

MOAFS RIVERS AND STREAMS TECHNICAL COMMITTEE MEETING

Summer/Fall meeting – 8/3/2010 at the USGS Columbia Environmental Research Center, Columbia, MO

The meeting was called to order by Chairperson Chris Riggert at 10:05 AM.

Attendees included: Ann Allert, Chris Barnett, Mark Boone, Andrew Branson, Paul Calvert, Aimee Coy, Mary Culler, Jim Fairchild, John Fantz, Kenda Flores, Larry Furniss, Jen Gironde, Nate Gosch, Patty Herman, Matt Matheney, Joe McMullen, Amy Meier, Landon Pierce, Phil Pitts, Barry Poulton, Chris Riggert, Bob Temper, Darren Thornhill, and Kelly Whitsett

Minutes from the winter meeting were offered up for review by the committee. The minutes passed with a unanimous vote.

Chris Riggert: the first speaker for the day is Barry Poulton, an aquatic entomologist with the USGS in Columbia.

Guest speakers

Macroinvertebrates on the Large Rivers. Barry Poulton (USGS)

Barry has been working on macroinvertebrates on the lower Missouri River for the last 10-12 years and had been working with sampling gear before that to determine how to efficiently sample macroinvertebrates in large rivers. In Missouri, the Missouri and Mississippi Rivers include over 1,000 miles of river. “Great” rivers are those with Strahler stream order 9 or greater, which include both the Missouri and Mississippi Rivers in Missouri.

There was not much data for macroinvertebrates in the Missouri and Mississippi Rivers before the 1990’s and not much information on rare species. Barry’s work has focused on looking for habitat affinities for taxa, estimates of biodiversity, and the contribution of floodplains to macroinvertebrate abundance and diversity. Before this work, we did not have the data available to assess the health of the Missouri River, the feeding and diets of the fish species in the river, or the effects of river restoration projects.

Large river macroinvertebrate species are adapted to warm water, high turbidity, immediate egg hatching, fine substrates, and large woody debris snags. Initially, sampling methods were insufficient for large rivers, so preliminary work had to determine how to effectively sample in large rivers. A combination of gears was needed to sample off-channel habitats, dike pools and connected backwaters, sand/silt habitats in the main channel, rock habitats in the main channel, wing dikes or revetments, and macroinvertebrate drift. Methods used have included D-frame kick nets, rock-basket artificial substrates, benthic trawls, and Ponar grabs for fine sediments.

Large river sampling has shown there is a great diversity of macroinvertebrates living in the mainstem lower Missouri River, with 142 macroinvertebrate species found in the lower Missouri River. Sixty-six of these species are EPT taxa (mayflies, stoneflies, and caddisflies), 26 species are non-insect taxa (crustaceans, snails, clams, and worms), 30 species are midges (Chironomidae), 11 species are dragonflies or damselflies (Odonata), 6 species are beetles

(Coleoptera), and 3 species are true bugs (Hemiptera). Twenty-two of these species are large river obligates, living only in large rivers. Six of these obligates are mayflies. The proportions of these taxa are similar to what you find in wadeable streams. Within the mainstem of the river, rock habitat contained the greatest diversity of macroinvertebrates, also similar to patterns you find in wadeable streams. Overall, the mainstem river had a great diversity of Chironomidae and Ephemeroptera. One hundred and seventy species have been found in off-channel wetlands, and 132 of these species are unique to just the wetlands and are not found in the mainstem of the river. Some unique macroinvertebrates found during sampling include a rare sand dwelling mayfly in the family Oligoneuridae and river shrimp (*Macrobrachium ohione*). The river shrimp was found during sampling in 2007 and had not been seen in the Missouri River since the 1950's.

Mayfly emergence in the Upper Mississippi river occurs over a short period of time and the number of mayflies emerging are so great that the emergence can be picked up on Doppler radar. On the Missouri River, we don't have as many dike pools as the Upper Mississippi River and our hatch in Missouri is a more delayed hatch that occurs over several weeks, so we don't have as noticeable of an emergence as on the Upper Mississippi. The hatch on the Missouri river occurs in August and can be seen if you are on the river in a boat at night.

Water quality was also measured during the studies with a Hydrolab Quanta probe and a "Missouri mud sucker", a device that takes pore water from backwater sediment. Pore sediment water was tested for ammonia, sulfides, and oxidation reduction potential. The studies found that the size of the dike pool was correlated to water quality. The larger dike pools had more stable pools, better water quality, and also better populations of mayflies and other invertebrates that are a food source for fish.

To give an idea about the density of macroinvertebrates on some substrates, artificial rock basket samplers contained 50,000 to 1,000,000 macroinvertebrates per square meter, and about 90% of these macroinvertebrates were net-spinning caddisflies. The Corps of Engineers has used mattress blocks to revet banks and they have put grooves into the mattress blocks to increase the surface area and substrate complexity for macroinvertebrate attachment.

Questions/Comments:

John Fantz: What percentage of your drift net samples were Trichoptera?

Barry P: The drift net samples were not nearly as dominated by Trichoptera as the rock basket samples. However, mayflies may have swam off of the rock basket samplers when they were retrieved, while the Trichopterans stayed in their cases on the basket.

Additional data needs on the Missouri River include:

- 1.) Food availability related to fish and how this relates to available habitat or desired habitat.
- 2.) Limnological research from the mainstem. There is nothing comprehensive since 1951. There may be some oxygen related problems during late summer. Also primary productivity in key habitats during different river conditions is needed.

- 3.) Habitat based evaluation of changes and association with restoration activities.
- 4.) Response of invertebrate communities to stressors on a localized scale, effects of exotic species (zebra mussels), and development of large river biocriteria for meeting Clean Water Act goals.

Amy Meier: Do you think the additional rock that has been added to the river on dikes and revetments has added to the macroinvertebrate diversity compared to natural conditions?

Barry P: I don't know what the natural conditions were because we don't have that data, but I suspect it has led to community shifts towards those species that prefer coarse substrates. There is some natural rock habitat on outside bends of the Missouri River, but there is much more rock now in the Missouri River due to the artificial rock that has been added.

Matt Matheny: What is considered main channel habitat for your work?

Barry P: Main channel habitat is within the confines of the levee and banks, including dike pools.

The Watershed Evaluation and Comparison Tool. Chris Barnett (CARES at University of Missouri-Columbia)

This web based watershed tool was developed using 319 funding from the Missouri Department of Natural Resources to provide basic watershed information and compare multiple watersheds. The idea was proposed to create a tool to support the State Water Plan. There was a need to prioritize watersheds and to identify watershed needs. In 2005, the tool was developed as an internal tool for DNR. In 2007, nutrient management issues were added to the tool, and in 2008 the tool was made available to the public on the CARES website and includes a basic watershed profile. In 2009, the tool was updated based on hydrologic units, current data, and updated printable maps.

The Watershed Evaluation and Comparison Tool can be accessed on the CARES website at www.cares.missouri.edu. Click on the link for "Map Room" on the middle of the page. Then click on "Missouri Watershed Tool" on the right side of the page. The direct link to the tool is at <http://ims.missouri.edu/website/watershedTool/>.

You can search for a watershed based on county, hydrologic unit code (8, 10, 12, or 14 digit), interactive map, or street address. The 14 unit hydrologic code is an out of date system but is being utilized for some current DNR projects, so using the 14 unit code for new projects or searches is discouraged.

You can create a watershed profile, which is a basic watershed report. This is also printable as a pdf. Some information in the profile includes streams, land use, elevation, land slope, soils, precipitation, karst features, CAFOS, 303 (d) listed lakes and streams, protected waters, drinking water intakes and wells, USGS monitoring sites, local initiatives, and census data. You

can also generate a “nutrient indicator report” with information that relates to nutrient impairment and management, such as animal feeding operations and TMDL status.

Questions/Comments:

Kelly Whitsett: How often is the water quality data updated and where does the water quality data come from?

Chris B: The update is irregular, but data was last updated in fall of 2009. The data comes from DNR and other public sources.

Kelly W: Question about the hydrologic dataset used by the watershed tool

Chris B: The hydrologic dataset used on this map is the system developed by the USDA and USGS, which is the common layer across the nation. There is no crosswalk between the HUC14 and HUC12 digits that I know, but you can overlay and compare them. The HUC14 digits were not liked by many aquatic biologists.

Kelly W: The Forest Service reports by 12 digit code.

Chris B: This watershed tool is based on the Watershed Boundary Dataset (WBD). The HUC 12's are about 15,000 to 25,000 acres. I used hydrologic unit and watershed interchangeably through my talk, but really they are different. Watersheds are the drainage area for the entire stream but hydrologic units are management units based on hydrologic principles that follow the ridges, but in a hydrologic unit you could have inputs from upstream from another hydrologic unit. Interactive maps (GIS maps) are also available on CARES. A lot of this information is also available by going through the interactive maps. You can find the National Hydrologic Dataset (NHD) stream identifier number by going through the interactive map, but this identifier number is currently not available on the watershed evaluation tool profile report.

11:30 AM Break for lunch

12:55 PM Meeting was called to order

Utilizing Stream Team Volunteers in Aquatic COAs. Jen Girondo (MDC)

Recently Stream Team volunteers have been used to gather data from priority aquatic Conservation Opportunity Areas (COAs). In the St. Louis region, work has focused the last year on Dry Fork Creek and the Meramec River. Dry Fork is a lower gradient stream with sand substrate, and the Meramec River is more of a typical Ozark stream with gravel and cobble substrate. The confluence of both areas provide for high diversity of fish. Part of the COA also is a losing stream section that drains to the Meramec Spring. There are also other partners (The Nature Conservancy, USFWS) that are interested in conserving this COA as a priority.

Some goals for the Dry Fork aquatic COA were to increase the percent forested riparian area from 55% to 65%. A specific project manager, Adam Boman, worked to implement BMPs and water quality monitoring was wanted to try to show funding sources that the BMPs were having

a good effect over time. Also, biologists were interested in the diverse fish community and wanted to be able to identify water quality parameters that may be affecting the fish community.

Because BMPs included livestock exclusion and planting riparian corridors, water quality parameters that would be affected by these parameters were chosen, and parameters were chosen that were also used in Stream Team protocol. In addition to water quality testing, macroinvertebrates were collected and identified to order according to Stream Team protocol. The Rolla Master Naturalist Chapter was enlisted to help with the monitoring. The volunteers were trained to Level 2 in the Stream Team Program. MDC biologists helped them gain access to sites and provided some mentoring at the beginning of the process until the volunteers were comfortable collecting the data. They selected 3 sites throughout the watershed and asked volunteers to sample at least two times per year but volunteers could also sample monthly if they desired. Jen displayed some of the data which is providing a baseline dataset and also information about typical ranges of data. One of the difficulties with having volunteers collect the data is getting them to go sample exactly when you would like them to sample. Another difficulty is finding the one volunteer that will become a leader within the group. The other difficulty is that the Master Naturalist group is involved in a lot of other activities and have other projects to work around. Some of the benefits include getting the water quality information from volunteers free of charge and also having citizens out in the streams observing stream changes and impacts.

Questions/Comments

John Fantz: I noticed there was a note about someone dumping dirt in the floodplain at a site. What is this referring to? Are they filling a wetland?

Jen G: A landowner was dumping dirt in a floodplain but it was more than 100 feet from the stream. They were not filling in a wetland.

Paul Calvert: A contractor may be paying the landowner to dispose of fill. On another note, it is important to be direct with Stream Teams and tell them what you would like them to do for scheduling.

Chris Riggert: It would be good to develop an actual sampling plan that defines times that you would like them to sample.

John F: How do you generate more interest with the volunteers? How could the Master Naturalist group generate more volunteers?

Jen G: Sometimes there is not a need for more volunteers because if macroinvertebrates are only sampled twice a year, there are only a few people that are needed. The issue is getting your few volunteers to show leadership and commit to sampling at certain times.

John F: If there are more trained volunteers, they could rotate if there is a time conflict.

Amy Meier: They can overlap these hours with Master Naturalist hours.

Paul C: There is a need to have a consistent time of day when the sites are sampled. You need to standardize the time of day and month that the sites are sampled or there will be too much variability in your water chemistry just because of the time of day it is taken.

Jen G: Good point. The data gives us a snapshot of the water quality.

John F: As we continue to move forward with our watershed work, organization of volunteers will be essential.

Kenda Flores: Landowners know where wastewater treatment plants hit their creek, they are watching their creeks. Even though they go to the water quality training, a lot of times they lack confidence.

Jen G: Which is why mentoring is important.

Paul C: How much riparian forest was added in the project?

Jen G: I think he gained between 10-15 miles. Some research has shown that when the watershed is 60-70% forested, the watershed has good ecological integrity.

John F: I just attended a grant writing workshop and there are lots of dollars out there for this type of activity. You don't want to try to write yourself into a box having to prove water quality is improved because it may take 20 or 50 years to see improvements when you are increasing forest cover.

Kelly W: The federal programs require accomplishments and tracking programs to show improvement.

New Business

Chris Riggert: The next item on our agenda is discussing the 2010 MNRC workshop.

MNRC Workshop

Phil Pitts: Last year the workshop consisted of five 20 minute presentations. I would like to have ideas about what we would like to hear at the workshop.

Kenda F: What is the conference theme? We should probably try to make the workshop theme related to the conference theme.

Phil P: One complaint of our workshop last year was that we were too heavy on MDC speakers. We need more speakers from other agencies.

John F: Possibly an AOP (aquatic organism passage) workshop with people from MODOT and other agencies.

Phil P: I have Steve McMurray and Joanne Grady on my committee for the workshop, so if you want to be on the committee, let me know.

Kelly W: I went to a Forest Service Groundwater Restoration class in Oregon that discussed using groundwater to restore wetlands. The Milwaukee office just hired a man from Alaska that has experience in wetland restoration, and I would like to get him to visit Missouri. I would like to also get everyone in the watershed in my area together to work together to coordinate watershed restoration.

Mary Culler: One of the suggestions last year was to have a panel of various agencies to discuss how they were going to address watershed issues.

Kelly W: I was actually considering submitting an abstract about the direction the Forest Service is going with watershed work.

Phil P: Sounds like we may have a good start for a workshop idea. Let me know if you want to be on the workshop committee.

Election of Officers for 2011

Chris Riggert: It's time to elect a new chairperson to begin in 2011. Mary Culler has volunteered for the position. Is there anyone that would like to nominate themselves for the position? There are no other nominations. Mary Culler was elected unanimously. We also need a new secretary. Jen Gironde, John Fantz, and Nate Gosch were nominated. The nominees exited the room and some discussion followed. Nate Gosch was unanimously elected the new secretary.

John F: we need a new newsletter editor and also a new IT chair.

Kenda F: Please start thinking about award nominations.

Call to adjourn by Matt Matheny, seconded by Paul Calvert.

Meeting adjourned at 2:31 PM