

Watershed Achievements Report

2019 Annual Report to the U.S. Environmental Protection Agency

Clean Water Act Section 319, Clean Water Fund,
and Clean Water Partnership Projects in Minnesota



m MINNESOTA POLLUTION
CONTROL AGENCY



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Success at last: First Fulda Lake

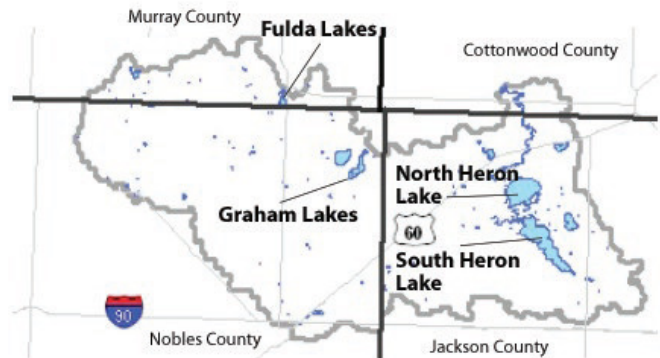
First Fulda Lake was determined to be meeting standards during the Minnesota Pollution Control Agency’s (MPCA) 2016 water quality assessments and it was recommended to be removed from Minnesota’s Section 303(d) Impaired Waters List. The basin was first listed in 2008. The original listing data (Table 1) indicated total phosphorus (TP), chlorophyll-*a* (Chl-*a*), and Secchi exceeded the trophic state thresholds. Expectations for the lake changed when the lake eutrophication standards were promulgated in 2008, applying the Western Corn Belt Plains (WCBP) ecoregion shallow lake eutrophication standard in lieu of the previous thresholds.

Table 1. Lake eutrophication standards

Ecoregion	TP	Chl- <i>a</i>	Secchi
	µg/L	µg/L	meters
WCBP – Trophic State Thresholds for impairment (pre-2010 cycle)	< 90	< 32	> 0.7
WCBP – Aquatic Rec. Use (Class 2B) – Shallow Lake Criteria	<90	< 30	> 0.7
1997-2006 First Fulda Lake Data (Original Listing Dataset)	110	45.9	0.4
2006-2015 First Fulda Lake Dataset	104	27	0.8

The 472-square-mile Heron Lake Watershed empties into the West Fork Des Moines River (WFDMR) in southwestern Minnesota (Figure 1). The watershed includes the Heron, Graham, and Fulda lake systems and drains portions of Jackson, Nobles, Murray, and Cottonwood counties.

Figure 1. Heron Lake watershed is in southwestern Minnesota



These lakes, particularly the Heron lake system (which includes the 3,204-acre North Heron Lake and the 2,641-acre South Heron Lake) and the Fulda lake system (which includes the 182-acre, interconnected First Fulda and Second Fulda Lakes), have elevated phosphorus levels. The levels are high because of inputs from agriculture (cropland and pastureland), sediment eroded from streambanks,

atmospheric deposition, and urban runoff. Results of monitoring from 1997 through 2002 showed that levels of phosphorus and Chl-*a* in the Fulda lakes exceeded Minnesota’s water quality standards. The standards require that the summer (June – September) average for TP concentration be 90 micrograms per liter (µg/L) or less and that the Chl-*a* concentration be 32 µg/L or less. On the basis of these data, MPCA added First Fulda Lake (Waterbody ID 51-0021-00) to the Clean Water Act (CWA) Section 303(d) List of Impaired Waters in 2008 for failing to support its aquatic life designated uses and was listed as impaired for nutrients and biological indicators.

Results

Recent data (Table 2) shows significantly lower Chl-*a* concentrations and improved transparency in comparison to the original listing dataset from 2008; with both meeting their respective standards. Total phosphorus seasonal average still exceeds the 90 µg/L criteria. There is a large standard error around the average, showing that this lake is highly variable.

Table 2. Seasonal averages of TP, Chl-*a*, and Secchi over time

	2008 Assessments	2005 – 2009	2010 and 2014	2015 Assessments
TP	140	130	50	104
Chl- <i>a</i>	42	29	22	27
Secchi	0.4	0.6	1.2	0.8

Project highlights

There was significant alteration and restoration in this lakeshed, which resulted in water quality improvement. Minnesota Department of Natural Resources (DNR) and local units of government decided to temporarily drawdown First and Second Fulda, which occurred in 2008. A Section 319 grant in 2007 was used to develop a plan and install critical area planting, shoreline restoration, and provide incentives to operators who practices conservation tillage on their farmland. There were three highly erodible channels that feed directly into the lakes and these channels were reshaped, widened, and seeded with permanent vegetation. Some farmers were asked to contain 55% residue cover for corn and 30% residue cover for soybean fields. Local units of government established and implemented three shoreline restoration projects. A settling pond was established between the fall of 2009 and spring of 2010. In 2011, the stormwater outlet from the City of Fulda was rerouted from straight pipe access to the lake to a rock outwash area to prevent erosion. Six rain gardens were installed within the City of Fulda between 2011 and 2015. Many education events took place during the different implementation projects as well. These efforts resulted in the reduction of phosphorus and improvement of water quality. As a result of the improved conditions in First Fulda Lake, the lake was

recommended for delisting and was removed from the 2018 Impaired Waters List.

Partners and funding

Project partners

Partners include the Heron Lake Watershed District (HLWD), DNR, U.S. Fish & Wildlife Service (USFWS), Fulda Fish and Game Club, Murray County, Bondin Township, Heritage Society members, City of Fulda, landowners, non-profit and local organizations, and the MPCA through U.S. Environmental Protection Agency's (EPA)

Section 319 Grant Program.

This grassroots endeavor started on behalf of Fulda townspeople noticing the

degradation of two beautiful natural resources located within city limits, First and Second Fulda Lakes. The main interests of the residents were water quality improvements and getting the lakes back to a natural, unpolluted state. Through strong partnerships, the grassroots ideas turned to reality. The HLWD was able to apply for funds based on the needs described by local landowners. Their participation was a key factor in project initiation.

Project funding

The HLWD received \$55,800 for the Fulda Lakes BMP Project through an EPA Section 319 grant in February 2007 through the MPCA. HLWD staff worked with Murray Soil and Water Conservation District (SWCD), Nobles SWCD, and DNR staff. The HLWD contributed \$20,328 cash and \$19,875 in-kind. Murray SWCD contributed \$480 in-kind, Nobles SWCD contributed \$85 in-kind, and DNR contributed \$16,084 in-kind. The HLWD received \$12,600 for the Fulda Phosphorus Reduction Initiative through an EPA Section 319 grant in January 2011 through the MPCA. The HLWD worked with non-profit groups and local organizations. The HLWD contributed \$11,200 in cash and in-kind with non-profit and local organizations contributing \$1,371 in in-kind contributions.

Success at last: Lake Rebecca

A gently rolling Big Woods landscape and numerous wetland areas make up the beautiful Lake Rebecca Park Reserve. In addition to the many opportunities for outdoor fun, this park is also a haven for wildlife and is part of the Three Rivers Park District Trumpeter Swan restoration program. Free-flying Trumpeter Swans may be seen in the park year round. Several hundred swans gather there during late fall.



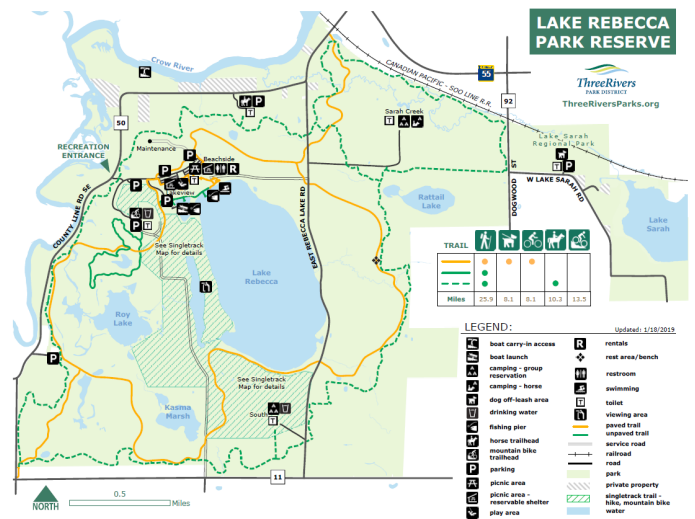
Lake Rebecca is in the Lake Rebecca Park Reserve, which is owned and managed by the Three Rivers Park District (TRPD). The lake has many recreational resources such as fishing piers, boat access, swimming area, and beach. Lake Rebecca is also surrounded by pedestrian hiking trails, paved and single track biking trails, horse trails, picnic areas, play areas, and an off leash dog park. The lake is of high recreational importance to the TRPD. The lake is frequently monitored for Chl-*a*, TP, and Secchi disk transparency.

Lake Rebecca (ID: 27-0192-00) is a 258 acre lake with a 1,230 acre drainage area that contains park reserve and rural agricultural landuse. The lake has a maximum depth of 30 feet and is considered a deep lake with respect to the phosphorus standards that apply to the lake (<40 µg/TP). The lake is home to many game and non-game fish species.

Lake Rebecca is located one and a half miles south of the town of Rockford west of Minneapolis in Hennepin County. The lake is in the South Fork Crow River Watershed in the Upper Mississippi River Basin.

[Lake Rebecca](#) was listed on Minnesota’s Impaired Waters List in 2008 for excess phosphorus. In 2009, TRPD staff launched efforts to control the invasive curly leaf pondweed, which can cause harm to water quality and impair recreational activities. TRPD staff worked with Hennepin County Environmental Services to improve manure and stormwater management by a horse farm operation in the lake’s watershed. The TRPD also used

Figure 1. Lake Rebecca TRPD map



several different methods to treat stormwater from developed areas within the Park. The most critical component of the project was the application of alum to the lake to reduce internal cycling of phosphorus from lake bottom sediments. TRPD staff worked with contractors to make two applications of alum to the lake, one in the fall of 2010 and the other in the spring of 2011.

Rebecca Lake restoration initiative was largely completed in 2011, and Rebecca Lake has generally met standards since completion. The lake has now been recognized in the MPCA’s Watershed Restoration and Protection Strategies (WRAPS) report as candidate for protection strategies and for monitoring effectiveness of previous restoration efforts. ([Pioneer-Sarah Creek Subwatershed Watershed Restoration and Protection Strategy Report, 2017](#)). Lake Rebecca was recommended for delisting and was removed from Minnesota’s 303(d) Impaired Waters List in 2018.

The original listing data compared to data collected after implementation of BMPs and alum (aluminum sulfate) treatments is displayed in Table 1.

Table 1. Lake eutrophication standards

Ecoregion	TP	Chl-a	Secchi
	µg/L	µg/L	meters
NCHF – Trophic State Thresholds for impairment (pre-2010 cycle)	< 45	< 18	> 1.1
NCHF – Aquatic Recreation Use (Class 2B)	<40	< 14	> 1.4
1994-2005 Lake Rebecca Data (Original Listing Dataset)	81	46.7	1.2
2012-2017 Lake Rebecca Data (Post BMP and Alum)	33	14.8	1.8

Partners and funding

Project partners

- TRPD
- Hennepin County Environmental Services
- Pioneer Sarah Creek Watershed Management Commission
- Metropolitan Council
- DNR

Project funding

Funding Sources: Lessard-Sams Outdoor Heritage Fund – This fund is from the Clean Water, Land and Legacy Amendment.

TRPD was awarded a Lessard-Sams Outdoor Heritage Fund (LSOHF) grant of \$450,000 in 2009 to implement the water quality improvement projects for Lake Rebecca, including a shoreline restoration project, a multi-year curly leaf pondweed control project, and an alum treatment for the lake. Previously, a project had been completed to significantly reduce watershed nutrient inputs from a horse farm, the only known source of significant “external” loading in the drainage area of the lake. The total cost of the LSOHF project was estimated at \$480,000 with the Park District providing an in-kind service match valued at \$30,000.



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A portion of the Clean Water Partnership Grant funds that are passed through to local units of government for nonpoint source implementation projects listed in this report are appropriated from the Clean Water, Land, and Legacy Amendment.

Cover photo: Rain garden along tributaries in Minnesota River Basin. For more information, see page 63.

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List of acronyms

BCWMC Bassett Creek Watershed Management Commission

BMPs best management practices

BOD biochemical oxygen demand

BOD₅ five-day biochemical oxygen demand

BWSR Minnesota Board of Water and Soil Resources

CD County Ditch

CFU colony forming units

Chl-*a* chlorophyll-*a*

CLFLWD Comfort Lake – Forest Lake Watershed District

COD chemical oxygen demand

CRWD Clearwater River Watershed District

CRWP Cannon River Watershed Project

cu/ac volume cubic acres of volume

CWA Clean Water Act

CWF Clean Water Fund

CWLA Clean Water Land Legacy

CWP Clean Water Partnership

DNR Minnesota Department of Natural Resources

DO dissolved oxygen

EPA U.S. Environmental Protection Agency

FC Fecal Coliform

ft/yr feet per year

GBERBA Greater Blue Earth River Basin Alliance

GIS geographic information system

HEI Houston Engineering, Inc.

HCWP Hawk Creek Watershed Project

HLWD Heron Lake Watershed District

HSPF Hydrologic Simulation Program FORTRAN

HUC hydrologic unit code

IWAV Impaired Waters Viewer

IWM Intensive Watershed Monitoring

JD2 Judicial Ditch 2

lbs/yr pounds per year

LGU Local Government Unit

LSOHF Lessard-Sams Outdoor Heritage Fund

LWG Local Work Group

mi² square mile

MDH Minnesota Department of Health

MFCRWD Middle Fork Crow River Watershed District

MPCA Minnesota Pollution Control Agency

NDSU North Dakota State University

NOI North Ottawa Impoundment

NPS nonpoint pollution sources

NRCS Natural Resources Conservation Service

NWQI National Water Quality Initiative

PDTRA Pomme de Terre River Association

PLA Prior Lake Association

PTM Prioritized, Targeted, and Measurable

PTMApp Prioritize, Target, and Measure Application

RCRCA Redwood-Cottonwood Rivers Control Area

SAM Scenario Application Manager

Section 319 Section 319 Grant Program

SEMWRB Southeast Minnesota Water Resources Board

SLA Spring Lake Association

SRF state revolving funds

SRP soluble reactive phosphorus

SRWD Sauk River Watershed District

SSTS Subsurface Sewage Treatment System

SWCD Soil and Water Conservation District

T/yr tons per year

TMDL total maximum daily load

TP total phosphorus

TRPD Three Rivers Park District

TSS total suspended solids

USFWS U.S. Fish & Wildlife Service

UMN University of Minnesota

µg/L micrograms per liter

WASCOB Water and Sediment Control Basin

WCBP Western Corn Belt Plains

WD watershed district

WFDMR West Fork Des Moines River

WRAC Water Resources Advisory Committee

WRAPS Watershed Restoration and Protection Strategies

WWTP Wastewater Treatment Plant

Introduction

Minnesota's water resources are treasured by its citizens for the beneficial uses they provide including recreation, drinking water, aquatic life, industrial and agricultural uses. With more than 10,000 lakes, 100,000 river and stream miles, and extensive groundwater systems, water is a major part of Minnesota's culture, economy, and natural ecosystems.

Two programs provide local governments with resources to restore and protect surface water, with a special focus on nonpoint pollution sources (NPS). The Minnesota Pollution Control Agency (MPCA) relies on the Federal Section 319 Grant Program (Section 319) to provide funding for efforts to reduce nonpoint sources of pollution. The second source, the Clean Water Partnership (CWP) loan program provides low interest loans to local units of government for best management practices (BMPs) which reduce nonpoint source water pollution in local areas. The Watershed Achievements Report is an annual report on the efforts supported by these funding resources and the state's progress for reducing NPS pollution. This report describes the newly awarded, active and final nonpoint source projects for statewide and watershed-based projects.

Watershed Program Accomplishments – 2019

Clean Water Accountability Reporting

Minnesota's Clean Water Legacy Act requires that MPCA report actions taken in Minnesota's watersheds to meet water-quality goals and milestones (Minn. Stat. 114D.26, subd. 2). This accountability reporting is required every two years, though updates to these reports will occur annually by July of each year.

MPCA's first report was in 2016 and included simple short summary documents for a handful of watersheds with completed WRAPS at that time. Significant updates were made to the report in 2018 and 2019 to include information for all 80 watersheds statewide, and through a webpage platform that allows users to see a wide variety of data on water quality implementation efforts at varying scales of geography and time.

- [Healthier watersheds: Tracking the actions taken](#)

What's in the reports?

- WRAPS approval status
- Total maximum daily loads (TMDLs) approved
- Wastewater Treatment Plant (WWTP) pollution reduction progress
- Nonpoint BMPs in all subwatersheds
- Funding (federal, state, local, point/nonpoint) by watershed



What's new in 2019?

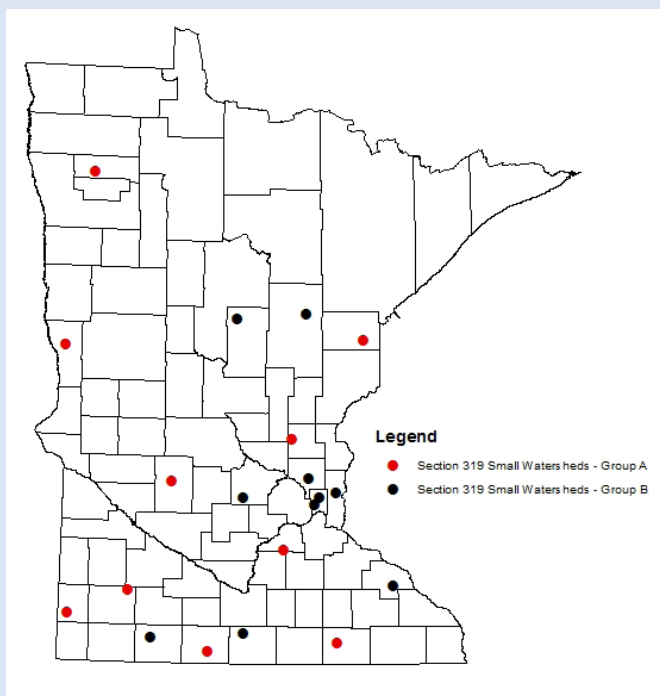
- New wastewater trend report with watershed pollutant reduction and facility data;
- More state and federal programs and enhanced graphics and maps.

Section 319 Grant Program Changes – Small Watersheds Focus

MPCA is developing a new [Section 319 Small Watersheds Focus Program](#) in partnership with small watersheds to develop a long-term roadmap to support comprehensive nonpoint source implementation on a small-scale watershed.

Ten small watersheds selected for focused funding

The MPCA selected 10 watersheds for longer-term federal funding starting in 2020.



The selections are part of the transition in the federal Clean Water Act Section 319 Program from one-time grants to more reliable funding focused on small watersheds. The goal of the program is to help local governments make measureable changes toward water quality improvements. Based on input from many local governments, the program is designed to provide a reliable and longer-term funding source to address all pollutants in small watersheds.

Watersheds chosen for prioritized funding in 2020, 2024, 2028 and 2032:

1. Martin SWCD, for the Fairmont Chain of Lakes and Dutch Creek
2. Mower SWCD, for Dobbins Creek
3. Redwood County SWCD, for Plum Creek Watershed
4. Hawk Creek Watershed Project (HCWP), for Upper Hawk Creek and Wilmar Chain of Lakes
5. Scott County, Scott Water Management Organization, and SWCD, for Sand Creek
6. West Polk SWCD, for the Red Lake River – middle subwatershed
7. Carlton SWCD, for Skunk Creek
8. Buffalo Red River Watershed District, for Whiskey Creek
9. Rum River Watershed, for the Rum River – middle subwatershed
10. Pipestone County, for Split Rock, Mound, and Pipestone Creeks

Forty-one Local Government Units (LGUs) applied for funding. The MPCA conducted telephone interviews with all applicants and chose 19 for site visits. The agency then chose ten watersheds for funding based on criteria such as state priorities and collaboration, along with input from the Minnesota Board of Water and Soil Resources (BWSR).

The MPCA will choose additional groups of 10 watersheds for prioritized funding in 2019, 2020 and 2021. More information is on the program [webpage](#).

- Most reports show data from 2004 (first TMDL approval) through the end of 2018.

Clean Water Partnership Loan Program

The CWP program offers zero-interest loans to local units of government for implementing nonpoint source BMPs and other activities that target the restoration and protection of a water resource such as a lake, stream, or groundwater aquifer. Loans can be used for these activities:

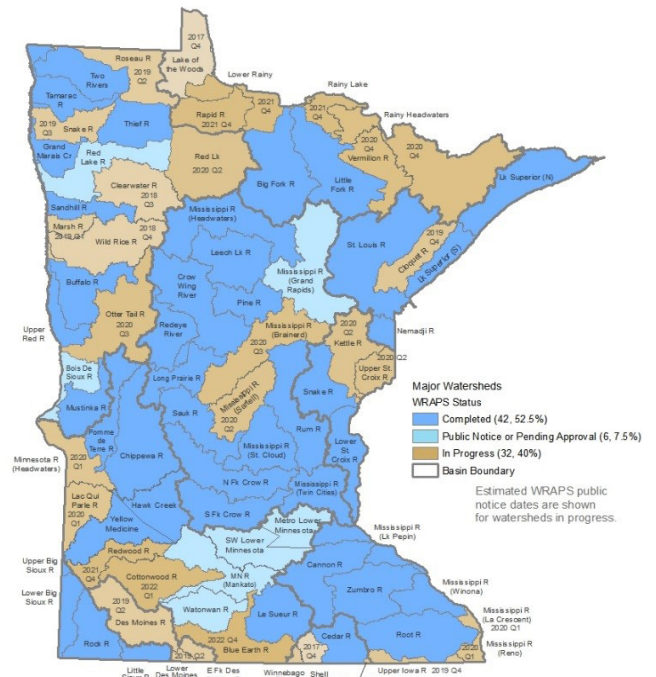
- Urban green infrastructure
- Buffers
- Septic system upgrade or replacement
- Technical assistance, outreach and education
- Equipment (e.g., salt application, street sweeping)
- Any nonpoint source BMP
- Feedlot upgrade or replacement

Minnesota’s Watershed approach

All 80 watersheds in Minnesota have restoration and protection strategy projects underway. Strategy plans have been completed for 53% of the watersheds and more are on track for completion this year. More information is on this webpage [MPCA watershed approach](#).

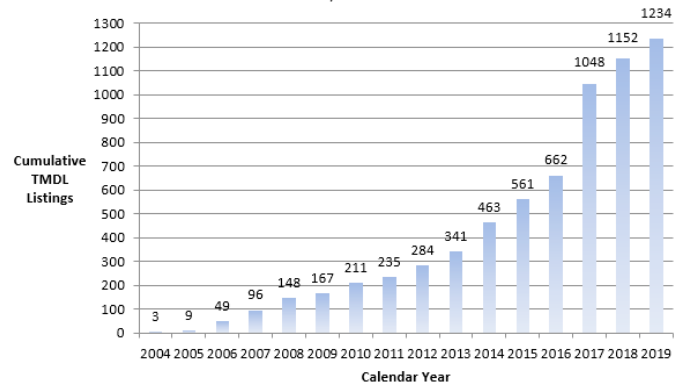
Progress is also being made in completing TMDL studies for impaired waters in the state. TMDL studies are being done on a watershed scale as part of the watershed approach, which has accelerated the pace on TMDL study completions.

Watershed Restoration and Protection Strategies (WRAPS)



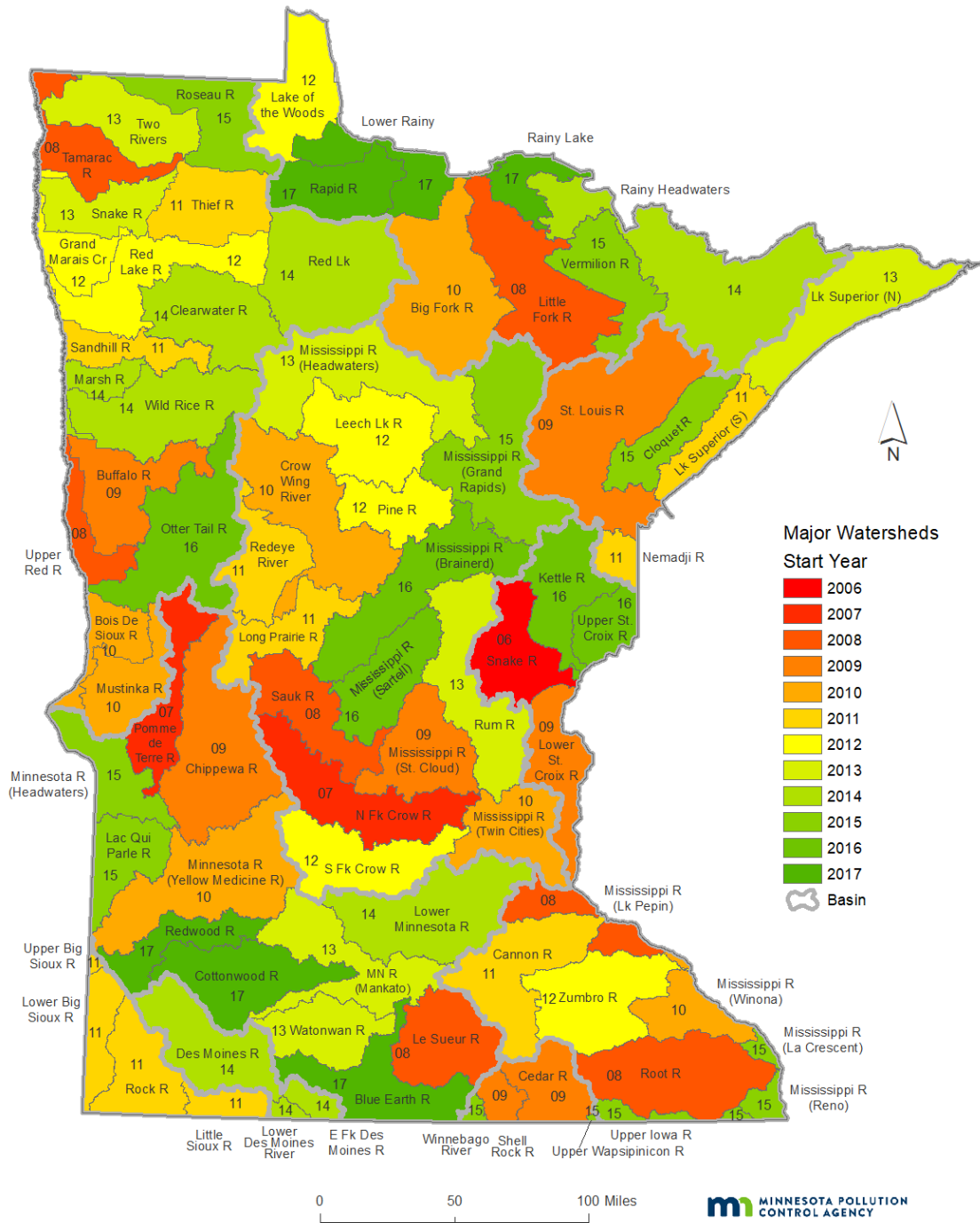
September 2019
MPCA MINNESOTA POLLUTION CONTROL AGENCY

Approved TMDLs in Minnesota
 July 2019



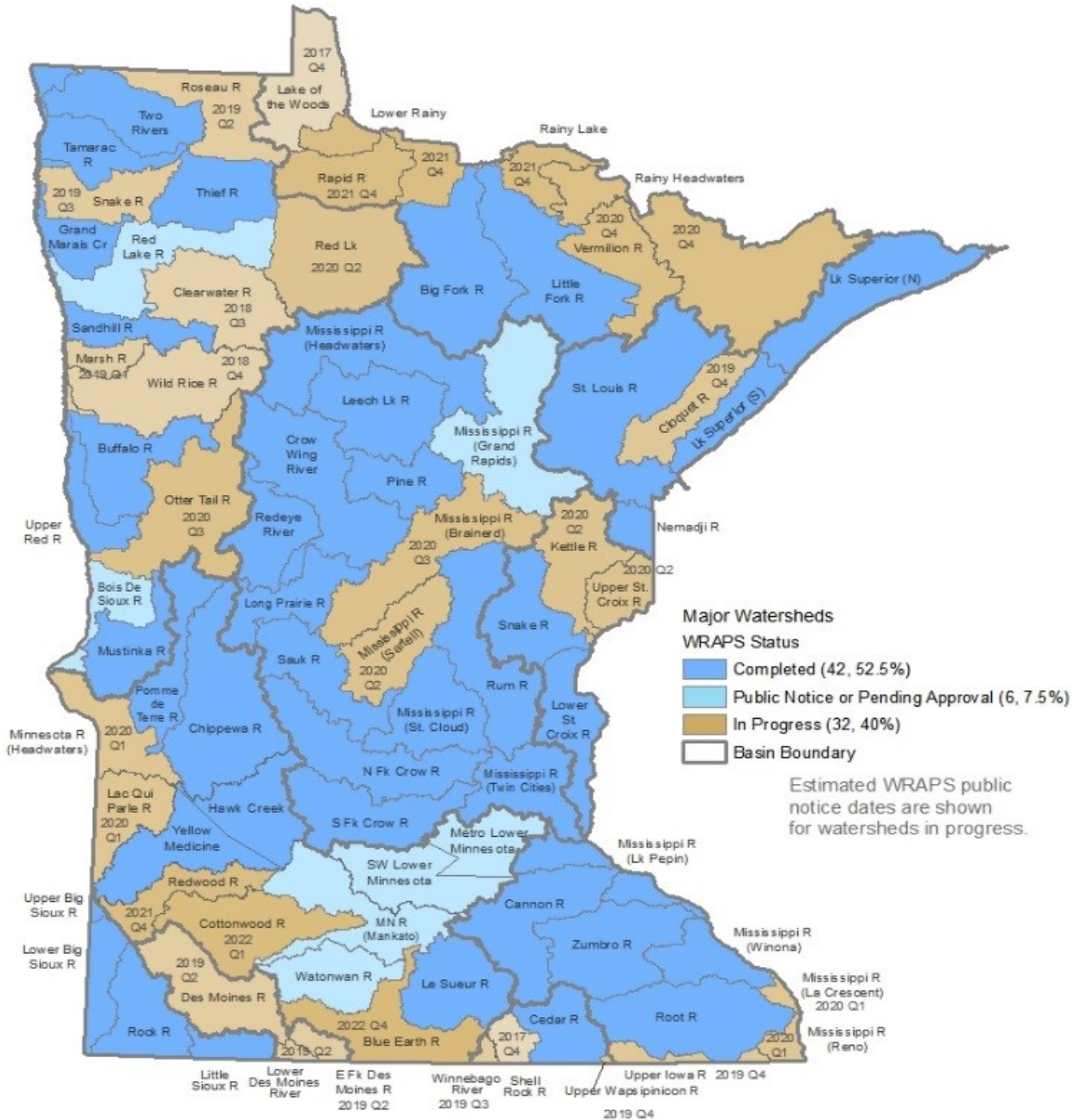
Statewide intensive watershed monitoring schedule and progress

Minnesota’s Watershed Approach starts with Intensive Watershed Monitoring (IWM) around the state. Because of MPCA’s monitoring efforts, combined with other local monitoring efforts, Minnesota is well on its way to a comprehensive assessment of the waters of the state on a 10-year cycle, wrapping up in 2018. The MPCA has now initiated or completed IWM in all of the state’s major watersheds. The level of effort of this monitoring and the amount and types of data being collected in Minnesota’s Watershed Approach is well beyond that of past monitoring efforts.



Watershed Restoration and Protection Strategies (WRAPS) progress

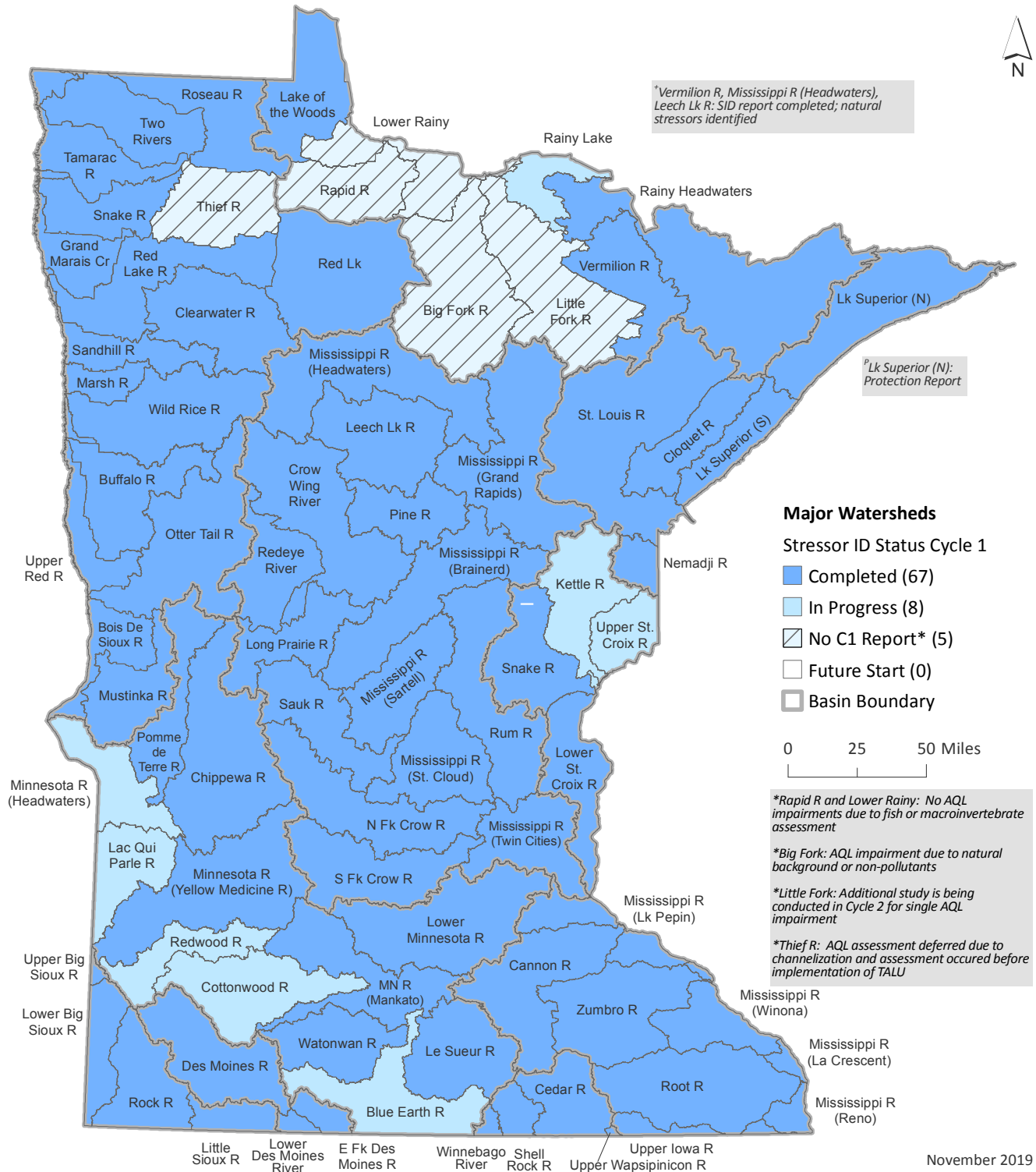
WRAPS reports for the major watersheds in Minnesota are completed or underway. As of September 2019, there are 37 completed WRAPS studies and work in the other watersheds is underway with monitoring, watershed modeling, biological stressor work, and/or a WRAPS project in progress.



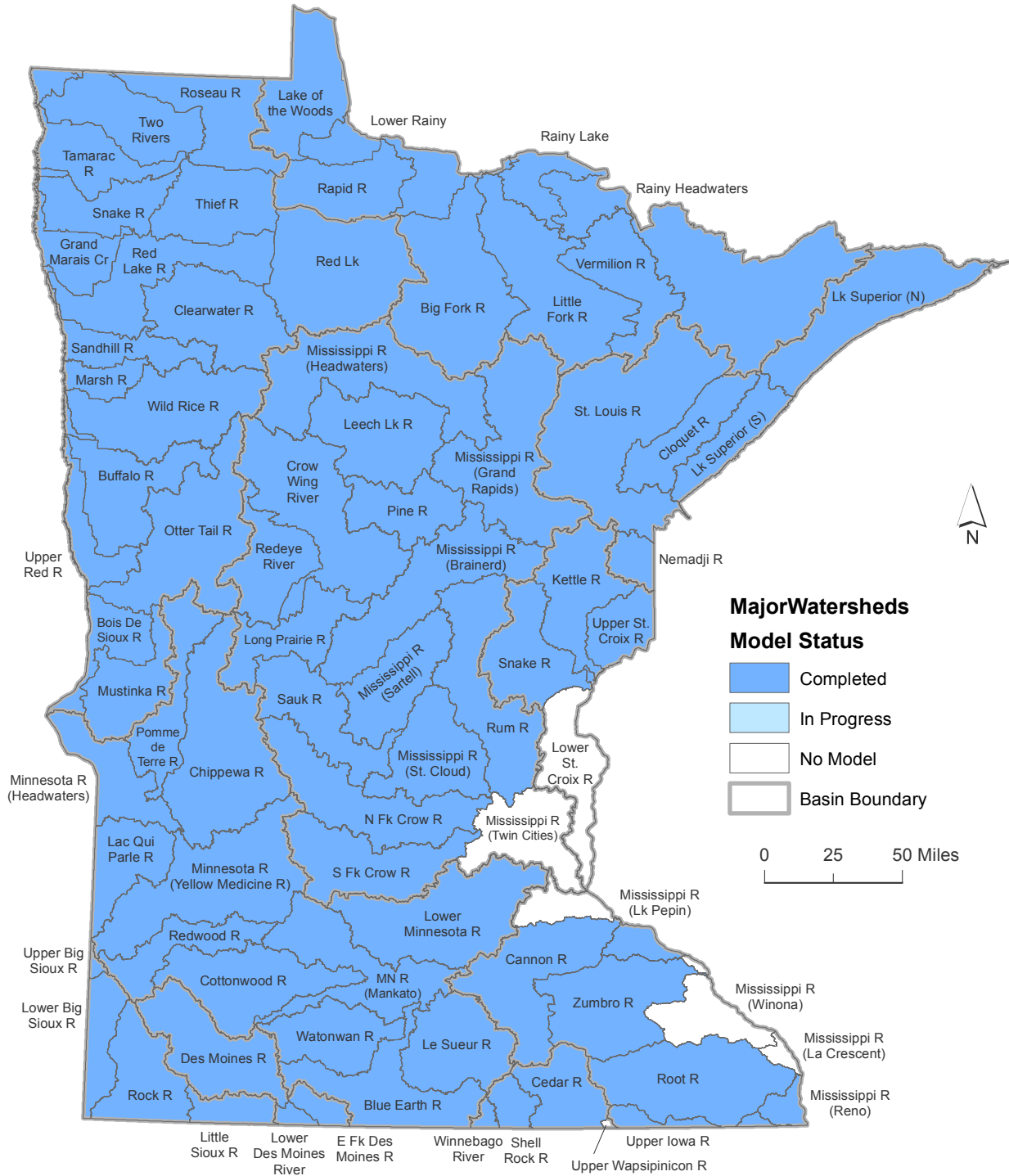
September 2019



Major watersheds Stressor Identification status



Major watersheds model status



October 2018



Impaired waters in Minnesota

Impaired waters in Minnesota can be viewed using the MPCA's impaired waters viewer (IWAV) (<https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav>). This is a web-based mapping application, which is kept up-to-date with the most recent impairment listings and the draft listings, as they become available.

Approved TMDLs in Minnesota

Approved TMDLs in Minnesota can be viewed using the MPCA web-based mapping application for Surface water data access (https://cf.pca.state.mn.us/water/watershedweb/wdip/search_more.cfm?datatype=assessments). By clicking on the "Map" tab, the viewer can manipulate the data layers to view approved TMDLs, impaired streams, monitoring information, and other information about the chosen watershed.

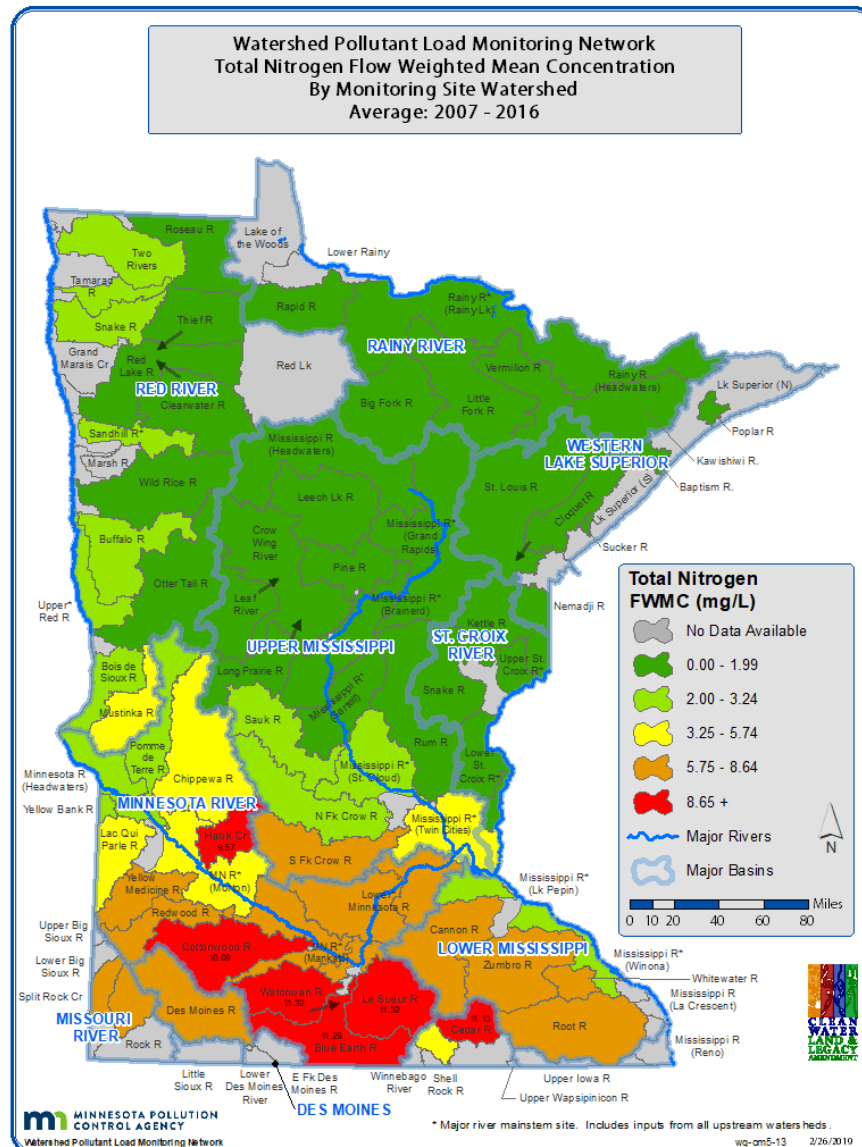
Tracking progress

November 2019

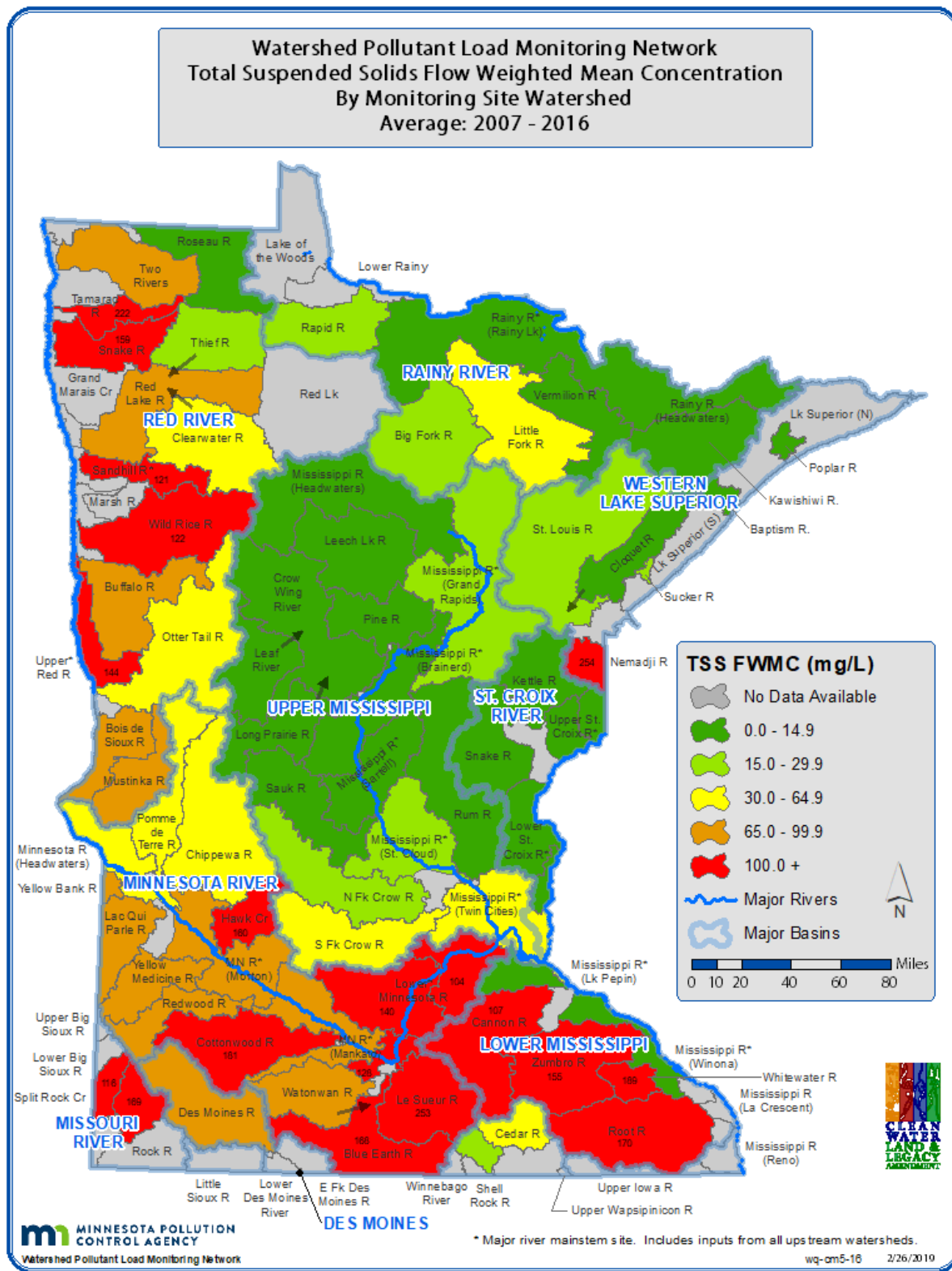
The Watershed Pollutant Load Monitoring Network is designed to obtain spatial and temporal pollutant load information from Minnesota’s rivers and streams and track water quality trends. This long-term program utilizes state and federal agencies, universities, local partners and MPCA staff to collect water quality and flow data to calculate pollutant loads. Monitoring sites span three ranges of scale:

- Basin – major river main stem sites along the Mississippi, Minnesota, Rainy, Red, and St. Croix rivers
- Major watershed – tributaries draining to major rivers with an average drainage area of 1,350 square mile (mi²) (8-digit hydrologic unit code [HUC] scales)
- Subwatershed – major branches or nodes within major watersheds with average drainage areas of approximately 300-500 mi²

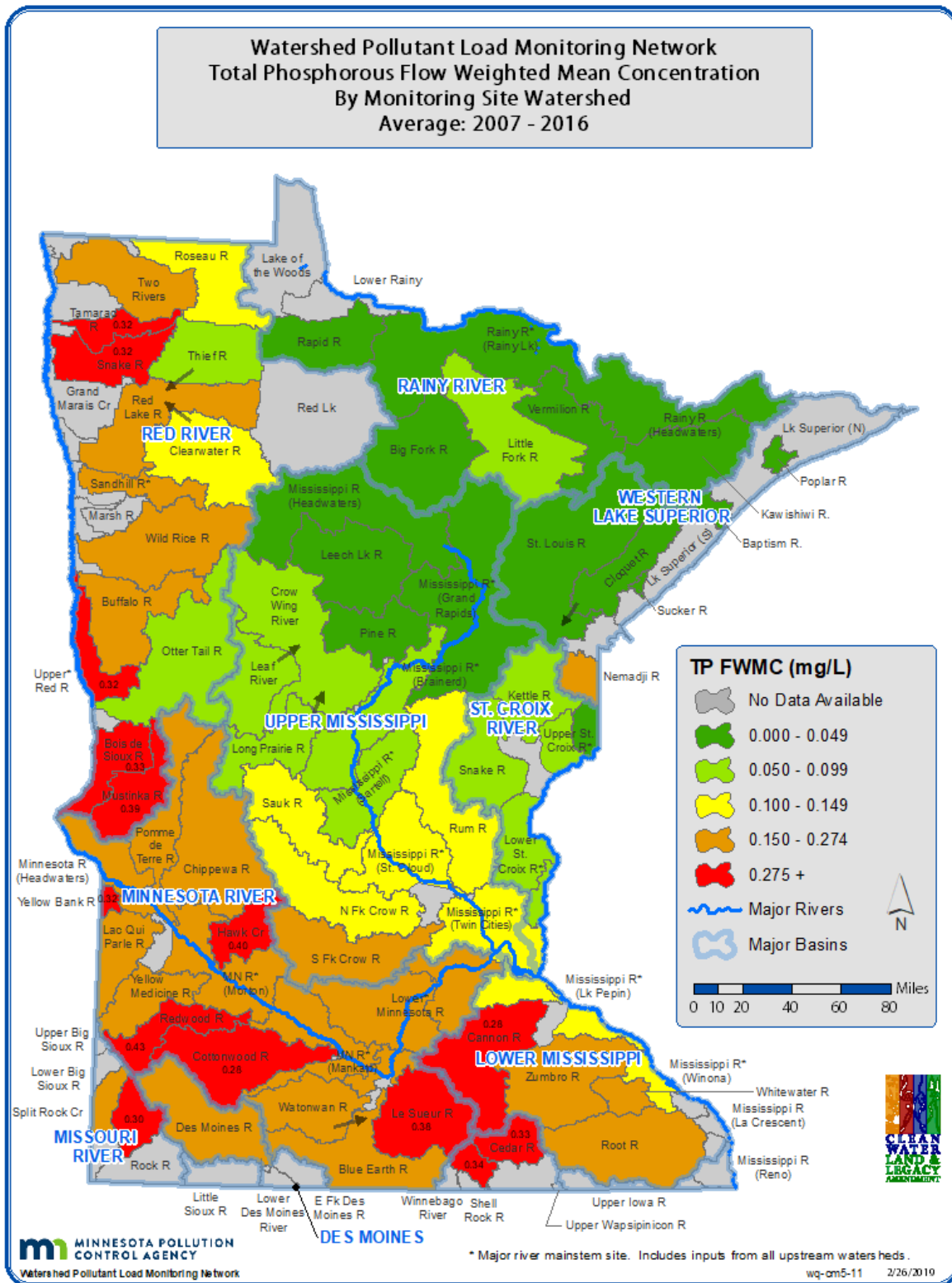
Most installations occurred in 2008 and 2009, all sites were installed by the end of 2010 and intensive sampling began the year following installation.



Tracking progress continued



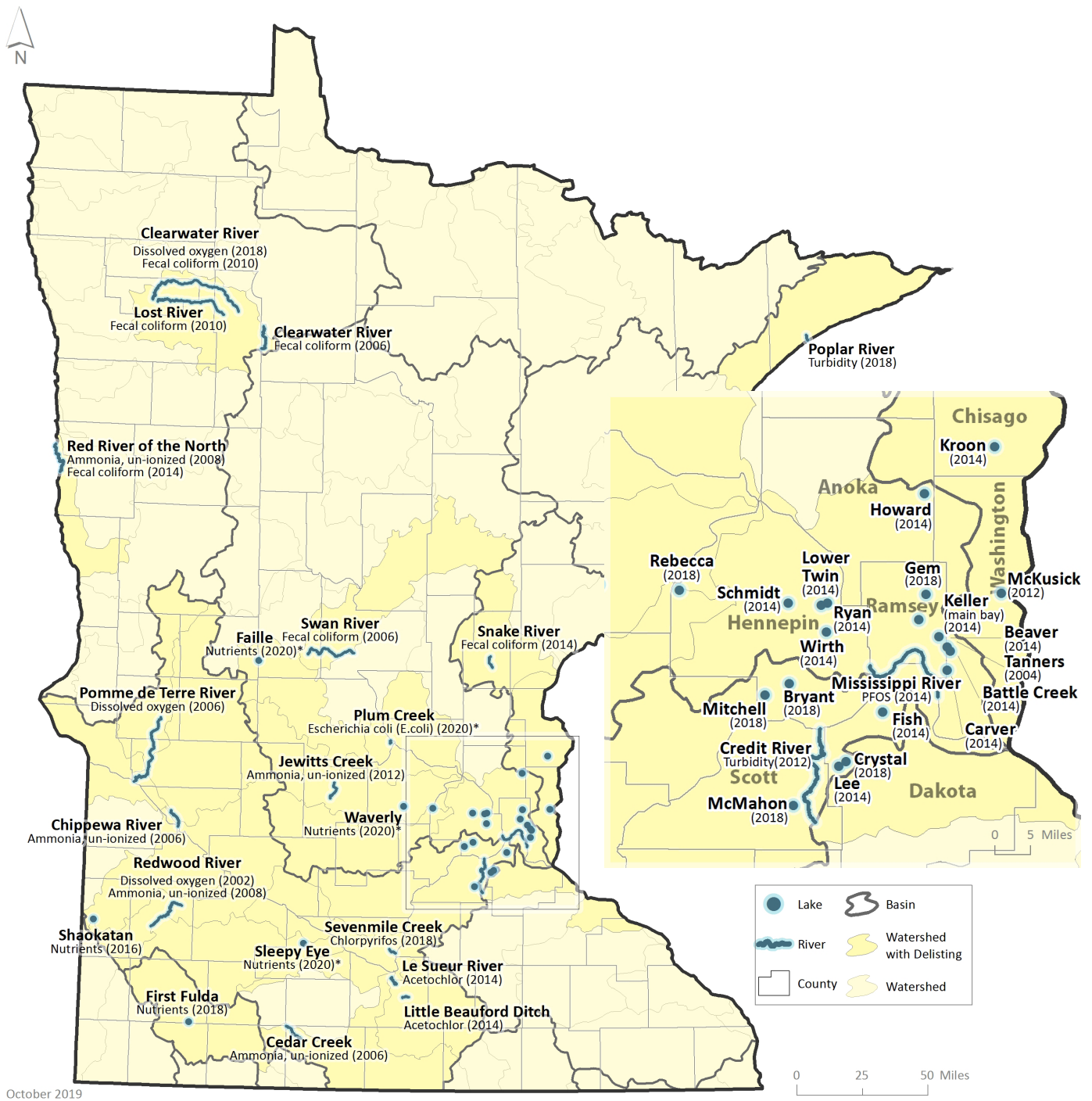
Tracking progress continued



Previous impairments now meeting water quality standards due to corrective actions

October 2019

51 delisted due to restoration activities



October 2019

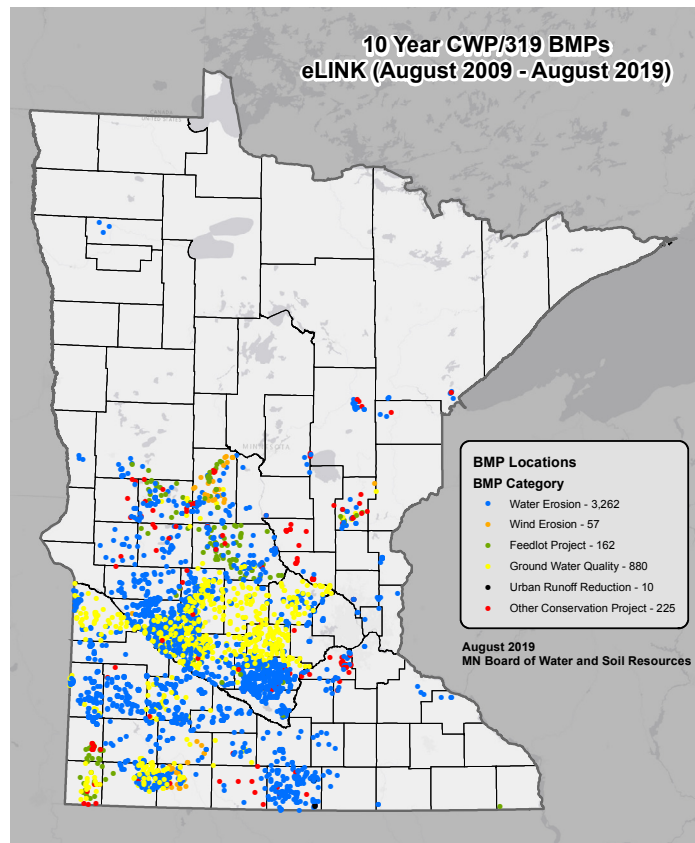
eLINK results from Section 319 and CWP projects August 2009 – August 2019

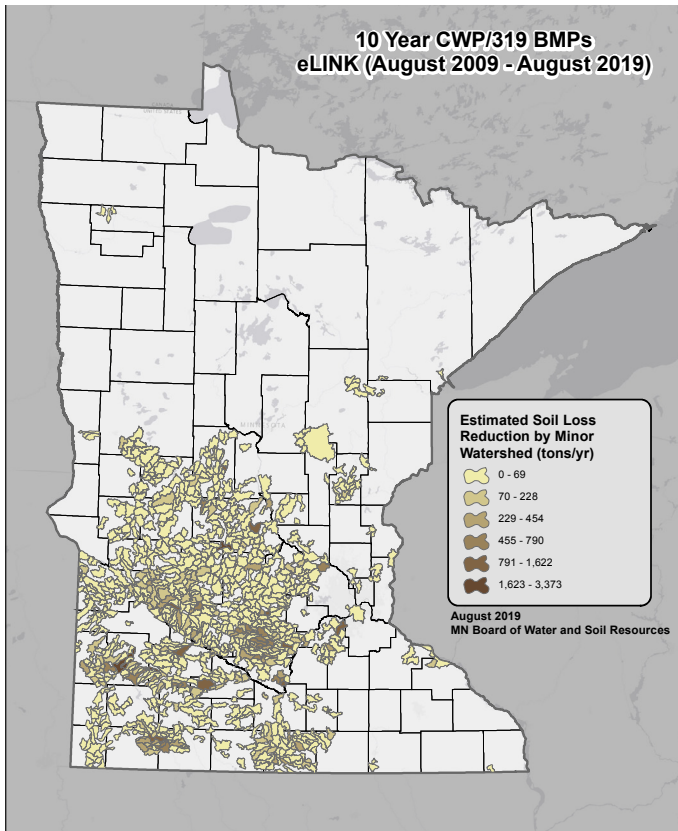
The following table shows progress through August 2019 based on reporting data from eLINK (August 2009 – August 2019). Based on eLINK reporting by CWP and Section 319 project partners, these projects have reduced **soil loss** from August 2009 through August 2019 by more than 76,940 tons per year (T/yr). During the same period, **sedimentation** was reduced by more than 88,576 T/yr, **phosphorus** loading by more than 115,129 pounds per year (lbs/yr), and **nitrogen** reduction by more than 244,828 lbs/yr. This report only reflects the last 10 years.

Pollution Reduction Estimate Type	# of BMPs	Estimated Soil Loss Reduction (tons/yr)	Estimated Sediment Reduction (tons/yr)	Estimated Phosphorus Reduction (lbs/yr)	Estimated Nitrogen Reduction (lbs/yr)*
Feedlot Project	162	0	0	7,804	15,127
Ground Water Quality	880	0	7,898	7,751	17,239
Other Conservation Project	225	1,840	6,540	6,748	23,647
Urban Runoff Reduction	10	0	1	1	1
Water Erosion	3,262	75,091	74,137	92,823	188,812
Wind Erosion	57	9	0	2	2
Total	4,596	76,940	88,576	115,129	244,828

* If no nitrogen reduction was reported, then estimated nitrogen was calculated by doubling estimated phosphorus

CWP/Section 319 BMPs
eLINK (2009 – present)

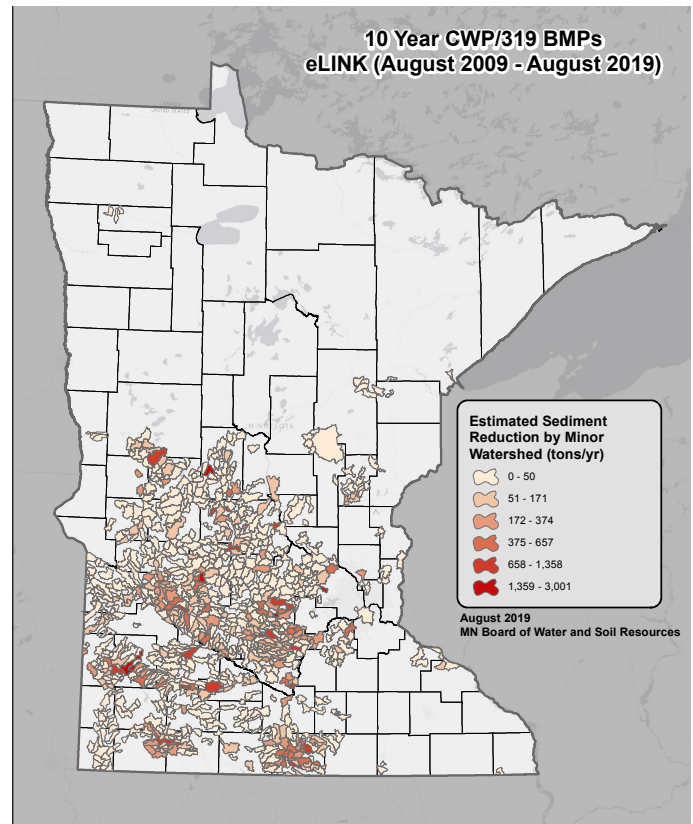




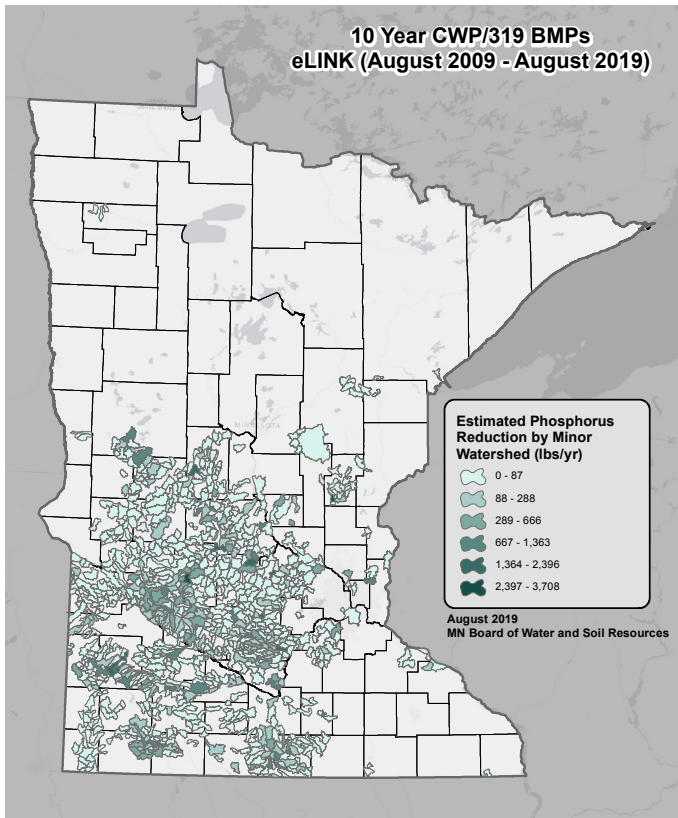
**Estimated soil loss reduction
CWP/319 BMPs
eLINK (2009 – present)**

* These are ESTIMATED soil loss reductions. They DO NOT represent reductions in WATERSHED soil loss yield. They represent the sum of estimated soil loss reductions to all waterbodies (even isolated ones) within the geographic regions of the watershed.

**Estimated sediment reduction
CWP/319 BMPs
eLINK (2009 – present)**



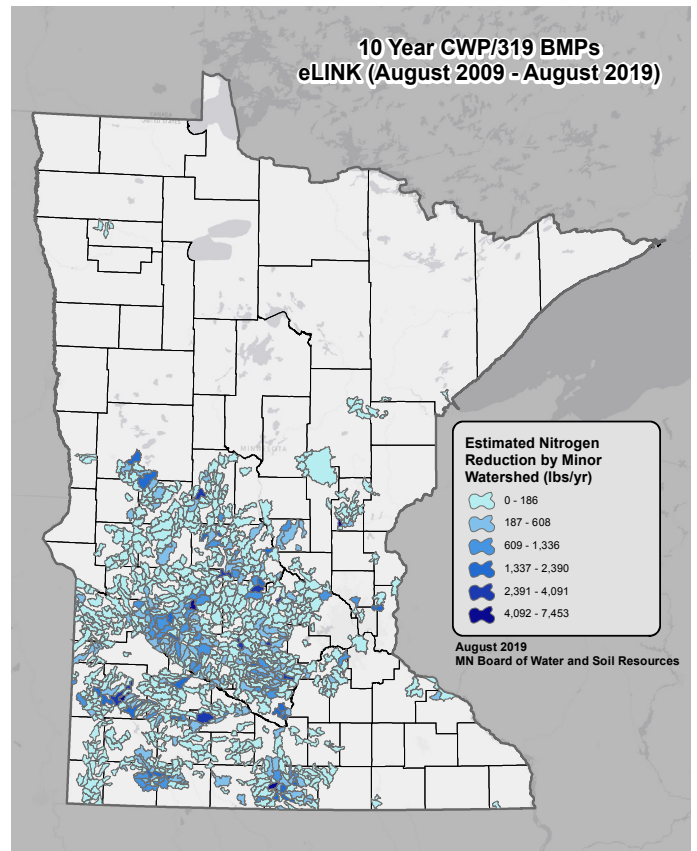
* These are ESTIMATED sediment reductions. They DO NOT represent reductions in WATERSHED sediment yield. They represent the sum of estimated sediment reductions to all waterbodies (even isolated ones) within the geographic regions of the watershed.



**Estimated phosphorus reduction
CWP/Section 319 BMPs
eLINK (2009 – present)**

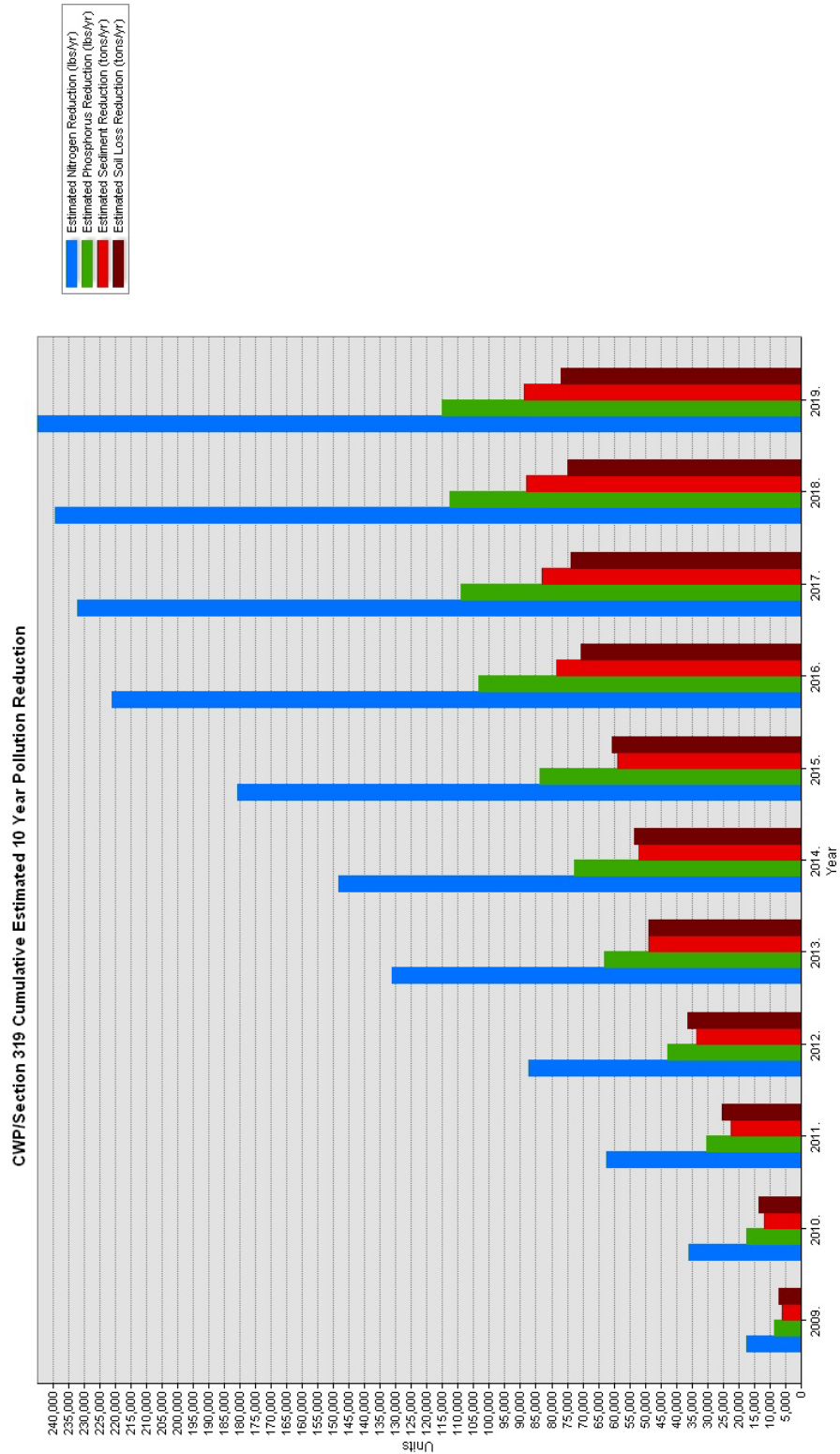
* These are ESTIMATED phosphorus reductions. They DO NOT represent reductions in WATERSHED phosphorus yield. They represent the sum of estimated phosphorus reductions to all waterbodies (even isolated ones) within the geographic regions of the watershed.

**Estimated nitrogen reduction
CWP/Section 319 BMPs
eLINK (2009 – present)**



* These are ESTIMATED nitrogen reductions. They DO NOT represent reductions in WATERSHED nitrogen yield. They represent the sum of estimated nitrogen reductions to all waterbodies (even isolated ones) within the geographic regions of the watershed.

CWP/Section 319 cumulative estimated pollution reduction benefits via local government reporting and eLINK (2009–2019)



All projects awarded through 2019

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Statewide</i>				
	Reducing Manure Nutrient Loss with Cover Crops	C	2015	\$ 228,852
	Training & Tech Support for Maintenance Staff	A	2016	\$ 249,971
	Smart Salting and Nutrient Reduction Training and S	A	2016	\$ 15,000
	Kandiyohi County SSTS Upgrades	N	2018	\$ 1,000,000
	Cottonwood County SSTS Low Interest Loan Project	N	2018	\$ 900,000
Statewide Total				\$ 2,393,823

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Cedar River</i>				
	Effectiveness of Targeted Dobbins Creek BMPs	C	2014	\$ 297,189
Cedar River Total				\$ 297,189

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Des Moines and Missouri River Basins</i>				
	WFDNR Targeting and Prioritizing Endeavor	C	2015	\$ 21,941
	Heron Lake TMDL Nutrient Reduction Project	A	2016	\$ 450,000
	South Heron Lake TMDL Implementation Plan	N	2018	\$ 122,125
Des Moines and Missouri River Basins Total				\$ 594,066

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Lake Superior Basin</i>				
	Port Authority Stormwater Study and Concept Design	C	2015	\$ 24,000
Lake Superior Basin Total				\$ 24,000

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Lower Mississippi</i>				
	Building a Culture of Citizen Engagement	C	2014	\$ 45,673
	Zumbro River: Ultra-Urban Vol/TSS/FeC Reduction	C	2014	\$ 300,000
	Downtown Winona Pre-Mississippi River Rain Garden	C	2015	\$ 36,366
	Middle Fork Zumbro River Critical Source Area Restoration	A	2016	\$ 219,000
	Mississippi River Lake Pepin Watershed WRAPS Implementation	A	2016	\$ 87,500
	Reducing Bacteria from Southeast Minnesota Feedlots	A	2017	\$ 336,000
	Whitewater Watershed Nitrogen Reduction Project	A	2017	\$ 232,825
Lower Mississippi Total				\$ 1,257,364

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Minnesota River Basin</i>				
	Hawk Creek Watershed Dissolved Oxygen Restoration Project	C	2014	\$ 237,585
	Pomme de Terre WRAPS Implementation Project	C	2014	\$ 267,649
	Greater Blue Earth Nonpoint Reduction Initiative	C	2014	\$ 364,163
	Lower Prior Lake Protection Project Implementation	C	2014	\$ 142,521
	Renville County Minnesota River Mankato Watershed Protection Project	C	2014	\$ 306,750
	Middle Minnesota Watershed SSTS Loan Project	C	2014	\$ 342,059
	Blue Earth River Dissolved Oxygen: Managing Flows and Nutrients	C	2015	\$ 234,334
	Chippewa River Watershed Protection	C	2015	\$ 646,965
	GBERBA Conservation Drainage Partnership Program	C	2015	\$ 147,200
	Redwood River Turbidity Reduction Project	C	2015	\$ 150,512
	Carp Management in Spring Lake & Prior Lake	C	2015	\$ 67,323
	Greater Blue Earth River Basin TMDL Implementation	A	2016	\$ 400,000
	Chippewa River Sediment Reduction	A	2016	\$ 285,878
	Le Sueur River WRAPS Implementation Endeavor	A	2016	\$ 347,950
	Hawk Creek Watershed Subsurface Sewage Treatment System (SSTS) Upgrade Implementation	A	2016	\$ 1,050,000
	Hawk Creek Watershed FY16 Implementation Project	A	2016	\$ 190,054
	Pomme de Terre WRAPS BMP Implementation Project	A	2016	\$ 285,000
	Chippewa Countywide Septic System Upgrades	A	2017	\$ 200,000
	Hawk Creek Watershed Improvement Project	A	2017	\$ 397,000
	Mankato Watershed – Renville Co FY17 Improvement Project	A	2017	\$ 297,000
	Seven Mile Creek Assessment and Implementation	A	2017	\$ 475,524
	Lac Qui Parle-Yellow Bank SSTS Loan Program	A	2017	\$ 500,000
	Swift County SSTS Upgrades	A	2018	\$ 250,000
	Internal Loadin BMPs in Spring Lake and Prior Lake	N	2018	\$ 80,300
	Hawk Creek Watershed FFY 2018 Implementation Project	N	2018	\$ 477,000
	Lac Qui Parle-Yellow Bank SSTS Loans Phase II	N	2019	\$ 500,000
Minnesota River Basin Total				\$ 8,642,767

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Red River Basin</i>				
	Red River Basin Reservoir Nutrient Load Reduction	C	2014	\$ 283,612
	Upper Buffalo River Sediment Reduction	N	2018	\$ 498,000
Red River Basin Total				\$ 781,612

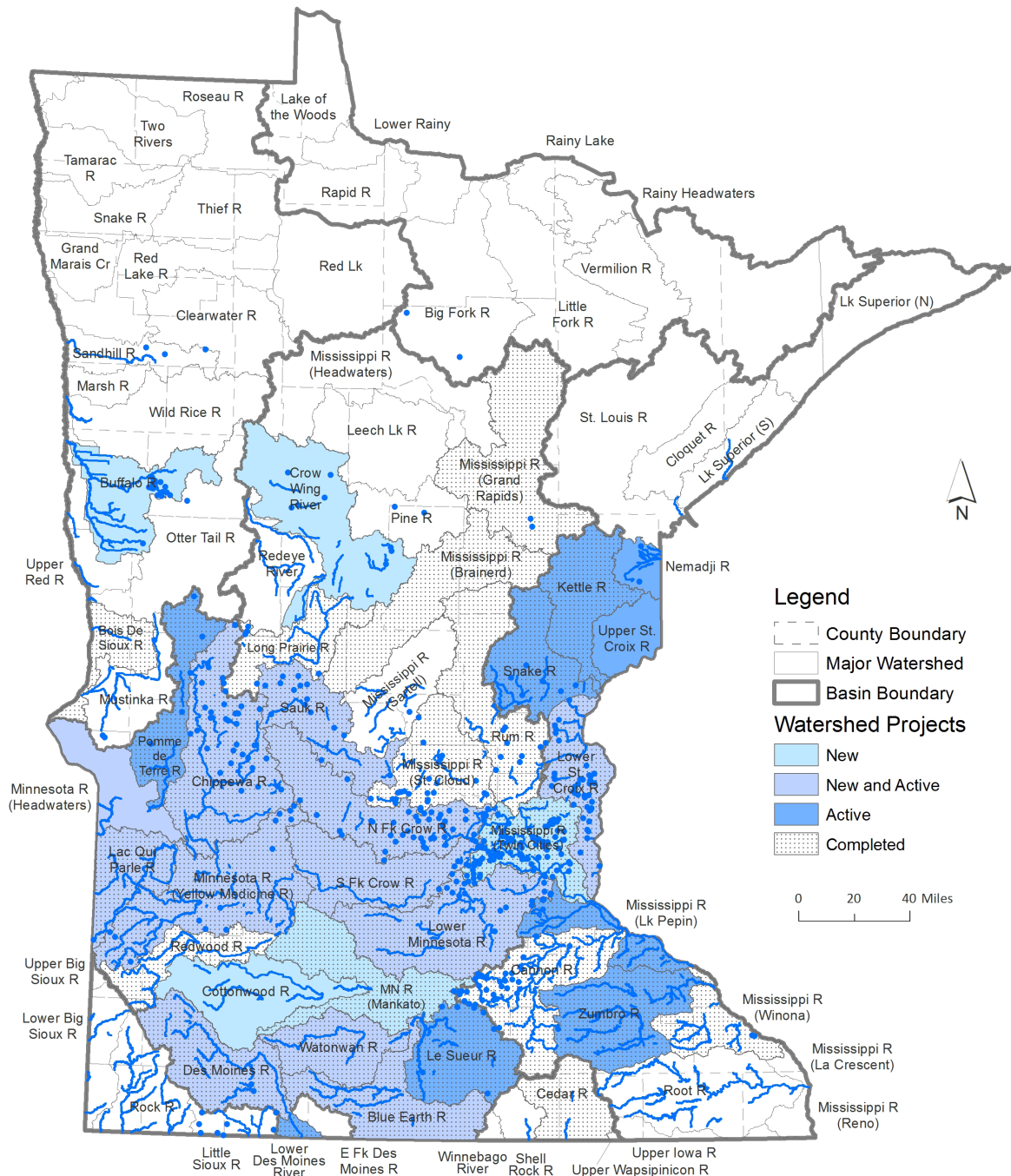
	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>St. Croix River Basin</i>				
	Forest Lake Diagnostic Study	C	2015	\$ 46,270
	Kanabec Water Resources Protection Project Phase 2	C	2015	\$ 111,150
	Ann Lake Watershed BMP and Internal Load	C	2015	\$ 36,767
	Moody Lake Wetland Rehabilitation Project	A	2016	\$ 81,497
	Snake River Watershed Resource Protection Project	A	2016	\$ 400,000
	Lower St. Croix Targeted Phosphorus Reduction Project	A	2017	\$ 300,000
	Goose Lake TMDL Final Implementation Projects	A	2017	\$ 76,000
	Marine on St. Croix Stormwater Phase 2	A	2017	\$ 92,500
	Pine County SSTS Upgrades	N	2017	\$ 600,000
	Chisago Lakes Gully Restoration Green Lake	N	2018	\$ 50,000
	Marine on St. Croix Stormwater Phase 3	N	2018	\$ 169,000
	Comfort Lake Forest Lake Adaptive Management Project Implementation	N	2018	\$ 1,500,000
St. Croix River Basin Total				\$ 3,463,184

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Upper Mississippi River Basin</i>				
	Clearwater River Watershed Alternative Tile Intake	C	2014	\$ 42,486
	Osakis Lake Nutrient Reduction - Crooked Lake	C	2014	\$ 71,766
	Mille Lacs Lake Protection - Stormwater Control	C	2014	\$ 64,535
	Middle Sauk River Targeted Reduction & Outreach	C	2014	\$ 243,689
	Clearwater River Restoration & Protection Phase II	C	2014	\$ 70,272
	Big Sandy and Minnewawa Lakes Phosphorus Reduction	C	2014	\$ 71,766
	MFCRWD Loan Program for BMPs/Septic Upgrades	C	2015	\$ 268,205
	Northwood Lake Water Quality Improvement Project	C	2015	\$ 300,000
	Swan River Headwaters Subwatershed Restoration	C	2015	\$ 38,650
	NE St. Cloud Mississippi River Protection Project	C	2015	\$ 200,000
	SRWD Groundwater Protection Project	C	2015	\$ 93,708
	Mill Creek Watershed Nutrient Reduction	C	2015	\$ 36,029
	Crow River SSTS Restoration Project	A	2015	\$ 1,350,000
	Osakis Lake Subwatershed Nutrient Reduction	A	2015	\$ 142,525
	Lower Sand Creek Corridor Restoration	A	2017	\$ 300,000
	Osakis Lake Basin Restoration - Phase 2 Implementation	A	2018	\$ 1,500,000
	Long Prairie River Streambank Restoration	N	2018	\$ 156,450
	Middle Sand Creek Corridor Restoration Project	N	2018	\$ 291,000
	Middle Sauk River Field Runoff Reduction	N	2018	\$ 291,883
	JD2 Sediment Pond Dredging Project	N	2018	\$ 575,000
	Partridge River E. coli Reduction	N	2018	\$ 79,722
	Lake Monongalia Stormwater Projects Importance	N	2018	\$ 275,000
Upper Mississippi River Basin Total				\$ 6,462,686

Summary of statewide watershed project activity

Projects completed, currently active and awarded

Made possible through a variety of funding sources – EPA Section 319 grants, Clean Water Fund (CWF), and Clean Water Partnership (CWP) – and the dedication and hard work of our agency partners, the following map represents major watersheds where water quality improvement projects are currently underway, ready to begin, or recently completed in the state.



Statewide

Project completed

Reducing Manure Nutrient Loss with Cover Crops



Project involving multiple watersheds

Reducing Manure Nutrient Loss with Cover Crops

Liquid swine and dairy manure is frequently applied in the fall, prior to planting corn the following spring. Most of the nitrogen in swine manure and about one-half in dairy manure is in the inorganic ammonium form, which can convert to leachable nitrate rapidly when soil temperatures are above 50°F, in either fall or spring, before the subsequent corn crop is taking up nutrients. A winter rye cover crop established in the fall can take up nitrate in both fall and spring, and can reduce soil erosion and phosphorus transport. Small-plot research in Iowa showed that manure can be injected into a cover crop to sequester nitrate, but there was no research at commercial scale to provide confidence to farmers that this practice would maintain yield of the subsequent corn crop.

Project highlights

- Approved watersheds for this project, listed as impaired for excess nutrients or low dissolved oxygen (DO) with manure nutrients as an identified source and with EPA/MPCA approved plans, are listed in the Grant Project Summary. Nineteen on-farm trials compared liquid swine or dairy manure injected into a winter rye cover crop or no-cover crop check established following corn silage or soybean harvest. The rye was terminated in the spring before reaching 10-12 inches in height. Measurements included soil nitrate 0- to 24-inch depth following spring rye termination, weight of the rye, and yield of the subsequent corn silage or corn grain crop.
- On all farms, spring soil nitrate was less in the rye plots than in the control plots, indicating that the rye had been effective in taking up nitrate. Across sites, there was no significant difference in corn grain or silage yield when following the cover crop compared to no cover crop. Results were presented to farmers and agricultural professions at events attended by 2,643 participants, and through publications of University of Minnesota (UMN) Extension and livestock producer organizations.



Knife injectors disturbed much of the surface soil

Partnerships

- UMN Extension Educators arranged for and assisted with on-farm trials, workshops, and field days.
- Minnesota Pork Producers Association and Minnesota Milk Producers Association disseminated project results through their newsletters and websites.
- Hosts of livestock producer meetings and field days where cover crop information and results of this project were presented included Soil and Water Conservation Districts (SWCDs), a Watershed District (WD), Midwest and Minnesota Forage Councils, County Feedlot Officers, Minnesota Corn and Soybean Growers Associations.
- Farmers hosted on-farm trials.

Financial information

Funding type: Section 319

Grant amount: \$228,852

Matching funds: \$193,290

Contact information

Jeffery Peterson, Director
UMN Water Resources Center
173 McNeal Hall
1985 Buford Ave.
St. Paul, MN 55108

612-624-3963, impeter@umn.edu

MPCA project manager: Joanne Boettcher

Statewide

Active projects

Cottonwood County SSTS Low Interest Loan Project – 2019

Sponsor: Cottonwood County

Funding: CWP (Loan) \$900,000

Purpose: This project provides much needed low interest loan dollars to rural homeowners of Cottonwood County. It is estimated by County Subsurface Sewage Treatment System (SSTS) staff that 38% of the county may potentially still be straight-pipes under State statute definition based on a records search. The average cost of septic system in the county is roughly \$12,500 for a typical 3-bedroom above ground mound system. In the 2018 septic season, the county used over \$300,000 of AgBMP loan monies to help rural homeowners update their non-compliant septic systems. At the start of this project, the county is already aware of nearly \$100,000 in needed loan money and expect more loan requests to come as the season progresses.

HSPF Scenario Application Manager (SAM) User Group Workshop – 2015

Sponsor: RESPEC

Funding: Section 319 (Grant) \$10,060

Purpose: Provide funding for a SAM User Group workshop to assess the needs of likely users for a watershed-scale, decision-support tool to facilitate prioritization and placement of BMPs to achieve the needed pollution reductions identified by the WRAPS/TMDL reports.

Kandiyohi County SSTS Upgrades – 2018

Sponsor: Kandiyohi County

Funding: CWP (Loan) \$1,000,000

Purpose: Upgrading substandard SSTS with loan dollars enables citizens within the community to have an active role in water quality improvement in their neighborhood. For each nonconforming or failing system that is replaced, untreated or poorly treated septic effluent is removed from the receiving environment, leading to actual and tangible public health and environmental health benefits. Every major watershed in Kandiyohi County has lakes and stretches of river that are impaired for fecal coliform (FC) bacteria or nutrients.

Removing contributors to these degradations throughout each watershed will lead to overall water quality improvements.

Level 2 Winter Maintenance Training – 2014

Sponsor: Fortin Consulting, Inc.

Funding: Section 319 (Grant) \$129,176

Purpose: Create a Level 2 winter maintenance training curriculum, conduct up to 24 Level 2 MPCA certification training courses and/or presentations; train up to 400 senior maintenance professionals and certify the majority; produce specific and substantial organizational changes in maintenance practices as a result of training; and produce and distribute the use of education. We will evaluate success by the number of classes conducted, number of short presentations given in support of the long-term viability of the program, number of individuals trained, number of organizations trained, educational materials produced and distributed, number of individuals certified, estimated pollutant reductions, Winter Maintenance Assessment reports/refinement and course evaluations.

Training & Tech Support for Maintenance Staff – 2016

Sponsor: Fortin Consulting, Inc.

Funding: Section 319 (Grant) \$249,971

Purpose: Reduce loading of nutrients and chloride to surface and groundwater from outdoor maintenance activities through presentation of 70-80 BMP instruction workshops (Winter Maintenance for Roads, Winter Maintenance for Sidewalks and Parking Lots, Level 2 Winter Maintenance and Turfgrass Maintenance); 3 webinar events to serve as updates or more detailed information to the BMP information given to those already trained; 3 field information exchanges or demonstrations targeted on particular BMPs that show potential for large reductions in chemical use and identification of new techniques and technologies by maintenance and appropriate environmental professionals, with inclusion of these into workshops if warranted.

Turf and Winter Maintenance Training Amendment – 2016

Sponsor: Fortin Consulting, Inc.

Funding: Section 319 (Grant) \$15,000

Purpose: This grant amendment funding providing an additional 3 turfgrass maintenance classes, 2 roads classes and 2 parking lot maintenance classes, and a 2 hour presentation at the Minnesota Chief Engineers Guild Annual Conference. We were able to train an extra 114 maintenance professionals, public and private, who engage in winter and summer activities which lead to the introduction of nutrients/phosphorus and chloride into the environment. We also offered the MPCA test for voluntary Level 1 Certification. Past in-class exercises and surveys shows a minimum reduction of 20% in chlorides and 35% reduction of phosphorus.

Cedar River Basin

Project completed

Effectiveness of Targeted Dobbins Creek BMPs



Saturated buffer completed at Tapp Farm

Cedar River Watershed

Effectiveness of Targeted Dobbins Creek BMPs

The Dobbins Creek watershed has been a community priority for many decades, in Mower County and in the Austin vicinity. That continued with the combination of this Section 319-funded project, with an accelerated implementation grant project from the BWSR, from 2015 to 2018. Local project leadership and management is coordinated through the Mower SWCD and Cedar River Watershed District. The Section 319-funded portion of the project helped to conduct water quality monitoring, design “treatment train” BMPs, and develop protocols that can be expanded to other areas in the larger watershed and region. The project was successful because of local leadership that involved private landowners, businesses, and many governmental groups.

Project highlights

- The overarching goal was development of a systems-approach to watershed management, with the implementation of water storage and soil conservation practices that would change water quality of the streams. Longer-term monitoring is required to track effectiveness, and this project helped to meet that objective, during the project’s term. The partnership also discovered that the scale of some of the monitoring projects also needed to be reduced, if actual and meaningful changes were going to be observed. While aspects of the project covered the entire watershed, other elements were focused on smaller sub-drainage units. However, the BMP adoption that occurred in the focus areas was significant and unprecedented for this area. Adoption rates were high and the landowners were engaged in adopting practices and being a part of an active improvement project. The project success lies in the comprehensive work that all partners contributed to help create opportunities for voluntary BMP implementation on private lands.
- The only downside was that the grant was relatively short term, and some people involved during this phase have moved into new roles and positions.

Partnerships

- Cedar River Watershed District – local project levy funding and staffing resources for project



Saturated buffer construction at Tapp Farm

management, landowner outreach, and communication

- Hormel Foundation – funding support reflecting local interest from the community
- U.S. Department of Agriculture partners – key program assistance including Mississippi River Basin Initiative and National Water Quality Initiative (NWQI)
- DNR – in-channel and stream bank technical assistance and permitting
- BWSR – provided key grant funding through CWF for BMP implementation and State matching dollars
- MPCA – grant formation, project technical assistance, financial review and reporting
- UMN – Department of Biosystems and Bioproducts – subwatershed assessments, monitoring, and protocol development
- Minnesota Valley Testing Laboratory – water sample analysis
- Watershed Recovery, LLC – BMP analysis and protocol developments
- Barr Engineering – Design and engineering services

Financial information

Funding type: Section 319

Grant amount: \$297,189

Matching funds: \$429,399

Contact information

Justin Hanson, Cedar River Watershed District

2508 21st Ave NW

Austin, MN 55912

507-434-2603, justin.hanson@mowerswcd.org

MPCA project manager: Bill Thompson

Cedar River Basin

No active projects

No projects were awarded in 2019

Des Moines and Missouri River Basins

Project completed

Heron Lake Watershed

WFDMR Targeting and Prioritizing Endeavor



Des Moines River – Headwaters

Heron Lake Watershed

WFDMR Targeting and Prioritizing Endeavor

The West Fork Des Moines River (WFDMR) watershed is part of the Western Corn Belt Plains and Northern Glaciated Plains ecoregions. The watershed extends across seven counties: Murray, Cottonwood, Jackson, and Nobles and small portions of Pipestone, Lyon, and Martin. It covers an area of 1,333 mi². Its principal source is Lake Shetek. The river flows from the Lake Shetek outlet near Currie in a southeasterly direction for 94 miles to the Minnesota/Iowa border and eventually enters the Mississippi River at Keokuk, Iowa.

Project highlights

- Point and non-point source pollution, intensive tillage, non-compliant septic systems, feedlots, and urban stormwater runoff are prevalent throughout the WFDMR watershed. The Prioritize, Target, and Measure Application (PTMApp) that is the result of the grant effort will be invaluable in assisting local units of government within the watershed to identify the most cost-effective BMPs and the best locations for pollution reduction. This information will be used in grant applications and watershed planning efforts.
- Locating the sources of sediment, phosphorus, and bacteria is integral to reducing the effect they have on a waterbody. Houston Engineering, Inc. (HEI) was hired to complete the WFDMR Targeting and Prioritizing Endeavor. This resulted in a set of data that is the most cost-effective for the implementation of BMPs for all identified priority resources. The results were expressed as the maximum reduction of a water quality contaminant (e.g. sediment, phosphorus) at a priority resource (e.g. an impaired stream) for a given level of investment. This optimized BMP cost-effectiveness will serve as the measuring component for project specific evaluation of BMPs. This project included measuring water quality benefits from both existing conservation efforts and future targeted opportunities to implement BMPs. It also provides an estimate of the likely reduction that can be achieved through implementation of suitable practices at priority resources.

Partnerships

- Heron Lake Watershed District (HLWD): project sponsor, project staff, project administration, and in-kind contribution
- HEI: complete PTMApp for the WFDMR Targeting and Prioritizing Endeavor

Financial information

Funding type: CWP grant

Grant amount: \$21,941

Matching funding: \$29,038

Contact information

Jan Voit, District Administrator
Heron Lake Watershed District
PO Box 345

Heron Lake, MN 56137

507-793-2462

jvoit@hlwdonline.org

MPCA project manager: Katherine Pekarek-Scott

Des Moines and Missouri River Basins

Active projects

Des Moines River Basin

Des Moines River – Headwaters

Heron Lake TMDL Nutrient Reduction Project – 2016

Sponsor: HLWD

Funding: CWP (Loan) \$450,000

Purpose: This project will implement 30 SSTS upgrades in the Heron Lake Watershed, resulting in an estimated annual reduction of 304 pounds of phosphorus, 3.2 tons of sediment, and 807 pounds of nitrogen. Septic system upgrades are recommended in the WFDNR and Heron Lake TMDL Implementation Plan.

West Fork Des Moines River

South Heron Lake TMDL Implementation – 2018

Sponsor: HLWD

Funding: Section 319 (Grant) \$122,125

Purpose: The primary purpose of the South Heron Lake TMDL Implementation is to reduce phosphorus entering South Heron Lake. To accomplish this purpose, the HLWD intends to restore and stabilize 3,300 linear feet of streambank in the JD 3 system that outlets directly into South Heron Lake. In addition, two wetland restorations will be completed and nine alternative side inlets will be installed. The outlined practices would provide a TP load reduction of 895.2 pounds annually, resulting in a 3.5% reduction towards the overall goal.

Missouri Basin

No projects active in Missouri Basin

Lake Superior Basin

Project completed

St. Louis River Watershed

Port Authority Stormwater Study and Concept Design



Lake Superior

St. Louis River Watershed

Port Authority Stormwater Study and Concept Design

Identify and develop a concept design for a structural BMP to be implemented in the future at the Clure Public Marine Terminal. The BMP discharge will meet stormwater benchmark monitoring values and reduce the discharge of applicable Great Lakes Initiative pollutants to St. Louis Bay.

Financial information

Funding type: CWP grant

Grant amount: \$24,000

Matching funds: \$24,000

Contact information

Deborah DeLuca

Government & Environmental Affairs Director

Duluth Seaway Port Authority

1200 Port Terminal Drive

Duluth, MN 55802

218-727-8525

ddeluca@duluthport.com

MPCA project manager: Brian Fredrickson

Lake Superior Basin

No active projects

No projects were awarded in 2019

Lower Mississippi River Basin

Projects completed

Cannon River Watershed

Building a Culture of Citizen Engagement

Lower Mississippi River – Twin Cities Watershed

Lower Prior Lake Protection Project Implementation

Lower Mississippi River – Winona Watershed

Downtown Winona Pre-Mississippi River Rain Garden

Zumbro River Watershed

Zumbro River Ultra-Urban Vol-TSS-FeC Reduction



Lower Mississippi River – Winona Watershed

Cannon River Watershed

Building a Culture of Citizen Engagement

This grant titled “Building a Culture of Citizen Engagement” was developed in partnership between the Cannon River Watershed Partnership (CRWP), the UMN’s Department of Forest Resources and Center for Changing Landscapes, and the MPCA. The CRWP and these partners researched effective means of community and civic engagement related to water quality, watershed issues, and strategies for restoring impaired waters. These efforts were focused in two small watershed areas: Circle Lake and the Waterville area lakes.

The main project activities included usually one-hour long one-on-one interviews with area residents and leaders in these subwatersheds, community meetings, brief individual surveys and follow-up with folks via the mail, online, or local newspaper articles. The premise for this project was based on the previous research by the UMN’s Department of Forestry Resources’ 2013 “Cannon River Watershed Landowner Survey” as a baseline for a strategic capacity-building program. The communities this project focused on now have worked on the foundation to build their community leadership capacity and have deepened their group and individual connections with CRWP so that we may be able to assist in these areas down the road based upon the strong relationships this project laid. The waterbodies this project focused on were both inside the Cannon River Watershed. The first subwatershed was Circle Lake watershed. The Whitewater/Waterville Creek watershed that straddles the border of Waseca and Le Sueur Counties was the second subwatershed that was the focus of this project. The completed Cannon River Watershed WRAPS and water quality models may be used to provide further water quality information and context for the project watersheds.

Project highlights

- CRWP staff used interview questions developed by UMN partners to intensively interview (12) community members. These interviews gave us new insight into the clean water challenges facing these small town and rural residents. The interviews also identified community leaders who could lead future clean water projects and policy initiatives.



Public meeting

- The two community meetings in Waterville and two meetings in Circle Lake were also highlights of the project. Meeting participants were excited to hear about water quality data pertaining to their local lake. They also took a much shorter survey that we used to “ground truth” some of the things we found in the more intensive hour-long interviews. While the intensive interviews gave us some history about water issues in the region, the community meetings added to our knowledge, as there were people in the meeting who had lived on their lake for 40 years and seen the water change in that time.

Partnerships

- UMN Department of Forest Resources
- Center for Changing Landscapes
- Circle Lake Association
- Waterville Lakes Association
- St. Olaf College Academic and Civic Engagement Office
- MPCA

Financial information

Funding type: Section 319

Grant amount: \$54,584

Matching funds: \$45,673

Contact information

Kristi Pursell, Executive Director

Cannon River Watershed Partnership

710 Division St.

Northfield, MN 55057

507-786-3913

MPCA project manager: Justin Watkins

Lower Mississippi River-Twin Cities Watershed

Lower Prior Lake Protection Project Implementation

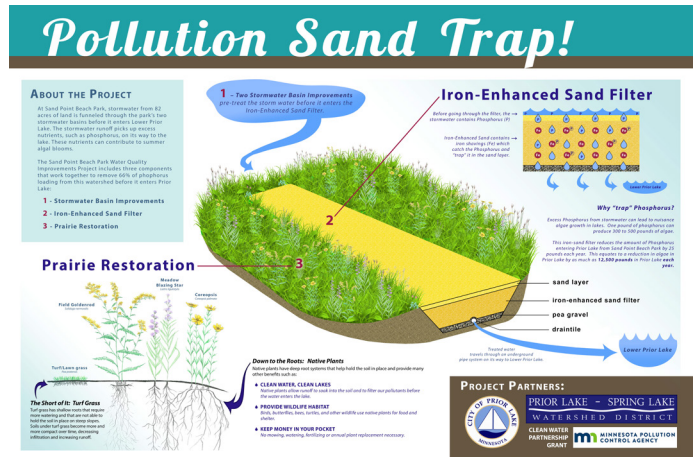
Lower Prior Lake is an important recreational and ecological resource in Scott County with a public boat landing and swimming beach. The lake drains to the Lower Minnesota River through an outlet channel. Although Lower Prior Lake currently meets water quality standards, it is located downstream of two impaired lakes. In order to maintain and improve the water quality, a CWP Diagnostic Study was completed in 2013 which found that over half of the drainage area receives insufficient to no treatment of phosphorus in runoff before discharging to Lower Prior Lake. The study set a water quality goal of reducing phosphorus loading by 10% within 10 years by implementing water quality projects.

Project highlights

- This grant project resulted in the construction of five BMPs that together reduce the phosphorus loading to Lower Prior Lake by 33.6 lbs/yr. This meets the goal listed in the 2013 CWP Diagnostic Study which recommended a 10% reduction in phosphorus loading (33 lbs/yr). One pound of phosphorus can produce up to 500 pounds of algae, so this project could prevent as much as 16,800 pounds of algae growth per year.

Partnerships

- City of Prior Lake
 - Landowner for all five projects
 - Contributed cash match for Watzl’s Beach, Fish Point Park and Sand Point Beach Park
 - Contributed in-kind match for all five projects
 - Project manager for the Watzl’s Beach and Sand Point Beach Park projects
- Prior Lake-Savage Public School District
 - Organized student volunteers for native plantings at Fish Point Park
 - Provided outreach & educational opportunities
- Minnesota Conservation Corps
 - Provided in-kind labor at Watzl’s Beach
 - Provided in-kind labor at Fish Point Park



Financial information

Funding type: CWP grant
 Grant amount: \$142,521
 Matching funds: \$291,237

Contact information

Maggie Karschnia
 Water Resources Project Manager
 4646 Dakota Street SE
 Prior Lake, MN 55372
 952-447-9808, mkarschnia@plslwd.org
 MPCA project manager: Chris Zadak

Lower Mississippi River-Winona Watershed

Downtown Winona Pre-Mississippi River Rain Garden

Stormwater runoff from urban areas along the lower Mississippi River can be a source nutrients and other contaminants that cause water quality problems. The goal of this project was to develop an urban rain garden in the City of Winona designed to catch and filter stormwater as well as serve as a model for others to replicate.

This project removed an incorrectly sloped, 100% impervious parking lot surface. It regraded and resurfaced the parking lot to direct runoff into a central rain garden planted with deep-rooted native vegetation that filters pollutants such as oil, grease, dirt, debris, broken glass, road salt, sand and unseen nutrients before the runoff reaches Winona's stormwater system and ultimately the Mississippi River. The rain garden serves to slow the velocity of runoff and reduce the likelihood of flooding which is a concern in Winona.

Project highlights

- Rain garden was successfully installed
- This project will serve as a demonstration for what can be done in other areas in Winona to address urban stormwater runoff
- Signage near the project will support education of the public
- Estimated pollution reduction includes 89 lbs/yr of sediment
- Other expected pollutant reductions include metals, nitrogen, phosphorus, organics, and bacteria

Partnerships

- City of Winona
- Bluff Country Coop, Winona MN

Financial information

Funding type: CWP grant

Grant amount: \$36,366

Matching funds: \$38,156

Contact information

Myron White, Development Coordinator

Port Authority of Winona

207 Lafayette Street, PO Box 378

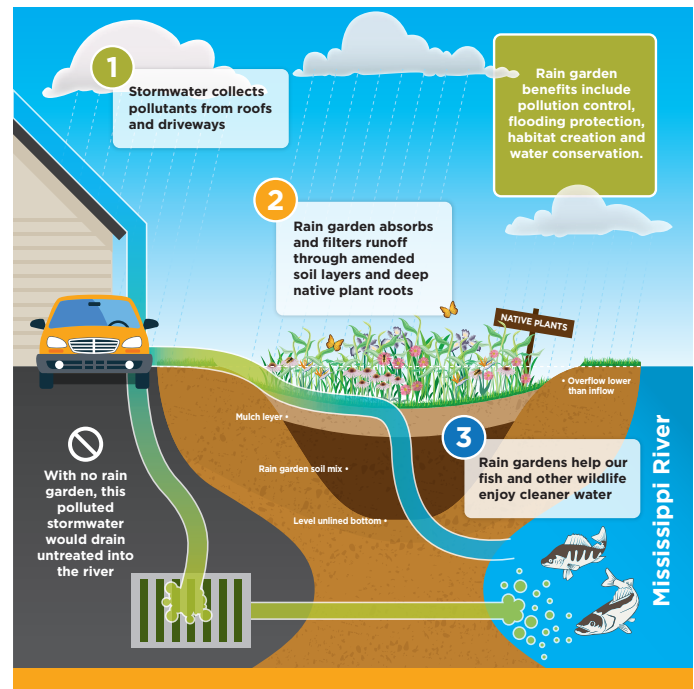
Winona, MN 55987-0378

507-457-8250, mwhite@ci.winona.mn.us

MPCA project manager: Mark Hanson

RAIN GARDEN

Built and maintained in partnership by the City of Winona, The MN Pollution Control Agency and Bluff Country Co-op



A rain garden is a planted depression that allows rainwater runoff from impervious urban areas, like roofs, driveways, walkways, and parking lots, the opportunity to be absorbed. This reduces rain runoff by allowing stormwater to soak into the ground as opposed to flowing into storm drains.

Rain garden explanation

Zumbro River Watershed

Zumbro River Ultra-Urban Vol-TSS-FeC Reduction

The South Fork Zumbro River and its tributaries are impaired for turbidity and fecal coliform (FC) bacteria. The South Fork Zumbro River is the main receiving water for Rochester's highly-impervious, "ultra-urban" downtown area, but Cascade Creek and Bear Creek also receive runoff from the project area.

The downtown area developed between about 1850 and 1950 – long before stormwater quality and quantity control requirements existed. As a result, this area has many above and below-ground constraints that may preclude onsite volume control, which is an important tool to reduce downstream river bank destabilization and sediment loading. To be well-positioned to encourage the adoption of green infrastructure practices when public and private redevelopment projects are proposed downtown, the City needs to know what areas will likely support stormwater infiltration and storage.



Overview of nearly completed demo stormwater system.



City of Rochester's booth on stormwater management

In addition to delineating these areas, volume control practices need to be demonstrated to help "sell" their effectiveness and attractiveness and to clarify their maintenance needs.

The City just completed a street reconstruction project west of downtown that incorporated some infiltration BMPs, so a small step has been taken to help create a green infrastructure vision for public projects. There have been no private green infrastructure projects associated with downtown redevelopment.

Project highlights

- The development of a geographic information system (GIS)-based volume control feasibility map to assist developers and engineers to conduct site-specific assessments for volume control potential.
- 2016 Urban Prototyping Festival was an opportunity for the City of Rochester and IBM to explore technology integration with stormwater management systems.
- Thursdays on First and Third Summer Market and Music Festival was an opportunity for the City of Rochester to have a booth and interactive public art rainscape that facilitated stormwater education and raised awareness of the demonstration stormwater project planned for construction in 2018.
- Construction of the demonstration stormwater system that is highly visible, interactive and educational.

The construction of a high-profile demonstration stormwater management project and a GIS-based volume control feasibility map that together will

help educate and provide objective information for developers and engineers to implement stormwater volume control measures in the ultra-urban downtown of Rochester.

Partnerships

- The results of the public education and outreach events have strengthened the connections between the City's stormwater educators, the Rochester Downtown Alliance, the Rochester Arts Center and the Destination Medical Center Economic Development Agency.
- All of these downtown entities provide leadership in the downtown development community and have a heightened sense of awareness for providing stormwater management solutions that enhance the public realm.
- The City explored a technology partnership with IBM through the Urban Prototyping Festival. IBM's Bluemix technology was prototyped in 2016, but ultimately not selected to be part of the permanent demonstration project constructed in 2018.



Urban Prototyping Festival

Financial information

Funding type: Section 319

Grant amount: \$300,000

Matching funds: \$445,898

Contact information

Megan Moeller, Communications Coordinator
Cannon River Watershed Partnership
201 Fourth St. SE, Room 108
Rochester, MN 55904
507-328-2436
MPCA project manager: Justin Watkins

Lower Mississippi River Basin

Active projects

Projects involving multiple watersheds

Reducing Bacteria from Southeast Minnesota Feedlots – 2017

Sponsor: Southeast Minnesota Water Resources Board (SEMWRB)

Funding: Section 319 (Grant) \$336,000

Purpose: A successful strategy used in the basin to reach runoff reduction goals has been to build local capacity for accelerating producer compliance with state feedlot rules. Employing this strategy in previous regional feedlot projects, SEMWRB completed runoff reduction designs for over 1,500 feedlots, and implemented over 780 feedlot fixes. SEMWRB will build upon this strategy to target efforts to those remaining open lot feedlots under 500 animal units that pose the greatest bacteria pollution potential and priority areas identified in local WRAPS and TMDL implementation plans. This project will target a goal of 30 open lot feedlots. Based on the annual reductions from a previous grant of similar size and scope we estimate the following reductions per year for this project: 71,000 pounds chemical on demand (COD); 1,300 pounds; 3,900 pounds nitrogen; 16,000 pounds biochemical oxygen demand (BOD) and 2.0+E17 fecal colony forming units (CFU).

Cannon River

Steele County Septic System Loan Program – 2012

Sponsor: Steele County

Funding: CWP (Loan) \$700,000

Purpose: This project will promote and install 70 SSTSS in Steele County.

Lower Mississippi River – Lake Pepin

Mississippi River Lake Pepin Watershed WRAPS Implementation – 2016

Sponsor: Goodhue County SWCD

Funding: Section 319 (Grant) \$87,500

Purpose: Implement BMPs that will effectively make progress towards the reduction goals of 20% total suspended solids (TSS) as well as the reduction of the other pollutants, specifically through grade stabilization structures, terraces, and WASCOBs.

Lower Mississippi River – Winona

Whitewater Watershed Nitrogen Reduction Project – 2017

Sponsor: Whitewater Joint Powers Board

Funding: Section 319 (Grant) \$232,825

Purpose: The priority resource of concern of this project is surface water and project work will focus on nitrogen load reduction through BMPs that minimize nitrate loss through leaching while optimizing row crop yield and maximizing rate of return for participating farmers. Project initiated BMPs include Nutrient Management and Cover Crops. The critical nitrate source areas for this project include nine upstream HUC 14 subwatersheds within the Middle and South Forks that are predominately row-cropped. This project will enhance and complement current nitrogen reduction activities in the region. If these adoption rates were applied to the entire watershed, 504,000 lbs/yr would be achieved. A successful nitrogen reduction project will contribute a 126,000 lbs/yr reduction for the entire watershed. An approximate 13% reduction in nitrogen loading for the Mississippi River-Winona HUC-8 suggests a proportional reduction for the Middle and South Forks of the Whitewater Watershed, which would approximate goal attainment per respective TMDLs.

Zumbro River

Middle Fork Zumbro River Critical Source Area Restoration – 2016

Sponsor: Dodge SWCD

Funding: Section 319 (Grant) \$219,000

Purpose: Implement 16-18 sediment reducing projects in two targeted subwatersheds with an estimated 200-246 tons of TSS per year reduction to the Middle Fork Zumbro River.

Minnesota River Basin

Projects completed

Projects involving multiple watersheds

GBERBA Conservation Drainage Partnership Program
Greater Blue Earth Nonpoint Pollution Initiative

Chippewa River Watershed

Chippewa River Watershed Protection Project

Lower Minnesota River Watershed

Carp Management in Spring Lake & Prior Lake

Minnesota River – Mankato Watershed

Middle Minnesota Watershed SSTS Loan Project
Renville County MN River Mankato Watershed Protection

Minnesota River – Yellow Medicine River

Hawk Creek Watershed Dissolved Oxygen Restoration Project

Pomme de Terre Watershed

Pomme de Terre WRAPS Implementation Plan

Redwood River

Redwood River Turbidity Reduction Project



Wetland restoration by Pelican Lake

Project involving multiple watersheds

GBERBA Conservation Drainage Partnership Program

Thirty-nine stream reaches in the Greater Blue Earth River Basin (GBERB) were listed as impaired for turbidity. Located in Southern Minnesota, the GBERB consists of the Blue Earth, Le Sueur, and Watonwan major watersheds. Agricultural row crops dominate the landscape with 85% of the land use in the basin. Not only are the DNR protected waters conveying water, but so are an additional 719 miles of public open ditches that extend into headwater areas. Achieving water quality goals in the 39 impaired stream reaches of the GBERB requires protection of ditches in headwater areas. Greater Blue Earth River Basin Alliance (GBERBA) staff and partners saw the need for a more focused, coordinated effort to address this problem.

Project highlights

- There have been strengthened partnerships between staff and elected officials in the watershed. Local Drainage Staff implementing the alternative side inlets have numerous reports of positive landowner interactions regarding the placement and design of the BMP. The practice allows for better field operations for the landowner and a water quality benefit for the public.
- The 119 new practices will prevent a total of 452.1 tons of sediment and 519.9 pounds of phosphorus per year from reaching the surface waterbody. An engineering worksheet to facilitate quick estimates for Side Inlet projects and a “Conservation and Drainage Projects” booklet were developed during the grant period to continue to assist the effort for years to come.

Partnerships

- This project helped strengthen the partnership between the County and SWCD staffs within the GBERBA. GBERBA members include County and SWCD staffs from Blue Earth, Brown, Cottonwood, Faribault, Freeborn, Jackson, Le Sueur, Martin, Waseca, and Watonwan Counties. We also had an opportunity to develop a partnership with the Water Resources Center at Minnesota State University – Mankato and a local engineering firm in ISG based out of Mankato, Minnesota.



Greater Blue Earth River Basin ditch area drainage project

Financial information

Funding type: CWP grant

Grant amount: \$147,200

Matching funding: \$157,472

Contact information

Kay Gross

GBERBA Administrative Coordinator

339 9th St

Windom, MN 56101

507-831-1153, Ext. 3, kay.clark@windomnet.com

MPCA project manager: Paul Davis

Project involving multiple watersheds

Greater Blue Earth Nonpoint Pollution Initiative

During the five years of this grant, agricultural and urban BMPs were completed throughout Faribault County. BMPs completed in agricultural settings focused on sediment, while urban BMPs focused on volume reduction. During this timeline a TMDL/WRAPS was completed for the LeSueur Watershed and monitoring started in the Blue Earth Watershed.

Project highlights

- Projects were completed throughout the watershed with willing landowners, individual project monitoring was not completed. The work plan focused on the larger Greater Blue Earth area for civic engagement while BMP implementation occurred at the county level.
- Four demonstration projects were completed: Schrader Enterprises, highlighting a stormwater treatment train philosophy; Grandgenett Dental Demonstration, demonstrates permeable patio and bioswales; Blue Earth Community Foundation, created open Green Space; and, an agricultural rain garden to show how urban stormwater practices can be used in agricultural settings. All total Demonstration projects utilized \$25,000 in grant funding and generated \$24,787.79 in cash match. In total, the practices generated 89.23 T/yr of TSS reductions, 9.13 lbs/yr of TP, and 15.20 cubic acres of volume (cu/ac volume) per year. These reductions came at a cost of \$202.93 tons of TSS and \$1,983.17/3 pounds of TP and \$1,191.21 cu/ac volume reduction.
- Urban stormwater projects include permeable pavement, six rain gardens, native plantings, and a swale. Urban stormwater projects utilized \$25,000 in grant funding and generated \$15,504.25 in cash match. The practices generated 290 T/yr of TSS reductions, 1.6 lbs/yr of TP, and 9.82 cu/ac of volume per year.
- General BMPs include a rain garden, native plantings, and contracts for over 3,550 acres of cover crops. General BMP projects utilized \$54,000 in grant funding and generated \$59,524.85 in cash match. The practices generated T/yr of TSS reductions and lbs/yr of TP. These reductions came at a cost of \$6.97 tons of TSS, \$22.32 pounds of TP and \$7.60 per acres.



Civic Engagement implementation

- Drainage BMPs include 87 conservation intakes with 12 landowners and 24 side inlets were implemented on County Ditch 3 (CD). Drainage projects utilized \$50,000 in grant funding and generated \$73,451.01 in cash match. All total the practices generated 3,386.35 T/yr of TSS reductions and 4,021 lbs/yr of TP. These reductions came at a cost of \$14.77 per ton of TSS and \$12.43 per pound of TP.
- Cumulatively, this grant produced substantial pollution reduction numbers: 7,536 tons of TSS, 5,142 pounds of TP, and 25.05 per cu/ac volume. The cumulative reductions were achieved at a low cost of \$20.43 per ton TSS, \$29.95 per pound TP, and \$998 per cu/ac volume.
- SWCD staff feels this project was a tremendous success. The results of the activities completed with this grant will go well beyond the timeline of this grant.

Partnerships

Faribault County SWCD staff could not have completed this grant without its partners. The assistance of the Faribault County Soil Health Team was vital in the successful completion of both civic engagement and BMP implementation. Staff coordinated the ideas of the team and provided the technical assistance needed to implement their ideas.

- Faribault County
- Faribault County Drainage Department
- Faribault County Planning and Zoning
- Cities in Faribault County
- Faribault County Soil Health Team

- South Central Drainage Group

Financial information

Funding type: CWP grant

Grant amount: \$364,163

Matching funding: \$377,281

Contact information

Michele Stindtman

Program Administrator

Faribault SWCD

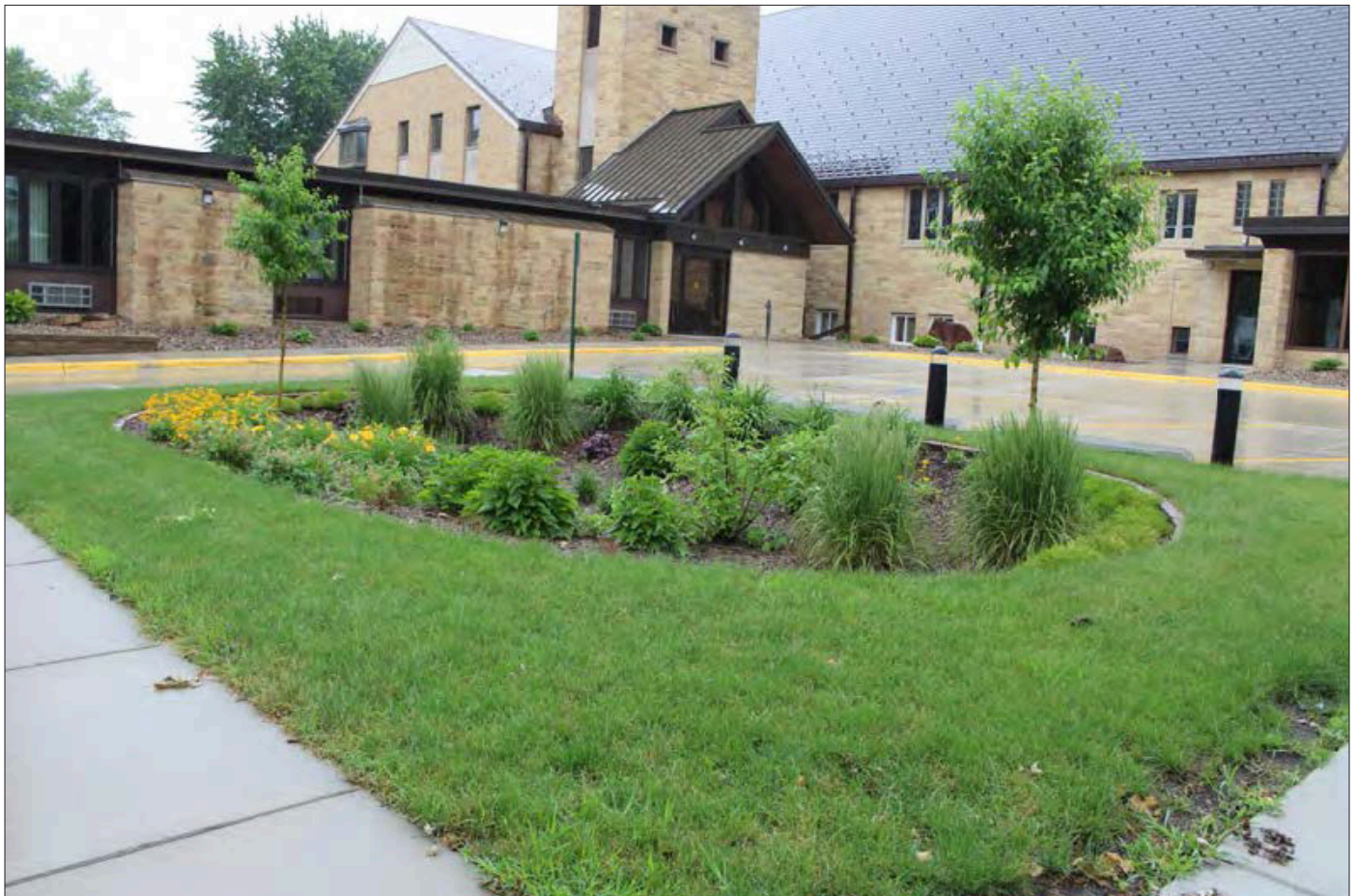
415 S. Grove St., Ste. 8

Blue Earth, MN 56013

507-526-2388

michele.stindtman@co.faribault.mn.us

MPCA project manager: Paul Davis



Greater Blue Earth River Basin rain garden project

Chippewa River Watershed

Chippewa River Watershed Protection Project

This grant focused on two areas for protection located in the Chippewa River Watershed, a major tributary of the Minnesota River, and referenced in the Minnesota River Basin Plan (MPCA). The first focal area for protection are the three HUC 12s in northwest Kandiyohi County that support Games, Andrew, and Florida Lakes in the Shakopee Creek subbasin of the Chippewa River.

Games, Andrew, and Florida Lakes are among the few larger and deeper mesotrophic lakes in the southern part of the state that are not impaired for excessive nutrients and currently meeting beneficial uses for aquatic life and aquatic recreation. Identified upstream pollution sources come include tributaries CD 27 and CD 29 which feed Norway Lake and impact the entire chain of Games, Andrew, and Florida Lakes. The continued pollutant loading from CD 27 and CD 29, along with internal loading from Norway Lake, which is impaired for excessive nutrients, poses a significant and immediate threat to this chain of lakes. Sources of NPS pollution are overland runoff carrying sediment, nutrients and bacteria, from both agricultural and urban (developed shoreline) areas, and erosion.

The second focal area for protection are the four HUC 12s of Dry Weather and Spring Creeks, tributaries of the Chippewa River located in Chippewa County. The last few miles of Dry Weather Creek are one of only a few natural stream reaches that remain in Chippewa County. These need protection to prevent impairments. Spring Creek is also unimpaired, meeting the same beneficial uses as Dry Weather, and is located in the Montevideo, Minnesota, well-head protection area.

Project highlights

Based on the final implementation activities, most of the measures for success were met and/or exceeded.

- Streambank stabilization was exceeded by 966 feet.
- Livestock exclusion fencing was exceeded by 3.12 miles.
- Buffer strips became the law during this grant period and therefore, the funds were not used for this practice.
- Additional BMPs were implemented: 100 acres of cover crops, 18.5 acres of wetland restoration, and



Before – Chippewa River Watershed protection project

70 acres of upland native plantings with a wetland restoration.

- Counties implemented a total of 27 septic system upgrades, six fewer septic system upgrades than projected. However, it was close to the original goal of 33 septic system upgrades.

The Chippewa River Watershed Project had a turnover in staff. The Executive Director retired in April 2018, and the Watershed Specialist resigned and took a different job in June 2018. A new Watershed Coordinator was hired in the middle of June 2018. This transition occurred in a critical time at the completion of this grant project. Much of the information for the remainder of this project was unorganized and had to be organized to bring this grant project to a close. Much of this final report was compiled, edited, and completed by the MPCA staff working on the project.

The following pollutant reduction estimates were taken from the work plan. Using BWSR's calculation tools, it is estimated that 235 feet of streambank stabilization reduced phosphorus by 68 lbs/yr and delivery of sediment by 59 T/yr. Shoreline Restorations reduced phosphorus by 35.05 lbs/yr and sediment by 41.25 T/yr, buffer strips reduced phosphorus by 3,416 lbs/yr and sediment by 2,867 T/yr, sediment basins reduced sediment by 75 T/yr and reduced phosphorus by 90 lbs/yr, livestock exclusion fencing saves 3 T/yr of soil and reduces phosphorus by 3 lbs/yr, and cover crops reduce 620 lbs/yr of phosphorus and reduced sediment by 414 T/yr.

Although there were no final pollutant reduction estimates completed due to staff turnover, the projects that were implemented would have a positive effect to improve water quality in the reduction of pollutants such as sediment, nutrients, and bacteria along with creating some wildlife habitat and water storage.

Partnerships

- Land Stewardship Project – technical services provider, lead and implementation of 104,000 feet of livestock exclusion fencing project.
- Chippewa SWCD – technical service provider, lead of the three sites of the 1,000 feet of streambank stabilization project.
- Chippewa County Highway Department – lead and implementation of 200 feet of streambank stabilization project on Highway 35.
- Chippewa County Drainage Authority – lead and implementation of riprap erosion control along with 13 drop inlet pipe structures on CDs 16 and 22.
- Kandiyohi SWCD – technical service provider – lead and implementation of 100 acres of cover crops and 18.5 acres of wetland restoration.
- Swift SWCD – technical service providers.
- U.S. Fish and Wildlife Service (USFWS) – lead and implementation of 70 acres of upland native planting/wetland restoration.
- Chippewa County Land Resources Office – SSTS Loan Management, installed 13 SSTS.
- Kandiyohi County Land Resources Office – SSTS Loan Management, installed 14 SSTS.

Financial information

Funding type: CWP grant and loan

Grant amount: \$262,842

CWP Loan funds: \$298,729

Matching funds: \$33,915



After – Chippewa River Watershed protection project

Contact information

Emma Volz, Watershed Coordinator
 Chippewa River Watershed Project
 629 11th St., Ste. 17
 Montevideo, MN 56265
 320-321-1717, emmavolz@chippewariver.org
 MPCA project manager: Mark Hanson

Lower Minnesota River Watershed

Carp Management in Spring Lake & Prior Lake

In 2002, Spring and Upper Prior Lakes were listed on Minnesota's 303(d) List of Impaired Waters for nutrient/eutrophication biological indicators, and do not currently meet two of the three state eutrophication standards. Common carp management is a way to significantly reduce estimated internal phosphorus loading.

The goal accomplished with this project was to improve the water quality of Spring, Upper Prior, and Lower Prior Lakes by decreasing TP concentrations through the use of integrated pest management to effectively manage the common carp populations. Activities completed include:

1. Tracking carp to identify spawning grounds, migration routes, and aggregations areas.
2. Installing barriers to prevent carp from accessing spawning areas.
3. Removing a significant population of the carp to reduce internal loading.
4. Create an integrated pest management plan for carp to guide future management.

Project highlights

Partners in completing the projects were the City of Prior Lake, the Prior Lake Association (PLA) and the Spring Lake Association (SLA). The City owns the property where the Northwood's carp barrier was designed; the PLA helped with outreach, and the SLA contributed funding to purchase an YSI antenna for staff and volunteers to monitor carp.

This grant project resulted in the successful completing of the following:

- **Carp tracking:** Thirty (30) carp were implanted with radio-tags, which were tracked throughout the lakes to identify spawning grounds, migration routes, and aggregations areas.
- **Removal efforts:** Three successful seine events lead to the removal of approximately 32,000 pounds of carp from Spring Lake and 37,000 pounds of carp from Upper Prior Lake.
- **Carp barriers:** Based on information gained from tracking, five potential carp barrier locations were identified. Barriers were installed at three locations during the course of the project and design work was completed for two additional barriers.



Carp tagging

- **Community engagement:** The lake associations and City staff actively participated in tracking and removals. This project gained a lot of attention from the local paper and through social media.

Partnerships

- **City of Prior Lake:**
 - Landowner for two of the carp barriers
 - City staff participated in carp events
- **Prior Lake Association:**
 - Members volunteered boat and time for carp tracking
 - Volunteers attended carp seine events
 - Helped promote carp program on social media and through newsletter
- **Spring Lake Association:**
 - Contributed funding for a YSI antennae for volunteers and staff to track carp
 - Participated at carp events
 - Helped promote carp program through annual newsletter

Financial information

Funding type: CWP grant

Grant amount: \$67,323

Matching funds: \$80,529

Contact information

Maggie Karschnia, Water Resources Project Manager

4646 Dakota St. SE

Prior Lake, MN 55372

952-447-9808, mkarshnia@plslwd.org

MPCA project manager: Chris Zadak

Minnesota River – Mankato Watershed

Middle Minnesota Watershed SSTS Loan Project

Noncompliant septic systems are a source of bacterial contamination to surface waters in the Middle Minnesota Watershed. Water quality evaluations have indicated that waterbodies located in the watershed exceed established standards for FC and *E. coli* bacteria. Inadequately treated wastewater is a source of bacterial contribution and is often the result of failing septic systems. Many of these failing septic systems outlet by tile or surface runoff into a nearby drainage systems, road ditches or streams. The presence of bacteria can also signify the presence of other disease causing viruses, or protozoans, which threatens groundwater and drinking water resources. Properly functioning septic systems effectively treat bacteria, as well as other pollutants of concern.

Project highlights

- The goal of the Middle Minnesota Watershed SSTS Loan Project was to “Establish and administer a low interest septic loan program to provide financial assistance for landowners to upgrade noncompliant failing septic systems in the Middle Minnesota Watershed.” The Project utilized CWP State Revolving Funds (SRF) low interest loans to provide second-tier loans to landowners for the replacement or upgrade of noncompliant failing septic systems.
- The CWP grant for the project started on October 1, 2014, with an end date of September 30, 2017. The SRF Loans for the project started on October 14, 2014, with an end date of September 30, 2017. The project grant funds were used for the General Obligation Notes and bonding documentation required for each county to participate as a Loan Sponsor. Renville County served as the Project Sponsor for the Middle Minnesota Watershed SSTS Loan Project with Renville County Water Management staff coordinating the Project on behalf of the participating counties. Individual counties served as Loan Sponsors and administered the loan program within their respective county.
- Since the CWP grant expired, the Middle Minnesota Watershed SSTS Loan Project continued as a loan only project. An amendment to the Work Plan and Budget was approved extend the existing CWP loan

agreements and funds for one year for the following participating counties: Cottonwood (extended to 3/26/19), Redwood (extended to 4/21/19), and Renville (extended to 3/26/19). Nicollet County, which participated in the loan program previously, opted not extend the use of available loan funds.

Partnerships

- Cottonwood County
- Nicollet County
- Redwood County
- Renville County

Financial information

Funding type: CWP grant and loan

Grant amount: \$3,877

Loan amount: \$338,182

Contact information

Diane Mitchell

Assistant Director/Water Planner

Renville County

105 South 5th St., Ste. 311

Olivia, MN 56277

320-523-3760, dianem@renvillecountymn.com

MPCA project manager: Mark Hanson

Minnesota River – Mankato Watershed

Renville County MN River Mankato Watershed Protection

The goal of this project was to protect the waterbodies within the Renville County portion of the Minnesota River – Mankato Watershed from elevated nutrient levels, in particular phosphorus. A major focus of this project was to implement BMPs to protect waterways of beneficial use and prevent impairments and degradation. The proposed work area included those portions of the watersheds of Birch Coulee Creek, Purgatory Creek, Three Mile Creek, Fort Ridgely Creek, and Little Rock Creek that lie within Renville County and also the small areas between those respective watersheds, encompassing a total of 158,320 acres that drain directly to the Minnesota River. To address nutrients in surface waters coming from the most common origins of upland sources (eroding soils and runoff from fields, animal feedlots, and urban areas) and near-channel sources (ravines, gullies, bluffs, and streambanks), multi-beneficial, targeted BMPs were a priority in order to prevent impairments and degradation.

Project highlights

This project implemented 18 BMPs with 13 landowners and resulted in an estimated annual reduction of 727.56 pounds of phosphorus and 558.80 tons of sediment. The measurable outcomes identified in the workplan were exceeded. The primary outcome was to work with five landowners to implement BMPs with an estimated annual reduction of 680 lbs/yr of phosphorus and 255 T/yr of sediment.

- 3 bank/grade stabilizations
- 3 side inlets
- 2 WASCOBs
- 342.2 acres of cover crops
- 2 alternative intakes
- 4 lined/grass waterways

Hawk Creek Watershed Project (HCWP) staff produced and mailed five newsletters and nine postcards/letters to Minnesota River-Mankato Watershed residents. HCWP staff also held 14 meetings, 2 field days, 12 youth events, and several educational and outreach activities. The HCWP website was also active to provide information on current HCWP happenings, cost-share funding, and education and outreach.



Cost-share for cover crops

Partnerships

- BWSR: Staff participated in the HCWP Local Work Group (LWG) and provided educational, technical, and evaluation assistance.
- HCWP: Staff were responsible for overall grant program administration, including BMP implementation, education and outreach, budgets, and reporting.
- HCWP Board of Directors: The HCWP Board of Directors is comprised of one appointed County Commissioner from each of the three counties involved with the Project. The Board of Directors communicated regularly with HCWP staff to discuss and make decisions regarding financial, policy, and personnel issues. The Board also provided input into the issues, priorities, and restoration and protection strategies of the watershed.
- HCWP Citizen Advisory Committee: The Citizen Advisory Committee communicated regularly with HCWP staff.
- HCWP LWG: The LWG is made up of technical personnel from Renville, Chippewa, and Kandiyohi Counties, as well as state and regional agency representatives.
- Landowners: HCWP routinely works with landowners on BMP projects and has regular interactions with them through civic engagement activities
- Local media: The local media provided newspaper, online, and radio coverage of HCWP activities.
- DNR: DNR staff were a part of the LWG and assisted in project evaluation activities. The DNR also has permitting authority over in-stream restoration work and provided design specifications needed to perform streambank restoration work.

- MPCA: MPCA staff worked with HCWP staff to ensure efficient completion of grant activities.
- Natural Resources Conservation Service (NRCS): NRCS personnel participated in the HCWP LWG and provided educational, technical, and evaluation assistance.
- Renville County: The Renville County Board of Commissioners are supportive of this Project and County Commissioners continued to communicate with other Commissioners, citizens, and state and federal elected officials.
- Renville County SWCD: Renville County SWCD personnel provided technical assistance, helped with BMP promotion, and provided education and outreach.
- USFWS: Staff of the USFWS provided technical assistance for wetland restorations, land acquisition, habitat management, and educational activities.

Financial information

Funding type: CWP grant

Grant amount: \$306,750

Matching funds: \$306,750

Contact information

Heidi Rauenhorst, Coordinator

Hawk Creek Watershed Project

500 E. DePue Ave., Ste. 104

Olivia, MN 56277

320-523-3666, heidi@hawkcreekwatershed.org

MPCA project manager: Mark Hanson



Youth environmental education event

Minnesota River – Yellow Medicine River

Hawk Creek Watershed Dissolved Oxygen Restoration Project

The Hawk Creek watershed is comprised of a main tributary (Hawk Creek) and several other streams that flow directly into the Minnesota River. The HCWP work area includes Hawk, Chetomba, Sacred Heart, Beaver, Middle, Timms, Smith, Brafee's, and Palmer Creeks. An estimated 98% of the original wetlands in the watershed have been drained to increase agricultural land use. The highly manipulated hydrology within the watershed has resulted in a very effective drainage system which allows agriculture, the region's primary land use, to thrive in the middle to lower reaches of the watershed. This project addresses the nutrient phosphorus as it relates to the low dissolved oxygen (DO) impairment identified in the Lower Minnesota River Dissolved Oxygen TMDL Implementation Plan. Significant sources of phosphorus have been identified as coming from storm drain runoff, wastewater treatment plant effluent, ag-field runoff, livestock operations, and failing septic systems. Reduced phosphorus levels, increased base flow, and reduced sediment volume will be instrumental in correcting the impairment of low DO levels in the Minnesota River.

Project highlights

This project focused on implementation of BMPs in the Hawk Creek Watershed that elevate DO levels in watercourses by reducing phosphorus in agricultural and urban areas and/or increasing groundwater infiltration, thereby increasing stream base flows. This project implemented 19 BMPs with 16 landowners and resulted in an estimated annual reduction of 521.30 pounds of phosphorus and 292.08 tons of sediment. Public education and outreach was another major focus of this grant. HCWP staff also held 29 events/meetings/field days and participated in several educational and outreach activities, including public meetings, field days, workshops, youth activities, local water plan meetings, several trainings, distribution of HCWP and Citizen Monitor Network newsletters, postcards, brochures, and online resources, such as the HCWP website and Facebook page. Although the grant project is considered a success, the lower Minnesota River and impaired waters within the Hawk Creek Watershed is still not to ecoregion standards. The HCWP will continue the goals of BMP implementation and increased watershed

citizen involvement to improve the water quality of the watershed.

Partnerships

- BWSR
- Chippewa, Kandiyohi, and Renville Counties and SWCDs
- City of Willmar
- Eagle, Long, Foot, and Willmar Lake Associations
- HCWP staff and Board of Directors
- HCWP Citizen Advisory Committee
- HCWP Citizen Monitors
- HCWP LWG
- Landowners
- Local media
- State and federal agencies: DNR, MPCA, NRCS, and USFWS

Financial information

Funding type: Section 319

Grant amount: \$237,585

Matching funds: \$194,600

Contact information

Heidi Rauenhorst, Coordinator

Hawk Creek Watershed Project

500 E. DePue Ave., Ste. 104

Olivia, MN 56277

320-523-3666, heidi@hawkcreekwatersehd.org

MPCA project manager: Mark Hanson

Pomme de Terre River Watershed

Pomme de Terre WRAPS Implementation Plan

The Pomme de Terre Watershed underwent the first round of IWM in 2007 – 2009 which resulted in four lakes and six stream reaches being added to the 303(d) Impaired Waters List for parameters including turbidity, DO, nutrients, bacteria, macroinvertebrate/fish bioassessments, and impaired recreational and aquatic life value. The TMDL study conducted for the Pomme de Terre River indicated that a 53% reduction, 1,590 T/yr, in sediment at the mouth of the Pomme de Terre would be necessary in order to meet water quality standards. According to the WRAPS, the root cause of sediment loading the Lower Pomme de Terre River is livestock overgrazing and poor vegetation cover in riparian areas, upland soil erosion, bank erosion/excessive peak flows, and channelization.

The goal of the Pomme de Terre WRAPS Implementation Plan is to install BMPs to accomplish a reduction of 1,220 lbs/yr of phosphorous and 1,100 T/yr of sediments, monitor the Pomme de Terre River in Appleton, Minnesota, as well as the three main tributaries of the river, and educate local citizens on the importance of protection and restoration of our water resources.

Project highlights

Through the following practices, 15,937.59 lbs/yr of phosphorous and 467 T/yr of sediment was calculated to have been abated from entering waterways contributing to the Pomme de Terre River and other downstream resources from agricultural and urban non-point source pollution. Pomme de Terre River Association (PDTRA) collected data on the major tributaries of the Pomme de Terre River at MPCA and funding was utilized to provide education and outreach.

PDTRA and LGU partners implemented:

- 5 Agriculture Waste Pit Closures
- 12 Rain gardens
- 65 Feet of shoreline restoration
- 41 Water and Sediment Control Basins (WASCOBs)
- 1 Wetland restoration
- Developed website (www.pdtriver.org)
- County fair presentations and education
- Annual kayak run



County fair presentation

- Watershed bus tour and Section 319 project promotion
- Watershed education in classroom

Financial information

Funding type: Section 319

Grant amount: \$267,649

Matching funds: \$313,474

Contact information

Stephanie Adams

JPB Project Coordinator

Pomme de Terre River Association

12 Hwy 28 E., Ste. 2

Morris, MN 56267

320-589-4886, Stephanie.adams@pdtriver.org

MPCA project manager: Mark Hanson and Paul Wymar

Redwood River Watershed

Redwood River Turbidity Reduction Project

There are few naturally occurring lakes in southwestern Minnesota, limiting the area resident's recreational opportunities. Of special significance, Lake Redwood was created in 1902 when the Redwood River was impounded. At that time, Lake Redwood's sedimentation rate was 1.5 feet per year (ft/yr). Since that time, numerous conservation projects have been implemented and the sedimentation rate reduced to 0.13 ft/yr. The once prolific lake of 27' depth is now 2.8' deep on average. Excessive sediments have reduced the lake's use exponentially. The Redwood River itself provides swimming, boating and fishing opportunities however current identified impairments hinder and restrict its use by the public. The river is a regional priority due to its significance to Lake Redwood. Current impairments include Aquatic Recreation, Aquatic Consumption, and Aquatic Life for numerous stream reaches within the Redwood River watershed; many of the impairments stem from excessive sedimentation. The earliest turbidity impairment was listed in 2004. Lake Redwood sediment core data analyzed by the Minnesota Geological Survey reveal that more than 70% of the current loading stems from streambank erosion caused by increased hydraulic loading.

Collaboration between Redwood-Cottonwood Rivers Control Area (RCRCA), SWCD/NRCS staff from Lincoln, Lyon, Murray, Pipestone, Redwood and Yellow Medicine Counties, implementation of conservation BMPs, including WASCObS, grade stabilization structures and streambank stabilizations, is needed to address the excessive sediment. This project focuses on improving the turbidity impairments by reducing phosphorus and sediment pollutants within the Redwood River watershed.

Project highlights

- Successfully utilized the \$100,000 of cost-share assistance for BMPs with associated reductions in sediment and phosphorus of 939.39 lbs/yr and 966.52 lbs/yr respectively
- Unexpected partnerships arose due to the grant funding.
- March 29, 2017, a Soil Health Workshop was organized by the NRCS. David Brandt, a nationally recognized leader in cover crops was the keynote speaker and spurred incredible interest from the nearly 100 people who attended the workshop at the Marshall Golf Course.
- In addition to presentations of cover crop success stories, a rainfall simulator demonstration and hands-on slake testing of the landowner's own soil sample were conducted. Connections were made with past RCRCA cooperators to celebrate the 20th Anniversary of Redwood River Clean Water Project which began in 1995. This project resulted in eight cooperators installing 12 new conservation BMPs on the landscape within the Redwood River corridor and very near the main stem river. The reduction goals were surpassed which totaled 966.52 lbs/yr of reduced phosphorus and 939.39 T/yr of reduced TSS in the Redwood River.
- Due to Minnesota Buffer Law requirements, cooperators had already installed the required buffers prior to BMP installation. Civic engagement efforts reached out to new cooperators to provide information on conservation BMP cost-share funding available to them, connected with past cooperators to inform them of cost-share availability, and to commemorate the 20th Anniversary of the Redwood River Clean Water Project.
- Although considerable interest lies in soil health and cover crop technologies, cooperators still prefer the time-proven BMPs that help hold the soil on the land and prevent the sediments from entering our streams and rivers. After 20 years, it was suspected that newer BMPs were desired, however the theory was discredited by the survey results.

Partnerships

- Lincoln SWCD – \$200 donation to the Soil Health Workshop
- Lyon SWCD – \$200 donation to the Soil Health Workshop; technical assistance provided to the projects completed within Lyon County.
- Murray – \$200 donation to the Soil Health Workshop
- Redwood SWCD – technical assistance provided to the projects completed within Redwood County
- NRCS (Marshall Area Office) – \$300 donation to the Soil Health Workshop

- Yellow Medicine River Watershed District – \$200 donation to the Soil Health Workshop
- Minnesota Grazing Lands Conservation Association (GLCA) – \$200 donation to the Soil Health Workshop
- Minnesota Corn Growers Association – \$200 donation to the Soil Health Workshop
- Millborn Seeds – \$50 donation to the Soil Health Workshop
- Saddle Butte Agriculture – \$50 donation to the Soil Health Workshop
- Prairie Creek Seed – \$50 donation to the Soil Health Workshop

Financial information

Funding type: CWP

Grant amount: \$150,512

Matching funds: \$152,856

Contact information

Kerry Netzke

1424 East College Dr, Suite 300

Marshall, MN 56152

507-532-1325, kerry.netzke@rcrca.com

MPCA project manager: Mark Hanson

Minnesota River Basin

Active projects

Projects involving multiple watersheds

Chippewa Countywide Septic System Upgrades – 2017

Sponsor: Chippewa County

Funding: CWP (Loan) \$200,000

Purpose: Provide low interest loans up to 20 homeowners throughout Chippewa County for upgrading their individual septic systems, continually working towards improving water quality and threats to drinking water and human health because diseases and infections may be transferred to people and animals directly and immediately by failing SSTS.

Greater Blue Earth River Basin TMDL Implementation – 2016

Sponsor: GBERBA

Funding: Section 319 (Grant) \$400,000

Purpose: Cover 1,500 open tile intakes, reducing sediment and phosphorus loading by 15,000 tons and 15,000 pounds in 10 years respectively, contributing 16% to the listed TMDL plan goal. In addition, this project will implement 3,000 acres of cover crops, reducing sediment by 201 tons, phosphorus by 570 pounds, and nitrates by 19,800 pounds.

Lac qui Parle-Yellow Bank SSTS Loan Program – 2017

Sponsor: Lac qui Parle-Yellow Bank Watershed District

Funding: CWP (Loan) \$500,000

Purpose: Provide low interest loans to up to 45 homeowners throughout the Lac qui Parle-Yellow Bank Watershed District area for upgrading their individual septic systems. This project will result in an estimated annual reduction of 210 pounds of phosphorus, 1.4 tons of sediment and 675 pounds of nitrogen and BOD₅ 5,060 lbs/yr.

Lac qui Parle-Yellow Bank SSTS Loans Phase II – 2019

Sponsor: Lac qui Parle–Yellow Bank WD

Funding: CWP (Loan) \$500,000

Purpose: This project is to provide loan funds to upgrade SSTSs in Lac qui Parle County. A poorly functioning septic system is a threat to the water quality of nearby streams, lakes and groundwater. The effluent from an SSTS contains solids, phosphorus, nitrogen, chloride, bacteria,

viruses and organic chemicals. An education packet is provided to homeowners that use the loan program that promotes good water use practices, product use and disposal, and routine maintenance to prevent septic system failures. Bacteria impaired reaches are located throughout Lac qui Parle County.

Swift County SSTS Upgrades – 2018

Sponsor: Swift County

Funding: CWP (Loan) \$ 250,000

Purpose: The major reason for safe disposal of sewage is to prevent the spread of disease. If a septic system is properly sited, is working properly, and has been maintained regularly it will remove disease-causing bacteria effectively and efficiently. Swift County estimates that out of the estimated 3,965 individual sewage treatment systems in the county, 50% are failing to protect the groundwater or surface water. Nutrients from failing septic systems can also cause serious health problems. Improperly treated sewage can also contaminate surface waters. Being primarily agriculture and rural, many of our failing systems are hooked up to tile lines running directly into ditches or streams. Bacteria from this sewage can be harmful to humans and animals. SSTS upgrades are a priority in the Swift County Local Water Plan. Protection of existing compliant systems and upgrading of failing systems will prevent the growth of this problem.

Chippewa River

Chippewa River Sediment Reduction – 2016

Sponsor: Chippewa River Watershed Project

Funding: Section 319 (Grant) \$285,878

Purpose: Implement 25 structures to control sediment, runoff and associated gullies on cropland. Estimated sediment yield reductions 50% on acres contributing to each structure; have 15 cooperators adopt cover crops on 600 acres in their operations to protect soils from water and wind erosion from fall harvest to spring planting and to improve soil health properties. Estimated sediment yield reductions between 50-90% on affected acres; develop two grassed or lined sites for the protection of gullies and washout areas to control erosion and sedimentation near surface waters. Estimated sediment delivery yield reductions 60% on contributing acres; complete three sites to help prevent the formation or advancement of gullies while reducing sediment delivery to downstream waters; develop five

sites to include practices and methods that control and treat livestock related sediment delivery to surface waters.

Le Sueur River

Le Sueur River WRAPS Implementation Endeavor – 2016

Sponsor: Faribault County SWCD

Funding: Section 319 (Grant) \$347,950

Purpose: Implement stormwater BMPs, such as bioretention, filtration, infiltrations, iron enhanced sand filters, permeable pavement, water re-use, and urban forestry, in four cities; develop and engineer a structural BMP to store and treat surface water runoff on community property in the Bass Lake subwatershed; increase perennial vegetation; agricultural BMPs, such as conservation tiling, riparian corridor management (bank stabilization, saturated buffer), increased vegetated cover and nutrient management BMPs. Appropriate BMPs will also be implemented on the land in any of the watersheds listed as a high priority.

Lower Minnesota River

Internal Loading BMPs in Spring and Prior Lakes – 2018

Sponsor: Prior Lake-Spring Lake Watershed District

Funding: Section 319 (Grant) \$80,300

Purpose: The TP concentrations in Spring Lake and Upper Prior Lake will be reduced following the management and removal of carp in the two lakes. The proposed project will also maximize water quality restoration or remediation by addressing the root cause of internal loading identified in the TMDL for Spring and Upper Prior Lakes. By removing the majority of carp from the system, both the phosphorus within the carp carcass and the amount that would typically be excreted will be completely removed, while also abating the release of phosphorus created by foraging behavior. Following carp removals, the reestablishment of native aquatic vegetation will be encouraged by closely monitoring and treating invasive curly-leaf pondweed that might inhibit its successful establishment. Aquatic management plans will be developed for the two lakes to guide long-term management strategies for success.

Minnesota River and Sand Creek Improvement Project – 2016

Sponsor: Scott County/Scott Watershed Management Organization

Funding: Section 319 (Grant) \$565,000

Purpose: Complete 30 to 35 structural BMPs, 20 to 25 acres of nonstructural BMPs, 550 acres of cover crops, 4 near channel capital stabilization projects, monitoring of Sand and Roberts Creeks, trend analysis for Sand Creek, 2 landowner surveys, and 8 to 10 riparian vegetation improvement projects in critical watershed areas.

Quarry Creek Collaborative – 2015

Sponsor: Scott County/Scott Watershed Management Organization

Funding: CWP (Loan) \$1,998,800

Purpose: This project will reduce sediment to the Minnesota River, control erosion and reduce sedimentation in Quarry Creek, and protect private land and public infrastructure. Stabilization techniques proposed are designed to significantly reduce flow rates and velocities, channel incision, the migration of knick points and head cuts, such that sediment erosion will be reduced by at least 75% to 80% within the stabilized areas. The project activities include stabilizing 2 knick points, thousands of feet of channel armoring and turf reinforced mat, a couple dozen grade control/rock weir structures, and 1 large detention basin. Landowners are contemplating a native prairie planting, grassed waterways, and several WASCObS in the areas tributary to the ravines. With the heavy rains of mid-June 2014 there is significant damage to ravines and creeks like Quarry Creek throughout the area and the project will serve as an example.

Minnesota River – Mankato

Mankato Watershed – Renville County FY17 Improvement Project – 2017

Sponsor: HCWP

Funding: Section 319 (Grant) \$297,000

Purpose: BMPs will reduce phosphorus and erosion as determined through research of the hydrology, geomorphology, land use, connectivity, water chemistry, and biology of the area. The BMPs will improve water quality, aquatic and riparian habitat, increase biodiversity, and enhance hydrology. The estimated pollutant reductions for BMPs are 300-800 pounds of

phosphorus per year and 200-700 tons of sediment per year. Educational efforts will include effects of altered hydrology and the importance of retaining water to reduce nutrient export and water quantity.

Middle Minnesota Watershed, Implementation of Conservation Practices – 2011

Sponsor: Cottonwood County

Funding: CWP (Loan) \$1,400,000

Purpose: Coordinate the CWP loan program in southern Minnesota counties to demonstrate the influence low interest SSTS loans has on the rate of SSTS compliance. It is anticipated that 120-160 new systems will be installed. Each of these systems will be financed through low interest loans which will be administered by individual counties: Blue Earth, Brown, Cottonwood, Nicollet, Redwood, Renville and Sibley.

Seven Mile Creek Assessment and Implementation – 2017

Sponsor: Gustavus Adolphus College

Funding: Section 319 (Grant) \$475,524

Purpose: The SMC watershed was identified as a NWQI watershed by the NRCS and, in 2014, BWSR designated it as one of its Targeted Watershed Demonstrations. These concentrated monitoring funds will show that targeting conservation in agricultural landscapes can produce measureable improvements in stream metrics. This monitoring project is to create an expanded and coordinated monitoring program designed to capture change at multiple scales, with the hope of applying those lessons to similar landscapes across the upper Midwest.

Minnesota River – Yellow Medicine River

Hawk Creek Watershed FFY 2018 Implementation Project – 2018

Sponsor: HCWP

Funding: Section 319 (Grant) \$477,000

Purpose: This project addresses the impairments identified in the Hawk Creek Watershed TMDL report. Much of the watershed is channelized and in poor condition, so altered hydrology is negatively impacting water quality watershed-wide. Water quality improvement efforts will be concentrated in the areas that are the most impaired. The critical area of the lower Hawk Creek subwatershed will be a focus because it is impaired for *E. coli* and turbidity and has

substantial altered hydrology. This critical area also has a growing group of conservation-minded farmers that are implementing cover crops and reduced tillage and this grant can be utilized to continue that growing momentum and expand to other areas as the use of cover crops and reduced tillage grows. BMPs to address impairments will focus on agricultural areas of the subwatershed because the majority of the land use is agricultural, but BMPs will also be encouraged in urban/developed areas as well. Estimated pollutant reductions for BMPs completed through this grant are 4,000-6,000 pounds of phosphorus per year and 2,000-3,000 tons of sediment per year. Anticipated BMP projects and estimated annual pollutant reductions (subject to change based on landowner cooperation and project scope): five alternative intakes, five side inlets, one streambank/grade stabilization, one WASCOP, one lakeshore restoration, one agricultural waste project, 1,500 acres cover crops, and 1,000 acres no till/strip-till.

Hawk Creek Watershed FY16 Implementation Project – 2016

Sponsor: HCWP

Funding: Section 319 (Grant) \$190,054

Purpose: In strategic targeted locations complete 8 alternative intakes, 8 side inlets, 20 acres of buffers, 2 agriculture waste projects, 3 streambank/grade stabilizations, 1,500 acres of cover crops, and 1 WASCOP. These BMPs will achieve an estimated annual reduction of 9,002 pounds of phosphorus and 2,480 tons of sediment from entering the Minnesota River via the Hawk Creek Watershed. The civic engagement/outreach component will use effective and practical techniques to increase public involvement and input in local decision-making processes and water quality improvement efforts. This increased public participation will promote local leadership and build local water quality management capacity.

Hawk Creek Watershed Improvement Project – 2017

Sponsor: HCWP

Funding: Section 319 (Grant) \$397,000

Purpose: This project addresses excessive phosphorus and low DO. Reduced phosphorus levels, increased base flow, and reduced sediment volume will be instrumental in correcting the impairment of low DO levels in the Minnesota River. The BMPs will be selected based on their ability to reduce phosphorus and erosion; eligible

practices include, but are not limited to, side inlets, alternative tile intakes, WASCOBs, grade stabilizations, streambank stabilizations, feedlot waste reduction projects, lakeshore buffers, and/or cover crops. These BMPs improve water quality and improve aquatic and riparian habitat, increase biodiversity, and enhance hydrology. The estimated pollutant reductions for BMPs are 1,000-2,000 pounds of phosphorus per year and 1,000-2,000 tons of sediment per year. Education and outreach activities will be used to increase engagement, relationships, and willingness to participate in water quality improvement.

Hawk Creek Watershed Subsurface Sewage Treatment System (SSTS) Upgrade Implementation – 2016

Sponsor: HCWP

Funding: CWP (Loan) \$1,050,000

Purpose: The project will utilize low interest loan funds to landowners for the replacement or upgrade of 75 noncompliant septic systems located in the Chippewa, Kandiyohi, and Renville County portions of the Hawk Creek Watershed. This project will result in an estimated annual reduction of 240 pounds of phosphorus, 5,300 pounds of TSS, and 600 pounds of nitrogen. In the Lower Minnesota River DO TMDL Implementation Plan SSTS upgrades are recommended for reducing pollution.

Pomme de Terre River

Pomme de Terre WRAPS BMP Implementation Project – 2016

Sponsor: Pomme de Terre River Association

Funding: Section 319 (Grant) \$285,000

Purpose: Install 20 rain gardens, 33 WASCOBs, 4 shoreline restorations, 4 agricultural waste pit closures, and 90 acres of wetland restorations. The BMPs/conservation projects to be implemented will reduce sediment by 1,304.00 T/yr and phosphorus by 1,304.86 lbs/yr. It will also increase participation in watershed management activities through educating local schools, lakeshore residents, farm groups, outdoor sport groups, and recreation club members.

Red River Basin

Project completed

Bois De Sioux River Watershed

Red River Basin Reservoir Nutrient Load Reduction



Red Lake River

Bois De Sioux River Watershed

Red River Basin Reservoir Nutrient Load Reduction

Reducing nutrient loads in the Red River Basin is a priority issue. The North Ottawa Impoundment (NOI) is a three square mile treatment wetland that provides a variety of services including nutrient capture, flood protection, and waterfowl habitat. Monitoring efforts have been implemented at the NOI to identify the pollutant reduction potential of the impoundment and ultimately inform management practices to achieve maximum water quality benefits.

Project highlights

- The North Ottawa Reservoir, constructed by the Bois de Sioux Watershed District, was retrofitted with vegetated treatment cells, and stream flow above the reservoir was rerouted through these cells. The impoundment is designed to store excess runoff on 1,920 acres of land and provide 16,000 acre feet of gate controlled storage. The NOI reduces peak flows in the Bois de Sioux River, controls excess nutrients through utilization of wetland plants, and reduces sedimentation. The Minnesota Nutrient Reduction Strategy calls for a 13% reduction in nitrogen in the Red River Basin, while the newer (April 2015) Red River Basin Nutrient Reduction Strategy calls for a 50% reduction in phosphorus loads. Achieving these goals will require the implementation of many BMPs to control nonpoint nutrient sources.
- The NOI project has been useful in recent years in protecting the Red River Valley from potential flood damage as well as providing many other services. During its years of operation, the NOI captured pollutants and reduced nutrient loads to downstream waters (Vieths et al. 2017). There is clear evidence of water quality benefits from denitrification and sediment and phosphorus capture. Continued monitoring efforts within the impoundment and watershed sites are recommended for the NOI project for improved understanding and analysis of nutrient loading and reduction in the Red River Basin area.

Partnerships

- UMN (St. Paul and Crookston)
- Bois de Sioux WD
- North Dakota State University (NDSU)

- Energy and Environmental Research Center NDSU
- International Water Institute
- Watershed Recovery LLC
- RMB Environmental Labs, Inc.

Financial information

Funding type: Section 319

Grant amount: \$283,612

Matching funding: \$186,318

Contact information

Joe Courneya, Project Coordinator

Red River Basin Commission

1120 28th Ave. N.

Fargo, ND 58102

701-356-3183, joe@redriverbasincommission.org

MPCA project manager: Cary Hernandez

Red River Basin

Active project

Buffalo River Watershed

Upper Buffalo River Sediment Reduction – 2018

Sponsor: Buffalo-Red River Watershed District

Funding: Section 319 (Grant) \$498,000

Purpose: The main purpose of the project is to continue in implementation of BMPs in the Buffalo River watershed in Becker County to achieve water quality standards for sediment. The project is expected to reduce the annual sediment loading to the Buffalo River by 20,583 tons. Sediment loading to the Buffalo River needs to be reduced by more than 9,000 T/yr in AUID 0902010601-594 and by more than 60,000 T/yr in AUID 0902010601-595 (which extends several miles out of Becker County). The BMPs installed for this project will be selected based on a number of factors including: PTMApp results, WQDSA results, GIS terrain analysis, and landowners' willingness to implement BMPs. This project will also develop the final engineered implementation roadmap critically needed to reduce in-channel erosion and help achieve water quality standards along the upper Buffalo River. More than half of these proposed BMPs are expected to be implemented by the end of 2021.

St. Croix River Basin

Projects completed

Lower St. Croix Watershed

Forest Lake Diagnostic Study

Snake River-St. Croix Watershed

Ann Lake Watershed BMP and Internal Load

Kanabec Water Resources Protection Project – Phase 2



Filters strip seeding

Lower St. Croix Watershed

Forest Lake Diagnostic Study

The focus of this project is on protection efforts to maintain or improve the water quality of Forest Lake by reducing phosphorus loads to the lake, especially from stormwater. The summer season average water quality of Forest Lake currently meets state eutrophication standards and is not listed on the draft 2014 303(d) Impaired Waters List. However, a major concern is that the water quality of Forest Lake is near the thresholds and often exceeds water quality standards at certain times of the year. As a result, Forest Lake was given a water quality rating of C in the Comfort Lake-Forest Lake Watershed District (CLFLWD) 2012-2021 Watershed Management Plan.

Project highlights

- Forest Lake (82015900) is located in the CLFLWD and adjacent to the City of Forest Lake in northern Washington County. The watershed of Forest Lake is 8,160 acres and dominated by open water lake surfaces, medium-density residential, wetlands, and forested land cover. The more developed area of the City of Forest Lake is situated along the west and southern shores of Forest Lake, and discharges stormwater to Forest Lake through numerous stormwater outfalls dispersed around the lake perimeter.
- The two main objectives of this project were to 1) compile and make minor updates to a large body of diagnostic work that already exists for Forest Lake, and 2) develop a comprehensive, site-specific implementation plan for Forest Lake. The first task involved a combination of compiling existing information by reviewing existing studies, and gathering new information by engaging stakeholders and performing on-the-ground monitoring.
- This project compiled past implementation activities into one plan, filled gaps in implementation activity identification, and developed a concise implementation schedule that targets projects with high phosphorus reduction cost-benefit and/or projects that can be implemented on a multi-subwatershed scale. Several subsequent, smaller-scale projects are currently underway as a result of this project. These include studies and projects in four subwatersheds around Forest Lake that have

been identified as major pollutant contributors, and development of a targeted street sweeping plan and purchase of a regenerative air vacuum sweeper for the City of Forest Lake.

Partnerships

- City of Forest Lake: provided data on known stormwater outfall locations, attended project coordination meetings, and maintained ongoing communication throughout project.
- Forest Lake Association, Citizen Advisory Committee: provided feedback on known stormwater outfall locations, attended project coordination meetings, and maintained ongoing communication throughout project.
- Forest Lake area residents: provided feedback on known stormwater outfall locations.
- Castlewood Golf Course: coordinated to identify projects in the Castlewood East priority subwatershed.
- Washington Conservation District: provided information on stormwater retrofit assessments for the direct drainage area of Forest Lake.

Financial information

Funding type: CWP grant

Grant amount: \$46,270

Matching funding: \$46,270

Contact information

Mike Kinney, District Administrator
 Comfort Lake-Forest Lake Watershed District
 44 Lake St. S., Ste. A
 Forest Lake, MN 55025
 651-395-5855, michael.kinney@clflwd.org
 MPCA project manager: Chris Zadak

Snake River – St. Croix Watershed

Ann Lake Watershed BMP and Internal Load

Both Ann and Fish Lakes are on the Minnesota 303(d) Impaired Waters List for nutrient impairments from 2004. The Ann River Watershed Bacteria, Nutrient, and Biota TMDL from 2013 identified Ann Lake with needing 4,758 pounds of TP reduced from internal sources (approximately needed 86% reduction). Sediment cores sampled suggest that the phosphorus release from the Ann Lake sediment to be a major source of soluble phosphorus in the lake's water column in the summer's growing season. The proposed Ann Lake Internal Load Feasibility Study as part of this grant reviewed four treatment options to address the high internal loading of phosphorus in Ann Lake. With a future proposed treatment to Ann Lake the internal load is anticipated to be reduced by 75%; a total of 4,096 lbs/yr of phosphorus reduced. We anticipate seeking funding for the first phase of the 14-year treatment plan in 2019.

Project highlights

- One project highlight was the public forum meeting held August 10, 2018, to further discuss an Ann Lake treatment option and our next steps in addressing this problem. This was a great discussion with about 25 people in attendance. The Kanabec SWCD continues to work closely with the Ann Lake Watershed Alliance on a plan for a lake treatment to reduce the internal high phosphorus load. Three best management practices (BMPs) were installed, as match. A grassed-lined waterway and two shoreland restoration projects were installed. Two roadside projects have been designed and hope to be installed this spring, 2019. The total of the installed BMPs resulted in 16 pounds of phosphorus reduced per year; 16 tons of soil saved per year and 16 tons of soil sediment prevented per year.

Partnerships

- Ann Lake Watershed Alliance
- Ann Lake Township
- Fish Lake Improvement Association

Financial information

Funding type: Section 319

Grant amount: \$36,767

Matching funding: \$31,418



Shoreline restoration project

Contact information

Deanna Pomije, District Manager

Kanabec SWCD

2008 Mahogany St., Ste. 3

Mora, MN 55051

320-679-3982, deanna@kanabecSWCD.org

MPCA project manager: Eric Alms

Snake River – St. Croix Watershed

Kanabec Water Resources Protection Project – Phase 2

The Snake River Watershed within Kanabec County was the focus for this Phase II Protection Project. Ninety percent of the Snake Watershed falls within Kanabec County. The waters of concern for this project are those lakes and streams within this area that are not currently impaired. The focus has been protection of this clean water resource.

The water quality monitoring portion of this grant was goaled with sampling lakes and streams previously not extensively sampled to gauge their quality for future planning needs. Of the three lakes sampled, only Mora Lake shows indicator of a possible impairment listing. Following the second cycle Surface Water Assessment Grants monitoring in 2018 this will be determined. All six streams were often over the standard limit on TP and generally within the limits for total suspended sediments.

Project highlights

- This protection project has provided a unique opportunity to offer education. In August 2017, we coordinated a 'Shallow Lakes Workshop', which provided education on the realistic water quality expectations for shallow lakes, of which many lakes in Kanabec County are. Working with residents of both Ann and Fish Lake on shoreland restoration projects we have seen residents empowered into action to improve the water quality of their lakes. We have also seen a greater interest in learning about the specific local water quality concerns. Our most extensive Best Management Conservation Practice installed was the closure of six abandoned manure storage pits. Abandoned manure pits are environmental liabilities, in need of being properly closed to ensure the excess nutrients do not inadvertently leach into our waters. One pit closed was immediately adjacent to a wetland and three others were near streams. Reduction results are phosphorus reductions of 10,523 pounds, nitrogen reductions of 11,453 pounds, and sediment reductions of 1,490 pounds.

Partnerships

- Through this protection project, we have had great opportunities to partner with local lake associations

in the promotion of shoreland restoration projects. Two lake associations we have worked with extensively have been the Fish Lake Improvement Association and the Ann Lake Watershed Alliance. We have presented educational power points on the benefits of utilizing native plants on shoreland for improved water quality. This has resulted in five shoreland restoration projects.

Financial information

Funding type: Section 319

Grant amount: \$111,150

Matching funding: \$88,110

Contact information

Deanna Pomije, District Manager

Kanabec SWCD

2008 Mahogany St., Ste. 3

Mora, MN 55051

320-679-3982, deanna@kanabecSWCD.org

MPCA project manager: Eric Alms

St. Croix River Basin

Active projects

Projects involving multiple watersheds

Pine County SSTS Upgrades – 2017

Sponsor: Pine County

Funding: CWP (Loan) \$600,000

Purpose: This project will upgrade 20 septic systems per year over the three-year loan period. Septic systems are recognized as an acceptable means for treating wastewater and this project will annually prevent 50 pounds of phosphorus, 200 pounds of nitrogen and 97.4×10^{16} (quintillion) CFU of fecal coliform (FC) and *E. coli* from entering the groundwater in Pine County.

Lower St. Croix River Watershed

Chisago Lakes Gully Restoration – Green Lake – 2018

Sponsor: Chisago SWCD

Funding: Section 319 (Grant) \$50,000

Purpose: As stated in the Chisago Lakes Chain of Lakes WRAPS Plan, it is estimated that 563 pounds of phosphorus enters Green Lake from watershed loading each year. This project is on the Parmly Lifepointes Campus in Chisago City, Minnesota. The senior living community has many acres of lakeshore on Green Lake that are protected from further development near the edges of the lake. Within this campus, there is a large actively eroding gully that cuts through the property. Stormwater pipes from development, roads, and grassland feed the gully that has existed for over 50 years. This project will help protect Green Lake from becoming impaired by stopping significant soil erosion and phosphorus loading into the lake. Green Lake is on the verge of being impaired for excess nutrients – phosphorus. Stabilizing this gully will reduce phosphorus and sediment entering the lake through erosion.

Goose Lake TMDL Final Implementation Projects – 2017

Sponsor: Carnelian-Marine-St. Croix Watershed District

Funding: Section 319 (Grant) \$76,000

Purpose: The purpose of this project is to design and install up to four stormwater-quality improvement practices to reduce phosphorus loading to Goose Lake. Prioritization and outreach efforts have resulted in the identification of six locations discharging excessive

phosphorus to Goose Lake, of which one has been completed and the second will be installed in 2017. This project will complete the final 38 lbs/yr watershed phosphorus contributions to Goose Lake identified in the 2012 Multi-Lakes TMDL Plan. The Multi-Lake TMDL Plan for Goose Lake, approved in 2012, identifies a 50% (77 pounds) reduction of phosphorus from watershed runoff and a 9.4% (22 pounds) reduction of internal load of phosphorus is needed to achieve a target in lake phosphorus concentration of 40 µg/L. The WD, working in partnership with landowners, has completed the installation of three projects achieving approximately 50% of the targeted load reduction.

Lower St. Croix Targeted Phosphorus Reduction Project – 2017

Sponsor: Washington Conservation District (WCD)

Funding: Section 319 (Grant) \$300,000

Purpose: The Lake St. Croix TMDL Implementation Plan estimates that a 15,700 lbs/year reduction in phosphorus is needed from Washington County to meet the 2012 Lake St. Croix TMDL. Targeting and prioritization analyses were completed between 2012 to 2015 by the WCD. The “Top50P! Rural Subwatershed Analysis” evaluated rural catchments directly discharging to the St. Croix River and Lake St. Croix. The proposed practices in this project will reduce phosphorus loading by 160 lbs/yr as part of ongoing efforts to reduce annual phosphorus discharges from Washington County into the St. Croix River and Lake St. Croix. This will be achieved through the design and installation of up to 16 stormwater quality improvement practices within the Lower St. Croix Watershed to reduce phosphorus loading by at least 160 lbs/yr. These BMPs could include grassed waterways, native vegetation conversion, stream/ditch buffers, sediment control basins, bioretention basins, ravine stabilization, shoreline stabilization. As of June 2019, grant activities included the completion of the Behrends basin and grassed waterway, project development for the Wagner grassed waterway, design and construction documents for the Carpenter project, project development on McQuade, reporting and team project meetings. Match grant activities included the installation of the Behrends basin and grassed waterway, completion of the Srock design and construction documents, project development for the Wagner grassed waterway, and bid documents for the Wiessner grade stabilization design.

Marine on St. Croix Stormwater Phase 2 – 2017

Sponsor: Carnelian-Marine-St. Croix Watershed District

Funding: Section 319 (Grant) \$92,500

Purpose: The purpose of this project is to design and implement a ravine stabilization and wetland restoration project in the City of Marine on St. Croix in Washington County draining to the St. Croix River and Lake St. Croix. The approximate length of ravine to be stabilized is 375 feet, which is 100% of the unstable ravines. The approximate area of wetland restoration is 2+/- acres. The proposed practices will reduce phosphorus loading by approximately 17 lbs/yr as part of ongoing efforts to reduce annual phosphorus discharges from the City of Marine on St. Croix into the St. Croix River and Lake St. Croix.

Marine on St. Croix Stormwater Phase 3 – 2018

Sponsor: Carnelian-Marine-St. Croix Watershed District

Funding: Section 319 (Grant) \$169,000

Purpose: The purpose of this project is to reduce phosphorus loading and sedimentation to the St. Croix River, a National Wild and Scenic River, and downstream to Lake St. Croix which is on the EPA 303(d) list of impaired waters for excess nutrients. Phosphorus load reduction will be achieved via design and construction of biofiltration basins (2) and rain gardens (up to 10) in areas currently unmanaged for stormwater within the City of Marine on St. Croix.

Moody Lake Wetland Rehabilitation Project – 2016

Sponsor: CLFLWD

Funding: Section 319 (Grant) \$81,497

Purpose: Acquire or obtain a conservation easement on approximately 10 acres of land to permanently remove cattle, construct a grassed waterway and 50 foot buffer strip to infiltrate and filter runoff, and excavate an average of 12 inches of soil from a targeted area of wetlands near Moody Lake.

Snake River Watershed**CLFLWD Adaptive Management Project Implementation – 2018**

Sponsor: Comfort Lake Forest Lake Watershed District

Funding: CWP (Loan) \$1,500,000

Purpose: The CLFLWD is committed to using sound scientific principles and a systematic adaptive management approach to protecting and improving

its waterbodies. Six projects aimed at improving Moody Lake, Bone Lake, Little Comfort Lake, Shields Lake, Forest Lake, Comfort Lake, and Sunrise River are planned for implementation. Each is part of a comprehensive plan to bring target waterbodies back to pre-development conditions. Projects may include implementation of multiple BMPs, as identified through additional monitoring and feasibility. An outreach component will be included for each project as well. By engaging the public through these activities, the District aims to enable and encourage social behaviors such as environmental appreciation and stewardship. The District aims to use Prioritized, Targeted, and Measurable (PTM) projects to meet quantitative water quality goals across the state. CLFLWD projects will have a pre- and post-construction monitoring element that will specifically address the “Measurable” component in PTM.

Snake River Watershed Resource Protection Project – 2016

Sponsor: Snake River Watershed Management Board

Funding: CWP (Loan) \$400,000

Purpose: This project will implement 27-33 SSTs upgrades within the Kanabec County portion of the Snake River Watershed. Septic systems are recognized as an acceptable means for treating wastewater and this project will prevent 136 pounds of phosphorus, and 574 pounds of nitrogen from entering the groundwater in the Snake River Watershed. These activities were documented in the Snake River Watershed WRAPS, Groundhouse River Fecal Coliform and Biota (Sediment) TMDL Implementation Plan, the Ann River TMDL Study (Phase II) and Stressor ID report and the Snake River Watershed TMDL Study.

Snake River Watershed Resource Protection Project – 2012

Sponsor: Snake River Watershed Management Board

Funding: CWP (Loan) \$400,000

Purpose: This project will promote and install 40 SSTs and other rural BMPs in the Snake River Watershed.

Upper Mississippi River Basin

Projects completed

Clearwater River Watershed

Clearwater River Watershed Alternative Tile Intake
Clearwater River Restoration and Protection Phase II

Mississippi River – Brainerd

Swan River Headwaters Subwatershed Restoration

Mississippi River – Grand Rapids

Big Sandy and Minnewawa Lakes Phosphorus Reduction

Mississippi River – St. Cloud

Northeast St. Cloud Mississippi River Protection Project

Mississippi River – Twin Cities

Northwood Lake Water Quality Improvement Project

Rum River

Mille Lacs Lake Protection Stormwater Control

Sauk River

Middle Sauk River Targeted Reduction and Outreach

Mill Creek Watershed Nutrient Reduction

Osakis Lake Nutrient Reduction — Crooked Lake

Sauk River Watershed District Groundwater Protections Project



Lynn Gallice, Mille Lacs SWCD Little Whitefish Lake

Clearwater River Watershed

Clearwater River Watershed Alternative Tile Intake

The Clearwater River upstream of Lake Betsy is currently impaired for bacteria and DO. Data has also identified total suspended solids (TSS) and localized erosion issues in the watershed.

Through this project, the Clearwater River Watershed District (CRWD) staff coordinated with Soil and Water Conservation District (SWCD) partners to reach out to landowners and promote the installation of BMPs targeting these contaminants. The locations for the projects were based on a prior project wherein the CRWD completed a prioritization effort to identify and prioritize areas for implementing projects and practices to reduce bacteria and sediments in the upper watershed.

Project highlights

- Five projects were constructed to reduce nutrient and sediment loading in the target watershed. The CRWD also deepened working relationships with area SWCDs through sharing the results of other projects and coordinating to get projects implemented. Outreach to area landowners was also increased, as was the awareness of existing grant programs and alternative tile intakes. Between the five projects constructed, a nutrient load reduction of 631 pounds of TP and 621 tons of TSS over the project lifecycle. The projects constructed will provide pollutant load reductions on receiving waters and downstream. Projects identified in the BMP Siting Plan which will be constructed in the future should continue to improve District lakes, streams and wetlands.

Partnerships

- Meeker County SWCD
- Stearns County SWCD

Financial information

Funding type: Section 319

Grant amount: \$42,486

Matching funds: \$27,799



Clearwater River

Contact information

Rebecca Carlson
Clearwater River Watershed District
75 Elm St E, PO Box 481
Annandale MN, 55302
320-274-3935, admin@crwd.org
MPCA project manager: Phil Votruba

Clearwater River Watershed

Clearwater River Restoration and Protection Phase II

Clear Lake and Lake Betsy were impaired waters for aquatic recreation impairment due to nutrients in 2008. The upper Clearwater River was impaired for aquatic life and aquatic recreation impairment due to DO and FC in 1996. The dominant land use in the area is row crops (corn and soy beans). Assessing the land condition helps recommend most suitable BMP to the location and maximize cost benefit. Then implementing said BMPs can help reduce loading downstream.

Project highlights

- This grant project identified 40 BMP locations and ranked them for TSS and TP removal potential. Implementation of these practices will reduce runoff, soil erosion, and sediment loads to the Clearwater River and provides direct benefit of water quality to the receiving water.
- The upper Clearwater River Watershed draining into Lake Betsy as well as Clear Lake are the direct receiving waterbodies within the target program area. However, given the riverine nature of the system, downstream waters also benefit from load reductions in upstream waters.
- This project resulted in implementation of seven agricultural BMPs, with a TP reduction to the receiving water of 434.18 pounds annually, along with a TSS reduction of 352.72 tons annually.

Partnerships

- Several landowners/producers enrolled their working lands into the project's programming and contributed their own funds to implement BMPs.
- Local SWCDs provided technical assist, project management and financial contributions to assist with implementing BMPs.
- Meeker County SWCD
- Stearns County SWCD
- CRWD & District Engineer Wenck – Project Owner and Project Engineer

Financial information

Funding type: CWP

Grant amount: \$70,272

Matching funds: \$257,976

Contact information

Cole Loewen, District Administrator

Clearwater River Watershed District

75 Elm St. E., PO Box 481

Annandale MN, 55302

320-274-3935, admin@crwd.org

MPCA project manager: Phil Vortruba

Mississippi River – Brainerd

Swan River Headwaters Subwatershed Restoration

The Swan River Minor Watershed number 10133 is located in the upper Mississippi River Basin in Central Minnesota. It is located in the southeast corner of Todd County and is within the Central Hardwood Forest Ecoregion. Major lakes and rivers within this minor watershed are Trace, Lady, Big and Little Swan, Moose, Bass, Long, and Mound Lakes as well as Swan River. The Local Water Plan currently identifies surface water contamination and declining water clarity as a priority concern of Todd County. Agency members specifically identified the Swan River Watershed as an area of high priority for restoration efforts.

Waterbody improved

The grant dollars available through the CWP grant enabled three projects on three different lakes within the Swan River Watershed (Big Swan Lake, Little Swan Lake, and Bass Lake) and spurred the completion of three others through community outreach efforts.

Project highlights

- Of the three projects funded by the grant, the biggest success of this funding was the ability to address the water quality concerns on the east side of Little Swan Lake using a true treatment train approach. Through the partnerships of Todd County Public Works, Burnhamville Township, City of Swanville, Swanville Lions Club, West Central Technical Service Area and Todd SWCD the public swimming and fishing area have a new design.
- The original beach and headwaters to the Swan River was plagued with erosion, a restrictive bridge design and a beach area which was a catch area for garbage and road runoff. In 2016, Todd County Public Works was hired to remove the old box culvert bridge and replace it with a concrete beam span bridge. The new structure now slows water currents and allows fish passage for spawning between Little Swan and the Swan River. The design uses rock weirs to drop elevation while maintaining lake levels. When part of the township road was resurfaced during the bridge project Todd SWCD worked with Burnhamville Township to incorporate a 15" Reinforced Concrete Pipe culvert. This now takes the water from the catch



Revegetation of shoreland in the Mississippi River – Brainerd Watershed

basin to the wetland on the opposite side of the road, away from the lake where it can infiltrate. The historical erosion control mechanism (cemented rock chute) was removed and revegetated. An infiltration trench was installed behind the beach wall to catch parking lot water and any overflow runs over a vegetated turf reinforced mat before going to lake. Rock riprap and coir logs were installed along shoreline to stop erosion which had been created when large shoreland trees uprooted.

- Final reductions included 78 T/yr of sediment and soil, 77 lbs/yr of phosphorus, 8 lbs/yr of nitrogen and 197 lbs/yr of TSS.

Partnerships

- Long Lake Association
- Big Swan Lake Association
- Swanville Lions Club
- City of Swanville

- Burnhamville Township
- Todd County Public Works
- Private landowners

Financial information

Funding type: CWP

Grant amount: \$38,650

Matching funds: \$42,971

Contact information

Tim Steiber, Division Director

Todd County SWCD

215 1st Ave. S., Ste. 104

Long Prairie, MN 56347

320-732-2644, tim.steiber@co.todd.mn.us

MPCA project manager: Bonnie Finnerty

Mississippi River – Grand Rapids

Big Sandy and Minnewawa Lakes Phosphorus Reduction

Big Sandy and Minnewawa Lakes were listed on the MPCA 303(d) Impaired Watershed List in 2002. They are impaired for Aquatic Recreation, due to excessive nutrients (phosphorus). Unique land use changes have occurred in this watershed since the late 1800s. Impacts to water quality have resulted from wetland drainage, agricultural conversion, and shoreline development. Elevated nutrients levels have resulted in algae blooms, limiting the suitability of the lakes.

Big Sandy Lake (01-0062) and Lake Minnewawa (01-0033) were targeted for improvements. The Big Sandy Lake Watershed includes portions of Aitkin, Carlton, and St. Louis Counties in northeastern Minnesota. The watershed is 672,452 acres in size. Lake Minnewawa is within the watershed of Big Sandy Lake. Big Sandy is a reservoir system created by the construction of a dam in 1886. The outlet of Big Sandy Lake is just upstream of the Mississippi River.

Project highlights

- Water BMPs and educational efforts were highlights of the project. Project implementation had a goal of restoring water quality of Big Sandy and Minnewawa Lakes. BMPs installed include four rain gardens and 10 shoreline stabilization/revegetation projects, exceeding the targeted outcomes of three rain gardens and five stabilization projects. Pollution reduction estimates totaled 33.79 lbs/yr reduction in TP inputs and 33.65 T/yr reduction in sediment load. These greatly exceeded the targeted reduction estimates of phosphorus reductions in the amount of 9.145 lbs/yr, and a reduction in sedimentation of 5.165 T/yr. Education activities were also implemented. This grant hosted 8 seminars and 13 guest speakers at meetings of the Big Sandy Area Lakes Watershed Management Project to share information relating to water quality. A total of 1,552 people participated in these education efforts.

Partnerships

- Janet Smude, Aitkin County SWCD – EPA Section 319 Grant Coordinator and Technical Advisor
- Barbara Dahl, Big Sandy Area Lakes Watershed Management Project Chairperson – Local Project Coordination



Revegetation project installation

- Melanie Bomier, Carlton County SWCD – Technical Advisor
- Anna Bosch, MPCA – Project Manager
- Aitkin and Carlton Counties – Local Project Coordination
- Big Sandy Area Lakes Watershed Management Project Members – Local Project Coordination
- Big Sandy, Minnewawa, and Prairie Lake Improvement Associations – Local Project Coordination
- Tamarack River Watershed Team Members – Local Project Coordination

Funding information

- Funding type: Section 319
- Grant amount: \$71,766
- Matching funds: \$109,353

Contact information

Janet Smude, District Technician
Aitkin County SWCD
130 Southgate Dr.
Aitkin, MN 56431
218-927-6565, smude.atkinswcd@gmail.com
MPCA project manager: Anna Bosch

Mississippi River – St. Cloud

Northeast St. Cloud Mississippi River Protection Project

The Northeast St. Cloud Mississippi River Protection Grant Project began in June 2015 using the CWP funding made available through the MPCA. The specific stretch of the Mississippi River affected by this project is in northeast St. Cloud, Minnesota where the project area drains into a wild and scenic section of the River. This River section provides many recreational activities and the City of St. Cloud's sole drinking water intake is located within this section of the Mississippi River.

The project area is a 367-acre subwatershed in northeast St. Cloud. This subwatershed has been identified as the top priority subwatershed by the City for improving water quality. Within this watershed, significant sediment loading to the Mississippi River is the major issue of concern as indicated through customer calls, inspections, and observations. The project zone is urban, completely developed, and has numerous gravel/exposed soil areas with very little greenspace. In most instances, runoff enters the stormdrain system and is directly discharged to the Mississippi River through a 96' outfall.

In response to the above findings, the City completed a subwatershed assessment for the northeast drainage area. The assessment laid the framework for improving water quality in this subwatershed. The goal of this grant project was to use \$200,000 of CWP grant funds and \$200,000 of cash/in-kind match to focus on installing "green" and volume reducing BMPs identified in the plan along with providing additional public education in the area. Also, the City is working in partnership with Benton SWCD to install a portion of the "gray" (sumps, regional underground treatment, street sweeper) BMPs identified in the plan.

Waterbody improved

Projects completed with this grant include the installation of a large rain garden, underground infiltration system, and over 1 acre of green space with 62 trees to reduce and filter stormwater runoff. It is estimated that these projects annually remove 14 pounds of phosphorus and 7,000 pounds of sediment from entering the Mississippi River.



Rain garden project installation

Project highlights

This grant implemented two major projects identified in the Northeast Subwatershed Assessment Plan that was needed to meet water quality goals for the watershed. This grant project improves the likelihood that the 70% watershed-wide TSS reduction goal can be achieved. A detailed plan is being implemented to ensure long-term accomplishments are met in this watershed. Additional projects are planned for 2019 and beyond.

The City of St. Cloud received two awards during the grant period because of the Northeast St. Cloud Water Quality Improvement Projects:

- Environmental Leadership Award (MECA), 2017
- Source Water Protection Award (Minnesota Department of Health [MDH] & Minnesota Rural Water Association), 2017

Partnerships

Numerous partnerships and relationships occurred because of this project, mainly with watershed property owners. Several property owners commented that because of this project they are more aware of their actions and how they affect water quality. The Pervious Right-of-Way project helped create a buzz in the City's revitalization efforts of northeast St. Cloud. The increase in public awareness during this grant period has been exceptional. Major project partners include:

- SEH, project consultant, engineer and construction manager
- Benton SWCD, project support

- C&L Excavating, East Germain Parking Lot Project contractor
- Gertken Brothers, Pervious Right-of-Way Project contractor
- Prairie Restorations, East Germain Parking Lot Project sub-contractor
- Blades Outdoor Services, Pervious Right-of-Way Project sub-contractor
- Numerous private property owners
- City's Engineering, Public Works, Public Utilities, Economic Development Authority and Planning Departments

Funding information

- Funding type: CWP
- Grant amount: \$200,000
- Matching funds: \$200,112

Contact information

Patrick Shea, Director of Public Services
City of St. Cloud
400 2nd St. S.
St. Cloud, MN 56301
320-255-7225
MPCA project manager: Phil Votruba



Green Rights-of-Way Project

Mississippi River – Twin Cities

Northwood Lake Water Quality Improvement Project

Northwood Lake is an impoundment of the North Branch of Bassett Creek in the City of New Hope and is directly tributary to the North Branch Bassett Creek, which flows into the Main Stem of Bassett Creek and into the Mississippi River.

Northwood Lake was added to the State's Impaired Waters List (303(d) list due to high nutrients in 2004. A TMDL has not been completed for this lake. The lake's fully developed watershed of 1,341 acres has little or no stormwater treatment. Other pollutants impacting the lake include bacteria, solids, chlorides, PAHs, etc.

Project highlights

- The Northwood Lake Water Quality Improvement Project treats stormwater runoff from 110 acres of previously untreated urban land. At the east end of the lake in Northwood Park the project included design and construction of a pre-treatment device, a 160,000-gallon underground stormwater reuse chamber, pump house, distribution system to irrigate 6.4 acres of adjacent ball fields, and an overflow structure directed into a series of linear rain gardens for treatment prior to discharging into Northwood Lake. At the west end of Northwood Lake, a wet ponding basin was constructed to treat stormwater runoff from backyards and Jordan Avenue. The project was designed to reduce TP loadings to the lake by an estimated 22 lbs/yr.
- The Project was designed in late 2015 and constructed March 2016 to May 2017. The stormwater reuse tank and irrigation system first operated in June 2017. To date, over 1.2 million gallons of water have been captured and re-used to irrigate ballfields. The rain gardens have captured and infiltrated overflow water from the tank and vegetation around the rain gardens is now well established. The pond on the west end of the lake is working well and vegetation surrounding the pond is well established.

Partnerships

- City of New Hope – through a cooperative agreement with the Bassett Creek Watershed Management Commission (BCWMC), the city designed and constructed the project and is responsible for project maintenance and operation



Northwoods tank construction

- BWSR – provided \$400,000 CWF grant used as matching funds
- Friends of Northwood Lake – local resident group that helped build community support for the project and educated residents about the project and their personal connections to clean water

Financial information

Funding type: CWP

Grant amount: \$300,000

Matching funds: \$1,378,060

Contact information

Laura Jester

BCWMC Administrator

16145 Hillcrest Lane

Eden Prairie, MN 55346

952-270-1990, laura.jester@keystonewaters.com

MPCA project managers:

Rachel Olmanson and Brian Livingston

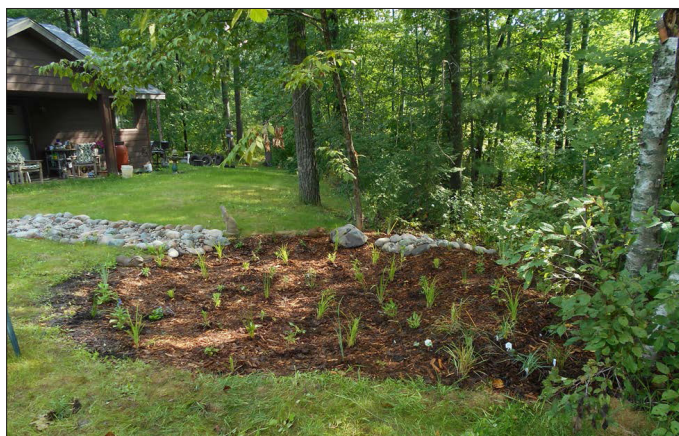
Rum River Watershed

Mille Lacs Lake Protection Stormwater Control

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 throughout the watershed of Mille Lacs Lake. Efforts included installation of BMPs that address stormwater runoff, education of landowners, and baseline water quality monitoring. 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.

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 also 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 (BWSR) 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



Rain garden near Borden Lake

- and shoreline buffer projects. Dedicated volunteers are committed to carrying this effort forward.
- 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 six BMP projects supported by the grant. Projects reduced phosphorus loading in the watershed by 8.19 lbs/yr, sediment reaching the surface waters was reduced by 8.47 T/yr. 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.

Partnerships

- 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 DNR and Environment – 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.

Financial information

Funding type: CWP

Grant amount: \$64,535

Matching funds: \$86,878

Contact information

Janet Smude

District Technician

Aitkin County SWCD

120 Southgate Dr.

Aitkin, MN 56431

218-927-6565, Smude.aitkinswcd@gmail.com

MPCA project manager: Bonnie Finnerty



Stabilized shoreline – Round Lake

Sauk River Watershed

Middle Sauk River Targeted Reduction and Outreach

The Sauk River currently meets water quality standards for turbidity, however water quality data from 1995-2013 indicates that the Sauk River is at risk of becoming impaired for sediment. This is most evident in the river reach between County Road 31, near the City of New Munich, and County Road 111, at Richmond. The land use in this area is intensely farmed with row crops and livestock operations as the main components of the agricultural economy. This CWP project focused on the middle Sauk River region, starting from the Sauk Lake outlet, at Sauk Centre, to the inlet of the Sauk River Chain of Lakes at Richmond. This project provided producers an opportunity to install vegetated buffer strips along water resources and private ditches and provided funding to restore riparian areas and field erosion to prevent sediment from reaching the Sauk River.

To address the sediment concerns for the Sauk River, the Sauk River Watershed District (SRWD) and the Stearns SWCD worked with area landowners to implement erosion control BMPs on their fields and along the riparian areas. Vegetated buffers were encouraged along all water resources. The implementation efforts funded under this CWP project reduced approximately 2,817 tons of sediment and 3,211 pounds of phosphorus from reaching the Sauk River.

Project highlights

- On May 19, 2015, the SRWD Board approved the Hayed Buffer Policy which was guided by the SRWD's Farmer-Led Council. Eleven landowners participated in the Hayed Buffer program, enrolling 92.71 acres, which nearly double the acreage that was proposed. During the 2016 and 2017 construction season, three bank stabilization projects and two grass waterways were completed to address significant erosion issues. The District's 2014-2024 ten year comprehensive plan focuses on the main stem of the river and its major tributaries. The SRWD will continue to address stream bank erosion and field erosion to protect the Sauk River.
- The efforts put forth in this CWP project far exceeded the proposed sediment reduction of 19.2 T/yr. The 92.71 acres of vegetated buffer installed in this project



reduced 1113.69 tons of sediment and 1545.49 pounds of phosphorus per year. Three riparian restorations along the Sauk River and two field gully restorations reduced 2,088.15 tons of sediment and 2,193.85 pounds of phosphorus from reaching the Sauk River.

Partnerships

- Stearns County SWCD – provided technical assistance and outreach to landowners
- Stearns County NRCS – provided technical assistance and financial assistance to landowners
- West Central Technical Service Area Engineers – provided engineering services
- Pheasants Forever – provided technical assistance and outreach efforts to landowner
- DNR – technical assistance with stream bank permits
- Minnesota Soy Bean Growers – provided outreach efforts

Financial information

Funding type: CWP grant and loan

Grant amount: \$243,689

Loan amount: \$24,516

Matching funds: \$429,200

Contact information

Sarah Jo Boser, Water Resource Manager
Sauk River Watershed District
524 4th St. S.
Sauk Centre, MN 56378
320-352-2231, sarah@srwdmn.org
MPCA project manager: Anna Bosch



Hayed buffers

Sauk River Watershed

Mill Creek Watershed Nutrient Reduction

The goal of the Mill Creek Watershed Nutrient Reduction Project was to reduce nutrient loading and *E.coli* impacts by addressing land use issues within the watershed through civic engagement and public outreach efforts, and implementing conservation BMPs. Section 319 funds were used to implement recommended conservation BMPs associated with agricultural nutrient management with priority given to a targeted 400 acres with a high nutrient delivery potential that are adjacent to a stream or channel.

Waterbody improved

To address the *E.coli* concerns for Mill Creek, the SRWD and the Stearns SWCD worked with area landowners to implement erosion control BMPs on their fields and along the riparian areas. Vegetated buffers were highly encouraged along all water resources. The implementation efforts funded under this Section 319 project reduced approximately 286.35 tons of sediment and 252.17 of phosphorus from reaching Mill Creek.

Project highlights

- The Stearns County SWCD and NRCS worked with two landowners to install conservation practices on highly erodible land. Approximately 1,900 linear feet of grass waterways were installed.
- A shoreline restoration project was implemented along the shore of Pearl Lake. The Stearns County SWCD provided the technical assistance with financial assistance from the SRWD.
- The SRWD and SWCD worked with three landowners to plant cover crops before they harvest their crop. A highboy seeder was initially lined up to do the inter-seeding. However, due to mechanical issues the seeding had to be completed using aerial seeding. The extended warm weather provided good soil conditions for growth before the field was harvested. A total of 232 acres were planted with cover crops within the Mill Creek Watershed.
- The efforts put forth in this Section 319 project were not as anticipated due to lack of landowner participation. However, the conservation projects that were completed benefited Mill Creek. The grassed waterway installed reduced 232.11 pounds of phosphorus and 273.08 T/yr of sediment. The riparian



Aerial seeding of cover crops

restoration along Pearl Lake reduced four pounds of sediment and four pounds of phosphorus per year. The three cover crop projects reduced 13.16 tons of sediment and 16.06 pounds of phosphorus.

Partnerships

- Stearns County SWCD – provided technical assistance and outreach to landowners
- Stearns County NRCS – provided technical assistance and financial assistance to landowners
- West Central Technical Service Area Engineers – provided engineering services
- Pheasants Forever – provided technical assistance and outreach efforts to landowner
- DNR – technical assistance with stream bank permits
- City of Rockville – stakeholders meetings and provided meeting place

Financial information

Funding type: Section 319

Grant amount: \$36,029

Matching funds: \$73,941

Contact information

Sarah Jo Boser, Water Resource Manager
 Sauk River Watershed District
 524 4th St. S.
 Sauk Centre, MN 56378
 320-352-2231, sarah@srwdmn.org
 MPCA project manager: Anna Bosch

Sauk River Watershed

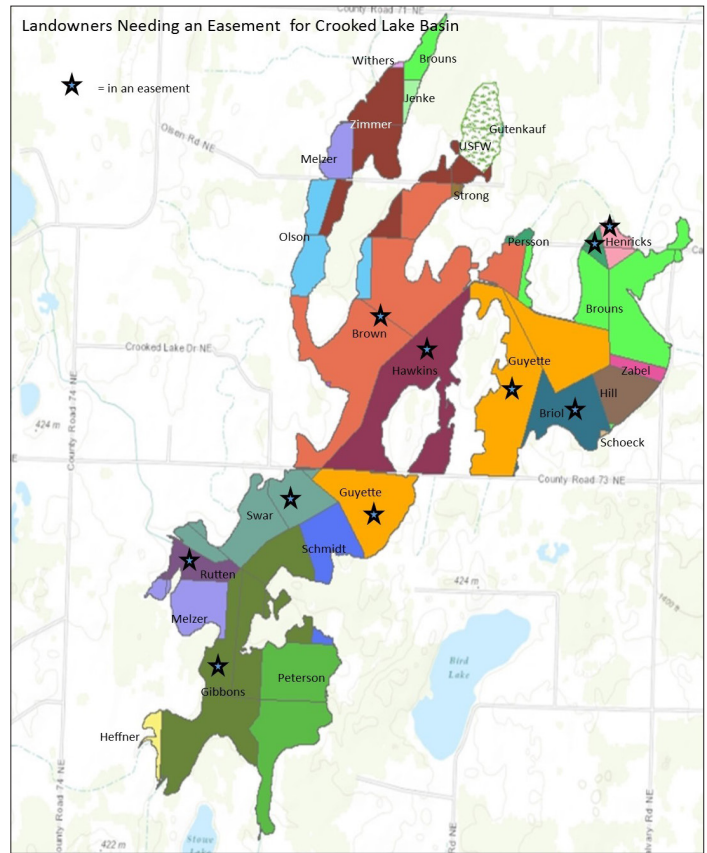
Osakis Lake Nutrient Reduction – Crooked Lake

The Osakis Lake watershed is the headwaters of the Sauk River, a major tributary to the Mississippi River. In 2004, Osakis Lake was listed as impaired for excessive nutrients on the State 303(d) list. The TMDL study completed in 2012 on the Osakis Lake Watershed, and area lakes, states that a 41% (9,416 lbs/yr) reduction in phosphorus is required in order for Osakis Lake to meet state water quality standards. The Judicial Ditch 2 (JD2) subwatershed makes up approximately 30% of the Osakis Lake Watershed. The TMDL identified JD2 watershed as a high nutrient contributor, carrying approximately 3,800 lbs/yr of phosphorus to Osakis Lake. To meet the TMDL, a 34% (3,373 lbs/yr) reduction in watershed loading will be needed from the JD2, Maple Lake Downstream and Osakis Lake Direct subwatersheds combined.

Project highlights

The JD2 subwatershed contributors approximately 3,800 lbs/yr of phosphorus to Osakis Lake. According to the 2012 feasibility analysis the 2,200 acre drained Crooked Lake basin contributed approximately 2,135 lbs/yr of phosphorus. The Douglas County SWCD, with assistance from Ducks Unlimited, has secured 920 of the 2,200 acres into a Reinvest in Minnesota (RIM) wetland restoration program. In 2018, the SRWD secured 514.59 acres in a perpetual conservation land conversion. This resulted in increased storage, decreased nutrient transport, decreased sediment runoff, flood mitigation and increase wildlife habitat. The restored acreage will enhance the quality of water flowing through JD2, which directly outlets to Osakis Lake. To date, 65.2% of the basin has been restored to wetland and wet prairie. The remaining 34.8% of the Crooked Lake basin will be addressed as funding becomes available and landowners are willing to enroll in a program.

- Enrolled 920 acres into the RIM wetland program
- Enrolled 514.59 in a SRWD perpetual conservation land conversion
- Conducted monitoring on JD2 and Osakis Lake to determine changes and nutrient loading
- Conducted kitchen table meetings with all landowners within the Crooked Lake basin area



Parcels within the Crooked Lake Basin – stars indicate enrolled in program

Partnerships

- Douglas County SWCD
- Ducks Unlimited
- Douglas County NRC

Financial information

Funding type: Section 319

Grant amount: \$71,766

Matching funds: \$109,353

Contact information

Sarah Jo Boser, Water Resource Manager
 Sauk River Watershed District
 524 4th St. S.
 Sauk Centre, MN 56378
 320-352-2231, sarah@srwdmn.org
 MPCA project manager: Anna Bosch

Sauk River Watershed

Sauk River Watershed District Groundwater Protections Project

Groundwater is a very valuable resource in the Sauk River Watershed. It is the primary source for drinking water throughout the SRWD. Groundwater also recharges the lakes and streams within the Sauk River watershed. Public and private wells are susceptible to contamination from abandoned wells, noncompliant septic systems and agriculture nutrient leaching. The local county agencies and the SRWD have been working together to address groundwater concerns within the Sauk River Watershed. Local municipalities have completed wellhead protection plans and have expressed their concerns for groundwater protection. It is very important that groundwater supplies remain clean for they are extremely expensive to remediate once contaminated and can have long term impact on area lakes and streams. This Clean Water Partnership (CWP) project addressed identified abandoned wells and non-compliant septic systems.

Project highlights

- Conducted nine radio sessions with the KASM and KEYL radio station to discuss groundwater protection and available funding.
- Conducted 15 (5 X 3 years) water fests throughout the Sauk River Watershed to increase groundwater protection awareness and risks to drinking water in rural areas. These events reached over 5,700 fourth graders, parents and teachers.
- Conducted three community awareness events for urban areas, reaching 500 plus residents
- Addressed two abandoned wells
- Addressed six non-compliant septic systems

The Sauk River Groundwater Protections CWP project addressed abandoned wells and noncompliant septic systems within the Sauk River watershed to protect area groundwater from potential contamination as well as prevent septic leachate from reaching nearby surface waters. The SRWD's and partners outreach efforts provided residents with the UMN Extension's septic system guidebook to properly maintain their new systems and guidance to protect groundwater contamination. Information regarding proper well maintenance was also provided. Through these

outreach efforts, as well as others provided by the Central Minnesota Water Education Alliance and county agencies, watershed residents were equipped to properly maintain their septic systems and wells to protect their drinking water from contaminants. By addressing two abandoned wells and six non-compliant septic systems, approximately 147 pounds of nitrogen, 45 pounds of phosphorus, 518 pounds of TSS and 937 pounds of BOD was reduced.

Partnerships

- Douglas County Land Resource Management – Technical assistance
- Todd County Environment and Land Resource Management – Technical Assistance
- Stearns County Environmental Services – Technical Assistance
- DNR – Technical Assistance, education events
- Central Minnesota Water Education Alliance – Volunteers, education events
- Osakis Lake Association – volunteer, education events
- Big Sauk Lake Association – volunteers, education events
- Sauk River Chain of Lake Association – volunteers, education events
- Minnesota Extension Service – volunteers, Education events
- MDH – volunteers, Education events
- Middle Sauk Water Fest Committee – volunteers, education events
- Lower Sauk Water-Fest Committee – volunteers, education events

Financial information

Funding type: CWP grant and loan

Grant amount: \$10,000

Loan amount: \$83,708

Matching funds: \$93,285

Contact information

Sarah Jo Boser, Water Resource Manager

Sauk River Watershed District

524 4th St S

Sauk Centre, MN 56378

320-352-2231, sarah@srwdmn.org

MPCA project manager: Anna Bosch

Upper Mississippi River Basin

Active projects

Projects involving multiple watersheds

Crow River SSTS Restoration Project – 2017

Sponsor: Crow River Organization of Water (CROW)

Funding: CWP (Loan) \$1,350,000

Purpose: This project will focus on addressing excess nutrients and bacteria on a comprehensive scale through the Crow River watershed. To achieve this goal up to 115 SSTS will be installed to mitigate pollution sources and transport. This project will result in an estimated annual reduction of 340 pounds of phosphorus, 7,566 tons of TSS, and 834 pounds of nitrogen.

Crow Wing River

Partridge River *E. coli* Reduction – 2018

Sponsor: Todd SWCD

Funding: Section 319 (Grant) \$79,722

Purpose: The project goal is to significantly reduce *E. coli* loading into the Partridge River by closing unlined manure storage basins located close to the river and its contributing waters. Seven unlined manure storage basins located within 400 feet of the Partridge River will be abandoned using cost share incentives and by providing technical assistance. Calculations detailed in the application show that a combined reduction of 7.94 billion *E. coli* per day to the river. That level of reduction will reduce *E. coli* loading by 18% during normal conditions and by 5% during wet conditions. Nitrogen losses from the manure basins will also be eliminated totaling a reduction of 224 pounds of nitrogen per year reaching the Partridge River. These will be permanent closures with any new installations needing to meet basin-lining requirements. It is expected that staff work with the seven sites will generate additional interest for manure basin closure and other BMPs in the area. These will be cost share with other funds or funding sources developed to meet those needs.

Long Prairie River

Long Prairie River Stream Bank Restoration – 2018

Sponsor: Todd SWCD

Funding: Section 319 (Grant) \$156,450

Purpose: The purpose of the project is to improve water quality through reduction of phosphorus, sediment, and BOD contributions into the lower reaches of the Long Prairie River. The lower reaches of this river have been listed as impaired for dissolved oxygen (DO) level during low flow periods. Low DO levels have reduced the suitability of the river for many species of fish and some macro-invertebrates. The project goal is to complete two streambank restoration and streambarb installations that will result in maintaining DO levels above the 2B daily minimum standard of 5 mg/L DO during late summer low flow conditions.

Mississippi River – Brainerd

Platte River Restoration/Protection Project – 2015

Sponsor: Morrison SWCD

Funding: CWP (Grant) \$34,900

Purpose: Through a combination of rock, streambarbs and bio-engineering, the stream channel will be slightly modified to deflect the river's energy away from the bridge abutments and the eroded banks. Through this combination of practices erosion will be reduced and long term stabilization can be achieved. The bio-engineered components and riparian buffer will also add aquatic and pollinator habitat with water quality benefits. The water quality improvements predicted are decreased water turbidity, decreased sediment load of the river by 39.6 T/yr, and stabilization of the north bank of the river.

Mississippi River – Twin Cities

Lower Sand Creek Corridor Restoration – 2017

Sponsor: Coon Creek Watershed District

Funding: Section 319 (Grant) \$269,563

Purpose: The main stem of Sand Creek is impaired for aquatic life impairments. Excess phosphorus, TSS, habitat alterations, and altered hydrology were identified as the primary stressors to Sand Creek's biota. To meet

pollution standards, the watershed must meet annual load reductions of approximately 36 tons of TSS and 813 pounds of TP per year. To address the remaining non-point sources of TSS and TP in Sand Creek, in-channel BMPs are necessary to prevent further channel incision and bank erosion. This project will implement multiple streambank and in-stream BMPs to reduce sediment and nutrient loading and to improve in-stream and riparian habitat. A one-half mile of river, identified as a TSS loading hot spot, will have targeted practices installed to address bank erosion, which contributes an estimated cumulative annual TSS load of 372 tons attributable to streambank erosion. The proposed BMPs will reduce approximately 75% of the bank erosion in the project area. Additional TSS and TP load reductions can be expected from preventing further channel incision with grade control structures and from enhancing riparian vegetation to treat overland flow.

Middle Sand Creek Corridor Restoration Project – 2018

Sponsor: Coon Creek Watershed District

Funding: Section 319 (Grant) \$291,000

Purpose: To provide long-term channel stability, reduce non-point source sediment and nutrient loading, and to enhance aquatic and riparian habitat along a 2/3-mile reach of Middle Sand Creek. This project will make significant progress towards addressing the aquatic life impairments and related TMDL load allocations for TSS and TP in Sand Creek and downstream Coon Creek. The project will implement multiple targeted BMPs to reduce sediment and nutrient loading and to improve in-stream and riparian habitat. Specifically, root wads, log toes, brush mattresses, stream barbs, and vegetated riprap will be implemented to stabilize 1,850 linear feet of actively eroding streambanks and to enhance depth, substrate, and cover variability for aquatic organisms. The incised channel will be reconnected to the floodplain as possible to improve access to backwater habitat. Additionally, tree-thinning within 25 feet of the channel and buckthorn removal will allow sunlight to penetrate the overgrown canopy and will promote the growth of low-lying vegetation along previously bare streambanks and riparian areas. These newly established vegetated buffer strips will reduce additional sediment and nutrient inputs by filtering overland runoff.

Shingle Creek Watershed SRP Reduction – 2018

Sponsor: Shingle Creek WMC

Funding: Section 319 (Grant) \$72,170

Purpose: The purpose of this project is to reduce soluble reactive phosphorus (SRP) loading in outflow from disturbed wetlands by field evaluating the effectiveness of three types of filter media and permanently installing filters using the best-performing media at the outlets of two wetlands currently discharging high SRP concentrations to impaired waterbodies. The SRP Reduction Project goal at the Wetland 639 W outlet site is to reduce SRP load export by at least half, or 97 lbs/yr. The goal at the Cherokee Wetland outlet site is a 50% reduction in SRP annual load at the Bass Creek Park monitoring site just downstream of the wetland outlet, or an annual reduction of 360 pounds SRP per year.

North Fork Crow River

Lake Monongalia Stormwater Projects Importance – 2019

Sponsor: Middle Fork Crow River WD (MFCRWD)

Funding: CWP (Loan) \$275,000

Purpose: The MFCRWD has identified several priority issues outlined in its approved Watershed Management Plan. Among these priority issues are agricultural drainage and stormwater management. The implementation of BMPs on high-priority waterbodies will help reduce sediment and nutrient loading, promote desirable groundwater infiltration, and mitigate the effects of stormwater and agricultural drainage. This loan funding seeks to build the top prioritized projects. These will include iron-enhanced sand filters, infiltration trenches, rain gardens, and tree trenches. Installation of these projects will result in a cost-effective pollutant reduction from city runoff to various nearby water resources, and downstream drinking water supply of Minneapolis and St. Paul.

MFCRWD Loan Program for BMPs/Septic Upgrades – 2015

Sponsor: Middle Fork Crow River Watershed District

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$100,000

Purpose: The project goal is to reduce the impacts of stormwater runoff and sediment and nutrient loading into the Middle Fork Crow River by implementing a variety of BMPs including stormwater retrofits, streambank restorations, conservation agricultural

projects, and septic system upgrades. This will be done by evaluating current water quality impacts, implementing BMPs already in the planning stages, and promoting BMPs to landowners with the support of a low interest loan program.

North Fork Crow River Septic System/Feedlot Upgrades – 2012

Sponsor: North Fork Crow River Watershed District

Funding: CWP (Loan) \$500,000

Purpose: The CWP Loan Program will finance ongoing efforts to upgrade 45-50 noncompliant septic systems in the watershed area of Rice and Koronis Lakes and undertake two to three cooperative feedlot manure management projects such as manure pit upgrades, installing storage ponds, pumps, liners, and clean water diversions.

Sauk River

Crooked Lake Basin Restoration Project – 2013

Sponsor: Sauk River Watershed District (SRWD)

Funding: CWP (Loan) \$665,000

Purpose: This project will use CWP loan funds to purchase 1,280 acres from 12 landowners in order to install a ditch weir which will hold back water to re-establish the lake basin. Under management, a restored Crooked Lake will provide 2,200 acres of submerged and emergent plants that will filter and take up nutrients and stabilize sediments from Judicial Ditch 2 (JD2).

JD2 Sediment Pond Dredging Project – 2019

Sponsor: Sauk River Watershed District

Funding: CWP (Loan) \$575,000

Purpose: The 2014 Osakis TMDL states that, a 41% reduction in phosphorus loading is required to meet state standards. In order to achieve this required reduction a 34% reduction in watershed loading will be needed from the JD2 and Osakis Lake direct subwatersheds. The JD2 subwatershed accounts for over 30% of the lake's total watershed and is the largest tributary inflow to Osakis Lake. Currently the JD2 sedimentation ponds are not functioning as designed due to the sediment build up in the ponds. The scope of this project is to dredge the JD2 sedimentation ponds, both primary and secondary, to remove the captured sediment and nutrients to improve the efficiency of the ponds.

Lake Osakis Minor Watershed Nutrient Reduction – 2017

Sponsor: Todd County SWCD

Funding: Section 319 (Grant) \$300,000

Purpose: These funds would be used to bring approximately 5-7 feedlots into compliance. This would be done by the construction and installation of approximately 30 completed and certified BMPs including: properly abandoning waste ponds, clean water diversions (curbs, earthen berms and gutters), vegetated filter strips, stacking slabs and nutrient management plans to bring existing livestock operations into compliance with current feedlot regulations. These BMPs would reduce phosphorus by 120 lbs/yr from reaching Lake Osakis. Additional water quality benefits would include reducing nitrogen contributions by 360 lbs/yr, 480 lbs/yr BOD, 6,486 lbs/yr COD and FC.

Middle Sauk River Field Runoff Reduction – 2018

Sponsor: Sauk River Watershed District

Funding: Section 319 (Grant) \$219,883

Purpose: Improve public outreach and conservation efforts by involving a "farmer-led" council. The SRWD will be working in collaboration with the Stearns SWCD, the UMN Extension, and Pheasants Forever to increase resident's awareness on the impacts of sediment's effect on the ecological balance of the Sauk River and its tributaries. The SRWD will work with its Farmer-led Council to encourage area producers to protect and improve water quality within the Sauk River Watershed through its enhanced nutrient management programs, which include hayed buffers, cover crops, soil grid testing, conservation tillage and variable rate fertilizer application. Section 319 funds will also be utilized to provide technical and financial assistance to landowners to address field erosion affecting water resources. This will be completed using practices to provide the greatest water quality, such as cover crops, rock tile inlets, buffers, and grassed waterways. Technical assistance will also be provided by the Stearns County SWCD and NRCS offices and the West Central Area Technical Service Engineers.

Osakis Lake Basin Restoration-Phase 2 Implementation – 2018

Sponsor: Sauk River Watershed District

Funding: CWP (Loan) \$1,500,000

Purpose: The goal of the Osakis Lake Restoration-Phase 2 Project is to install water retention practices to

increase subsurface infiltration and decrease overland run-off rates to reduce nutrient loading to Osakis Lake. Increasing enrollment by approximately 100 acres in existing conservation programs will increase surface water storage through impoundments and decreased drainage. Enhancing the SRWD's sedimentation pond system along JD2 was also identified as a cost effective BMP to address phosphorus loading to Osakis Lake. Funds will also be used to implement standard BMPs such as filter strips, grassed waterways, and saturated buffers; that have been shown to have measurable reductions to the receiving waters. In addition, implementing these conservation BMPs will increase aquatic and terrestrial habitat and wildlife corridor areas. The SRWD will work with local citizen groups, such as the Osakis Lake Association, to put projects on the ground and expand its public outreach efforts.

South Fork Crow River

Ardmore Avenue Stormwater Retrofit – 2015

Sponsor: City of Medina

Funding: CWP (Grant) \$33,163

Purpose: The installation of a filtration basin to treat stormwater prior to entering Lake Ardmore and Lake Independence, will result in a reduction of the TP and TSS load contributed to these waterbodies from a portion of the neighboring developed area. Lower TP and TSS loads also reduces Chl-*a* concentrations in-lake, an indirect measure of the amount of algae within these lakes. Lower phosphorus and Chl-*a* concentrations improve water clarity (Secchi depth) as well and allow the lakes to support the designated uses assigned to them. This project will serve as a city-led example of a stormwater retrofit for a 6.8 acre tributary area that can be replicated on a smaller scale by private property owners. Native plantings installed with the proposed BMP will facilitate bioretention and plant uptake. The filtration basin includes a drain-tile due to poorly draining soils. However, the proposed engineered mix of sand and compost within the basin will provide water quality treatment of the lawn and impervious runoff.

Buffalo Creek – Marsh Water Project – 2014

Sponsor: Buffalo Creek Watershed District

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$294,540

Purpose: The Marsh Water Project includes the construction of a stormwater wetland BMP, placed in-line with the existing ditch, to treat stormwater from agricultural, industrial, and residential land uses. Since few (if any) vegetative buffers, ponds, or other BMPs exist along the drainage system, nutrient concentrations are relatively high at the proposed BMP site, enabling substantial reductions as a result of the BMP through both particle settlement and absorption from the wetland plantings. Total anticipated yearly pollutant removals for the stormwater wetland BMP is 23 tons of TSS and 67 pounds of TP.



520 Lafayette Road North
St. Paul, MN 55155
651-296-6300 or
Toll-free 800-657-3864
www.pca.state.mn.us

Regional Offices

MPCA Brainerd Office

7678 College Road
Suite 105
Baxter, MN 56425
218-828-2492 or
Toll-free 800-657-3864

MPCA Detroit Lakes Office

714 Lake Avenue
Suite 220
Detroit Lakes, MN 56501
218-847-1519 or
Toll-free 800-657-3864

MPCA Duluth Office

525 Lake Avenue South
Suite 400
Duluth, MN 55802
218-723-4660 or
Toll-free 800-657-3864

MPCA Mankato Office

12 Civic Center Plaza
Suite 2165
Mankato, MN 56001
507-389-5977 or
Toll-free 800-657-3864

MPCA Marshall Office

504 Fairgrounds Road
Suite 200
Marshall, MN 56258
507-537-7146 or
Toll-free 800-657-3864

MPCA Rochester Office

18 Wood Lake Drive SE
Rochester, MN 55904
507-285-7343 or
Toll-free 800-657-3864