

MINUTES OF THE MISSISSIPPI RIVER COMMITTEE

Wisconsin Conservation Congress, Lock and Dam 8 Genoa WI

9:30 am July 28 2012

The meeting was called to order by Chairman Marc Schultz at 9:30 am. Committee members and DNR liaison present were Gary Dillaber, Ted Engelein, Richard Wayne, Marc Schultz, Mike Hayes, William Howe, Ralph Kunkel, Ron Benjamin, Bob Jumbeck. Excused were Michael Britton, Robert Brunkow and Wes Domine. Guests were Mark Clements and Darlene Kunkel.

Motion by Mike Hayes second by Gary Dillaber to approve the agenda as presented. Passed unan. Marc Schultz read the committee mission statement. Motion by Ralph Kunkel second by Bill Howe to approve the existing mission statement. Passed unan.

There were no public comments.

Marc Schultz distributed a July 2012 fact sheet on the invasive species research and activities of the UMESC USGS staff in La Crosse. A copy of the fact sheet is attached and made part of these minutes. There was concern by committee members regarding the lack of barriers to intentional and non-intentional importation into the country of non-native species without a demonstration that those species would not be harmful to existing natural ecosystems. The Wildlife Health and Invasive Species WCC committee meeting was held last Saturday at Mead Visitor Center. Marc Schultz attended and reported that Greg Stacey discussed the progress of the WDNR water guard program in Wisconsin and outlined the stringent aquatic invasive species enforcement programs in western states. Ron Benjamin reported that the Wisconsin legislature passed and the Governor signed a bill Wisconsin Act 207, 2011 that did away with the need for an import permit for persons importing aquatic species into Wisconsin and that this has deterred enforcement actions against illegal importations.

Mark Clements who owns and operates Clements Fishing Barge which is directly below Lock and Dam 8 reported on his research and findings regarding FERC licensing of hydropower facilities on Mississippi River Locks and Dams. He stated that hydro power is, under the 1924 federal law that establishes the refuge, not allowed on the Upper Mississippi River Refuge. The hydro-power license applications are for the locks and dams which are US Army Corps of Engineers (COE) project facilities hence not in the refuge. The COE is required by law to grant approval of the license applications. The licensee would be subject to the strictures of any FERC license requirements. USFWS and the WDNR as well as citizens have asked FERC to require detailed study and analysis of the many likely impacts of the proposed hydro facilities. Free Flow Power has withdrawn their license applications, however there are other applicants who have applied for hydro licenses on several Mississippi River locks and dams

including L&D 8. Mark said local governments including County Boards in Wisconsin and the adjacent states have adopted resolutions opposing granting the license's on economic, social and environmental grounds. Marc Schultz offered that a FERC license would bestow ownership of the water which is now public to the licensee and a license could be construed as establishing hydro-power as a public purpose.

Motion by Mike Hayes second by Gary Dillaber that the committee draft a letter to the WCC officers with copies to our state and federal representatives detailing the Mississippi River Committees concerns regarding establishing hydro power at river locks and dams and suggesting that federal legislation is necessary to resolve the conflict between the apparent diametrically opposed federal laws (1930's authorization for lock and dam construction and 1924 authorization for the refuge) regarding establishing hydropower on the Mississippi River. Issues of concern involve fish passage, water flow, water levels, sedimentation, dam structural integrity, public use, negative economic impact on nearby communities, power line corridors and others have been put forth by USFWS, WDNR and the public as needing study before the license is granted. It is likely that the proposed hydro power facilities will negatively impact the Mississippi River ecosystem upon which the refuge depends to fulfill its purpose. The river ecosystem is experiencing real threats from existing and potential invasive species.

A draft of the letter will be circulated to committee members for input before it is finalized and sent.

River program funding was discussed. Ron Benjamin updated the members regarding funding for EMP, NESP, and state budget implications. The outlook for funding except invasive species is not good. It was noted that the number of retirements at WDNR fisheries will be approximately one half of the staff over the next 5 years.

Marc Schultz gave the committee an update of the activities of the WCC Strategic Planning Committee. He reviewed the facilitators report and noted that the July 23 meeting minutes and report should be on the WCC web page shortly.

He encouraged the members to let the Strategic Plan Committee members know of their ideas and recommendations as the process goes forward.

Resolution 3350512 Allow harvest of minnows on VHS affected waters for personal use. Discussion of the resolution by the committee with both agreement and disagreement as to its merits. Ron Benjamin advised that the regulations on minnows is a state wide policy and applies to all waters of the state. Motion by Mike Hayes second by Gary Dillaber to move the resolution forward. Resolution passed 4 ayes 2 nos.

Bob Jumbeck discussed recent drownings on the river. It was noted that the last three years have been high water years that present real navigation dangers with debris in the water and fast current. The current status of the warden force was also discussed. Marc Schultz said that the recent high water years have changed the backwaters considerably with many areas on pool 7 no longer navigable during normal water due to sand bars across channels.

Adjourned 12:15 PM

Ted Engelein provided barbecue and beans for lunch. Thanks Ted

After lunch some members took the opportunity to tour Lock and Dam 8 facilities which had been rehabilitated in 2003. Mississippi River Committee member Ted Engelein, who is a retired COE lock employee was our tour guide.

USGS-UMESC Aquatic Invasive Species Research

July 2012

Task Force Participation

USGS-UMESC researchers participate on the following taskforces:

- (1) MN-WI Task Force on Asian carp in the UMR and St. Croix;
- (2) UMRBA ANS Task Force; (3) Minnesota Governor Dayton's Asian Carp Summit; (4) Great Lakes Basin ANS Task Force, and
- (5) Mississippi Interstate Cooperative Resource Association (MICRA).

All these organizations and task forces share a desire to control and manage invasive species, although their focal areas, responsibilities, and authorities are unique.



Field Research Update

Field research in 2010 focused on assessment of the ecological effects of Asian carp on river and avian foodwebs on the Illinois and Upper Mississippi Rivers.

It appears that Asian carp have a detrimental effect on desirable and native fish and other wildlife.

- ✓ UMESC determined native fish from waters with high densities of Asian carp in the Illinois River, had about 1/4th the total fat (lipid) content and lower levels of essential fatty acids like DHA and EPA in muscle tissue, thus effecting the capability of these fish to survive and thrive.
- ✓ Fish like sauger, smallmouth bass, bigmouth buffalo, white bass, and freshwater drum had lower reproductive success in high Asian carp infested waters.
- ✓ Tree swallows on the UMR have more fat (lipid) than birds on the Illinois River, indicating effects of Asian carp higher in the food web.

Field research in 2010, 2011 and 2012 included

- ✓ Comparisons of the digestive enzyme activity of Asian carp versus native filter-feeding fish on the Illinois (IL), Wabash (IN), and James River (SD). Comparing the digestive enzyme activity of these species in different river systems allowed us to assess whether the differences observed in the Illinois River also occur in fish in other habitats with different food resources. This was critical to confirm that one microparticle formulation could be used in different habitats to selectively deliver control agents to Asian carp while having minimal effects on native species.
- ✓ Collections of digestive tract samples of Asian carp and native planktivores to compare the microbial communities present in these fish. Identifying unique microbial communities in bighead carp and silver carp could allow the development of microbial source tracking procedures that could complement environmental DNA (eDNA) monitoring of Asian carp.

Laboratory Research Update

As part of an **integrated pest management (IPM) approach**, UMESC has been conducting investigations to identify Asian carp biological and physiological characteristics for use in the development of control tools and techniques to selectively control Asian carps with minimal impact on native species.

UMESC's approach is to work concurrently to 1) identify control agents with greater specificity for Asian carp, and 2) develop methods to selectively deliver control agents to Asian carp because of their greater filtration capacity and the greater activity of certain enzymes in the digestive tract of Asian carp compared to native filter-feeding fish.

Cooperative agreements are also being formed with private companies to develop microparticles using novel compound capture technologies that have the capacity to deliver biocides to targeted groups of fish. Funding for these projects is provided by the Great Lakes Restoration Initiative.

Coordination & Cooperation (GLRI) – Asian Carp & Zebra Mussels

USGS has been given the **science lead** for the (GLRI) Asian carp projects by the President's Council for Environmental Quality under John Goss' direction. USGS is coordinating with over 50 partners through annual science meetings; February 2011 in Chicago and March 2012 in La Crosse to discuss GLRI project status, collaborations, and future efforts.

UMESC ASIAN CARP ACTIVITIES

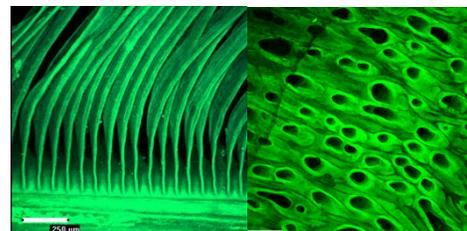
The objectives of UMESC research are:

Identification of Potential Control Agents for Toxicant Screening Program

- Viterbo University collaboration - **synthesized different formulations of GD-174**; compound previously found to have selectivity to common carp
- Initiated studies with GD-174 and other candidate compound
- Compared the metabolism of rotenone by silver & bighead – identified different metabolic pathways are used by these closely related species
- Developed chemical database of over 274 compounds which will be used to screen larger databases for potential piscicides – the database will soon be served on-line to allow access by other researchers

Technologies Using Targeted Oral Delivery for Species-Specific Control

- Filtration efficiency of Asian carps - **microparticle size testing completed – target size range selected (50-100 µm)**
- Microparticle preparation - **multiple microparticle formulations tested; testing with biocide-laden microparticles planned for winter 2012.**
- Gut physiology of native and non-native planktivores
 - ✓ **Tested 19 digestive enzymes - Results show unique species differences** (gizzard shad, bigmouth buffalo, Asian carp); beginning to assess geographic differences
 - ✓ **Compared trypsin activity between silver carp and gizzard shad** – silver carp have more trypsin and more “active” trypsin than gizzard shad
- University of Wisconsin-La Crosse collaboration - morphology of gill rakers from Asian carp and native planktivores. Prepared **2- and 3-dimensional images of gizzard shad and silver carp gill-rakers**. The inter-raker spacing of the gill rakers of gizzard shad differed based on both season and location while those of silver carp did not. This suggests that one microparticle size range could be



Gizzard shad

Silver carp

effective against Asian carp regardless of location or season. It also suggests that the potential impact to gizzard shad could differ based on location and season.

Development of Rapid Molecular Surveillance Tools to Detect Asian

- Army Corps of Engineers collaboration – Environmental DNA (eDNA) 1) decrease processing time (improve sample throughput), 2) calibrate eDNA response to fish populations to allow eDNA monitoring to predict fish population size, 3) validate species specificity, and 4) identify and evaluate vectors of eDNA transmission (*e.g., fish-eating birds, barges, etc.*) to determine the whether these vectors could cause positive eDNA responses.
 - ✓ Initial method modifications have given **sample-to-detection results in as little as 4 hours**; work continues to validate these findings.
 - ✓ Compared eDNA extraction methods – will likely result in modification to current eDNA processing procedures
 - ✓ Developed 19 potential markers for bighead carp and silver carp for possible incorporation into the screening program
 - ✓ Fed silver carp to bald eagles at the National Eagle Center in Wabasha, MN then collected fecal material for 7 days post-feeding, sample analysis in progress; feeding trials planned with cormorants and white pelicans (Brookfield Zoo, August 21012)
- University of Illinois Urbana-Champaign collaboration – identifying bacterial populations in Asian carp and native planktivore GI tract to determine whether **microbial tracking** could detect Asian carp.
 - ✓ Completed DNA sequencing of >200 Asian carp and native planktivore samples
 - ✓ Analysis of >83% of sequences completed
 - ✓ Hindgut microbial communities of indigenous fishes (*e.g., gizzard shad*) were clustered closer to each other than to Asian carps.
 - ✓ Foregut communities were generally different from hindgut communities for gizzard shad and silver carps.
 - ✓ Specific microbial populations associated with grass carp, gizzard shad, and silver carp were observed, suggesting primers specifically targeting these microbial populations can be designed and used as biomarkers in Asian carp surveillance.
- University of Minnesota and Minnesota DNR collaboration – eDNA surveillance of Asian carp in the UMR and connected Minnesota waters.
 - ✓ New collaboration being established to process samples to determine the presence or absence of Asian carp eDNA in the UMR and in connected Minnesota waters

Evaluate Physical Methods to Disrupt Asian Carp Spawning Behavior and Decrease Egg Viability

- Purdue University collaboration – assess the **effects of electricity on eggs** of Asian carp and native species; evaluate placement of electrical barriers downstream of spawning sites.
 - ✓ Completed tests with native test species and with bighead carp; electricity limited Asian carp egg survival only at voltage gradients that are impractical for field use.

UMESC DREISSENID (Quagga and Zebra) MUSSEL ACTIVITIES



- New York State Museum collaboration – **collaborative effort to evaluate the potential non-target effects of ZEQUANOX®, a killed *Pseudomonas fluorescens* bacterium product that may be effective in controlling dreissenid mussels.**
 - ✓ Met with AIS specialists from Iowa, Minnesota, and Wisconsin to identify locations for field trials in 2012. In 2011 caged zebra mussels were placed in Lake Carlos (MN), Lake Pepin (MN), and Lake Shawno (WI) for 2012 field trials. Mobile bioassay laboratory being readied for field trials.
 - ✓ Completed non-target evaluations with glochidia and newly-transformed juveniles of several native mussel species, tests with native fishes are in progress, tests with year-old+ native mussels are planned for 2013
 - ✓ Additional work selected for funding by Legislative Citizens Commission on Minnesota Resources (LCCMR) – field trials and additional laboratory investigations of ZEQUANOX®
- Filtration efficiency of Native & Zebra Mussels –
 - ✓ **~10-fold greater filtration rate in Zebra mussels compared to natives**
- Gut physiology of Native & Zebra Mussels –
 - ✓ **Seasonality** – **determined the digestive enzyme activity in native and zebra mussels. Digestive enzyme activity was decreased in native mussels sampled in the fall compared to summer as water temperatures decreased while digestive enzyme activity in zebra mussels remained constant.**
 - ✓ University of Wisconsin-La Crosse collaboration – graduate student expanding work with native mussels and zebra mussels to include mayflies and caddis flies

Cooperative IPM Activities with other USGS Centers

USGS Columbia Environmental Science Center – Assessment of **carp pheromones (attractants & repellants); use of alternative Great Lakes food resources (blue-green algae, dreissenid mussel feces); and risk assessment modeling**

USGS Illinois Water Science Center – Assessment of **inter-basin transfer** of AIS

USGS Rocky Mountain Science Center – Assessment of **physical control methods** of AIS, such as pulse pressure technology (e.g., waterguns)

For additional information on USGS AIS research activities, please visit: <http://www.umesc.usgs.gov/>
or <http://cida.usgs.gov/glri/>