

MUDDY WATERS

News from the Missouri Cooperative Fish and Wildlife Research Unit

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Missouri Cooperative Fish and Wildlife Research Unit

302 ABNR Building,
Department of Fisheries and
Wildlife Sciences
University of Missouri
Columbia, MO 65211
573-882-3634
www.coopunits.org/Missouri/

COOPERATORS



MORE THAN FISH?

For those of you that have followed Muddy Waters over the years you will recall that the newsletter has been devoted to fish and fish research. However, just as many things have changed in the last year so has Muddy Waters. I was content focusing on fish as we continued this newsletter. However, Lisa Webb, the Missouri Unit's new Assistant Leader-Wildlife has told me that there is apparently more to life than fish.

After this crazy concept finally sunk in, we have modified the newsletter to include wildlife as well. Lisa's expertise is in wetland and waterfowl ecology, a discipline that has been sorely missed for many years at the University of Missouri and the Missouri Unit. The addition of Lisa puts the wildlife back in the Missouri Cooperative Fish and Wildlife Research Unit for the first time since 2003.

With Lisa coming to the Unit we bring some additional diversity to the Missouri Unit and this newsletter. In this issue you will find research related to light goose conservation efforts in Nebraska, and the use of wetlands by waterfowl in the Midwest, in addition to the fisheries work being conducted by the students and staff. As Lisa's program grows you will see more wildlife information in this newsletter as she develops her research in wetlands and waterfowl ecology.

I finally had to admit it. There is more to life than fish. So sit back, relax, and enjoy the new diversity of Muddy Waters.

Craig Paukert

paukerc@missouri.edu



LISA WEBB NEW AUL

Lisa Webb started as the new AUL- Wildlife with the Missouri Coop Unit in May 2011, after spending five years as an Assistant Professor of Wildlife Ecology at Arkansas Tech University. Lisa's research expertise is primarily in waterfowl and wetland ecology, with an emphasis on quantifying factors that influence habitat quality, behavior and body condition of wetland birds during migration. Current topics that Lisa and her graduate students are researching include: 1) Factors influencing body condition and nutrient reserves of waterfowl during spring migration; 2) Energetic carrying capacity and water bird use of WRP lands in the Lower Mississippi Alluvial Valley 3) Effects of the Light Goose Conservation Order on waterfowl behavior and habitat use during spring migration, and 4) Assessing wetland habitat quality for water birds using plasma metabolite concentrations. Lisa is excited about establishing a research program in Missouri and is already collaborating with MDC biologists on several projects. If you would like additional information or to discuss potential research projects, please contact Lisa at webbli@missouri.edu.

SCIENTISTS, STUDENTS WIN AWARDS

Jake Faulkner received the Duffy Travel Award to the Midwest Fish and Wildlife Conference in 2011. This is a monetary award from the North Central Division and Missouri Chapter of the AFS to attend this meeting. Jake was also a finalist for the Janice Lee Fenske Award, which recognizes up to 25 fish or wildlife students in the North Central Division for their professionalism, ambition, and promise in the field. **Craig Paukert** received a STAR award from USGS for outstanding performance in 2011. **Joe Gerken** received a Special Achievement Award from the Kansas Cooperative Research Unit. **Jason Fischer** received the Outstanding Unit Student of 2010 from the Kansas Cooperative Fish and Wildlife Research Unit. Finally, the research conducted by **Joe Gerken** and **Allison Pease** were two of 10 research projects highlighted by USGS and distributed by the media for the AFS meeting in Seattle.

STUDENTS HELP THE MISSOURI RIVER

Unit students participated in one of the cleanup days organized by [Missouri River Relief](#). **Jake Faulkner** and **Jon Spurgeon** volunteered their time and the Unit provided a boat to help with a Missouri River cleanup in Jefferson City. This was a great opportunity to give back to the resource.



Jon Spurgeon (L) and Jake Faulkner (R) help a Missouri River cleanup

STUDENTS AND STAFF

The backbone of the Unit's research is graduate students and research staff. Below briefly describes some of their backgrounds and projects.

Jon Spurgeon is a MS student evaluating translocations as a tool to recover humpback chub in Grand Canyon. Jon is a MU graduate and has been working on his MS since summer 2010. He intends to graduate in spring 2012, and is



Jason Harris, Jon Spurgeon, and Landon Pierce 'working' on Table Rock Lake

currently seeking a PhD position. **Jake Faulkner** is also a MU grad and is currently working on his MS studying resource selection of Niangua darters. He also started in summer 2010 and plans on graduating in 2012. Previously Jake worked with MDC on various stream issues, including Niangua darter monitoring. He is from Jefferson City, Missouri. **Justin Buckler** is from Columbia, Missouri and just defended his MS thesis working on how contaminants affect sturgeon reproduction and early life stages. He received from BS from MU and will be finishing December 2011. **Jason Harris** is from Rapid City, South Dakota, and started at MU in January 2011 to work on habitat selection of largemouth bass in Table Rock Lake. He has been tracking fish monthly and will continue through summer 2012. **Andy Dinges** is a MS student studying the effects that hunting disturbance has on waterfowl behavior and distribution during the



Andy Dinges

Light Goose Conservation Order in the Rainwater Basin of Nebraska. A native of Nebraska, Andy received his BS from the University of Nebraska-Lincoln. He plans to graduate in the fall of 2012.

Nick Sievert is a native of Sturgeon Bay, Wisconsin and finished his BS from the University of Wisconsin-Madison before arriving at MU in fall 2011 to start his MS. Nick will be working with existing data from MDC to identify areas of high aquatic biodiversity in



Nick Sievert

Missouri, and developing strategies to best protect biodiversity in future scenarios of land use and climate change. **Emily Pherigo** is a new MS student at MU but is not new to Columbia. Emily is

a native of St. Louis and will help identify seasonal use of two Missouri River tributaries by large river fishes. Prior to grad school, Emily worked for USGS and the USFWS in Columbia on Missouri River fisheries issues. **Jessi Tapp**, a western Kentucky native, began her MS research in January at Arkansas Tech University and followed her advisor Dr. Lisa Webb to MU in August 2011. Jessi has been conducting waterbird/wetland management related research on private lands in the Lower Mississippi Alluvial Valley and will continue with data collection through fall 2012.



Jessi Tapp

Landon Pierce is a PhD student studying how landscape factors affect fish distributions in the Missouri and Colorado River basins. He is a native of Nebraska, and completed his BS at Nebraska before finishing his MS at South Dakota State University working on paddlefish population dynamics, and he recently published his thesis work. **Jeff Fore** is a PhD student working on how conservation practices in the Missouri River Basin affect fishes. He received his BS from Oklahoma State University and MS from Eastern Illinois University and is a native of Ponca City, Oklahoma. Jeff will be finishing in fall 2012.

There are several research staff or co-investigators affiliated with the Unit. **Dr. Jodi Whittier** is a co-principal investigator on several grants related to conservation planning for fishes, and how climate change will affect fish habitat, and modeling stream temperatures in Missouri. She is a native of California and has a BS from Cal Poly-San Luis Obispo, and a MS and

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NATIONAL FISH HABITAT ACTION PARTNERSHIP RESEARCH AT MISSOURI UNIT

Scientists are working on several projects related to the National Fish Habitat Action Partnership (NFHAP), an effort to protect fish habitats nationwide. Craig **Paukert** is one of about 15 scientists of the NFHAP Science and Data Committee. In addition, Craig and **Jodi Whittier** are co-investigators of a 17-investigator project on how climate change affects fish habitats nationwide. They are also working to identify priority watersheds in the Desert Fish Habitat Partnership region. In addition, Craig is working with MDC and MS student **Jason Harris** on habitat selection of artificial structures on Table Rock Lake in Missouri, which is part of the Reservoir Fish Habitat Partnership project. The NFHAP is a strong link to meet local and national needs on fish habitat and the Missouri Unit is on the forefront of research to help meet those needs.

UNIT STUDENTS AND STAFF OFFICERS IN PROFESSIONAL SOCIETIES

Jodi Whittier and **Craig Paukert** are both elected officers of sections of the American Fisheries Society. Craig is President-Elect of the Education Section, and Jodi is the President for the Fisheries Information and Technology Section of the AFS. In addition, the students have also been very active in professional societies. **Jeff Fore** is the President the Student Subsection of the Education Section of the AFS. **Landon Pierce** is the Secretary-Treasurer of the same organization. The Student Subsection has over 800 members so it is an honor to be elected to represent all fisheries students in AFS.

STUDENTS AND STAFF (CONTINUED)

PhD from Oklahoma State University. Her primary efforts involve research and working with graduate students, but she also will be teaching undergraduates at MU in GIS applications in ecology. **Dr. Allison Pease** is a post-doctoral researcher working on the population-level effect of climate change on smallmouth bass. She is a native of Texas and received her BS from University of Texas, MS from University of New Mexico, and PhD from Texas A&M University before arriving in summer 2010 at MU. **Dr. Karthik Masagounder** is a post-doctoral researcher working on invasion potential of Asian carp into the Great Lakes. He is working closely with USGS Columbia Environmental Research Center in Columbia, and received his PhD in Fisheries and Wildlife at MU. He will be leaving soon for a job in Singapore related to animal feed nutrition. **Dr. Jacob Westhoff** received his BS from MU, his MS at Tennessee Tech University, and his PhD from MU. Jacob is currently working on modeling stream temperature and habitat in the Current and Jacks Fork rivers and will start tracking smallmouth bass this winter to determine if they select certain temperatures. **Dr. Michelle Staudinger** is stationed at the USGS National Climate Change and Wildlife Science Center in Reston, VA, but is a MU post-doc that will be helping USGS work on the biodiversity component of the National Climate Assessment. Michelle received her PhD from University of Massachusetts, a MS from Stony Brook, and a BS from Boston University. **Dan Whiting** is a Senior Research Technician working in the Grand Canyon. He received his BS



Dan Whiting

and MS from Southern Illinois University. Dan splits his time between the Grand Canyon and the lab, evaluating the impacts of non-native trout on native fish species in tributaries within the Grand Canyon. He will stay on for a couple more years working with Grand Canyon National Park on humpback chub recovery. Finally, **Emily Tracy-Smith** is a research associate working on identifying the key biological metrics related to flows to help the Missouri Department of Conservation identify future research needs related to environmental flows. Emily received her BS from Florida, and her MS from MU, but worked for a couple years with the MO DNR before accepting her current position.

Craig Paukert still has a couple of graduate

students he advises at K-State and are considered part of our group. **Joe Gerken** is a PhD student at K-State and is working on how flood-plain connectivity and river flows affect river fishes. Joe is a native of Ohio and has his BS from Miami University of Ohio and a MS from the University of Central Arkansas. **Jason Fischer** is from Flint, Michigan and received his BS from Michigan State University. He is currently working on his MS at K-State evaluating how sand dredging effects fish and fish habitat in large rivers. Both Joe and Jason will be wrapping up at K-State in 2012.



WHAT IS A RWO AND WHY DO I CARE?

One unique aspect of the Cooperative Research Units is the ability for agencies to non-competitively distribute funds to conduct research and graduate training. The process, called the Research Work Order (RWO) allows federal agencies to transfer funds to USGS, who then transfers funds to the university. This also allows these funds to be carried over for up to five years, which can be a substantial advantage for agencies. The RWO is not just for Unit scientists; anyone in the university can use this process for federal funds through the Unit, if the research is led by a university researcher or faculty member, fits under the mission of the Cooperative Research Units, has a strong research component, and has a graduate student or post-doc on the project. On occasion we will get a call from a federal cooperator who needs research done that does not fit the expertise of the Unit scientists. In those cases we look for other university collaborators to help the cooperator on the project, often through the RWO. Since 2006 the Missouri Cooperative Research Unit has had 8 RWOs totaling \$1 million to non-Unit scientists at MU in the Fish and Wildlife, Forestry, and Statistics departments. So if you are a cooperator with a research need feel free to contact Unit scientists and we will help you find the expertise you need. For university faculty feel free to contact the Unit scientists to get more information on how to use this unique resource.

RESEARCH PROJECTS

Recruitment of large river fishes.

The objectives of this project are to identify recruitment bottlenecks for large river fishes and aid in the development of minimum flow requirements for fishes in the Kansas River. **Joe Gerken**, PhD student at K-State, finished his third field season where he is concentrating on the link between backwaters and the mainchannel to determine how fishes in large rivers use the habitats and energy from backwaters. In addition, Joe has been working on developing strategies for Asian carp suppression in rivers. The study is funded by K-State and Kansas Department of Wildlife, Parks, and Tourism, and will build on previous studies funded by KDWPT on the Kansas River.



Effects of sand dredging on fish and fish habitat.

This study, which is housed at K-State and funded by Kansas Department of Wildlife, Parks, and Tourism, will help determine if fish communities and instream habitat differ at sand dredging sites and more natural river reaches in the Kansas River. **Jason Fischer**, a MS student at K-State, is working on the project in collaboration with Melinda Daniels, a fluvial geomorphologist at K-State. The project has recently received a bit of attention due to potential reauthorization of sand dredging permits on the Kansas River. The project will wrap up in Spring 2012.

Assessing the effects of contaminants on sturgeon.

Contaminants in shovelnose sturgeon, a close relative to the endangered pallid sturgeon, continue to be found at concentrations above thresholds for adverse effects on reproduction and development in other fish species. Concentrations of polychlorinated biphenyls (PCBs), organochlorine pesticides (OCPs), and polybrominated diphenyl ethers (PBDEs) in wild Middle Mississippi River shovelnose sturgeon eggs from two sites were assessed. Decreased survival and percent hatch were observed with increasing egg contaminant concentrations, suggesting that contaminants may be one factor impacting *Scaphirhynchus* sturgeon populations. **Justin Buckler** is a MS student on this project, which was funded by MDC, MU, and USGS.

Use of alternative food sources of bighead and silver carp.

This study is designed, through laboratory and mesocosm experimentation, to determine if food available in the Great Lakes is adequate for long term survival and growth of bigheaded carps shed. **Karthik Masagounder** is the post-doctoral researcher on this project, which is funded by USGS and is working closely with Duane Chapman at the Columbia Environmental Research Center. Laboratory experiments have revealed that fish gained about 30-50% body weight in 2 weeks. The results also indicated growth was lower than expected based on the previous bioenergetic model developed.

Evaluations of translocation humpback chub in Grand Canyon.

This project is evaluating the response of humpback chub translocated in Shinumo Creek, and potential interactions including predation and trophic suppression between native and non native fishes in Bright Angel Creek, a potential site for HBC relocations.

Initial analysis show that 42% of introduced chub have left Shinumo Creek since beginning translocations in 2009, and that rainbow trout and humpback chub are consuming resources at the same trophic level. This work is part of a group effort between the National Park Service, US Bureau of Reclamation, the US Fish and Wildlife Service, MU, and others. **Jon Spurgeon**, MS student, and **Dan Whiting**, Sr. Research Technician, are both on the project, which is funded by USGS and the NPS.

Conservation planning for fishes in the Upper Colorado River Basin.

This project builds on previous and on-going research we have been conducting on fish communities in the Lower Colorado River Basin. We have compiled a suite of environmental characteristics and threats frequently associated with presence or absence of freshwater fish species. Federal and state agencies from all the states encompassing the Basin have contributed nearly 800,000 records of fish sampled from the late 1800's to 2010. The USGS-funded project is a joint effort between **Julian Olden**, University of Washington, **Jodi Whittier**, and **Landon Pierce**, PhD student.

Managing the nations fish habitat at multiple spatial scales.

This USGS-funded study addresses objectives of the National Fish Habitat Action Partnership to examine the impact of climate and land-use change on the Nation's aquatic systems. This a large effort with 17 principal investigators, and 13 students, post-docs, and research staff throughout the country. At MU, **Jodi Whittier** is leading the effort to determine how climate and land use will affect fish habitat in the Lower Colorado River Basin, while **Allison Pease**, a post doctoral researcher, is working on how climate change will affect smallmouth bass populations in the Central US. **Jake Faulkner**, MS student, is helping determine how climate change may affect Niangua darter distributions in Missouri.



Remediating the effects of human threats on lotic fishes.

The goal of this NRCS-funded study is to assess effectiveness of conservation practices at conserving lotic fish assemblages throughout the Missouri River Basin. **Jeff Fore**, a PhD student, has developed threat indices that represent the cumulative effects of multiple agriculture, urbanization, point-source pollution, and infrastructural threats for every stream segment in the Missouri River Basin. Results indicate that substantial agricultural conservation will be needed to improve ecological condition of Wadeable streams in the Missouri River basin.

Habitat selection of largemouth bass in Table Rock Lake.

In Table Rock Lake, MDC and other partners are attempting to improve fish habitat for largemouth bass and other fishes, and **Jason Harris**, MS student, will be helping these partners determine if largemouth bass select habitat structures that are being placed in the lake. Jason is using telemetry to track largemouth bass to

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RESEARCH PROJECTS CONTINUED

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determine if largemouth bass use these habitat structures and if this selection differs seasonally or by diel periods. The project, funded by MDC, will work closely with MDC fisheries biologists and will continue through 2012.



Tracking largemouth bass

hunting during the first four weeks of migration when 83% of the hunting encounters were documented in the region. Dabbling duck densities were also at least three times greater on wetlands closed to hunting in every week of this time period. Information from a survey as well as field data collected will be evaluated together to make future decisions regarding spring hunting regulations in the region. **Andy Dinges**, MS student, is heading up this project, which is funded by the Nebraska Game and Parks Commission and MU.

Helping refine ecological flow research in Missouri.

The MDC has researched ecological flow for several years and has developed a Missouri Hydrologic Assessment Tool (MOHAT) which can be used to establish a hydrologic baseline and help aid in the development of ecological flow standards. However, there are still substantial improvements that need to be made to MOHAT. This study, funded by MDC and led by Research Associate **Emily Tracy-Smith**, will help refine the list of flow metrics that can be used in refinement of MOHAT and further evaluate how these metrics are linked to biological metrics. Ultimately, this work could be used to determine the ecological response from altered hydrology to recommend suitable ecological flows for streams.



Snorkeling for *Niangua darters*

Climate change effects of biodiversity.

The objective of this study, funded by the USGS National Climate Change and Wildlife Science Center, is two-fold. First, **Michelle Staudinger**, a post-doctoral researcher, is helping USGS in the National Climate Assessment on how climate change affects biodiversity. The work will include an expert panel that will be held in Palo Alto, CA to summarize how climate change may affect biodiversity. The second phase of the project will be conducted in the state of Missouri, where MS student **Nick Sievert**, will identify aquatic biodiversity hotspots in the state, and help identify adaptation strategies for the state in the face of climate change.

The role of tributaries on Missouri River recovery.

Tributaries may play an important role for obligate large river fishes. This study, funded by USGS with support from the US Fish and Wildlife Service, will determine seasonal use of the highly regulated Osage River and the unregulated Gasconade River by mainstem Missouri River fishes. **Emily Pherigo** is the MS student on the project, and will also work with USGS CERC fish physiologist Diana Papoulias to determine reproductive condition of fishes in these rivers. The project began in fall 2011 and will continue for two years.

Effects of the light goose conservation order on behavior of waterfowl and hunting participants in the Rainwater Basin, Nebraska.

Spring is an energetically important time period for migratory waterfowl and special regulations have been set in this region to protect non-target species during this hunting season. The goal of this project is to determine how waterfowl respond to hunting disturbance in relation to these special regulations. In 2011 Mallards and Pintails spent twice as much time foraging in wetlands closed to



Waterbird use and food availability at Migratory Bird Habitat Initiative wetlands.

NRCS implemented the Migratory Bird Habitat Initiative (MBHI) in summer 2010 to mitigate potential impacts to coastal wetlands as a result of the Deepwater Horizon oil spill. The goal of the MBHI is to improve habitats on private farmlands, catfish ponds, and WRP easements in states near the Gulf of Mexico to provide additional habitats for wintering and migrating waterbirds that may be displaced from impacted coastal wetlands. To evaluate the effectiveness of the MBHI on WRP lands, **Jessi Tapp** is examining waterbird use and food availability on passively managed WRP sites, actively managed MBHI sites, and long-term actively managed public sites in the LMAV of Arkansas and Missouri.

Assessing validity and precision of moist-soil seed estimation techniques.

This project stemmed from discussions with MDC biologists and is a joint effort between MDC and Lisa Webb's current research. Estimates of moist-soil seed biomass are used to calculate dabbling duck carrying capacity, or duck-energy days (DEDs), on public and private wetlands. **Lisa Webb** and **Jessi Tapp** are assisting MDC in an evaluation of various techniques used to estimate moist-soil



seed availability in wetlands. MDC biologists joined Jessi at her study sites in October 2011 in south-eastern Missouri to

field-test an estimation technique involving plant measurements (e.g., plant height, seed-head diameter) and the lab component of this study is underway.

PRESENTATIONS BY UNIT STUDENTS AND STAFF

Midwest Fish and Wildlife Conference, December 2011

Davenport, S., E. Pherigo, C. Vishy, K. Chojnacki, D. Papoulias, A. Delonay, C. Paukert. Use of the Osage River by Telemetry Tagged Pallid Sturgeon.

Dinges, A., E. Webb, M. Vrtiska. Effects of the Light Goose Conservation Order on Waterfowl Behavior and Distribution in the Rainwater Basin of Nebraska.

Faulkner, J., C. Paukert. Seasonal Microhabitat Selection of Nianhua Darters.

Fischer, J., J. Gerken, C. Paukert, M. Daniels. Habitat and Fish Community Response to Sand Dredging in a Large Great Plains River.

Fore, J.D., and others. An Assessment of the Effects of Human Threats and Agricultural BMPs on Stream Fishes.

Gerken, J., C. Paukert. Can Silver Carp be Controlled? Population Level Response to Various Management Regimes.

Harris, J., C. Paukert, S. Bush, M. Allen, M. Siepkner. Movement and Habitat Selection of Largemouth Bass Related to Supplemental Habitat Structure in Table Rock Lake, Missouri.

Kaemingk, M., J. Jolley, C. Paukert, and others. The Role of Common Carp and Their Effects on Fishes, Invertebrates, and Water Quality in Shallow Lakes.

Masagounder, K., D. Chapman, C. Paukert. Validation of Bioenergetics Model for Bighead and Silver Carps.

Pease, A, C. Paukert. Potential Impacts of Climate Change on Growth and Performance of Stream dwelling Smallmouth Bass Populations in the Central U.S.

Pierce, L., C. Paukert, J. Whittier. The Effects of Abiotic and Biotic Factors on Native and Nonnative Fish Species Diversity in Headwater Streams.

Spurgeon, J., C. Paukert, B. Healy, D. Whiting. Beyond Stocking: Using Population Modeling to Increase Translocation Success.

Tapp, J., E. Webb. Waterbird Use on Wetland Reserve Program Sites Enrolled in the Migratory Bird Habitat Initiative.

American Fisheries Society Annual Meeting, September 2011

Fischer, J. J. Gerken, C. Paukert, M. Daniels. Habitat and Fish Community Response to Dredging in a Large Great Plains River.

Fore, J.D., and others. An Initial Assessment of NRCS Conservation Practices Effects on Stream Fishes.

Gerken, J., C. Paukert. Age-Specific Demography of Silver Carp: Implications for Management and Control.

Pease, A., C. Paukert. Potential Effects of Climate Change on Growth of Smallmouth Bass in Streams of the Central U.S.

Spurgeon, J., D. Whiting, C. Paukert, B. Healy. Trophic Structure of Fish Communities in Grand Canyon National Park Tributary Streams.

Whittier, J., C. Paukert, and others. Developing Conservation Priorities for Native Fish in the Lower Colorado River Basin.

Other meetings:

Buckler, J., and others. Persistent Organic Pollutant Effects on Shovelnose Sturgeon Reproduction and Early Life Stages. Society of Environmental Toxicology and Chemistry Annual Meeting, Boston, MA.

Pease, A. Influences of Environmental Change on the Functional Structure of Stream Fish Communities. Biology Departmental Seminar, Stephen F. Austin State University, Nacogdoches, TX.

Harris, J., C. Paukert, S. Bush, M. Allen, M. Siepkner. Movement and Habitat Selection of Largemouth Bass in Table Rock Lake. Missouri-Arkansas White River Fisheries Partnership Meeting, Yellville, AR.

Healy, B., E. Omana-Smith, J. Spurgeon, D. Whiting, C. Paukert. Humpback Chub Translocations to Grand Canyon Tributaries: preliminary results. 11th Biennial Conference of Research on the Colorado Plateau. Flagstaff, AZ.

Whittier, J., C. Paukert. Priority Watershed Planning in the Colorado River Basin: New Tools and Approaches. Missouri Chapter of the American Fisheries Society Rivers and Streams Technical Committee, Jefferson City, MO.

Paukert, C. Rivers and Stream Research at the Missouri Cooperative Fish and Wildlife Research Unit. Missouri Chapter of the American Fisheries Society Rivers and Streams Technical Committee, Jefferson City, MO.

Pease, A., and others. Functional Trait Diversity and Trait-Environment Relationships in Central Texas Stream Fish Assemblages: Implications for Biomonitoring. Annual Meeting of the Ecological Society of America, Austin, TX.

Paukert, C. Some Like it Hot: Quantifying Fish Habitat in a Changing Climate. Annual Meeting of the Texas Cooperative Fish and Wildlife Research Unit, Athens, TX.

Fore, J.D., and others. Assessing NRCS Conservation Practice Effectiveness Using Stream Fishes. Annual Meeting of the Soil and Water Conservation Society. Washington D.C.

Daniels, M. K., J. Fischer, K. Costigan, J. Gerken, C. Paukert. Making Sense of an Intensively Modified Sediment Regime: Measuring the Relative Impact of In-Channel Dredging Amidst Reservoir Trapping and Network-Scale Incision in the Kansas River basin. International Symposium on the Interactions between Sediment and Water. Darlington, England.



Rafting the Colorado River, Grand Canyon

TEACHING AND STUDENT MENTORING STRONG AT THE MISSOURI UNIT

A large part of the role of the Cooperative Research Unit is mentoring and training of graduate students. This is primarily done through the University of Missouri as the students are typically housed in the Department of Fisheries and Wildlife Sciences at MU. Currently Unit scientists have eight graduate students at MU, four post-doctoral researchers, and five full-time staff, in addition to up to a half dozen student technicians. All told the Unit has over 20 students, scientists and staff housed through the Fisheries and Wildlife Sciences Department—all supervised by two Unit scientists! With these students and staff comes the need to teach. Unit scientists and staff have recently taught or will teach four courses. **Allison Pease** volunteered her time to teach a Lotic Community Ecology course to 11 graduate students in fall 2011. **Jodi Whittier** will teach an undergraduate GIS course in spring 2012. In addition, **Lisa Webb** will teach Waterfowl Ecology and **Craig Paukert** will teach Advanced Fisheries Science in spring 2012. Finally, **Craig Paukert** is also working with an honors student that registered to conduct undergraduate research with him for fall 2011. Also, **Landon Pierce** was a Graduate Teaching Assistant in fall 2011 for Fisheries Management. In addition to this formal teaching, Unit scientists have guest lectured no less than eight times in at least three MU courses in fall 2011.

UNIT PUBLICATIONS

Jeffress, M., C. Paukert, J. Whittier, B. Sandercock, and P. Gipson. 2011. Scale-dependent Factors Affecting North American River Otter Distribution in the Midwest. *American Midland Naturalist* 166:177-193.

Jeffress, M., C. Paukert, B. Sandercock, and P. Gipson. 2011. Factors affecting the detectability of river otters during sign surveys. *Journal of Wildlife Management* 75:144-150.

Paukert, C., K. Pitts, J. Whittier, and J. Olden. 2011. Development and assessment of a landscape-level ecological threat index of the Lower Colorado River Basin. *Ecological Indicators* 11:304-310.

Pease, A., J. Taylor, K. Winemiller, and R. King. 2011. Multi-scale environmental influences on stream fish assemblage structure in central Texas streams. *Transactions of the American Fisheries Society* 140: 1409-1427.

Pierce, L., B. Graeb, D. Willis, J. Sorensen, and M. Pegg. 2011. Stocking success of paddlefish in Lake Francis Case, South Dakota: population characteristics and sport fishery potential. *Transactions of the American Fisheries Society* 140:1359-1369.

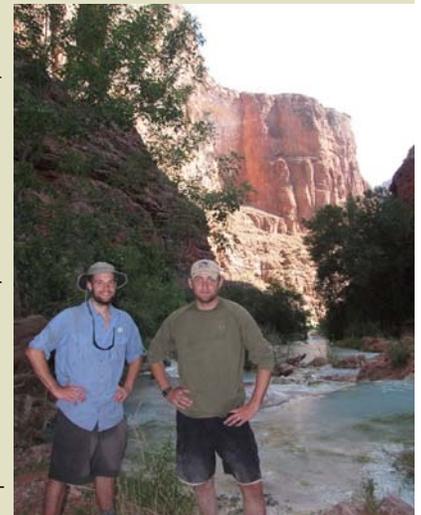
Schloesser, J., C. Paukert, W. Doyle, T. Hill, K. Steffensen, and V. Travnicek. In press. Heterogeneous detection probabilities for imperiled Missouri River fishes: implications for large river monitoring programs. *Endangered Species Research*.

Schloesser, J., C. Paukert, W. Doyle, T. Hill, K. Steffensen, and V. Travnicek. In press. Fish assemblages at engineered and natural channel structures in the Lower Missouri River: implications for modified dike structures. *River Research and Applications*.

Strecker, A., J. Olden, J. Whittier, and C. Paukert. In press. Defining conservation priorities for freshwater fishes according to taxonomic, functional, and phylogenetic diversity. *Ecological Applications*.

Webb, E., L. Smith, M. Vrtiska, and T. LaGrange. 2011. Factors influencing behavior of wetland birds during spring migration in the Rainwater Basin. *Waterbirds* 34:457-467.

Whiting, D., M. Whiles, and M. Stone. 2011. Patterns of macroinvertebrate production, trophic structure, and energy flow along a tall-grass prairie stream continuum. *Limnology and Oceanography*. 56:887-898.



Dan Whiting and Jon Spurgeon in Grand Canyon

UNIT INVOLVED IN NORTHEAST CLIMATE AND WILDLIFE SCIENCE CENTER

The University of Missouri is part of a consortium of universities in the northeast US that are now the [Northeast Climate Science Center](#) of the National Climate Change and Wildlife Science Centers. The consortium is led by the University of Massachusetts and includes MU, the University of Minnesota, College of the Menominee Nation, Columbia University, University of Wisconsin, and the Marine Biological Laboratory. Unit scientists and staff **Craig Paukert** and **Jodi Whittier** are two of the four faculty in MU's Fisheries and Wildlife Sciences Department that were part of the participating partners, that was spearheaded by Frank Thompson with MU and the US Forest Service. This program will open the door for continued climate change science work by Unit scientists and others. Currently, **Michelle Staudinger**, **Allison Pease**, **Jake Faulkner**, **Nick Sievert**, **Jodi Whittier**, and **Craig Paukert** are involved in climate change research related to fisheries and aquatic systems.

STAFF, STUDENT AND AFFILIATES CONTACT INFORMATION

Missouri Cooperative Fish and Wildlife Research Unit

302 ABNR Building,
Dept. of Fisheries and Wildlife Sciences
University of Missouri
Columbia, Missouri 65211
573-882-3634
www.coopunits.org/Missouri/

Niki Fuemmeler

Administrative Assistant
fuemmelern@missouri.edu

Dr. Craig Paukert

Unit Leader
paukertc@missouri.edu
<http://riverstudies.com/>

Dr. Elisabeth (Lisa) Webb

Assistant Leader Wildlife
webbli@missouri.edu

Dr. Joanna (Jodi) Whittier

Research Assistant Professor
(Unit affiliate with Fish and Wildlife Dept.)
whittierj@missouri.edu
<http://riverstudies.com/>

MS students

Justin Buckler (Advisor: Galat)
jabx97@mail.mizzou.edu

Andy Dinges (Advisor: Webb)
Email: adr43@mail.missouri.edu

Jake Faulkner (Advisor: Paukert)
jdf522@mizzou.edu

Jason Fischer (K-State; Advisor: Paukert)
fisch133@k-state.edu

Jason Harris (Advisor: Paukert)
jmhtnc@mail.mizzou.edu

Emily Pherigo (Advisor: Paukert)
ekvpx8@mail.mizzou.edu

Nick Sievert (Advisor: Paukert)
nas4tf@mail.mizzou.edu

Jonathon Spurgeon (Advisor: Paukert)
jjscm3@mail.missouri.edu

Jessi Tapp (Advisor: Webb)
Email: tappjl@missouri.edu

PhD students

Jeff Fore (Advisor: Galat)
jdfz2@mail.mizzou.edu

Joe Gerken (K-State; Advisor: Paukert)
gerkenje@ksu.edu

Landon Pierce (Advisor: Paukert)
LLP5YC@mail.missouri.edu

Post Docs and Research Staff

Tom Boersig (Supervisor: Paukert)
Research Technician
Email: BoersigT@missouri.edu

Jacob Cowan (Supervisor: Webb)
Research Technician

Erin Fore (Supervisor: Paukert)
Research Technician
Email: emfore@hotmail.com

Scott James (Supervisor: Webb)
Research Technician

Dr. Karthik Masagounder (Advisor: Paukert)
Post-doctoral Researcher
MasagounderK@missouri.edu

Dr. Allison Pease (Advisor: Paukert)
Post-doctoral Researcher
peasea@missouri.edu

Dr. Michelle Staudinger (Advisor: Paukert)
Post-doctoral Researcher
mstaudinger@usgs.gov

Emily Tracy-Smith (Supervisor: Paukert)
Research Associate
Email: tracysmithe@missouri.edu

Dr. Jacob Westhoff (Advisor: Paukert)
Post-doctoral Researcher
jtw7a1@mail.mizzou.edu

Dan Whiting (Supervisor: Paukert)
Sr. Research Technician
whitingd@missouri.edu



SERVICE AN IMPORTANT PART OF THE MISSOURI UNIT

Service to professional societies is a large part of the Units role. **Craig Paukert** is active in the American Fisheries Society (AFS), and recently 'retired' as an Associate Editor for North American Journal of Fisheries Management after eight years. He is also currently a guest co-editor (with Steve Cooke from Carlton University and Zeb Hogan from Nevada-Reno and National Geographic) for *Endangered Species Management* for an issue focused on imperiled river fishes. Craig continues as a member of the National Fish Habitat Action Partnership (NFHAP) Science and Data Team. **Lisa Webb** was recently appointed as an Associate Editor of the Wildlife Society Bulletin where she will review papers related to a variety of topics on waterfowl and wetlands. **Jodi Whittier** has been active with the Desert Fish Habitat Partnership with research conducted with Julian Olden and Angela Strecker, and recently attended the Desert Fishes Habitat Partnership meeting in Salt Lake City. Jodi also serves on the Parent Society AFS Electronic Services Advisory Board, and the Management Committee.

Jeff Fore is the Student's Angle Editor for *Fisheries*, the monthly periodical of the American Fisheries Society. **Landon Pierce** started in fall 2011 as the co-newsletter editor for the Education Section of the AFS. **Joe Gerken** is currently serving his third term as the Co-Chair of the fundraising committee for the Kansas Chapter of AFS. He also held a workshop for Kansas Department of Wildlife, Parks, and Tourism biologists on age and growth assessments. **Allison Pease** served on the Transactions of AFS publications award committee in 2011 and will chair the committee for 2012. The students have been very active helping the undergraduates in the MU Fisheries and Aquatic Science Societies (FASS), which is the MU student subunit of the AFS. **Jake Faulkner**, **Jon Spurgeon**, **Allison Pease**, and **Dan Whiting** have all spoken about their research, or helped them with their monitoring projects. Finally, **Jon Spurgeon** wrote an article about his research for the Arizona/New Mexico AFS newsletter.