

By: Corey Hanson, Water Quality Coordinator
For: July 14, 2011
Red Lake Watershed District Board Meeting

Highlights in this Report:

- ▶ RLWD Rain Garden
- ▶ June rainfall events create gullies and high flows in rivers.
- ▶ Lost River Success Story
- ▶ June 2011 River Watch Report

RLWD Office Rain Garden

- Breiland Landscaping started working on the rain garden on June 20th and had it finished by the end of the next day.
- Plant labeling stakes were along the walking path in the garden.



Stream Gauging

- Installed HOB0 Water Level Loggers at:
 - Polk County Ditch 79 at Hwy 102 – to get a temperature and water level record to gauge the potential this stream has to support fish if a restoration project is pursued in the Burnham Creek watershed (recommendation from the Spring Gravel dam on-site meeting).

Grade Stabilization for Sediment Reduction in the Thief River

- Marshall County staff chose the locations where grade stabilization structures will be installed along County Ditch 20.
- The grade of the ditch bottom currently gets steeper as it gets closer to the Thief River (SD83). So, the structures will be placed closer together near the lower end of the ditch.
- When all the grade stabilization structures are in place, the grade of the ditch should be about .03, which is consistent with the original designed grade.

Thief River Watershed Assessment Project (Watershed-Based TMDL)

- Sample analysis for stressor/pollutant identification was piggy-backed onto samples collected for the Thief River SWAG monitoring.
- Jim Blix attended training for LIDAR Terrain Analysis (in preparation for Task 12 – Identification of Sources and Solutions in the work plan) in June.
- Worked with RMB Environmental Laboratories to get a contract drafted for the civic engagement work. I met with Erika Johnson, Robert Borash, and Lori Clark at RMB Labs to work through the components of the civic engagement work plan and contract.
- Swapped freshly cleaned and calibrated Eureka Manta multi-parameter logging sondes for the ones that have been deployed for two weeks at the 5 continuous water quality monitoring sites in the Thief River watershed two times this month.
- Cleaned and calibrated Eureka Manta multi-parameter logging sondes that were deployed at 5 of the monitoring sites three times this month.
- Inspected Branch A of JD21 for erosion problems that would have caused the high turbidity readings that Jan Kaspari and Lisa Newton recorded there on June 7th.
 - There is a large gully in a field, approximately ¼ mile northeast of the CR48 crossing of Branch A JD21 along the east side of 305th Ave NE.



- There was another large gully in a field on the east side of CR127 near the middle of Section 22 of Moose River Township.



- Conducted a reconnaissance via kayak of the CSAH 12 to 140th Ave NE reach of the Thief River with Dave Friedl of the DNR as part of the stream channel stability assessment. Erosion sites were GPS'd and photographed. Bank Erosion Hazard Index (BEHI) information was recorded for erosion sites along the way.



Thief River Watershed Assessment Monitoring Surface Water Assessment Grant

- The Marshall County Water Planner (Jan Kaspari, 6 sites)
- The Pennington County (Cassie Jacobson, 3 sites) water planners each collected two rounds of samples in May.

- I helped Cassie with her first round of sampling for this grant. Danni Halvorson (International Water Institute) also helped her through her first calibration of Pennington County's water quality monitoring equipment.
- Regularly compiled data from Marshall County, Pennington County, and RMB Labs.
- Charges for lab analysis on bills from RMB labs were divided between this project and the Thief River TMDL.
- There were a lot of high E. coli levels in the Thief River watershed in June. On June 22nd, there were extremely high levels coming into Thief Lake from JD21 and the Moose River, in the Mud River, and in the Thief River north of Agassiz NWR.

District Monitoring

- Worked on the second round of sampling for the RLWD long-term monitoring program.
- High E. coli levels were found in Kripple Creek, Gentilly Creek, and Cyr Creek.
- Large rainfall events led to high water levels and flows in rivers throughout the watershed. Around four inches of rain in the Oklee caused the Lost River to flood. The Clearwater River at Plummer also overtopped its banks and some township roads were under water north of Erskine.



Crookston Stormwater Monitoring

- Michael Knudson, a Green Corps employee at the University of Minnesota Crookston, has been collecting turbidity measurements at the outlets of stormwater drainage systems in the city of Crookston.
- Turbidity levels in stormwater water draining from the industrial park stormwater system have been very high compared to the rest of town. The readings have ranged from 76 NTU to 447 NTU (the water quality standard for rivers is 25 NTU).

Other Notes

- Wrote a success story for the MPCA about the Lost River fecal coliform impairment that was taken off of the 303(d) List of Impaired Waters (see the end of this report).
- Updated dates and addressed some final comments from the MPCA for the work plan for the Red Lake River watershed-based TMDL. The MPCA approved the work plan and got the Joint Powers Agreement for this contract to us on June 30, just before the State government shutdown.

June 2011 Meetings and Events

- **June 8, 2011** – Marshall County Water Resources Advisory Committee
- **June 9, 2011** – NCERA 217 – Drainage Design and Management Practices to Improve Water Quality, Fargo, ND, 8:15 AM presentation.
 - I gave a presentation on the results of the RLWD tile drainage study.
- **June 14, 2011** – Reconnaissance of the Thief River from the Rangeline Road (CSAH 12) to the Hillyer Bridge (140th Ave NE) via kayak with Dave Friedl (DNR Clean Water Legacy Specialist) for the Stream Channel Stability Assessment task of the Thief River Watershed Assessment Project.
- **June 16, 17, & 18, 2011** – MAWD Summer Tour, hosted by the RLWD and Middle Snake Tamarac Watershed District.
- **June 22, 2011** – Land Management Field School, UMC, 6:30 pm to 8:00 pm
 - I will be giving a presentation entitled “Watershed-Based Water Quality Concerns, Management, and TMDLs.”
 - Michael Knudson gave a presentation on the work he has done so far for the Crookston Stormwater Study.
- **June 23, 2011** – Red Lake River Corridor Enhancement meeting at the Red Lake Falls City Hall, 7 PM
 - Thief River Falls has received funding to create paved trails along Pennington Avenue and Greenwood Street. Future phases include a trail along Pennington Ave. to Challenger School, improving the Oakland Park trails, and connecting Oakland Park with Digi-Key/Arctic Cat (across Hwy. 32).
 - Crookston will be making improvements to Castle Park (west side of town, near the hospital). It will be a natural resource-based park with fishing piers, trails, camping (will replace Central Park campground), some play equipment, a dog park, shelter, and a natural play area.
 - New park by the Hwy. 32 Bridge over the Clearwater River in Red Lake Falls.
- **June 24, 2011** - Meeting with RMB Labs and the MPCA to work on a Civic Engagement contract for the Thief River Watershed Assessment Project.
- **June 27, 2011** – Red River Basin Water Quality Team meeting.
- **June 29, 2011** – Burnham Creek Reconnaissance with Dave Friedl

Plans for July 2011

- Facilitate progress on the CD20 grade stabilization CWF project.
- Finish the second round of 2011 District Monitoring.

- Thief River Watershed Assessment Project.
 - Continuous flow and water quality monitoring
 - Get the civic engagement contract with RMB Environmental Laboratories completed, approved, and signed.
 - Flow measurements
 - Inventory of existing water quality data
 - Stream channel stability assessment beginning in the week of July 18th – 22nd.
- Compile water quality data collected by Pennington and Marshall County water planners for the Thief River Surface Water Assessment Grant monitoring.

Future Meetings/Events

- **July 2011** – Third round of RLWD long-term monitoring for 2011.
- **July 18-22** – Thief River geomorphology field work
- **August 1-5** - Thief River geomorphology field work
- **August 1, 2011** – BWSR CWF Grant semi-annual progress reports are due.
- **August 1, 2011** – MPCA Thief River Watershed Assessment Project semi-annual progress report is due.
- **September 2011** – Fourth round of RLWD long-term monitoring for 2011.
- **September 6, 2011** - Pennington County Water Resources Advisory Committee, 9 AM
- **September 14, 2011** – Pennington County Outdoor Education Day
- **September 20, 2011** – Northwest Minnesota Water Festival in Warren
- **September 21, 2011** – Northwest Minnesota Water Festival in Fertile
- **October 4, 2011** – Pennington County Water Resources Advisory Committee, 9 AM
- **November 1, 2011** – Deadline for submitting field and lab data to the MPCA for
- **November 2, 2011** - Marshall County Water Resources Advisory Committee
- **January 3, 2012** – Pennington County Water Resources Advisory Committee, 9 AM
- **January 31, 2012** – First progress report for the Thief River SWAG monitoring is due.
- **February 1, 2012** - BWSR CWF Grant semi-annual progress reports are due.
- **February 1, 2012** - MPCA Thief River Watershed Assessment Project semi-annual progress report is due.
- **August 1, 2012** – BWSR CWF Grant semi-annual progress reports are due.
- **August 1, 2012** – MPCA Thief River Watershed Assessment Project semi-annual progress report is due.
- **January 31, 2013** – The second progress report or final report for the Thief River SWAG monitoring is due.
- **February 1, 2013** - BWSR CWF Grant semi-annual progress reports are due.
- **February 1, 2013** - MPCA Thief River Watershed Assessment Project semi-annual progress report is due.
- **June 30, 2013** – Expiration of the Thief River Watershed Assessment Project Contract.
- **June 30, 2013** – Final report for the Thief River SWAG grant is due
- **July 30, 2013** – Due date for the final progress report and final invoice for the Thief River Watershed Assessment Project
- **July 31, 2013** – Final payment request for the Thief River SWAG is due.

Water quality within a reach of the Lost River in Northern Minnesota has improved enough to be safe for Aquatic Recreation

The Lost River, a tributary of the Clearwater River in northwestern Minnesota, was found to be impaired by fecal coliform when samples were collected for a water quality study in the early 1990s. After the construction of a wastewater treatment facility and a couple of decades of best management practice (BMP) installation, the river now meets the aquatic recreation water quality standard for *E. coli* bacteria. Since the wastewater treatment facility has been operational, individual samples have not exceeded the 1260 CFU individual sample maximum standard and all the monthly geometric means fall below the 126 CFU/100 ml geometric-mean-based standard.

The Lost River begins in Clearwater County, south of Pine Lake near the town of Gonvick, Minnesota. It then flows through a portion of Polk County and into Red Lake County where it is joined by the Hill River and flows into the Clearwater River shortly thereafter. The towns of Oklee and Brooks are also located near the Lost River. On a broad scale, the Lost River is located within the Red River of the North basin.

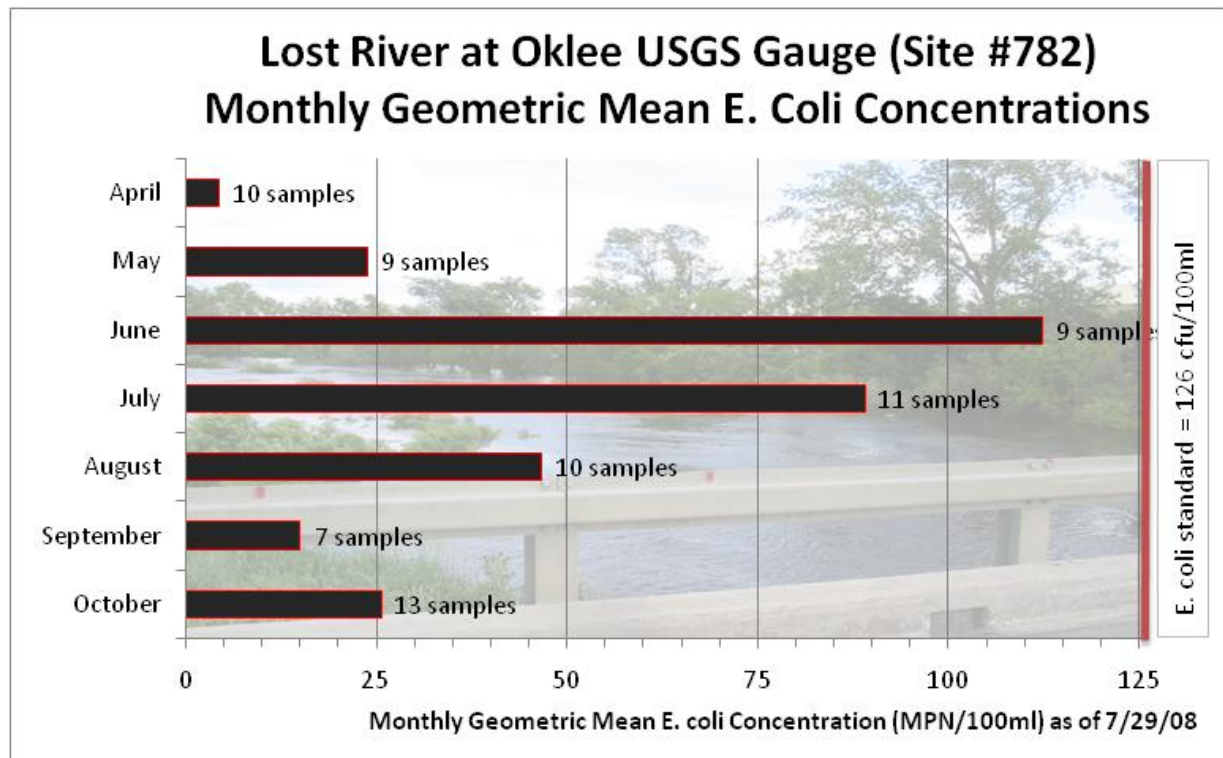
The reach of the Lost River that extends downstream from its confluence with Silver Creek at Anderson Lake to its confluence with the Hill River was originally listed as impaired by high fecal coliform levels and in the 303(d) List of Impaired Waters. The impairment was based on data that was collected in 1992 and 1993 for the Clearwater River Nonpoint Study. A drastic difference in fecal coliform levels before and after the construction of a wastewater treatment facility for the town of Oklee indicates that wastewater was the most significant source of the problem. Feedlots have also been identified near the river during windshield surveys of the watershed. Load duration curves show that more recent high concentrations occur during high flows. This indicates that feedlot runoff is probably the most significant source that is currently contributing to exceedances of the water quality standard.

A TMDL Study was conducted in 2007 – 2009 to verify the impairment, define current loads, estimate desired loads, and suggest strategies for attaining water quality goals. *E. coli* sampling was conducted on each end of the reach that yielded five samples per month at each of the two sites. The increased number of samples decreased the influence of occasional high bacteria concentrations. Applying Minnesota State water quality standards to the data collected from the most recent years (through 2008) showed that the Lost River no longer has an aquatic recreation impairment based on bacteria concentrations. The reach was officially delisted in December of 2009.

Water quality in the river isn't always perfect and high levels of *E. coli* still occasionally occur. Using *E. coli* data from 2000 – 2010 from the Lost River crossing near the town of Oklee, the June geo-mean *E. coli* concentration is 111 CFU/100 ml. Though this reach of the Lost River technically meets the State's aquatic recreation water quality standard, the May (108 CFU/100 ml) and June monthly geo-mean *E. coli* concentrations in the Lost River still close enough to 126 CFU/100ml for some concern. So, there is still room for more improvement. The Clearwater River TMDL Stakeholders Group, the Minnesota Pollution Control Agency, and the Red lake Watershed District agreed that it was wise to proceed with the writing of a report that will be used to create a protection plan for this river.



The improvement in water quality in the Lost River is most likely the result of a combination of ongoing efforts by cities, landowners, local and state agencies. Upstream of the impaired reach, an intensive riparian buffer initiative was implemented by the Clearwater Soil and Water Conservation District (SWCD) in the Silver Creek watershed. The Clearwater County, Polk County, and Red Lake County SWCDs and NRCS staff continue to implement BMPs throughout the watershed. They regularly implement BMPs such as buffer/filter strips, residue management, grazing management, nutrient management, grade control structures, side water inlets, streambank protection, and grassed waterways using cost share and incentive programs like CRP and EQIP. The MPCA regulates discharge from the Oklee wastewater treatment facility. This facility seems to have had a major impact on keeping harmful bacteria out of the Lost River. Extremely high fecal coliform levels were consistently recorded in samples collected during the summer of 1992 (1200 – 4100 col/100 ml in June and July samples) until the facility became operational in August of 1992.



The Clearwater River Nonpoint Project was funded by local agencies and a loan from the 319 program. The Phase I study portion of the project was completed by the RLWD and HDR Engineering. The study was sponsored by the RLWD and local SWCDs. The recent TMDL Study was completed in 2009 by the RLWD under a \$100,000 contract with the MPCA.

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River Watch

River Watch volunteers collect macroinvertebrate samples for water quality assessment.



Grygla student uses a kick net to collect macroinvertebrate samples.



Macroinvertebrates are preserved in alcohol for later identification.



2011 Stream Monitoring

The Spring River Watch trips began in April after the snow melt was almost complete. Four school groups, Grygla, Clearbrook, Win-E-Mac, and Bagley, monitored a total of 35 stream sites for routine field measurements (dissolved oxygen, conductivity, pH, and turbidity). The Grygla and Win-E-Mac groups also gathered macroinvertebrate samples from the stream beds and preserved them in alcohol for later identification.

In May, five groups, Fosston, Grygla, Bagley, Win-E-Mac, and Red Lake Falls monitored a total of 41 stream sites. The Grygla and Win-E-Mac groups also collected and preserved macroinvertebrate samples from their sites.

In June, three groups, Bagley, Win-E-Mac, and Grygla, monitored a total of 29 sites. Grygla also collected and preserved macroinvertebrate samples.

Teacher Jill Bakken of Bagley brought three River Watch students to the June 9th RLWD Board meeting to present their annual water quality summary and answer questions.

River Watch Promotional Video

On May 19th, film maker Erika Johnson conducted interviews and recorded various activities for a Red Lake Watershed District promotional video of the River Watch Program. Wayne Goeken (International Water Institute), Myron Jesme, Jim Blix, and the teacher and students from the Bagley River Watch team were interviewed, and an assortment of still photos from other River Watch groups was submitted. An initial draft version of the video awaits further editing.

2011 MAWD Tour

The Bagley River Watch group loaned their 2010 water quality summary display to the Watershed District for use in the MAWD presentations on June 18th. Jim Blix also delivered a short presentation to the touring group.