July 2006 Water Quality Program Progress Summary

By: Corey Hanson

For: August 10, 2006 RLWD Board Meeting

Lake and Stream Monitoring:

Monthly RRB Buffer Initiative samples from the Silver Creek watershed were collected (except the Clear Brook site, which was completely dry). Monthly Maple Lake area monitoring sites (inlet, outlet, JD73) were visited but the outlet was the only site with flow. Supplemental fecal coliform samples were collected at selected district monitoring sites. The list of sites needing supplemental fecal coliform samples was shortened by removing sites that are monitored by other agencies and/or haven't had any exceedances of the fecal coliform standard. Priority sites are those that have had exceedances of the fecal coliform standard, but have less than 5 samples per calendar month for any of the months of June through August over the last 10 years.

Clearwater, Maple, and Cameron Lakes were sampled. Samples were also collected at Buzzle Lake and Blackduck Lake.

The Project 60 monitoring equipment is still in place, but there hasn't been any flow for a long time now. I checked on them in July to clean the equipment so that it is ready for flow, just in case there is a storm that actually produces some runoff.

Calibration of the Ruffy Brook In-Situ TROLL 9000 logging multiprobes continues on a bi-weekly basis.

Tile Drainage Study:

There hasn't been any flow from the sites since early June. Sampling at the wild rice paddies started at the beginning of August. There won't be as much flow from them as last year either because of the lack of rain and high amount of evaporation. I have been submitting rainfall data from the rain gauge at the Stanley Pumped Tile monitoring site to the Marshall Beltrami SWCD every month.

July Meetings

- **July 8th** – Maple Lake Improvement District Annual Meeting
  - Talked to the group about our monitoring efforts and results.
- **July 19th** – Marshall County Water Resources Advisory Committee meeting in Newfolden
  - The MarshallCounty Board will approve water plan at their August 1st meeting.
  - Jeff Hrubes of BWSR spoke about the newly passed Clean Water Legacy (CWL) Act

- This act provides funding for surface water Restoration and Protection activities
- It is (for now) a one-time allocation of money.
- Requests for proposals will be available on Sept 1, 2006 and will be due Sept 30.
- There is no maximum $ amount for the application.
- Restoration
    - $2.5 million will go toward restoration activities for areas that have approved TMDL implementation plans (none in the RRB)
- Protection
    - BWSR is providing $1.5 million for targeted non-point restoration, $500,000 to targeted protection efforts, and $1.41 million to local non-point source protection projects.
    - This funding will be used to implement project to prevent impairments and to address existing impairments without implementation plans.
    - The funding and application process will use existing grant and loan authorities (BWSR Challenge Grants and the MPCA/EPA 319 Grant Process) with some adjustments
    - Projects that will receive preference
        - Coordination among agencies and local water plans
        - Ability to implement the project
        - Feasibility
        - Long-term benefits
        - Good cost/benefit ratio
        - Impact of not receiving funding
        - Leveraging additional funds
            - Matching funds are not required, but can improve chances of receiving funding if compared to a similar project w/o additional leveraged funds
        - Community support
        - Project addresses a priority concern within a local water plan
    - This funding is designed for implementation of projects, not for monitoring or public education (although they do want to see a plan for effectiveness monitoring – like we are doing for the Greenwood 27 and Gully 6 projects).
    - My briefly brainstormed ideas (If we apply we would pick the one(s) that we think would have the greatest chance of success).
        - Work with the Clearwater SWCD to construct the stormwater pond that will be designed by the Clearbrook Stormwater Study Challenge Grant project
        - Rock riffles in JD11 @ Agassiz NWR to address erosion, dissolved oxygen, and hydrogen sulfide

            - Mike Vavricka will be checking to see if we should apply for CWL $ for this or apply for the MPCA's 319 Grant $.
                - The MPCA will be adding $1 million to their normal 319 Grant money for nonpoint restoration.
        - Erosion along the Red Lake River (especially any sites that are threatening roads – like the Huot area)
            - They have allocated $1 million for these kinds of projects
        - Expand the buffer initiative project to other watersheds
        - Restoration activities along Ruffy Brook
    - Mike Vavricka talked about TMDLS and about what the MPCA will be doing with the CWL funding.
        - The new impairments are now official.
        - They will be expanding statewide monitoring where necessary, especially where additional monitoring may affect status on the list of impaired waters (see if additional data can lead to a delisting)
- **July 24th** - Red River Basin Water Quality Team Meeting in Moorhead
    - **Assessing Water Quality Trends and Realtime Monitoring** – Skip Vecchia and Karen Ryberg of the USGS
        - Vecchia
            - Trend analysis from 1970 - 2001
            - Applied techniques to adjust data based on annual and seasonal variability
            - Found that concentrations on the main stem of the Red River have been constant and that the concentrations on the tributaries (including the Red Lake River) have decreased.
                - This shows that there is something going on along the Red River that is countering the water quality improvements occurring on the tributaries (increased urban runoff, wastewater?)
            - 8 samples/year is the ideal number of samples needed at a station for reliable trend detection. This involves monthly sampling from April to August and bi-monthly sampling from October to February.
        - Ryberg
            - Correlated parameters that can be continuously monitored (flow, turbidity) with other parameters (TSS, fecal coliform)
    - **Buffalo Red Sediment Source Study** – Mark Deutschmann (Houston Engineering)
        - In channelized reaches, the fact that the stream is channelized (degraded habitat) may be more of a limiting factor for aquatic life than the water quality within that reach.
        - Baseline water quality values should be set at 1950's levels instead of pre-settlement levels (pre-modern agricultural practices)

        - There should be a study on how well side inlet pipes work to reduce the amount of sediment that is eroded from fields.
- **July 25th** – Sediment Summit @ the Detroit Lakes MPCA office
- **July 28th** – Red River Basin Monitoring Advisory Committee Meeting at the Sand Hill WD
    - MPCA will be getting $1 Million for TMDL and condition monitoring
    - Update on Waffle and SWAT by Bethany Kurz (Bolles)
        - Waffle storage sites generally stored 150 – 180 acft. of water
        - They held 200 acft. for 28 days at the trial site near Agassiz NWR
            - Held water longer than intended because water in the receiving ditch (Branch 200 of JD 11)
        - Haven't seen any erosion problems within fields
        - Some denitrification
        - Didn't have to improve any roads, studied stability – results showed little affect from water storage
        - Not a significant delay in planting
        - Reduction of total phosphorus in the soil was noted.
        - A 100% implementation of the WAFFLE project at suitable sites within the Red Lake River watershed would have resulted in a 49% reduction in peak flows during the 1997 spring flood
        - Landowners are paid the rental rate at enrollment and then paid the average rental rate again each time their field is used for flood storage as part of the Waffle project. Plus, farmers are usually still able to get a crop from the field as well.
- **August 7**th – Pennington County Water Resources Advisory Committee
    - Penn Co Water Plan Coordinator Andrea Hedemann has accepted a Land Use Specialist position in Waukesha County, Wisconsin and will be resigning from her current position on August 17th.
    - Penn. Co. water quality monitoring
        - Found fecal coliform concentrations >1000 col/100 ml on the Black River near the Penn/RL Co. line.
        - The reconstruction of the Goose Lake outlet (rock riffle spillway) seems to have had a positive impact on dissolved oxygen levels
    - Penn. Co. received some extra money from the MPCA this year for ISTS administration (have been limited by $ in the past)
    - Discussion on the need for feedlot ordinances, NMF Water Watch Grant, erosion control projects, Clean Water Legacy funding, CRP haying, improved CREP, CSP in the Red Lakes subwatershed

Future Meetings/Events

- **August 10th** – Next Red Lake River Corridor Enhancement Project Meeting – in Fisher
- **August 11th** – CREP/Clean Water Legacy informational session at the RLWD office at 9:30 am. **I would recommend coming to this meeting to learn about the Clean Water Legacy money that will be available for implementation projects.**

- **August 16th** – Water Watch/ Red Lake River Corridor Enhancement Planning mtg @ 105 Kiehle Auditorium @ UMC from 9-11 am
- **August 25th** - Red River Basin Monitoring Advisory Committee
- **September 2nd –** Requested to say a few words at the Clearwater Lake Area Association meeting at 1:00 pm.
- **September 7th – 8th –** 2006 Minnesota Lakes and Rivers Conference – Duluth Entertainment and Convention Center
- **September 26th –** Northwest Minnesota Water Festival in Warren
- **September 27th –** Northwest Minnesota Water Festival in Fertile
- **October 29th –** Marshall County Water Resources Advisory Committee Meeting

Other Notes

- The MPCA has decided to give $100,000 to the RLWD to conduct a TMDL study on some impaired reaches within the Clearwater River Watershed. Mike Vavricka from the MPCA will be coming to the Board to officially propose this project. A rough draft workplan from Molly MacGregor is included at the end of this report. The reaches that will be studied include:
  - Clearwater River; Ruffy Bk to Lost R 09020305-510 Fecal coliform
  - CD #57; Unnamed Ditch to Clearwater R 09020305-508 Low Oxygen
  - Clearwater River; Ruffy Bk to Lost R 09020305-510 Low Oxygen
  - Poplar River; Spring Lk to Hwy 59 09020305-518 Low Oxygen
  - Lost River; Silver Cr to Hill R 09020305-507 Fecal
  - Possibly Silver Creek as well (fecal coliform impairment)
  - Walker Brook (continue working on reclassification)
- Sent Clearwater Lake data and an annual report to the Clearwater Lake Area Association via John Cucci.
- Streamgauged at several sites this month – should be able to get the bottom ends of some rating curves established.
- Ordered wetland banking stickers for boundary markers.
- Updated website (improved 10-yr plan section, updated minutes, updated contacts and group pictures).
- Talked to a Lincoln High School Natural Sciences class about water quality on the morning of July 7th.
- Ideas for Clean Water Legacy Act projects
  - Clearbrook stormwater pond construction – partner w/Clearwater SWCD
  - Buffer initiative in a new watershed (similar to the one that is being implemented in the Silver Creek watershed)
  - Erosion control projects that are threatening roads/infrastructure (Huot erosion)
  - Lisa Newton (MBSWCD) proposed the idea of erosion control along the Moose River. This may work if grade stabilization structures (rock riffles) are involved to address the dissolved oxygen impairment on this reach. Grant applications for implementation projects need to be on an impaired reach and address the impairment in order to be competitive.
  - Grade stabilization structures on JD11 from the Agassiz Pool outlet to the Thief River to reduce erosion (and, therefore, downstream sedimentation), improve

oxygen levels in the water, and reduce hydrogen sulfide concentrations in the water. This project will likely require multiple rock riffles to accomplish its goals so it may be too expensive for this grant process and may be better suited to a 319 grant or other funding source.

- Installation of main line tile in wild rice paddies.

Rough Draft TMDL Workplan– Molly MacGregor has made updates and corrections since sending me this version. The final draft will be officially presented to the board when it is ready. This is just to give you an idea of what it will be like.

Clearwater River Dissolved Oxygen and Fecal Coliform TMDLs Project
Work Plan and Project Summary
Year One:
June 7, 2006

Project and Budget Period: July 1, 2007 – June 30, 2009

Project Amount: $100,000
Project Funding Sources:
TMDL: $100,000

Project Sponsor:
Corey Hanson, Water Quality Specialist
Red Lake Watershed District
101 N Third Street
Thief River Falls MN 56xxx
218/681-5800
coreyh@wiktel.net

Project Representatives:
Corey Hanson, Water Quality Specialist
Red Lake Watershed District
101 N Third Street
Thief River Falls MN 56xxx
218/681-5800
coreyh@wiktel.net

Michael Vavricka
PCA
714 Lake Avenue
Detroit Lakes MN 56501
218/846-0494
Michael.vavricka@pca.state.mn.us

IMPAIRED REACHES

Reach	HUC Code	Impairment	Listed	Dates
Clearwater River; Ruffy Bk to Lost R;	09020305-508	Low Oxygen	**2002**	2004-07
Clearwater River; Ruffy Bk to Lost R;	09020305-508	Fecal Coliform -	**2002**	2006-09
Lost River, Silver Creek to Hill R	09020305-510	Fecal coliform	**2002**	2006-09
CD #57, Unnamed Ditch to Clearwater R;	09020305-507	Low Oxygen	**2002**	2004-07
Poplar River, Spring Lk to Lost R (Hwy 59(	09020305-518	Low Oxygen	**2002**	2004-07
Silver Creek, Headwaters to Anderson Lk	09020305-527	Fecal Coliform	**2002**	2006-09
Walker Brook (previously listed, recommended for reclassification in 2006, pending)				

Project Summary

The Clearwater River Dissolved Oxygen and Fecal Coliform TMDLs Project is a watershed based water quality impairment study in the Red River Basin in Minnesota. Work will be coordinated by the Red Lake Watershed District, a local unit of government based in Thief River Falls, Minnesota. This is a two-year work plan for completion of six impaired waters studies.

Project Background

The Watershed District has xx years water quality monitoring and these impairments are likely based on their data results. The strategy for these impairments are to verify the impairment and then either recommend the reach for declassification, reclassification or develop a work plan for it.

Verification of the Listing: Red Lake watershed District will deploy In-Situ TROLL 9000 logging sondes to verify the low oxygen impairments.

That we are currently using on Ruffy Brook. They were purchased with the expectation that they would be needed for future DO TMDL studies as well. Fecal coliform transport modeling would make sense (maybe figure out which areas are contributing the most

through transport modeling?). Address fecal Coliform by verifying whether or not it exists and if it exists, track down the source of the exceedance.

1. Clearwater River; Ruffy Bk to Lost R 09020305-510 Fecal coliform

Ag and urban stormwater runoff are likely contributors to this impairment, if it even exists. In the 2005 assessment, our data showed only one exceedance out of 31 samples in the most recent 10 years. If I remember right, the impairment was likely carried forward because we had an insufficient number of samples from some of the critical months of June and August. We are currently working on remedying this (starting last year) with supplemental fecal coliform sampling. This is an impairment that would have to be verified through sampling (possibly delisted - you never know). The last recorded exceedance of the standard was in 1995.

2. CD #57; Unnamed Ditch to Clearwater R 09020305-508 Low Oxygen

This site is probably impaired because it is a ditch (no shade from a riparian cover, periods of low flow, warm temps, high sediment, etc.). Looking at the old data, however, it looks like there were some high fecal coliform levels as well. This site may need to be monitored as a possible source of the fecal coliform problem on the Clearwater River.

3. Clearwater River; Ruffy Bk to Lost R 09020305-510 Low Oxygen

Much of this reach is made up of the channelized portion of the Clearwater River. This channelization has negatively affected water quality and biotic integrity. The reach is isolated from the fen-related-oxygen-impaired headwaters of the Clearwater River by the trout stream reach (high oxygen) and Clearwater Lake. Any occurrences of low dissolved oxygen on this reach would likely be due to low flows, high sediment concentrations, lack of riparian cover, hot weather, discharges from surface-drained wild rice paddies, or a combination thereof. This reach is one in which the impairment is questionable. The original impairment is likely based upon 2 samples out of 19 collected for the Clearwater Nonpoint Study (10.5%). We have only had one occurrence of DO <5 mg/L since (4.52 on July 26, 2000). This would be a good reach for deploying an In-Situ sonde. The critical months would be July and August.

5. Poplar River; Spring Lk to Hwy 59 09020305-518 Low Oxygen

The area upstream of our monitoring site (109) is one that I haven't really "explored" a lot yet, so a lot of this is speculation and is mostly based on data (RLWD and RW). This would be the only one to which we may be able to apply some results of the Walker Brook study. There are some areas on low flow and there are some wetland-like areas that it flows through that may or may not be fens. Most of the exceedances at our site on the Poplar River (downstream end of this reach) occurred during the winter monitoring (low flow under ice). There was one occurrence in the month of September that could have been due to low flow, high temps, and possibly some soil-related oxygen depletion (as in the Walker Brook watershed). It seems as though there may be different conditions

in the upper part of this reach (Spring Lake through Fosston - only 1 sample <5 mg/L) vs. the lower part.

6. Lost River; Silver Cr to Hill R 09020305-507 Fecal

This impairment likely goes "hand-in-hand" with the fecal coliform impairment on Silver Creek. Looking at data from the last ten years, it appears that there is no impairment (although there are exceedances). The impairment is obviously based upon 1992 data where there were a lot of very high fecal coliform concentrations. There are some comments from the past like "unknown influent from culvert", "appears to be sewer seepage from bank", "strong H2S smell present", "gray discharge from culvert in City Park", and "flow along road ditch has grayish color."

Regarding recent exceedances of the standard, I suppose it would depend upon what is coming out of Anderson Lake. If there aren't exceedances at the outlet of this lake, then the sources of the exceedances on the Lost River are downstream of the confluence of the Lost River's confluence with Silver Creek (at Anderson Lake). Possible sources: Silver Creek and all of its sources (Clearbrook, ag), runoff from the City of Oklee, agricultural runoff, etc.

Project Activities

Activities that will be accomplished during this contract are:

. Verification of the Listing: Red Lake watershed District will deploy In-Situ TROLL 9000 logging sondes to verify the low oxygen impairments.
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1. Assessment of water quality conditions for the impaired waters using data from STORET. Data has been collected by the Red Lake Watershed District, Minnesota Pollution Control Agency and River Watch. This product will be produced by the staff of the Red Lake Watershed District. Products :
1. Water quality data analysis for each reach, verifying the determination of impairment.
2. Report of water quality conditions, land uses, sources of pollution and assessment of ability to reduce pollution from each source.

2. Define sources and amounts of pollutant entering the impaired reaches using the SWAT model. Work will be performed by the Energy & Environment Research Center at University of North Dakota, under contract to the MPCA. (prefer Red Lake Watershed District?) Product will be:
1. Pollutant load estimates for each impaired reach.
2. Define total maximum daily load of each pollutants for each reach.
3. Best management practices scenarios for achieving water quality target.

3. Identify strategies to reduce pollutant and restore water quality standard for each impaired reach. This work will be developed by team members working together and then reviewed at public meetings in the area. Products will be:
1. Definition of margin of safety and reasonable assurance for each impaired reach.
2. Report of strategies to restore water quality conditions, and assessment of likelihood to achieve goals.

4. Develop a plan for implementation of the watershed-based sediment reductions, to be developed by the Red River Basin Water Quality Team with technical support from local governments and the monitoring network. MPCA will produce the six impaired waters reports.

ROLES AND RESPONSIBILITIES

Understanding, defining, addressing and remedying impaired waters in the Red River Valley requires effective partnerships. Therefore, this project will be coordinated by the Red River Basin Water Quality Team, which is an informal association of agencies and organizations dedicated to water quality management and advising the MPCA on setting and meeting water quality goals in the Red River of the North Basin. The team was convened in 1997 to review nonpoint source pollution for the basin, assess conditions and recommend strategies for improvement. Team members were recruited from all sectors – public and private – with a stake in the Red's water quality. The team includes representatives from other political jurisdictions in the basin – North Dakota and Manitoba.

The Basin Team will provide overall project coordination by reviewing work plan progress at monthly meetings. The MPCA Red River Basin Coordinator will provide technical and administrative to assistance to the team and will gather all land use and soils information necessary for the assessments and maps products. MPCA Regional PCS staff will work with local government staff in the listed reaches. MPCA PIO staff will also draft, edit and publish the reports for each impaired reach, in consultation with the PCA staff, Basin Coordinator, Basin Team, CAW Supervisor and NW REM Manager. MPCA Regional Water Quality Manager will coordinate the monitoring and water quality assessments of the project.

Role of Red Lake Watershed District
Role of EERC

PROJECT COSTS

This project requests $100,000 to be used to pay activities associated with this project in 2007 and 2008.

PROJECT ACTIVITIES AND SCHEDULE

TASK	LEAD	SCHEDULE	AMOUNT & SOURCES
Data analysis and interpretation	Red Lake Watershed District	October 2007 – April 2008	$15,000
Estimate pollutant loads; define water quality target; Model pollutant reduction strategies	EERC	September 1, 2007 – August 30, 2009	$45,000
Water quality monitoring	Red Lake Watershed District		$15,000
Identify BMPs and apply to watershed	Red Lake Watershed District	October 09- February 09	$15,000
Project outreach, coordination and draft TMDL reports	Red Lake Watershed District & MPCA	March- June 09	$10,000