

**Poplar River TMDL
Third Public Meeting
September 16, 2008**

7:00 Introduction – Dave Stark

Review of steps taken:

1. Evaluated existing data
2. Evaluated existing WEPP model and developed a new WEPP model
3. Physical channel assessment
4. SWCD contract: Finish biological monitoring, SWCD write up final report by Oct. 1.
5. Megaslump project underway.

The WEPP model

looked at a scenario of a fully forested watershed to try to compare the difference between that condition and current landuse in terms of sediment yield to the river. The TMDL hasn't been written yet. Comments from various parties have resulted in a delay. Gathering additional information to decide how to proceed.

7:10 Water Plan Updates – Cindy Gentz

Water plan is available to the public for viewing on the County web site, under SWCD link.

7:15 Hydrology Overview – Jesse Schomberg

Schomberg: This area was mostly coniferous and is now mostly deciduous, which makes it behave differently with regard to water movement.

Question: Couldn't it have been mostly deciduous before it was coniferous? I thought it went back and forth. Schomberg: Wouldn't have been solid old-growth coniferous, would have been a mosaic of different ages of forests and types, but would have been much more dominated by coniferous.

Stark: Some of the work that was done in preparation for the TMDL tried to look at models of historical versus current flows.

Question: Have you looked at sources of sediment in other rivers such as the Caribou versus the Poplar? What is natural? Other rivers such as Caribou have a lot of sediment in them too.

Schomberg: It isn't a simple answer. If we have totally changed the vegetation in the watershed, do we call that "natural" or human-caused?

7:45 Biological Monitoring – Dr. Valerie Brady

Channel of Poplar where benthos was collected is very wide compared to other North Shore (NS) streams. Size matters. In wide, shallow streams, will see different “bugs” than in wide, large streams. Small and large streams are not directly comparable.

Velocity is fairly fast in the Poplar compared to other NS streams

Embeddedness of Poplar is not too high (fairly typical for NS streams). Bugs want to be under the rocks. If the underside of rocks is full of sediment, there is less habitat for bugs. Velocities in study are from summer, low flow. If you have high velocity, don't usually have much fine sediment hanging around. Bedrock means bugs have nowhere to hide.

During storm events, sand-silt-clay particles are moving right through these stretches. Sensitive taxa tend to live in rocks – lots of places to live. If there is a lot of sand and clay – less places to live. Also, moving sediment can hurt invertebrates or clog their feeding nets. Can get tumbled by moving sediment.

Poplar on the better end in terms of substrate type (boulder, cobble, pebble)

Bugs – Caddisflies, Mayflies, and Stoneflies are sensitive. Diptera are more hardy. Poplar has lots of Diptera. In terms of macroinvertebrate assemblages, the Poplar is dominated by hardy invertebrates and few of the sensitive invertebrates. Lots of Dipterans. But, if you separate out Dipterans, in terms of sensitive versus not sensitive Poplar looks a little better. Many of its Dipteran genera are fairly sensitive. Poplar bugs are tolerant of low dissolved oxygen. 30-40% of bug taxa are hardy bugs. Food web seems to be functioning okay, though sensitive taxa aren't there in usual proportions.

How do invertebrate feeding strategies compare to other streams? Good. Have lots of predators and fair numbers of filterers. Poplar looks very good in terms of behavior types that are present. Lots of clingers versus burrowers. That means that in these stretches of the Poplar, there isn't a lot of fine sediment.

Summary: The lower Poplar is a very physically harsh environment. Benthos shows signs of stress relative to other NS streams. Floods like the one in 2006 will blow everything away.

Question: What is relative importance of flashy velocity versus sediment? Brady: Depends on particle size. Finer sediment would be better for bugs than coarse. Assuming velocity stays the same, getting sand out will help the bugs. Clay will still clog gills, but would be better than getting pummeled by sand. If you reduce sand without reducing clay – hard to know how much better it would be. The larger the particle that is moving, the harder on the bugs.

Site A below the slump may be worse than the others. Shows signs of stress, but can't attribute that directly to the slump. Too far downstream.

Don't seem to be a lot of refuges for the bugs in the stream (at least in that stretch).

Question: Lots of dragonflies up higher on the river. Are the conditions better up there? Brady: Flow might be slower up there, which is better for dragonflies and damselflies.

Full report will be on Web site by end of September.

8:30 Fishery Summary – Karl Koller (Presenting for Steve Persons, Grand Marais Area Fisheries Supervisor)

Study divided into two parts – below natural barrier and above. Above – catch rates were low relative to other NS streams and relative to upriver. In entire reach – young-of-year were rare. Below barrier – steelhead juvenile abundance was low compared to other NS streams. Pink and Chinook salmon also spawn in Poplar. Smallmouth bass may have been increasing since 1994. Sunfish seen just since 1994. 1961 survey near mouth said 3% silt. 1989 – no silt or muck reported. 1994 and 1995 surveys reported knee-deep silt and clay in pools above mouth. Lower density of fish than other NS streams. Limited reproductive success, reduction in habitat quality, and possible increase in warmwater species. No data are available from prior to development so unable to say whether current conditions of apparent lower trout production due to watershed impacts or simply natural variation.

Limiting factors – lack of spawning habitat, marginal water temperatures in both summer and winter, and low winter flows. Large sand and pea-sized gravel are needed for spawning. Very little of that available. Not enough groundwater coming in – can end up with anchor ice forming. Comes back to the question of whether we are letting water infiltrate adequately to replenish the base flow of the stream.

To improve the situation, we need to reduce siltation, examine land management practices, and stabilize stream. To improve the stream temperature regime, we need a narrower channel with increased shading. To improve flows, we need to increase retention of stormwater/snowmelt and reduce the flashiness in the stream channel. Need to look at hydrology with relation to connectivity, geomorphology, water quality, and biology.

Question: There was an attempt made to introduce trout to make the Poplar a destination for trout fishing. What can be learned from this? Koller: Not being from the area I am unaware of the circumstances. Before you put fish in, need to make sure you have a stable stream. Need to look at all 5 components above to evaluate this.

Question: Seems like there are less trout than in the past. What effect does water taken from stream for snow-making have on winter flows? Koller: I don't know how much is being taken out relative to what is there or whether it is warmer or cooler. Also, when snow melts from snow-making in the spring, there will be more water in the stream. If the change in flows is significant, this can cause stability problems as the stream adjusts, which can affect habitat. If you've seen a change in fish population in the stream, maybe there has been something related to land use or hydrology that has de-stabilized the stream, filled in pools, etc.

8:45 Updates and Next Steps – Karen Evens

MN Clean Water Legacy Act (CWL) passed in 2006 is accelerating some of our work. CWL makes us able to work on our TMDLs and is giving us technical and financial assistance, including some implementation money. For example, we are putting a year-round gage on the Poplar, which will give us some of the information we need.

We use a formula to develop a TMDL – Point sources, nonpoint sources, margin of safety, reserve capacity for future growth. Level of pollutant that will be allowed to meet the water quality standard (WQS) is determined from this formula.

TMDL process – collecting new watershed data to get better picture of whole Poplar system. With information we have right now, we could develop TMDL formula. Do we have completed TMDL study? Not quite. Could complete monitoring plan and implementation plan in cooperation with stakeholders. Need more work to figure out implementation and monitoring that is needed. We have a lot of these pieces and would need to pull them together. Then would need public hearing and then submit to EPA. Then could get more funds to do stuff.

March – September, 2008. Final report closed out – officially completed. Reviewed feedback. The feedback we received included recommendations that we should do more monitoring and more modeling, do a better job on physical channel, and evaluate the best management practices (BMPs) that have been done.

Internally at MPCA we have talked about how to incorporate all this feedback. Also talked about putting the turbidity standard up for routine triennial review. Have until Sept. 26 to give input on this process.

Also looking at using a North Shore comparative approach – assessing other streams, finding reference streams.

Your input matters. Possible next steps:

- Could complete TMDL with data as is.
- Could enhance data and write TMDL
- Could delay TMDL until turbidity standard evaluation/revision.

This is one of the first TMDLs for the region. Sets a direction and stakeholder expectations for future work.

Question: How determine what is normal? Will there be a study? Evens: Couple of studies ongoing at different level. USGS in the 1980s evaluated WI and MN rivers, another set of studies on gauged streams which are stable/unstable. Other than that there are no studies. Don't know what is normal. Climate change has to be factored in too. North Shore comparative scenario would look at entire range of streams to figure out which streams are comparable to Poplar. Might need to do this.

Question: How do you equate different benthos samples? Are they all collected at the same time? Brady: Yes, all between mid-Aug and Mid-Sept so invertebrate samples are mature enough to be identified and are comparable to one another.

Stark: Last steps: Submission of the biological report, Stark's report to SWCD. Then, more meetings with stakeholders and a Poplar River Management Board meeting to decide what to do next. This has been lots of work, and we can all see that it is not simple and that there is no one answer. But decisions will have to be made, and we need to be proactive about working on river. Now is the time to define our path forward, since we have a lot of the basics done now.

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