

Long Term Resource Monitoring Program

Products List – 2009

This document was prepared by members of the LTRMP Analysis Team (A-Team) in order to highlight work and collaborations that have been completed by LTRMP staff and associates. This list does not include formal LTRMP products, but instead focuses on other products to which field station staff have contributed. Items included in this list were generally completed during calendar year 2009, though some items from previous years have been included. The A-Team plans to produce a new list annually.

More information on the Long Term Resources Monitoring Program can be found at:

<http://umesc.usgs.gov/ltrmp.html>

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Peer reviewed Publications

- Ahrenstorff, T. D., G. G. Sass, and M. R. Helmus. 2009. The influence of littoral zone coarse woody habitat on home range size, spatial distribution, and feeding ecology of largemouth bass (*Micropterus salmoides*). *Hydrobiologia* 623:223-233.
- Buck, D.H. and G.G. Sass. 2010. Foreword. In: Invasive Asian Carps in North America: the Proceedings of a Forum on Their Biology and Management. D. Chapman et al. (eds.). American Fisheries Society. Bethesda, Maryland. (In press).
- Gray, B. R., R. J. Haro, and J. T. Rogala. 2009. Addressing among-group variation in covariate effects using multilevel models. *Environmental and Ecological Statistics*, Springer Netherlands. DOI 10.1007/s10651-009-0119-y.
- Guy, C. S., P. J. Braaten, D. P. Herzog, J. Pitlo, and R. S. Rogers. 2009. Warmwater Fish in Rivers. Pages 59-84 in S. A. Bonar, W. A. Hubert, and D. W. Willis, editors. *Standard Methods for Sampling North American Freshwater Fishes*. American Fisheries Society, Bethesda, Maryland.
- Herzog, D. P., D. E. Ostendorf, R. A. Hrabik, and V. A. Barko. 2009. The mini-Missouri trawl: a useful methodology for sampling small-bodied fishes in small and large river systems. *Journal of Freshwater Ecology* 24(1): 103-108.
- Houser, J. N., D. W. Bierman, R. M. Burdis, and L. A. Soeken-Gittinger. 2010. Longitudinal trends and discontinuities in nutrients, chlorophyll and suspended solids in the Upper Mississippi River: implications for transport, processing, and export by large rivers. *Hydrobiologia*.
- Irons, K. S., G. G. Sass, M. A. McClelland, and T. M. O'Hara. 2010. The long-term resource monitoring program: insights into the Asian carp invasion of the Illinois River, Illinois, USA. In: Invasive Asian Carps in North America: the Proceedings of a Forum on Their Biology and Management. D. Chapman et al. (eds.). American Fisheries Society. Bethesda, Maryland. (In Press).
- Pegg, M.A., J.H. Chick, and B.M. Pracheil. 2009. The influence of non-native species on paddlefish. Pages 185 – 201 in C.P. Paukert and G.D. Scholten, editors. *Paddlefish management, propagation, and conservation in the 21st century: building from 20 years of research and management*. American Fisheries Society, Symposium 66, Bethesda, Maryland.
- Phelps, Q. E., D. P. Herzog, R. C. Brooks, V. A. Barko, D. E. Ostendorf, J. W. Ridings, S. J. Tripp, R. E. Columbo, J. E. Garvey, and R. A. Hrabik. 2009. Seasonal comparison of catch rates and size structure using three gear types to sample sturgeon in the Middle Mississippi River. *North American Journal of Fisheries Management* 29: 1487-1495.
- Pinter, N., A. A. Jemberie, J. W. F. Remo, R. A. Heine, B. S. Ickes. 2009. Cumulative impacts of river engineering, Mississippi and Lower Missouri rivers. *River Res. Applic.*, Published Online, DOI: 10.1002/rra.1269.
- Rogowski, D.L., D.J. Soucek, J.M. Levensgood, S.R. Johnson, J.H. Chick, J.M. Dettmers, M.A. Pegg, and J.M. Epifanio. 2009. Contaminant concentrations in Asian carps, invasive species in the Mississippi and Illinois Rivers. *Environmental Monitoring and Assessment* 157: 211-22.
- Sampson, S.J., Chick, J.H., and M.A. Pegg. 2009. Diet overlap among two Asian carp and three native fishes in backwater lakes on the Illinois and Mississippi rivers. *Biological Invasions* 11:483-496.
- Sass, G. G. 2009. Coarse woody debris in lakes and streams. In: *Encyclopedia of Inland Waters*. Volume 1. G.E. Likens (ed.). Oxford: Elsevier. pp. 60-69.

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- Sass, G. G., T. R. Cook, K. S. Irons, M. A. McClelland, N. N. Michaels, T. M. O'Hara, and M. R. Stroub. 2010. A mark-recapture population estimate for invasive silver carp (*Hypophthalmichthys molitrix*) in the La Grange Reach, Illinois River. *Biological Invasions* 12:433-436. DOI:10.1007/s10530-009-9462-z.
- Sauer, J., and Johnson, B., 2009, Taking the pulse of a river system: research on the Upper Mississippi River System: U.S. Geological Survey Fact Sheet 2009-3045, 4 p.
- Tripp, S. J., Q. E. Phelps, R. E. Columbo, J. E. Garvey, D. P. Herzog, and R. A. Hrabik. 2009. Maturation and reproduction of shovelnose sturgeon in the Middle Mississippi River. *North American Journal of Fisheries Management* 29: 730-738.
- Yin, Y. and Yegang Wu. 2009. A spatial simulation model for forest succession in the Upper Mississippi River floodplain. *Ecological Complexity* 6(4):494-502
- Yin, Y., Yegang Wu, S. M. Bartell, and R. Cosgriff. 2009. Patterns of forest succession and impacts of flood in the Upper Mississippi River floodplain ecosystem. *Ecological Complexity* 6(4):463-472.

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Miscellaneous Publications and Reports (grey literature)

- Bowler, M. C. 2009. Fisheries Monitoring in Pool 13, Upper Mississippi River, by the Long Term Resource Monitoring Program. Fisheries Management Investigations 2008 Annual Report. Iowa Department of Natural Resources. Des Moines, Iowa.
- Burdis, R.M. 2009. Analysis of water quality following a drawdown in Navigation Pool 5 Upper Mississippi River System. U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin, July 2009. Long Term Resource Monitoring Program Completion Report 2008D7 submitted to the US Army Corps of Engineers, Rock Island, Illinois. 19 pp
- Crites, J. W. 2009. Buffalo Chute fisheries and water quality monitoring: a synopsis of pre-construction data on the habitat rehabilitation project. *Science Notes* 4(12). Missouri Department of Conservation, Jefferson City.
- Gray, B., Weiliang Shi, J. T. Rogala, J. Cochran, J. Houser and Zi Guan. 2009. Cumulative effects of restoration efforts on ecological characteristics of an open water region within the Upper Mississippi River. U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin, July 2009. Long Term Resource Monitoring Program Completion Report 2007APE10 submitted to the US Army Corps of Engineers, Rock Island, Illinois. 24 pp.
- Henderson, D. E., P. Botch, J. Cussimano, D. Ryan, J. Kabrick, and D. Dey. 2009. Growth and mortality of Pin Oak and Pecan reforestation in a constructed wetland: analysis with management implications. *Science and Management Technical Series* (1). Missouri Department of Conservation, Jefferson City.
- Irons, K.S., S.A. DeLain, E.J. Gittinger, B.S. Ickes, C.S. Kolar, D. Ostendorf, E.N. Ratcliff, and A.J. Benson. 2009. Nonnative fishes in the Upper Mississippi River System: U.S. Geological Survey Scientific Investigations Report 2009-5176, 68 pp.
- Johnson, B.J and K.H. Hagerty. 2009. Status and trends of selected resources of the Upper Mississippi River System: A synthesis report of the Long Term Resource Monitoring Program. U.S. Geological Survey, La Crosse, WI. (J.H. Chick – Section Author for Chapter 2.88. Recreationally Harvested Native Fishes, and Chapter 2.8.9. Commercially Harvested Native Fishes)
- Kennedy, C. J., and R. A. Hrabik. 2009. A progress report on the Alligator Gar reintroduction project in southeastern Missouri and a recommendation for continuance of the program. Missouri Department of Conservation, Jefferson City.
- McCain, K. N. S. 2009. Information needs and difficulties with floodplain management. *Science Notes* 4(25). Missouri Department of Conservation, Jefferson City.
- McCain, K. N. S., R. A. Hrabik, V. A. Barko, B. R. Gray, and J. R. Bidwell. 2009. An evaluation of invertebrate sampling methods for use in the Open River reach of the Upper Mississippi River. *Science Notes* 4(20). Missouri Department of Conservation, Jefferson City.
- McCain, K.N.S. and J. DeLay. 2009. New gear evaluation for sampling fish and herpetofauna in emergent vegetation. *Science Notes* 4(28). Missouri Department of Conservation, Jefferson City.
- McClelland, M. A. and G. G. Sass. 2009. The long-term Illinois River fish Population monitoring program: project F-101-R-16-20 final report (2004-2008) with program amendment, 2009. Illinois Natural History Survey Technical Report 2009 (21).
- McClelland, M. A. and G. G. Sass. 2009. The long-term Illinois River fish population monitoring program: project F-101-R-20. Illinois Natural History Survey Technical Report 2009 (7).

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- McMullen, J. and F. A. Nelson. 2009. Bird communities and habitat use in bottomland hardwood forests in Mingo National Wildlife Refuge, Missouri. *Science Notes* 4(15). Missouri Department of Conservation, Jefferson City.
- Michaels, N. N. and G. G. Sass. 2009. Fish and Aquatic Vegetation Monitoring of The Nature Conservancy's Emiquon Preserve. Illinois Natural History Survey Technical Report 2009 (10).
- Nelson, F. A. 2009. Reed Canary Grass management evaluation. *Science Notes* 4(16). Missouri Department of Conservation, Jefferson City.
- Nelson, F. A., J. W. Crites, and D. E. Ostendorf. 2009. Shallow bathymetric mapping of Buffalo Chute: examining change over time. *Science Notes* 4(13). Missouri Department of Conservation, Jefferson City.
- Ridings, J. 2009. The brail trawl: an improved gear for sampling darters, madtoms, and sculpins. *Science Notes* 4(11). Missouri Department of Conservation, Jefferson City.
- Sass, G. G., M. A. McClelland, T. R. Cook, K.S. Irons, T. M. O'Hara, and N. N. Michaels. 2009. Factors supporting or limiting submersed aquatic vegetation establishment and growth in the Starved Rock reach of the Illinois River. U.S. Army Corps of Engineers Technical Report, Rock Island District.
- Smith, D., J. T. Rogala, B. Gray, S. Zigler, and T. Newton. 2009. Evaluation of single and two-stage adaptive sampling designs for estimation of density and abundance of freshwater mussels in the Upper Mississippi River. U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin, July 2009. Long Term Resource Monitoring Program Completion Report 2008APE3 submitted to the US Army Corps of Engineers, Rock Island, Illinois. 25 pp.
- Sullivan, J.F. , H. Langrehr, S. Giblin, M. Moore, and Y. Yin. 2009. Submersed aquatic vegetation target for the turbidity-impaired reach of the upper Mississippi River Pool 2 to upper Lake Pepin. Final Report to Minnesota Pollution Control Agency: 23 pp.
- Yin, Y., H. Langrehr, T. Shay, T. Cook, R. Cosgriff, M. Moore, and J. Petersen. 2009. Vegetation sampling in the Upper Mississippi River System: Annual update. U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, Wisconsin. An LTRMP Web-based report available online at http://www.umesc.usgs.gov/reports_publications/ltrmp/veg/vegetation_update.html. (Accessed Feb. 2009, with 2008 data.)

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Technical Presentations

Platform Presentations:

- Bartels, A. D. 2009. Exploring UMR fish datasets and indices. Examining Biological Indicators for the Upper Mississippi River: Applications in Clean Water Act & Ecosystem Restoration Programs Workshop. Sponsored by the UMRBA with support from the USACE & USEPA.
- Chapman, D. C., M.A. McClelland, T.M. O'Hara, G.G. Sass, J.A. Thomas, and M.S. Pearson. The 57th Annual Meeting of the North American Benthological Society, 2009. Grand Rapids, Michigan. Title of Talk: Asian carps in the mid-continent great rivers.
- Chick, J. H. The potential for international collaborative monitoring and research: perspectives of a river science center. Annual Meeting of the Upper Mississippi River Conservation Committee, La Crosse, WI. March 2009 (invited presentation)
- Crites, J. W. 2009. Buffalo Chute restoration project. Southeast Missouri State University, Student Chapter of the Wildlife Society.
- Henderson, D. 2009. Management Issues for bottomland hardwoods restoration in big river floodplains. Bottomland Hardwoods Workshop. Missouri Natural Resources Conference, Tan-Tar-A Resort, Osage Beach.
- Henderson, D. 2009. Mixed species planting of hard-mast and light-seeded species. Project Review, Missouri Department of Conservation, Cape Girardeau.
- Henderson, D. E. 2009. River processes and bottomland forest development: restoration in Big River floodplains. United States and China Mississippi and Yangtze Rivers Scientific Exchange. Missouri Department of Conservation, Cape Girardeau Nature Center, Cape Girardeau.
- Henderson, D.E. 2009. River processes and bottomland forest development: restoration in Big River floodplains. Southeast Missouri State University, Student Chapter of the Wildlife Society.
- Herzog, D. P. 2009. An evaluation of age, growth and mortality of the shovelnose sturgeon in the segments of the Lower Missouri River and Mississippi River adjacent to Missouri. Project review. Missouri Department of Conservation. Jefferson City.
- Herzog, D. P. 2009. Missouri Department of Conservation river studies: sturgeons. River Resources Action Team (RRAT). U.S. Army Corps of Engineers. Alton, IL.
- Herzog, D. P. 2009. Missouri Department of Conservation Sturgeon studies. MICRA Paddlefish and sturgeon subcommittee meeting. Memphis, TN.
- Herzog, D. P. 2009. UMR and MMR Pallid Sturgeon updates: MDC sturgeon studies. Middle Basin Pallid Sturgeon working group. U.S. Fish and Wildlife Service. Blue Springs, MO.
- Hrabik, R. A. 2009. Floodplain discontinuity and riverine fishes: what have we learned from large floods in the last 15 years? Missouri Academy of Science Annual Meeting. Maryville.
- Hrabik, R. A. 2009. Floodplain discontinuity and riverine fishes: what have we learned from large floods in the last 15 years? Bottomland Hardwoods Workshop. Missouri Natural Resources Conference, Tan-Tar-A Resort, Osage Beach.

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- Hrabik, R. A. 2009. Long-term monitoring of the Upper Mississippi River: case history of the Long Term Resource Monitoring Program (LTRMP). Ohio River Ecological Program Conference. Electrical Power Research Institute. Louisville, KY.
- Hrabik, R. A. 2009. Natural history of the Middle Mississippi River and evolution of programs at the Open Rivers and Wetlands Field Station. United States and China Mississippi and Yangtze Rivers Scientific Exchange. Missouri Department of Conservation, Cape Girardeau Nature Center. Cape Girardeau.
- Hrabik, R.A. 2009. 1993 -2007 Open River catfish population data. LTRMP Analysis Team Meeting. Dubuque, Iowa.
- Hrabik, R.A. 2009. An evaluation of invertebrate sampling methods for use in the Open River reach of the Upper Mississippi River. LTRMP Analysis Team Meeting. Dubuque, Iowa.
- Hrabik, R.A. 2009. Sampling stream fish communities: an approach to improve species detection, estimate species richness, and reliably determine trend through time. Big Rivers Symposium, American Fisheries Society Annual Meeting. Nashville, TN.
- Hrabik, R.A. 2009. Spatial, temporal, and environmental trends of fish assemblages within six reaches of the Upper Mississippi River System. Big Rivers Symposium, American Fisheries Society Annual Meeting. Nashville, TN.
- Hrabik, R.A., and L.B. Mills. 2009. Priority rivers for conserving rare fish in the state of Missouri. Southeastern Fishes Council Annual Meeting. Lake Guntersville State Park, Alabama.
- Hrabik, R.A., and L.B. Mills. 2009. Distribution and possible threats to the plains topminnow (*Fundulus sciadicus*) in Missouri. Plains Topminnow Colloquium. University of Nebraska. Kearney.
- Irons, K.S., D.C. Chapman, M.A. McClelland, T.M. O'Hara, G.G. Sass, J.A. Thomas, T.R. Cook, and M.S. Pearson. 139th Annual Meeting of the American Fisheries Society, 2009. Nashville, Tennessee. Title of Talk: Asian carps: big rivers, big fish, big problems?
- Kennedy, C. J. and R. A. Hrabik. 2009. Monitoring the effects of Alligator Gar on fish communities in an accelerated learning environment. Project Review. Missouri Department of Conservation, Jefferson City.
- Lamer, J., C. Dolan, J. Petersen, J. Chick, J. Epifanio, and G.G. Sass. 139th Annual Meeting of the American Fisheries Society, 2009. Nashville, Tennessee. Title of Talk: Hybridization between silver and bighead carp in the Mississippi and Illinois rivers.
- Langrehr, H. A. 2009. Developing biocriteria using submersed macrophytes for assessing ecosystem health of the Upper Mississippi River. Examining Biological Indicators for the Upper Mississippi River: Applications in Clean Water Act & Ecosystem Restoration Programs Workshop. Sponsored by the UMRBA with support from the USACE & USEPA.
- Langrehr, H. A. and M. Moore. 2009. Developing biocriteria using submersed macrophytes for assessing ecosystem health of the Upper Mississippi River. Mississippi River Research Consortium, La Crosse, WI.
- Langrehr, H. A. and M. Moore. 2009. Developing biocriteria using submersed macrophytes for assessing ecosystem health of the Upper Mississippi River. Technical meeting at the Minnesota Pollution

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Control Agency with presentations on developing vegetation biocriteria for rivers, lakes and wetlands. St. Paul, MN.

- Langrehr, H. A., and M. Moore. 2009. Developing biocriteria using submersed macrophytes for assessing ecosystem health of the Upper Mississippi River. Sixty-fifth annual meeting of the Upper Mississippi River Conservation Committee, La Crosse, WI.
- Lubinski, B.J., N. Ratcliff, E.J. Gittinger, L.S. Gittinger, and J.H. Chick. Changes in fish and water quality parameters during extreme flood years and non-flood years in Pool 26 of the Mississippi River. Mississippi River Research Consortium 41st Annual Meeting, 2009.
- McCain, K. N. S. 2009. Linking large river ecological theory with needs of managers. United States and China Mississippi and Yangtze Rivers Scientific Exchange. Missouri Department of Conservation, Cape Girardeau Nature Center, Cape Girardeau.
- Michaels, N. N., Greg G. Sass, Timothy W. Spier, Kevin S. Irons, Michael A. McClelland, Timothy M. O'Hara, and Thad R. Cook, UIS Emiquon Field Station Public Lecture, 2009. Title of Talk: The Nature Conservancy's Emiquon Preserve: Resetting and Restoring Thompson Lake.
- Michaels, N. N., G. G. Sass, T. W. Spier, T. R. Cook, T. M. O'Hara, K. S. Irons, and M. A. McClelland. Mississippi River Research Consortium 41st Annual Meeting. La Crosse, Wisconsin. Title of Talk: The Nature Conservancy's Emiquon Preserve: resetting and restoring the Thompson Lake fish community
- Michaels, N. N., G.G. Sass, T.M. O'Hara, M.A. McClelland, K.S. Irons, and T.R. Cook. 70th Annual Midwest Fish and Wildlife Conference, 2009. Springfield, Illinois. Title of Talk: The Nature Conservancy's Emiquon Preserve: fish and aquatic vegetation monitoring, 2007-2009
- Nelson, F. A. 2009. The differences between discussion and dialogue. Spring Wetland Review, Missouri Department of Conservation. Columbia, MO.
- Nelson, F. A. 2009. Tips and tricks for wetland management in the digital age. Moist Soil Workshop, Mingo NWR. Puxico.
- Nelson, F. A. 2009. Results of the 2009 spring Wetland Review. Regional Supervisors Meeting, Missouri Department of Conservation. Jefferson City.
- Nelson, F. A. 2009. Setting the stage: wetland plan revision. Wetland Partners Meeting. Missouri Department of Conservation. Jefferson City.
- Nelson, F. A. 2009. Supplement to LiDar: when conditions are less than ideal. MGISAC 2009. Missouri GIS Conference. Osage Beach.
- Nelson, F. A. 2009. Using digital technology to economically obtain bathymetric and topographic data. United States and China Mississippi and Yangtze Rivers Scientific Exchange. Missouri Department of Conservation, Cape Girardeau Nature Center. Cape Girardeau.
- Ostendorf, D. E. 2009. On the use of the Missouri Trawl. United States and China Mississippi and Yangtze Rivers Scientific Exchange. Missouri Department of Conservation, Cape Girardeau Nature Center. Cape Girardeau.

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- Popp, W. A., and M. Moore. 2009. Lessons learned from 20 years of monitoring on the Upper Mississippi River. Presentation to Ecological Resources Division staff at the Minnesota DNR, St. Paul, MN.
- Ridings, J. W. 2009. The Pallid Sturgeon: overview of an endangered species project. United States and China Mississippi and Yangtze Rivers Scientific Exchange. Missouri Department of Conservation, Cape Girardeau Nature Center. Cape Girardeau.
- Ridings, J. W. 2009. The Stargazing Darter (*Percina uranidea*) in Missouri. Inter-state meeting on the status and distribution of Stargazing Darter. U.S. Fish and Wildlife Service. West Plains, MO.
- Sass, G. G. Illinois Lake Management Association Annual Meeting. 2009. Peoria, Illinois. Title of Talk: Environmental and Economic Impacts of Asian Carps on the Illinois River.
- Sass, G. G. Kent State University, 2009. Kent, Ohio. Title of Talk: Fish community and food web responses to a whole-lake removal and addition of coarse woody habitat.
- Sass, G. G., S. R. Carpenter, J. F. Kitchell, and J. Gaeta. 139th Annual Meeting of the American Fisheries Society, 2009. Nashville, Tennessee. Title of Talk: Fish population dynamics in a northern Wisconsin lake following a whole-lake addition of coarse woody habitat.

Posters:

- Baerwaldt, K., G. G. Sass, and J. E. Garvey. 139th Annual Meeting of the American Fisheries Society. Nashville, Tennessee. Title of Poster: Growth rates of silver carp in different regions of the world: higher growth in non-native habitats
- Cook, T. R., K.S. Irons, M.A. McClelland, G.G. Sass, T. M. O'Hara, N. N. Michaels, and M. R. Stroub. 70th Annual Midwest Fish and Wildlife Conference, 2009. Springfield, Illinois Title of Poster: Long-term trends in Illinois River water quality: reflective of global changes?
- Crites, J.W., and R.A. Hrabik. 2009. Buffalo Chute side channel restoration project. Mississippi River Research Consortium. Radisson Hotel. La Crosse, WI.
- Dukerschein, J. T. and A. D. Bartels. 2009. Relative influence of nine IBI metrics on IBI scores calculated from three Upper Mississippi River datasets. Sixty-fifth annual meeting of the Upper Mississippi River Conservation Committee, La Crosse, WI.
- Henderson, D., P. Botch, J. Cussimano, D. Ryan, J. Kabrick, and D. Dey. 2009. Afforestation of a constructed wetland using pin oak and pecan of different stock types at different elevations. Missouri Natural Resources Conference. Tan-tar-A Resort, Osage Beach.
- Irons, K.S., D. Chapman, M.A. McClelland, T.M. O'Hara, and G.G. Sass. 70th Annual Midwest Fish and Wildlife Conference, 2009. Springfield, Illinois. Title of Poster: Asian carps in the mid-continent great rivers.
- McCain, K.N.S. 2009. Information needs and difficulties with floodplain management. Visions of a Sustainable Mississippi River Conference. National Great Rivers Research Education Center. Collinsville, IL.
- McCain, K.N.S. and R.A. Hrabik. 2009. Large river ecology theory: past, present, and future needs and implications for restoration. First Biennial Symposium for the International Society of River Science. St. Petersburg, FL.

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- Michaels, N.N., G.G. Sass, T. Spier, T. Cook, T.M. O'Hara, K. Irons, and M.A. McClelland. 139th Annual Meeting of the American Fisheries Society, 2009. Nashville, Tennessee. Title of Poster: The Nature Conservancy's Emiquon Preserve: resetting and restoring the Thompson Lake fish community
- Nelson, F. 2009. Shallow bathymetric mapping of Buffalo Chute: examining change over time. MGISAC 2009. Missouri GIS Conference. Osage Beach, MO
- Nelson, F. A., J. W. Crites, and D. E. Ostendorf. 2009. Shallow bathymetric mapping of Buffalo Chute: examining change over time. Mississippi River Research Consortium) Radisson Hotel. La Crosse, WI.
- O'Hara, T. M., M. A. McClelland, K. S. Irons, T. R. Cook, and G. G. Sass. 70th Annual Midwest Fish and Wildlife Conference, 2009. Springfield, Illinois. Title of Poster: Status and trends of channel catfish in the UMRS: identifying mechanisms determining year class strength and relative abundances
- Ruebush, B., G. G. Sass, and J. H. Chick. 70th Annual Midwest Fish and Wildlife Conference, 2009. Springfield, Illinois. Title of Poster: Ecosystem-scale evaluation of sound bubble barrier technologies to prevent range expansions of Asian carps
- Yin, Y., D. E. Henderson, and P. Botch. 2009. Re-examining the effects of a rare flood event on forest succession trajectory along a modified stretch of the upper Mississippi River. Missouri Natural Resources Conference. Tan-tar-A Resort, Osage Beach.

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Outreach

- Burdis, R. 2009. Aquatic ecology presentation through the Lake City Environmental Learning Program to middle school aged kids. Lake City, MN
- Chick, J.H., E.N. Ratcliff, E.J. Gittinger, L.S. Gittinger, J.K. Tucker, and B.J. Lubinski, Demonstrated fish and water quality sampling techniques and fish identification for scientists visiting from China, August 2009.
- Crites, J. W. 2009. Southeast Missouri State University Internship and Employment Booth. Disseminated information regarding our internship program to university students Cape Girardeau.
- Crites, J. W. and D. E. Ostendorf. 2009. *Water quality and fish sampling techniques* program at the Cape Girardeau Nature Center's *Outdoor Skills Workshop* for the Family Resource Center. Missouri Department of Conservation. Cape Girardeau.
- DeLain, S. 2009. Continuous presentations and demonstrations on water quality, invertebrates and fish to eight classes of 3rd graders. Red Wing, MN
- Henderson, D. 2009. Southeast Missouri State University Internship and Employment Booth. Disseminated information regarding our internship program to university students Cape Girardeau.
- Herzog, D. P. and D. E. Ostendorf. 2009. Resource Science, Big Rivers and Wetlands Field Station: River tour and information exchange with Southeast Missouri Region Nature Center and Wildlife Staffs. Missouri Department of Conservation. Cape Girardeau.
- Hrabik, R. A. 2009. *Stream Investigations*. Sampled fish and critters from the Whitewater River at Old Plantation Access with 4th grade students from Jefferson School in Cape Girardeau. Missouri Department of Conservation. Patton.
- Lubinski, B.J. Highlights from 15+ years of sampling at the Illinois Natural History Survey Great Rivers Field Station. The Rotary Club of Alton-Godfrey, Alton IL, April 2009.
- McCain, K. N. S. 2009. *Lizard of Oz* program (Dorothy). Missouri Department of Conservation. Cape Girardeau Nature Center. Cape Girardeau.
- McCain, K. N. S. and F.A. Nelson. 2009. *Aquatic Investigations* program at the Cape Girardeau Nature Center's *Outdoor Skills Workshop* for the Family Resource Center. Missouri Department of Conservation. Cape Girardeau.
- Ratcliff, E.N., - gave a presentation about local fishes, reptiles and amphibians to two classes at Carlinville Elementary School, Carlinville, IL. 2009
- Ratcliff, E.N., - mentored a Franklin, IL High School student doing a senior project on Asian carp. 2009
- Ratcliff, E.N., - served as an "expert" for an NGRREC high school education program on river issues. 2009
- Ratcliff, E.N., E.J. Gittinger, Lubinski, B.J., Demonstrated fish sampling techniques and fish identification for the National Great Rivers Research and Education Center summer Intern Orientation, May 2009.
- Ratcliff, E.N., E.J. Gittinger, Lubinski, B.J., Demonstrated fish sampling techniques and fish identification for the USFWS Two Rivers Family Fishing Fair, Pere Marquette State Park, Grafton, IL, June 2009.

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Ratcliff, E.N., E.J. Gittinger, Lubinski, B.J., Presented information on Mississippi River fishes and mussels for over 250 fifth grade students and teachers at Waterfest 2009, Lewis and Clark Community College.

Ridings, J. W. 2009. Presented *Furs, Feathers and Scales* program at St. Vincent De Paul (Second) Grade School. Jackson, MO.

Wisconsin LTRMP Field Station staff. 2009. Reached about 500 students of all ages in at least six talks, workshops, and events. Three of these efforts are significant, collaborative and on-going each year, such as an effort helping students collect river data and enter it into a national river water quality database for middle and high school students.

Wisconsin LTRMP Field Station staff. 2009. Worked alongside USGS staff to reach nearly 1400 people in the La Crosse area for the Upper Midwest Environmental Sciences Center's 50th anniversary open house, La Crosse, WI.

Popular articles

Hrabik, R. A. 2009. Resource scientist travels to China for scientific exchange. *Conservation Currents* (January-February). Missouri Department of Conservation, Jefferson City.

Nelson, F. 2009. Wetland mapping in Missouri: LiDar and mapping potential waterfowl foraging habitat. *Wetland News* (Aug-Sept). Association of State Wetland Managers.

Technical Assistance and Collaborations

Bartels, A. D. and J. T. Dukerschein. 2009. Provided data summarized analysis comparing three electrofishing methods used to develop a fish IBI to USEPA. This represents a data collection and analysis collaboration among four partner agencies – USEPA/ORD, MPCA, MNDNR, and WIDNR.

Burdis, R. 2009. Participation on the Science Advisory Panel for the South Metro Mississippi River TMDL for turbidity and the Lake Pepin TMDL for eutrophication.

Burdis, R., S. DeLain, H. Langrehr, and M. Moore. 2009. Participation, as technical experts, in the selection of indicators for the reach of river from Pool 2 through upper Pool 4 and Lake Pepin for the Mississippi Makeover process.

Burdis, R., S. Giblin, H. Langrehr, and M. Moore 2009. Provided data, analysis, and technical assistance for development of site specific, total suspended solids and aquatic vegetation standards for the South Metro Mississippi River TMDL effort.

DeLain, S. 2009. Collection of multiple specimens of five species of fish in Pool 2 to assess bioaccumulation levels of PFOS, in cooperation with the MNDNR Fisheries Management, MN Pollution Control Agency, MN Dept. of Health, and 3M Corporation.

Hrabik, R.A. 2009. Assisted St. Louis MDC Fisheries staff with a taxonomic question separating Spotfin and Steelcolor Shiners, which are often sympatric and hybridize.

Hrabik, R.A. 2009. A wrote a piece that will aide managers and scientists in distinguishing female mud darters (*Etheostoma asprigene*) from dusky darters (*Percina sciera*).

Hrabik, R.A. 2009. Assisted in a search for extant records for Alabama shad (*Alosa alabamae*) in Missouri at request of Susie Adams, USFWS, Mississippi to aid in a student project to obtain baseline biological

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data for the species.

Hrabik, R.A. 2009. At the request of and financing by Fisheries and Oceans-Canada, Dave Herzog, Dave Ostendorf, and I demonstrated the Missouri Trawl to professionals from Manitoba and Ontario. We used the mini-Missouri Trawl and a larger mesh trawl in the Assiniboine, Red, and Whiteshell rivers in Manitoba. Scientists from Canada were interested in how well the trawls will work to detect and monitor large river species of concern, such as silver chub and lake sturgeon. We were successful in detecting both these species and over 30 other species in these systems. The Canadians had previously purchased mini-Missouri Trawls and are using them as I write this piece to better define the known distribution of species of conservation concern and to develop more effective monitoring programs in Canada. Many images were taken and I kept a daily journal of our activities that we will eventually use to prepare a trip report.

Hrabik, R.A. 2009. Creation of a Missouri Biological Survey (MBS) and Systematics Research Collections in Missouri. Wrote a "Call to Action" paper to Resource Science Division administration and was given the approval to create such an entity under the auspices of the Missouri Academy of Science (MAS; memo available upon request). At the MAS meeting in Maryville on April 25, MBS committee members agreed to moving the concept forward by first obtaining data and information on collections and orphaned data residing at Missouri universities and to develop grassroots support for a consortium of universities and agencies willing to participate in the creation of the MBS.

Hrabik, R.A. 2009. Met with Chelsey Young (University of Nebraska-Kearney), who will be conducting work on plains topminnow (*Fundulus sciadicus*) in both Nebraska and Missouri. As part of her Master's work, she will be documenting changes in distribution of this species in both states and conducting laboratory experiments to understand the interactions between plains topminnows and mosquitofish (*Gambusia affinis*). It is suspected that mosquitofish are competing with plains topminnows and causing their decline, especially in Nebraska.

Hrabik, R.A. 2009. Provided comments to Dave Knuth (MDC Stream Ecologist) that fall in line with new habitat descriptions for Missouri's fish species of conservation concern.

Hrabik, R.A. 2009. Provided Jason Datillo (Missouri River Field Station) with a bit of history concerning the taxonomy of *Macrhybosis* chubs, especially *M. aestivalis* (speckled cub) and *M. hyostoma* (shoal chub). The Missouri River folks were trying to update their species lists and obtaining correct taxonomic information for the databases.

Hrabik, R.A. 2009. Sent distributional and habitat information to Bob Todd (*River Hills Traveler* fame), who caught a Pirate Perch in the Ozark uplands in the St. Francis River drainage. I explained why it was perfectly reasonable to find one there.

Hrabik, R.A. 2009. The protocol we developed to estimate species richness has already caught the attention of other researchers outside MDC. Harry Crockett with Colorado Department of Wildlife, a fish community specialist, was working on a parallel path in estimating species richness and occupancy of stream fishes in the plains of Colorado. We have engaged in healthy dialog to improve our designs.

Hrabik, R.A. 2009. Verified an important record of pugnose shiners (*Notropis anogenus*) collected from Lake Okoboji, Iowa. The first record of this species in a very long time from Iowa.

Hrabik, R.A. 2009. Verified some cyprinid specimens from the Missouri River bordering Nebraska. One

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was a very small spottail shiner (*Notropis hudsonius*) and the other an odd looking river shiner (*Notropis blennius*), having a rather smaller than usual jaw length. I have collected river shiners from the Nebraska Sand Hills that also untypical eye diameter/jaw length ratios.

Hrabik, R.A. 2009. Worked with Bob DiStefano (MDC) to update distributional and biological information about Ohio shrimp for the MDC webpage.

Hrabik, R.A. 2009. Worked with Chris Kennedy (MDC) to develop a sampling protocol and schedule for sampling the fish community in Mingo National Wildlife Refuge. With help from the USFWS-Columbia, Regional fisheries staff, and ORWFS staff, we completed most of the planned effort from May 26-29. This year's effort focused on more intensive sampling in Mingo River/Stanley Creek, Gumpstump Marsh, and Ditch 11 to determine the effect of increased effort and a new gear on the variance of the species richness estimates, which have been biologically relevant for ditches, but variable for Mingo River and the marsh areas.

Hrabik, R.A. 2009. Working with Dawn Henderson and Lisa Mobley (MDC), the final touches were put on the first *Missouri Conservation Technical Report Series* (the name may still change slightly). Pending approval at the May RSD DMT meeting, the Technical Report will be released. The real work was done by Dawn (report on *Growth and mortality of Pin Oak and Pecan Reforestation in a Constructed Wetland*) and Lisa, who is skilled at formatting a professional looking technical report.

Hrabik, R.A. 2009. Wrote a document describing the theory, sampling design, and statistical considerations for implementing a stream fish community sampling protocol using a multiple gear array and a repeated-measures design to obtain estimates of species richness, sampling error, and 95% confidence intervals around the richness mean. This is the protocol we have been using at Mingo NWR to assess the existing fish community structure and establish a baseline. It does not take into account abundance, which is the subject of another line of research we are working on with the University of Missouri-Columbia. It is my hope that this design will be considered for other projects in which management wants to monitor species richness through time.

Langrehr, H. A. 2009. Worked with National Park Service, assisting them with QA/QC for National Parks mapping.

Langrehr, H. A. and M. Moore. 2009. Provided summary of SAV data and analysis from 2008 for Pools 1-11 to USEPA, as part of a GRE-EMAP supported effort to develop a submersed macrophyte index as a bioindicator of water quality impairments.

Nelson, F. 2009. Participated and facilitated various portions of the 2009 Spring Wetland Review, May, and the September Partner's Meeting. These meetings were to generate buy-in from a diverse group of field managers across agencies and help determine the guiding principles as MDC revised the state's Wetland Management Plan.

Nelson, F. 2009. Provided technical support to Mingo NWR staff on the access and utilization of Surdex's LiDAR data for the Mingo Basin using ArcMap.

Nelson, F. 2009. Worked with MDC biologists to provide data to Blaine Elliott (USFWS) for the Waterfowl Sanctuary Database, which is a product of the Lower Mississippi Alluvial Valley Joint Venture, Waterfowl Working Group.

Open Rivers and Wetlands Field Station. 2009. Hosted Chinese scientists representing the Yangtze River as part of a United States and China, Mississippi and Yangtze Rivers Scientific Exchange supported by

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The Nature Conservancy-China. Several presentations were given by ORWFS staff detailing projects in the Mississippi River and floodplain and two field trips were taken, one on the river to sample fishes (especially using the Missouri Trawl), and one in the floodplain to discuss bottomland topography and restoration of plant communities. Missouri Department of Conservation, Cape Girardeau Nature Center, Cape Girardeau.

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For more information on LTRMP Field Stations, please the Field Station Team Leaders below:

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<p><u>Bellevue Field Station</u></p> <p>Team Leader: Dave Bierman</p> <p>Iowa Department of Natural Resources 206 Rose Street Bellevue, Iowa 52031 Phone: 563-872-5495 Fax: 563-872-5456 dave.bierman@dnr.iowa.gov</p>	<p><u>Great Rivers Field Station</u></p> <p>Team Leader: John Chick</p> <p>Great Rivers Field Station Phone: 618-466-9690 chick@inhs.illinois.edu</p>
<p><u>Illinois River Field Station</u></p> <p>Team Leader: Greg Sass</p> <p>Illinois Natural History Survey 704 N. Schrader Avenue Havana, Illinois 62644 Phone: 309-543-6000 Fax: 309-543-2105 ggsass@uiuc.edu</p>	<p><u>Open Rivers and Wetlands Field Station</u></p> <p>Team Leader: Robert Hrabik</p> <p>Missouri Department of Conservation 3815 East Jackson Boulevard Jackson, Missouri 63755 Phone: 573-243-2659 Fax: 573-243-2897 Robert.Hrabik@mdc.mo.gov</p>

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