

Asian Carp Distribution in North America

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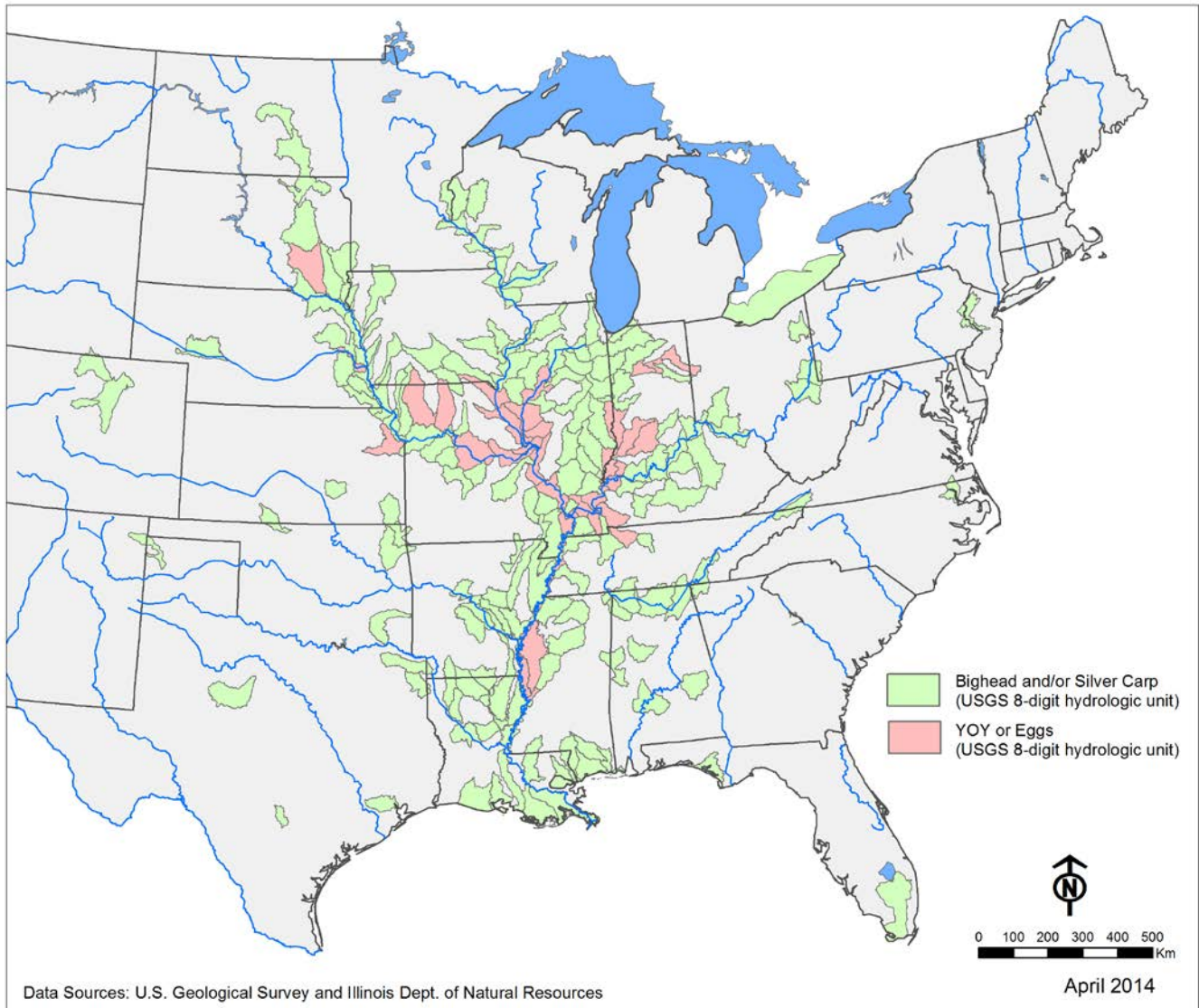
Bighead carp (*Hypophthalmichthys nobilis*), silver carp (*H. molitrix*), black carp (*Mylopharyngodon piceus*) and grass carp (*Ctenopharyngodon idella*), are together referred to as Asian carp. These fish are highly invasive and threaten the integrity of native fish species and ecosystems as their spread progresses throughout the Mississippi River Basin of North America. Of immediate concern is the threat that two of these species (bighead carp and silver carp) pose to the Great Lakes. Due to the proximity of large populations of bighead and silver carp in the middle and lower segments of the Illinois River, the upper Illinois River (Waterway) and the Chicago Area Waterway System (CAWS) have been under intensive monitoring. Since 2009, this effort has been overseen by the Asian Carp Regional Coordinating Committee (ACRCC). In addition, the U.S. Army Corps of Engineers (USACE) has constructed a series of electric barriers on the Chicago Sanitary and Ship Canal outside Chicago, Illinois, in hopes of preventing the further spread of aquatic invasive species such as Asian carp between the Mississippi River Basin and the Great Lakes. The first barrier began providing electricity to the water in 2002 and to date, only one bighead carp has been found above the barrier in the waterway (Lake Calumet, June 2010). The presence of the less talked about black carp and grass carp is also concerning, and effects on the ecology of lake and river environments has the attention of scientists and managers. The USACE, in consultation with federal, state, and local stakeholders, is conducting the Great Lakes and Mississippi River Interbasin Study, which evaluates options and technologies available to prevent the transfer of aquatic invasive species (Asian carp and other species) between the Great Lakes and Mississippi River basins via aquatic pathways. Other efforts of the ACRCC can be found at www.asiancarp.us. This report is to share succinctly the efforts of biologists across the U.S. to graphically document the current knowledge of Asian carp populations.

To adequately assess the distribution of Asian carp species, an Asian Carp Questionnaire was distributed via email to biologists at many federal, state, academic, private consulting, and non-governmental organizations to solicit input and current data/knowledge on the presence of Asian carp (bighead carp, silver carp, and grass carp) at all life stages in their waterways through 2012. A total of 81 respondents from 22 states contributed to these efforts. In addition, a large source of information was data compiled by the ACRCC's Monitoring and Response Work Group which includes data from 2010 in detail for the CAWS, and some studies also covered a majority of the Illinois Waterway. Lastly, the U.S. Geological Survey's Nonindigenous Aquatic Species Database, a clearinghouse for distribution information on Asian carp as well as many other species, was accessed for additional locations. Data from these sources are compiled in the maps below. Basins where carp are present are represented on the maps by Hydrologic Units (<http://water.usgs.gov/GIS/huc.html>). Attachment 1 also shows the questionnaire and response table, as well as a map representation of the responses.

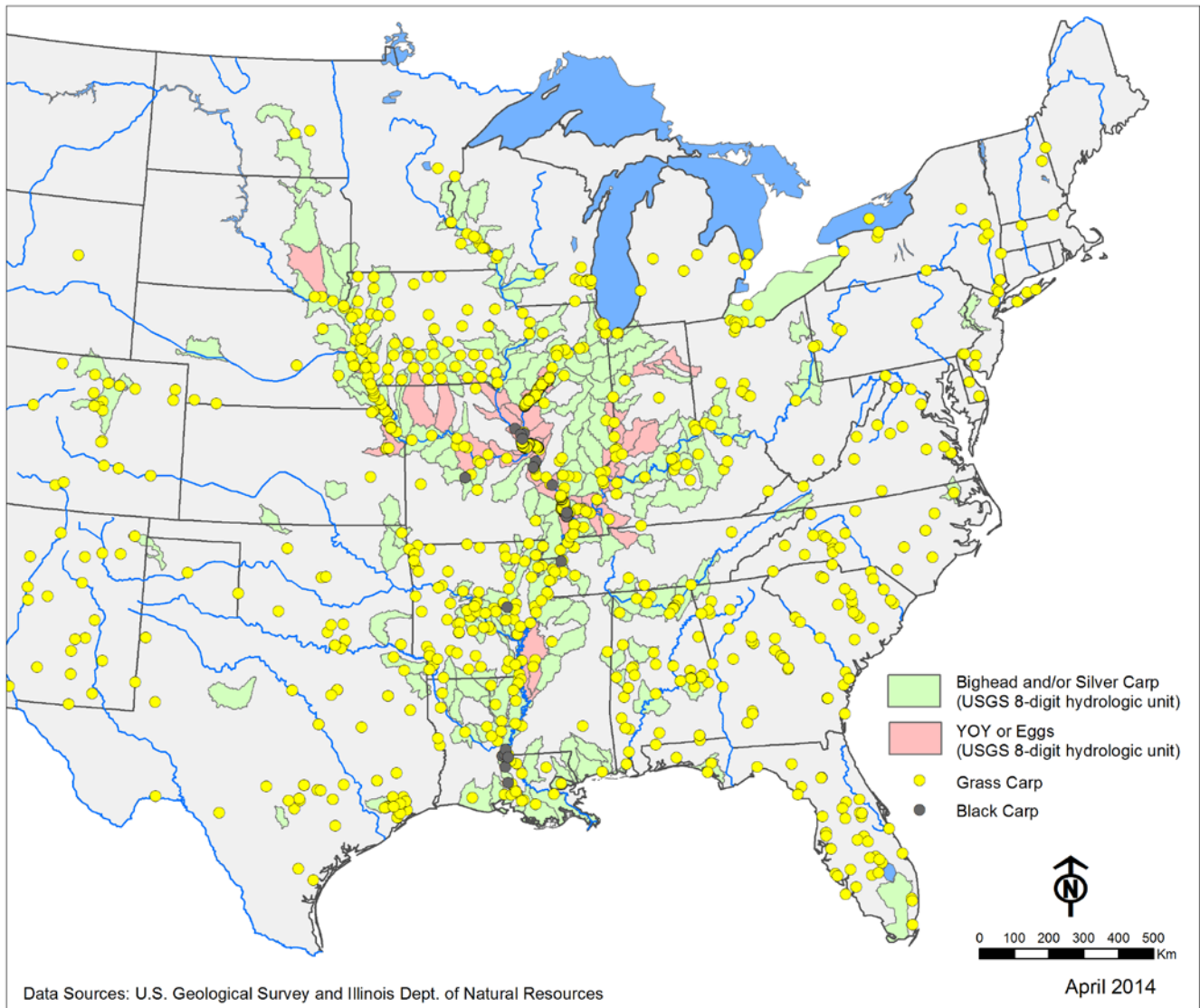
The intent is to continually update these maps as data becomes available, and to have them serve as reference documents for biologists, managers, and decision makers working with Asian carp in North America.

Suggested citation: Baerwaldt, K., A. Benson, and K. Irons. 2013. Asian Carp Distribution in North America. Report to the Asian Carp Regional Coordinating Committee, April 2013. (updated April 2014)

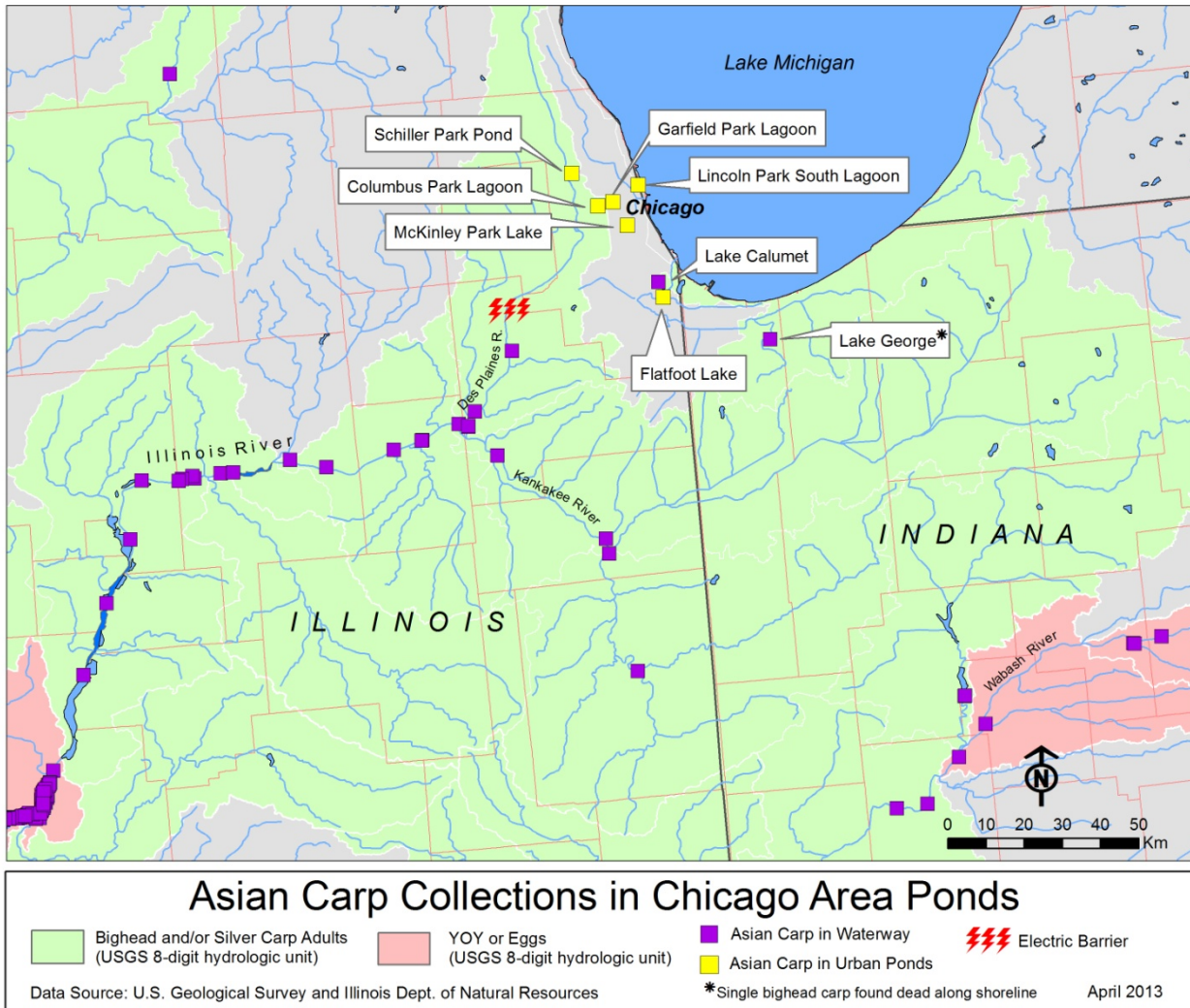
Map 1. Distribution of both bighead and silver carp in the Mississippi River, Ohio River, and Great Lakes in North America. The green shaded areas indicate adult presence of at least one individual fish in each delineated watershed. The areas in red indicate young-of-year (YOY) capture locations or where eggs have been collected, indicating natural reproduction. In Lake Erie from 1995 to 2000, three adult bighead carp have been captured in the western basin by commercial fishermen. Two of which were in the waters off Sandusky, Ohio, and the third was captured on the Canadian side opposite Sandusky.



Map 2. Distribution of both bighead and silver carp in the Mississippi River, Ohio River, and Great Lakes in North America with the addition of capture locations of black and grass carp individuals. *Grass carp* are known to have established populations in the central Mississippi River Basin and in the Texas Gulf Coast drainage. The reproductive status of wild-caught black carp is unknown. Note: shading is consistent as that in Map 1. In Lake Erie from 1995 to 2000, three adult bighead carp have been captured in the western basin by commercial fishermen. Two of which were in the waters off Sandusky, Ohio, and the third was captured on the Canadian side opposite Sandusky.



Map 3 depicts the Chicago Area locations for bighead and silver carp individual captures. The green shaded areas indicate adult presence of at least one individual fish in each delineated watershed. The areas in red indicate young-of-year (YOY) capture locations or where eggs have been collected, indicating natural reproduction. Fish captured in isolated ponds without access to CAWS or Illinois Waterway are depicted by the yellow boxes.



Appendix 1. Questionnaire, Responses by state, Respondent table

Asian Carp Questionnaire

The rationale for this questionnaire is to provide insight into the life history and distribution of small size classes of Asian Carp species in your management area. Specifically, we are seeking information on small Bighead, Silver, and Grass Carp. (Grass carp biology is very similar to Bighead and Silver Carp biology, so please note to which species you are referring for all answers below).

We are hopeful that the information will prepare managers to reduce risk of Asian carp spread within and between basins of the Midwest. This information will be shared among the contributors and reside in a white paper as a living document for informational purposes to help control and manage these species. This is also not meant to be laborious, so a data dump is not necessary. Rather, we are asking for a brief overview of what carp are doing in your management area. If you prefer, you may call any of the people below and we can summarize the information from a brief interview. Thank you for your time and effort.

- 1) What is the basin, waterway, or state that you are managing /researching?
- 2) What are the names of the common waterways within this area?
- 3) Have Asian carp been reported/collected within these waterways (names of waterways; please characterize abundance e.g. rare, moderate, very abundant)? Please note if abundant in some and rare in others when possible.
- 4) Have Asian carp YOY been documented within these waterways (names of waterways; how was assessment made e.g. larval tows, small fish collection (with gear), public phone call, visual confirmation of spawning activity; please include size or range of sizes of YOY fish collected/observed)?
- 5) Have Asian carp eggs or physical spawning been collected/observed within these waterways (names of waterways and method of collection/observation; please describe the location of where spawning was observed)?
- 6) What are the most upstream locations for collection of Asian carp eggs or YOY within these waterways (provide distance in miles from downstream confluence of waterway)?
- 7) Are there waterways worth noting that have had an adult Asian Carp presence for a significant time but no spawning or YOY observed?
- 8) To the best of your ability, can you please provide a brief description of the predominant habitat and environmental characteristics in a given waterway at the location of the uppermost known population of adult Asian carp and YOY Asian carp?
- 9) Please briefly describe how the data for above statements is collected (e.g. once a year survey of the basin for fish community assessment by DNR staff, ongoing intense surveillance looking for Asian Carps, basin survey conducted every 5 years, public phone calls, long term monitoring, other)

If grass carp are noted in your answers above, can you briefly describe the presence of diploid and triploid grass carp within your management/research area (e.g. only diploid detected, only triploid detected, both triploid and diploid grass carp sampled in river x, or don't know the ploidy)?

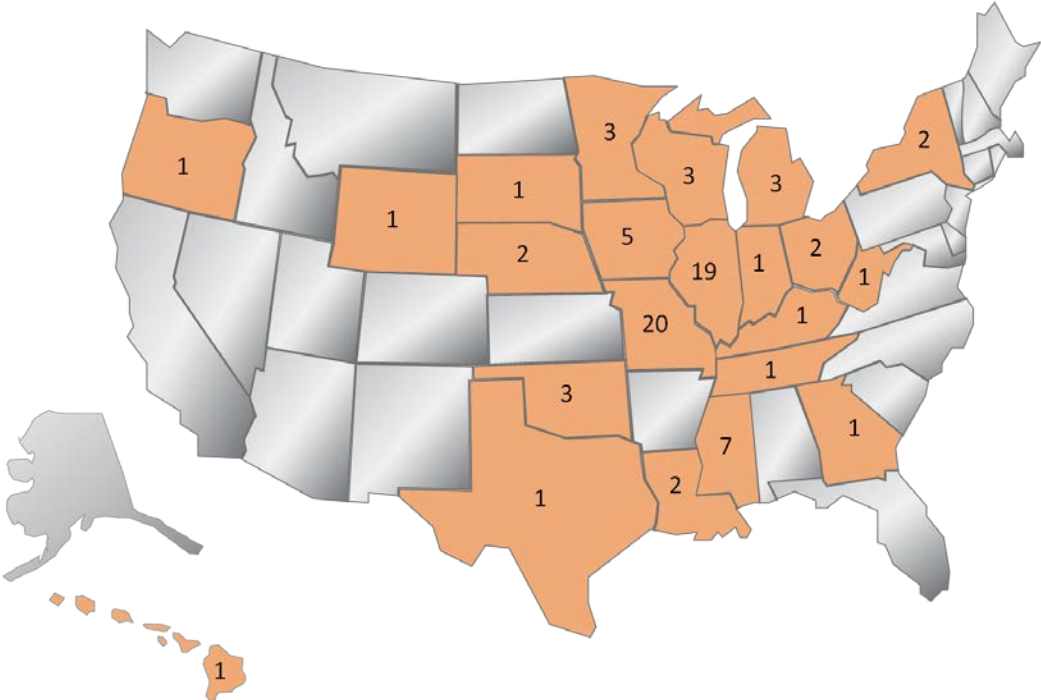
Finally just a little background:

Please insert your name, title and for which agency you work for. Please describe your responsibilities (i.e. state policy person; research biologist; or ANS program head) and a phone number and email that we could reach you if any questions remain. Thanks once more for your time.

For information on this white paper or general questions please contact any of the following:

<p>Kevin S. Irons</p> <p>Aquaculture and Aquatic Nuisance Species Program Manager</p> <p>Illinois DNR One Natural Resources Way Springfield, IL 62702-1271</p> <p>email: kevin.iron@illinois.gov Phone: 217.557.0719 Work mobile: 217.685.3103</p>	<p>Kelly Baerwaldt</p> <p>Fishery Biologist / eDNA Program Manager</p> <p>US Army Corps of Engineers Rock Island, IL 61204-2004</p> <p>email: Kelly.L.Baerwaldt@usace.army.mil Office: 309-794-5285 Cell: 309-230-3804</p>	<p>Jeff Stewart</p> <p>Fish Biologist</p> <p>US Fish and Wildlife Service Carterville FWCO 9053 Rt 148, Suite A Marion, IL 62959</p> <p>email: jeff.stewart@fws.gov Office: (618) 997-6869 x 11</p>
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Asian Carp White Paper: Responses



Respondent Name, title	Respondent Agency
Duane Chapman Research Fish Biologist, Columbia, MO	USGS
Hal Schramm Research Biologist and Leader, Mississippi State, MS	USGS
Michael A. Goehle, Aquatic Invasive Species Coordinator, Amherst, NY	USFWS
Bobby Wilson, Chief of Fisheries, ANS rep on MRBP	Tennessee Wildlife Resources Agency
John Biagi, Chief of Fisheries	Georgia DNR
Ron Brooks, Fisheries Division Director	KY Dept of Fish and Wildlife Resources
Mike Smith, ANS Coordinator	South Dakota Game, Fish & Parks
Steven Schainost, Rivers and Streams Program Manager	Nebraska Game and Parks Commission
Mark Flammang, District Fisheries Management Biologist	Iowa Department of Natural Resources
Doug Keller, Aquatic Habitat Coordinator	Indiana Dept. of Natural Resources
John Dettmers, Senior Fishery Biologist	Great Lakes Fishery Commission
John Navarro, Program Administrator	Ohio Dept. of Natural Resources
Byron Karns, Biologist, Aquatic Invasive Species Program Coordinator	St. Croix National Scenic Riverway, National Park Service
John Anfinson, Chief Mississippi National River and Recreation Area	National Park Service
Andy Bartels, LTRM fish specialist for Pool 8 Field Station	Wisconsin Dept of Natural Resources
Ron Benjamin, MICRA Chair	Wisconsin Dept of Natural Resources
Beth Bear, Aquatic Invasive Species Coordinator	Wyoming Game and Fish Department
Paul Sleeper, Fisheries Management Biologist	Iowa Department of Natural Resources
Curtis Tackett	Oklahoma Department of Wildlife Conservation
David Britton	U.S. Fish and Wildlife Service
Brent Bristow	Oklahoma Department of Wildlife Conservation
Doug Carney, Rivers Biologist	Illinois Dept. of Natural Resources
David Clapp, Research Station Manager	Michigan Department of Natural Resources
Brian Gunderman, Senior Fisheries Management Biologist	Michigan Department of Natural Resources
Tim Edison, Large River Ecologist	Illinois Natural History Survey
Bryan Hayes, Fisheries Management Biologist	Iowa Department of Natural Resources
Wayne Herndon, District management biologist	Illinois Dept. of Natural Resources
Shawn Hirst, Fisheries Biologist	Illinois Dept. of Natural Resources
Jeff Thomas, Biological Programs Manager	Ohio River Valley Water Sanitation Commission
Frank Jernejcic, Fishery Biologist	West Virginia Division of Natural Resources
Mike Mounce, District Fisheries Biologist	Illinois Department of Natural Resources
Nerissa Michaels, Large River Fisheries Ecologist	Illinois Natural History Survey
Steve Robillard, biologist	Illinois Department of Natural Resources
Patrick H. Short, Mississippi River Fisheries Biologist	Wisconsin Department of Natural Resources
Gary Sobotka, Fisheries Biologist	Iowa Department of Natural Resources
Dan Sallee, Fisheries Biologist	Illinois Department of Natural Resources

Rob Klumb - Project Leader	USFWS
Keith Meals, Conservation Resources Management Biologist	Mississippi Dept. of Wildlife, Fisheries and Parks
Jerry Brown, Fisheries Biologist	Mississippi Dept. of Wildlife, Fisheries and Parks
Larry Bull, District Fisheries Biologist	Mississippi Dept. of Wildlife, Fisheries and Parks
Stephen Brown- Coastal Region Fisheries Biologist	Mississippi Dept. of Wildlife, Fisheries and Parks
Jan Hoover, Research Fishery Biologist	USACE ERDC
Nathan Aycock, Conservation Resource Biologist	Mississippi Dept. of Wildlife, Fisheries and Parks
Dave Tunink, Assist. Admin. Fisheries Management Section	Nebraska Game and Parks Commission
Tim Schlagenhaft, DNR Mississippi River Coordinator	Minnesota Dept of Natural Resources
Joe Ridings, LTRMP fish component lead	Missouri Department of Conservation
Mark Boone, Big River Specialist	Missouri Department of Conservation
Mike Clancy, Regional Fish Manager	New York State Dept. of Environmental Conservation
Dave Terre, Chief, Management and Research	Texas Parks and Wildlife Department - Inland Fisheries
Dan Kirby; Natural Resource Biologist	Iowa Department of Natural Resources
Jana Hirst	Illinois Department of Natural Resources
Blake Ruebush, Large River Fisheries Ecologist	Illinois River Biological Station
Levi Solomon, Large River Fisheries Ecologist	Illinois River Biological Station
Jeremiah J Haas, Principal Aquatic Biologist	Exelon, Quad Cities Nuclear Station
Brennan Caputo, Natural Resource Coordinator	Illinois Dept. of Natural Resources
Mike McClelland, Natural Resource Specialist	
David Wyffels, Natural Resource Specialist	
Tristan Widloe, Natural Resource Coordinator	
Robyn Draheim, AIS Coordinator	USFWS, Portland State University
Joshua Fisher, Invasive Species Biologist	USFWS Pacific Islands Fish and Wildlife Service
Rob Miller, Fisheries Biologist	Illinois Dept. of Natural Resources
Randy Sauer, Stream Specialist	Illinois Dept. of Natural Resources
Wes Bouska, Fisheries Researcher	SIUC Fisheries and Illinois Aquaculture Center
Jody David Inland Fish Division	Louisiana Wildlife and Fisheries
Bobby Reed Inland Fisheries Senior Technical Advisor	Louisiana Wildlife and Fisheries