



Asian Carp eDNA

What is it? How is it used? Where is it going?

FULL SUMMARY

Honorary cosponsors of this briefing are Senate and House Great Lakes Task Force Co-Chairs Senator Carl Levin, Senator Mark Kirk, Congresswoman Miller, Congressman Dingell, Congressman Duffy, & Congresswoman Slaughter

Monday, September 16, 2013

Capitol Visitor's Center

Congressional Meeting Room North

CVC-268

10:30 a.m.

Speakers:

Charles Wooley, U.S. Fish and Wildlife Service

Kelly Baerwaldt, U.S. Army Corps of Engineers

Bill Bolen, U.S. Environmental Protection Agency

David Lodge, Ph.D., University of Notre Dame

Tammy Newcomb, Ph.D., Michigan Department of Natural Resources

John Navarro, Ohio Department of Natural Resources

Kevin Irons, Illinois Department of Natural Resources

BRIEFING RECAP: Asian carp eDNA

On Monday, September 16, 2013, the NEMWI coordinated a briefing on Asian carp environmental DNA (eDNA) history, use, and future developments, in preventing the spread of Asian carp into the Great Lakes. Charles Wooley, U.S. Fish and Wildlife Service, provided background on the development of eDNA as a sensitive tool for surveillance of Asian carp. He explained the development and testing of the protocols, which have passed the high standard of peer review. Additionally, he explained how monitoring in the Chicago Area Waterway System and the Great Lakes is coordinated with the Asian Carp Regional Coordinating Committee, consisting of the federal partners, states, tribes, and local stakeholders. Though only one live Asian carp has been caught in the Chicago Area Waterway System north of the electric barrier, numerous eDNA samples have been taken throughout the areas past the electrical barrier and explaining these positive samples with a lack of caught fish has been difficult.

Kelly Baerwaldt, U.S. Army Corps of Engineers, described the ECALS study, which is meant to further refine and describe the eDNA tool. As part of these efforts, the agencies tested the persistence of eDNA in the environment and whether sources other than a live fish could produce a positive hit. This area of research, known as vectors, is where the majority of the ECALS work has been up to this point. Additional work will focus on increasing the speed of results as well as decreasing the cost of testing, with the final report expected in September 2014. She described the use of eDNA and ongoing refinement as a process similar to “building

the airplane as we fly it” – that is, the technology is new and ever developing. Recently, the Army Corps had transitioned its eDNA lab to the US Fish and Wildlife Service, with a lab established in La Crosse, WI. This lab will provide results of eDNA sampling to the state partners and the public.

Bill Bolen, U.S. Environmental Protection Agency, provided information on the funding, including the bipartisan Great Lakes Restoration Initiative. GLRI initially funded all the efforts related to eDNA including monitoring, sample analysis, and technology development, as there was a need for a rapid deployment of this technology in FY2010.

Attendees then heard from Dr. David Lodge, University of Notre Dame, about the academic community’s involvement in eDNA development and research, which has exploded in terms of publications over the previous four years. He explained the research community’s role is to support managers with practical applications and knowledge, while depending on state and federal legislature for direction and support. Dr. Lodge highlighted the damages done by invasive species, estimated to cost the Great Lakes at least \$200 M annually. Given the likely negative impacts of Asian carp on the Great Lakes, it is essential to ensure they do not establish in the Great Lakes. Dr. Lodge maintained, that given the probabilities, a finding of eDNA most likely indicates the presence of a live Asian carp at some point. The delay in the results along with the difficulty of traditional capture methods on Asian carp make finding the live Asian carp more unlikely. False negatives, that is not detecting Asian carp eDNA when Asian carp are present, are still more prevalent and a greater issue than false positives, the presence of Asian carp eDNA without the presence of a live Asian carp. Sources of eDNA other than a live fish are possible, though Dr. Lodge pointed out that alternative sources are unlikely to account for the large number of positive eDNA samples. Dr. Lodge closed with the call for more research, better tools for managers to respond, and continuing importance of the research-management interface.

State agency representatives from Illinois, Ohio, and Michigan offered their views and interactions on the Asian carp eDNA front. Kevin Irons, Illinois Department of Natural Resources, discussed how 2009 was a trigger year for action: eDNA positive results, a live Asian carp, and maintenance needed on the electrical barrier. Over \$5 M was spent to treat six miles of river, where the one carp was found. He noted the continued finding of positive eDNA results covered a large geographical area, though the percentage of positive results out of the entire set of samples was quite small.

John Navarro, Ohio Department of Natural Resources, highlighted the good news of no evidence of Asian carp spawning in Ohio waters. Ohio contains two medium-risk connections, identified as part of the Great Lakes-Mississippi River Interbasin Study, where continued intensive monitoring will occur to determine the current status of carp populations. He also noted the importance of having multiple tools to locate invasive carp.

Tammy Newcomb, Michigan Department of Natural Resources, noted the recent resolution agreed on by the Council of Great Lakes Governors, asserting their commitment to preventing invasive species from coming into the Great Lakes. She also provided an overview of the steps in an invasion, the related actions by managers at those steps, as well as where each of the states currently is in the steps. Illinois, with its management of Asian carp populations in the Illinois River and prevention work related to the Great Lakes, has to contend with more stages of invasion than the other Great Lakes states. As well, the financial investment at each stage of invasion, from prevention to management, increases, the economics of prevention are still the best. The conundrum remains what do you do and how much do you spend. States have to be strategic and smart about their investments, focusing efforts in the areas where they can have the most impact, as well as prudent given the limited resources. She highlighted the technology, tools, and partnerships need to continue to evolve to changes and improvements.

Charles Wooley, USFWS, finished up the session by noting that eDNA is a useful tool to aid state and federal resource managers and will be rapidly improved in the coming years due, in large part, to effective collaboration to prevent the spread of Asian carp into the Great Lakes.