

News from the Battlefield: The Latest Developments in the War Against Asian Carp

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The battle to protect the Great Lakes from an invasion of Asian carp has dramatically been escalating since the fall of 2009. As Asian carp populations continue to migrate further north through the Mississippi-Illinois river system, concern has been mounting that this invasive fish may be closing in on Lake Michigan. In response, unprecedented levels of federal, state and local resources are being dedicated to preventing the establishment of self-sustaining populations of invasive bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*Hypophthalmichthys molitrix*) in the Great Lakes watershed. The threat of Asian carp invading the Great Lakes has received widespread attention with new developments emerging on an ongoing basis. This article covers significant events that have recently occurred in Asian carp policy, research, control and management.

The increase in Asian carp management and control efforts in the Chicago Area Waterway System (CAWS) was sparked by the detection of silver carp environmental DNA (eDNA) in water samples collected over the summer of 2009 from the three locks immediately south of the aquatic invasive species (AIS) electric dispersal barrier system (barrier).¹ Follow-up sampling detected eDNA in several locations upstream (north) of the barrier throughout the CAWS. In addition, a live specimen of bighead carp was collected from Lake Calumet in June 2010. Faced with this new evidence and repeated calls for action, the federal government convened the Asian Carp Regional Coordinating Committee (RCC) to lead the development and implementation of a comprehensive Asian carp control strategy. The RCC released its first version of the *Asian Carp Control Strategy Framework* (Framework) in February 2010 which has most recently been updated in December 2010. The Framework, available on the RCC website, recommends a range of short and long-term actions that provide collaborative-based guidance to federal, state and local agencies leading Asian carp response efforts.

The RCC is moving forward on implementing the Framework under the leadership of Asian Carp Director John Goss, appointed in September 2010 by the White House Council on Environmental Quality (CEQ). As Director and RCC Chair, Goss oversees the coordination of Asian carp prevention and control efforts and serves as principle advisor to the CEQ on Asian carp issues. One of the Director's first actions as RCC Chair was to invite two representatives from each Great Lakes state to serve on the RCC; previously only the state of Illinois was represented.

The RCC recognizes the urgent need to identify the frontline of the Asian carp migration and to reduce the population size in the waterways connected to the Great Lakes basin. Toward this end, federal and state agencies along with private partners have conducted sampling at a range of sites in and around Chicago. In addition, scientists are maintaining efforts to analyze water samples from the CAWS and other locations in Illinois and Indiana for evidence of Asian carp eDNA. Sampling results are available on the U.S. Army Corps of Engineers (USACE) and RCC websites.

Other recent efforts under the Framework have included the construction of barriers across two waterways that could potentially provide a pathway for Asian carp movement between the Great Lakes and Mississippi River basins. The Indiana Department of Natural Resources constructed a 1,177 foot chain link fence and a supplemental 494 foot debris catch fence in Eagle Marsh to impede the movement of Asian carp from the Wabash River into the Maumee River. In addition, the USACE installed 13 miles of concrete barriers and mesh fencing along the Des

Plaines River and the Illinois & Michigan (I&M) Canal to prevent Asian carp from bypassing the electric dispersal barrier system. Completed in the fall of 2010 with federal funding from the Great Lakes Restoration Initiative (GLRI) program, both barriers are considered short term solutions to preventing potential fish passage during flood events.

Complementing on the ground activities, significant initiatives are underway to better understand Asian carp risks and management techniques and to find a permanent solution to the movement of all genera of AIS between the two basins. Fisheries and Oceans Canada and the Great Lakes Fishery Commission are conducting a cross-border risk assessment to determine the potential for and impacts of Asian carp establishing self-sustaining populations in the Great Lakes watershed. The U.S. Geological Survey is studying two potential methods of controlling Asian carp populations: the use of pheromones and methods for delivering biocides. In addition, Southern Illinois University Carbondale has received funding to study mechanisms for developing an Asian carp fishery in order to reduce their population size and thus the potential for invasion.

To address the long-term invasive species threat, the USACE has initiated the Great Lakes and Mississippi River Interbasin Study (GLMRIS). Under the study, the USACE will identify, characterize and propose solutions to the risk of interbasin exchange of AIS at hydrologic connections between the Great Lakes and Mississippi River watersheds. GLMRIS, covering all AIS, will be conducted on two simultaneous tracks: one focusing on the CAWS, the pathway of greatest risk for AIS exchange, and the other assessing all other aquatic pathways that could potentially connect the basins. Study efforts are dependent on federal funding and the USACE has projected that recommendations for the CAWS will not be released before 2015.

In a parallel effort, the Great Lakes Commission and the Great Lakes and St. Lawrence Cities Initiative are leading a multi-stakeholder project: *Envisioning a Chicago Area Waterway System for the 21st Century*. With funding from several of the region's largest foundations, the project will define options for separating the Great Lakes and Mississippi River watersheds to prevent the exchange of AIS—including but not limited to the Asian carp—while improving transportation, water quality, and stormwater management in the Chicago area. An evaluation of the costs, impacts and potential benefits of separation will also be conducted. A final report on project outcomes, to be released in January 2012, is expected to support and complement the work of the USACE on GLMRIS.

The challenges are steep in the battle to prevent the invasion of Asian carp into the Great Lakes. Given the high environmental and economic risks that Asian carp pose to the native food web, fisheries, and boating and tourism industries, the region cannot afford to lose this battle. As Great Lakes stakeholders take steps to build the technical capacity and political will to halt the invasion of Asian carp, defenses must also be established to protect the Great Lakes and Mississippi River basins from the exchange of all AIS. Although these feats will require a significant investment, the return on this investment will benefit future generations and help safeguard both regions from the impacts of new aquatic invasions.

¹ Current eDNA testing methodology is limited to providing information on whether a species is present or absent and cannot determine fish size, age, sex, or means of the DNA arrival at the collection point. For more information on eDNA methodology and other topics covered in this article, refer to the Great Lakes Commission website at www.glc.org/ans/ansupdate.

Washington Watch

In late 2010, Congress passed and the President signed S. 1421, the Asian Carp Prevention and Control Act, which adds the bighead carp to the list of injurious species under the Lacey Act. Congress also introduced several other bills to combat Asian carp. The Permanent Prevention of Asian Carp Act (H.R. 5625 and S. 3553) would direct the USACE to study hydrologic separation of the Great Lakes and Mississippi River basins to prevent the exchange of AIS. In addition, the Close All Routes and Prevent Asian Carp Today Act (H.R. 4472 and S. 2946) would require a number of prevention and control activities including closure of the O'Brien Lock and Dam and the Chicago Controlling Works locks until a strategy for controlled lock operations is developed. No action was taken on these bills. The U.S. Coast Guard is continuing work on a ballast water discharge standard. The proposed rulemaking lays out a two-phase standard for the allowable concentration of living organisms in ships' ballast water discharge. The phase-one standard is based on the International Maritime Organization (IMO) standard and the phase-two standard is 1,000 times more stringent than IMO. A final rule is expected in 2011. **Contact:** Erika Jensen, Great Lakes Commission, 734-971-9135, cjensen@glc.org.

Around the Basin:

ILLINOIS: The Illinois Dept. of Natural Resources (DNR), with cooperation of federal and state partners, applied rotenone to a 2.5 mile stretch of the Little Calumet River immediately downstream of the O'Brien Lock and Dam in May 2010. Electrofishing and commercial netting occurred immediately downstream from this area for an additional 2.5 miles. While no Asian carp were captured or observed, the data gathered will be used to compare capture rates of traditional methods (e.g., electrofishing and netting) with rates of capture of fish killed with rotenone. Illinois-Indiana Sea Grant (IISG) has been involved in several Asian carp outreach initiatives including participation in the production of a "how to clean" video and the Chef's Collaborative discussing Asian carp as an "underutilized" food fish. In September, IISG also hosted an Asian Carp Marketing Summit. **Contact:** Patrice Charlebois, IISG, 847-242-6441, charlebo@illinois.edu.

INDIANA: The Indiana DNR, in conjunction with the U.S. Geological Survey and USACE, investigated a natural inter-basin watershed connection that occurs during flood stage at the boundary between the watersheds of the Maumee River (Great Lakes) and Wabash River (Mississippi River). Historical records indicate this connection could be relatively large with the potential to occur on an annual basis. Concern over the potential for Asian carp exchange increased among resource managers with the detection of adult Asian carp in the Wabash River 20 miles from the basin boundary. In addition, silver carp spawn was confirmed approximately 100 miles downstream of this area with an abundance of silver carp fingerlings observed in the lower Wabash. In fall 2010, Indiana DNR used GLRI funds to install a mesh fence across Eagle Marsh, a recently restored wetland complex, to block the movement of Asian carp into the Great Lakes watershed. **Contact:** Doug Keller, Indiana DNR, 317-234-3883, dkeller@dnr.in.gov.

MICHIGAN: June 12-20, 2010 was designated as Aquatic Invasive Species Awareness Week in efforts to protect the state and its waters against AIS. The Michigan Dept. of Natural Resources and Environment (DNRE) has partnered with Wildlife Forever on a multi media outreach campaign. This project will utilize the *Stop Aquatic Hitchhikers!* theme to deliver clear, concise, and consistent AIS prevention and control messages to the vast outdoor recreational and conservation communities. DNRE hosted *Michigan's Asian Carp Prevention Workshop* in November, featuring John Goss, Asian Carp Director. The purpose of the workshop was to discuss prevention and control activities being taken at the federal, regional, and state level as well as Michigan's Asian Carp Management Plan. **Contact:** Emily Finnell, Michigan DNRE, 517-241-7927, finnelle@michigan.gov.

MINNESOTA: The 2010 Minnesota Legislature passed a new law (Minnesota Statutes 2008, section 84D.10) to reduce the risk of AIS transport on boating-related equipment holding water and live wells and bilges. The law requires water drainage by removing the drain plug before leaving waters of the state and transporting the watercraft and associated equipment on public roads. Marine sanitary systems and portable bait containers are excluded from this requirement. Draining of bait buckets still applies when leaving designated infested waters. The Minnesota DNR is now required to report to the Minnesota Legislature each odd-numbered year on additional measures to protect state water resources from human transport of invasive species. The law went into effect July 1, 2010. **Contact:** Luke Skinner, Minnesota DNR, 651-259-5140, luke.skinner@dnr.state.mn.us.

NEW YORK: The New York State Invasive Species Council released the report, "A Regulatory System for Non-Native Species," calling for a multi-pronged approach to invasive species. The Council proposed a new assessment system to categorize invasive species as "prohibited," "regulated," or "unregulated," and to support restrictions on the sale and use of potentially harmful species. The Council is drafting legislation to prevent the spread of AIS by boats and other watercraft. State staff coordinated the development and prioritization of a number of GLRI proposals with stakeholders. In regards to ballast water management, the state certification pursuant to Section 401 of the Clean Water Act was challenged and upheld in state court. This certification sets conditions necessary to meet state water quality standards for vessels operating in New York waters that are covered by EPA's Vessel General Permit. The DEC is currently reviewing requests to extend the implementation dates for installation of appropriate treatment technology to meet state standards. **Contact:** Dave Adams, NY DEC, 518-402-9149, djadams@gw.dec.state.ny.us.

OHIO: Ohio's AIS Committee continues to work on the development of a mission statement and goals for the group. Ohio DNR has contracted with Ohio Sea Grant to work on the revision of Ohio's AIS State Management Plan; a completed draft is planned for June 2011. Strategies have been developed for implementation of several GLRI funded projects, including: pathway analysis, a monitoring workshop, control of invasive plants along Lake Erie in northwest Ohio, and outreach/education efforts. Ohio DNR continues to follow up on reported AIS sightings and recently had scientists from the University of Notre Dame and The Nature Conservancy conduct an invasive plant survey on 80 inland reservoirs and the Ohio River. **Contact:** John Navarro, Ohio DNR Division of Wildlife, 614-265-6346, john.navarro@dnr.state.oh.us.

ONTARIO: During 2010, Ontario Ministry of Natural Resources (MNR) continued eradication efforts for two invasive plants. Infestations of European water chestnut have been managed using a mechanical harvesting system known as a Biocapteur. While efficient at removing large quantities of the plant from sites with moderate water depth, Biocapteur was ineffective in the many shallow nearshore areas, necessitating labor intensive manual removal. While current efforts appear to be containing the species, additional resources will be necessary if eradication is to be achieved. Detection of the invasive plant water soldier was first reported in the Trent River in 2008; it is the only known wild occurrence of this plant in North America. Although the infestation was treated with an aquatic herbicide in 2009, additional monitoring in 2010 documented the persistence of the plant at several locations. Further manual removal and chemical treatments were used in 2010. Surveillance and control measures will be continued in 2011. **Contact:** Jeff Brinsmead, Ontario MNR, 705-755-5424, jeff.brinsmead@ontario.ca.

WISCONSIN: New appointments were recently made by Wisconsin DNR for a state AIS Coordinator and AIS Outreach Coordinator. Efforts in 2009 to control red swamp crayfish in a storm water detention pond were found to be unsuccessful and additional control efforts were taken in 2010. The DNR is strengthening partnerships with other entities with GLRI funding to combat AIS. The state has increased outreach efforts targeting science teachers, nurseries and the aquarium trade. A new "no transport" law is now in effect and being enforced. Conservation Wardens are also developing a statewide media campaign to promote compliance with AIS laws. This past summer, the state's successful Water Guard Program received new recruits stationed around the state. Additionally, The Clean Boats Clean Waters Program was implemented in coordination with Wisconsin Sea Grant, University of Wisconsin-Oshkosh and many local partners. **Contact:** Bob Wakeman, Wisconsin DNR, 262-574-2149, robert.wakeman@wisconsin.gov.

Great Lakes Panel Update

The spring 2010 meeting was held April 27-28 at the Maumee Bay State Park in Ohio. The fall 2010 meeting was held December 8-9 in Ann Arbor, Mich. Featured meeting topics included GLRI implementation and Asian carp prevention and control initiatives. Meeting materials are available at www.glc.org/ans/panel.html#glpmeet. **Contact:** Kathe Glassner-Shwayder, 734-971-9135, shwayder@glc.org.

ANS Task Force Update

The spring 2010 meeting of the ANS Task Force was held in Portland, Maine in May. The fall 2010 meeting was held November 3-4 in Arlington, Virg. Meeting information is available at www.anstaskforce.gov/meetings.php. **Contact:** Susan Mangin, ANS Task Force Executive Secretary, U.S. Fish and Wildlife Service, 703-358-2466, Susan_Mangin@fws.gov.