

Final Report

Mille Lacs Lake Protection - Stormwater Control Clean Water Partnership Grant October 2014 - June, 2018



Aitkin County SWCD
Janet Smude, District Technician
July, 30, 2018



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Executive summary

Problem

Mille Lacs Lake is located in central Minnesota, in the counties of Aitkin, Mille Lacs, and Crow Wing. It is the headwaters of the Rum River. The water quality of Mille Lacs Lake is currently good. The Trophic Status Index of the lake places it in the mesotrophic range, but Mille Lacs is vulnerable. Impacts from development in the watershed are high and have the potential to negatively impact the water quality of the lake. This grant has addressed the problems associated with Shoreline Development, Nutrient Enrichment, and Stormwater Runoff. (Nutrients – 900; Phosphorus – 910) throughout the watershed of Mille Lacs Lake. Efforts included installation of BMPs that address stormwater runoff, education of landowners, and baseline water quality monitoring. A WRAPS Report was completed for the Rum River Watershed, including Mille Lacs Lake, in 2017. The northern portion of the Rum River watershed, near Mille Lacs Lake, is currently fairly healthy but sensitive fisheries and associated macroinvertebrate communities will be negatively impacted by increased runoff and pollutant loads. Protection efforts are the primary emphasis in this portion of the watershed.

Waterbody improved

The Mille Lacs Lake Watershed Management Group has adopted a goal of preserving the water quality of Mille Lacs Lake through an ongoing program of advocacy, education, protective actions, planning, and monitoring. Activities supported by this grant focused on stormwater control in an effort to reach that goal. Activities focused on implementation of stormwater control BMPs, and comprehensive outreach and education efforts. The water quality of Mille Lacs Lake has remained fairly steady. CLMP data indicates there is a slight increasing transparency trend. The TSI for the lake is 48, placing it in the mesotrophic range.

Project highlights

The Mille Lacs Lake Watershed Management Group has been active since 1997 and has focused its efforts on protecting the water quality of the lake and its watershed. A management plan has been developed for the watershed. Partners continually work to implement this plan. Activities supported by this grant were undertaken during the entire grant period – October 2014 through June 2018. Major partners in this effort included:

Janet Smude, Aitkin County SWCD – CWP Grant Coordinator and Technical Advisor;
Laurie Westerlund, Mille Lacs Lake Watershed Management Group Chairperson – Local Project Coordination;
Lynn Gallice, Mille Lacs SWCD – Technical Advisor;
Harmony Maslowski, Mille Lacs SWCD – Outreach Coordinator;
Sara Ahlers, A.W. Research Laboratory – Water Quality Analysis Laboratory Director;
Bonnie Finnerty, MPCA – Project Manager;
Perry Bunting, Mille Lacs Band of Ojibwe DNRE – Technical Advisor;
Aitkin, Mille Lacs, and Crow Wing Counties – Project Sponsor, Project Coordination;
Aitkin, Mille Lacs, and Crow Wing SWCDs – Technical Advisors, Project Coordination;
Round Lake Association – Project Coordination;
Numerous volunteers in the Mille Lacs Lake Watershed.

Without the assistance of these partners, successful implementation of the grant objectives would not have been reached.

A highlight of this grant was the development and promotion of the “Mille Lacs Compass” program. This program focuses on the major impacts of stormwater runoff and the negative effects on water quality. “Filter, Absorb, and Capture” are highlighted through education efforts, installation of BMPs and technical assistance provided to shoreline landowners. The goal of this project has been not only water quality protection, but the creation of a network of Compass members that can assist one another, their neighbors, and carry the principles of stormwater management forward.

Water quality protection efforts will continue into the future. A grant from the Minnesota Board of Water and Soil Resources will support and Outreach Coordinator through 2019. This staff person is working to promote the Mille Lacs Compass program. Another BWSR Grant is supporting installing of BMPs on Round Lake, a Cisco/Tullibee Habitat Lake. Technical Advisors from the Mille Lacs and Aitkin SWCDs are currently assisting landowner on Mille Lacs Lake with rain garden and shoreline buffer projects. Dedicated volunteers are committed to carrying this effort forward.

Results

Implementation of activities supported by this grant have preserved the water quality of Mille Lacs Lake. Pollutant load reductions were achieved by installation of the 6 BMP projects supported by the grant. Projects reduced phosphorus loading in the watershed by 8.19 lbs per year, Sediment reaching the surface waters was reduced by 8.47 tons per year. In addition to these measureable results, pollutant reductions resulting from outreach and education efforts have occurred. These results are more difficult to measure, however the comprehensive education efforts have increased awareness of the need for stormwater management. BMPs like rain gardens, buffer strips, and rain barrels have increased in use and acceptance.

Body of main report

Section I – Work plan review

The Aitkin County Soil and Water Conservation District received the Clean Watershed Partnership Grant “Mille Lacs Lake Protection – Stormwater Control” from the Minnesota Pollution Control Agency in October 2014. The SWCD has worked with the Mille Lacs Lake Watershed Management Group to implement activities supported by this grant. The Project Workplan was amended in 2015 to increase the funding. An additional \$ 9,320 was received from the MPCA. The grant timeline was extended to allow for use of the additional funding. In 2018 a Change Order was completed to enable the grant to be spent appropriately by the end of the contract period. Grant supported activities were completed on June 30, 2018.

The Grant was comprised of 5 Objectives that focused on the Mille Lacs Lake Watershed Management Group’s goal of preserving the water quality of Mille Lacs Lake through an ongoing program of advocacy, education, protective actions, planning, and monitoring. The Objectives are summarized below:

Objective 1: Stormwater Control BMP Implementation: Technical assistance for this Objective was provided by the Aitkin and Mille Lacs SWCD staff. During the grant period they met with 20 landowners the Mille Lacs Lake Watershed to discuss shoreland best management practices and stormwater control. Six BMP projects were installed – shoreland buffers on Mille Lacs, Smith, and Little Whitefish Lakes, Rain Gardens on Borden, and Holt lakes, rock rip rap plus a native vegetation buffer on Round Lake, and a stabilization with coir logs and native vegetation project on Round Lake. In addition to these BMP projects, four Shoreland Stewardship Plans focusing on stormwater management were written for landowners.

Objective 2: Outreach & Education Efforts: Task 1 - MLLWMG Marketing Plan / Image Update: We cooperated with Red House Media to develop an appealing and effective marketing plan designed to engage the public promote stormwater management. Two campaigns were undertaken. The first focused on a “Splash” theme. The second on the “Mille Lacs Compass” program. Both promoted the themes of Filtering, Absorbing, and Capturing Stormwater. Task 2- Website/Facebook Revision: The MLLWMG website and Facebook page were updated and used as tools for engaging the public and sharing the work being done in the Mille lacs Lake Watershed. Task 3 – Educational Events: Three workshops / seminars were planned. We were able to host 8 different workshops – Recommendations for Damaged Shorelines (5/15), Managing Aquatic Vegetation (9/16), Controlling Buckthorn and Stabilizing Soil (9/16), Aitkin County Contractors meeting (4/17), Capturing Rainwater (7/17) and Lake Health Conferences in 2015, 2016, and 2017. Partners were instrumental in hosting and sharing information at these events. Three guest presenters were welcomed at meetings of the Mille Lacs Lake Watershed Management Group. They shared information on the Sustainable Forest Incentive Act, Rum River Watershed WRAPP, and Buffer Law Implementation. One Watershed Tour was planned. We were able to host two tours of best management practices installed with grant funds. The first was held in October of 2017 and the second in June of 2018. Task 4 - Printed Materials / Targeted Mailings: Printed materials were used to communicate stormwater management strategies to landowners in the watershed. The MLLWMG wrote 23 “Topic of the Month” articles that were shared with local news papers, on the website and facebook page, and through email. A series of 3 postcards and a Rack Card promoted the Compass program in 2017. In 2018 a postcard was sent to targeted landowners and promoted shoreland buffers / filter strips. Task 5-Rain Barrel Incentive Program: Rain barrels were offered for purchase at a reduced rate through this program. The MLLWMG partnered with 2 local hardware stores on this program. This program was not extremely successful. A total of 8 barrels were sold during the grant period. Task 6 – Participate in Community Events: The MLLWMG worked to become a visible presence in the watershed. The watershed display was updated. We hoped to participate in 7 community events. We were able to share the watershed display at the Aitkin County Rivers & Lakes Fair in 2015, 2016, 2017, and 2018. We also exhibited at the Mille Lacs County Fair in 2016 and 2017, as well as the Aitkin County Fair in 2017. The display was shared at all public education meetings / seminars hosted by the MLLWMG.

Objective 3: Water Quality Monitoring: Task 1- Lake Water Quality Monitoring: Round, Big Pine, and Kenney Lakes were proposed for baseline monitoring. Due to challenges finding volunteers we were not able to complete the desired 10 samples per lake. The following samples were taken: Big Pine Lake – 5 sample sets, Kenney Lake – 8 sample Sets, Round Lake 9 sample sets. Mille Lacs Lake water quality samples were taken by the Mille Lacs Band of Ojibwe DNRE. Task 2 – Stream water Quality Monitoring: -12 inlets to Mille Lacs Lake and the Lake Outlet were sampled for total phosphorus and total suspended solids, plus field parameters. Twelve sample sets were projected over the 3 year grant period. We were able to collect 11 samples for total phosphorus and field parameters, and 6 TSS samples. Available staff time limited the quantity of samples.

Objective 4: Watershed Coordinator Support: The watershed coordinator duties were shared between the Aitkin and Mille Lacs SWCD staff. Staff worked together to facilitate the activities of the MLLWMG and promote the successful completion of the grant.

Objective 5: Grant Administration: Administrative services were provided by the Aitkin County SWCD. Meeting minutes were prepared, finances and in-kind contributions tracked, and semi-annual reports submitted.

Section II – Grant results

Measurements: Success of this project was measured by the successful completion of work plan objectives. Information on grant objectives was gathered in several ways. Spot checks of installed BMPs were conducted to ensure they were functioning as designed. Evaluation forms were distributed at seminars so that feedback could be gathered from participants. Members of the Mille Lacs Lake Watershed Management Group regularly shared their opinions and impressions of grant supported activities. Their connection to the local community was valuable in providing programs that were acceptable to the public, as well as beneficial in protecting water quality.

Pollution reduction calculations were completed for each BMP project funded through this effort. These results have been combined and are listed below:

Phosphorus Load Reduction: 8.19 lbs/yr

Sediment Load Reduction: 8.47 tons/yr

Products: Several documents and products were developed through implementation of this grant. Below please find a listing of the documents included with this report. Copies of the documents are available in the attached folder – Final Report Documents. Monitoring data has been submitted for inclusion in the EQUIS data base. These submissions may also be found in the attached folder.

Outreach and Education Products:

Compass Media Campaign 2017

CompassLogo_Plain.jpg

CompassRackCard_FinalCopy.pdf

MLWG_CompassPostcard_1.pdf

MLWG_CompassPostcard_2.pdf

MLWG_CompassPostcard_3.pdf

Lake Health Conferences

2017 Flyer.pdf

Lake Health Conference Agenda & Speaker Summary.pdf

Lake Health Conference Flier(2).pdf

Lake Health Conference Flyer 2016_Final Draft.pdf

Lake Health Conference Newspaper Ad draft.pdf

Lake Health Conference Newspaper Ad.pdf

Lake Monitoring Summaries

2015 Lake Monitoring Summary.pdf

2016 Lake Monitoring Summary .pdf

Rain Barrel Program Information

Rain Barrel Flier (2).pdf

Rain Barrel Program Information Sheet.pdf

Splash Media Campaign 2015

Splash MLLWVG Postcard 2015.pdf

Splash MLLWVG Poster 2015.pdf

Splash MLLWVG Rack Card 2015.pdf

Watershed Tours

Tour Handout 2017.pdf

Tour Handout 2018.pdf

Tour Invite 2017.pdf

Workshops

Aitkin-CW Shoreland Wksp Flyer 2015(2).pdf

Aquatic Vegetation Survey Public Meeting 2016.pdf

Capturing Rainwater Workshop Flier.pdf
Capturing Rainwater Workshop News Release.pdf
Controlling Buckthorn Seminar Flier.pdf
News Release – Buckthorn Control 2016.pdf

Project photographs are shared below. These include education events and BMPs that were installed. .



Contractors learned about working with DNR Division of Waters permits from Rian Reed, DNR Area Hydrologist. 2017.

Lynn Gallice, Mille Lacs SWCD taught about shoreline buffers at the fall tour in 2017. This



site is on Little Whitefish Lake.



A rain garden was installed near Borden Lake. Stormwater from the home and driveway will be captured.



A buffer of native plants was added to the shoreline on Smith Lake.



An eroding shoreline due to high stormwater and wind / wave action was stabilized with coir logs and native vegetation. This is on the north side of Round Lake.

Public outreach and education: Outreach and education was a key component of this grant.

Numerous activities were undertaken in an effort to share information regarding stormwater management with members of the local community. A Lake Health Conference was hosted each August. Topics focused on the key messages of Absorb, Filter, and Capture that were the components of the Compass Program. 5 different seminars / workshops were hosted. These focused on various aspects of stormwater management, and sought to reach a variety of audiences. Three guest speakers shared information at meetings of the Mille Lacs Lake Watershed Management Group. Two tours of BMPs projects were hosted. Interested members of the public were able to view installed projects and learn how they protect water quality. Information was also shared at community events including the Mille Lacs and Aitkin County Fairs, and the Aitkin County Rivers and Lakes Fair. Numbers of people reached by these efforts are summarized below:

- Lake Health Conference Participants = 110 participants
- Public Seminars / Workshops = 125 participants
- Guest Speakers at MLLWMG Meetings = 41 members present
- BMP Project Tours = 21 Participants
- Community Event Participants = 1,820, plus County Fair attendance

Long-term results: This project has increased the capacity of the Mille Lacs Lake Watershed Management Group to address stormwater impacts. Members have an increased understanding of the impacts of stormwater runoff on water quality and a variety of ways to address concerns. We will be moving forward with the Mille Lacs Compass Program. This will include discussions of BMPs and water quality protection with interested landowners. Shoreland stewardship plans will be written for visited properties. These will outline potential BMPs that could be installed in an effort to minimize impacts from stormwater runoff.

Partnerships between local units of government were strengthened. A good working relationship was developed between the Mille Lacs and Aitkin SWCD. It is our hope that this will continue and we can cooperate on future projects that impact our shared Mille Lacs Lake Watershed. The Mille Lacs Lake Watershed is part of the One Watershed One Plan effort being proposed for the Rum River Watershed. The partnerships built through this effort will help to make this next step successful.

This project has been well received by the Mille Lacs Lake Watershed Management Group and local partners. The funding has helped to focus the efforts of this group and move them forward. Through the marketing plan and implementation of this effort we have developed the Mille Lacs Compass program which will carry this work ahead. We will be focusing on the identified elements of Absorbing, Capturing, and Filtering stormwater runoff. Shoreland Stewardship Plans will be developed for interested landowners. In order to increase outreach to property owners a grant was received from the Minnesota Board of Water and Soil Resources. This grant will support an outreach coordinator to work in the Mille Lacs Lake Watershed.

In addition, an effort to generate additional cost share projects was undertaken in the spring of 2018. Three specific projects were identified – a shoreland buffer on Round Lake, a shoreland buffer on Mille Lacs Lake and a rain garden on Mille Lacs Lake. These projects were not able to be installed before the June 30th deadline of this grant. Alternate sources of funding were found for these projects. They will be installed later in 2018, and early 2019. Local partners have made a commitment to continue water quality protection work in this watershed.

Our main method of sharing information is through our website – www.millelacswatershed.org. We have also increased use of Facebook. These have proven to be useful tools in reaching the landowners in the watershed and visitors to the area. The folks who come to the lake for the weekend are difficult to reach through the previously used methods of newspapers and

newsletters. These new tools have been successful in reaching a new audience.

Implementation of activities in this grant has taught us that it is important to focus efforts of staff and volunteers. Water quality / stormwater impacts was the main focus of this grant. As we were working to educate the public on this topic, there was also much concern about the fishery resource of Mille Lacs Lake and its management. Aquatic Invasive Species became a topic of concern. A new infestation of zebra mussels was discovered in a watershed lake and the State began providing significant funding to combat the spread of AIS. Splitting time and energy between all of these concerns was difficult for many of our local volunteers. They were not as able to assist with efforts as we had anticipated.

Section III – Final Expenditures

An accounting of the final grant expenditures and inkind contributions can be found in the attached spreadsheet [Semi Annual Report Mille Lacs Lake Protection – Stormwater Control 2018a with change order](#). The final numbers are listed below:

Final Grant Expenditures = \$ 64,534.52

Final Inkind Expenditures = \$ 86,878.32

Total Cumulative Expenditures = \$ 151,412.84

Grant project summary

Project title: Mille Lacs Lake Protection
Organization (Grantee): Aitkin County Soil and Water Conservation District
Project start date: 10/1/2014 Project end date: 6/30/2018 Report submittal date: 07/30/2018
Grantee contact name: Janet Smude Title: District Technician
Address: 130 Southgate Drive
City: Aitkin State: Mn Zip: 56431
Phone number: 218-927-6565 Fax: NA Email: Smude.aitkinswcd@gmail.com
Basin (Red, Minnesota, St. Croix, etc.) Aitkin, Mille Lacs, & Crow
Watershed & 8 digit HUC:: Upper Mississippi; 07010207 County: Wing

Project type (check one):

- XX Clean Water Partnership
 Total Maximum Daily Load (TMDL)/Watershed Restoration or Protection Strategy (WRAPS) Development
 319 Implementation
 319 Demonstration, Education, Research
 TMDL/WRAPS Implementation

Grant funding

Final grant amount: \$ 85,520.00 Final total project costs: \$ 64,534.52
Matching funds: Final cash: \$ 9,242.42 Final in-kind: \$ 77,635.90 Final Loan: \$
MPCA project manager: Bonnie Finnerty

For TMDL/WRAPS development or TMDL/WRAPS implementation projects only

Impaired reach name(s): _____
AUID or DNR Lake ID(s): _____
Listed pollutant(s): _____
303(d) List scheduled start date: _____ Scheduled completion date: _____
AUID = Assessment Unit ID
DNR = Minnesota Department of Natural Resources

Executive summary of project (300 words or less)

This summary will help us prepare the Watershed Achievements Report to the Environmental Protection Agency. (Include any specific project history, purpose, and timeline.)

Problem: Mille Lacs Lake is considered to be one of Minnesota's Crown Jewels, a key part of our natural heritage. . The water quality of Mille Lacs Lake is not impaired, however the Clean Water Partnership Diagnostic Study, completed in 2003, indicated the vulnerability of the lake. Development on the shoreline of Mille Lacs, and other watershed lakes, is high. Impervious surfaces and removal of shoreline vegetation have the potential to negatively impact the lakes. Partners in the Mille Lacs Lake Watershed Management Group have joined efforts to target stormwater runoff management. We have been working to address a confirmed problem that has a direct impact on Mille Lacs Lake.

Waterbody improved: At 132,500 acres of surface water, Mille Lacs Lake is the second largest in Minnesota. The Lake and its watershed are unusual in that the land-to-water ratio is less than 1:1, as opposed to the more typical ratio of 10:1. The lake is shallow, with an average depth of 21 feet, and a lengthy water and phosphorus retention time, Work supported by this grant was conducted throughout the watershed of Mille Lacs Lake, with all efforts protecting the water quality of the lake. Mille Lacs lake is currently struggling with impacts from Aquatic Invasive Species. The Lake is infested with Eurasian Watermilfoil, Zebra Mussels,

and Spiny Water Fleas. Efforts to control the spread of these invaders have consumed significant energy of partners working on water quality of the lake. Also of concern is the fishery health in Mille Lacs Lake. The walleye population has declined. Smallmouth bass and Muskies have thrived. Management of this fishery resource has been a challenge. Quality of this resource – both water quality and fishery population - is valuable and supports the local economy, which has been struggling in many ways.

Project highlights: A highlight of this grant was the development and promotion of the “Mille Lacs Compass” program. This program focuses on the major impacts of stormwater runoff and the negative effects on water quality. “Filter, Absorb, and Capture” are highlighted through education efforts, installation of BMPs and technical assistance provided to shoreline landowners. The goal of this project has been not only water quality protection, but the creation of a network of Compass members that can assist one another, their neighbors, and carry the principles of stormwater management forward.

Results: Implementation of activities supported by this grant have preserved the water quality of Mille Lacs Lake. Pollutant load reductions were achieved by installation of the 6 BMP projects supported by the grant. Projects reduced phosphorus loading in the watershed by 8.19 lbs per year, Sediment reaching the surface waters was reduced by 8.47 tons per year. In addition to these measurable results, pollutant reductions resulting from outreach and education efforts have occurred. These results are more difficult to measure, however the comprehensive education efforts have increased awareness of the need for stormwater management. BMPs like rain gardens, buffer strips, and rain barrels have increased in use and acceptance.

Partnerships (Name all partners and indicate relationship to project)

Janet Smude, Aitkin County SWCD – CWP Grant Coordinator and Technical Advisor

Laurie Westerlund, Mille Lacs Lake Watershed Management Group Chairperson – Local Project Coordination

Lynn Gallice, Mille Lacs SWCD – Technical Advisor

Sara Ahlers, A.W. Research Laboratory – Water Quality Analysis Laboratory Director

Bonnie Finnerty, MPCA – Project Manager

Perry Bunting, Mille Lacs Band of Ojibwe DNRE – Technical Advisor

Aitkin, Mille Lacs, and Crow Wing Counties – Project Sponsor, Project Coordination

Aitkin, Mille Lacs, and Crow Wing SWCDs – Technical Advisors, Project Coordination

Round Lake Association – Project Coordination

Pictures: Fall Tour 2017. Rain Garden near Borden Lake

