

By: Corey Hanson, Water Quality Coordinator  
 For: November 12, 2009  
 Red Lake Watershed District Board Meeting

## Thief River Watershed Sediment Investigation

- Collected water quality samples
  - High E. coli
    - Site 156 (Thief R. N of Agassiz NWR)
    - Site 760 (Thief R. near TRF)
    - Site X4 (Moose R.)
  - High turbidity
    - Site 6 (ditch 200 downstream of Farmes Pool)
    - Site 40 times 4 measurements (Thief River at CR7)
    - Site 760 times 2 measurements
    - Site 757 (Mud River)
- Maintained continuous monitoring Equipment
  - 5 Eureka Manta multi-parameter sondes (760, 40, 41, 6, 757)
  - Eureka Midge dissolved oxygen logger (Moose River at Hwy 54)
  - In-Situ TROLL 9500 (Moose River at the State Forest Road)
- Worked on providing Houston Engineering with data to aid in the calibration and development of the SWAT model.
  - Identifying feedlot locations
  - Found the correlation between turbidity and total suspended solids for this watershed. I used this correlation to convert the continuous monitoring turbidity records into TSS records for use in calibrating the SWAT model.
  - Compiled and sent 2007-08 flow records
- Began working on a work plan for the upcoming watershed-based TMDL Study
- Agassiz NWR began releasing water on October 16<sup>th</sup> to draw down the Agassiz pool.
  - The water quality of the discharge was very bad. A turbidity level of 132.5 FNU was recorded on 10/16 (the standard is 25).
  - Turbidity in the Mud River was also quite high



during this time (103 FNU measured on 10/19).

- Moose River began discharging water on October 17<sup>th</sup>.
- Runoff from the JD21 along Hwy 54, which was under construction, was carrying plume of sediment into the Moose River.
- Measured flow at stream gauges 6 and 40.
- Attended watershed-based TMDL planning meeting in Detroit Lakes.
- Entered 2009 monitoring data into the RLWD water quality database.
- Identified stream/ditch reaches that will need to be monitored as part of the watershed-based TMDL and/or Surface Water Assessment Grant projects (like Branch A of JD21, see photo to the right).
  - Although the MPCA has the Thief River is listed as a priority watershed for this year's round of SWAG applications, the MPCA actually prefers that applications for SWAG monitoring in the Thief River watershed are submitted next year. SWAG monitoring would then coincide with the MPCA's intensive watershed monitoring program's monitoring that will be taking place in the Thief River Watershed.



### **Surface Water Assessment Grant Monitoring**

One round of samples and field measurements were collected at the Blackduck River, South Cormorant River, Darrigan's Creek, O' Briens Creek, Kripple Creek, and Lower Badger Creek monitoring sites in October. High E. coli concentrations were found in Darrigan's Creek and Lower Badger Creek. This monitoring is being paid for by Surface Water Assessment Grant funds being administered by the Red River Watershed Management Board. I entered 2009 SWAG field measurements into a spreadsheet for Danni Halvorson (RRWMB) and entered all the year's SWAG data into the RLWD water quality database.

### **Project 60 Monitoring**

- Retrieved the Stevens-Greenspan TS300 turbidity loggers from both sites.
- Entered 2009 monitoring data into the RLWD water quality database.

### **Other Notes**

- Retrieved HOBO water level loggers from the tile drainage monitoring sites.
- Discussed possible SWAG monitoring sites with SWCDs that are submitting applications.
- Entered 2009 monitoring data from the RLWD's district monitoring program into the RLWD water quality database.

### October Meetings and Events

- **October 6, 2009** – Silver Creek SWAT model meeting in Clearbrook
  - Explanation of the SWAT model.
  - Nutrients: in-stream kinetics adapted from QUAL2E.
  - 62 sub-basins, 3.77 square miles each
  - 653 hydrologic response units for an average of 10.53 HRUs per sub-basin
  - The model delineated a watershed boundary that differed from existing maps.
  - BMPs modeled:
    - Conservation tillage
    - Residue management
    - Grassed waterway
    - Wetland restoration
    - Streambank stabilization
    - Biofuel – switchgrass
    - Cover crops
    - Buffer strips
    - Point source elimination (livestock operation BMPs)
    - Rotational grazing
  - Nice BMP implementation maps
  - The model predicted that point source elimination would result in a 100% reduction in fecal coliform bacteria at the outlet.
    - In reality, it would be impossible to remove 100% of the bacteria, but this statistic at least shows the relative impact that feedlots are having on E. coli and fecal coliform levels in the stream.
  - Buffer strips are very important for reducing pollutants
  - Livestock management is crucial for reducing E. coli bacteria concentrations
  - Grassed waterways, wetland restorations, and biofuel – switchgrass are the other effective strategies.
- **October 13, 2009** – BWSR Competitive Grant informational meeting, 9am
- **October 13, 2009** – Watershed Based TMDL meeting in Detroit Lakes
- **October 23, 2009** – Red River Basin Monitoring Advisory Committee meeting, Sand Hill WD in Fertile
  - Flow monitoring in the Basin
    - There may be funding for the DNR to install and maintain new flow gauges in the Thief River and Red Lake River watersheds. Priority sites will be located near confluences (main channel and tributary), at major land use breaks, and on major ditches.
  - Training
    - The RRBMN Annual Water Quality Training Session will be held on March 3<sup>rd</sup> or 4<sup>th</sup>. It may be held at Concordia College or NDSU this year.
    - Continuous monitoring training in the spring after the regular session
    - Stream morphology
    - Communication
    - Stream Ecology – free course taught by Karen Terry?
  - Data management

- Tips for data prep for submittal to STORET
  - Check for obvious typos by sorting.
    - Verify that the site names and STORET codes match
    - Standardize time stamps (lab and field data)
    - Find typos and correct prior to submittal
  - Separate data by project and convert into the STORET template
    - Submit data by project in separate data sheets.
    - The River Watch website is supposed to convert data to the STORET template for you. However, there currently are some issues with functionality.
- Equipment
- Status Updates
  - Red Lake DNR received \$150,000 for restoration of the Mud River (removing the dam).
- **October 26, 2009** - Pennington County Water Resources Advisory Committee, 9 am
- **October 26, 2009** – Red River Basin Water Quality Team meeting, RLWD office, 10am
  - Rain gardens: design and maintenance considerations for the Red River Basin
    - Presentation by Howard Person
      - For a rain garden to function properly, water will need to infiltrate within 24-36 hours. Otherwise, you'll have root rot and problems maintaining plants in the rain garden.
      - Rain gardens are designed to capture the first ¼" to ½" of rain
      - Call Gopher One before you dig.
      - The size of the rain garden depends on the percolation rate and runoff area.
      - Make sure that the soil doesn't get compacted during construction.
      - Lots of compost is needed. Extra compost may be needed post-construction as compost breaks down and settles.
      - Keep shredded wood mulch away from plant stems (disease).
      - Even gardens <30% of the ideal size can still handle 70% of stormwater.
      - Perennial plants = less work
      - Design to fit the landscape.
      - Maintenance = removing weeds and trash
      - Plant suggestions for this area:  
Canada anemone is a tough plant,  
wild bergamot, obedient plant



- Blue Thumb website has a plant selector – doesn't have zones, though.
- We need to buy plants that will work here.
- Some species go wild when competition is removed – maintenance



becomes more intense. This is how a garden could begin to look weedy and have poor aesthetics. Master gardeners will likely know which plants can be pushy. Switchgrass, for example, goes crazy.

- Use native cultivars. They behave themselves. Irises are good. Also, add ground cover around the edges of the garden.
- Not all of the plants you want will be in stock, order ahead of time.
- MPCA would like to propose 2 pilot projects
  - Thief River Falls
    - Where in town could we put one, other than at the RLWD office? Look for residential, commercial, and city-owned sites along the river.
    - UMC students would like to work on it.
  - Mahnomon County sensitive lakes
- We need a source of guidance for residential property owners.
  - Where do people get the materials?
  - Flyer/brochure
  - Where do people get help or rent equipment for excavation?
  - To whom can people turn to recruit/contact volunteers?
  - Thief River Falls examples:
    - Shredded wood by the city's lagoons
    - ODC has a wood bin
    - The city has a leaf composting site (free)
    - Heavy clay = rain gardens will have to be larger – 30% of the collection area
    - May need plants with shallow root systems that are more tolerant of wet conditions.
    - Dig deeper, remove the clay, and replace the clay with good soil. Although you dig deeper initially to allow for more infiltration, the final surface depression will be shallower because of slower infiltration. An overflow point will be needed (berm, beehive inlet).
  - Updated wetlands restoration factors document: review and discuss
  - Buffalo Watershed study circles project

- Recruit participation from all sectors of the watershed (financial, natural, social, human, political) to form a diverse group of 8-12 participants.
- Educate the “study circle” on river issues critical for watershed management.
- Identify, discuss, and find connections among Community Capitals. Community Capitals represent the assets that the community has to work with. If they are used correctly, “invested,” they can be used to create/enhance new assets for the community.
- Talk about what is working well, rather than just talking about what the problems are.
- Use feedback from the study circle in the watershed planning process, e.g. developing vision statements and desired future conditions
  - The Watershed Approach: Linking State and local goals: review and discuss
- **October 28, 2009** - CD20 grade stabilization meeting

### November Plans

- Submit 2009 monitoring data to STORET.
- Retrieve continuous monitoring equipment for the year.
- Thief River watershed-based TMDL work plan.
- Start working on compiling and making corrections to continuous monitoring records.
- Surface Water Assessment Grant application(s).

### Future Meetings/Events

- **November 1, 2009** – Deadline for submitting data to STORET
- **November 17, 2009** – Pennington County WRAC, 9am
- **November 18, 2009** – Marshall County Water Resources Advisory Committee, 9:30 am, Newfolds
- **December 3, 2009** – Presentation at the MAWD drainage conference about the tile drainage study
- **December 11, 2009** – Red River Basin Monitoring Advisory Committee
- **January 2010** – completed work plan for the Thief River watershed-based TMDL