

# Upper Midwest Environmental Sciences Center

## April 2011 Activity Report

### Aquatic Invasive Species – Sea Lamprey

#### Presentations

- Terry Hubert presented the proposed UMESC budget requirements for fiscal year 2012, at the spring Sea Lamprey Integration Committee meeting in Ann Arbor, MI, April 18-19.

#### Publications

- Mike Boogaard and Jane Rivera published results from their study of the lampricides TFM and TFM mixed with Niclosamide on a number of non-target species; the American eel, haliplid water beetles (*a surrogate for the endangered Hungerford's crawling water beetle*), and three native mussel species. The study showed that acute TFM toxicity was not evident among the species studied, at the concentrations used to control sea lamprey.
  - Boogaard, M.A., and Rivera, J.E. 2010. [Acute toxicity of two lampricides, 3-trifluoromethyl-4-nitrophenol \(TFM\) and a TFM:1% niclosamide mixture, to sea lamprey, three species of unionids, haliplid water beetles, and American eel.](#) Great Lakes Fish Comm. Tech Rep. 70.

#### Training

- Terry Hubert and Jane Rivera attended the Biopesticide Registration Improvement Course (BRIC) at the U.S. Environmental Protection Agency's (EPA) Headquarters in Arlington, VA, April 13-15. BRIC is a special overview and trouble-shooting course intended to serve as a building block for constructing a sound foundation for a biopesticide registration application. Canada, Mexico, and the United States are committed to working together on an international level to mainstream biopesticide reviews. The goals of the course are; (1) increase registrant and industry understanding of the biopesticide regulatory processes, (2) define the national and international criteria for biopesticide regulatory assessments, and (3) update registrants/manufacturers on emerging issues.

#### Other

- Steve Redman acquired adult bigmouth buffalo from Harper, KS, and juvenile black bullhead from Valentine, NE. These fish will be used for a variety of new and ongoing research at UMESC including work to assess non-target effects of proposed new piscicide formulations and to assess the utility of a uridinediphosphate glyuronyltransferase (UDP-GT) assay to determine the relative sensitivity of species of concern to the lampricide TFM.

### Congressional Activities

#### U.S. Representative Ron Kind, WI 3rd District

- UMESC hosted a visit from two members of U.S. Congressman Ron Kind's staff, Shannon Glynn (*Legislative Assistant for environmental issues in DC*) and Karrie Jackelen (*Legislative Aide in the La Crosse office*), April 18. Jack Waide provided a tour of the Center's new wing addition and information on the Center's other construction and maintenance projects, in addition to providing an overview of the Center's current research activities.

#### Upcoming Visits

- Mike Jawson, Randy Hines (*UMESC*), and Bill Lukas (*USGS Congressional Affairs*) will provide annual briefings on science and program activities to congressional staff May 3-4 in Washington DC.

### Great Lakes Restoration Initiative (GLRI)

### **Project #73, Avian Botulism in Distressed Great Lakes Environments**

- Kevin Kenow participated in a conference call with Minnesota Department of Natural Resources (DNR) to discuss the assessment of oil spill impacts on common loons and white pelicans which breed in Minnesota and over-winter in the Gulf of Mexico, April 19.
- Kevin Kenow was interviewed by Danielle Kaeding (*The Daily Press, Ashland, WI*) concerning ongoing common loon research, April 20. The [article](#) was published April 21.

### **Project #80, Birds as Indicators of Contaminant Exposure**

- Thomas Custer and Christine Custer presented a seminar on GLRI Project #80, at the EPA Mid-Continent Ecology Division in Duluth, MN, March 30. The Custers also explored options for collaboration with the EPA on the St. Louis River Area of Concern (AOC), and initiated this year's field work.
- Christine Custer and Thomas Custer initiated field work at several study sites during April 6-13. Several new tree swallow sites were installed; Detroit River (n = 2), Saginaw River (n = 1), and White Lake (n = 1), and location and access for one new site (Sheboygan River) was investigated.

## **Geospatial Science & Technology**

### **Computer Applications**

- Doug Olsen completed the Raster Split Tool, a new Arc Toolbox command for the software program ArcGIS version 10. The tool is designed to automate the process of breaking up large raster data sets (*e.g., National Land Cover Database (NLCD) files*) into smaller pieces (*e.g., counties, watersheds*) and allowing the output raster data sets to be named according to an attribute in the split data set. Without automation, this process can be quite time-consuming and tedious. The Raster Split tool is available to download via the UMESC website at <http://www.umesc.usgs.gov/dss.html>

### **Elevation Data**

- John (JC) Nelson attended the Wisconsin Geographic Information Coordination Council Elevation Sub-team Meeting in Madison, WI, April 6. The meeting focused on maintaining a statewide inventory of available elevation data; creating and maintaining a location to store and provide access to elevation data; providing education and outreach; and creating and maintaining a set of independent quality control standards. During the meeting UMESC offered to make the Center's experience in collecting and using LiDAR data for various applications available to the Council.

### **Red River**

- Jason Rohweder and Tim Fox discussed collaboration on a Plains and Prairie Pothole Landscape Conservation Cooperative proposal with U.S. Fish and Wildlife Service (FWS) Region 3 hydrologists, April 18. The proposal would outline the development of a decision support tool aimed at restoration efforts in the Red River Watershed based, in part, on abiotic parameters such as soils and hydrology.

## **Mississippi River**

### **Presentations**

- Nate De Jager gave the following presentations at the [2011 U.S. International Association for Landscape Ecology Symposium](#), April 3-7 in Portland, OR.

- ["Modeling and mapping hydrologic thresholds for plant and soil properties along the Upper Mississippi River Floodplain, USA,"](#) an oral presentation by Nathan De Jager, Yao Yin, and John Nelson.
- ["Hot and cold spots of total nitrogen \(TN\), total phosphorus \(TP\), and TN:TP in the Upper Mississippi River USA,"](#) a poster presentation by Nathan De Jager and Jeffrey Houser.
- UMESC scientists gave the following presentations at the Freshwater Mollusk Conservation Society's (FMCS) 7th Biennial Symposium in Louisville, KY, April 11-15. The FMCS is dedicated to the conservation of and advocacy for freshwater mollusks, North America's most imperiled animals.
  - A mussel community assessment tool for the Upper Mississippi River, by Heidi Dunn, Steve Zigler, and Teresa Newton (*UMESC*).
  - Effects of Food Quality on Juvenile Unionid Mussel Survival and Growth in the St. Croix National Scenic Riverway, by Michelle Bartsch, William Richardson, Lynn Bartsch, Jon Vallazza (*UMESC*), and Brenda Moraska La Francois (*NPS*).
  - Effects of sub-lethal temperatures on adult and juvenile freshwater mussels, by Alissa Ganser (*Univ. of WI-La Crosse*), Teresa Newton (*UMESC*), and Roger Haro (*Univ. of WI-La Crosse*).
  - Models of unionid distribution and abundance in a reach of the Upper Mississippi River, by Steve Zigler, Teresa Newton, and Doug Olsen (*UMESC*).
  - Response of native mussels to water level manipulation in the Upper Mississippi River, by Teresa Newton, Steve Zigler, Robert Kennedy (*UMESC*), Ashley Hunt (*FWS*), Mike Davis (*MN DNR*), and Patty Ries (*UMESC*).
- UMESC scientists gave the following presentations at the [43<sup>rd</sup> Annual Meeting of the Mississippi River Research Consortium](#), April 28-29 in La Crosse, WI.
  - "Lipid Flux from the Upper Mississippi (UMR) and Illinois Rivers (IR) by Insect Emergence: Preliminary Results," by William Richardson, Brent Knights (*UMESC*), Patrick Kelly, and Roger Haro (*Univ. of WI-La Crosse*).
  - "Observational Evidence for Adverse Effects of Invasive Asian Carps on Reproductive Success of Native Fishes," by Steve Gutreuter, Jonathan M. Vallazza, Michelle R. Bartsch, Lynn A. Bartsch, Brent C. Knights and William B. Richardson (*UMESC*).
  - "The Effects of Water Level Manipulation on Native Mussel Populations in the Upper Mississippi River," by Teresa Newton, Steve Zigler, Robert Kennedy (*UMESC*), Ashley Hunt (*FWS*), Mike Davis (*MN DNR*), and Patty Ries (*UMESC*).
  - "Threshold Effects of Flood Duration on the Vegetation and Soils of the Upper Mississippi River Floodplain," by Nathan R. De Jager (*UMESC*), Meredith A. Thomsen (*Univ. of WI-La Crosse*), Yao Yin, and John C. Nelson (*UMESC*).

*Poster Presentations*

- “Abiotic Effects on the Zooplankton Community Structure of the Upper Mississippi River,” by Michael S Ahmann, Michael D. Delong (*Winona State Univ.*), William B. Richardson (*UMESC*).
- “Biotic Interactions and Regulation of Zooplankton Communities in a Hydrologically Dynamic Large River,” by Joshua L. Anderson, Michael D. Delong (*Winona State Univ.*), William B. Richardson (*UMESC*).
- “Effects of Climate Change on Adult and Juvenile Freshwater Mussels,” by Alissa Ganser (*Univ. of WI-La Crosse*), Teresa Newton (*UMESC*), and Roger Haro (*Univ. of WI-La Crosse*).
- “Evaluation of a Voluntary Program to Curtail Boat Disturbance to Migrating Waterfowl Using Pool 7 of the Upper Mississippi River,” by Kevin P. Kenow, Brian Gray (*UMESC*), James Nissen (*FWS*), Pete Boma, Steve Houdek (*UMESC*), Jessica Larson, and Luke Fara (*FWS*). The Lake Onalaska Voluntary Waterfowl Avoidance Area is a 13.6 km<sup>2</sup> (3,365 acre) area within Lake Onalaska in Navigation Pool 7 of the Upper Mississippi River that was established to reduce boating disturbance and therefore provide a quality resting and feeding stopover area for migratory waterfowl on the Upper Mississippi River National Wildlife and Fish Refuge. The observed boating disturbance rate during fall 2010 was at a level of concern under the Refuge Comprehensive Conservation Plan threshold for implementing more restrictive regulations.
- “Evaluation of Shorebird Response to Changes in Vegetation on Newly-Constructed Islands within the Wisconsin Islands Closed Area, Navigation Pool 8 of the Upper Mississippi River,” by Steven C. Houdek (*UMESC*), Craig Kelling (*Winona State University*), Kevin Kenow, Brian Gray, James Rogala, and Pete Boma (*UMESC*). This project investigated shorebird response to experimental habitat features incorporated into the island designs. The poster highlights the need for long-term evaluations of shorebird response to plant growth on newly-constructed islands in order to provide river managers with information relative to shorebird habitat management strategies.
- “Patterns of Phytoplankton Chlorophyll and Nutrients in Riverine Patches of Differing Hydrological Retention,” by Qurratul-aine Jadran, Michael D. Delong (*Winona State Univ.*), William B. Richardson (*UMESC*).
- “Spatial Clusters of Total Nitrogen (TN), Total Phosphorous (TP), and TN:TP in the Upper Mississippi River, USA,” by Nathan R. De Jager and Jeffery N. Houser (*UMESC*).
- “Shorebird Response to Island Restoration in the Pool 8 Wisconsin Islands Closed Area on the Upper Mississippi River,” by Craig Kelling (*Winona State University*), Kevin Kenow (*UMESC*), Neal Mundahl (*Winona State University*), Steve Houdek, Pete Boma, Eileen Kirsch (*UMESC*).

### Remote Sensing Projects

- Larry Robinson assisted the FWS Region 3’s pilot with flight planning and aerial photo acquisition focused on heron rookeries located on the Upper Mississippi River in navigation Pools 5 through 14 (*Alma, WI to the Rapids City, IL*), and for an invasive species study in navigation Pools 8, 9, and 13 (*La Crosse, WI to Harpers Ferry, IA and Bellevue to Clinton, IA*).

### National Park Mapping

#### Appalachian National Scenic Trail (APPA)

- Jennifer Dieck, Kevin Hop, and Andrew Strassman (*UMESC*) met with Mark Hall (*NatureServe*), James Vanderhorst (*Natural Heritage Program, WV DNR*), Jason Harrison (*MD NHP, MD DNR*), Tony Davis (*PA NHP*), Chris Lea, Stephanie Perles, and John Young (*NPS*) to discuss the vegetation classification for the Central Appalachian Ecoregion of the Appalachian National Scenic Trail (APPA) Vegetation Mapping Project, April 21-22. This meeting involved a discussion of the natural communities likely to be found along the APPA from Virginia north to the Pennsylvania-New Jersey border, the distinguishing characteristics of these communities, and how best to identify them in the field.

## National Research Program

- UMESC hosted a visit from Pierre Glynn (*Chief of the Eastern Branch, USGS National Research Program*) April 20, who provided a detailed overview of the NRP and engaged UMESC scientists in an open dialog regarding areas of potential future collaboration and interaction. Glynn also used this visit to learn more about UMESC's research mission, and the Center's current research activities.

## Wildlife Ecology

### White-nose Syndrome

- Wayne Thogmartin gave the presentation, "A Demographic Model of Indiana Bats Subject to White-nose Syndrome," at the Department of Forestry and Wildlife Ecology, University of Wisconsin-Madison, April 6.

### Remote Sensing – Spring Bird Migrations

- Robb Diehl and Todd Preston (*NOROCK*) visited UMESC April 27-29 to work with Eileen Kirsch, Mike Wellik and Manuel Suarez using portable marine radar in horizontal and vertical modes to monitor nightly spring songbird exodus from Upper Mississippi River floodplain and nearby upland forests, in a preliminary feasibility study. This work brings together two UMESC study areas; (1) assessing songbird use of floodplain versus upland forest during spring migration, and (2) examining airspace use and movement patterns of birds during migration. These data will be provided to the FWS for their evaluation of wind power development proposals.

## Other

### Yangtze River, China

- Yao Yin (*UMESC*) and Stephen Waste (*WFRC*) are two of four American scientists invited to the Fourth Yangtze Forum, April 18-19 in Nanjing, China. Yin co-chaired the session, "Aquatic Ecosystem Protection and Restoration," and Waste gave the presentation, "Long-term Monitoring Strategies for Large River Systems: Developing the Basis for the Adaptive Fisheries Management in Response to Climate Change and Aquatic Invasive Species." After the Forum Yin and Waste accompanied the American delegation as they continued in a science exchange tour to Wuhan, Jianli, Yichang, and Beijing, China before returning to the U.S. April 26. The Nature Conservancy's Great Rivers Partnership (GRP) is leading the initiative for these cross-basin river science exchanges and Yin acts as its Director of International Strategies. USGS, in conjunction with the U.S. Army Corps of Engineers' (USACE) Environmental Management Program (EMP) and the Long Term Resource Monitoring Program (LTRMP), is the primary science partner of the GRP. Contact: Yao Yin [yyin@usgs.gov](mailto:yyin@usgs.gov).
- Brian Ickes will travel to China, May 16-28, to assist with the implementation of fish sampling and radio tracking that will allow for comparisons between the Yangtze and Mississippi Rivers. Ickes coordinates fishery projects for the Upper Mississippi River's LTRMP, a cooperative

research and monitoring program between the USACE, USGS, FWS, EPA, and the states of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. This trip is sponsored and funded by The Nature Conservancy's GRP, which is leading the initiative for these cross-basin river science exchanges. UMESC has a contractual agreement with the GRP for Ickes service as a GRP Yangtze Fellow.

### Personnel

- John (JC) Nelson was elected to represent the Federal Sector on the Wisconsin Geographic Information Coordination Council, replacing Dick Vraga (*USGS Geospatial Liaison*). The Wisconsin Geographic Information Coordination Council (WIGICC) is a newly formed organization that serves as the primary forum and coordinating body for geographic information and technology in the State of Wisconsin. WIGICC offers a model for coordination that is inclusive, representative, and participatory. The overarching goal of the WIGICC is to give all stakeholders within the geospatial community a voice in statewide initiatives. Thus, the proposed model includes two equally important components - a Council and a stakeholder "Network."

### Miscellaneous

- Steve Redman provided 200 adult rainbow trout reared at UMESC to the EPA research laboratory in Duluth, MN. This was the first of 2 fish lots UMESC will provide this year, for use in multiple EPA research projects. UMESC has been providing the EPA with fish for use in research projects for over 5 years.

### Acronyms

AOC: Area of Concern  
APPA: Appalachian National Scenic Trail  
BRIC: Biopesticide Registration Improvement Course  
DNR: Department of Natural Resources  
EPA: U.S. Environmental Protection Agency  
EMP: Environmental Management Program  
FMCS: Freshwater Mollusk Conservation Society  
FWS: U.S. Fish and Wildlife Service  
GLRI: Great Lakes Restoration Initiative  
GRP: Great River Partnership  
IR: Illinois River  
LiDAR: Light Detection and Ranging  
LTRMP: Long Term Resource Monitoring Program  
NHP: Natural Heritage Program  
NLCD: National Land Cover Database  
NOROCK: Northern Rocky Mountain Science Center  
NPS: National Park Service  
NRP: National Research Program  
TFM: a type of lampricide (3-trifluoromethyl-4-nitrophenol)  
TN: Total Nitrogen  
TP: Total Phosphorus  
UDP-GT: uridinediphosphate glyuronyltransferase  
UMESC: Upper Midwest Environmental Sciences Center  
UMR: Upper Mississippi River  
USACE: U.S. Army Corps of Engineers  
WFRC: Western Fisheries Research Center  
WIGICC: Wisconsin Geographic Information Coordination Council