

Minnesota Chapter Report

NCD Rivers and Streams Technical Committee

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MN Division of Ecological and Water Resources, Minnesota Department of Natural Resources

Stream Habitat Program

Stream restoration projects:

Completed:

- **Chamber's Grove, St. Louis River** - bank protection using toe-wood sod mats, two j-hooks, and a weir. Design by Luther Aadland.
- Knutson Dam, **Cass Lake on Mississippi River near Bemidji** - dam replaced with a rock-arch-rapids. Design by Luther Aadland and Jon Hodgson, USFS.
- High Island Creek **near Mankato** = removal of a dam that had failed, construction of a riffle for grade control, and construction of a meander protected by a toewood sod mat. Design by Luther Aadland. In partnership with DNR – Fisheries.
- **Whiskey Creek, Barnesville** - replaced an old mill dam with a rock-arch-rapids spillway. Design by Dave Friedl. In partnership with DNR – Fisheries.
- **Buffalo River, Hawley** –added meanders to 2 straightened reaches: 1) north of US HWY 10 2) south of US HWY 10. Design by Luther Aadland.
1)



2)



Starting in 2016:

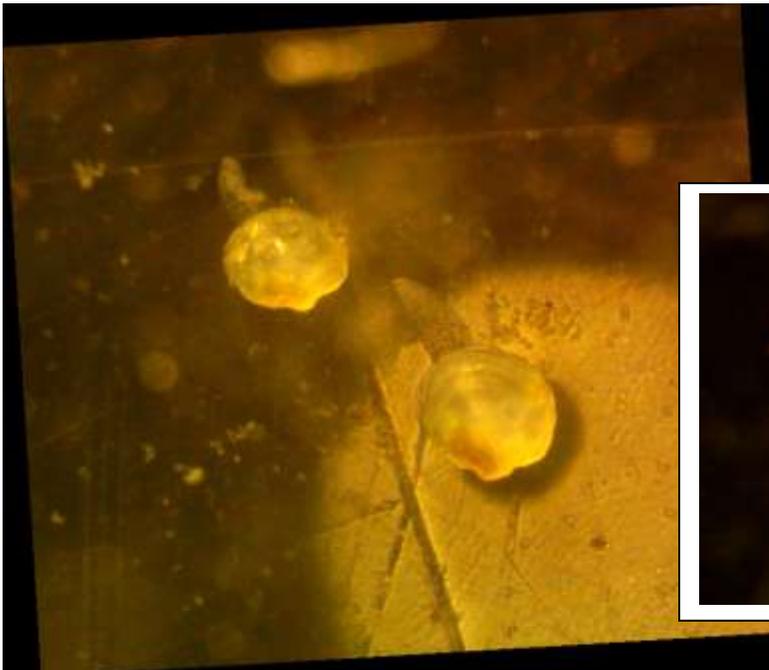
- Sandhill River, near Fertile - four dam removals and 18 riffle structures for grade control. Design by Luther Aadland. Construction anticipated start August 2016.

- Lake Shady Dam, Zumbro River, Oronoco - replacing the dam with a rock arch rapids & river restoration through the reservoir. Design by Luther. Construction anticipated start fall 2016.
- Middlefork of the Whitewater River - river restoration including repositioning channel to former alignment and rock riffles. Design by Kevin Zytovicz. Construction to begin fall 2016.

Mussels:

- **Publication:** Tiemann, J., S. McMurray, B. Sietman, L. Kitchel, S. Gritters, and R. Lewis. 2015. Freshwater mussels of the Upper Mississippi River. 3rd edition. Upper Mississippi Conservation Committee, 63 pp.
- Logperch have been inoculated with the federally endangered snuffbox mussel and bass with mucklets collected from the St. Croix River. These will be released at our reintroduction site in the Mississippi River in St. Paul in the fall of 2017.
- Collaborating with the MN Zoo to set up a mussel growing facility that will also be on display for the public as they walk across the bridge over the zoo's lake to access the large mammal exhibits. This will expose thousands of people to mussel conservation and stream ecology during their visits to the zoo.
- Have transformed more than 40,000 glochidia in the lab now, the now free living are about 200 - 250 microns long.

Still frames from the microscope video of two baby winged mapleleaf mussels. The brownish green color inside them is food.



Inside the mussel propagation facility.



Fish habitat sampling:

- Pre-data was collected for the Grindstone Dam and Sandhill River restoration projects.
- Post-data was collected for High Island Creek, Lawndale Creek, and the Buffalo River restoration projects.
- Collected data at both long-term data sites – Otter Tail River (19 years of data) and Yellow Medicine River (26 years of data).
- Total of 10 rivers, 23 sites, 504 pre-positioned cells, 60 species and 9800 fish sampled. Data will be used to update habitat suitability criteria.

Stream crossing assessment – LSOHC funding:

- In order to help prioritize projects, it was decided that an inventory of stream crossings (dams & culverts) and an assessment of their effect on fish passage was needed.
- Objectives of the project: 1) Assess one watershed in each region of the state.
2) Prioritize where restoration would yield the greatest impacts.
3) Use this data to demonstrate need of a statewide inventory of crossings and to pursue funding to create inventory.
- The document Stream Crossing Inventory and Barrier Ranking Guidelines was written as a reference for others to complete similar assessments and inventories.
<http://files.dnr.state.mn.us/waters/publications/stream-crossing-guidelines.pdf>

Upper Mississippi River Restoration (UMRR) Long Term Resource Monitoring (LTRM)

Publications: DeLain, S.A., and Popp, W.A., 2014, [Relationship of weed shiner and young-of-year bluegill and largemouth bass abundance to submersed aquatic vegetation in Navigation Pools 4, 8, and 13 of the Upper Mississippi River, 1998– 2012](#): A technical report submitted to the U.S. Army Corps of Engineers' Upper Mississippi River Restoration-Environmental Management Program from the U.S. Geological Survey, Technical Report 2014–T001, 29 p.

DeLain, S.A., 2015, Five year summary of LTRM Fish Data on Pool 4 of the Upper Mississippi River 2009-2013

Popp, W. A., R. M. Burdis, S. A. DeLain, and M. J. Moore. 2014. Temporal trends in water quality and biota in segments of Pool 4 above and below Lake Pepin, Upper Mississippi River: indications of a recent ecological shift. Upper Mississippi River Restoration Long Term Resource Monitoring Program Completion Report 2010D6 submitted to the U.S. Army Corps of Engineers, Rock Island, Illinois. 47 pp.

Moore, M. 2015. Analysis of Spatial and Temporal Dynamics of Submersed Aquatic Vegetation and Metaphyton Communities of Pool 4, Upper Mississippi River (1998–2011). A completion report submitted to the U.S. Army Corps of Engineers' Upper Mississippi River Restoration Program from the U.S. Geological Survey, Completion Report LTRM–2012A6, 33 p

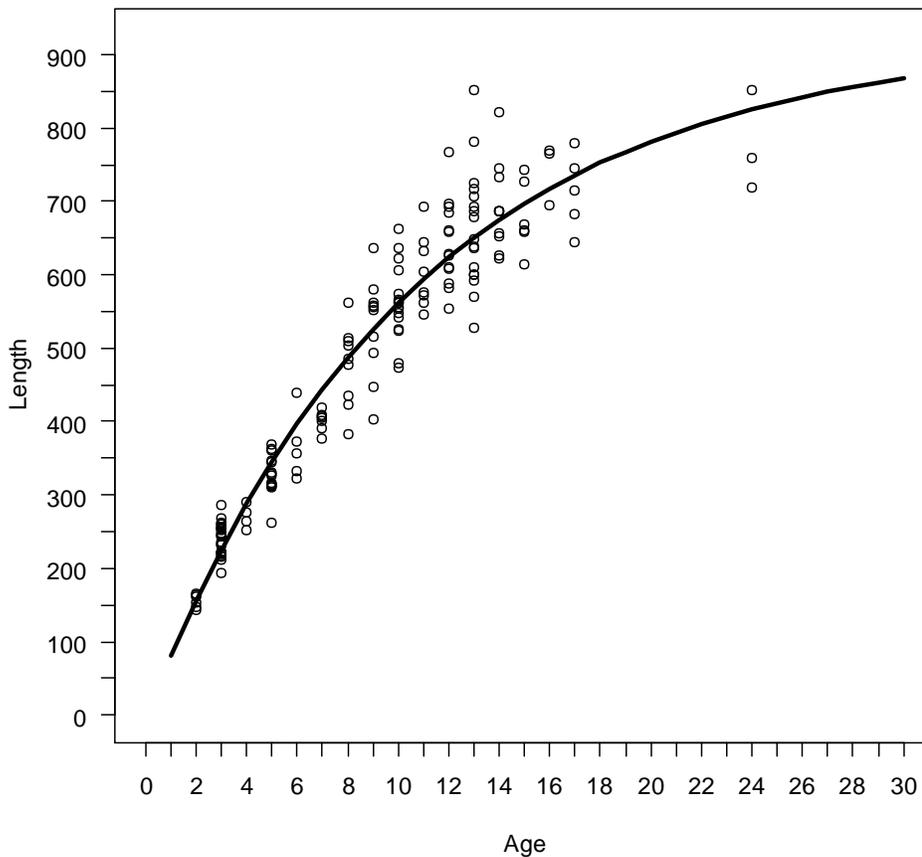
Clean Water Legacy funds:

- **Flandreau Creek** (Pipestone County) re-meandering project. Pipestone County widened the road which made them relocate the stream. Instead of keeping a straight channel along the road, we created a meandering channel design that the county dug in January 2015.
- **Dry Wood Creek:** move channel to old, meandering channel and protect banks with toe wood (w/ stream habitat program)
- **Kanaranzi Creek** dam removal in Adrian, MN. (collaboration with FWS and Stream Habitat Program)
- **Knife River Bank Stabilization** (collaboration with Lake SWCD) Stabilized a 800 foot long, 40 foot high eroding bluff. Designed by Mike Geenen and Keith Anderson. Completed in 2015.
- **Mound Creek** surveying and design recommendations for Blue Mounds State Park dam washout (collaboration with Stream Habitat Program)

MN Division of Fish and Wildlife, Minnesota Department of Natural Resources

Fisheries:

- 2015: **Straight River** Tree Drop on May 13th, 2015. 150 trees were used to create 32 new structures, beef up 3 old structures and block off a beaver cut off that was forming. Work was completed on 4,200 feet of stream, connecting all past tree drops.
- 2016: **Kabekona** Alder Removal is scheduled for the week of June 6-9th, 2016. The area of the river where the work will take place has dense alders on both banks that are causing stream stability issues, along with limiting anglers access to the stream in area along almost 6 miles of stream.
- **Minnesota River**
Key accomplishments over the last year include completing a two year evaluation of spatial and temporal trends in large hoop net catches and conducting annual Fish Index of Biotic Integrity assessments at 16 fixed sites. Pectoral spines were also removed from nearly 200 Minnesota River Channel Catfish and used to develop a Von Bertalanffy growth curve (Figure 1).



- LCCMR recommended funding for a three-year project to enhance understanding of the Minnesota River aquatic ecosystem. Assuming funding is provided, this three year project will

start July 2016 and will focus on four specific project activities: 1) Accelerate collection of baseline Minnesota River lower trophic data, 2) Quantify physical habitat characteristics of the Minnesota River, 3) Inventory Minnesota River backwater fish communities, and 4) Evaluate population dynamics, movement, and habitat use of Shovelnose Sturgeon in the Minnesota River.

- Also worth noting, within the last few months, commercial fishermen have captured the very first Grass Carp (12-15-2015) and Bighead Carp (02-18-16) from the Minnesota River.
- Enhanced floodplain connectivity and instream habitat on six trout streams
- Partnered with local lake association to construct a walleye spawning riffle in a lake tributary (Rat Root River)
- Modified two lake outlet structures to allow fish passage, creating upstream access to almost 3,000 acres of lake habitat from downstream lakes and rivers.
- Partnered with Trout Unlimited to complete 11 habitat enhancement projects in southeast and northeast MN.

University of Minnesota – Mark Hove, malacologist:

- LCCMR project involves field and laboratory studies to better understand the impacts of suspended sediment and bedload movement on native mussels. During 2015 Macalester College and the University of Minnesota observed declining mussel catch rates among rivers in the Minnesota River basin with increasing suspended sediment loads. This summer we plan to study the effects of suspended sediment, and bedload movement on native mussels in flumes and an outdoor stream laboratory at the U of MN St. Anthony Falls Laboratory.
- Cooperative project between the USGS, NPS, and UMN to study seasonal movements of channel catfish with attached federally endangered winged mapleleaf glochidia in the St. Croix River. The last project is to determine life history requirements, specifically glochidial hosts, of rare and common native mussels in Minnesota streams and rivers.

Lake County SWCD

- **Stewart River** Stabilization and Habitat Improvement Project. Stabilized 4,000 feet of stream channel while stabilizing eroding banks and providing habitat. Design by Dave and Brandon Rosgen (Wildland Hydrology) and Mike Geenen, with Keith Anderson (TSA 3) and Karl Koller (DNR). Completed fall of 2015. In partnership with: Sustain Our Great Lakes, DNR Lessard Sams Outdoor Heritage Council, Clean Water Fund grant, BWSR Flood Relief, DNR debris and sediment Removal grant, Minnesota Trout Unlimited

Buffer Mapping project

Governor Mark Dayton's landmark buffer initiative was signed into law in 2015. The law establishes new perennial vegetation buffers of up to 50 feet along rivers, streams, and ditches that will help filter out phosphorus, nitrogen, and sediment. The new law provides flexibility and financial support for landowners to install and maintain buffers.

The MN DNR's role in Minnesota's new buffer law is to produce maps of public waters and public ditch systems that require permanent vegetation buffers. The DNR is scheduled to produce these maps by July 2016.

Buffer bill purpose:

- **Improving Water Quality** - The Buffer Initiative will protect Minnesota's water resources from erosion and runoff pollution by establishing perennial vegetative cover adjacent to Minnesota's waters.
- **Cooperation and Compromise** - This proposal was crafted with input from agriculture groups, environmental groups, local government groups, legislators from both parties, and landowners.
- **A Multi-Agency Effort** - The four lead state agencies are: Minnesota Department of Agriculture, Minnesota Board of Water and Soil Resources, Minnesota Department of Natural Resources, and the Minnesota Pollution Control Agency.

More information can be found at the following links.

<http://www.dnr.state.mn.us/buffers/index.html>

<http://www.bwsr.state.mn.us/buffers/>

MN AFS position on 2015 law change regarding culverts

Issue: During the 2015 legislative session, a change was made in Minnesota statute 103G.245, subdivision 2, to exempt the replacement of a culvert from state permitting, so long as the replacement culvert is an identical size and set at the same elevation.

Why should we care? Culverts installed in the past were often undersized in order to minimize costs to the road authority. Undersized culverts are barriers to fish passage due to high velocity within the culvert, and also destabilize streams by causing scour downstream and sediment deposition upstream when water is backed up. Perched culverts are also often a problem, where the downstream end of the culvert is elevated above the water below. Most native fish in Minnesota do not jump to overcome such obstacles. Because of the new law change, there is now an incentive for road authorities to replace culverts, even when they are blown out by a flood, with an identical culvert in order to avoid paying a permit fee. The scope of this problem is huge, because initial surveys around the state have found that over 80% of culverts are undersized.

This issue becomes even larger in the context of climate change. Large storms are already more frequent in Minnesota than they were when many of the culverts in Minnesota were originally installed. Replacing them with an identical size will be even more of a problem in the future, as climate predictions indicate that large floods will become even more frequent going forward. This will cause

even more problems for fish passage and stream stability, not to mention public safety and costs to taxpayers due to increasing culvert failures.

Fish passage is critical for most native fish in Minnesota. Most fish migrate between different habitats seasonally, as well as during different stages in their lives. For example, adult walleye live in lakes and deeper pools of rivers, but spawn on gravel riffles that may be miles away. Barriers such as culverts force fish to use sub-optimal habitats where they may not be as successful at critical times such as spawning.

Action: The state permit requirement for culvert projects allows for review of the size and elevation of the proposed replacement, and is one of the only means available to force road authorities to install culverts appropriately. The exemption for culvert replacements should be repealed.