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 invasive species moving between the Great Lakes and Mississippi Basins.

Thank you very much for this opportunity, and I'll be happy to answer any questions you might have.

[The prepared statement of Mr. Rogner follows:]

PREPARED STATEMENT OF JOHN ROGNER, ASSISTANT DIRECTOR, ILLINOIS DEPARTMENT OF NATURAL RESOURCES, SPRINGFIELD, IL

Thank you Chairwoman Stabenow and members of the subcommittee, for this opportunity to update you on the role the Illinois Department of Natural Resources is playing in battling the Asian carp invasion.

First let me assure the Subcommittee that the IDNR has maintained its vigilance and remains fully engaged in this effort. In fact with the financial support of the Great Lakes Restoration Initiative, we have dramatically expanded our efforts.

In my testimony today I will quickly review the action steps we have taken above the electric barrier, outline some of our plans below the barrier and discuss what lessons we have learned.

Action Steps Above the Electric Barrier

- Beginning in early February and continuing through April we conducted an extensive monitoring operation of warm water discharges from power plants and

water treatment facilities. With low water temperatures, biologists determined that these were areas with the greatest potential for finding Asian carp. In areas downstream of the electric barrier with documented Asian carp populations, this strategy proved to be very successful. While we collected many fish, this effort produced no Asian carp above the barrier.

- In March we began developing a comprehensive monitoring and rapid response plan for the Chicago Area Waterways system and Upper Illinois River (MRRP). This plan was designed to systematically determine the distribution and abundance of Asian carp in the waterways, remove any Asian carp in the CAWS, define the location of the leading edge and reproduction of those populations, and identify eDNA triggers for specific response actions in portions of the Chicago Area Waterway System.
- On April 9th we were notified that e-DNA for silver carp was again detected in the Little Calumet River where 2009 monitoring had previously detected multiple positive samples. Plans were developed for a sampling operation including the application of rotenone, to a 2.5 mile stretch of the river in south Chicago and commercial netting in an adjacent 2.5-mile stretch.
- On April 30th we were notified that e-DNA for silver carp was detected in the north shore channel downstream from Wilmette. (see chart) It was decided that given its shallow depth and narrow channel, conventional electro-fishing, combined with commercial fishing gear would be appropriate. Crews were deployed May 11-13th. We recovered many fish but no Asian carp.
- On May 20th the Little Calumet River was closed to all traffic and we initiated Operation Pelican. This effort was designed to better assess the monitoring data we had available to us and was the second time we applied the toxicant rotenone in the Chicago Area. The operation involved participation from all of our federal partners including the USEPA, USCG, USACE, USGS, USFWS as well as state and local partners. The direct cost was approximately $1.7 million, with over 300 individuals participating. We recovered 134,000 pounds of fish from 40 species, but no bighead or silver carp.
- On June 4th we were notified that e-DNA for silver carp was detected in the Chicago River near Bubbly Creek a short distance south of downtown Chicago. We immediately developed rapid response plans to increase monitoring and sampling operations in this zone. Electro-fishing crews and commercial netters were deployed over two days on June 15-16. We recovered no Asian carp.

On June 22nd, commercial fishing crews working as part of our comprehensive monitoring plan, recovered one big head carp in the northwest corner of Lake Calumet.

In response, we immediately increased our electrofishing and commercial netting efforts in both Lake Calumet, and the Calumet River. To aid in our efforts we incorporated small mesh seines and the use of side scan sonar, which provides valuable information on fish distribution in the river channels.

- In an effort to use the full range of sampling gear available to us, on July 1st, our sampling crews worked Lake Calumet near where we recovered the bighead first used a half-mile-long seine. Using this very effective technique they recovered over 40,000 pounds of fish in one haul but no Asian carp. (See Picture)
- In the Calumet River we have spent several days focused on the slips and back channels and have recovered several thousand fish, including ones that our biologists have visually identified several times. We have recovered no additional Asian carp.
- You may have heard about the bighead carp caught last week in a Chicago Park District Lagoon. While this fish had no access to the Chicago Area Waterway System or the Great Lakes, it underscores the need for continued outreach to prevent the unintentional introduction of these fish into new waters. IDNR began a surveillance program directed at bait shops last winter and will continue with this program into the future.

Action Steps Below the Electric Barrier

- Reducing Asian carp populations downstream of the electric barrier is one of the tactics outlined in the Asian Carp Control Strategy Framework. An initiative that we believe will significantly reduce these populations was announced yesterday in Chicago by Governor Pat Quinn. Currently Asian carp is on the menu at some of Chicago's finest restaurants and this agreement to purchase up to 30 million pounds of Illinois River Asian carp annually for consumption in China will greatly reduce over time the large numbers of carp downriver that create pressure on the electric barrier. It will also create 61 direct and 120 indirect jobs.

IDNR has partnered with the Department of Commerce and Economic Opportunity who agreed to make the strategic investments necessary to upgrade Illinois fish processing facilities to improve their capacity.

Working with resources available to us from the Great Lakes Restoration Initiative we have developed an incentive program for commercial fisherman. This is a critical piece of our strategy because these areas currently will not support a commercial fishery, yet are an important component in reducing propagule pressure on the electric barrier system. These crews have begun operations and on their first day they removed 2600 pounds of Asian Carp. (See picture)*

Lessons Learned

We are still analyzing the totality of the monitoring and sampling data we have collected over the past year, but one trend in the data has clearly emerged. If an Asian carp population exists above the electric barrier system it is very small.

Since February 2010 we have deployed 3200 hours of labor monitoring and sampling the waters above the electric barrier for Asian carp. We intend to remain vigilant in our monitoring and sampling efforts in the Chicago Area Waterways.

A second lesson we have learned is that the multi-agency coalition that has come together in response to this crisis is working extremely well. We believe that this is a model that should be continued as it has developed an unprecedented level of cooperation, communication, transparency, and flexibility to respond quickly to changing circumstances.

As we now know this is a problem that is not going to be solved by one state, or one agency. As a region the Great Lakes states have a long and established history of using a proactive and collaborative approach. 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 invasive species moving between the Great Lakes and Mississippi basins. Thank you and I will answer any questions you have.

Senator STABENOW. Thank you very much.

Mr. Tim Eder. Welcome.

STATEMENT OF TIM EDER, EXECUTIVE DIRECTOR, GREAT LAKES COMMISSION, ANN ARBOR, MI

Mr. EDER. Thank you, Chairwoman Stabenow. Thank you for this opportunity to testify today.

My name is Tim Eder, and I'm the executive director of the Great Lakes Commission, which represents the eight Great Lakes States, Ontario, and Quebec.

Let me begin by emphasizing that the Great Lakes States and our Canadian partners have grave concerns about the dire threat that Asian carp pose to the ecological and environmental integrity of our region's most valuable natural resource. Stated directly, Asian carp have the potential to devastate the Great Lakes ecosystem, as well as the jobs and economic vitality of the communities that depend on our lakes. For more than a decade, we have known that Asian carp were approaching, and we've been trying to prevent their introduction.

Let me be clear about how appreciative we are of the efforts of the State of Illinois, the other States that have been involved, and the other Federal agencies that you've heard about, testifying here earlier today.

Unfortunately, events over the past year show that our efforts have been inadequate to date. The key message I bring is that our region must act together in a more coordinated and decisive man-

* Graphic has been retained in subcommittee files.

ner if we're to keep Asian carp out. Unless more effective short-term, and especially long-term, solutions are accelerated, we fear it is only a matter of time before the Asian carp invade.

First, I want to convey some recommendations on immediate actions to strengthen the Asian Carp Control Strategy Framework and associated efforts to implement it.

No. 1, Federal agencies must improve how they're organizing and coordinating their response effort. This should include the appointment of a single point of contact or incident response coordinator. At the same time, the Federal response must respect State authorities. This is not simply an acknowledgment of State sovereignty, but also recognition that the States are indispensible allies. I should point out that, as you've just heard from the State of Illinois' extraordinary efforts, this is not a concern, as much as an acknowledgment that it's something that needs to be continued to be paid attention to.

No. 2, communication and coordination must be improved. It has not always been clear how the Regional Coordinating Committee and its workgroups are structured, how membership is determined, and what the scope of work is, and how communications are executed. One option would be to include participation from each of the States. We appreciate you bringing up the point about Michigan's participation, earlier today, Senator.

No. 3, assess the risks throughout the watershed divide to identify places like the Wabash/Maumee that pose the greatest risk of allowing the movement of Asian carp. We're pleased that the legislation recently introduced by you and Senator Durbin would expedite this work.

No. 4, while it's important to evaluate all areas where Asian carp could enter the Great Lakes, the Regional Coordinating Committee should continue to focus on the Chicago area.

No. 5, the States were very troubled to learn that there's been a gap in e-DNA testing. The Federal Government should immediately reinstate the use of this important tool.

No. 6, we need to ensure that Federal agencies budget for ongoing monitoring and control. This is not a special or a one-time expense, but, rather, an ongoing part of management responsibilities.

Now I want to turn to long-term solutions. While improved near-term actions are vital, Federal agencies must commit to a permanent, long-term solution. If we've learned anything from the past year, it should be that current efforts are unsustainable and, we fear, will ultimately fail.

There's a clear consensus among the Great Lakes States that the best long-term solution is to permanently sever the artificial hydrologic connection in Chicago. Earlier this year, the Great Lakes Commission agreed unanimously—all eight States—that, quote, "The best permanent solution for the health of both the Mississippi River and the Great Lakes watershed is ecological separation, with the goal being preventing the movement of invasive species between the watersheds.

As a practical matter, ecological separation means physical separation at one or more places in the Chicago area. Unfortunately, there's been little progress by the Federal Government toward this goal. The Corps of Engineers currently projects that the first phase

of their study will not be completed until late 2012, with the full study projected to be completed in 2014. This timetable is acceptably long.

Another problem is that the Corps intends to consider ecological separation as one of but several options. For that reason, we strongly support the legislation that you and Senator Durbin now recently introduced that will direct the Corps to specifically study hydrologic separation while carefully assessing options to accommodate current uses of Chicago area waterways.

It is also critical that Congress provide the funding necessary for the Corps to complete this work. The administration has requested only 400,000 for this study in FY11, which, unfortunately, is too little.

In conclusion, I want to echo you, Senator Stabenow, earlier this year. You noted—I believe it was in Ypsilanti—that there are certainly problems associated with controlling carp that we can solve. For example, separating the Great Lakes from the Mississippi River is a big challenge, to be sure, but a problem that we cannot solve is the Great Lakes that have been infested with Asian carp. We haven't lost the battle against Asian carp, but without accelerated action, we could be close. We must not be the generation that allowed Asian carp into the Great Lakes on our watch.

I thank you for your steadfast efforts in this regard, Senator. I'd be happy to answer any questions that you might have.

[The prepared statement of Mr. Eder follows:]

PREPARED STATEMENT OF TIM EDER, EXECUTIVE DIRECTOR, GREAT LAKES COMMISSION, ANN ARBOR, MI

INTRODUCTION

Madame Chair and members of the Water and Power Subcommittee, thank you for the opportunity to testify on the urgent situation surrounding the discovery of Asian carp in Lake Calumet—just six miles from Lake Michigan. My name is Tim Eder and I am executive director of the Great Lakes Commission. The Great Lakes Commission is a public agency established by the Great Lakes Basin Compact in 1955 to help its eight member Great Lakes states and associate member provinces of Ontario and Québec speak with a unified voice and collectively fulfill their vision for a healthy, vibrant Great Lakes-St. Lawrence River region.

ASIAN CARP THREATEN THE VALUABLE ASSETS OF THE GREAT LAKES

The Great Lakes states and provinces have grave concerns about the dire threat Asian carp pose to the ecological and environmental integrity of the region we call home. In brief, our Great Lakes region faces a crisis, and we must act with urgency commensurate with the implications of this crisis. Stated directly, Asian carp have the potential to devastate the Great Lakes ecosystem and the jobs and economic vitality of the communities that depend on the Great Lakes.

Containing 20 percent of the world's fresh surface water, the Great Lakes are an extraordinary natural resource for our country and our neighbor to the north. The lakes provide valuable ecological and economic benefits to the more than 33 million Americans and Canadians who live in the basin, including transportation for raw materials and finished goods; fresh water for industries; drinking water for communities; recreation for citizens; and a vibrant ecosystem for diverse communities of plants and animals. Despite the current economic climate, the Great Lakes regional economy remains the third largest in the world behind only that of the United States and Japan. The invasion of Asian carp has the potential to cause irreversible damage to these valuable commercial, recreational and ecological assets. Due to their rapid reproduction, growth patterns and ability to outcompete native fish, the Asian carp population established in the Mississippi River basin has experienced unparalleled population growth. In a three-year span, the commercial harvest of bighead carp in the Mississippi River Basin went from 5.5 to 55 tons—a ten-fold in-

crease.[1] In some areas of the Mississippi and Illinois River, the Asian carp now make up more than 95% of the biomass.[2] Of particular concern is the looming threat Asian carp pose to the Great Lakes recreational boating industry and commercial, sport and tribal fisheries that generate a combined economic benefit of more than $16 billion in the region.[3]

In addition to the recent discovery of Asian carp in Lake Calumet, they continue to approach the Great Lakes basin through other waterways. For example, Asian carp continue to migrate up the Wabash River, a tributary of the Ohio River, where they are actively spawning within 100 miles of the headwaters of the Wabash. The Wabash is separated from the Maumee River, which drains to Lake Erie, by a floodplain. There is legitimate and justified concern that flooding in this area could create a temporary connection between the Wabash and Maumee rivers and provide a pathway for Asian carp to enter Lake Erie at the very heart of the Great Lakes. It is worth noting that flooding in the Mississippi River in the early 1990s provided one of the pathways for Asian carp to escape from commercial fish ponds into the river and begin their migration northward toward the Great Lakes.

We have long known the potential for Asian carp and other non-native aquatic species to enter the Great Lakes from points around and beyond the Chicago area. The recent capture of a live carp in Lake Calumet should give new urgency to direct our actions to the points where the Great Lakes are artificially connected to other watersheds, beginning with the Chicago area.

It is imperative that our region act together in a coordinated and decisive manner if we are to protect the Great Lakes from invasion by Asian carp. Our region has a long history of working with the federal government on Asian carp control. Our experience with the construction of the electric dispersal barrier system on the Chicago Sanitary and Ship Canal near Chicago goes back to the early part of the last decade. Unfortunately, these experiences do not fill us with confidence in the ability of the federal government to move quickly and decisively to confront current challenges.

However, we recognize that this is a new day. We hope that recent events will ignite and accelerate the coordinated and urgent response that the situation demands. Now, more than ever, we need leadership from the federal government, a response that is coordinated closely with state agencies, and an aggressive plan of attack that matches the urgency of this crisis.

THE FEDERAL RESPONSE MUST ACCELERATE BOTH SHORT AND LONG-TERM ACTIONS

The recent discovery of Asian carp only six miles from Lake Michigan has severe implications for our region's economic and ecological health. Unless both short-term and long-term solutions are implemented quickly, it may only be a matter of time before Asian carp invade the Great Lakes. If a self-sustaining population becomes established, the carp will be difficult—and most likely impossible—to control or eradicate.

Our region has been calling for concerted action to prevent the introduction of Asian carp into the Great Lakes for nearly two decades. Most recently, in February of 2010 the Great Lakes Commission unanimously adopted a resolution that recognizes ecological separation of the Great Lakes and Mississippi River watersheds as the best, permanent solution to preventing the movement of invasive species between the watersheds. It calls for a unified, immediate, and substantial commitment of resources to investigate and identify alternatives for existing uses of the Chicago Sanitary and Ship Canal (CSSC). It is worth emphasizing that this resolution was adopted with support from all eight of the Great Lakes states, Ontario and Québec.

The discovery of live Asian carp in and near tributaries of the Great Lakes heightens the urgency of finding and implementing long-term solutions that will permanently prevent further exchange of invasive species between the Great Lakes basin and the Mississippi watershed. The long timeframe of the Corps of Engineers' study of ecologically separating the Great Lakes basin from the Mississippi watershed is unacceptable and does not inspire confidence that the federal government is reacting with the urgency that is required.

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[1] Chick, J.H. and M.A. Pegg (2001) Invasive carp in the Mississippi River basin. Science 292 (5525):2250-2251.

[2] MICRA (2002) Asian carp threat to the Great Lakes, River Crossings: The Newsletter of the Mississippi Interstate Cooperative Resource Association 11 (3):1-2.

[3] U.S. Army Corps of Engineers (2008), In response to Public Law 106-53, Water Resources Development Act of 1999, Section 455(c), John Glenn Great Lakes Basin Program, Great Lakes Recreational Boating, Submitted to Congress Dec. 15, 2008; Barnhart, G. (2005) The Threat Posed to the Great Lakes Basin by Asian Carp, accessible at: http://www.glfc.org/fishmgmt/testimony__AsianCarp.pdf.

Moreover, recent discoveries heighten the urgency to accelerate critical short-term actions needed to ensure that Asian carp do not enter and establish reproducing populations in the Great Lakes. Federal agencies must coordinate closely with state agencies and must take all necessary actions described in the Asian Carp Control Strategy Framework to monitor, detect and eradicate Asian carp in the Chicago Area Waterway System (CAWS) and other points where the Great Lakes are artificially connected or where they could be temporarily connected with other watersheds.

Asian carp are both the most imminent and likely the most damaging threat to the Great Lakes. We must act immediately if we are to prevent this threat from becoming a reality.

THE NEED FOR CONCERTED ACTION: THE ASIAN CARP CONTROL STRATEGY FRAMEWORK

In February 2010, the U.S. EPA-led Asian Carp Regional Coordinating Committee released the draft Asian Carp Control Strategy Framework providing a blueprint for action by federal and state agencies and other partners. The framework was updated in May. It provides an important summary of short-term strategies for combating the invasion of Asian carp; clarifies the roles and responsibilities of the federal, state, municipal and other agencies involved; and identifies funding sources to pay for immediate action.

Several of the Great Lakes Commission's member states provided comments on the Framework when it was published as a draft in February. In general, the states recognized the Framework as an articulation of various short-term and other measures that federal and state agencies will take to monitor and control the spread of Asian carp.

States have recognized positive actions called for in the Framework, but they also have identified significant concerns about the Framework. These points do not reflect a consensus of all eight states. But, to summarize the comments from the some of the states, below are some of the positive aspects of the Framework:

- Completion of dispersal barrier IIb on the CSSC by October 2010;
- Construction of interim barriers between the Des Plaines River and the CSSC to prevent the transfer of Asian carp during flood events;
- Research on Asian carp spawning, habitat, and feeding habits and associated risks of becoming established in the Great Lakes; and
- Increased outreach to and participation by other stakeholders and agencies.

Similarly, and again, not reflecting the views of all states, some of the concerns identified by the states include:

- Failure to call for closure of locks and other structures on the CAWS, or to change their operations or modify their structures, while a permanent solution is developed and implemented;
- Lack of adequate short-term control measures in the CAWS;
- Lengthy timeframes for implementing control strategies, conducting studies, and advancing ecological separation of the Great Lakes and Mississippi River watersheds;
- Failure to study alternate modes for transferring cargo besides that provided by the CAWS;
- Inadequate measures to prevent the transfer of Asian carp eggs and larvae via ballast water in commercial vessels; and
- Insufficient communication with and formal participation from the Great Lakes states in the Asian Carps Regional Coordinating Committee.

In May, the attorneys general of five of the eight Great Lakes states conveyed a detailed critique of progress under the Framework. In correspondence to the commander of the Corps of Engineers' Great Lakes and Ohio River Division, the attorneys general noted that:

> In sum, apart from the already planned improvements . . . relatively little concrete action has been taken under the Framework since February to prevent the migration of Asian carp into Lake Michigan. Even the limited "modified structural operations" proposed by the Corps as an alternative to lock and sluice gate closure, have yet to be implemented as initially described in the Framework. And, significantly, the critical first step toward a permanent solution—a feasibility study evaluating permanent ecological separation of the CAWS from the Great Lakes—remains, under the May Framework[ ], years away from completion.

Their next statement aptly reflects the collective sentiment of the Great Lakes states: "Further delay is unacceptable."

The measures called for in the Framework clearly are necessary in the near term and must be implemented. However, the fundamental criticism of the Framework is that it does not provide a clear track on an acceptable timetable to the most permanent, sustainable and effective solution to keeping Asian carp out of the Great Lakes.

Thus, reiterating the key message from the Commission's February 2010 resolution, we must commit to ecological separation of the Great Lakes and Mississippi River watersheds as the only permanent and most effective long-term solution to keeping Asian carp from entering the Great Lakes through the CAWS. More than anything else, this was the predominant theme consistently conveyed by the states in reaction to the Framework.

RECOMMENDATIONS FOR IMMEDIATE ACTION

The crisis we face requires a re-examination and acceleration of our collective efforts. As Senator Durbin remarked in a recent statement, "We have to go at this as if we were at war. The viability of the Great Lakes is at stake."

Notwithstanding our comments above and the concerns our states have expressed, the Asian Carp Control Strategy Framework forms a foundation for improving and accelerating regional action in response to the recent discoveries. The Great Lakes states offer the following recommendations to strengthen this foundation and ensure the timely and comprehensive protection of our valuable resources:

Establish a more organized and coordinated federal response to Asian carp

A fundamental need at this moment is to improve how federal agencies are organizing and coordinating their response efforts to reflect a greater sense of urgency and accountability. There must be a single and clear point of contact overseeing the collective federal effort, empowered to ensure action and provide the requisite accountability. Federal agencies must be given the authority and the ability to marshal all of the resources necessary to expeditiously thwart the further advance of Asian carp toward the Great Lakes.

At the same time, it is also critical that the federal response be managed in a way that respects the authorities of states to manage natural resources within their borders. This is not simply an acknowledgement of state sovereignty, but also recognition that the states are indispensible allies in the battle against Asian carp. States have intimate knowledge of the waterways within their borders and staff and equipment "on the ground" throughout the region poised to support monitoring, control and eradication efforts. This was aptly demonstrated during last year's large-scale chemical treatment of the CSSC, when the Great Lakes states and the Canadian provinces of Ontario and Québec pulled together to contribute staff, equipment and funding to support the interagency operation.

Improve communication and coordination with states and other partners

The Regional Coordinating Committee (RCC) has spearheaded monitoring and control efforts in the CAWS to date but it is not clear to the states how this committee and its workgroups are structured, how membership is determined, what the scope of work is and how communications are planned and executed. Unfortunately, this has resulted in confusion and a lack of effective integration of our collective efforts. One option would be to expand the RCC to include an opportunity for participation from each of the Great Lakes states. Until recently, the only state represented on the RCC was Illinois. We understand that Indiana and Ohio have recently been added. Clearly, Asian carp are a threat to the entire Great Lakes region and a more effective mechanism is needed to coordinate our intergovernmental partnership.

Assess risks throughout the watershed divide

A risk assessment exercise should be undertaken immediately to identify the places that pose the greatest risk of facilitating the movement of Asian carp from the Mississippi River watershed to the Great Lakes basin. While this is (at least in part) the intended focus of the Corps of Engineers' Great Lakes and Mississippi River Interbasin (GLMRIS) study—currently projected for completion in 2014—recent evidence indicates that a quicker and more comprehensive approach is required. Risk assessments must be conducted on all tributaries of the Mississippi River and artificial connections between the Mississippi watershed and Great Lakes basin which Asian carp can potentially use to breach the divide between the two ecosystems. Once the highest risk locations are identified, resource agencies should follow up using eDNA and traditional monitoring to track movement of carp and en-

sure early detection. Rapid response plans must be put in place to thwart any possible migration. We are pleased that such a monitoring effort is called for in the legislation recently introduced by Senators Stabenow and Durbin. In addition, as called for in the Stabenow-Durbin bill, we urge close consultation with the Great Lakes states both to respect their jurisdictional authorities and to utilize their knowledge of the watersheds and associated hydrology.

Continue to focus on the CAWS as the highest priority

While it is important to evaluate the risk of Asian carp moving to the Great Lakes at all points along the watershed divide, the RCC should continue to focus the brunt of its efforts on the CAWS. The finding of the bighead carp in Lake Calumet and the numerous positive eDNA samples indicate the presence of Asian carp in several locations upstream of the electric barrier. It is essential that response activities continue to be focused in the Chicago region.

Immediately accelerate eDNA testing

The discovery of Asian carp in Lake Calumet and other areas such as the Wabash River should trigger an aggressive effort to document and verify the extent of Asian carp populations in these areas. The Commission is troubled to learn that there has been a gap in eDNA testing during this critical time. This is an example of how an aggressive, coordinated federal response has been lacking. The federal government should immediately reinstate the use of eDNA testing to better understand the populations in the CAWS and at other potential points of hydrologic connection.

RECOMMENDATIONS FOR A PERMANENT, LONG-TERM SOLUTION

There is a clear consensus among the Great Lakes states that the best long-term solution to prevent the exchange of invasive species—including, but not limited to, Asian carp—between the Great Lakes basin and the Mississippi River watershed is to permanently sever the artificial connection between the two watersheds. Although the states have disagreed in the past on whether the threat from Asian carp is sufficient to close the O'Brien and Chicago locks, there is now no disagreement that permanent ecological separation is the best longterm solution.

At the Great Lakes Commission's semiannual meeting last February in Washington, D.C., our Commissioners unanimously approved the attached resolution. Our Commissioners—representing all eight of the Great Lakes states, Ontario and Québec—agreed unanimously that "the best permanent solution for the health of both the Mississippi River and Great Lakes watersheds is ecological separation, with the goal being preventing the movement of invasive species between the watersheds, and that the pursuit of this goal must start with a unified, immediate, and substantial commitment of resources to investigate and identify alternatives for existing uses of the CSSC, including for stormwater and wastewater control and commercial and recreational navigation."

The resolution further "calls on Congress and the Obama Administration to immediately provide substantial resources to expedite the investigation and implementation of permanent solutions to prevent the transfer of aquatic invasive species between the Great Lakes and Mississippi River basins and that the first phase of these studies, those related specifically to the CSSC, be completed no later than Sept. 30, 2011, and be followed by an aggressive timetable for implementation."

Although chemical, biological, and interim physical methods are essential to repelling the immediate invasion of Asian carp into the Great Lakes and adjacent waterways, these solutions are neither economically nor environmentally sustainable. The goal of permanent ecological separation would be to entirely prevent the interbasin transfer of aquatic invasive species between the Mississippi River and Great Lakes watersheds via the CAWS.

Ecological separation is a relatively simple concept: it means taking steps to prevent the interbasin transfer of aquatic organisms through the waterways. It means preventing the movement of all aquatic organisms—at all life stages—via canals and waterways between the watersheds. As a practical matter, ecological separation means physical separation of the watersheds at one or more places in the CAWS. For our purposes, ecological separation is synonymous with hydrologic separation.

The CAWS encompasses a complex system of rivers, canals and navigation structures centered in the Chicago metropolitan area but stretching into Indiana and west toward the Mississippi River. Begun in the 19th century to facilitate the movement of commercial goods between the Great Lakes and the Mississippi River, the waterway system has evolved over more than a century to support an array of important uses, including commercial transportation, recreational boating, wastewater management, flood control and emergency response. Achieving ecological separation likely will require modifying existing water infrastructure or building physical bar-

riers to stop the flow of water while maintaining the system's benefits. Ideally, if done correctly, ecological separation will not only solve a serious threat to the health of the Great Lakes, but also improve the overall transportation and water management system of the greater Chicago area.

Unfortunately, progress by the federal government toward this goal has been unacceptably slow. In the Water Resources Development Act of 2007, Congress authorized the Corps of Engineers to conduct a feasibility study of "the range of options and technologies available to prevent the spread of aquatic nuisance species between the Great Lakes and Mississippi River Basins through the Chicago Sanitary and Ship Canal and other aquatic pathways." Under this study (GLMRIS) the Corps intends to consider separation as but one option. To date, there has been virtually no visible progress toward completing the study. The Corps of Engineers has yet to even complete a project management plan, one of the first steps in beginning the study. No public meetings have been held or scheduled, and no notices or updates on progress under the study have been released. The Corps of Engineers is currently projecting that the first phase of the study will not be completed until late 2012, with the full study projected to be completed in 2014. This timetable is unacceptably long.

Clarify the direction, accelerate the timetable and provide funding for the Corps of Engineers study of hydrologic separation

It is essential that Congress and the Administration provide the Corps of Engineers with a clear directive and the funding necessary to accelerate the timetable for completing the GLMRIS study. The resolution adopted by the Great Lakes Commission calls for completion of the first phase of the study—the portion focused on the CAWS—by September 2011. Thus, we support the legislation introduced recently by Senators Stabenow and Durbin, which gives the Corps a necessary and clear directive to conduct a study that focuses on hydrologic separation of the Great Lakes basin and the Mississippi watersheds. The legislation calls for completion of the study within 18 months of enactment. The legislation also properly directs the Corps to carefully assess options to accommodate the uses currently provided by the CAWS, including flood prevention, wastewater, waterway safety operations, and barge and recreational traffic alternatives.

In addition to providing the Corps with clear marching orders and an aggressive timetable, Congress must provide the appropriations necessary to complete the study in a timely fashion. We are concerned that the Administration's budget calls for only $400,000 for the GLMRIS study for next fiscal year. To be done correctly, a study of this magnitude and complexity clearly requires significantly more funding.

In conjunction with the Great Lakes and St. Lawrence Cities Initiative, the Great Lakes Commission intends, pending successful completion of raising the needed funds, to initiate an independent study to research options for ecological separation. The study is intended to complement, support and help accelerate the work of the Corps, not duplicate it. The study team would operate in close coordination with the Corps' feasibility study, either the GLMRIS study and its interim report(s) or a new study that would be initiated by the Stabenow-Durbin legislation. An independent study team can provide a more concerted and detailed focus on how to achieve ecological separation than likely will be produced by the Corps, and in a much quicker timeframe. Based on experience to date, it will also afford states, cities, tribes, and other affected stakeholders a greater opportunity to provide input, define key questions and establish criteria for developing and evaluating the scenarios for ecological separation.

Ensure federal agencies budget for ongoing monitoring and control of Asian carp

Safeguarding the Great Lakes against Asian carp will be an ongoing need for many years to come. As discussed, achieving ecological separation of the Great Lakes basin and Mississippi River watersheds will be complex and will take years to implement. In the meantime, it is imperative that we maintain the highest level of vigilance in keeping Asian carp out of the Great Lakes. It bears repeating that, once established, Asian carp most likely will be impossible to control or eradicate and the economic and ecological impacts could be devastating. While they may take years to migrate among the Great Lakes, migrate they likely will, just as zebra mussels, round gobies, spiny water fleas and a host of other damaging aquatic invasive species have migrated across the Great Lakes. Thus, it is imperative that federal agencies include the costs of Asian carp monitoring and control in their base budgets. This is not a special or one-time expense, but, rather, an ongoing part of their management responsibilities for the Great Lakes. We must not allow the President's unprecedented commitment to restoring the lakes under the Great

Lakes Restoration Initiative to become the only source of funding for these baseline management responsibilities.

SUMMARY OF KEY REQUIRED ACTIONS

In summary, the Great Lakes Commission urges Congress and the Administration to implement the following actions that are urgently needed to prevent Asian carp from invading and permanently devastating the ecological and environmental health of the Great Lakes:

- Strengthen the Asian carp response structure with improved transparency and communication, increased participation from the Great Lakes states, a single point of contact with authority to marshal all necessary federal resources and clear accountability for action;
- Maintain close cooperation with state agencies, utilize their expertise and respect their legal authorities and jurisdictional rights; and
- Maintain and accelerate the use of eDNA testing in the CAWS and other areas where Asian carp may be present;
- Initiate a regional risk assessment to identify places that pose the greatest risk of facilitating the movement of Asian carp from the Mississippi River watershed to the Great Lakes basin;
- Ensure that federal agencies budget for Asian carp control efforts in their base programs to ensure that these ongoing costs do not undermine progress being made under the Great Lakes Restoration Initiative;
- Commit to and move aggressively toward developing and implementing ecological separation of the Great Lakes basin and Mississippi River watershed as the best permanent long-term solution to preventing the exchange of aquatic invasive species between the two;
- Accelerate the Corps of Engineers GLMRIS study to provide an interim report on the CAWS within 18 months and provide the Corps with all necessary funding and authority to carry out this and related studies as expeditiously as possible and to implement any needed emergency response actions.

CONCLUSION

The Great Lakes are a national treasure and a vital economic asset for our region and our country. Last year President Obama began the Great Lakes Restoration Initiative (GLRI), an unprecedented, multi-year commitment to implement a comprehensive restoration plan for the Great Lakes that was guided by our region's governors and broadly endorsed by states, cities, tribes, business and industry, environmental and conservation groups, and other stakeholders. The GLRI is a wise investment that advances our broader strategy to create jobs, stimulate economic development and invest in freshwater resources that are a critical component of our regional economic infrastructure.

However, just as we are poised to make historic gains in restoring the Great Lakes, we are faced with the prospect of watching them suffer great ecological damage. Even worse, we have seen this threat coming. For more than a decade, federal and state agencies have been taking action to prevent Asian carp from getting into the Great Lakes. The past year has made it painfully clear that our efforts to date have been inadequate.

We haven't lost the battle against Asian carp, but without accelerated action, we could be close. We face a crisis and must respond correspondingly. It is imperative that we take the near-term actions needed to push back against the forward movement of Asian carp while committing to a long-term vision that permanently protects our economic and ecological health. There are challenges to surmount and difficult problems to address. But, just as more than a century ago the City of Chicago reversed the flow of the Chicago River, we can tackle the problems associated with separating the Great Lakes basin and Mississippi River watersheds. A problem that we cannot solve, however, is a Great Lakes infested with Asian carp. We must not be the generation that allowed what may be the most damaging invasive species into the Great Lakes on our watch.

I thank you for your time and welcome any questions you may have.

Senator STABENOW. Thank you very much, to both of you, for coming.

First, Mr. Eder, I'll start with you. You talked about a gap in e-DNA testing. Could you talk a little bit more about that?

Mr. EDER. Yes, there was a contract with the—with Notre Dame University. They were the ones that developed the e-DNA sampling

technique—the technology. They were doing it on sort of an experimental basis, to prove that it would work. Of course, as you know, they found—they had—e-DNA hits of positive results were shown in a number of places in the Chicago area. That contract has been concluded, and they're in the process of transferring that authority over to the Corps of Engineers. In the meantime, there has not been any e-DNA testing. This took place—this gap has occurred at the time when the carp was found—the live carp was found.

Now, there have been other efforts underway. You know, one way to look at it is that we know that the carp are there. We've had numerous e-DNA hits. We've found one live Asian carp. So, part of the use of the tool is to tell—to give us an early indicator that carp may be present. We know that carp may be present, now. So—but, we think it's important to reinstate that tool and use it, not only in the Chicago area, but in other places, like the Wabash/Maumee and other places that have been talked about, where there's a potential connection.

Senator STABENOW. Mr. Rogner, you were talking about e-DNA testing. At this point, is it—is that stopped because of what Mr. Eder was talking about? Or, are you doing something separate? I mean, what—where are we with this? What do we need to do to—it seems to me, this is a pretty basic part of monitoring that we have got to keep going.

Mr. ROGNER. That's absolutely correct. There are really a couple of things going on. One is, under the RCC structure, we have a variety of work groups, one of which is the Monitoring and Rapid Response Workgroup. What that group is doing right now is, developing a comprehensive e-DNA sampling plan for the entire Chicago Area Waterway System. We've developed a draft of that. We've sent it to the workgroup for reviews. We'll be finalizing that. Then that will be our blueprint for how we use e-DNA sampling to inform our management actions, going forward. I expect that to be completed very soon.

There is a—we are in a period of transition right now from the—formerly, the Lodge of—the lab of Dr. David Lodge, at Notre Dame, doing the work, to the Corps of Engineers taking the e-DNA sampling work over, themselves. My understanding, we're just a matter of a few short weeks from them being able to take this program over, begin doing the sampling and the analysis, so that we hope that sampling will resume, actually, very quickly.

Senator STABENOW. As we all know, I mean, the fish aren't taking a break. So, every day counts on this. I'm always concerned when I'm hearing—I understand the need for standards and for committees and so on, but we need to move as quickly as possible on this. So, if there—again, if there is an issue where we need to intervene or push, or if there's some reason this is not happening fast enough with the Corps, we're—we will monitor this. We will go back and double back on what's happening, because—I'm not questioning intentions, but, you know, as we listen to all of this, and we look at what has been done, and the intensity of the work that you have had to keep doing, obviously there's a great sense of urgency about not wasting any time at all about this. So, I appreciate, Mr. Eder, your raising this so that this is something we will go back and monitor.

From the Commission's standpoint, what is the view of the Federal Government's role and reaction—or State partners—to the carp that was found in Lake Calumet? In your view, was the response adequate? Is there more that the Federal Government or the State government should be doing, in the context of the fish that was found?

Mr. EDER. It's pretty clear, from the testimony that you've heard, that the State of Illinois and the Federal partners are doing an awful lot to try to capture any carp that might be present. I—frankly, I don't know what else could be done. You asked the previous panel about the use of rotenone. I think there's probably pretty good reasons why rotenone hasn't been used, or they would have tried it. So, I'm not sure what else they could have done in that particular case.

Senator STABENOW. OK.

Mr. Rogner, with all the work that's being done—I mean, it—and there's no question—I mean, the intensity, the hours, the efforts that are going into place—it does raise the question, when listening to all this, of, How long can we keep this up? I mean, again, the fish aren't going to go away. You know, we have to keep this up until we have a permanent solution. But, why aren't we closing the locks and—or—and addressing what are legitimate concerns in Chicago? Obviously, you would have to open them if there was a concern about flooding, or have to deal with other issues. But, why isn't closing the locks right now a part of that strategy?

Mr. ROGNER. Of course, the State of Illinois does not operate the locks.

Senator STABENOW. Right.

Mr. ROGNER. So, we don't have——

Senator STABENOW. No, I understand.

Mr. ROGNER [continuing]. The capacity to do that kind of management action. The Corps has made the decision that the best way to operate the locks is to close them, in support of actual fish-suppression operations, presumably because they are in agreement with our conclusions, at this point, that fish are there in very low numbers, if they're there at all. So, I presume that that's the reason for their decision, although I cannot speak for the Corps of Engineers.

You're certainly aware of the impacts that could occur if the locks were closed and—the impacts on storm water and waste water, and navigation, also, of course. So, the State of Illinois is concerned about those impacts. We are more than willing to engage in conversations about separation of the 2 systems. We're going to be a full participant with the Corps of Engineers in their GLMRIS study. We hope that we can find some kind of acceptable middle ground that works for the economy of the State of Illinois, but also for the ecology of the Great Lakes.

Senator STABENOW. I appreciate that. It is—when we look at the devastation to the Great Lakes if we see the Asian carp take hold in the Great Lakes, and what could happen—the economic impact, the quality-of-life impact—even though there are certainly very legitimate issues around Chicago, I'd much rather be focusing on ways to redirect commercial activity, and funding that, which is

much cheaper than what in the world we would do if this—if the Asian carp got into the Great Lakes.

So, you know, I appreciate the issues. Certainly you have to manage things, in terms of flooding, as well. But, when we look at relative cost and risk and permanent damage, it seems to me that, even though we're going to move the Army Corps of Engineers to move much more quickly—and, Mr. Eder, you're right—I mean, we can't be talking about something that has an interim report in 2012 and a final report in 2014. I mean, that's just absolutely unacceptable. We have to tighten up the focus on what the Army Corps is being asked to do—directed to do—to specifically look at hydrological separation, which is what our legislation would do, and then give a much shorter timetable, and obvious—funding. Obviously, we have to make sure it can actually be done.

But, again, when I look at and listen to all of the efforts that have to be going on right now, and the intensity of that, we have to find a permanent solution as quickly as possible. I also believe that if, in fact, that's not going to happen for a while, that medium-term efforts on the locks have to be seriously looked at if we're going to—unless you think you can keep up the level of activity that you're talking about and—which you're going to have to do, by the way. I mean, we have no choice. You're going to have to keep up that level of focus right now, as we expand with some of the other things that were being talked about, as well.

Let me ask, from the Illinois DNR standpoint, about the effectiveness of the electric barriers, again. We've put—up to this point—up until the e-DNA was found, we have been very focused on the electric barriers, adding an electric fence, getting a third one in place. How effective do you believe these barriers are in keeping the carp from passing upstream, and how much will a third barrier add to the security system, in your judgment?

Mr. ROGNER. As Dr. Carl explained earlier, the Corps of Engineers is operating the barriers now at a set of operating parameters that tests have shown should be very, very effective. Now, prior to last fall, it was being operated at a lower voltage, lower frequency, different pulse rate. Of course, when the DNA first suggested that the fish might be closer to the barrier system than we had previously realized, they upped the operating parameters to make it more effective—again, based on data that they had.

So, we believe that it will be very effective—a very effective tool. Obviously, if you add redundancy to a barrier system, you incrementally increase the effectiveness of that system. So, additional barriers, no question, would add an additional safety margin and additional safeguards that would ultimately make it a more effective system, no question.

Senator STABENOW. Now, I wonder if you might talk about the new Asian Carp Initiative that the Governor has just announced and that you mentioned—talk a little bit more about the initiative to combat the Asian carp. It sounds like it's really about reducing the populations, in terms of commercial fishing and the other efforts. Can you explain how this will really prevent the spread of the carp to new places? I think some people back home may not understand why you'd want to promote a fishery for the fish, when

we're trying to keep them out of the Great Lakes. So, wonder if you might talk more about that.

Mr. ROGNER. Sure. Absolutely. First of all, there's a pretty established principle of invasion biology that—what you want to do is reduce propagule pressure against new areas where a species might otherwise tend to invade. So, the whole focus of this is to keep the numbers of carp downriver, at much, much lower numbers, so you won't have the number of carp trying to test the barrier and potentially, occasionally, some getting through. So, that's the whole idea behind it.

What we're doing is kind of a two-phased approach. In the upper reaches of the river nearest the barrier, where Asian Carp are in low numbers right now, there would not be a market-based way of making commercial fishing work, because there just aren't enough carp there. Yet, we know we need to reduce populations, beginning at the barrier and then extending downriver. So, what we're doing, again, using GLRI money—Great Lakes Restoration Initiative funds—we're actually contracting ourselves with commercial fishermen to go in those upstream areas and just start hauling fish out. Again, they began that operation several weeks ago, and, in 1 day, hauled out 2600 pounds. So, we know they know how to catch them. They can reduce their numbers. We did redeploy those people up to Lake Calumet when we caught that one bighead carp, but they've since been moved back below the barrier to start to remove those fish again.

But then, further downriver, where the Asian Carp are in great numbers, that's where we want to try and develop a profit-based commercial fishery. What we've done is, brokered a deal—again, using State of Illinois capital dollars—we've brokered a deal between a fish processor in Illinois and a Chinese meat processing company. These fish are considered a delicacy in China, where the per-capita fish consumption is enormous—way larger than what we're used to, here in the United States.

They view these fish as a delicacy. They're marketing them as coming from the pristine waters of America, versus the kinds of waters that they're typically grown in, in China. It's a marketing strategy they believe will be very effective.

So, the agreement is to haul out and sell 30 million pounds of Asian carp the first year, and another 30 million pounds in year 2. Then, we hope we can only increase it after that. Again, this is all focused on the Illinois River right now—not the Mississippi, but the Illinois—because obviously that's the portal, the gateway, the pathway to the Great Lakes.

But, it—there's no reason why the—if the markets are there, both foreign and domestically—why the commercial fishery couldn't continue to grow and be a strategy in other parts of the United States, as well.

We're very sensitive to the concern that this will create an incentive, perhaps, to move carp and establish them elsewhere. We'll have to be attentive to that. States and Federal Government will have to develop and apply and enforce the proper regulations to prohibit interstate transport, to prohibit establishment in new waters, certainly. But, at this point, we feel that we have no other alternative, no other feasible way to haul out the huge numbers of

carp that we really need to pull out to make a difference, and make sure that they have a minimal chance of moving upriver and establishing in the Great Lakes.

Senator STABENOW. So, basically, you are taking a portion of the Illinois River—downstream—you know, farther away from the Great Lakes, downstream of the locks and so on—and trying to haul out the fish so they don't swim upstream and aren't moving, essentially, closer, in terms of the electric barriers and the locks and so on. That's a very interesting strategy. I hope it works. I hope it helps. At this point, you said, though, this is Illinois River only, not Mississippi, because, of course, all of this started in the Mississippi River. But, at this point, you're talking about Illinois River.

Mr. ROGNER. Correct. Again, because that's the direct portal to the Great Lakes. But, where there are other threats, perhaps in the Wabash, as we've heard about earlier, that would be an approach that could be taken there, as well. We'll see how effective it will be, over the coming year or two.

Senator STABENOW. Thank you.

As we come to a close, Mr. Eder, I wonder if you would want to give any specific recommendations, in terms of better coordination or better communication. When you listed the areas that you would recommend that we focus on for improvement, is this primarily a Federal coordination in communication, or State, or both? Or what would you recommend, in terms of improving that?

Mr. EDER. I think you touched on one of the more important things that needs to be addressed, and that is inclusion of all of the States in the—either the Regional Coordinating Committee, or its successor, the next iteration of whatever mechanism is needed. It's clear that we need to look beyond the immediate area of the Chicago Area Waterway System. But, as I also said in my testimony, that's where we need to continue to focus. So, including all the States would be one thing.

As I said in my testimony, it's not always clear how decisions are made, when they're being made, and how communication is rolled out. There was some concern about how the information on the Wabash/Maumee was rolled out. Some of the States weren't happy with the timing and the way they received that information.

The other thing I will just say to you, in closing, Senator, is simply how important it is that we move forward with the interbasin transfer study, and specifically the study of hydrologic separation. Your legislation is absolutely critical to move that study forward on a much more quick timetable. If your legislation doesn't pass—and we certainly hope it does, and we're hopeful that we can help do whatever is necessary to make sure that that happens—but, if it doesn't, we hope that we can work with you and your colleagues to accelerate the Corps' existing study, because that's really the permanent long-term solution that we've all agreed on, in the Great Lakes Commission.

Senator STABENOW. We're going to move as quickly as we possibly can. I feel a great sense of urgency about this. The subcommittee is going to continue to be monitoring this very closely, and doing everything we can, not just monitoring, but following up on every suggestion, everything that we need to be focused on to

be able to both make sure that the resources continue to be there. This is something, of course, the Great Lakes resources, that the President included in his budget for the first time—the extraordinary investment of $475 million for Great Lakes protection, really came at a time when it was critical for us to have the flexibility to be able to respond, and for all of you to be able to respond as you have done.

So, we will continue to do everything we can. We appreciate both of your leaderships.

As I indicated before, the only area, Mr. Rogner, that we have a disagreement on is on the strategy of closing the locks. It's hard for us, in Michigan—you know, realizing we're a step away from this—but, it's hard for us to understand why we wouldn't do that as part of the strategy. So, we're going to continue to push forward for that, as part of the strategy, as well as support all of your other efforts that are happening, and address the questions that came up today regarding the gap in e-DNA testing, and how we can make sure that there's not a gap in testing, which is so critical, and be able to enhance the communication and coordination.

Part of that—and it was mentioned before—but, Senator Durbin and I and others have sent a letter to the administration asking that there be one person put in charge of coordination. I know there's been a tremendous amount of efforts going on with the Council, with the States, and so on. But, I believe we need one person that is in charge, that can be able to react quickly and respond, and for you to know who that person is and be able to coordinate things as directly as possible.

So, thank you, again, for being here.

At this point, I want to note that, if there is any additional written testimony for the subcommittee, we will receive that testimony from witnesses or from other members of the committee, to make it part of the official record. We'll keep the record open for a period of 2 weeks to receive additional statement. For the information of Senators and their staff, questions from the record are due by close of business day tomorrow.

With that, the subcommittee meeting is adjourned. Thank you.

[Whereupon, at 4:54 p.m., the hearing was adjourned.]

[The following statement was received for the record.]

STATEMENT OF ROBERT E. CARTER, JR., DIRECTOR, INDIANA DEPARTMENT OF NATURAL RESOURCES

Indiana has been an active participant in efforts to thwart the movement of Asian carp. We share your concern about the threat posed to the ecological balance of the Great Lakes. Indiana is a member of the Great Lakes Commission and Council of Great Lakes Governors, which have called for increased resources to be allocated to expedite efforts to close off avenues for Asian carp to reach the Great Lakes. In February, Governor Daniels sent a letter to Nancy Sutley, Chair of the White House Council for Environmental Quality, commending the aggressive yet balanced approach laid out in the "Control Strategy Framework." In that letter (attached for inclusion with this testimony), he raised concerns about rash calls to close locks in the Chicago Area Waterway System. In addition to the serious flooding problems that would result, lock closure also would displace significant commercial activity. The Ports of Indiana is in the process of completing a major study on the economic impacts of waterborne shipping on the Indiana Lakeshore, and the preliminary findings show an annual impact of:

- 104,567 direct, induced, indirect and related jobs;
- $14.2 billion of economic activity to the state;

- $567 million of state and local tax revenue; and
- 17,655 jobs and $1.9 billion in economic activity attributed to Indiana barge movements through the O'Brien Lock

This impact is huge, and yet just accounts for Indiana's 45 miles of coastline; it doesn't include the rest of the Great Lakes ports and industry.

Much attention has been placed upon the Chicago Area Waterway System, and rightfully so—it presents a direct pathway for Asian carp to move into the Great Lakes. However, it has long been understood that there are other potential natural and engineered connections. One of those potential connections is in northeast Indiana. Eagle Marsh straddles a geographic divide between the Wabash River (Mississippi River basin) and the Maumee River (Lake Erie watershed). Although the Wabash and Maumee basins drain in opposite directions and have no direct connection under normal conditions, their waters do commingle under certain flood conditions. The potential connection was originally created by glacial movement during the ice age.

The State of Indiana is taking a lead role in implementing a short-term step to address the advance of Asian carp up the Wabash River system and their potential movement into the Maumee River. A permanent solution to prevent Asian carp from being able to pass through this area during flooding conditions will take more time to develop, design and construct. Therefore, as an immediate preventive measure, the Indiana DNR will install mesh fencing across a section of the marsh, creating a barrier against passage of Asian carp between the Wabash and Maumee drainage basins.

The fencing will be substantial enough to withstand floodwaters but will be designed so it does not increase flood elevations and cause property damage. The goal is to have the fencing installed this summer. Additional monitoring will be conducted and more aggressive action taken if the threat warrants. I have attached additional information regarding Indiana's actions.

Indiana will continue to work with other states and federal agencies to develop appropriate actions to stop the advance of Asian carp toward the Great Lakes while maintaining the viability of Indiana's shipping economy.

ATTACHMENT

STATE OF INDIANA,
OFFICE OF THE GOVERNOR,
February 11, 2010.

MS. NANCY SUTLEY,
White House Council on Environmental Quality, 722 Jackson Place, NW, Washington, DC.

DEAR NANCY: Indiana remains firmly committed to preventing the establishment of Asian Carp in Lake Michigan. To do so, we must use many different control strategies and Indiana appreciates the approach you have laid out in the draft "Control Strategy Framework". It seeks to aggressively address a threat in a balanced and informed manner. Indiana will be a partner in further developing and executing the Framework.

As you note in the Framework, the Chicago waterway lock system is not a fish barrier and even when closed, fish may "simply swim through the lock". Further, there are many other ways for the Asian Carp to enter Lake Michigan completely independent of the lock system. One of those other pathways is through flooding, a danger the locks are currently used to prevent or minimize.

While some are demanding the extreme action of permanently closing the lock system, Indiana is committed to the multi-tiered approach laid out in the Framework. There is no single simple solution and we must utilize a variety of science and engineering-based approaches. We agree with you that we must embrace an aggressive but balanced approach.

The Framework points out the risk that permanent closure will cause serious flooding; to us that possibility is not hypothetical. Northwest Indiana is home to almost 800,000 Hoosiers, who have repeatedly suffered through the destruction and health dangers of severe flooding. In the last two years alone property damage amounted to $127 million and at least two lives were lost.

After decades of futile efforts to get flood controls on the Little Calumet River, Indiana and the Army Corps of Engineers are less than 12 months away from completing a levee system designed to control the water flows as we have known them for the last 100 plus years. If the lock system is permanently sealed, the water volumes will rise significantly (Chicago removes two billion gallons a day from Lake Michigan) and the levee system likely will be inadequate to protect the people,

homes and businesses in that water's path. There must be a credible plan to deal with all of the water not going through the locks before closing that system. The failure to do so would be dangerously irresponsible.

Indiana will be a partner in addressing the threat of Asian Carp, but not at the needless expense of increased flood damage and risk to life and property. The Framework is balanced and thoughtful and we look forward to assisting in its implementation.

Sincerely,

MITCHELL E. DANIELS, JR.,
Governor.

APPENDIX

RESPONSES TO ADDITIONAL QUESTIONS

RESPONSES OF NANCY SUTLEY TO QUESTIONS FROM SENATOR STABENOW

Question 1. On July 14, 2010, the Indiana Department of Natural Resources announced a plan to use a mesh barrier to prevent the potential movement of Asian carp up the Wabash River system into the Maumee River. Do you believe such a barrier is sufficient to prevent the movement of Asian carp through that system? Are there other preventative measures that should be taken to ensure that all potential pathways to the Great Lakes are covered?

Answer. As explained in more detail below, with respect to the Wabash River-Maumee River connection, the Indiana Department of Natural Resources (DNR) is implementing an effective interim solution while partner agencies are evaluating a more permanent solution. The US Army Corps of Engineers (USACE) and partner agencies are also in the process of evaluating other connections between the basins.

The US Geological Survey (USGS) has estimated that a 10% annual frequency (10-year) flood event is required to complete a surface water connection between the Maumee River and the Little River (Wabash River system) in Fort Wayne, Indiana sufficient for a fish such as an Asian carp to swim across the drainage divide between the Great Lakes and Ohio River Basins. The mesh barrier plus two feet of freeboard being designed and constructed by the Indiana DNR is for a 1% annual (100-year) flood event, and will serve as an interim risk reduction measure that should substantially reduce the risk of adult Asian carp from being able to swim across the drainage divide. The interim measure is focused on adult Asian carp because Indiana DNR believes it is unlikely that either viable Asian carp eggs or juvenile fish would be present in the flooding area.

USACE is working with the US Environmental Protection Agency (EPA), USGS and other partner agencies to evaluate, and develop a more permanent solution to prevent the transfer of Asian carp and other aquatic invasive species at this connection.

With respect to other connections between the basins, as part of the Great Lakes and Mississippi River Basin Study (GLMRIS), the USACE, along with partner agencies, is performing a Preliminary Inter-Basin Connections Risk Characterization, which will culminate in a September 2010 report that will provide an inventory of potentially significant surface water connections that exist or may form across the entire length of the Great Lakes and Mississippi River Basin drainage divide. This report will provide conclusions by an interagency panel of experts regarding the relative risk associated with invasive species transfer at each of the locations identified in the inventory, and it will serve as a basis for identifying other preventative measures or further study to address the risk of aquatic invasive species transfer via all pathways between the Great Lakes and Mississippi River basins.

Question 2. We received testimony that eDNA testing for Asian carp was interrupted while responsibility for the testing was transferred from the University of Notre Dame to the U.S. Army Corps of Engineers. In light of that decision, how can we be certain that detection efforts will continue and how will decisions to interrupt testing be determined and publicized in the future?

Answer. The eDNA sampling and processing capability is currently being transitioned from the University of Notre Dame to USACE's Engineering Research and Development Center (ERDC). Tasks associated with the application of this monitoring technique will be conducted by an interagency sampling team under the supervision of the Monitoring and Rapid Response Work Group (MRRWG) of the Asian Carp Regional Coordinating Committee (ACRCC). This team will consist of USACE, the US Fish and Wildlife Service (FWS), and the Illinois DNR. The samples will be filtered by USACE at an EPA facility in Chicago, and then shipped to the USACE ERDC laboratory for testing. The transition from Notre Dame is currently scheduled to be complete on 16 Aug 2010. During this transition Notre Dame

maintained its capability and continued to process and test samples in accordance with transition requirements. Once the transition is complete the USACE laboratory will be fully operational and will double the current sampling capacity from 60 samples per week to 120 samples per week.

Recent sampling has been focused on critical training of ERDC personnel by Notre Dame which included the taking of concurrent samples by both entities to confirm ERDC's process. During this same period, heavy rains in the Chicago area caused some delay in sampling. Upon recommendation by the MRRWG after discovery of a live carp in June, an additional 300 samples were collected in Lake Calumet, the Calumet River, and Indiana Harbor. These samples are being processed by Notre Dame. Therefore during the transition period, Notre Dame was able to continue to provide processing of samples as requested while the transition was occurring.

Question 3. How are decisions being made in terms of prioritizing the Asian carp detection and sampling and monitoring efforts within the Chicago area waterways and the other pathways such as the Maumee River?

Answer. With respect to the CAWS, monitoring/sampling prioritization and decision making is made by the Monitoring and Rapid Response Work Group (MRRWG), which includes representation by resource management agencies and organizations including USACE, FWS, and Illinois DNR. Decisions regarding monitoring, sampling, and rapid response are made by the MRRWG in support of policy and management goals established by the RCC and its member agencies. The MRRWG also convenes with non-governmental stakeholders in attendance. These discussions inform the MRRWG's prioritization and decision making process for all sampling and monitoring efforts in the CAWS. Currently, State and Federal resource agencies involved with Asian carp prevention and control within the region are working collectively to establish a strategy to address other potential pathways; this includes watershed-wide multi-agency efforts such as the Great Lakes Mississippi River Interbasin Study (GLMRIS), currently being led by the USACE. Also, individual States identify high priority prevention and control actions in their State Aquatic Nuisance Species Management Plans, which are updated annually and approved by the Aquatic Nuisance Species Task Force (as described under Nonindigenous Aquatic Nuisance Species Prevention and Control Act).

Question 4. Please describe your method of determining where and when to test for eDNA. What is your proposed method for making the eDNA testing results available to the public?

Answer. Originally, the eDNA sampling program was intended to identify the leading edge of Asian carp migration, which, based on other monitoring was presumed to be south of the Brandon Road pool. Once eDNA evidence of Asian carp was found above the fish barrier, the sampling plan has covered the entire Chicago Area Waterway System (CAWS). The specific locations and schedule were determined by the University of Notre Dame and The Nature Conservancy (TNC), in consultation with USACE and other ACRCC partners, based on fish expert assessments of the locations where Asian carp would most likely be found if present in the CAWS. Future eDNA sampling will be based on recommendations of the ACRCC's Monitoring and Rapid Response Work Group (MRRWG). These recommendations will be documented in a sampling plan, which is still under development.

In the past, USACE has posted eDNA results on its website, as well as on www.asiancarp.org, using a tracking map provided by Notre Dame. With the transition to ERDC, USACE intends to make results available on the Chicago District's website within one week of analysis.

Question 5. When do you expect the United States Army Corps of Engineers to complete the final efficacy report that will summarize the interim reports and recommend a multi-agency, comprehensive strategy as described in the recently completed dispersal barrier efficacy study?

Answer. USACE intends to release a draft of the Final Efficacy Study for public review in December of 2010 and finalize the report in the spring of 2011.

Question 6. Please describe the factors under consideration in connection with your decision whether to designate a federal commander for Asian carp strategies.

Answer. The Council on Environmental Quality plans to select an individual who can lead coordination efforts to keep Asian carp from becoming established in the Great Lakes ecosystem. The Asian Carp Control Strategy Framework is an aggressive plan for success. The coordinator will help ensure we are continuing to communicate with and draw on the expertise of key stakeholders in the region.

Question 7. Please provide us with an update with regard to the timeline for completion of the Great Lakes and Mississippi River Interbasin Study (GLMRIS). What is your response to the assertion that an independent study should be completed to research options for ecological separation? There is significant concern that waiting

until 2012 for the results will be too late. Can anything be done to speed things up?

Answer. GLMRIS was initiated in July 2009 on receipt of the initial appropriations for the study. In January 2010, the first interagency scoping meeting for GLMRIS was held, which informed development of the Project Management Plan (PMP). The Executive Steering Committee group, which includes the members of the Asian Carp Regional Coordinating Committee, has been briefed on the draft PMP and will remain engaged throughout the study.

The Corps has fully coordinated the scope for GLMRIS over the past year and has organized the study to proceed on two basic tracks simultaneously. One track will focus on the CAWS and the unique challenges posed in the evaluation of permanent measures to prevent the transfer of all manners of aquatic invasive species from one basin to the other through that waterway system. The CAWS is the most direct and highest risk pathway for aquatic species transfer between basins, and thus requires priority of effort. The second track has begun with a reconnaissance-level effort to identify and characterize the risk of all other potential aquatic passageways between the Great Lakes and the Mississippi River basins. This risk characterization is expected to be complete in September 2010.

Executing the GLMRIS is the first step in addressing permanent solutions to deter and prevent sustainable populations of aquatic invasive species from transferring from one basin to the other. This study will consider actions that are needed to prevent inter-basin migration of aquatic invasive species in both directions. This study is complex and far-reaching and any projects recommended for execution as part of the study would be subject to authorization, prioritization, and funding. A study of this scope and breadth requires a significant quantity and very high quality of environmental, economic, and social data and many variables and factors which are currently unknown. Given its scope, complexity and variables that will influence recommendations, it will likely take a significant amount of time to gather and analyze and understand information. It is likely to take longer than the 18 months proposed in the House T&I Committee Bill for a FY 2010 WRDA to gather, analyze, understand and apply data of this quality and quantity. The study will be approached in increments and interim reports with recommended actions will be released prior to full study completion, in the same manner as the Efficacy Study has been conducted. This procedure would potentially allow USACE to accelerate portions of the study in order to address urgent issues whenever adequately mature information is developed.

However, while USACE is conducting GLMRIS, it is using three mechanisms to assist the ACRCC in preventing the establishment of a sustainable population of Asian carp in the Great Lakes:

(a) Design, construction, operation, maintenance and improvement of the electric fish barrier system;

(b) Monitoring for the presence of Asian carp in the CAWS in collaboration with partner agencies, via the application of eDNA technology and more conventional monitoring methods; and

(c) Executing near-term control measures to address the threat of Asian carp migration via the CWS, using interim reports of the Efficacy Study, a study authorized in the Water and Resources Development Act (WRDA) of 2007, and using the emergency authority provided in Section 126 of the 2010 Energy and Water Development Appropriations Act.

Specifically, USACE is building a barrier system along the Des Plaines River and Illinois and Michigan Canal, which both flank the Chicago Sanitary and Ship Canal (CSSC). This bypass barrier will prevent fish from bypassing the electric fish barrier during flooding of these two waterways, which could create temporary hydrologic connections to the CSSC. USACE is also installing screens on the sluice gates at the T.J. O'Brien Lock and Dam to impede fish passage.

The Final Efficacy Study will summarize the interim studies and recommend a long-term, multi-agency comprehensive strategy to improve the efficacy of the electric fish barrier and additional measures throughout the CAWS to minimize the risk of Asian carp migrating into Lake Michigan. Given that Section 126 expires on October 28, 2010, the Assistant Secretary of the Army for Civil Works has sought a two-year extension of that authority, in addition to expanding it to allow USACE to take appropriate actions in other geographic locations, outside the CAWS, along the basin divide.

Question 8. Given the release of the Executive Order for the Stewardship of Our Oceans, Coasts, and Great Lakes, how do you plan to prioritize issues addressed given the broad scope of the Executive Order? What effect, if any, will the Executive Order have with respect to the ongoing Asian carp control strategies?

Answer.

Issue Prioritization

Within the next few months, the National Ocean Council will hold its first meeting to begin the work of implementing the National Ocean Policy outlined in the Executive Order. After an initial period to organize itself and its component advisory bodies, the National Ocean Council's interagency policy committees will develop strategic action plans for each of the nine priority objectives within six to twelve months of the Council's establishment. Through the development of the strategic action plans, the Council, with stakeholder and public participation, will identify actions to achieve these priority objectives. Each strategic action plan would identify specific and measureable near-term, mid-term and long-term actions, with appropriate milestones, performance measure, and outcomes to meet each objective.

In addition, the National Ocean Council may identify additional or different priority objectives in years to come. It is the function of the National Ocean Council to periodically update national priority objectives and review and provide annual direction on National Policy implementation objectives based on Administration priorities and recommendations from the Deputy-level.

The National Ocean Council will also begin to immediately implement the three-phased approach, as outlined in the Final Recommendations of the Ocean Policy Task Force (Final Recommendations), to develop and implement coastal and marine spatial planning in the United States. This bottom up, flexible, regional approach to coastal and marine spatial planning will allow the regions to identify priorities and objectives for such planning to address.

EO on carp control

The Great Lakes are included in the scope of the Executive Order and Task Force Final Recommendations. Although the Great Lakes are largely State waters, federal regulatory authorities apply in the Great Lakes and they will benefit from improved, integrated coordination. Like our ocean areas, the Great Lakes are subject to increasing demands, user conflicts, and conservation concerns, such as invasive species. The National Policy seeks to establish and implement an integrated ecosystem protection and restoration strategy that is science-based and aligns conservation and restoration goals at the Federal, State, tribal, local and regional levels, ultimately informing agency decision-making under existing statutory and regulatory authorities. For example, under the Executive Order, the work of the Great Lakes Restoration Initiative addressing the control and prevention of invasive species will inform the regional coastal and marine spatial planning process, and the resultant coastal and marine spatial plan developed by the Great Lakes Regional Planning Body will likely account for measures necessary to prevent the spread and introduction of such species.

Question 9. Regarding the Asian carp found in Lake Calumet in June 2010, has the Administration analyzed where that fish came from? An additional discovery was made of an 80-pound fish in a land-locked lake—is there any way to tell whether these fish have traveled through the natural pathways, or whether they were deposited into the reservoirs by "human" actions?

Answer. With reference to the Asian carp found in Lake Calumet in June 2010, Southern Illinois University has analyzed the otolith (ear bone) microchemistry and compared that information with existing otolith chemistry data from Asian carp captured in the Illinois, Mississippi, and Missouri Rivers and data on otolith chemistry from other fish species collected from these three rivers, Illinois tributaries, and Lake Michigan to determine whether stable isotopic and trace element compositions of otoliths from the two bighead carp might provide some insight into the environmental history of these two fish. Results of this comparison were inconclusive. A press release from IL DNR with additional information on the analysis of the specimen has been issued.

It may be possible to determine the origin and movement of the additional Asian carp ("land-locked") using existing methods and technology (e.g. analyses of otolith microchemistry, genetics, and other life history information). However, no conclusion has been made at this time regarding these fish.

RESPONSES OF NANCY SUTLEY TO QUESTIONS FROM SENATOR BROWNBACK

Question 1. Please describe the impact that other invasive species have had on the Great Lakes. How would the introduction of the Asian Carp into the Great Lakes compare in environmental and economic harm, as these other invasive species?

Answer. Several species clearly have been documented as causing significant harm to the Great Lakes ecosystem. Invasion of the sea lamprey was a major cause

of collapse of lake trout populations, and associated sport and commercial fisheries in the Great Lakes. Although progress continues in controlling sea lampreys, lake trout populations in many areas of the Great Lakes are supported mostly by stocking zebra and quagga mussels have invaded the Great Lakes and caused significant harm. One study, which was completed in 2005, estimated economic losses of invasive species at a minimum $5.7 billion dollars per year in the Great Lakes Basin. Commercial and sport fishing suffer the most from the biological invasions, with about $4.5 billion in losses reported for the Great Lakes Basin.

No quantitative models have been developed that predict ecologic and economic impacts of Asian carp, if they become established in the Great Lakes. Therefore, expert opinion of those impacts must be relied upon. A risk assessment, led by U.S. Fish and Wildlife Service on behalf of the U.S. Army Corps of Engineers, surveyed a panel of 9 experts. All but one of those experts concluded that the risk that any self-sustaining population of Asian carp located in the CAWS could move from the CAWS into the Great Lakes was unacceptably high, and that the establishment of a self-sustaining population of Asian carp could have negative environmental impacts, economic impacts, and impact on social and political constructs. Experts were either moderately or highly certain of their predictions of impacts.

Question 2. Please describe the funding levels for the Great Lakes Restoration Initiative.

Answer. GLRI was funded at $475M in 2010 and the President's 2011 budget requested $300M.

Question 3. Have you developed a cross-cut budget amongst all the cooperating agencies to determine how much is being spent on addressing the issue between Federal, state, and local agencies?

Answer. The Asian Carp Control Strategy Framework is the guiding document that describes the 32 short and long term activities that the Federal, State, and Local agencies are implementing to preclude the establishment of a self-sustaining population of Asian carp in the Great Lakes. This document also contains cross cutting budget information relating to what each Agency is spending on base program efforts and utilization of GLRI monies to combat Asian carp.

RESPONSES OF NANCY SUTLEY TO QUESTIONS FROM SENATOR SESSIONS

Question 1. In your evaluation of the best long-term solution for preventing the Asian carp threat, do you plan to consider the inland waterways and the economic effect that could occur should the answer be to permanently sever the connection between the Great Lakes Basin and the Mississippi River watershed?

Answer. Yes. The U.S. Army Corps of Engineers Great Lakes Mississippi River Inter-basin Study (GLMRIS) will determine the feasibility of the options to prevent or reduce the risk of aquatic nuisance species transfer between Great Lakes and Mississippi River basins through aquatic pathways. GLMRIS will identify all potential hydrologic connections, including all episodic and anthropogenic links, as well as exploring the greater realm of current and potential future invasive species, in addition to the Asian carp. Alternatives that would alter the existing flow, capacity, or uses of existing waterway systems will require sufficient analysis to provide information that will allow adequate understanding of the expected impacts on water quality, the environment, flooding risks, economic uses, and uses for public safety, and critical infrastructure, as well as the likely benefits from avoiding impacts from Asian carp.

Within GLMRIS, the Corps intends to develop the type and quality of information needed to support decision making on alternatives that may alter the existing flow, capacity, or uses of the Chicago waterways. In particular, economic studies will be conducted to identify and quantify the long-term impacts each proposed control has on the basins' users, including commercial and recreational navigation and commercial and sports fisheries. The GLMRIS economics investigations will involve extensive data collection and analysis, such as surveys of affected users to elicit information on the response to lock closures, among other alternatives, and quantify the user-specific cost and other impacts.

Question 2. Do you believe that application of toxicant is a cost-effective way to combat the Asian carp issue?

Answer. The U.S. Fish and Wildlife Service supported Illinois Department of Natural Resources' decision to use rotenone (a fish toxicant) in two locations (in December 2009 and May 2010) within the Chicago Area Waterways System. The Federal Government will continue to use, and support use by its partners, of an integrated pest management (IPM) approach for containing, controlling, and possibly eradicating Asian carp. The IPM approach employs an integrated, complementary and coordinated set of tools (e.g., electrical barriers, harvest, rotenone), applied in a man-

ner to effectively and efficiently reach Asian carp population management goals. The set of tools that the Federal Government will use, or support use by its partners, will depend on the details of: Asian carp distribution and abundance, physical environment, native species potentially impacted by use of proposed management tools, and risk of Asian carp becoming established in the Great Lakes (and other ecosystems in the U.S. where Asian carp have not yet invaded).

RESPONSES OF JOHN ROGNER TO QUESTIONS FROM SENATOR STABENOW

Question 1. On July 14, 2010, the Indiana Department of Natural Resources announced a plan to use a mesh barrier to prevent the potential movement of Asian carp up the Wabash River system into the Maumee River. Do you believe such a barrier is sufficient to prevent the movement of Asian carp through that system? Are there other preventative measures that should be taken to ensure that all potential pathways to the Great Lakes are covered?

Answer. We support Indiana DNR's use of mesh fencing as a short-term risk reduction measure to address the advance of Asian carp up the Wabash River system and their potential movement into the Maumee River, a tributary to Lake Erie. Inspection and maintenance of the mesh fence after every significant water level rise, is necessary and we understand that a permanent solution to prevent Asian carp from being able to pass through this area during flood conditions is currently under development.

We support expanding the use of E-DNA testing throughout the Great Lakes Basin as an additional preventive measure that should be taken to protect the Great Lakes.

Question 2. In your opinion, is the monitoring and sampling being done above the existing barriers in the Chicago area waterways sufficient at this time, or would additional resources be beneficial? Is there anything more that should be going on that is not?

Answer. We have a high level of confidence that the plan we have developed for monitoring and sampling above the barriers for this season is sufficient, however if we do find a population of Asian carp above the barrier we would need additional resources for a large scale eradication program. It is important to note that in these challenging economic times the financial support of the GLRI has been critical to the success of our efforts and we recognize and appreciate the support of the Congress.

Our monitoring and sampling plan is dynamic, flexible and is constantly reviewed and evaluated against new data. We have and will continue to modify our plan accordingly as the situation warrants.

Question 3. Do you anticipate you will continue to find Asian carp above the existing barriers as the searching and monitoring continues?

Answer. Based on the extensive monitoring and sampling of the Chicago Waterway System we have completed above the barrier system we know that if there are Asian Carp present they are in very low numbers. However we are maintaining a high level of vigilance and are continuing our extensive searching and monitoring operations above the barrier.

RESPONSES OF JOHN ROGNER TO QUESTIONS FROM SENATOR BROWNBACK

Question 1. Please describe the incentive programs you have developed to enlist commercial fishermen into the goals of the Framework, and as part of the Great Lakes Restoration Initiative, to address the Asian Carp.

Answer. The Illinois Department of Natural Resources is entering into an agreement with the Illinois Department of Commerce and Economic Opportunity (DCEO) for the administration of the Asian Carp Training, Certification, Incentives, and Market Development Program during State Fiscal Year 2011. This effort has two component parts: the first includes a series of training and certification programs for commercial fisherman. The second is a three tiered program of performance based financial incentives.

The training and certification programs are designed to ensure safe handling of Asian Carp for human consumption. This project will help not only with marketing of the Asian Carp to foreign and domestic markets but also work to ensure safe operation of the fleet of commercial fisherman. Fishermen who complete the program will then be eligible for performance based incentives.

Question 2. Please describe whether you believe there is enough monitoring and sampling data currently available to provide adequate modeling and protection to further reduce the likelihood of Asian carp entering the Great Lakes Basin.

Answer. At the current time there is not enough monitoring and sampling data to provide adequate modeling and protection to reduce the likelihood of Asian carp entering the Great Lakes Basin. However we are confident that with the completion of the monitoring and sampling plan underway and other related research efforts we will have adequate data to develop a risk assessment on the likelihood of the establishment of a reproducing population of Asian carp in Lake Michigan.

Question 3. In your testimony you list several dates this year where you were notified that eDNA for carp was found in various waterways along the CAWS, but that subsequent investigations and monitoring of the waterways yielded no Asian carp. What do you believe is the reason that no carp were found? Is the e-DNA data unreliable, or is it possible that the area covered during the response operations was too small in scope?

Answer. It is unclear at this time why after positive samples of Asian carp e-DNA were collected, subsequent investigations yielded no Asian carp. However based on our monitoring and sampling in the CAWS we know that if Asian carp are present they are in very low numbers, and may be below the threshold for detection with traditional fishing and sampling gear. We continue to believe that the use of e-DNA is an important tool to assist the RCC in making management decisions, especially in combination with other sampling efforts such as electro fishing, netting, and toxicant applications. E-DNA is reliable, however it has limitations in that a positive sample indicates that Asian carp may be present in a given area. It does not indicate whether or not live Asian carp are present, how many Asian carp may be present, or their age, sex or size. These variables must be taken into account, and planned research with the University of Notre Dame is designed to address these information gaps.

The past use of e-DNA does not necessarily mean it is unreliable, rather as we work with this tool we have come to the understanding that it simply does not produce a complete picture. With further refinement we anticipate that e-DNA will provide information on population densities and distribution which will be needed for a complete risk assessment.

We believe the area covered during the response operations was large enough in scope. Our decision making protocol is very straight forward. When positive e-DNA hits are discovered, we develop a monitoring sampling plan using the appropriate conventional gears that best fit the geography and features of that location. If after extensive monitoring and sampling prove ineffective and further e-DNA samples are positive we then develop a plan for more aggressive sampling using toxicants.

Location and size of treatment areas are selected carefully, taking all factors into consideration. The length and location of the application and fish removal area for Operation Pelican in May of 2010, for instance, was chosen to maximize the opportunity to capture Asian carp by including a variety of habitats along a substantial length of river channel that previously recorded multiple samples of positive e-DNA detections.

RESPONSES OF JOHN ROGNER TO QUESTIONS FROM SENATOR SESSIONS

Question 1. You outline in your testimony the action steps your department has taken above the electric barrier-and mention that several species of fish have been recovered, but no Asian carp except for the commercial fishing group on June 22nd. In your opinion, was the approximately $1.7 million cost of the toxicant application on May 20th a prudent use of resources?

Answer. In our opinion the application of rotenone on May 20th was a prudent use of resources and was the consensus opinion of the Rapid Response Committee. This particular reach of the Chicago Area Waterway System (CAWS) produced positive e-DNA detections for Asian carp from multiple independent sampling dates in 2009, and one sample date in 2010. The Asian carp Monitoring and Rapid Response Workgroup's monitoring plan indicates that this pattern of e-DNA detection from this reach of river warrants a response action to capture and remove Asian carp.

Question 2. Do you believe that application of toxicant is a cost-effective way to combat the Asian carp issue?

Answer. The application of rotenone by itself is not the most cost-effective way to combat the spread of Asian carp, however it has served as an important and effective tool for rapid response against Asian carp. It is our opinion that the benefits of selectively using rotenone to ensure the safety of our Great Lakes far outweigh the cost of such a procedure.

In the December 2009 operation, rotenone was used to prevent the spread of Asian Carp to Lake Michigan while the electric barrier system was taken down for required maintenance.

In Operation Pelican in May of 2010 rotenone was applied after multiple positive E-DNA samples were recorded and conventional monitoring and sampling gears proved in effective.

While rotenone by itself may not be the most cost-effective way to combat Asian carp, it is an effective one, particularly in locations with multiple positive e-DNA hits. Prior to use of rotenone, a wealth of other options are considered. Intensive sampling is performed to determine the best cause of action; if multiple e-DNA hits are detected and conventional techniques are ineffective rotenone is believed to be the best solution.

RESPONSES OF TIM EDER TO QUESTIONS FROM SENATOR STABENOW

Question 1. On July 14, 2010, the Indiana Department of Natural Resources announced a plan to use a mesh barrier to prevent the potential movement of Asian carp up the Wabash River system into the Maumee River. Do you believe such a barrier is sufficient to prevent the movement of Asian carp through that system? Are there other preventative measures that should be taken to ensure that all potential pathways to the Great Lakes are covered?

Answer. The Great Lakes Commission does not possess the technical knowledge to assess whether this response is adequate to prevent Asian carp from moving between the Wabash and Maumee River watersheds during flood events. We defer to the competent federal and state agencies on this matter. Generally, we believe this is a good first step to addressing this pathway for inter-basin transfer of aquatic invasive species. Plans are proceeding to construct a more permanent barrier.

Continued identification of pathways such as the Wabash-Maumee is critical to safeguard the ecological and economic security of the Great Lakes watershed. A systematic, ongoing risk assessment and response effort must be initiated immediately and sustained as needed, including consistent monitoring.

Question 2. In your testimony, you stated that along with the Great Lakes and St. Lawrence Cities Initiative, the Great Lakes Commission intends to initiate an independent study to research options for ecological separation. Please explain how this study will be carried out and how the independent study will complement, support, and help accelerate the Great Lakes and Mississippi River Interbasin Study (GLMRIS), and not duplicate it.

Answer. The study effort, entitled Envisioning a Chicago Waterway System for the 21st Century, will provide a detailed evaluation of potential scenarios for ecological separation, including their costs, benefits and impacts. It will evaluate the economic, technical, and ecological feasibility of eco-separation by illustrating scenarios to achieve it, along with associated costs, impacts and potential benefits of a re-engineered hydrologic system for greater Chicago. It is intended to support and complement the work of the GLMRIS study by defining, assessing and vetting scenarios for ecological separation. It is proceeding on a path toward completion (winter of 2011-12) that is much faster that the timetable for the GLMRIS study. The project, which has already begun, includes an extensive effort to engage users of the waterway in the Chicago area, including those who currently depend on current uses of the waterways for commercial and recreational transportation, stormwater and wastewater management. Key products will include a comprehensive report, a series of supporting technical sub-documents, and a clear and concise summary for a lay audience. Additional information is available online at http://www.glc.org/ans/chicagowaterway.html

Question 3. Could you please summarize what the role of states and other non-federal entities are in the on-going prevention of the migration of Asian carp?

Answer. Among the Great Lakes states, Illinois has been on the front line of Asian carp prevention. The state's Department of Natural Resources (DNR), in particular, has had a strong role in Asian carp prevention activities. Illinois DNR has monitored the Asian carp migration up the Illinois River since the mid 1990s and has contributed $1.8 million to fund construction of the dispersal barrier system. Illinois led the response effort (rotenone application) that took place in December 2009. In addition to Illinois DNR, over 35 other non-federal entities, including Environment Canada and fisheries management agencies from all seven of the other Great Lakes states, participated and contributed time and resources to this response effort.

Illinois DNR has been identified as a lead agency in a number of prevention actions outlined in the Asian Carp Control Strategy Framework. The Framework was developed by the Asian Carp Regional Coordinating Committee, which in addition to federal representation includes the Illinois DNR, the Great Lakes Fishery Commission, the City of Chicago and the Metropolitan Water Reclamation District of

Greater Chicago. These entities will continue to work together in coordinating and implementing the activities outlined in the Framework. Additional information on their roles and responsibilities is available online at: http://asiancarp.org/Wordpress/about-the-committee/.

Another example of non-federal involvement in Asian carp prevention activities is the role of the University of Notre Dame and The Nature Conservancy. Working in partnership, these two entities developed the eDNA monitoring techniques that have indicated the presence of Asian carp in the waterways around Chicago. They have an ongoing role in monitoring efforts.

Finally, many non-federal entities participate and contribute their time and expertise to a variety of forums that advance aquatic nuisance species prevention and control efforts, including the Dispersal Barrier Advisory Panel and the Great Lakes and Mississippi River Basin Panels on Aquatic Nuisance Species. The Great Lakes states also contributed funds to the construction of the dispersal barrier system in the Chicago Sanitary and Ship Canal.

Question 4. You emphasize the need for the federal agencies to put money in their budgets toward preventing the migration of Asian carp, can you summarize what the non-federal cost-shares have been, or are expected to be?

Answer. Below is a summary of non-federal contributions to the major Asian carp eradication effort conducted in December 2009. In addition, the states and other non-federal entities contribute a great deal of staff time and in-kind support to both site-specific and regional efforts to safeguard the Great Lakes against the introduction of Asian carp and other aquatic invasive species.

Non-federal monetary contributions:

- Quebec, Canada (Donation) $10,000
- Ohio DNR (Donation) $20,000
- Great Lakes Fishery Commission (Donation) $50,000

Non-monetary partner contributions:

- Michigan (Labor and Chemicals) $80,025
- Indiana (Labor and Expenses) $11,000
- Wisconsin (Labor and Expenses) $11,500
- New York (Chemicals) $87,750
- Canada (Labor and Expenses) $14,000
- Cook County Forest Preserve District (Labor) $5,375
- Great Lakes Fisheries Commission (Labor and Expenses) $2,745
- Wisconsin Sea Grant (Labor and Expenses) $3,500
- Illinois Incident Management Team (Labor and Expenses) $10,250

RESPONSES OF TIM EDER TO QUESTIONS FROM SENATOR BROWNBACK

Question 1. Please describe how you would accelerate the studying of the basins, and why you believe the Corp of Engineers' would not be the appropriate entity to conduct the study. Who do you believe should be the lead on studying the basins?

Answer. We assume this question refers to the Corps' interbasin transfer study. We believe the Corps is the appropriate entity to conduct the study, but believe that it must be accelerated and completed on a quicker timeframe. We also believe that it is critical that the study be coordinated closely with state agencies to build on their intimate knowledge of local watershed dynamics. In this regard, we note the State of Indiana's detailed knowledge to the interface between the Wabash and Maumee River watersheds and the potential for inter-basin transfer of Asian carp in this area. In addition, the Corps study effort can be accelerated through the use of existing data previously collected by other federal, state and local entities, as opposed to using the study to collect new data. At the same time, we believe that a study such as the one the Great Lakes Commission has begun in coordination with the Great Lakes and St. Lawrence Cities Initiative (Envisioning a Chicago Waterway System for the 21st Century) is an appropriate means to assist the Corps in accelerating its study. Our study will also provide the states and cities with more influence on outcomes and options than will the Corps' study.

Question 2. What short-term actions would you do, that are different than those currently being pursued?

Answer. My testimony provided recommendations for new and strengthened immediate actions to safeguard the Great Lakes from the invasion of Asian carp. In brief, these include:

- Establish a more organized and coordinated federal response to Asian carp: Improve how federal agencies are organizing and coordinating their response efforts to reflect a greater sense of urgency and accountability; establish a single point of contact overseeing the collective federal effort with the appropriate authority; provide federal agencies with all necessary authorities and resources; and respect state authorities and leverage their knowledge of watersheds within their jurisdictions.

  [The establishment of a single point of contact to oversee and coordinate federal efforts is especially critical. This has been pledged by the Obama Administration and we understand the appointment of a coordinator will take place within the month.]

- Improve communication and coordination with states and other partners: The Regional Coordinating Committee (RCC) should be more transparent and increase its communications with the states and others. The RCC should consider expanding its membership to include all of the Great Lakes states.
- Assess risks throughout the watershed divide: Conduct risk assessments on all tributaries of the Mississippi River and artificial connections between the Mississippi watershed and Great Lakes basin which Asian carp can potentially use to breach the divide between the two ecosystems. Once the highest risk locations are identified, use eDNA and traditional monitoring to track movement of carp and ensure early detection. Establish rapid response plans to thwart any possible migration.
- Focus on the Chicago Area Waterway System (CAWS) as the highest priority: The RCC should continue to focus the brunt of its efforts on the CAWS. The continued reports of positive eDNA samples upstream of the electric barrier make it essential that response activities continue to be focused in the Chicago region.
- Immediately accelerate eDNA testing: Maintain and increase the use of eDNA testing to document the extent of Asian carp populations both in Chicago-area waterways as well as other areas where carp may be able to cross from the Mississippi River watershed into the Great Lakes.

  [I noted in my testimony that eDNA testing had been suspended when the protocol was in the process of being transferred from Notre Dame University to the Corps of Engineers. We understand that in the intervening weeks, some progress has been made to resume eDNA testing but it is uncertain whether this technique is now being used.

Question 3. Please describe how the Basin has addressed other invasive species Great Lakes. Are there any lessons learned that could be applied to the Asian Carp?

Answer. Our experience in the Great Lakes region has shown that once aquatic invasive species (AIS) become established, controlling their spread is both technically difficult and expensive, with complete eradication being nearly impossible. Therefore, prevention of AIS introductions must remain our top priority. For example, approximately $20 million is spent annually to research and implement control technologies for the parasitic sea lamprey which devastated Great Lakes fisheries in the mid 1900s. An additional estimated $1 billion a year in damages and associated control costs is attributed to zebra and quagga mussels.

When prevention efforts fail and AIS introductions occur, policy makers, resource managers, outreach specialists and other stakeholders need the capacity to detect and respond to new threats. There is a critical period between introduction and establishment of a new AIS population when the focus of management must shift rapidly from prevention to control/containment. It is during this brief window where the opportunity exists to stop the permanent establishment of a new AIS population. Intervention through early detection and rapid response is a critical strategy for preventing the establishment of new AIS populations. Early detection and rapid response efforts increase the likelihood that invasions will be addressed successfully while populations are still localized and population levels are not beyond that which can be contained and eradicated.

A recent example occurred when the fish virus Viral Hemorrhagic Septicemia (VHS) was discovered in the Great Lakes. The pathogenic effects of the microbe are manifested by massive die-offs among infected fish. Once introduced into a wild fish community, the virus is essentially impossible to eliminate and difficult to control. The economic implications associated with VHS invasions are enormous given the threats to the sport and commercial fisheries. In response, the states quickly took measures to prevent the spread of the virus, including increased surveillance, restrictions on bait fish movement, and a moratorium on hatchery production of selected high-risk fish species. The federal government (U.S. Department of Agri-

culture—Animal and Plant Health Inspection Service) is also implementing emergency policies in response to this threat. While swift action was necessary to restrict interstate movement of certain fish species to prevent VHS from spreading beyond infested waters, coordination and communication remained a continuing challenge.

The overarching framework for addressing invasive species in the Great Lakes region is through the structure provided by the Great Lakes Panel on Aquatic Nuisance Species and individual state management plans (SMPs) for invasive species prevention and control. The Great Lakes Panel provides a valuable forum for information exchange, coordination and priority identification on a regional level. The SMPs provide a strategy for invasive species management on a state and local level. Unfortunately, neither effort has received sufficient funding for more than a decade, and thus, efforts have been limited. State and local stakeholders are on the front lines of AIS management and there is a critical need for more resources to build their capacity to prevent, detect and respond to new aquatic invasions.

Question 4. Please describe who you believe is in control, on behalf of the US Government, as it relates to these efforts.

Answer. No single agency—federal or state—is in control of efforts to safeguard the Great Lakes against Asian carp and other damaging aquatic invasive species. Due to their unique mandates, authorities and technical capabilities, the Corps of Engineers, U.S. EPA, U.S. Geological Survey, NOAA, and the Coast Guard all have important roles and responsibilities. Similarly, the Great Lakes states have both delegated authorities and long-standing historical knowledge of and engagement with local river systems and their watersheds. The Asian Carp Control Strategy Framework illustrates the varied legal authorities and technical capabilities that these agencies bring to this challenge. While the Commission has concerns about the long-term adequacy of the Framework, as well as the operation and composition of the Asian Carp Regional Coordinating Committee, we believe it is an important effort to integrate and coordinate contributions from multiple federal and state agencies. We support the committee's continued operation, oversight and expansion, where warranted, to include other entities. However, to provide further coordination and centralized direction, we believe the appointment of a single coordinator is a critical additional step to provide centralized direction and ongoing coordination.

RESPONSE OF TIM EDER TO QUESTION FROM SENATOR SESSIONS

Question 1. The Corps has indicated that a study of the magnitude that is being proposed would require at least 5 years. How can a mandate of completing the study in 1.5 years lead to anything that we could have confidence in?

Answer. With adequate resources and a clear focus on options for achieving ecological separation in the Chicago area, a detailed and credible study can be completed in approximately 18 months. The Corps of Engineers clearly requires additional resources to conduct the GLMRIS study. The Corps' budget for the study at present is only $500,000, which is insufficient. However, we understand that they plan to collect a great deal of data and information on their own, rather than building in existing resources. This approach will lengthen the time needed to generate results. They also appear to be taking a very broad and comprehensive approach, rather than focusing narrowly on the critical priority of developing feasible scenarios for ecological separation in the Chicago area. Our study will assemble a team of experts from the private sector and academia that can move quickly to provide a multi-disciplinary analysis of the Chicago Area Waterway System and potential approaches for achieving ecological separation that prevent the inter-basin transfer of aquatic invasive species while also accommodating the system's beneficial uses. While our study clearly will not be the "final word" on this complex topic, we believe it will provide a credible analysis that will inform the discussion and provide a foundation for further work. We expect that our study will complement ongoing work by the Corps and other federal agencies. In addition, because it is being led by the Great Lakes states and cities, it will provide a unique perspective from that provided by the Corps.

RESPONSES OF LEON CARL TO QUESTIONS FROM SENATOR STABENOW

Question 1. On July 14, 2010, the Indiana Department of Natural Resources announced a plan to use a mesh barrier to prevent the potential movement of Asian carp up the Wabash River system into the Maumee River. Do you believe such a barrier is sufficient to prevent the movement of Asian carp through that system? Are there other preventative measures that should be taken to ensure that all potential pathways to the Great Lakes are covered?

Answer. There are several vectors by which Asian carps could enter the Great Lakes. Some, such as intermittent connection between the Wabash and Maumee rivers, are hydrological linkages between infested waterways and the Great Lakes. These connections are currently being inventoried by the U.S. Army Corps of Engineers (USACE) as part of the larger "Great Lakes and Mississippi River Interbasin Study" (GLMRIS) as part of the multi-tiered efforts of the Asian Carp Regional Coordinating Committee described in the Asian Carp Control Strategy Framework (Framework). Other vectors, beyond hydrological connections, involve human-assisted transport from one basin to the other.

Invasion biologists use the term "propagule pressure" to indicate the number and quality of invading organisms as well as the number of release events. Published literature shows that propagule pressure is directly proportional to the success of invasions. Therefore, minimizing the number of colonizing organisms, by methods such as installing barriers, is important in preventing successful establishment of Asian carps in the Great Lakes.

Regardless of preventative measures to curtail movement of Asian carps from the Mississippi River basin to the Great Lakes through hydrological connections, it remains important to continue to educate the public on the dangers of human-assisted means by which Asian carps could be introduced into the Great Lakes. For example, juvenile Asian carps resemble gizzard and threadfin shads and people collecting their own baitfishes, or potentially even bait dealers that collect fishes from the wild, could inadvertently collect and transport Asian carps. Anglers might release unused live baitfish contaminated with Asian carps into the Great Lakes watershed. In addition, people may purposefully release wild-caught, hatchery-reared, or store-bought Asian carps into the Great Lakes watershed for a variety of reasons.

Question 2. In your testimony, you mentioned that the United States Geological Survey is conducting experiments using seismic technology as an Asian carp control strategy. At this time, are you able to provide the Subcommittee with an update regarding seismic activity for control efforts? When will the field testing begin and how soon will the results be available? Answer:

Answer. The U.S. Geological Survey (USGS) is conducting a study entitled, "Use of Seismic Technology to Divert or Eradicate Invasive Asian Carp" as part of the Framework. This study focuses on lethal and sub-lethal effects of sonic bursts (produced by hydroguns) to divert, trap, or eradicate invasive Asian carps. Initial testing ended late June and examined the effects of sound wave frequency on various age classes of trout (used as a surrogate species) at a range of distances from the hydrogun. Preliminary results demonstrated that a single blast from a hydrogun killed fish up to 6 meters away (about 20 feet) within 24 hours of exposure by rupturing the swim bladders and inducing internal hemorrhaging, although most mortality was not immediate. Fish mortality increased with proximity to the hydrogun and delayed mortality occurred during the first 48 hours from the exposure.

Peak sound pressure levels were measured as high 254 decibels at 3 feet away and as high as 210 decibels from the hydrogun at 130 feet indicating that the hydroguns could potentially used to deter fish movements. Summary tables of the results from this project have been developed for initial interpretation of findings. More rigorous statistical analysis will be completed by the end of August. The next phase of the study began August 9 and consists of logistical tests to determine how to most efficiently transport the hydrogun through the water, optimize fish capture capabilities, and effectively use this technology in a river system for the third phase of testing. Three different sized hydroguns have been procured for these tests (343 cubic inch, 80 cubic inch, and 1 cubic inch) and will be tested on larger fish comparable in size of adult Asian carps.

Field testing of this technology in a river with Asian carps (bighead and/or silver carps) is expected to begin in mid to late September. Contracts are currently being drawn up. USGS is in contact with DNRs in Missouri and Illinois to determine the best location to conduct the testing. We expect to have some initial summary data available about 4 weeks after the field testing and the majority of the analysis completed by the end of calendar year 2010.

Question 3. I understand there are efforts underway to look at the possibility of migration of Asian carp through underground rivers or other hydrologic connections, how long will it take to have a better idea of what the potential pathways are?

Answer. As explained, the USACE will evaluate surface water connections between the Great Lakes and Mississippi River basins as part of the GLMRIS. These will include surface water connections outside the Chicago area, along the length of the basin divide. USGS continues to work with the USACE, by providing technical assistance, primarily in the Wabash River and Maumee River focus area, to support completion of the GLMRIS. For example, USGS is working with local authorities to obtain, analyze, and provide detailed topographic data that includes the

Wabash River-Junk Ditch-Maumee River area. These data are being combined with information on channel profile and flow model data to develop hydraulic simulation models to assess Asian carp entry from this connection. USGS is also installing a new stream gage within the area of concern to provide data needed to better define flow exchanges in the Eagle Marsh area.

The USGS could provide further technical support for the GLMRIS in the forms of hydrologic simulation modeling; synthesizing bathymetric data with Digital Elevation Models and hydrologic measurements; model validation; geophysical surveys using ground penetrating radar and electromagnetic induction to locate culverts, drainage tiles, voids, and other subsurface features that could convey Asian carps or that could problematic for any potential Asian carp control structures; and soil core data to identify distribution and thickness of organic soils that could affect structure stability. Lastly, USGS has Water Science Centers in each of the Great Lakes States and can provide similar hydrologic and hydraulic data, analyses, and modeling support throughout the Great Lakes drainage. All of these Centers are providing support for the Preliminary Interbasin Connections Risk Characterization for all potential surface water connections between the Great Lakes and Mississippi River Basins, a part of the larger GLMRIS effort.

Non-surface water connections between the Mississippi River and Great Lakes watersheds are outside the scope of GLMRIS but are being addressed in a study entitled, "Feasibility Assessment of Inter-basin Transfer of Aquatic Invasive Species" being conducted by the USGS as part of the Framework. This project will determine the frequency via the surface-water pathway of potential for movement of aquatic invasive species (AIS) from the Des Plaines River to the Chicago Sanitary and Ship Canal (CSSC) during flooding conditions observed previously. It will also determine the potential for movement of AIS from the Des Plaines River and/or the Illinois and Michigan Canal to the CSSC via groundwater flow through fractured bedrock present between these surface water bodies. Coordination efforts with USACE to avoid duplication are underway.

To date, compilation and analysis of available information on area geology and hydrology has been performed; compilation of hydraulic, water-quality, and sediment-quality data from USGS databases has begun; field surveys of bathymetric, temperature, and specific conductance of the CSSC has been completed. Field surveys of sediment type and bathymetry of areas where bedrock is exposed at or near the land surface of the Des Plaines River (DPR) has been completed. Fracture orientations in the dolomite have been measured and a field assessment of stratigraphy in the area performed and surface geophysical surveys completed at several candidate sites. Data analysis has begun and a preliminary write up of the analysis of the data collected has been completed and is under review. USGS will have information by the end of summer 2011 on whether ther is a connection between the Des Plaines River and the Chicago Sanitary and Ship Canal through the fractured bedrock which separates these two water bodies.

RESPONSES OF LEON CARL TO QUESTIONS FROM SENATOR BROWNBACK

Question 1. Statistically, is it unusual to find only one fish, this size, without finding any other similar fish in the area?

Answer. The statistical probability of capturing fish is related to the density of the species, the vulnerability of the particular species to the types of gear used, and the amount of fishing effort put forth. Therefore, because a bighead carp was captured in Lake Calumet, it would be statistically unlikely to find only one fish without similar fish in the area, if the species in question was abundant, reasonably catchable with the gear in use, and if a reasonably large effort were expended in trying to catch the fish. If the species is rare and/or difficult to catch, or if only a little effort was expended, one would expect to catch no fish or very few fish.

In this case, a high degree of effort was expended to not only catch this fish, but also to capture any other fish in the area with additional sampling effort after the bighead carp was captured. In addition, Asian carps have low catchability, meaning that they have the ability to avoid gears typically used to capture fish. Thus, the density of Asian carps is unclear, but is probably low at this time, based on the capture of only one fish.

Question 2. In your testimony you state that finding just one fish does not pose an imminent threat. What number would you consider would cause such an imminent threat?

Answer. Our best understanding is that the threat to the Great Lakes is very low with very few fish present and increases gradually as the number of Asian carps increases. If one female and one male fish are present, the threat of establishment is not zero, but is extremely low. We are unable to statistically quantify the rate

at which the threat increases with increasing number of fish because of the complexity of the system and limits on our understanding of the biology of the fish. We do not know whether an unlimited number of introduced fish would create a self-sustaining population in the Great Lakes. For reference, one successful invasion of Asian carp to the Gobindsagar Reservoir in Asia is thought to have been the result of an escape of only about 50 fish, but we cannot be sure that there were no other unrecorded releases that contributed to the establishment of that population.

Question 3. Please further describe the work that you are undertaking to address hydraulic connections between the Great Lakes and Mississippi River Basins, as they relate to access points for carp eggs, larvae, juvenile fish and adults.

Answer. The previously discussed "Feasibility Assessment of Inter-basin Transfer of Aquatic Invasive Species" being conducted by USGS and the GLMRIS being conducted by the USACE are the primary studies described in the Framework that assess hydraulic connections between the Great Lakes and Mississippi River basins. The USGS has no further ongoing research in this area, so we have referred the question to the USACE and the following information was provided to more fully address your concern.

Amongst other efforts in addition to those described in the Framework, USACE has developed and is applying permanent and interim control measures to address the threat of Asian carp migration via the Chicago Area Waterway System (CAWS). USACE is operating and improving the electric barrier system in the CSSC. The operating parameters of this barrier are being further evaluated to ensure that the barrier deters all sizes of Asian carps. In addition, USACE is building a barrier system along the Des Plaines River and Illinois and Michigan Canal, which both flank the CSSC. This bypass barrier will prevent fish from bypassing the electric fish barrier during flooding of these two waterways, which could create temporary hydrologic connections to the CSSC. USACE is also installing screens on the sluice gates at the T.J. O'Brien Lock and Dam to impede fish passage. The Assistant Secretary of the Army for Civil Works has also approved the installation of an acoustic-bubble-strobe deterrent system at the Brandon Road Lock and Dam on the Des Plaines River, pending authorization and funding.

In GLMRIS, USACE intends to assess surface water connections between the basins as they relate to access points for all life-cycle stages of aquatic invasive species. The USACE has organized the GLMRIS to proceed on two basic tracks simultaneously. One track will focus on the CAWS and the unique challenges posed in the evaluation of permanent measures to prevent the transfer of all manners of aquatic invasive species, not just Asian carps, from one basin to the other through that waterway system. The CAWS is the most direct and highest risk pathway for aquatic species transfer between basins, and thus requires priority of effort. The second track, as discussed above, has begun with a reconnaissance-level effort to identify and characterize the risk of all other potential aquatic passageways between the Great Lakes and the Mississippi River basins. This risk characterization is expected to be complete in September, 2010.

Question 4. Could you please elaborate on the species specific chemical controls USGS is working to develop, and whether there are examples of these controls working in other situations of invasive species eradication? I'm curious what chemical could be developed that would only affect Asian carp and not the native fish within the Great Lakes.

Answer. Application of toxicants is an important tool used to manage and control nuisance and invasive aquatic organisms. Current toxicants registered with the U.S. Environmental Protection Agency for this use are non-selective and applied as immersion exposures, meaning that desirable and undesirable species are equally exposed to the toxicant. There are no current methods to specifically target Asian carps for control within aquatic ecosystems. USGS is conducting research to develop chemical control methods with higher specificity for Asian carp to better control or eradicate them without harm to native species and habitats.

There are two ways to target Asian carps using toxicants: (1) a chemical that is selectively toxic to Asian carps could be identified and methods developed for its application to control Asian carps in the field; and (2) the toxicity of a currently-registered, general use toxicant could be manipulated such that the toxicity is delivered only to Asian carps. USGS is conducting research along both these lines of reasoning.

In the first case, a compound previously identified as being selectively toxic to common carp is being evaluated for its efficacy in controlling bighead and silver carps.

In the second case, USGS is working with the private sector to incorporate a currently-registered general use toxicant into a molecule that would be developed to be within the size of particles filtered out by Asian carps during feeding. The toxicant

would be encapsulated, acting to stabilize, protect, and efficiently deliver it to the final target site of action. Species selectivity will be achieved by exploiting differences in enzyme activity in the gills and digestive systems among fish species. This technology is currently being used in a variety of applications, including vaccination of hatchery fishes. Using this technology to control an aquatic invasive species is novel, but successfully developing a control tool for Asian carps would demonstrate its applicability to the control of other high-profile aquatic invasive species such as zebra and quagga mussels.

This technology could also be used to induce sterility in female Asian carps. Fish have unique egg proteins that allow sperm from the same species to fertilize the eggs. After identifying these proteins in bighead and silver carps, USGS will use methods borrowed from the pharmaceutical industry to simulate an immune response which will cause females to create antibodies against their own egg proteins, thereby causing them to be sterile.

There are examples of using toxicants to selectively control aquatic invasive animals. Most notably is the use of two chemicals (TFM and niclosamide) to control sea lampreys in the Great Lakes. The Integrated Sea Lamprey Management and Control Program has successfully maintained sea lamprey populations at around 10% of their peak abundance levels for several decades.

Question 5. You note in your testimony that the Chicago Area Waterway System (CAWS) is only one potential Asian carp entry point to the Great Lakes. Where else along potential entry points is sampling currently taking place?

Answer. USGS is currently not conducting sampling for Asian carps in or around the CAWS. USGS on-the-ground activity in this area is focused on collecting hydrological data and conducting surveys necessary to assess the potential for the transport of larval Asian carps through bedrock fractures in the Des Plaines River.

The USACE is supporting monitoring and fish suppression activities being led by the Monitoring and Rapid Response Workgroup within the CAWS. The USACE may also provide near term assistance to the Ohio Department of Natural Resources and the Indiana Department of Natural Resources in arranging for procurement of water samples from the Little River on the west side of Fort Wayne and the Maumee River to the east for Asian carp eDNA analysis.

RESPONSES OF LEON CARL TO QUESTIONS FROM SENATOR SESSIONS

Question 1. In your evaluation of the best long-term solution for preventing the Asian carp threat, do you plan to consider the inland waterways and the economic effect that could occur should the answer be to permanently sever the connection between the Great Lakes Basin and the Mississippi River watershed? Answer:

Answer. USGS is not conducting an evaluation of the best long-term solution for preventing Asian carps from becoming established in the Great Lakes. What is described sounds most like the "Great Lakes and Mississippi River Interbasin Study" (GLMRIS) being conducted by the USACE as part of the multi-tiered efforts of the Asian Carp Regional Coordinating Committee described in the Asian Carp Control Strategy Framework (Framework).

USGS has several ongoing research projects on Asian carps that are directly applicable to assessing their threat to the Great Lakes, however. One is examining the diet habits and requirements of Asian carps and then comparing those to the available food resources in the Great Lakes. There is reason to believe that Asian carps may be able to use Cladophora and bluegreen algae to a greater extent than previously believed—two resources sometimes abundant in locations throughout the Great Lakes. Another project is using a combination of laboratory experiments, hydrological data, and modeling to identify tributaries in the Great Lakes in which Asian carps may be able to successfully spawn.

Question 2. Do you believe that application of toxicant is a cost-effective way to combat the Asian carp issue?

Answer. Although fish toxicants (piscicides) are commonly used to manage and control nuisance and non-native invasive fishes, they are expensive, labor-intensive, and are typically non-selective. The development of a selective toxin could be of great value and cost-effective if, for example, an infestation of Asian carps was found in the Great Lakes or potentially even in areas where they are currently abundant in the Mississippi River Basin. USGS has ongoing research projects as part of the Framework, including "Technologies Using Oral Delivery Platforms for Species-Specific Control" and "Identify Potential Compounds for Inclusion in a Toxicant Screening Program to Identify Potential Selective Toxicants for Control of Asian Carp" that are evaluating a delivery mechanism for a general-use toxicant that would make the toxic effect specific to Asian carps and to identify a toxicant that is selective for Asian carps, respectively. With such control a tool in hand and

a well-designed and implemented early detection network, managers could respond to positive findings of Asian carps in the Great Lakes without killing every fish in the surrounding water.

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