

Watershed Achievements Report

2016 Annual Report to the U.S. Environmental Protection Agency

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



Minnesota Pollution
Control Agency



This page left blank intentionally.

Watershed Achievements Report

2016 Annual Report to the U.S. Environmental Protection Agency

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



Minnesota Pollution Control Agency



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: Hay Lake, Minnesota River Basin

wq-cwp8-20

Contents

List of acronyms.....	5
Introduction	6
Maps	
Statewide intensive watershed monitoring schedule and progress	10
Watershed Restoration and Protection Strategies (WRAPS) progress	11
Major watersheds Stressor Identification status	12
Major watersheds model status	13
Impaired waters in Minnesota	14
Approved TMDLs in Minnesota	15
Tracking progress	16
Previous Impairments Now Meeting	18
Water Quality Standards Due to Corrective Actions	18
eLINK results from Section 319 and CWP projects 2006–July 2016	19
All projects awarded through 2016	23
Summary of statewide watershed project activity/Projects completed, currently active and awarded	27
Statewide	28
Assessing Iron-Enhanced Swales for Pollution Prevention	29
eLINK Database Support – FFY 2015	30
HSPF Scenario Application Manager (SAM) 2015 Package 1	32
Watershed Specialist Training, Phase 2	33

Statewide Active projects in 2016	34
Cedar River Basin	36
Cedar River Basin Active projects	37
Des Moines and Missouri River Basins	38
Fulda Phosphorus Reduction Initiative	39
West Fork Des Moines River TMDL Implementation Project	40
Des Moines and Missouri River Basins Active projects	41
Lake Superior Basin	42
Lake Superior River Basin Active projects	43
Lower Mississippi River Basin	44
Lower Cannon River Turbidity Reduction Project.....	45
Lower Mississippi Basin Active projects	47
Minnesota River Basin	49
Assessing Iron Enhanced Filtration Trenches	50
High Island Creek TMDL Project for Fecal Coliform.....	51
Neighborhood Lakes Management Plans.....	53
Protecting North and South Fork Yellow Bank River	54
Minnesota River Basin Active projects	56
Red River Basin	64
Red River Basin Active projects	65
St. Croix River Basin	66
St. Croix River Basin Active projects	67
Upper Mississippi River Basin	69
Kingston Wetland Feasibility Study and Restoration Project	70
Modular Green Roof Retro-fit System Development	71
Lower Sauk – Metro Area Water Quality Protection.....	72
Upper Mississippi River Basin Active projects	74

List of acronyms

BMP best management practice	lbs/yr pounds per year
BMPs best management practices	LGU Local Government Unit
BWSR Minnesota Board of Water and Soil Resources	LiDAR Light Detection and Ranging
CCMR Coalition for a Clean Minnesota River	MDA Minnesota Department of Agriculture
CFO County Feedlot Officer	mg/L milligrams/liter
CFU colony forming unit	MNDOT Minnesota Department of Transportation
CLFLWD Comfort Lake – Forest Lake Watershed District	MPCA Minnesota Pollution Control Agency
CRP Conservation Reserve Program	MVTL Minnesota Valley Testing Laboratory
CRWP Cannon River Watershed Project	NPS nonpoint source
CWF Clean Water Fund	NRCS Natural Resource Conservation Service
CWP Clean Water Partnership	P Phosphorus
DEM Digital Elevation Model	PAT Pre-processing Application Translator
DNR Minnesota Department of Natural Resources	RCRCA Redwood-Cottonwood Rivers Control Area
DO dissolved oxygen	RIM Reinvest in Minnesota
EPA Environmental Protection Agency	SAFL St. Anthony Falls Laboratory
EQulS Environmental Quality Information System	SAM Scenario Application Manager
FC Fecal Coliform	SCWMC Shingle Creek Watershed Management Commission
FTE full time equivalent	Section 319 Section 319 Grant Program
GBERBA Greater Blue Earth River Basin Alliance	SEMWRB Southeast Minnesota Water Resources Board
GCLWMO Gun Club Lake Watershed Management Organization	SRF state revolving fund
GIS geographic information system	SRWD Sauk River Watershed District
GPS global positioning system	SSTS Subsurface Sewage Treatment System
HEI Houston Engineering, Inc.	SWCD soil and water conservation district
HCWP Hawk Creek Watershed Project	SWPTSA 5 Southwest Prairie Technical Service Area 5
HICW High Island Creek Watershed	T/yr tons per year
HICWD High Island Creek Watershed District	TMDL total maximum daily load
HICWJPB High Island Creek Watershed Joint Powers Board	TP total phosphorus
HLWD Heron Lake Watershed District	TSS total suspended solids
HSPF Hydrologic Simulation Program FORTRAN	U of M University of Minnesota
HUC hydrologic unit code	µg/L micrograms per liter
IBI index of biological integrity	WD watershed district
IESF iron enhanced sand filtration	WDs watershed districts
IPM integrated pest management	WFDMR West Fork Des Moines River
IWAV Impaired water viewer	WMA Winter Maintenance Assessment
IWM Intensive Watershed Monitoring	WRAC Water Resources Advisory Committee
JD2 Judicial Ditch 2	WRAPS Watershed Restoration and Protection Strategies
LARS Local Annual Reporting System	WRC Water Resources Center
lbs pounds	WWTP Wastewater Treatment Plant

Introduction

Minnesota's citizens treasure their water resources 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.

Three Minnesota Pollution Control Agency (MPCA) programs provide local governments with resources to restore and protect surface water, with a special focus on nonpoint pollution sources (NPS). The 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) grant program was defunded by the state legislature in 2015. However, previous grants are underway and will be for the next three years. Finally, the 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 three 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 – 2016

Clean Water Accountability Act Reports

The MPCA has published seven [watershed reports](#) in accordance with the Clean Water Accountability Act. The requirement is in Minnesota Statute 114D.26, subd. 2, "Beginning July 1, 2016, and every other year thereafter, the MPCA must report on its website the progress toward implementation milestones and water quality goals for all adopted Total Maximum Daily Load's, and where available, Watershed Restoration and Protection Strategies."

In subsequent years, the reports will be updated, and new reports will be added. Each individual watershed report provides:

- Summarized description of the watershed

- Water quality measurements for Total Phosphorus, Total Suspended Solids, and Nitrogen
- Progress toward load reduction targets for each of the parameters above
- Most commonly applied BMPs for the watershed
- Water quality improvement spending totals in the watershed

2016 Clean Water Fund Performance Report

Minnesota agencies released their third collaborative [report](#) in February 2016 to help Minnesotans clarify connections between Clean Water Funds invested, actions taken and outcomes achieved. Twenty-seven measures in the report provide a snapshot of how Clean Water Fund dollars are being spent and what progress has been made. The measures are organized into four categories: investment, surface water quality, drinking water protection, external drivers and social measures. Each measure has detailed status ranking and trend information.

Minnesota's Statewide Buffer Initiative

Minnesota's landmark buffer initiative was signed into law by Governor Dayton in June 2015, designating an estimated 110,000 acres of land for water quality buffer strips statewide. The law establishes new perennial vegetation buffers of up to 50 feet along rivers, streams, and ditches that will help filter out phosphorus, nitrogen, and sediment. The new law provides flexibility and financial support for landowners to install and maintain buffers, and boost compliance with buffer laws across Minnesota.

The new Buffer Initiative enhances protection of Minnesota waters by building upon existing requirements in the following ways:

1. Expanding the scope of waters covered
2. Setting timelines for implementation
3. Providing for enforcement
4. Strengthening soil erosion statutes
5. Appropriating funding

Progress is being made in 2016 with the buffer law. The **2016 Buffer Law Amendments** provide clarifications to several provisions of the law, including the buffer requirement by ensuring it only applies to public waters and public ditches and compliance and enforcement responsibilities and processes.

Buffer mapping: the Minnesota Department of Natural Resources (DNR) has produced a [Buffer Protection Map](#) that will help guide implementation of Minnesota's buffer law. The map will help landowners and their local Soil and Water Conservation District (SWCD), County or Watershed District (WD) professionals identify where buffers are required and what buffer width is required.

Buffer program policies: buffer program policies are available on the Minnesota Board of Water and Soil Resources (BWSR) website at <http://bwsr.state.mn.us/buffers/> for review and public comment.

Guidance documents development: buffer program policy documents articulate *what* is required, supplemental guidance documents are being drafted to describe *how* specific components of the program will be implemented.



WRAPS: Prescriptions for healthy lakes and streams

Statewide efforts to check the health of lakes and streams are coming to fruition this year with "prescriptions" for healthy waters expected in more than two dozen watersheds.

"Our crews and local partners have been taking thousands of water samples, wading into streams across Minnesota to study fish and other creatures, and crunching far more data than ever before. We are building a comprehensive look of water quality across our state," said Rebecca Flood, Assistant Commissioner for the MPCA.

"This year we will turn the corner on checking the health of nearly all 80 watersheds. With local partners and citizens, we will also have prescriptions to restore and protect our waters in half those watersheds, with the rest slated for completion soon."

The MPCA started a holistic approach to measure the health of the state's 80 major watersheds beginning in 2008 with funding from the Clean Water Legacy Amendment. This watershed approach greatly accelerated the state's assessment of lakes and streams while saving money, compared to the previous approach of studying one lake and one stream section at a time. It also puts focus on protecting healthy waters, a critical component missing from the previous approach of focusing only on impaired waters.

This watershed approach consists of four main steps on a 10-year cycle:

1. Intensive water monitoring and assessment to see if major rivers and lakes meet water quality standards
2. Identifying conditions that stress fish and bugs as well as healthy conditions that foster them
3. Developing Watershed Restoration and Protection Strategies (WRAPS)
4. Implementing changes to restore and protect waters through local water plans

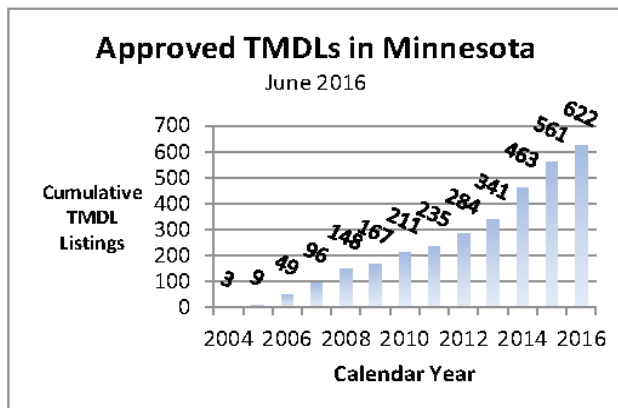


As part of developing WRAPS for the Mississippi River-Winona watershed, the Whitewater River Watershed Project held citizen dinners to gather input and information.

Local partners, such as watershed partnerships and conservation districts, usually play a major role with the MPCA in the first three steps. They take the lead in the last step – implementation. Local partners and the MPCA seek input from citizens, landowners and others throughout the process. Together, they develop strategies based on local data and sound science that can lead to focused action to protect and restore Minnesota waters into the future.

All 80 watersheds in Minnesota have restoration and protection strategy projects underway. Strategy reports have been completed for 10% of the watersheds and more are on track for completion this year. For more information, see the [MPCA watershed approach](#).

Progress is also being made in completing Total Maximum Daily Load (TMDL) studies for impaired waters in the state. As part of the watershed approach, TMDL studies are being done on a watershed scale which has accelerated the pace on TMDL study completions.



On the mend: Burandt Lake in Carver County

[Burandt Lake in Carver County](#) southwest of the metro area is popular for recreation with lakeshore owners, but plagued by high levels of phosphorus that cause algae blooms. Algae can make the water unsightly and smelly for swimming, paddling and fishing. Some forms can even make animals and people sick.

This lake, which is 10 to 24 feet deep and covers 92 acres, is on the mend, thanks to a multi-pronged approach by state agencies and local partners. This approach is like a health checkup for lakes and rivers, starting with water monitoring as a checkup, a study for prognosis with a

prescription for restoration, and steps taken to achieve better lake health.

Water monitoring found the phosphorus levels in Burandt Lake from 56 to 98 parts per billion, well above the water quality standard of 40 parts per billion. Because the phosphorus levels violated the standard, the MPCA placed Burandt Lake on the impaired waters list, kicking off a process to restore the lake.



Burandt Lake: TMDL was completed on June 9, 2009.

The first step was a study called a [TMDL](#), which determines the maximum amount – or load – of a pollutant that a water body can accept and still meet water quality standards. The [Carver County Water Management Organization](#) led this study for Burandt Lake. In this case, the maximum amount is the water quality standard – 40 parts per billion – of phosphorus. The study also figures the reductions needed to meet standards. For Burandt Lake, phosphorus loads into and within the lake need to decrease by 32 to 66%, depending on annual precipitation, to achieve the water quality goal.

The study identified the sources of phosphorus as stormwater running off developed and agricultural land, along with failing septic systems and degraded wetlands. The lake's bottom sediment also contains phosphorus that causes algae when stirred up by wind and boat propellers.

With the prescription in hand, Carver County and partners are now taking steps to improve water quality with an innovative stormwater project. The county is leading a partnership with the Carver County SWCD, Water Management Organization, City of Waconia and the Waconia School District to implement a major water

reuse project that should remove the lake from the list of impaired waters.

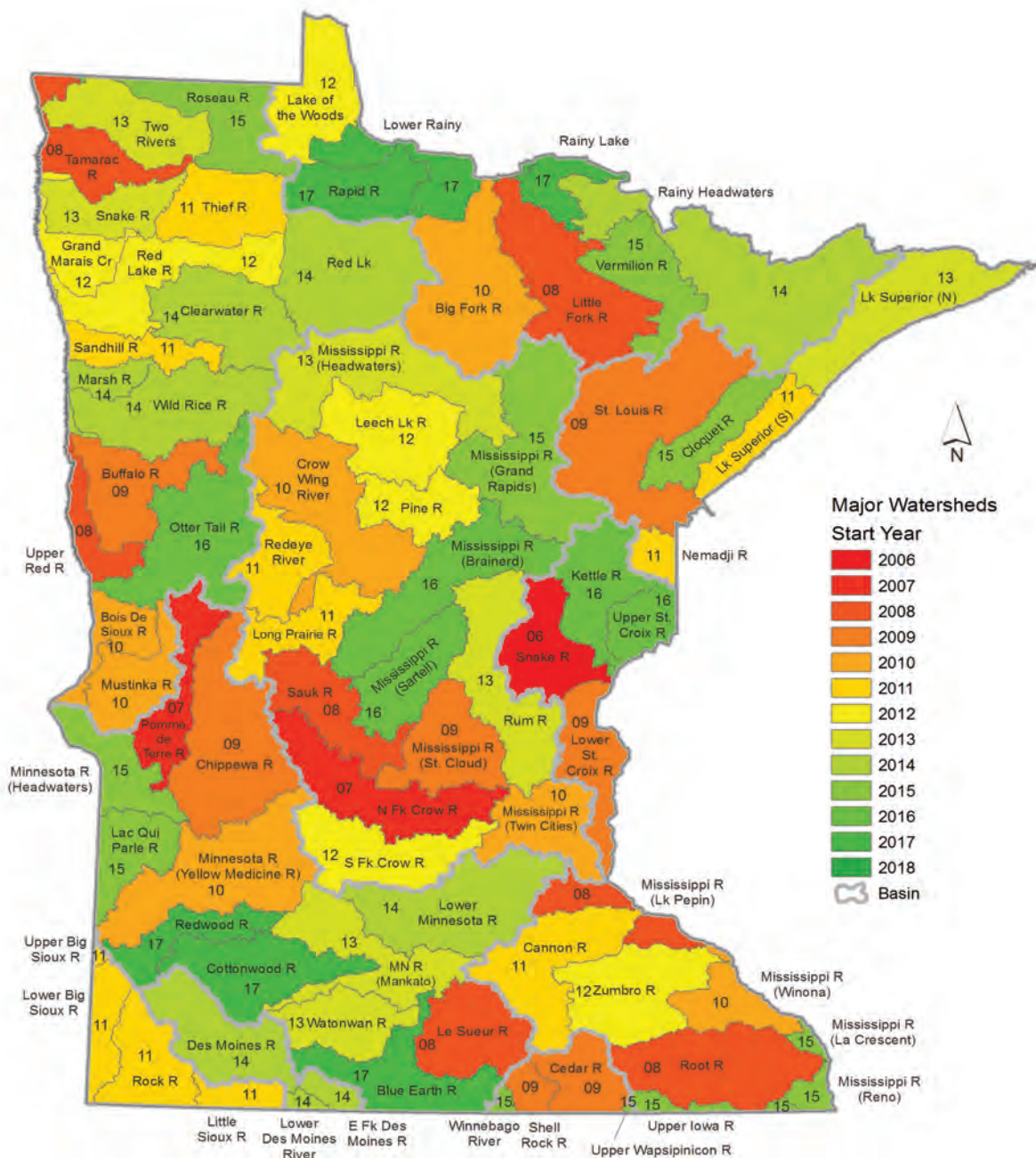
Reducing the stormwater also reduces the amount of nutrients flowing into the lake. Before this project began, almost 62 pounds of phosphorus flowed into Burandt Lake with stormwater runoff from this part of the lake. Once all three phases of this stormwater project are complete, that level should drop to about 14 pounds a year – a decrease of 77%.

In addition, reducing phosphorus will help restore water quality in Burandt Lake and downstream because the lake discharges to Carver Creek, which flows into the Minnesota River.

This project is a great example of how state agencies like the MPCA and [BWSR](#) can work with local partners like Carver County to use the Clean Water Fund to restore waters based on scientific studies and long-term efforts.

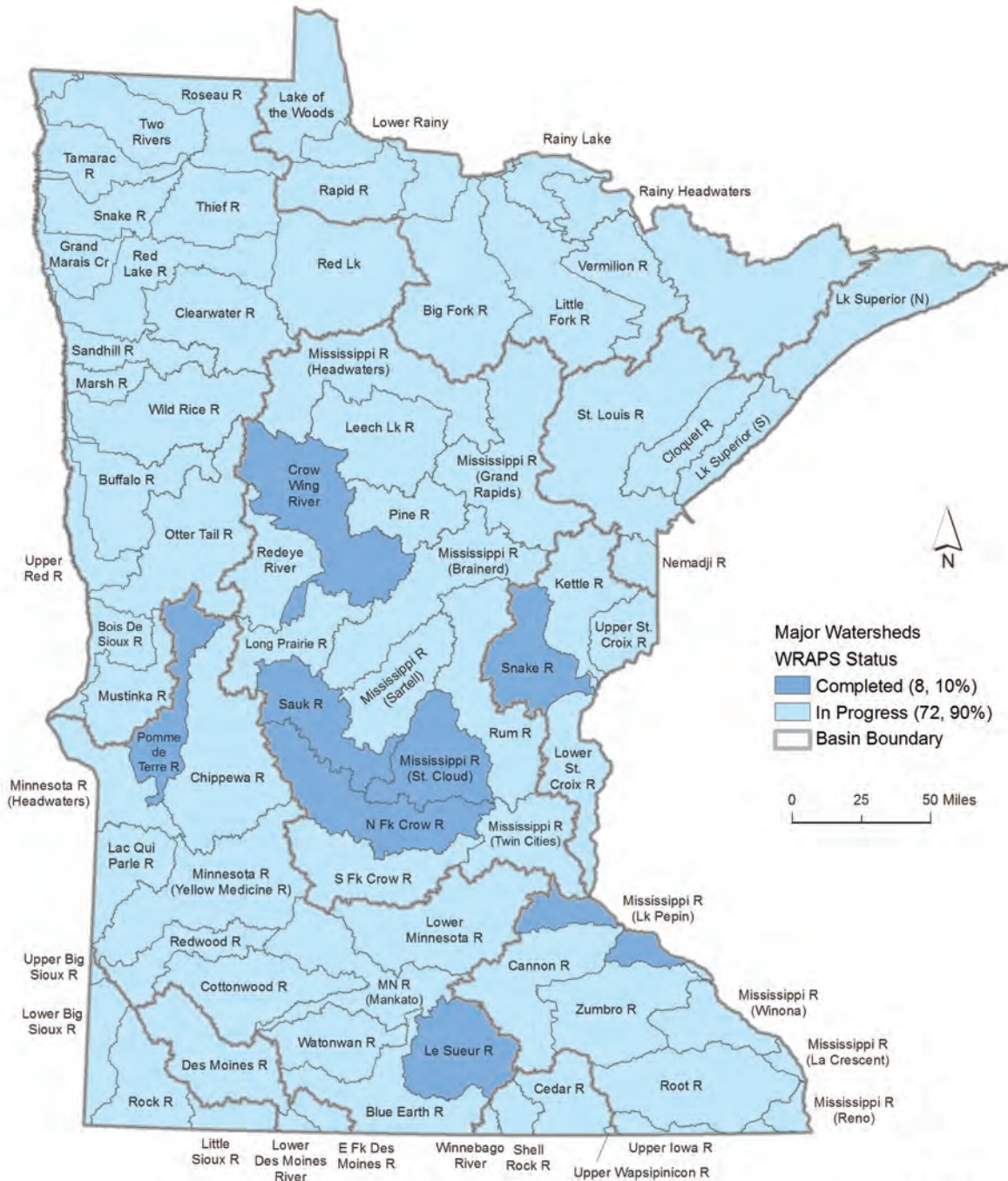
Statewide intensive watershed monitoring schedule and progress

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 69 of the state’s major watersheds – that is approximately 85% of the state’s watersheds. The level of effort of this monitoring and the amount and types of data being collected in this Watershed Approach is well beyond that of past monitoring efforts.

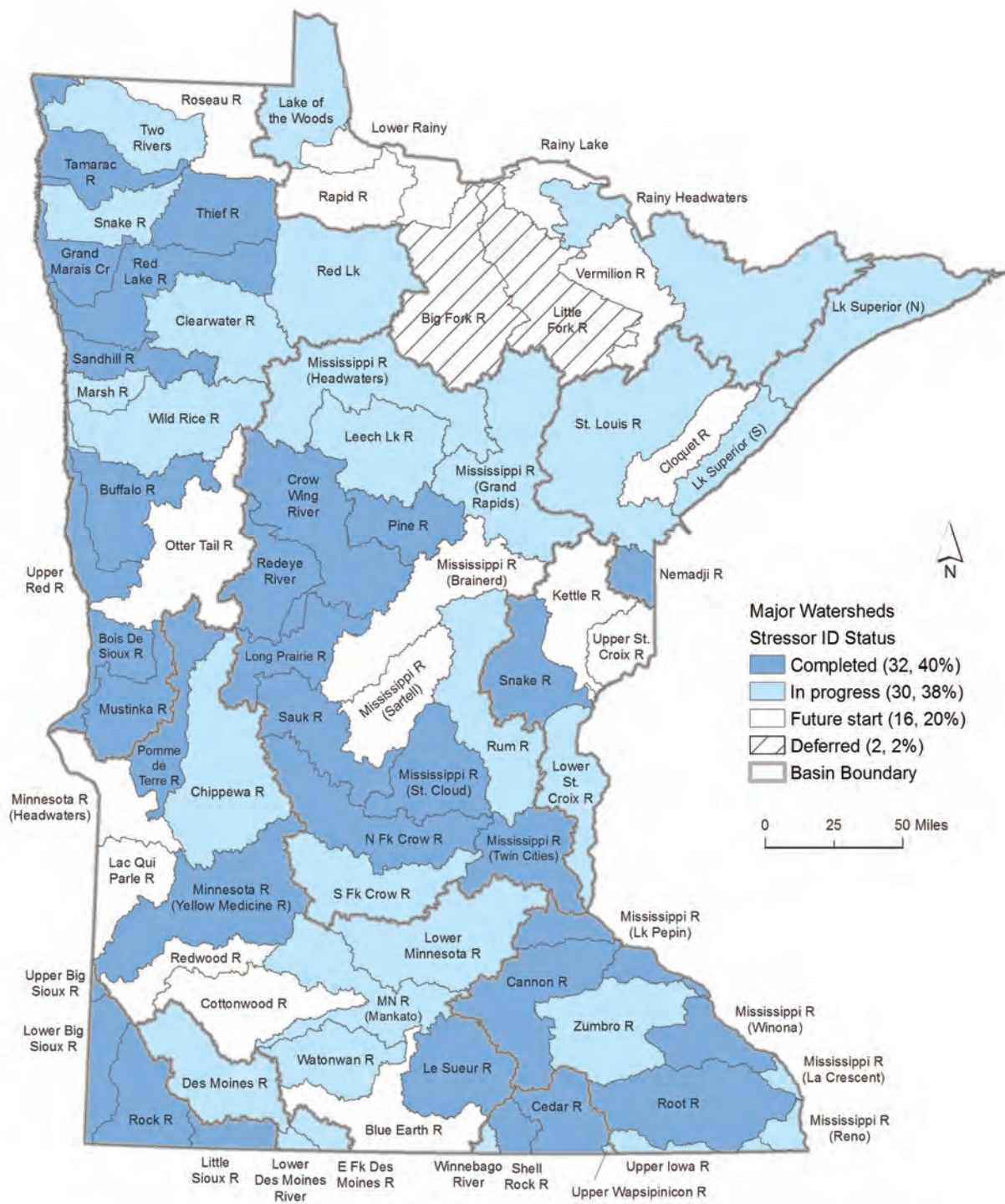


Watershed Restoration and Protection Strategies (WRAPS) progress

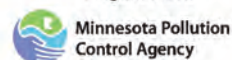
WRAPS reports for the major watersheds in Minnesota are completed or underway for all except one watershed. There are eight completed WRAPS studies and work in the other watersheds is underway with monitoring, watershed modeling, biological stressor work and/or a WRAPS project in progress.



Major watersheds Stressor Identification status

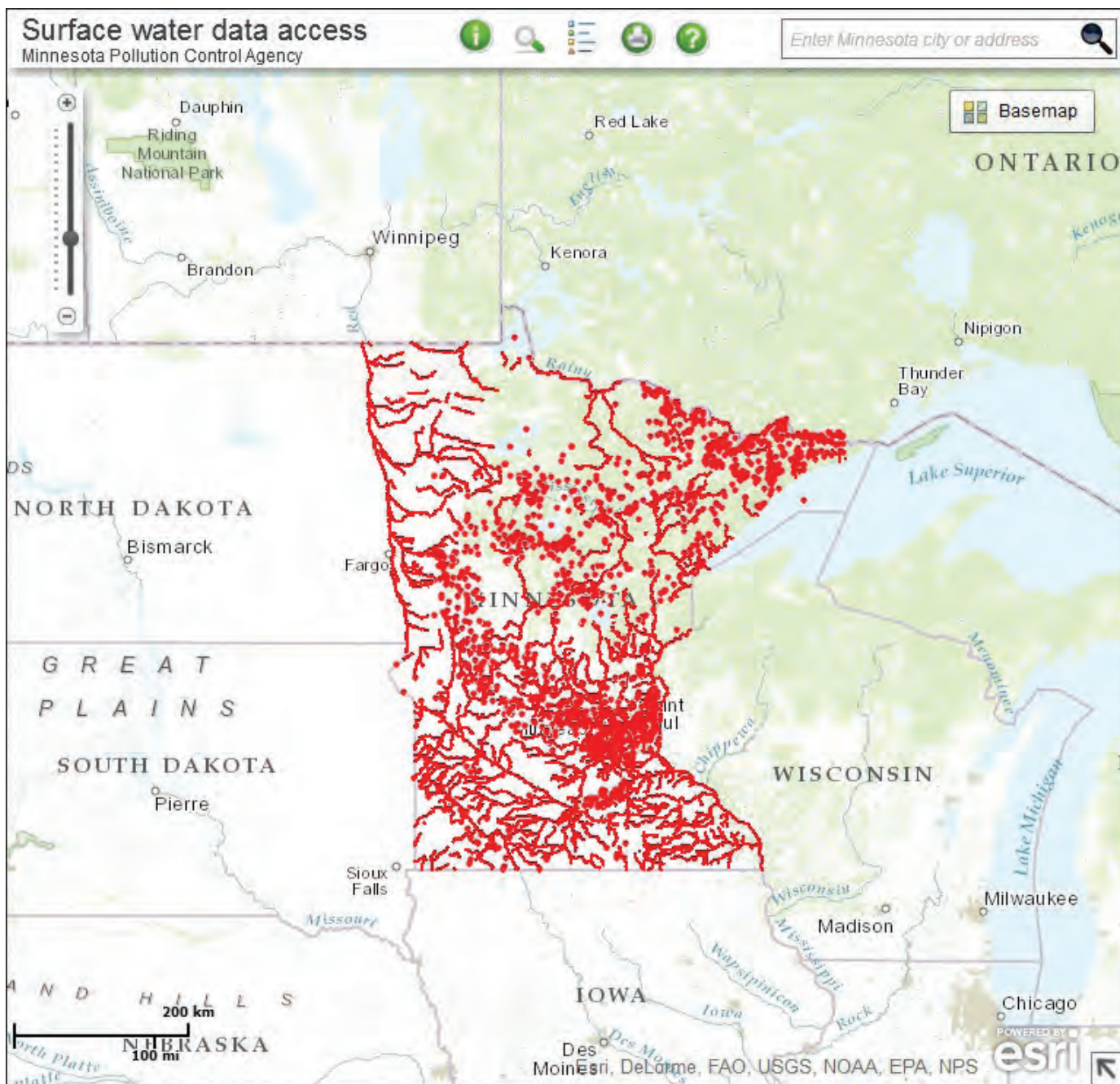


August 2016



Impaired waters in Minnesota

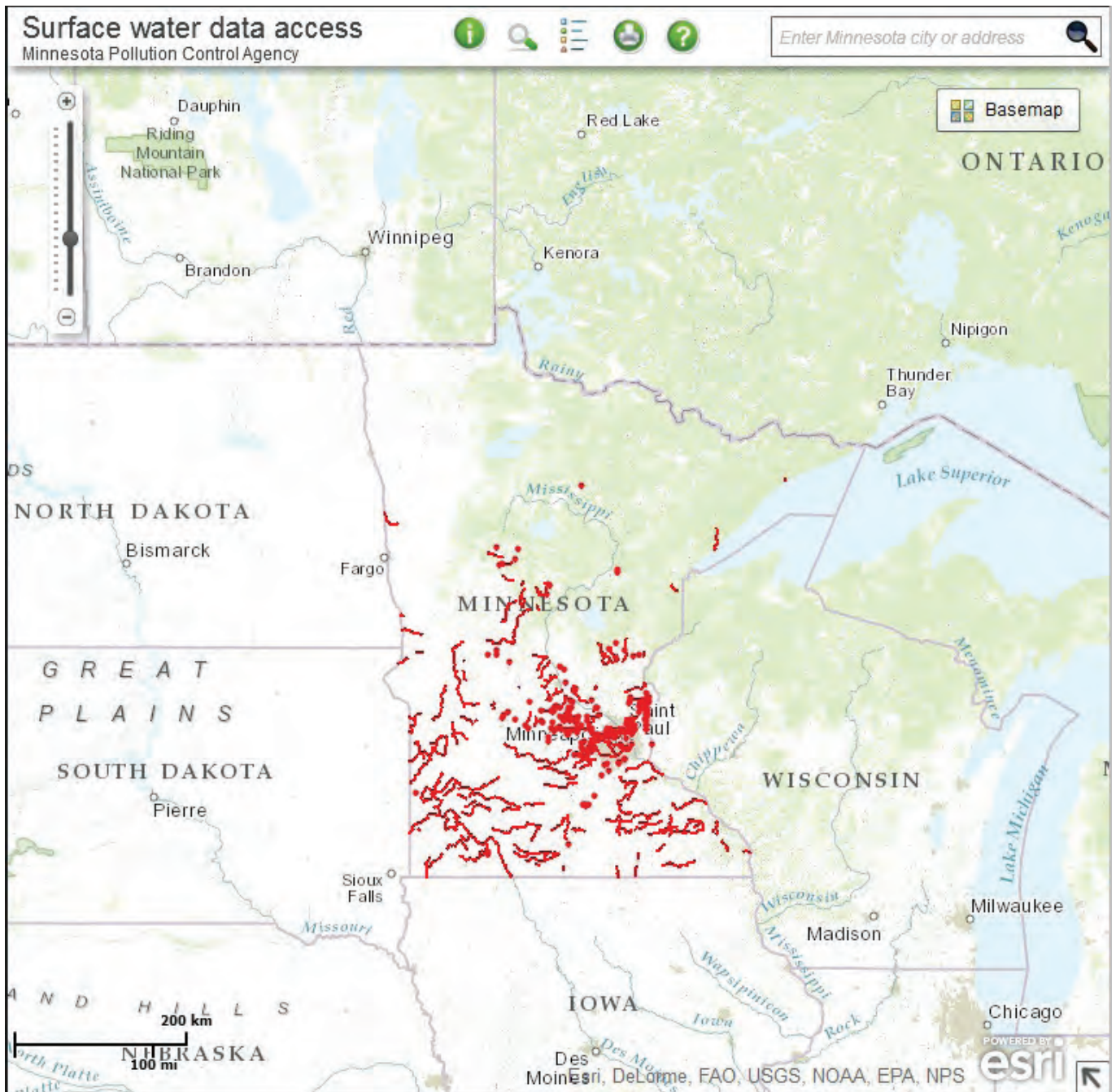
Impaired waters in Minnesota can be viewed using the MPCA web-based mapping application impaired waters viewer (IWAV). The graphic below is a screen shot of the application that is available at this internet address: <https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav>



Approved TMDLs in Minnesota

Approved TMDLs in Minnesota can be viewed using the MPCA web-based mapping application IWAV. The graphic below is a screen shot of the application that is available at this internet address:

<https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav>

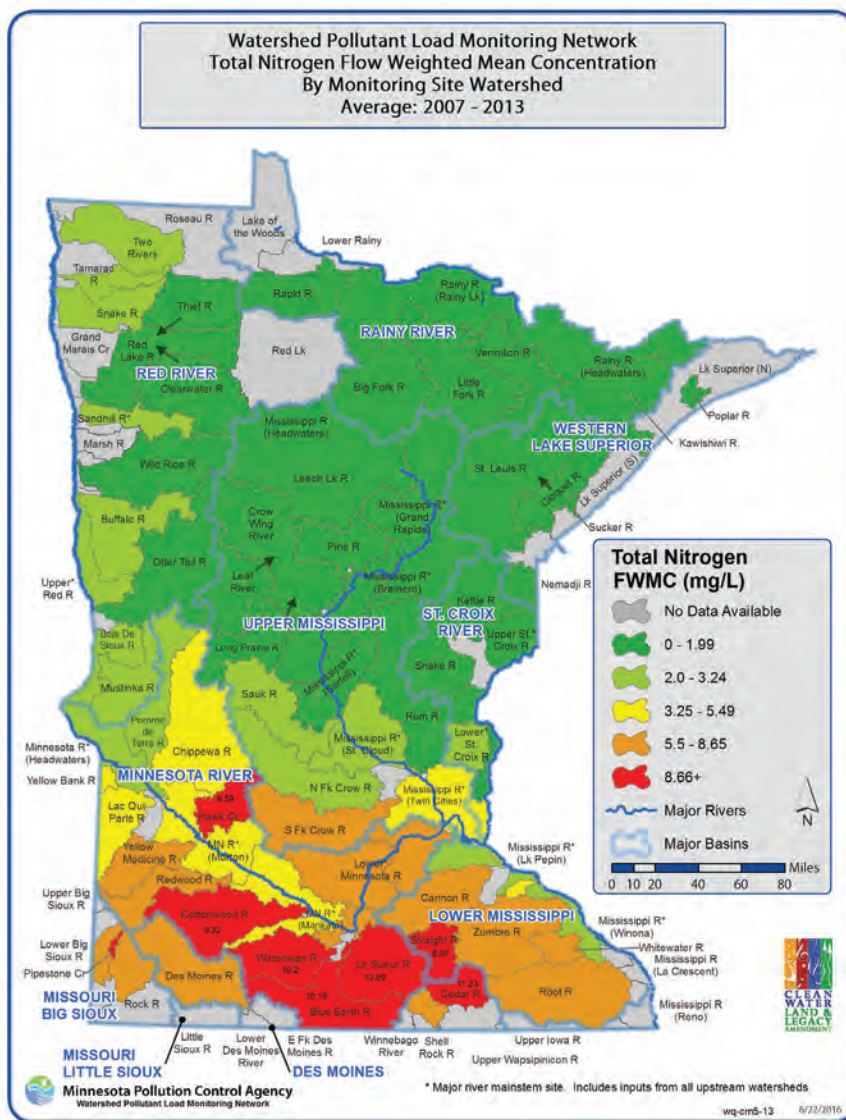


Tracking progress

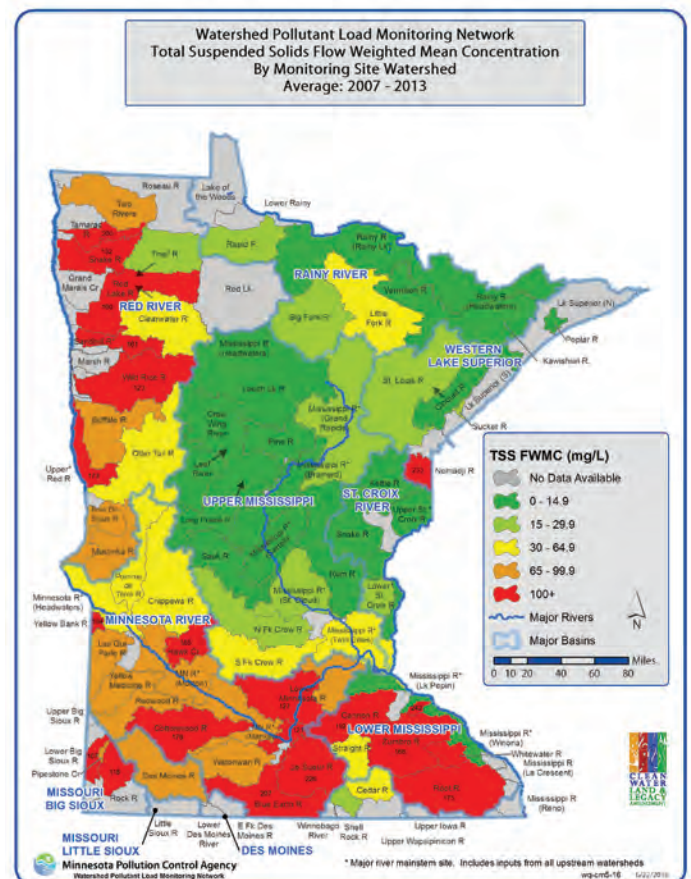
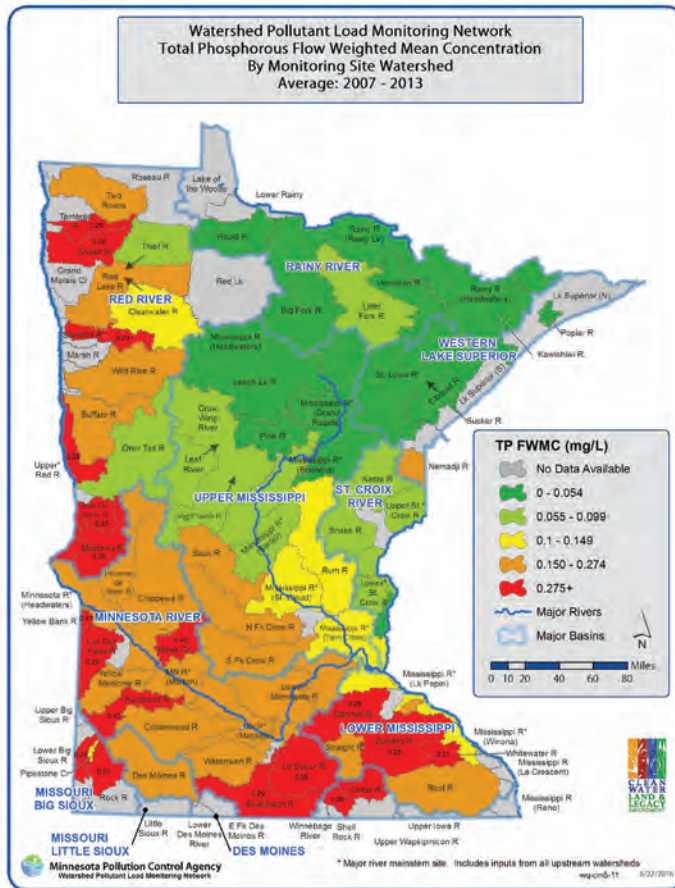
The Watershed Pollutant Load Monitoring Network is designed to obtain spatial and temporal pollutant load information from Minnesota’s rivers and streams and track water quality trends. This long-term program utilizes state and federal agencies, universities, local partners and Minnesota Pollution Control Agency 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 miles (8 digit hydrologic unit code (HUC) scales)
- Subwatershed – major branches or nodes within major watersheds with average drainage areas of approximately 300-500 square miles

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



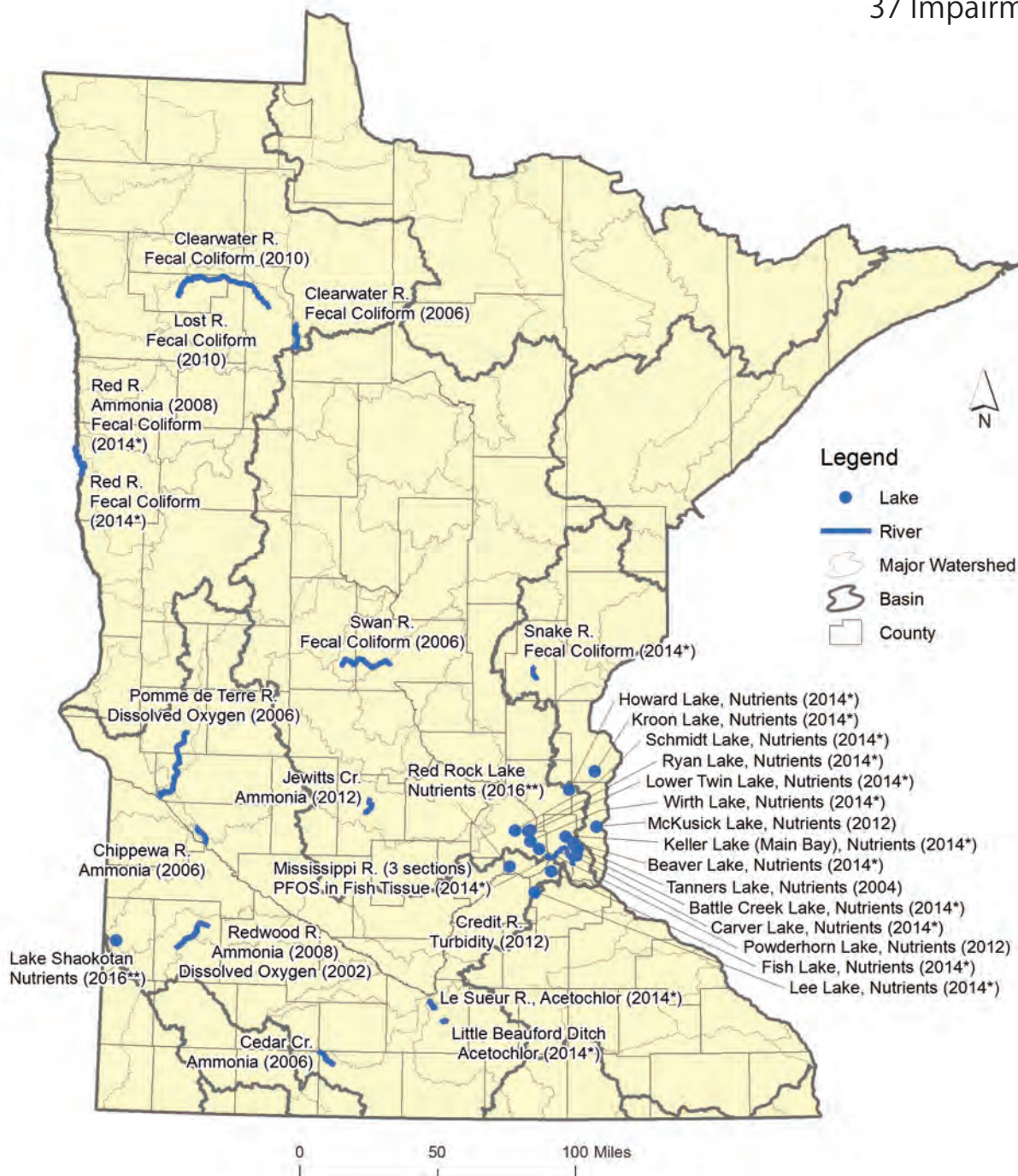
Tracking progress continued



Previous Impairments Now Meeting Water Quality Standards Due to Corrective Actions

August 2016

37 Impairments



* To be proposed by MPCA for delisting in the next listing cycle. Delisting proposals are subject to public comment and EPA approval.



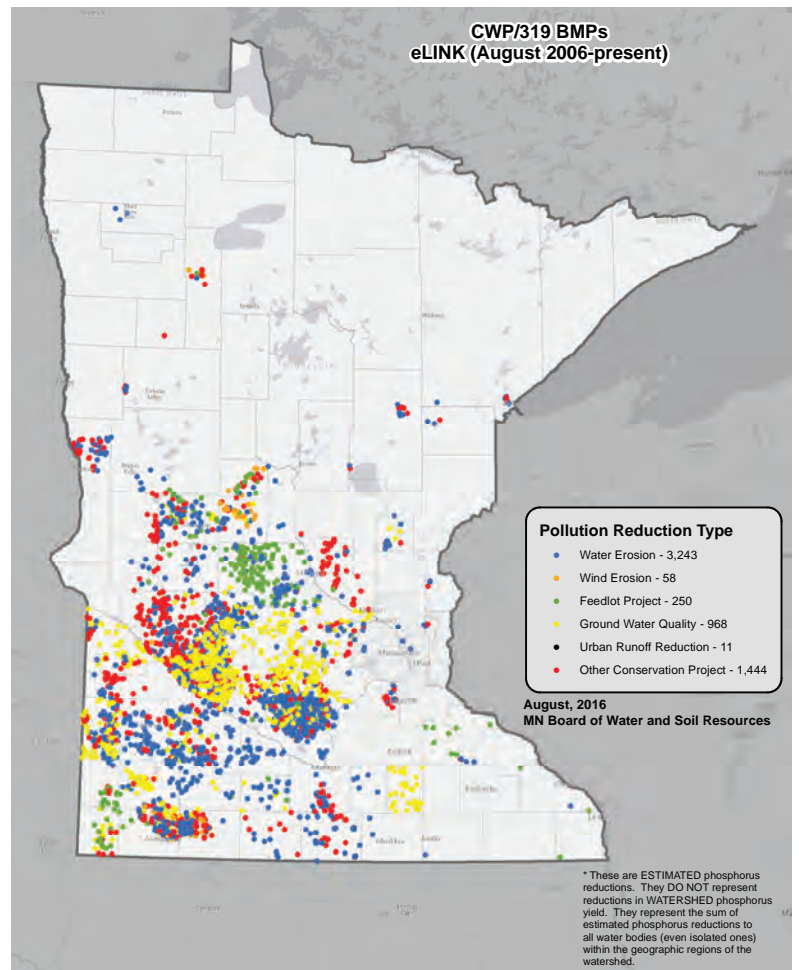
eLINK results from Section 319 and CWP projects 2006–July 2016

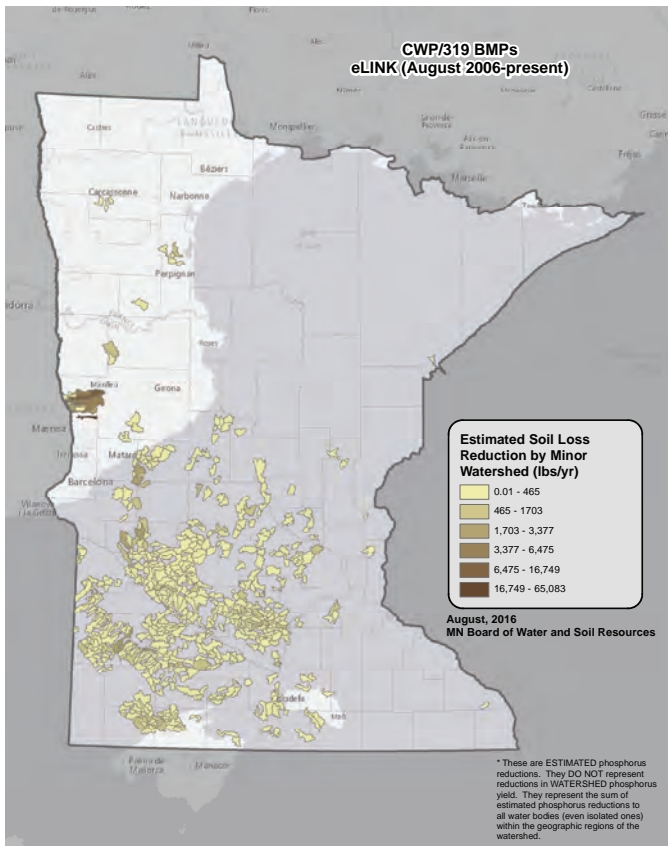
The following table shows progress through July 2016 based on reporting data from eLINK (2006 – July 2016). Based on eLINK reporting by CWP and Section 319 project partners, these projects have reduced **soil loss** from 2006 through July 2016 by more than 211,154 T/yr. During the same period, **sedimentation** was reduced by more than 99,120 T/yr, **phosphorus** loading by more than 228,168 lbs/yr, and **nitrogen** reduction by more than 398,376 lbs/yr.

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	250	0	0	97,891	138,293
Ground Water Quality	968	0	2,384	6,728	14,323
Other Conservation Project	1,444	42,762	37,938	55,505	109,207
Urban Runoff Reduction	11	0	1	1	1
Water Erosion	3,243	167,363	58,753	67,974	136,414
Wind Erosion	58	1,029	44	70	139
Total	5,974	211,154	99,120	228,168	398,376

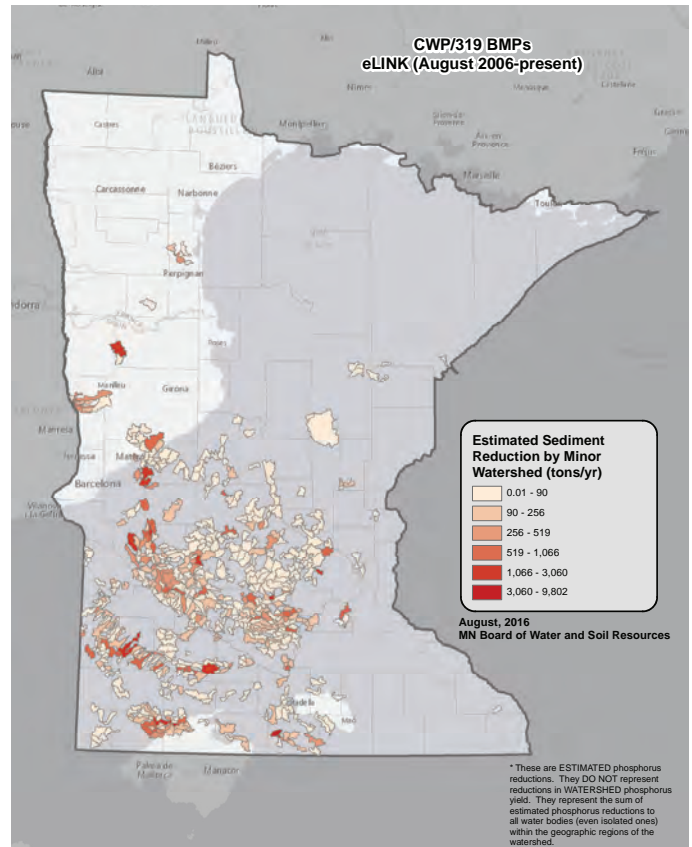
* If no nitrogen reduction was reported, then estimated nitrogen was calculated by doubling estimated phosphorus.

CWP/Section 319 BMPs eLINK (2006 – present)

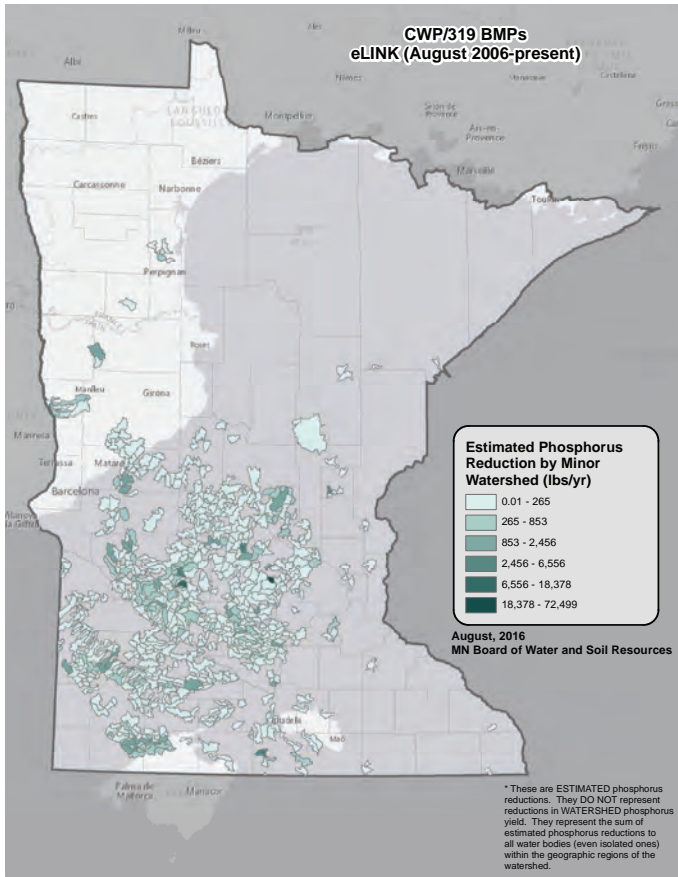




**Estimated soil loss reduction
CWP/319 BMPs
e LINK (2006 – present)**

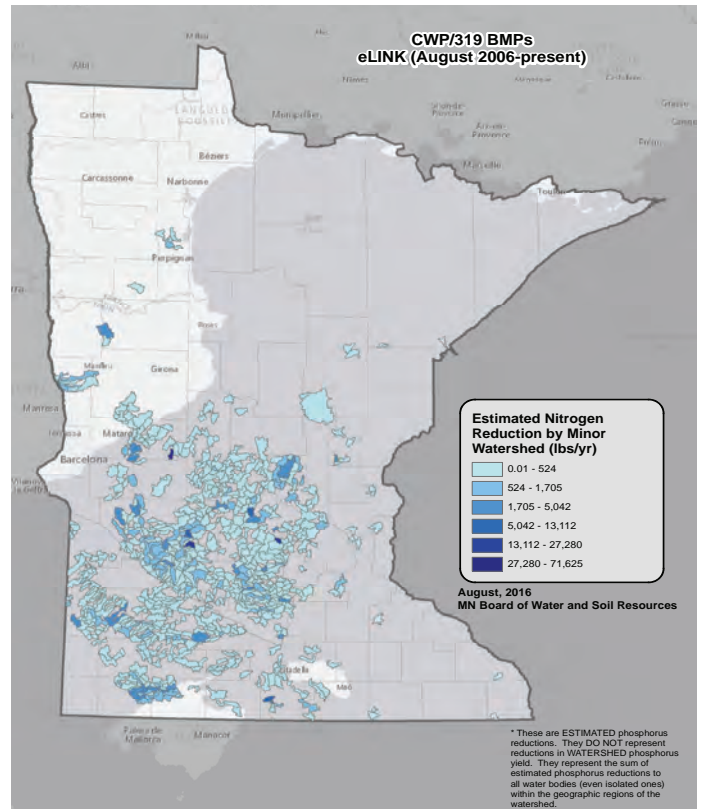


**Estimated sediment reduction
CWP/319 BMPs
eLINK (2006 – present)**

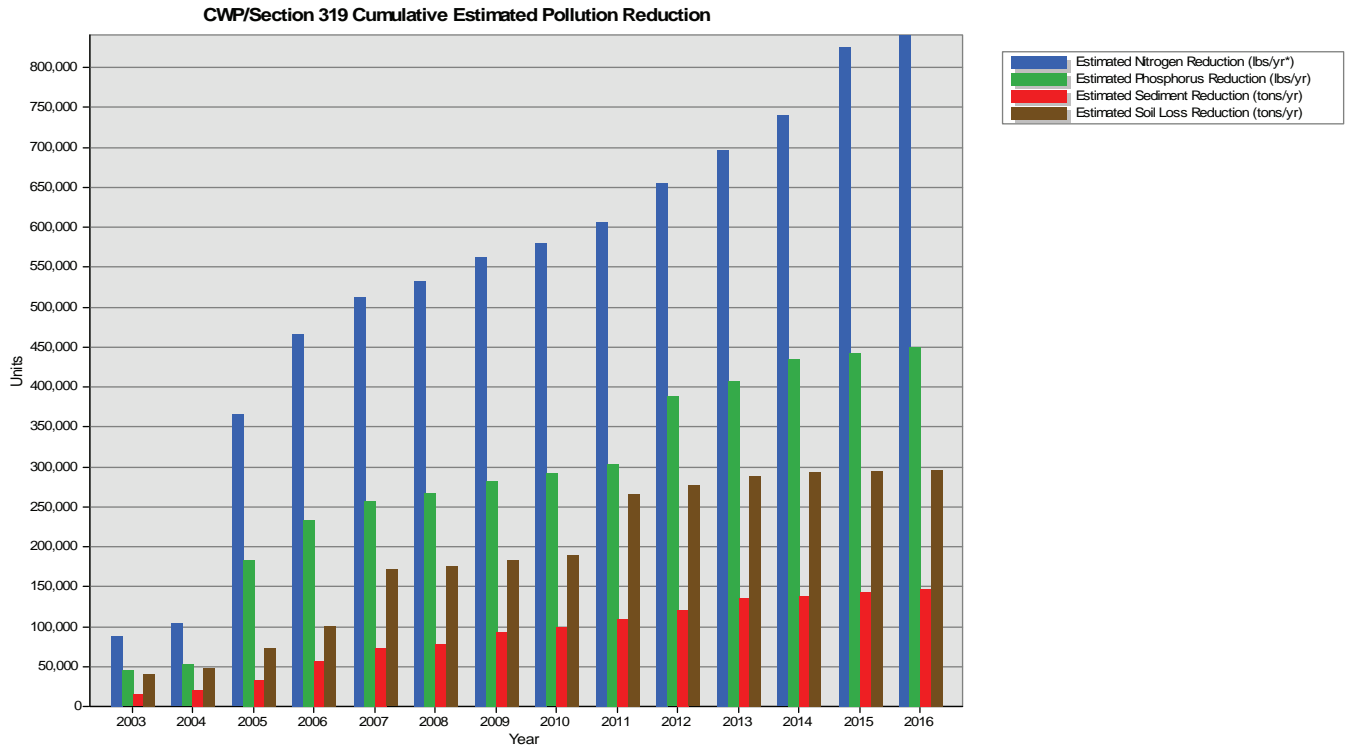


**Estimated phosphorous reduction
CWP/Section 319 BMPs
eLINK (2006 – present)**

**Estimated nitrogen reduction
CWP/Section 319 BMPs
eLINK (2006 – present)**



CWP/Section 319 cumulative estimated pollution reduction benefits via local government reporting and eLINK (2003–2016)



All projects awarded through 2016

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Statewide</i>	Assessing Iron-Enhanced Swales for Pollution Prevention	C	2011	\$ 400,000
	HSPF Scenario Application Manager (SAM) 2015 Package 1	C	2011	\$ 170,282
	HSPF Scenario Application Manager User Group Workshop	A	2011	\$10,060.00
	Watershed Specialist Training, Phase II	C	2011	\$ 167,230
	Linking Water Storage BMPs to Watershed Goals	A	2012	\$ 292,140
	Reducing Phosphorus Runoff From Livestock Farms	A	2012	\$ 296,318
	Chloride Reduction Outreach Program	A	2012	\$ 97,286
	Internal Phosphorus Load Reduction with Iron Filings	A	2013	\$ 299,047
	Performance of an Agricultural Drainage Tile Filter	A	2013	\$ 256,465
	Turf and Winter Maintenance Training	A	2013	\$ 110,000
	eLINK Database Support FY15	C	2014	\$ 60,000
	Level 2 winter maintenance training	A	2014	\$ 129,176
	Training & Tech Support for Maintenance Staff	N	2016	\$ 249,971
Statewide Total				\$ 2,537,975

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Cedar River</i>				
	Effectiveness of Targeted Dobbins Creek BMPs	A	2014	\$ 300,000
Cedar River Total				\$ 300,000

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Des Moines and Missouri River Basins</i>	Fulda Phosphorus Reduction Initiative	C	2011	\$ 12,600
	West Fork Des Moines River TMDL Implementation	C	2011	\$ 190,248
	Heron Lake TMDL Phosphorus Reduction Project	A	2012	\$ 450,000
	Jack and Okabena Creek Sediment Reduction Project	A	2012	\$ 20,600
	Heron Lake Third Crop Phosphorus Reduction Effort	A	2013	\$ 33,120
	WFDNR Targeting and Prioritizing Endeavor	A	2015	\$ 21,955
	Heron Lake TMDL Nutrient Reduction Project	N	2016	\$ 450,000
Des Moines and Missouri River Basins Total				\$ 1,178,523

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

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Lower Mississippi</i>	Lower Cannon River Turbidity Reduction Project	C	2011	\$ 170,378
	Steele County Septic System Loan Program	A	2012	\$ 700,000
	Dakota County Nitrate Reduction Project	A	2012	\$ 215,307
	Reducing Runoff from Southeast Minnesota Feedlots	A	2013	\$ 300,000
	Building a Culture of Citizen Engagement	A	2014	\$ 57,620
	Zumbro River: Ultra-Urban Vol/TSS/FeC Reduction	A	2014	\$ 300,000
	Downtown Winona Pre-Mississippi River Rain Garden	A	2015	\$ 41,324
	Middle Fork Zumbro River Critical Source Area Restoration	N	2016	\$ 219,000
	Mississippi River Lake Pepin Watershed WRAPS Implementation	N	2016	\$ 87,500
Lower Mississippi Total				\$ 2,091,129

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Minnesota River Basin</i>	Assessing Iron Enhanced Filtration Trenches	C	2011	\$ 240,000
	Middle Minnesota Watershed, Implementation of Conservation Practices	A	2011	\$ 1,400,000
	High Island Creek TMDL Project for Fecal Coliform	C	2011	\$ 227,004
	Chippewa River Accelerated Restoration	A	2012	\$ 900,000
	Collaborative for Sediment Source Reduction: Greater Blue Earth River Basin	A	2012	\$ 300,000
	Cottonwood Streambank Inventory and Prioritization Project	A	2012	\$ 297,000
	Greater Blue Earth Urban Retrofit Initiative	A	2012	\$ 270,250
	Le Sueur Watershed Targeted Conservation Practices	A	2012	\$ 82,491
	Middle Minnesota River Low Dissolved Oxygen TMDL Project	A	2012	\$ 245,475
	Neighborhood Lakes Management Plans	C	2012	\$ 167,000
	Protecting North and South Fork Yellow Bank River	C	2012	\$ 234,950
	Blackhawk Lake Protection Project	A	2013	\$ 46,500
	Chippewa River Phosphorus Reduction Practices	A	2013	\$ 279,518
	Cottonwood-Redwood River Septic Loan Program	A	2013	\$ 519,000
	Credit River Protection Plan	A	2013	\$ 225,000
	Elm Creek Tile Outlet Treatment Trains	A	2013	\$ 165,000
	Hawk Creek – Minnesota River Phosphorus Reduction	A	2013	\$ 228,992
	Hawk Creek Watershed Nitrogen Reduction Project	A	2013	\$ 1,060,000
	High Island Creek – McLeod County SSTS Project	A	2013	\$ 120,000
	Lake Minnewaska Phase I Resource Investigation	A	2013	\$ 112,435
	Pomme de Terre River Protective Buffer Project	A	2013	\$ 716,600
	Rush River Watershed – Nicollet County SSTS Project	A	2013	\$ 150,000
	Scott Watershed Management Organization TMDL Implementation	A	2013	\$ 298,512
	Blue Earth River Dissolved Oxygen: Managing Flows & Nutrients	A	2014	\$ 234,334
	Hawk Creek Watershed Dissolved Oxygen Restoration Project	A	2014	\$ 237,585
	Pomme de Terre WRAPS Implementation Project	A	2014	\$ 275,000
	Greater Blue Earth Nonpoint Reduction Initiative	A	2014	\$ 364,163
	Lower Prior Lake Protection Project Implementation	A	2014	\$ 142,522
	Renville County Minnesota River Mankato Watershed Protection Project	A	2014	\$ 306,750
	Blue Earth River Green Infrastructure Project	A	2014	\$ 1,010,000
	Lake Waconia Stormwater BMP Enhancement	A	2014	\$ 93,000
	Middle Minnesota Watershed SSTS Loan Project	A	2014	\$ 960,000
	Chippewa River Watershed Protection	A	2015	\$ 646,965
	GBERBA Conservation Drainage Partnership Program	A	2015	\$ 147,200
	Redwood River Turbidity Reduction Project	A	2015	\$ 150,512
	Quarry Creek Collaborative	A	2015	\$ 1,998,800
	Carp Management in Spring Lake & Prior Lake	A	2015	\$ 67,323
	Greater Blue Earth River Basin TMDL Implementation	N	2016	\$ 400,000
	Chippewa River Sediment Reduction	N	2016	\$ 285,878
	Le Sueur River WRAPS Implementation Endeavor	N	2016	\$ 347,950
	Minnesota River and Sand Creek Improvement Project	N	2016	\$ 565,000
	Hawk Creek Watershed Subsurface Sewage Treatment System (SSTS) Upgrade Implementation	N	2016	\$ 1,050,000
	Hawk Creek Watershed FY16 Implementation Project	N	2016	\$ 190,054
	Pomme de Terre WRAPS BMP Implementation Project	N	2016	\$ 285,000
Minnesota River Basin Total				\$ 18,043,763

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Red River Basin</i>	Red River Basin Reservoir Nutrient Load Reduction	A	2014	\$ 289,998
Red River Basin Total				\$ 289,998

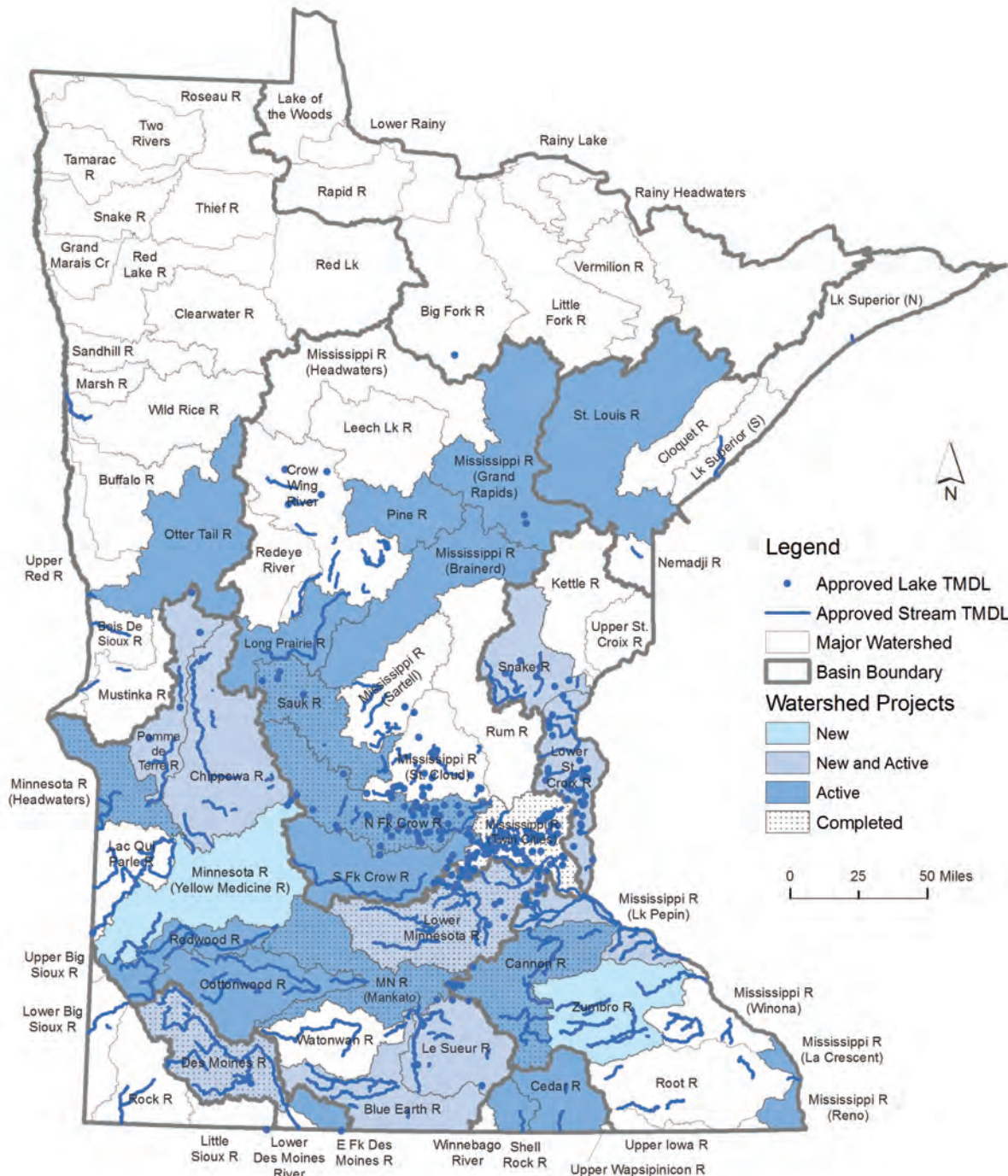
	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>St. Croix River Basin</i>	Kanabec Water Resources Protection Project	A	2012	\$ 201,892
	Snake River Watershed Resource Protection Project	A	2012	\$ 400,000
	Forest Lake North Shore Subwatershed Assessment	A	2013	\$ 12,000
	Forest Lake Stormwater Filtration Retrofit	A	2013	\$ 143,025
	Sand and Long Lakes Protection Project	A	2013	\$ 132,000
	Forest Lake Diagnostic Study	A	2015	\$ 52,500
	Kanabec Water Resources Protection Project Phase 2	A	2015	\$ 196,200
	Moody Lake Wetland Rehabilitation Project	N	2016	\$ 81,497
	Snake River Watershed Resource Protection Project	N	2016	\$ 400,000
St. Croix River Basin Total				\$ 1,619,114

	Project Name	C: Complete A: Active N: New	Year Awarded	Amount
<i>Upper Mississippi River Basin</i>	Kingston Wetland Feasibility Study and Restoraton	C	2011	\$ 322,218
	Modular Green Roof Retrofit System Development	C	2011	\$ 22,936
	Lake McCarrons Sub-watershed BMP Project	A	2012	\$ 275,000
	Lower Sauk-Metro Area Water Quality Protection	C	2012	\$ 289,953
	Targeted Fertilizer Application Reduction Project	A	2012	\$ 245,475
	Targeting BMPs in the Crow River Watershed	A	2012	\$ 1,100,000
	Bald Eagle Lake TMDL Implementation	A	2013	\$ 500,000
	Crooked Lake Basin Restoration Project	A	2013	\$ 665,000
	Crow Lakes Protection and Resource Investigation	A	2013	\$ 124,200
	Crow River Middle Fork Watershed Resource Investigation	A	2013	\$ 63,250
	Lake Koronis Subwatershed Protection Project	A	2013	\$ 197,871
	Long Prairie River Dissolved Oxygen TMDL Implementation	A	2013	\$ 300,000
	North Fork Crow River Septic System/ Feedlot Upgrades	A	2013	\$ 500,000
	Big Sandy and Minnewawa Lakes Phosphorus Reduction	A	2014	\$ 86,100
	Clearwater River Watershed Alternative Tile Intake	A	2014	\$ 45,000
	Osakis Lake Nutrient Reduction - Crooked Lake	A	2014	\$ 286,652
	Shingle Creek DO Reaeration Improvements	A	2014	\$ 93,500
	Mille Lacs Lake Protection - Stormwater Control	A	2014	\$ 85,520
	Pleasant Lake Stormwater Quality Improvements	A	2014	\$ 164,800
	Buffalo Creek - Marsh Water Project	A	2014	\$ 304,540
	Middle Sauk River Targeted Reduction & Outreach	A	2014	\$ 482,215
	Clearwater River Restoration & Protection Phase II	A	2015	\$ 72,000
	MFCRWD Loan Program for BMPs/Septic Upgrades	A	2015	\$ 110,000
	Northwood Lake Water Quality Improvement Project	A	2015	\$ 300,000
	Platte River Restoration/Protection Project	A	2015	\$ 34,900
	Swan River Headwaters Subwatershed Restoration	A	2015	\$ 38,650
	Ardmore Avenue Stormwater Retrofit	A	2015	\$ 33,163
	NE St. Cloud Mississippi River Protection Project	A	2015	\$ 200,000
	SRWD Groundwater Protection Project	A	2015	\$ 260,000
Upper Mississippi River Basin Total				\$ 7,202,942

Summary of statewide watershed project activity

Projects completed, currently active and awarded

Made possible through a variety of funding sources – U.S. Environmental Protection Agency (EPA) Section 319 grants, Clean Water Fund (CWF) and Clean Water Partnership – 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

Projects completed

Assessing Iron-Enhanced Swales for Pollution Prevention
eLINK Database Support – FFY 2015
HSPF Scenario Application Manager (SAM) 2015 Package 1
Watershed Specialist Training, Phase 2

Assessing Iron-Enhanced Swales for Pollution Prevention

The treatment of dissolved phosphorus and metals in runoff requires specialized filtration media, which is not accounted for in the typical swale ditch check designs currently employed. In this project, ditch checks with iron-enhanced sand filter inserts were developed to increase the retention of phosphate and metals in roadside swales and ditches.

Waterbody improved

Iron-enhanced swale ditch checks were designed and installed as part of roadway projects of the Minnesota Department of Transportation (MnDOT) and City of Roseville. The iron-enhanced ditch checks were found to reduce the phosphate mass load in runoff. The effect of the treatment achieved on the water quality of the receiving water bodies was not evaluated in this project.

Project highlights

- The effectiveness of the iron-enhanced ditch checks installed in the MnDOT and Roseville swales was investigated by field testing using synthetic runoff, and field monitoring during natural rainfall events in Fall 2014 and from Spring to Summer 2015. A ditch check containing no enhanced media was also monitored for comparison.

Results that count

- The MnDOT iron-enhanced ditch check monitored provided consistent phosphate mass reductions during 15 events (33% mean; 37% median). The cumulative mass removal was 35%. Metal reductions were largely negative, possibly due to leaching of metals from the filter media. The Roseville iron-enhanced ditch check exhibited 47%, 43%, 26% phosphate removal and 14% zinc removal under different field testing scenarios. The ditch check without the filter insert showed no phosphate removal but retention of metals in the top soil cover. Since the iron-enhanced ditch check monitoring excluded the effect of top soil, it can be presumed that an iron-enhanced ditch check will retain metals in the soil covering the ditch check and retain phosphate in the filter section. The project results were utilized to develop typical design recommendations for future applications of the iron-enhanced ditch check.



Photograph of the iron-enhanced ditch check installed at the City of Roseville swales.

Partnerships

- This 319 project involved partnerships between the MnDOT, the City of Roseville, and the St. Anthony Falls Laboratory (SAFL), University of Minnesota (U of M).

Financial information

Funding type: Section 319

Grant amount: \$400,000

Final in-kind: \$391,200

Contact information

John S. Gulliver, Professor

University of Minnesota

2 Third Avenue SE

Minneapolis, MN 55414

612-625-4080

gulli003@umn.edu

MPCA Project Manager: Greg Johnson

eLINK Database Support – FFY 2015

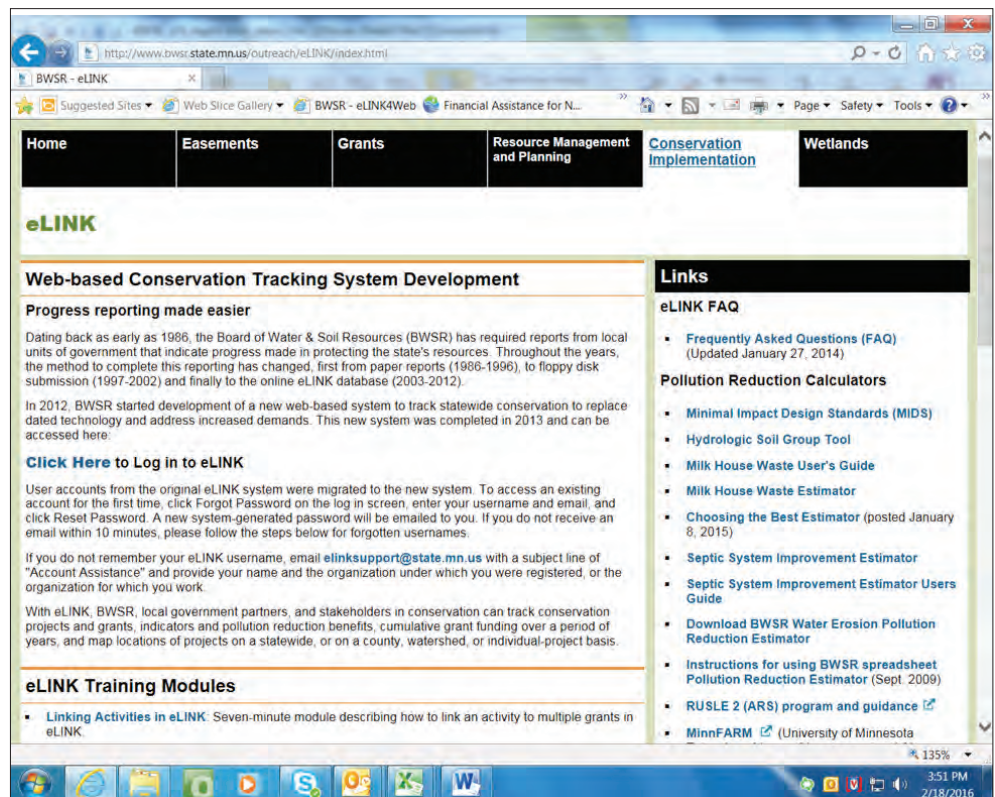
This project provides financial support to the information technology and grant program staff that support the eLINK reporting system and eLINK users. eLINK, the electronic link between state and local governments, is a web based reporting system that is maintained and supported by the Board of Water and Soil Resources (BWSR). eLINK is used by BWSR to track expenditures and accomplishments by local governments with state grant funds. In Minnesota, the same local governments who receive state grant funds from BWSR also receive Section 319 water quality grants via the MPCA. BWSR and MPCA have long had a coordinating relationship regarding the collection of expenditure and accomplishment reporting data from local governments. To the extent that state water quality agencies can coordinate their administrative requirements, we are all better off.

Specifically, this project provides financial support for BWSR staff to maintain and support the eLINK system. This includes a variety of tasks, such as server administration, database administration, geographic information system (GIS) administration, eLINK configuration, eLINK system reports management, eLINK account administration, eLINK user support, and eLINK user training. These support tasks are ongoing throughout the year.

BWSR staff provided system support and developed guidance materials for MPCA during the contract. Conor Donnelly provided system technical support, and Gwen Steel provided user interface support. During this reporting period, BWSR staff set up new grants in the system, created user accounts for relevant MPCA staff, ran reports for MPCA, and maintained Section 319 and CWP-specific training materials for distribution to MPCA grant recipients and project managers. BWSR will continue to work with MPCA as we maintain and improve the system.

Goals

- Provide access and support to local government Section 319 grant recipients so they can report expenditures and accomplishments back to the state via the eLINK reporting system.
- Provide training to MPCA staff to participate in the “set up” of Section 319 grant information.
- Provide data and maps from eLINK to MPCA upon request.



Results that count

- Local government staff have been submitting information about their BMP installations and associated pollution reductions via eLINK since 2004. There are more than 300 landowner BMP Section 319 implementations recorded in eLINK going back to 2004. New organizational and user accounts were created for new grantees, and user accounts for new MPCA project managers were created and team membership assigned to the applicable records.
- BWSR staff set up Section 319 records for local stakeholders and added the appropriate MPCA project managers to the “team membership” of Section 319

grants to allow MPCA to monitor what has been entered.

BWSR made minor updates to the guidance document for Section 319 and CWP grantees and project managers. A training video is available for MPCA project managers to instruct them in how to pull reports and find grant data in eLINK.

- MPCA receives data and maps out of the eLINK database annually upon request for inclusion in the annual Watershed Achievements Report submitted to EPA.

In February and August of 2015, eLINK staff provided the reported pollution reduction estimates of Section 319 funding projects for download to the Federal Governmental Reporting and Tracking System (GRTS) reporting system.

Financial information

Funding type: Section 319

Grant amount: \$60,000

Contact information

Gwen Steel

Grants & eLINK Specialist

MN Board of Water & Soil Resources

St. Paul, MN 55155

651-600-8390, Gwen.Steel@state.mn.us

MPCA Project Manager: Pete Fastner

HSPF Scenario Application Manager (SAM) 2015 Package 1

Minnesota faces many water quality and quantity challenges. State, federal and local organizations are faced with understanding hydrologic and water-quality problems and targeting cost effective solutions that are based in science. The MPCA has standardized its modeling approach for the development of the WRAPS and TMDL reports required by state and federal law. The MPCA uses of the Hydrologic Simulation Program – Fortran (HSPF) model to provide a highly effective means to spatially and temporally understand hydrologic and water quality processes over various land surfaces and water bodies. Because HSPF is a continuous model representing the complex physical and chemical processes and interactions, and because it is calibrated over extended time periods, it is conducive to holistically understanding current watershed conditions. Through careful changes to model inputs, it may be used to evaluate impacts of potential improvements or deterioration from watershed changes and/or the implementation of BMPs, helping pinpoint effective management approaches. However, the complexity of HSPF makes it difficult for non-modeling end users in conservation, implementation, permitting, and stressor identification programs to quickly get the needed information from these models; and thus, be able to test the model against what is known in the field and plan for the future. The MPCA has determined a translator is needed to convert the highly technical results of HSPF into applied analysis for planning and implementing targeted actions to restore or protect water quality in a specific geographic area. To accomplish this translation, the MPCA researched opportunities available and requested the development of application on a pilot scale to develop a proof of concept. Critical concepts the MPCA desired to understand is the appropriate use of BMPs in determining solutions and removal efficiencies related to specific pollutants and the accuracy of the predictions.

Project highlights

- Now that this phase of the project is completed, the Scenario Application Manager (SAM) provides a graphical interface to the HSPF model applications using agreed upon practitioner's language and expands the state's investment in HSPF to a broader audience in support of the development of TMDLs and WRAPS. The tool's framework currently consists of a GIS

for BMP site selection, a BMP database with pollutant removal efficiencies and associated costs, and the HSPF watershed model to simulate changes in water quality resulting from the application of user-specified BMPs. The decision support tool provides a user friendly, comprehensive approach to achieve the water quality improvement goals set by the TMDL assessments, protection strategies, and watershed restoration programs. It assists in understanding watershed conditions, identifying priority areas and BMPs that will provide the greatest water-quality benefits for each dollar invested. The value of the tool is in its simplification of complex hydrologic and water quality model applications into transparent estimates of the significant pollutant sources in watershed. Users apply their knowledge and expertise of BMP implementation using the tool's interpretation of model results.

Results that count

- The outcome of this project is the successful development of a watershed-scale, decision-support tool to facilitate prioritization and placement of management practices in the state of Minnesota utilizing the HSPF models currently being developed for the MPCA. Additionally, a Pre-processing Application Translator for HSPF (PATH) tool was developed to create SAM application files directly from the HSPF model applications.

Financial information

Funding type: Section 319

Grant amount: \$170,282

Matching funds: \$9,378

Contact information

Jason Love

Vice President

RESPEC, Water & Natural Resources

3824 Jet Drive

Rapid City, SD 57709-0725

605-394-6400, Jason.Love@respec.com

MPCA Project Manager: Charles Regan

Watershed Specialist Training, Phase 2

Local government employees, in collaboration with private sector and state agency staff, are responsible for planning and implementing water resource protection and restoration. Yet, no standardized, consistent, and comprehensive training program existed for these local professionals in Minnesota.

Goals

- The Watershed Specialist Training program is a 14-week online training program designed to complement existing training opportunities by providing a comprehensive framework of skills needed for local water resource management. The program emphasizes the integration of natural science and human dimension disciplines to effectively address water issues.

Results that count

- The resulting program has trained 88 people from 46 units of government, multiple private organizations, and university programs. Participants and their employers have responded positively about the value of the training and recommend it to others. Awareness of and interest in the program has been steadily growing. The program is positioned to be able to continue offering sessions into the foreseeable future.



Cook County SWCD hosted a shoreland education workshop last summer. Participants planted a shoreline after a classroom session with Mary Blickenderfer (U of M Extension Service).

Partnerships

- Partners were involved in planning the course and developing the course content, and continue to be involved in delivering instruction and providing consultation as members of the Advisory Board. Each of these roles has been filled by a mix of stakeholders from several departments of the U of M; local government including SWCDs, Watershed Districts (WDs), and

Tribal offices; and state agencies including the MPCA, DNR, Minnesota Department of Agriculture (MDA), and BWSR.

Financial information

Funding type: Section 319

Grant amount: \$167,230

Matching funds: \$18,157

Final in-kind: \$157,361

Contact information

Faye Sleeper

Associate Director

U of M – Water Resources Center

1985 Buford Avenue

St. Paul, MN 55108

612-624-3738

fsleeper@umn.edu

MPCA Project Manager: Lynne Kolze

Statewide

Active projects in 2016

Chloride Reduction Outreach Program – 2012

Sponsor: Freshwater Society

Funding: Section 319 (Grant) \$97,286

Purpose: This project will engage public officials, businesses and citizens in a facilitated planning process that will increase their understanding of chloride pollution, ways to reduce it at organizational and personal levels, create and implement a collaborative Chloride Reduction Outreach Strategy and Implementation Plan for Rochester, Mankato and St. Cloud that will be distributed to citizens, businesses and public officials for future action.

HSPF Scenario Application Manager User Group Workshop – 2015

Sponsor: RESPEC

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

Purpose: Provide funding for a Scenario Application Manager (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.

Internal Phosphorus Load Reduction with Iron Filings – 2013

Sponsor: U of M

Funding: Section 319 (Grant) \$299,047

Purpose: Determine the effectiveness of iron filings under different conditions at reducing internal phosphorus loading, determine the conditions required for iron filings to be effective at reducing internal phosphorus loading, and determine the quantity of iron filings that must be placed in the sediments for a successful reduction of internal phosphorus loading.

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 (WMA) reports/refinement and course evaluations.

Linking Water Storage BMPs to Watershed Goals – 2012

Sponsor: Minnesota River Board

Funding: Section 319 (Grant) \$292,140

Purpose: This project will develop, adjust, verify and test a water storage calculator that links new and existing individual projects to large-scale watershed goals, measuring the results in “cubic feet stored” or “volume and rate of storage” for structural and vegetative BMPs; establish and facilitate a Water Storage Learning Group; select and implement 5-10 water storage practices/projects; and reach out to technical service providers, certified crop advisors, SWCDs, and Natural Resource Conservation Service (NRCS) so this technology and thinking can be applied in everyday work.

Performance of an Agricultural Drainage Tile Filter – 2013

Sponsor: U of M

Funding: Section 319 (Grant) \$256,465

Purpose: This project will measure and evaluate the performance of an engineered enhancement to agricultural drainage tiles that will significantly decrease the release of phosphates to surface waters from agricultural runoff. The innovative filter design would be based on previously developed technology that enables increased phosphate removal by adsorption using iron, in the form of iron filings.

Reducing Phosphorus Runoff From Livestock Farms – 2012

Sponsor: U of M

Funding: Section 319 (Grant) \$296,318

Purpose: This project will determine phosphorus balances on farms in two regions of high dairy and beef density near nutrient impaired waters; select

management strategies for bringing representative farms with a phosphorus surplus into balance or below; develop selected farm analyses into teaching case studies; and use case studies from the farm phosphorus balance analyses to assist livestock producers and their agricultural professionals in evaluating their operations and select strategies to prevent excessive build-up in soil test phosphorus and transport of phosphorus to waters, while maintaining or improving profitability.

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); three webinar events to serve as updates or more detailed information to the BMP information given to those already trained; three field information exchanges or demonstrations targeted on particular BMP's 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 – 2013

Sponsor: Fortin Consulting, Inc.

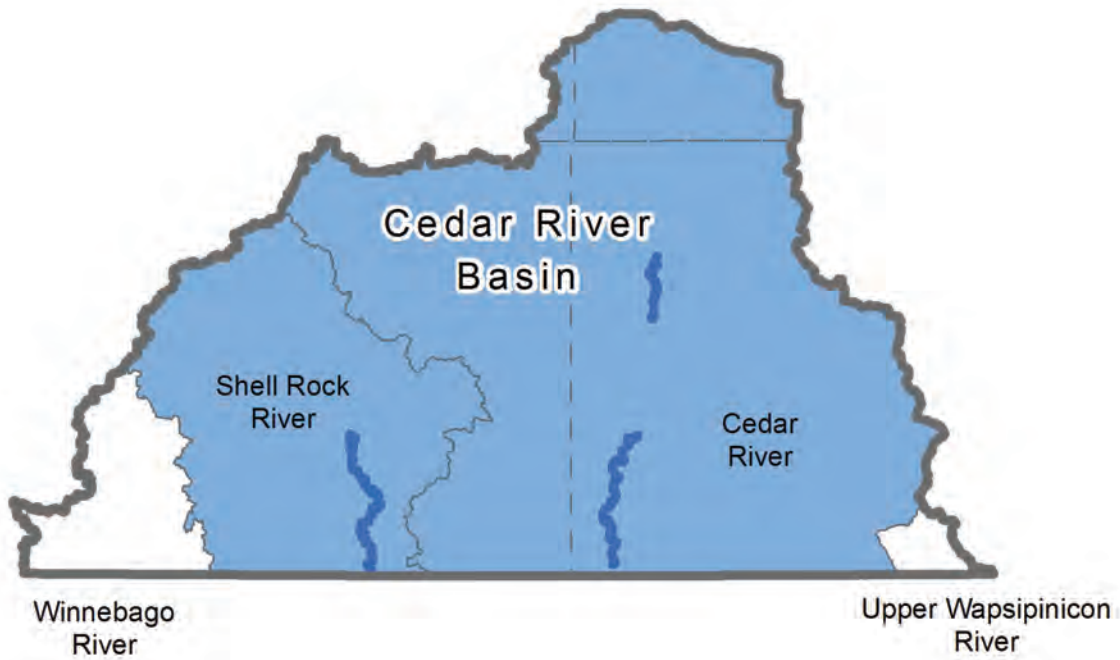
Funding: Section 319 (Grant) \$110,000

Purpose: Three different voluntary certifications courses will be taught: Winter Maintenance of Roads, Winter Maintenance of Parking Lots/Sidewalks and Turfgrass Maintenance with Reduced Environmental Impacts. We anticipate a fourth course, MPCA Level II Winter Maintenance, will exist so we can offer it. We will conduct 30-40 classes or shorter presentations at conferences or group meetings across the state. We will teach about 2,000 people and will reach many more through our training manuals and information on the MPCA website. This project is unique in that the audience is maintenance workers and it is a certification course. It will help organizations meet salt reduction goals expected to be established with the metro chloride plan. Based on results from previous classes, we expect changes

in practices and substantial reductions in salt, sand, nutrients pesticide and water use from this project, which will translate into pollutant loading reductions to Minnesota waters.

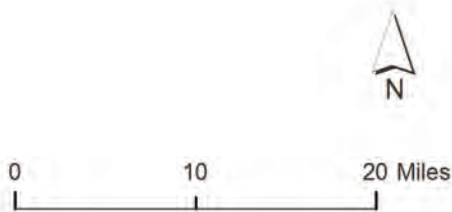
Cedar River Basin

None were completed in 2016



Legend

- Approved Lake TMDL
 - Approved Stream TMDL
 - - - County Boundary
 - Major Watershed
 - ▭ Basin Boundary
- ### Watershed Projects
- New
 - ▨ New and Active
 - Active
 - ▤ Completed



Cedar River Basin

Active projects

None were awarded in 2016

Effectiveness of Targeted Dobbins Creek BMPs – 2014

Sponsor: Cedar River Watershed District

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

Purpose: Demonstrate the ability of new GIS and Light Detection and Ranging (LiDAR) technology to facilitate water quality and aquatic habitat improvements in waterways receiving agricultural drainage using a suite of targeted conservation practices. The primary focus will be to assess and document targeted BMP performance in reducing sediment, nutrient, and fecal coliform loads, improving index of biological integrity (IBI) scores, and to analyze these changes from financial and watershed perspectives. This project will demonstrate the impact of prioritized, targeted, and tailored BMPs in the Dobbins Creek watershed with respect to hydrologic pathways and processes. This method could serve as a model for future watershed comprehensive BMP implantation projects.

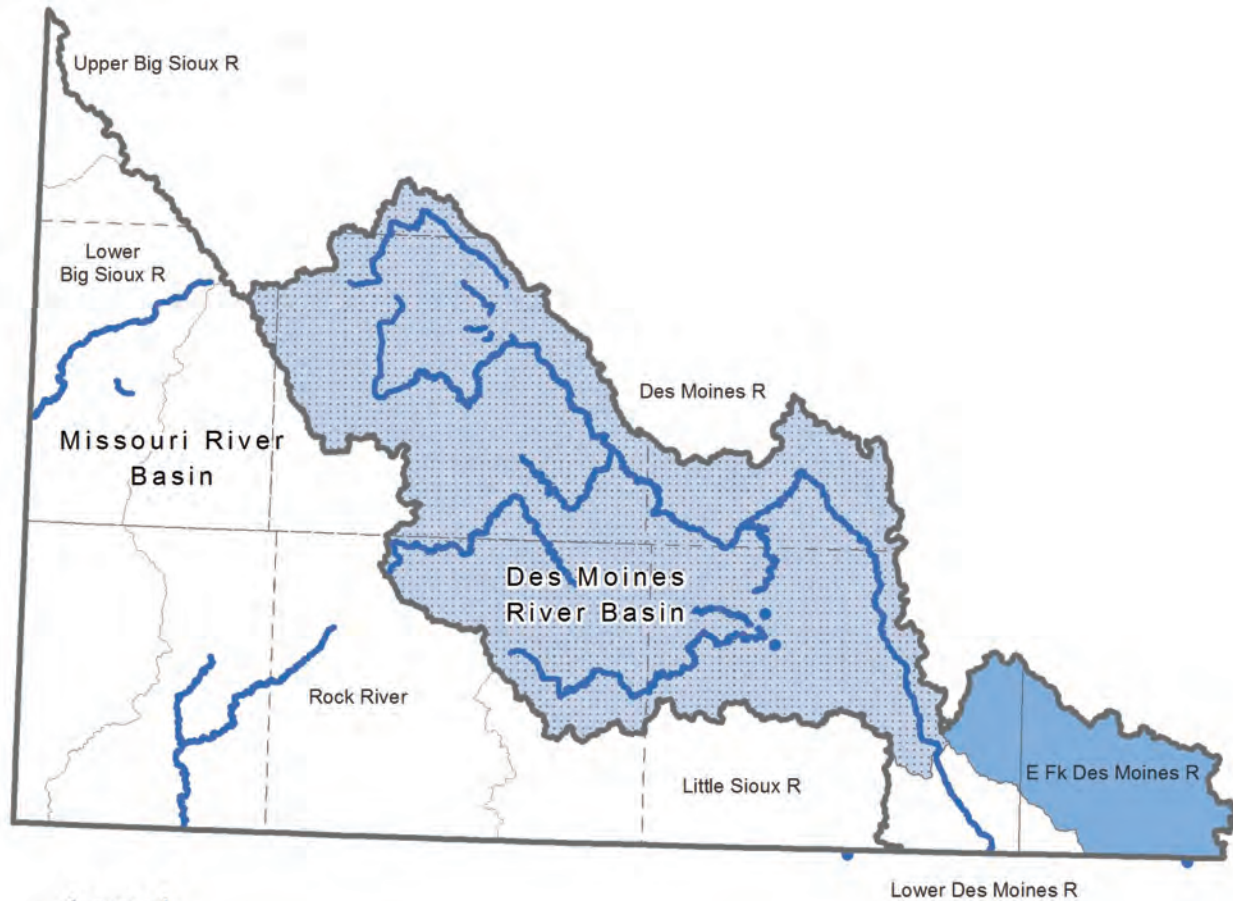
Des Moines and Missouri River Basins

Projects completed

Des Moines River – Headwaters

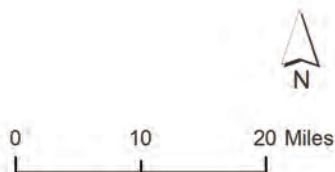
Fulda Phosphorus Reduction Initiative

West Fork Des Moines River TMDL Implementation Project



Legend

- Approved Lake TMDL
 - Approved Stream TMDL
 - County Boundary
 - Major Watershed
 - Basin Boundary
- Watershed Projects**
- New
 - New and Active
 - Active
 - Completed



Des Moines – Headwaters

Fulda Phosphorus Reduction Initiative

The City of Fulda is located at the north end of the Heron Lake Watershed District (HLWD) and includes two lakes, First Fulda Lake and Second Fulda Lake. Land use within the Fulda Lakes subwatershed is primarily agricultural. The majority of the City of Fulda contains impervious surfaces such as streets, parking lots, roof tops, and compacted lawns, which contribute to stormwater runoff.

Through this effort, the HLWD conducted a rain garden demonstration project. This was done by providing educational opportunities for students and the community to learn about native vegetation, water quality improvement, pollution reduction, and environmentally-friendly landscaping.

Presentations were given to the Master Gardeners, Bondin-Belfast 4-H Club, St. Paul's Lutheran School, Fulda City Council, Fulda Heritage Society, and Fulda Game and Fish. Through these presentations approximately 160 people received information about rain gardens and water quality improvement.

This allowed the opportunity to use the Prairie Ecology Bus in 2013 for a hands-on education event. Children and adults learned about rain gardens and had the opportunity to experience installation of two rain gardens. There were 23 participants.

Water quality data shows that small rain gardens save one pound of phosphorus per one-inch rain event or 50 to 80% and 90 to 100% of the heavy metals, petroleum, and bacteria found in stormwater. Rain gardens also have been found to reduce stormwater flows by 80 to 90%. Through an advertisement, flyer, news release, and newsletter, watershed residents, agency personnel, and legislators were provided information about the importance of rain gardens. In addition, a Rain Garden Open House was held in 2015 that allowed 30 people the chance to visit with HLWD staff and tour the six rain gardens that were installed through the Fulda Phosphorus Reduction Initiative.

Goals

- Provide educational materials and information to approximately 50 individuals
- Hire landscapers to install and coordinate the planting of five rain gardens within the City of Fulda



Fulda Phosphorus Reduction Initiative - rain garden planting

- Increase community awareness through an open house, newsletter, and by other news media

Results that count

- Educational materials and information was provided to approximately 190 individuals through presentations and the open house.
- Nelson Landscaping, Inc. was hired to install six rain garden sites within the City of Fulda.
- The open house was promoted through an advertisement, news release, and newsletter. There were 30 people in attendance at the open house.

Financial information

Funding type: Section 319

Grant amount: \$12,600

Final in-kind: \$12,571

Contact information

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

Heron Lake, MN 56137

507-793-2462

jan.voit@mysmbs.com

MPCA Project Manager: Katherine Pekarek-Scott

Des Moines – Headwaters

West Fork Des Moines River TMDL Implementation Project

Through this grant, the Heron Lake Watershed District (HLWD) and county staff completed a Level III Feedlot inventory of 80% of the feedlots in the West Fork Des Moines River (WFDMR) watershed. There were 43 sites in Cottonwood County, 142 sites in Nobles County, 190 sites in Jackson County, and 221 sites in Murray County for a total of 592 sites. The inventory is instrumental to gage the need to address feedlots and ultimately decrease the bacteria concentrations in the watershed.

The Watershed Coordinator hired through the grant promoted the project and sought additional funding for implementation. Project partners hosted a one-day manure management workshop for 31 feedlot owners and operators, distributed 1,102 project brochures, created a website, conducted seven semi-annual meetings, and held five meetings with county feedlot officers (CFOs).

The *WFDMR TMDL Implementation Project Level III Inventory Results* summarizes the objective, methods, results, types of feedlots, feedlot compliance, obstacles, unexpected outcomes, and conclusions. The results show that non-compliant feedlots are located throughout the entire watershed. Every county in the watershed has high-polluting feedlots that need to be addressed to control the *E. coli* levels in surface waters. The trend continues that the large feedlots expand while small or outdated feedlots have high rates of attrition. A new age of technology and a new generation of conservation-minded farmers are encouraging sound management practices. The summary report was uploaded to the HLWD website, distributed to the CFOs, and shared with the SWCD and NRCS staff in the WFDMR watershed.

Five feedlot environmental upgrades were completed, four in Murray County and one in Jackson County. The projects involved four landowners in the WFDMR watershed. In addition, a Clean Water Fund (CWF) grant was secured to implement a feedlot fix in Murray County.

Goals

- Conduct an intensive, onsite inventory and inspection of 80% of the feedlots in the watershed through a strong partnership with four counties and the HLWD.



Mason Township feedlot fix and filter strip

- Increase the knowledge of 50 feedlot operators through a one-day workshop.
- Increase public awareness of the WFDMR TMDL Project through the development of a brochure and website.

Results that count

- 80% of the feedlots in the watershed were inspected through a strong partnership with four counties and the HLWD
- 31 people attended the manure management workshop
- 1,102 brochures were distributed to feedlot owners and operators and a webpage dedicated to the project was developed on the HLWD website

Financial information

Funding type: Section 319

Grant amount: \$190,248

Final in-kind: \$149,767

Contact information

Jan Voit, District Administrator

Heron Lake Watershed District

PO Box 345

Heron Lake, MN 56137

507-793-2462, jan.voit@mysmbs.com

MPCA Project Manager: Katherine Pekarek-Scott

Des Moines and Missouri River Basins

Active projects

Projects awarded in 2016

Des Moines River Basin

Des Moines River – Headwaters

Heron Lake TMDL Nutrient Reduction Project – 2016

Sponsor: Heron Lake Watershed District

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 West Fork Des Moines River and Heron Lake TMDL Implementation Plan.

Heron Lake TMDL Phosphorus Reduction Project – 2012

Sponsor: Heron Lake Watershed District

Funding: CWP (Loan) \$450,000

Purpose: This project will promote and install 45 Subsurface Septic Treatment Systems (SSTS) and other agricultural BMPs in the Heron Lake Watershed.

Heron Lake Third Crop Phosphorus Reduction Effort – 2013

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) \$33,120

Purpose: Provide incentives to establish 200 acres of cover crops on an annual basis during the three-year grant period. This will be done by aerially seeding a third crop, or cover crop, of cereal rye, purple top turnip, and tillage radish. Cover crops reduce erosion, decrease soil compaction, increase water infiltration to prevent runoff, bring leached nitrogen back to the root zone for the following year's crop, increase organic matter, and provide habitat cover. The HLWD also proposes to conduct civic engagement through the development of a steering committee. Processes taught at the Southwest Civic Engagement Cohort will be employed with the committee to brainstorm about the needs, wants, and perceptions of watershed landowners as they relate to water quality improvement, focusing on cover crops.

They will also be asked to assist in identifying barriers to making changes and develop strategies for behavior change.

Jack and Okabena Creek Sediment Reduction Project – 2012

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) \$20,600

Purpose: This project will install 2 J-hook weirs on Jack and Okabena Creeks; monitor sites and collect documentation; publicize project through HLWD website, newsletters, local newspapers and landowner mailings; and complete all project reporting requirements.

West Fork Des Moines River

WFDNR Targeting and Prioritizing Endeavor – 2015

Sponsor: Heron Lake Watershed District

Funding: Clean Water Partnership (Grant) \$21,955

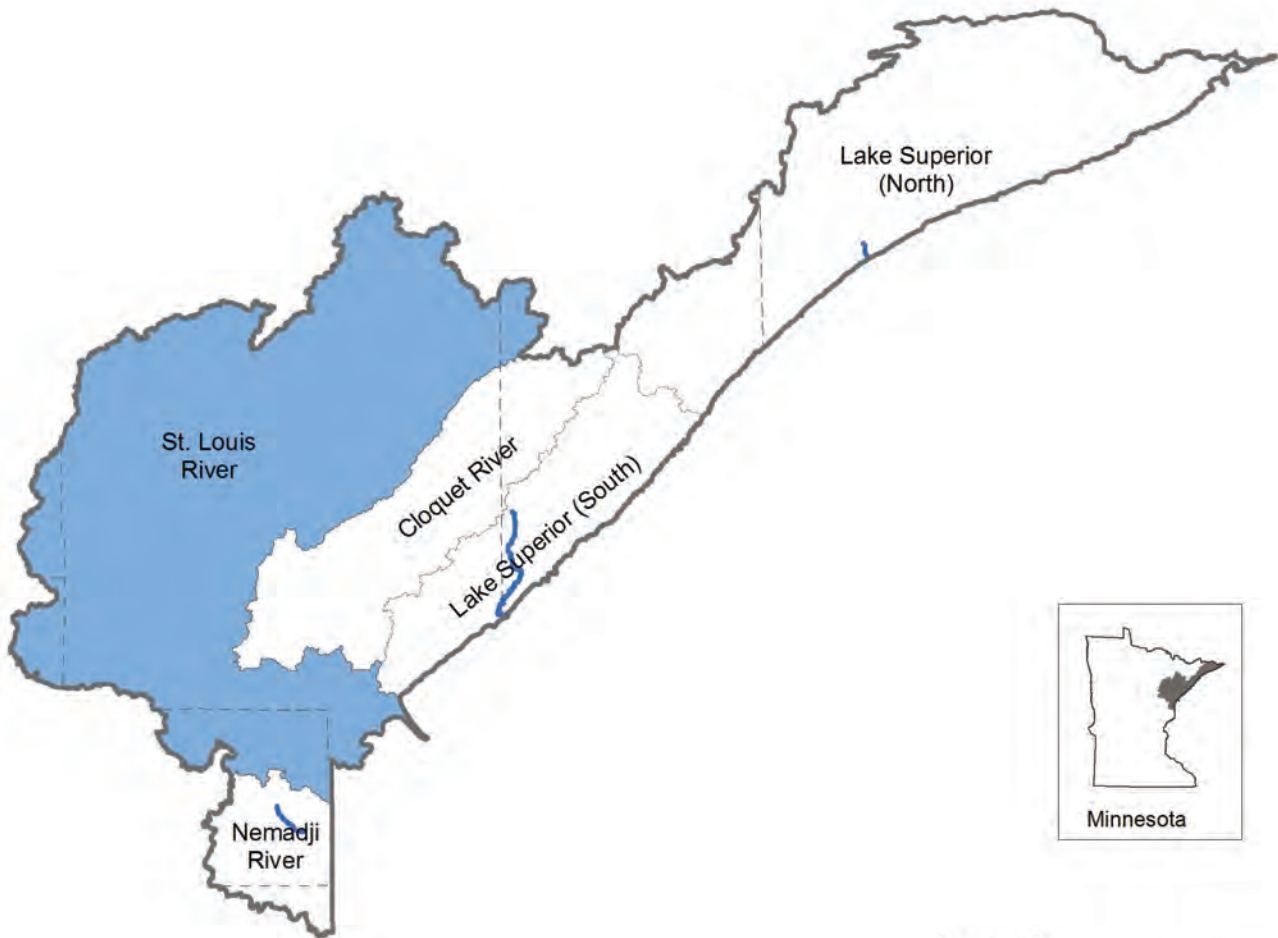
Purpose: HLWD proposes to build upon the terrain analysis products developed by Southwest Prairie Technical Service Area 5 (SWPTSA 5) and extend the data products to include BMP suitability, BMP effectiveness, and BMP value datasets. The extended data products are derived by using advanced GIS and engineering methods, developed by Houston Engineering, Inc. (HEI) and applied to the hydrologically corrected Digital Elevation Model (DEM). The outcome of this project will be GIS datasets, summary maps, and a technical memorandum describing the suitability for BMP placement, effect of implementation on priority resources, and the measurable cost-effectiveness of pursuing opportunities to implement BMPs. All of these methods are complimentary to implementation, restoration, and protection strategies identified within the WRAPS process and will aid local civic engagement efforts.

Missouri Basin

No projects active in Missouri Basin

Lake Superior Basin

None were completed in 2016



Legend

- Approved Lake TMDL
- Approved Stream TMDL
- - - County Boundary
- Major Watershed
- ▭ Basin Boundary
- Watershed Projects**
- New
- ▨ New and Active
- Active
- ▤ Completed

Lake Superior River Basin

Active projects

No projects were awarded in 2016

St. Louis River River Watershed

Port Authority Stormwater Study and Concept Design – 2015

Sponsor: Duluth Seaway Port Authority (Port Authority)

Funding: Clean Water Partnership (Grant) \$24,000

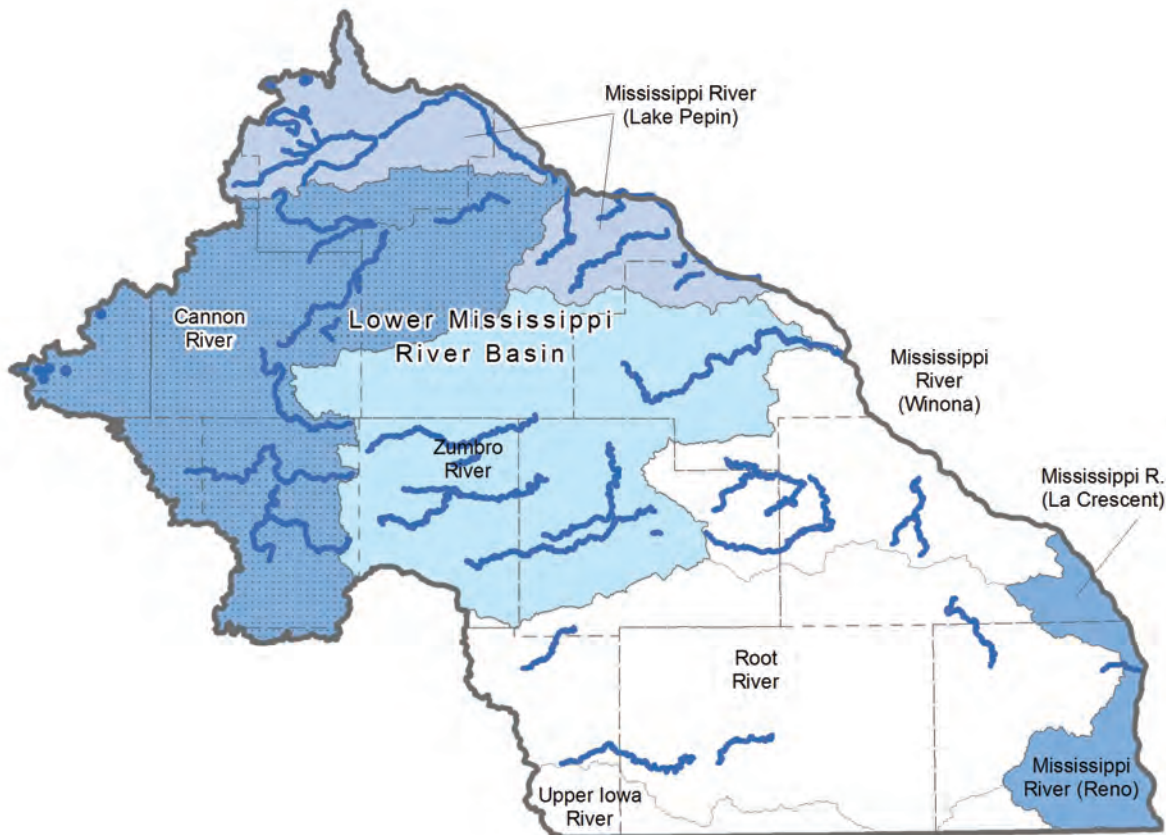
Purpose: This project will evaluate the sources of detected metals and other stormwater constituents, as well as identify and conceptually design effective green infrastructure BMPs to address these concentrations of metals and other constituents in stormwater at the Port Authority's Clure Terminal. The project's first phase includes development and implementation of a sampling plan to investigate stormwater quality within impervious areas for the previously described stormwater constituents; soil borings to determine the soil type; a topographical survey to determine drainage patterns and infrastructure locations; and data gathering of existing infrastructure and the extent of leased areas. A season-long stormwater quality monitoring program will monitor stormwater within the drainage areas that flow directly to the storm sewer, including monitoring of roof runoff and overland flow to determine potential pollutant sources and thus mitigation options. The project's second phase will propose options for effective BMPs within the investigated impervious areas. Another component of this phase will be implementing practices that protect stormwater through education and outreach to the Port Authority's tenants, which represent a variety of commercial and industrial activities.

Lower Mississippi River Basin

Projects completed

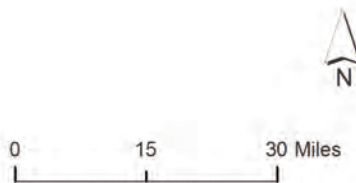
Cannon River Watershed

Lower Cannon River Turbidity Reduction Project



Legend

- Approved Lake TMDL
 - Approved Stream TMDL
 - - - County Boundary
 - Major Watershed
 - ▭ Basin Boundary
- Watershed Projects**
- New
 - ▨ New and Active
 - Active
 - ▤ Completed



Cannon River Watershed

Lower Cannon River Turbidity Reduction Project

The Lower Cannon River Turbidity TMDL study (2007) set significant load reductions for sediment in the Lower Cannon River watershed. The water quality goal is a Total Suspended Solid (TSS) value of 44 milligrams per liter (mg/L). At high flows, a reduction in TSS values ranging from 49% to 82% is needed in the Cannon River system depending on the reach. Nonpoint sources have been identified as the major contributor of sediment in the Lower Cannon River watershed.

Goals

This project had two primary goals.

- First, to identify the major sources of sediment to the Little Cannon River and Belle Creek that are contributing sediment pollution to both these streams and the Cannon River.
- Second, to begin implementing BMPs to reduce sediment delivery to these streams with the support of local landowners.

Results that count

- Overall, this project was successful in achieving both of these goals. Through field surveys, FLUX modeling, and SWAT modeling detailed information on sediment sources in the Little Cannon River and Belle Creek was created. Data gathered, conclusions about sediment sources and priority areas for BMP implementation were published in a report titled, *Assessment of Non-point Sediment Sources in the Little Cannon River and Belle Creek Subwatersheds*. This report will continue to be utilized in future efforts to make improvements in water quality in the Little Cannon and Belle Creek watersheds.
- Significant time and resources were invested into reaching out to and building relationships with local landowners and farmers to begin implementing BMPs to reduce sediment delivery to these two streams. Thirteen BMPs were implemented with project funds. The BMPs consisted of one grass waterway, one water and sediment control basin, two streambank stabilizations, and nine cover crop BMPs. Efforts by Cannon River Watershed Project (CRWP) to work with landowners and farmers in the two watersheds will continue in 2016 and beyond. CRWP has secured



Streambank erosion control at the Richard Rock Farm

- funding to continue with cover crop promotion and will continue to seek funding for additional structural BMP implementation.
- While the project was successful in reaching its overarching goals, there were parts of the project that were difficult or unsuccessful. The farmer-led watershed councils envisioned for engaging with local landowners and farmers was unsuccessful. One of the key lessons learned during this work was the critical importance of personal relationships in achieving success. Our project differed from the Iowa model (which was based on watershed councils) in that we did not have the extensive personal relationships with farmers going into the project that they did. Although CRWP staff were knowledgeable about the steps that needed to be taken to organize watershed councils, the level of trust we had going into the project was not what it needed to be. We were also unable to create partnerships with local agricultural groups to support and/or promote the watershed councils to their members or customers.

- Over the course of the project, we were successful in building relationships with many farmers in the two watersheds through individual meetings. It is possible that as we continue to build trust with these farmers there may be opportunity to re-visit the idea of forming a watershed council or some other organized group to collectively tackle the water quality issues in these two watersheds.

Partnerships

- U of M: Led collecting sediment source data and detailed analysis of sediment source locations. Also participated in development of recommendations for BMP prioritization.
- Goodhue County SWCD: Assisted with BMP design and implementation, as well as overall project management and direction.
- Goodhue County NRCS: Assisted with BMP design and implementation.
- DNR: Provided input on near-channel sediment sources and BMP prioritization.

Financial information

Funding type: Section 319
Grant amount: \$170,378
Final in-kind: \$115,233
Matching funds: \$36,364

Contact information

Bradley Frazier, Executive Director
Cannon River Watershed Project
400 Washington St.
Northfield, MN 55057
507-786-3913, brad@crwp.net
MPCA Project Manager: Justin Watkins

Lower Mississippi Basin

Active projects

Projects awarded in 2016

Projects involving multiple watersheds

Reducing Runoff from Southeast Minnesota Feedlots – 2013

Sponsor: Southeast Minnesota Water Resources Board (SEMWRB)

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

Purpose: A larger regional effort to comprehensively address sources of fecal coliform bacteria tied to the Regional TMDL Implementation Plan. Local feedlot staff in the 10 counties of southeast Minnesota will provide technical and engineering assistance to design and implement feedlot runoff control activities to treat polluted runoff. Farms will be prioritized based on criteria developed by each county and SWCD. The MinnFARM model will be run by feedlot technicians for each completed fix to determine reductions in polluted runoff from projects implemented. Reduction amounts will be reported using the Feedlot Unified Reporting Form developed for this project.

Cannon River Watershed

Building a Culture of Citizen Engagement – 2014

Sponsor: Cannon River Watershed Partnership

Funding: Section 319 (Grant) \$57,620

Purpose: Develop and pilot a process for building local community capacity for engaging in the watershed management process that can be sustained long-term with continuity. Using two subwatersheds currently engaged by CRWP, the process will cross-fertilize and organize diverse perspectives and segments of watershed residents and stakeholders to get watershed management work done in a way that is in tune with community needs, identities and aspirations. The project will explore new approaches to strategic collaborations and coalitions with local, regional and state programs and organizations.

Steele County Septic System Loan Program – 2012

Sponsor: Steele County

Funding: CWP (Loan) \$700,000

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

Mississippi River – Lake Pepin

Mississippi River Lake Pepin Watershed WRAPS Implementation – 2016

Sponsor: Goodhue County Soil and Water Conservation District

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

Purpose: Implement BMPs that will effectively make progress towards the reduction goals of 20% TSS as well as the reduction of the other pollutants, specifically through grade stabilization structures, terraces and water and sediment control basins

Mississippi River – Twin Cities

Dakota County Nitrate Reduction Project – 2012

Sponsor: Dakota County

Funding: Section 319 (Grant) \$215,307

Purpose: This project will create and implement agricultural projects to validate, demonstrate, and refine BMPs for nitrogen fertilizer for corn production that will lower nitrate levels in Dakota County's groundwater and surface water; promote Private Pesticide Applicator Training, Crops Days, "Focus on Ag" Newsletter and innovative demonstration projects to area farmers to improve quality of Dakota County's water resources; monitor nitrate levels in private drinking water wells and in the Vermillion River and its tributaries; track project grant, matching funds and expenditures; and complete required reporting.

Mississippi River – Winona

Downtown Winona Pre-Mississippi River Rain Garden – 2015

Sponsor: Port Authority of Winona

Funding: Clean Water Partnership (Grant) \$41,324

Purpose: This project will protect the Mississippi River at Winona, MN by the installation of a downtown Winona parking lot rain garden. This project will improve the Mississippi River water quality by removing an incorrectly sloped, 100% impervious parking lot surface then regrading and resurfacing the parking lot to direct runoff

into a central rain garden planted with deep-rooted native vegetation that will filter pollutants such as oil, grease, dirt, debris, broken glass, road salt, sand and unseen nutrients before any runoff reaches Winona's stormwater system and the Mississippi River. The rain garden will also serve to slow the velocity of runoff and reduce the likelihood of flooding which is a regular concern in Winona.

Zumbro River

Middle Fork Zumbro River Critical Source Area Restoration – 2016

Sponsor: Dodge Soil and Water Conservation District

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

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

Zumbro River Ultra-Urban Vol-TSS-FeC Reduction – 2014

Sponsor: City of Rochester

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

Purpose: Reduce turbidity and fecal coliform bacteria loading in the receiving waters for downtown Rochester by identifying feasible volume control locations in the project area and demonstrating green infrastructure designs, benefits, and maintenance practices before redevelopment opportunities arise. 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.

Minnesota River Basin

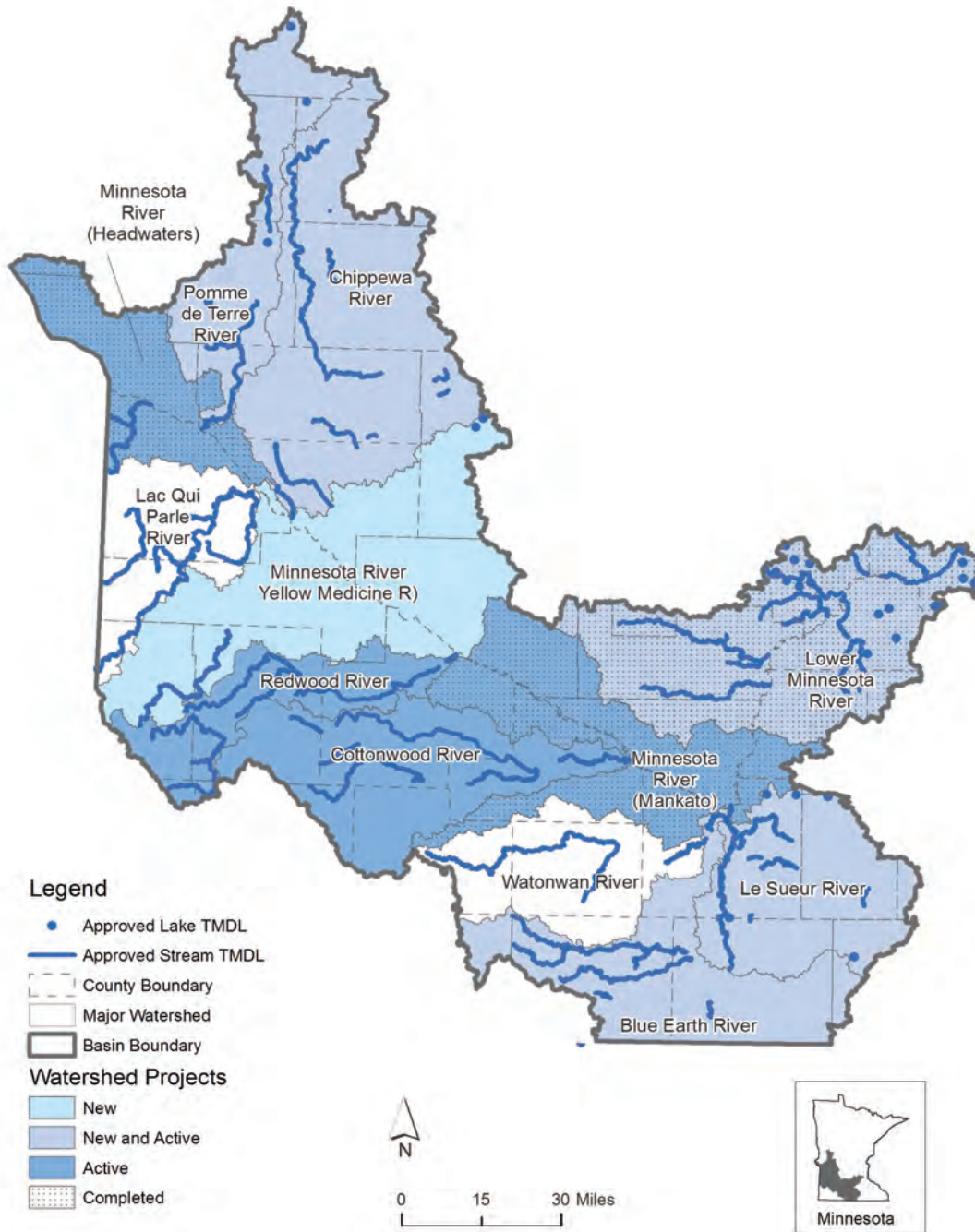
Projects completed

Lower Minnesota River Watershed

Assessing Iron Enhanced Filtration Trenches
 High Island Creek TMDL Project For Fecal Coliform
 Neighborhood Lakes Management Plans

Minnesota River – Headwaters

Protecting North and South Fork Yellow Bank River



Lower Minnesota River Watershed

Assessing Iron Enhanced Filtration Trenches

This monitoring project was performed on an iron enhanced sand filtration (IESF) trench in the City of Prior Lake. Water from the pond and IESF trench discharges into a wetland that ultimately drains into Upper Prior Lake. In 2002, Upper Prior Lake was listed on Minnesota's 303(d) List of Impaired Waters for nutrient/eutrophication biological indicators with aquatic recreation being impaired. Water quality has been reduced due to excessive phosphorus loading. According to the TMDL implementation plan developed for Spring Lake and Upper Prior Lake, the total phosphorus load must be reduced by 83% and 41%, respectively, to meet water quality goals.

Waterbody improved

In order to reduce phosphorus loading from stormwater runoff at pond 3B and other locations, the City of Prior Lake installed several iron-enhanced sand filter trenches. The main objectives of this project were to 1) monitor one such installation for its effectiveness with regards to phosphate removal over the course of several natural rainfall/runoff events and 2) develop design and maintenance recommendations for such installations. Although the quality of the effluent was improved, the impact this IESF trench had on the overall water quality of Upper Prior Lake was not evaluated.

Results that count

- Overall, for 28 monitored natural rainfall/runoff events from 2013-2015, the IESF trench removed 26% of the phosphate mass load it received, though after non-routine maintenance in August 2014 the performance improved to 45% phosphate mass load reduction. These results indicate the importance of maintenance. A newer installation was previously monitored, and found to retain 71% of the phosphate (Erickson and Gulliver 2010). Most of the overall phosphate load reduction was achieved during larger events that had comparatively high influent phosphate concentrations (32.3 – 125.2 µg/L) and mass loads. Many small events in this investigation with low influent phosphate concentrations (3.8 – 38.4 micrograms per liter [µg/L]) or mass loads exhibited negative removal (i.e., effluent mass load > influent mass load). The high



Assessing iron enhanced filtration trenches

effluent phosphate concentrations are suspected to be caused by the degradation of floating plants (primarily duckweed) that were deposited on the surface of the filter trench. As mentioned above, non-routine maintenance to remove this material resulted in substantial performance improvement. After this maintenance, positive removal was observed for influent concentrations ranging from 6.3 – 44.1 µg/L.

Partnerships

- This project was a close collaboration between the MPCA (Grant funds sponsor), the City of Prior Lake (Grantee, In-kind match provider), the Prior Lake Spring Lake Watershed District (In-kind match provider), the Scott County Watershed Management Organization (In-kind match provider), and the U of M (Sub-grantee, In-kind match provider).

Financial information

Funding type: Section 319

Grant amount: \$240,000

In-kind: \$256,571

Contact information

Pete Young, Water Resources Engineer

City of Prior Lake

4646 Dakota Street SE

Prior Lake, MN 55372

952-447-9831, pyoung@cityofpriorlake.com

MPCA Project Manager: Greg Johnson

Lower Minnesota River Watershed

High Island Creek TMDL Project for Fecal Coliform

The High Island Creek TMDL Project for Fecal Coliform was not a complete success. The three main project goals were as follows; make significant progress on achieving the High Island Creek TMDL for fecal coliform (FC) bacteria with a 30% reduction in the monthly FC geometric means from the FC TMDL Assessment Study, increase the adoption of best management practices (BMPs) that reduce FC bacteria levels in the High Island Creek Watershed (HICW), increase aquatic recreation opportunities in the watershed, and continue to foster watershed stewardship and community pride in clean water that achieves a legacy beyond this implementation grant. One of the biggest issues that occurred with the project was the downturn of small and medium sized animal producers remaining in animal agriculture within the watershed. It is also worth noting that during the course of the project multiple staff changes occurred with the coordinator position (five different coordinators during the project term), which left the watershed technician filling in during position vacancies.

Waterbody improved

After completion of the High Island Creek TMDL Project for Fecal Coliform, it is clear that there is still room for improvement within this watershed. With increased interest in sediment reduction BMPs, it is believed that improvement would be noticeable over time. Although there have been several implementations to contribute to water quality improvements in the HICW, many more need to be implemented before consistent water quality improvements will be noticeable. Taking an average of septic system installation pollution reduction calculations for *E. coli* it was possible to generate a rough number of 7.148×10^{13} colony forming unit (CFU) reductions per septic system upgrade or installation during the course of this project. Taking the average reduction per septic system upgrade for *E. coli* it was possible to generate an overall project reduction for *E. coli* as well, average *E. coli* reduction over the course of this project resulted in 593.284×10^{13} CFU's (from septic system upgrade or installation). All other BMPs involved in this project were



Rock tile installation, a successful BMP during the High Island Creek TMDL Project for fecal coliform

installed as preventative measures, and therefore *E. coli* reductions cannot be quantified. Although, there are other beneficial reductions with the additional BMP's; these BMP's (Conservation Reserve Program [CRP] buffer strips, intake alternatives, and terraces) resulted in a phosphorous reduction of 1,413.85 pounds per year, a nitrogen reduction of 2,473.4 pounds per year, and sediment reductions of 327.95 tons per year, all reductions were calculated using BWSR's e-LINK pollution reduction estimators (these values include septic system upgrade and installation reductions).

Project highlights

Upgraded septic systems and open intake alternatives were the two most successful BMP's offered. Community outreach was also a very successful aspect of this project with 13 quarterly newsletters and several mailings distributed, multiple meetings attended, and annual photograph contests to gain public participation. Field days with youth and landowners were also hosted to promote BMP's and water quality.

Results that count

- BMPs, water monitoring, and community outreach showed results worth noting. A total of 141 BMP's were installed during the course of this project; consisting of 83 SSTs, 30.25 acres CRP buffer strips, 17 open intake removals, 34 rock tile inlet installations, 1 terrace and 1 manure/nutrient management day. Water monitoring at 3 primary sampling locations was consistent from

2011 through 2014. Community Outreach was by far the most fulfilling portion of this project and was maintained from start to finish.

Partnerships

- Coalition for a Clean Minnesota River (CCMR)/Friends of the Minnesota Valley
- County Environmental Services Offices – Sibley, McLeod, Renville
- High Island Creek Watershed Joint Powers Board (HICWJPB)
HICWJPB is the governing body of the HICW. Its function is to provide oversight on watershed activities and funds.
- High Island Creek Watershed District (HICWD)
- Local Water Plan Administrators – Sibley, McLeod, Nicollet
- McLeod County
- Minnesota Board of Water and Soil Resources
- Minnesota Department of Natural Resources (DNR)
- Minnesota Pollution Control Agency
- Minnesota Valley Testing Laboratory (MVTL)
- Municipalities
- Natural Resources Conservation Service Offices – Sibley, McLeod, Renville
- Renville County
- Rush River Watershed Coordinator
- Sibley County
- Sibley County Water Resources Advisory Committee (WRAC)
- SWCDs – Sibley, McLeod, Renville
- University of Minnesota (U of M) Extension Service
- Water Resources Center (WRC) at Minnesota State University at Mankato

Financial information

Funding type: Section 319

Grant amount: \$227,004

In-kind: \$205,620

Matching funds: \$9,564

Contact information

Coleton Draeger

Sibley County

400 Court Ave P.O. Box 1051

Gaylord, MN 55334

507-237-4050

coletond@co.sibley.mn.us

MPCA Project Manager: Bryan Spindler

Lower Minnesota River Watershed

Neighborhood Lakes Management Plans

Through this resource investigation and protection project, co-sponsored by the Gun Club Lake Watershed Management Organization (GCLWMO), the City of Eagan (City) conducted state-of-the-art water quality investigations and developed management plans for 12 lakes. All of the lakes are within the Eagan-Inver Grove Watershed except a very small area of Apple Valley that drains toward Cliff Lake. The project evaluated in-lake water quality, assessed the total phosphorus (TP) loads affecting each system, and identified implementation projects and management activities to improve and protect the lakes. This has provided the City a coherent strategy and direction for implementing capital improvement projects and conducting management activities to improve and protect lakes, consistent with Eagan's Water Quality & Wetland Management Plan.

Financial information

Funding type: CWP

Grant amount: \$167,000

Final in-kind: \$73,170

Matching funds: \$126,961

Contact information

Eric Macbeth, Water Resources Manager

City of Eagan

3501 Coachman Point

Eagan, MN 55122-1452

651-675-5300, emacbeth@cityofeagan.com

MPCA Project Manager: Chris Zadak



Carlson Lake



Cliff Lake



Bald Lake

Minnesota River – Headwaters

Protecting North and South Fork Yellow Bank River

The North and South Forks of the Yellow Bank River begin in South Dakota and are located in the northern portion of Lac qui Parle County in western Minnesota. They merge in Section 25 of Yellow Bank Township to form the main stem of the Yellow Bank River. Both the North and South Yellow Bank Rivers are currently meeting the Minnesota Water Quality standard for turbidity and are currently listed on the 303 (d) impaired waters list for fecal coliform.

Waterbody improved

In 2010 and 2011 an intensive water sampling project was completed with East Dakota Water Development District, Upper Minnesota Watershed District and the Lac qui Parle-Yellow Bank Watershed District. The data from this project supported earlier data that the rivers meet the water quality standard for turbidity and exceeds the *E. Coli* bacteria standard. Conservation practices were selected to offer additional protection of sediment entering either of the streams.

Project highlights

A Friendship Tour of the watershed took about 100 participants into South Dakota to understand the elevation factor in the Yellow Bank River watershed. Information was presented on water quality results from a recent intensive sampling project, conservation management practices and programs available to landowners, flood control practices and future projects that are being developed. Other educational events such as field days provided encouragement to producers to try new conservation practices such as water control structures and cover crops. CRP contracts, water and sediment control basins, replacement of open tile intakes, and a streambank restoration projects were all completed to help protect the two rivers.

Results that count

- The North and South Fork Yellow Bank Rivers had 65.84 acres enrolled into continuous CRP contracts, six water and sediment control basins, eleven open intakes replaced and 120 feet of streambank restoration completed. The BWSR Water Erosion Pollution Reduction Estimator indicated TSS savings of 241 tons



Producers at cover crop field day along the South Fork Yellow Bank River

per year (T/yr) soil savings of 372 T/yr and phosphorus reduction of 313 pounds per year (lbs/yr).

- This grant did not expend all of its available funds and did not meet all of its goals for reduction. A survey was sent out to landowners prior to the grant application being submitted for funding. The results of that survey indicated interest in filter strips, construction projects and replacing open tile intakes. However, when landowners were contacted again they were hesitate about signing contracts which may have been in correlation to the higher commodity prices in the beginning of the grant period. More recently prices are lower, but landowners were still resistant to signing contracts. Informational meetings were held late summer and early fall to encourage landowners to sign up filter strip areas along watercourses and ditches as required by the Minnesota Buffer legislation. However, not all the details of this legislation was available. We did get some additional contracts after the meetings, but many still were hesitant because they had to do a dormant seeding in October or November.

Partnerships

- Lac qui Parle-Yellow Bank Watershed District-Sponsor
- Lac qui Parle County-Administrative In-Kind
- Lac qui Parle Natural Resource Conservation Service-Engineering services and in-kind
- Lac qui Parle Soil and Water Conservation District-Education Outreach

- Lac qui Parle Water Management Plan-Educational Outreach
- East Dakota Water Development District-Educational Outreach

Financial information

Funding type: CWP

Grant amount: \$234,950

In-kind: \$76,317

Matching funds: \$10,235

Loan match: \$466,147

Contact information

Mary Homan, Project Coordinator

Lac qui Parle-Yellow Bank Watershed District

600 6th Street, Suite 7

Madison, MN 56256

320-598-3319

mary.homan@lqpc.com

MPCA Project Manager: Katherine Pekarek-Scott



Wildung field day photo: Open tile intake replaced with pattern tiling

Minnesota River Basin

Active projects

Projects awarded in 2016

Multiple watersheds in the basin

Redwood-Cottonwood River Septic Loan Program – 2013

Sponsor: Redwood-Cottonwood Rivers Control Area (RCRCA)

Funding: \$ 9,000 CWF, \$510,000 CWP (Loan)

Purpose: This project will continue offering low-interest loans to citizens, some of whom may not be able to acquire funding otherwise, for upgrading 50 septic systems to ensure compliance with state rules. Grant funds will be used to administer the low-interest loan program.

GBERBA Conservation Drainage Partnership Program – 2015

Sponsor: Greater Blue Earth River Basin Alliance (GBERBA)

Funding: Clean Water Partnership (Grant) \$147,200

Purpose: Alternative side-inlets (categorized as grade stabilization structures) are an effective alternative to the classical side-inlet pipe. Instead of a horizontal pipe through the spoil bank, alternative side-inlets may utilize a drop structure with a water quality inlet on the surface. The water quality inlet allows water to temporarily pond, decreasing the stormwater's sediment carrying capacity by as much as 95%. Twenty-seven shovel-ready projects will reduce peak downstream flows and annually prevent 23.5 tons of soil and sediment and 23.5 pounds of phosphorus from entering ditches. The trash guard of the water quality inlet also prevents field residue from leaving the field. Additional water treatment (nitrogen) is likely with the setting of the water quality inlet in the grassed buffer of the drainage ditch.

Greater Blue Earth Nonpoint Reduction Initiative – 2014

Sponsor: Faribault SWCD

Funding: Clean Water Partnership (Grant) \$364,163

Purpose: Provide education, outreach and civic engagement necessary for the development of structural and non-structural BMPs needed to improve water quality within the Greater Blue Earth River Basin. General education will have a regional focus to landowners.

Outreach efforts will be focused on regional officials, staff and landowners. Civic engagement efforts will have a smaller watershed scale focus with efforts resulting in structural BMPs being placed on the land and non-structural BMPs being adopted. Provide cost-share assistance to landowners within the Greater Blue Earth River Basin to implement NPS reduction BMPs. Provide technical assistance to landowners and administration for this grant. Develop and deliver education, outreach and civic engagement efforts.

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.

Blue Earth River

Blue Earth River Dissolved Oxygen: Managing Flows & Nutrients – 2014

Sponsor: Faribault County SWCD

Funding: Section 319 (Grant) \$234,334

Purpose: Design a drainage watershed water quality treatment system through a mix of management and implementation practices to strike a balance between improved drainage need and local water quality benefit, while serving as an example site across the Greater Blue Earth River Basin. Install targeted BMP's to reduce the amount of phosphorus, nitrogen, and sediment reaching the Blue Earth River, including 2 woodchip bioreactors, 1 sediment basin, 5 water control structures, 6 alternative surface intakes, and 1 saturated buffer. Establish up to 75 acres of cover crop demonstration plots. Host a minimum of one workshop/field day on BMP installation and/or cover crops/soil health. Create short videos so landowners, elected officials and local government units (LGU) can see the installation process and how the practice works beneath the surface. Design and install signage at cover crop plots and BMP installation sites. Create and distribute promotional materials and advertisements as necessary.

Blue Earth River Green Infrastructure Project – 2014

Sponsor: City of Winnebago

Funding: CWP (Grant) \$10,000 and CWP (Loan) \$1,000,000

Purpose: Design and implement a region bioretention basin within the 25 block reconstruction project area, promote and implement green infrastructure activities throughout the City of Winnebago to reduce stormwater volume entering critical infrastructure, implement voluntary landowner BMPs found in the Minnesota Stormwater Manual, prepare an in-project area video on disconnect inflow and infiltration issues between the structures and main connection and develop SWCD grant program education and civic engagement within the City of Winnebago and project area.

Collaborative for Sediment Source Reduction: Greater Blue Earth River Basin – 2012

Sponsor: U of M, Jeff Marr

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

Purpose: This project will develop a sediment budget for the Greater Blue Earth River watershed; establish efficiency and cost of sediment reduction strategies (type, setting, and location); develop a sediment simulation model; build a decision analysis system; develop management strategy; provide seven workshops to develop and test the simulation model and decision tools; and complete all fiscal management and planning.

Elm Creek Tile Outlet Treatment Trains – 2013

Sponsor: Rural Advantage

Funding: Section 319 (Grant) \$165,000

Purpose: Demonstrate redesign of tile outlets using an innovative treatment train approach that addresses water traveling through drainage systems, focused toward linking upland practices with farm tile outlets to increase practice adoption, deliver environmental soundness and transfer knowledge on effective techniques resulting in improved nutrient management, post field treatment, reduced in-stream nutrient loads, and enhance wildlife and other ecosystem services while maintaining agricultural productivity.

Greater Blue Earth Urban Retrofit Initiative – 2012

Sponsor: Faribault County SWCD

Funding: Section 319 (Grant) \$270,250

Purpose: This project will use various electronic and printed media, as well as meetings, to promote

environmentally-friendly stormwater management practices; design and implement stormwater retrofit and new stormwater practices; provide technical assistance for stormwater implementation; track grant project and matching fund expenditures; and complete required reporting.

Chippewa River**Chippewa River Accelerated Restoration – 2012**

Sponsor: Chippewa County

Funding: CWP (Loan) \$900,000

Purpose: This project will promote and install 90 SSTS, rural and agricultural BMPs in the Chippewa River watershed.

Chippewa River Phosphorus Reduction Practices – 2013

Sponsor: Chippewa River Watershed Project

Funding: Section 319 (Grant) \$279,518

Purpose: Address phosphorus loading sources within the watershed and effectively reduce the amount of pollutant load entering the local priority waters within the watershed and lower the Chippewa River Watershed's contribution to the Minnesota River. The utilization of alternative surface tile intakes, drop side inlets, cover crops, livestock exclusion (fencing), pasture management/planned grazing, and water and sediment control basins will provide the best options for landowners to make site and management specific choices for reducing phosphorus.

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 2 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 3 sites to help prevent the formation or advancement of gullies while reducing sediment delivery to downstream waters; develop 5 sites to include

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

Chippewa River Watershed Protection – 2015

Sponsor: Chippewa River Watershed Project

Funding: Clean Water Partnership (Grant) \$296,965 and Clean Water Partnership (Loan) \$350,000

Purpose: Stabilize 235 feet of streambank with bio-engineering techniques, install 10 shoreline restorations, install approximately 3/4 mile of livestock exclusion fencing, enroll 30 acres of buffer strips, upgrade septic systems, and other recognized BMP's for reducing pollutant loading that may be brought forth by landowners that would have a direct impact on protecting water quality. Program evaluation tools will be developed to evaluate other key activities within program elements such as bus tours, field days, and public meetings. Levels of nutrients and sediments will be monitored on an ongoing basis to compare with the 15 years of historic data available and point to any increasing or decreasing trends in water quality. Using BWSR's calculation tools it is estimated that 235 feet of streambank stabilization will reduce phosphorus by 68 lbs/yr and delivery of sediment by 59 T/yr. Shoreline restorations reduce phosphorus by 35.05 lbs/yr and sediment by 41.25 T/yr, buffer strips reduce phosphorus by 3,416 lbs/yr and sediment by 2,867 T/yr, sediment basins reduce sediment by 75 T/yr and reduce phosphorus by 90 lbs/yr, livestock exclusion fencing saves three tons of soil per year and reduces phosphorus by three lbs/yr, and cover crops reduce 620 lbs/yr of phosphorus and reduce sediment by 414 T/yr.

Lake Minnewaska Phase I Resource Investigation – 2013

Sponsor: Pope Soil & Water Conservation District

Funding: CWP (Grant) \$112,435

Purpose: This project will hire a half time employee for three years responsible for meeting the requirements outlined in the preparation of a diagnostic study and implementation plan guidance document. The requirements are as follows but not limited to: monitoring water quality, compiling data, gathering public comments, identifying priority areas, providing timelines and cost estimates for BMPs and writing a detailed report. The resource investigation report will explore land use in the watershed, point and nonpoint pollution sources, agricultural practices being used, lakeshore development, septic system compliance, and water quality trends.

Cottonwood Streambank Inventory and Prioritization Project – 2012

Sponsor: RCRC

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

Purpose: This RCRC project will promote agricultural BMPs projects, identify sensitive areas for projects, inventory and prioritize project need, provide cost-share funding for BMP implementation, particularly the remediation of stream bank failures through direct streambank restoration and practices that slow hydrologic processes; identify high erosion streambanks and near-channel grade stabilization/ravine problems along the Cottonwood River corridor and create a method to prioritize the sites; and provide necessary project administration, meeting all grant requirements.

Le Sueur River

Le Sueur River WRAPS Implementation Endeavor – 2016

Sponsor: Faribault County Soil & Water Conservation District

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.

Le Sueur Watershed Targeted Conservation Practices – 2012

Sponsor: Minnesota State University – Mankato – Water Resources Center

Funding: Section 319 (Grant) \$82,491

Purpose: The Water Resources Center at Mankato will form a steering committee to serve an advisory role for the project; collect and organize data on existing BMP implementation, targeting and modeling research and other data for the map production; complete tillage transect survey/WinTransect; determine what existing laws or regulations, location and type of BMPs to target;

complete “Flow Calculation Modeling”; actively seek out willing stakeholders through the “Le Sueur Civic Engagement Project”; provide project information to LGU meetings; provide a project survey, and data usage analysis; and manage and coordinate project administration.

Lower Minnesota River

Blackhawk Lake Protection Project – 2013

Sponsor: City of Eagan

Funding: CWP (Grant) \$46,500

Purpose: The City of Eagan will collaboratively develop educational programs and materials for the Black Hawk Middle School and Deerwood Elementary School community and will determine the most appropriate opportunities for community education and involvement in site analyses and selection, design, installation, operation, and maintenance of selected BMPs.

Carp Management in Spring Lake & Prior Lake – 2015

Sponsor: Prior Lake - Spring Lake Watershed District

Funding: Clean Water Partnership (Grant) \$67,323

Purpose: Capture and surgically implant 30 adult carp throughout three lakes with high frequency radio transmitters. In addition to radio tagging, all remaining carp will be marked with a fin clip and returned to the lake to allow us to complete a mark/recapture population estimate. Radio tagged carp will be tracked to determine if migration routes exist, and if so, where barriers may be sited to restrict carp from potential nursery sites and spawning habitat, as well as to identify potential aggregation areas. Once a significant aggregation of carp has been located, a removal will be completed. During the removal, a count of the recaptured carp will be completed to generate a population estimate, combining the information with a weight and length subsample to obtain a biomass estimate. This value can then be used to gauge if additional removals are warranted on the lakes. By quantifying the amount of carp that are present post-removal, a total phosphorus load reduction can be estimated and compared to the amount specified in the 2012 TMDL for Spring and Upper Prior Lakes. Spring/Summer spawning tracking data will inform decisions on where we may be able to site carp barriers as part of our integrated pest management (IPM) strategy to inhibit carp recruitment. Barriers will be placed in identified locations after sufficient spawning period data has been collected. Carp will be tracked post barrier installation in 2017 to

determine the effectiveness of the barriers and allow us to determine if any modifications may be necessary.

Credit River Protection Plan – 2013

Sponsor: Scott Watershed Management Organization

Funding: CWP (Grant) \$225,000

Purpose: This project will promote land and water treatment practices, including wetland restoration, riparian vegetation management, geomorphic (stream stabilization and grade control), livestock exclusion, native grasses, and rain gardens. Also included are three specific geomorphic (stream/grade) stabilization projects in the Hidden Hills Park area of Savage, a wetland restoration in Savage, and finishing the Ponds Park Stormwater Reuse Project. The project includes a 0.25 full time equivalent (FTE) to provide the technical assistance necessary to implement the practices. Metrics or targets for this objective include: installation of 30 rain gardens, 70 acres of natural practices (i.e., wetland restoration, native grass or riparian vegetation management), the completion of 3-4 geomorphic practices (stream stabilization or grade control), and 1 stormwater reuse project. The bulk of the education/outreach effort, will develop and implement a program targeting small hobby farm and other large-lot residential land owners, to include both broad-based and individual (e.g. door-to-door) marketing and outreach components.

High Island Creek – McLeod County SSTS Project – 2013

Sponsor: McLeod County

Funding: CWP (Loan) \$120,000

Purpose: This project will work to address non-compliant SSTS in McLeod County’s portion of the HICW through the allocation of loan funds to rural homeowners. Overall, this specific project strives to implement 3 SSTS upgrades per year for the next 3 years.

Lake Waconia Stormwater BMP Enhancement – 2014

Sponsor: Carver County Water Management Organization (CCWMO)

Funding: Clean Water Partnership (Grant) \$93,000

Purpose: Mitigate phosphorus and TSS loading to Lake Waconia by enhancing urban stormwater treatment with the installation and inspection (to follow guidelines of the Minnesota Stormwater Manual) of up to 5 bioretention areas, a sand iron filtration bench, and approximately 90 feet of installed permeable pavers. Monitor practice outlet prior to BMP installation to assess total phosphorus and

TSS event-based loading. Install flow meter to gather in-pipe, event based, and storm hydrographs. Collect event samples for processing. Compile and analyze data to determine event based total phosphorus and TSS loading.

Lower Prior Lake Protection Project Implementation – 2014

Sponsor: Prior Lake-Spring Lake Watershed District

Funding: Clean Water Partnership (Grant) \$142,522

Purpose: A reduction in watershed phosphorus loading to Lower Prior Lake by 33 lb/yr, or 10% of the total drainage area phosphorus load of 326 lb/year, to maintain or improve water quality conditions (as monitored in the central basin) by up to 10% within 10 years of initiation of implementation activities, which include infiltration areas, water control structure, rain gardens, shoreline restorations and filter benches. Through community outreach activities, watershed residents will understand that immediate phosphorus reduction actions result in future benefits to water quality; in other words, that tangible benefits of watershed BMPs implemented now may only appear in long-term, future trends, and not until full BMP establishment (in particular, vegetation).

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: Clean Water Partnership (Loan) \$1,998,800

Purpose: This project will reduce sediment to the Minnesota River, control erosion and reduce sedimentation in Quarry Creek as well as 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 water and sediment control basins 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.

Rush River Watershed – Nicollet County SSTS Project – 2013

Sponsor: Nicollet County

Funding: CWP (Loan) \$150,000

Purpose: This project will work to address non-compliant SSTS systems in Nicollet County's portion of the Rush River Watershed through the allocation of loan funds to rural homeowners. Overall, this specific project strives to implement 5 SSTS upgrades per year for the next 3 years.

Scott Watershed Management Organization TMDL Implementation – 2013

Sponsor: Scott Watershed Management Organization

Funding: Section 319 (Grant) \$298,512

Purpose: Implement BMPs that are part of, and citizen engagement efforts that support implementation plans for Cedar and McMahan Lakes Excessive Nutrients and the Lower Minnesota River Dissolved Oxygen TMDLs. BMPs to be promoted include: harvestable filter strips, alternative tile intakes, water and sediment basins, grassed waterways, grade control, wet detention ponds, native vegetation plantings, wetland restoration, riparian vegetation improvements, and shoreline restoration and stabilization. Much of the funding is for staffing to provide the technical assistance necessary to promote and implement the BMPs. One specific project included on public land converts roughly 19 acres of cropland near Cedar Lake to native vegetation. A citizen engagement event using volunteers to complete the seeding and planting will be coordinated with this effort. A second citizen engagement/community capacity building effort that will be completed is a customer service survey with landowners who participated in the cost share/incentive program.

Minnesota River – Mankato

Middle Minnesota River Low Dissolved Oxygen TMDL Project – 2012

Sponsor: Renville County

Funding: Section 319 (Grant) \$245,475

Purpose: This Renville County project will offer one-time and annual financial incentives to landowners for BMP efforts that will be focused on activities that reduce phosphorus loss, prevent soil erosion, and increase groundwater recharge. The anticipated activities include 50 side inlets, 150 acres of buffers, two feedlot upgrades/livestock exclusions and other special projects to be determined.

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.

Middle Minnesota Watershed SSTS Loan Project – 2014

Sponsor: Renville County

Funding: Clean Water Partnership (Grant) \$10,000 and Clean Water Partnership (Loan) \$950,000

Purpose: The project will provide second-tier low interest loans to landowners for the replacement or upgrade of 65-85 noncompliant septic systems located in the Middle Minnesota Watershed. This project will serve as a means to financially assist landowners in Renville, Cottonwood, Redwood, Nicollet, and Le Sueur counties to continue eliminating noncompliant septic systems and improving water quality.

Renville Co MN River Mankato Watershed Protection – 2014

Sponsor: Hawk Creek Watershed Project

Funding: Clean Water Partnership (Grant) \$306,750

Purpose: 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, such as buffer strips, grassed waterways, grade/gully stabilizations, streambank and shoreline stabilizations, tile intake protection practices, controlled drainage, wetland restorations/protection, and feedlot runoff reduction practices will be a priority in order to prevent impairments and degradation. Based on past project pollutant reductions, the estimated pollutant reductions through this grant are 680 pounds of phosphorus per year and 255 tons of sediment per year.

Minnesota River – Yellow Medicine River

Hawk Creek – Minnesota River Phosphorus Reduction – 2013

Sponsor: Hawk Creek Watershed Project

Funding: Section 319 (Grant) \$228,992

Purpose: Cost-share assistance will be available for BMPs that focus on and are proven to be effective in reducing phosphorus, such as, but not limited to: side inlets, alternative tile intakes, conservation drainage systems, water and sediment control basins, grade stabilizations, streambank stabilizations, feedlot waste reduction projects, rain gardens, and lakeshore buffers. Another goal is to build on established relationships through increased authentic civic engagement activities to increase conversations and collaboration with a more diverse community.

Hawk Creek Watershed Dissolved Oxygen Restoration Project – 2014

Sponsor: Hawk Creek Watershed Project

Funding: Section 319 (Grant) \$237,585

Purpose: The goal of this project is to reduce phosphorus levels, increase base flows, and reduce sediment volume entering the Minnesota River via the Hawk Creek Watershed through restorative BMP implementation with 10 local landowners in strategic targeted locations as identified in the Lower Minnesota River Dissolved Oxygen TMDL Implementation Plan. BMPs with multiple benefits, such as improving water quality, habitat, and hydrology, will be a priority. Based on past project pollutant reductions, the estimated pollutant reductions through this grant are 680 pounds of phosphorus per year and 255 tons of sediment per year. A Volunteer Citizen Monitoring Network of approximately 25 volunteers will be maintained and water quality and precipitation data will be collected and analyzed. The data collected will be

added to long-term data to help identify water quality trends. Interactions with volunteers will strengthen citizen involvement in watershed issues and solutions. This project will utilize outreach and education to target BMP implementation and the decision making process of watershed issues.

Hawk Creek Watershed FY16 Implementation Project – 2016

Sponsor: Hawk Creek Watershed Project

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 water and sediment control basin. 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 Nitrogen Reduction Project – 2013

Sponsor: Hawk Creek Watershed Project

Funding: CWF (Grant) \$10,000, CWP (Loan) \$1,050,000

Purpose: This project will upgrade an estimated 75 SSTS for the three counties of Chippewa, Kandiyohi, and Renville within the watershed. The grant funds will be used to administer the loan program for the three counties.

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

Sponsor: Hawk Creek Watershed Project

Funding: Clean Water Partnership (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 Dissolved Oxygen TMDL Implementation

Plan SSTS upgrades are recommended for reducing pollution.

Pomme de Terre River

Pomme de Terre River Protective Buffer Project – 2013

Sponsor: Pomme de Terre River Association

Funding: CWF (Grant) \$216,600, CWP (Loan) \$500,000

Purpose: This project will offer incentives to protect 200 acres of riparian buffer in the headwaters of the watershed, accounting for 1,860 tons of sediment prevented from reaching surface waters each year the practices remain in place. This project will allow for outreach programs, such as tours, to engage more interested citizens. The desired outcome would include 30 or more participants in the program, and to develop a more extensive volunteer base.

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 water and sediment control basins, 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 1304.00 T/yr and phosphorus by 1304.86 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.

Pomme de Terre WRAPS Implementation Project – 2014

Sponsor: Pomme de Terre River Association

Funding: Section 319 (Grant) \$275,000

Purpose: This project will continue the BMP implementation process for the Pomme de Terre Watershed. Opportunities to reach landowners and citizens of the watershed will be leveraged through this project and will include an outreach program to inform citizens, city officials, and other individuals about water quality issues and solutions. The outcome will be a reduction of 1,220 lbs/yr of phosphorous and 1,100 tons/yr of sediment. The BMPs installed will provide 10 years of protection from agricultural and urban non-point source pollution. By addressing phosphorus and sediment concerns, this project will have a positive impact on aquatic life for both macroinvertebrates and fishes by reducing turbidity within the river. In addition, project

coordination with partnering LGUs will be strengthened with continued cooperation.

Redwood River

Redwood River Turbidity Reduction Project – 2015

Sponsor: RCRCA

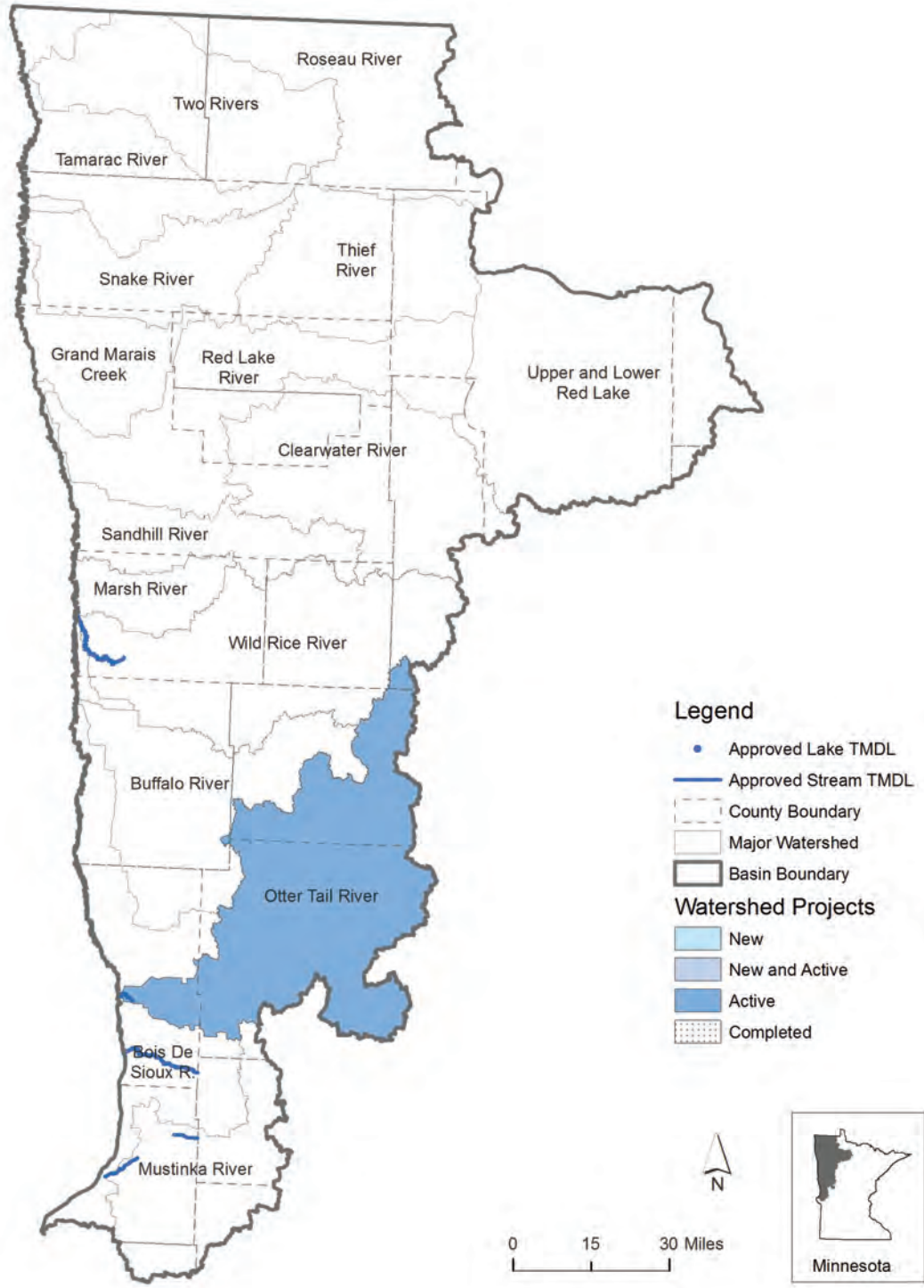
Funding: Clean Water Partnership (Grant) \$150,512

Purpose: Assist at least 12 cooperators to achieve total reductions of 715 tons/year of sediment and 715 lbs/year of phosphorus. This project will take further steps to provide funding, up to 70% cost-share, to cooperators to restore high priority erosion areas and to retain water in upland areas which retards flow into the system.

Proposed conservation practices of water and sediment control basins, grassed waterways, grade stabilizations and streambank stabilizations are in direct agreement with the planned activities by the partnering water management plans. In order to help determine which BMPs are most effective, which BMPs are needed, and which BMPs cooperators are most willing to implement, two civic engagement meetings will be hosted by this project. Dialogue will be facilitated by a past cooperator who can attest to the benefits provided by his personal BMP installations. The perceptions of past and future cooperators will be sought as to how they see the watershed restoration progressing, and to recommend methods to continue restoration efforts with greater public involvement. The results of these meetings will help identify the public concerns and will tailor future conservation approaches.

Red River Basin

None completed for 2016



Red River Basin

Active projects

Bois de Sioux River Watershed

Red River Basin Reservoir Nutrient Load Reduction – 2014

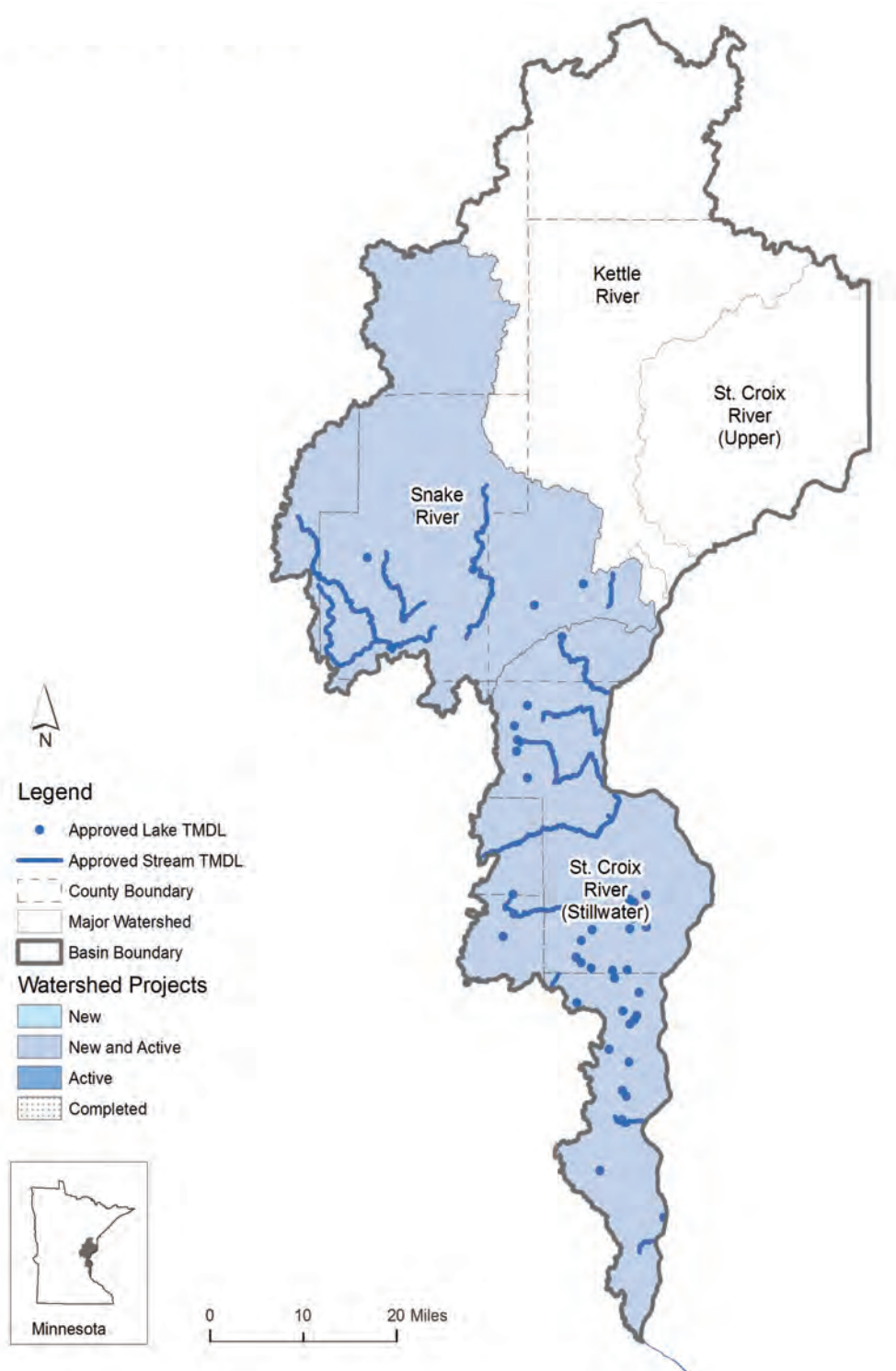
Sponsor: Red River Basin Commission

Funding: Section 319 (Grant) \$289,998

Purpose: Determine if vegetated flood storage reservoirs (current and future) can provide a 50% reduction in nutrient loading to selected tributaries that feed the Red River. This project will explore the use of flood-water impoundment structures for nutrient reduction by redesigning the cell management to reroute the stream flow through vegetated treatment cells. It is expected that the treatment cells will capture and hold nutrients both in sediment and in the vegetation (i.e., cattails); however, the nature of nutrient movement and storage is dynamic. This project will attempt to clearly define nutrient flux in the contributing watershed and both inside and outside of the impoundment's cells. This project will serve as a test pilot to aid with future nutrient control BMP design.

St. Croix River Basin

None completed for 2016



St. Croix River Basin

Active projects

Projects awarded in 2016

Lower St. Croix River Watershed

Forest Lake Diagnostic Study – 2015

Sponsor: Comfort Lake - Forest Lake Watershed District (CLFLWD)

Funding: CWP (Grant) \$52,500

Purpose: The primary outcome from this project is a comprehensive list of targeted implementation activities throughout the watershed, ranked by phosphorus reduction cost-benefit. This quantitative data will allow the CLFLWD and partnering organizations to implement activities that will maximize water quality protection/restoration. This project will also help achieve the actions identified for Forest Lake in the 2014 Sunrise River WRAPS report. The administrative outcomes for the project include a comprehensive work plan, timely invoicing, and meeting reporting and other grant requirements. The social outcomes for this project include educating lakeshore owners and City of Forest Lake residents on the connection between stormwater runoff and lake water quality. Additional elements of this project include a field inventory of stormwater outfall locations and conditions around the perimeter of Forest Lake, targeted monitoring of major stormwater outfalls and stream tributaries to refine watershed pollutant loading estimates that were modeled in the previously completed stormwater retrofit analysis, and collection of lake sediment samples in each of the three bays of Forest Lake to determine if internal loading is likely to be a problem in the future.

Forest Lake North Shore Subwatershed Assessment – 2013

Sponsor: CLFLWD

Funding: CWP (Grant) \$12,000

Purpose: This project will identify, prioritize, and prepare 10 to 15 feasible concept designs for specific water quality improvements capable of capturing and treating 1 inch of runoff from the direct contributing watershed of North Shore Trail.

Forest Lake Stormwater Filtration Retrofit – 2013

Sponsor: CLFLWD

Funding: CWP (Grant) \$143,025

Purpose: This project will implement a stormwater retrofit of an existing stormwater pond and shoreline stabilization project in the Hilo Lane development, circa 1970s, located on the south shore of Forest Lake. Stormwater treatment for this 14 acre tributary drainage area comprised of residential land uses will include bio-filtration, iron enhanced sand filtration, channel stabilization and shoreline stabilization. The estimated nutrient reduction from the project is almost 12 pounds per year of total phosphorous.

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.

Sand and Long Lakes Protection Project – 2013

Sponsor: Carnelian-Marine St. Croix Watershed District

Funding: CWF (Grant) \$132,000

Purpose: Implementation activities proposed as a part of this project, including water quality monitoring, biotic surveys, sediment core sampling, mechanical treatment of curly-leaf pondweed (in accordance with regulations and permitting), an iron-enhanced sand filter, with a high capacity multi-stage outlet weir and 40,000 pounds of iron filings and stakeholder involvement in the design process and educational presentations.

Snake River Watershed

Kanabec Water Resources Protection Project Phase 2 – 2015

Sponsor: Kanabec SWCD

Funding: CWP (Grant) \$196,200

Purpose: This project includes surface water monitoring of six rivers/tributaries and three lakes in the watershed that are currently un-assessed. The outcomes expected through this monitoring will provide a baseline of data to help prioritize and focus on future project areas for protection. This project will also include the

implementation of 16 approved BMPs in protection areas which include feedlot runoff treatment and control, manure storage pit closures, livestock fence exclusion from streams, heavy use protection areas for cattle crossings, roadside runoff/erosion control, critical area seeding, sediment basin, gully erosion control, wetland restoration, reduced tillage methods, cover crops, nutrient management, well abandonment and closures, streambank and shoreline protection, riparian vegetative buffer enhancements, and other approved BMPs that protect water quality. The measureable outcomes and non-point source pollutant reduction goals expected from these BMPs are: 76 T/yr of TSS, 76 T/yr of soil loss savings, 14,000 lbs/yr of phosphorus reductions and 18,000 lbs/yr of nitrogen reductions. This project also includes outreach, education, civic engagement, and civic organizing, to include key stakeholders, citizens and landowners in the process. Additional activities include the development of ten forest stewardship plans for landowners in areas that need protection to provide an inventory, assessment and mapping of the various forest cover types, and include management recommendations for reforestation practices, harvesting, wildlife habitat improvement, and overall protection of the forest resources. Finally, the agricultural BMP loan program will be used to assist landowners with BMP's that protect and improve water quality.

Kanabec Water Resources Protection Project – 2012

Sponsor: Kanabec SWCD

Funding: CWF (Grant) \$201,892

Purpose: This project will provide baseline data through water monitoring, recording and analyzing the results of six unassessed rivers/tributaries, three unassessed lakes and five stormwater outlets in the city of Mora which drain to the Snake River; promote and implement approved BMPs, including feedlot runoff treatment and control, livestock fence exclusion from streams, heavy use protection areas for cattle, roadside runoff/erosion control, critical area seeding, sediment basin and wetland restoration; sponsor an outdoor water quality learning event in 2012 for 90 Girls Scouts and their families, as a national event for the Girl Scouts of America; provide technical assistance for the development of eight nutrient management plans for landowners; develop eight forest stewardship plans for landowners; promote and implement the Agriculture BMP Loan Program to assist

landowners with BMPs that protect and improve water quality.

Snake River Watershed Resource Protection Project - 2016

Sponsor: Snake River Watershed Management Board

Funding: Clean Water Partnership (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 I.D. 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 SSTSs and other rural BMPs in the Snake River watershed.

Upper Mississippi River Basin

Projects completed

Mississippi River – St. Cloud

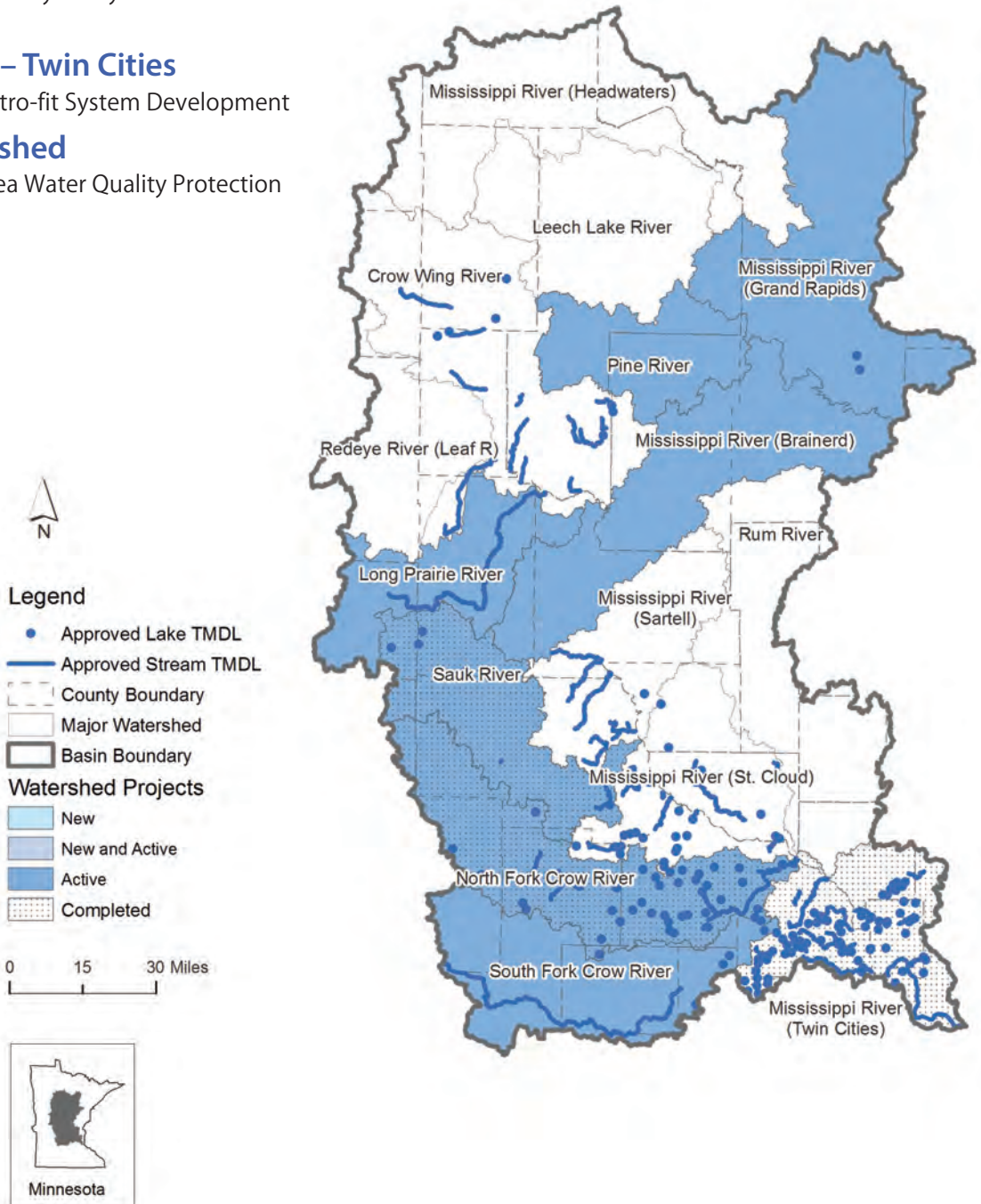
Kingston Wetland Feasibility Study and Restoration Project

Mississippi River – Twin Cities

Modular Green Roof Retro-fit System Development

Sauk River Watershed

Lower Sauk – Metro Area Water Quality Protection



Mississippi River – St. Cloud

Kingston Wetland Feasibility Study and Restoration Project

The Clearwater River flows through the 500 acre Kingston Wetland. The river was historically ditched through this wetland to provide agricultural drainage, and was placed on the impaired waters list because it did not meet standards for dissolved oxygen (DO). Studies showed that the wetland was exporting soluble phosphorus to downstream lakes (seven of which are listed as impaired). This project is the only known project in the state to address DO impairments with restoration techniques that do not rely on the removal of a wastewater treatment plant (WWTP) or dam.

The restored wetland/ main channel comes close to pre-agrarian hydrology by re-meandering the low flow channel through the wetland, allowing for reductions in oxygen demand and soluble phosphorus export, while allowing high flows to access the floodplain, maintaining the particulate phosphorus trapping capabilities of the wetland. The restoration improves wetland and riverine habitat to support a broader range of species. By restoring the main channel and meander, the river goes from being a ditch through a wetland to a more significant recreational resource. Data collected post-construction demonstrates the project meets its goals of maintaining wetland particulate phosphorus removal, while meeting state DO standards during most flow regimes and reducing soluble phosphorus exportation to downstream waters.

Results that count

- 60% reduction in wetland sediment oxygen demand targeted by project; DO concentrations have improved; 69% of pre-project DO measurements violated state standard across multiple flow regimes; only 27% of DO measurements post-project violate state standard, and primarily only during very low flows
- Project targets 1,970 lbs/yr total phosphorus reduction to downstream waters; nutrient monitoring above and below project post-implementation indicate the wetland is no longer a source of phosphorus to the river, indicating the goal of 20% nutrient loading to downstream waters was achieved; post-project measurements in downstream receiving water Lake Betsy support this assessment



Kingston Wetland

- Indices of biotic integrity show improvement post-project compared to pre-project measurements; Hilsenhoff biotic index pre-project was 8.26, post-project it is 6.08; best achieved index goal for rivers in this area is 5.8
- Re-meandered river channel provides a corridor for recreational users during optimal conditions (i.e. not low flow or flooding stages); primarily canoes, kayaks, or small boats with shallow drafts
- Additional environmental education opportunities were funded through the project; signage on the project was installed in Willow Creek Park in the City of Kimball

Financial information

Funding type: Section 319

Grant amount: \$322,218

Final in-kind: \$75,464

Matching funds: \$191,591

Contact information

Cole Loewen

Clearwater River Watershed District

75 Elm Street East, PO BOX 481

Annandale, MN 55302

320-274-3935, cole.loewen@crwd.org

MPCA Project Manager: Phil Votruba

Mississippi River – Twin Cities

Modular Green Roof Retro-fit System Development

The Shingle Creek watershed in Hennepin County is highly urbanized, with 13 nutrient-impaired lakes and 2 streams – Bass and Shingle Creeks – impaired for DO, impaired biota, bacteria and chloride. TMDLs for the impairments in the watershed have been completed and all call for reducing pollutant loading and runoff volume to the impaired waters.

Urban rooftop drainage is very often directly connected to drainage systems, and can contribute 15-20% of total annual runoff from an urbanized watershed. Green roofs are a BMP increasing in popularity, but they can be expensive and are difficult to retrofit when existing roofs have little additional load bearing capacity. The objective of this project was to develop and test several versions of a light-weight, portable, modular system of soil media and plants that could be constructed and installed by non-professionals on existing rooftops to catch and retain precipitation that would otherwise be converted to urban runoff. The modules would be suitable for installation on existing roofs without the need for supplemental structural reinforcement, membrane installation to combat leakage, or intensive maintenance such as supplemental irrigation.

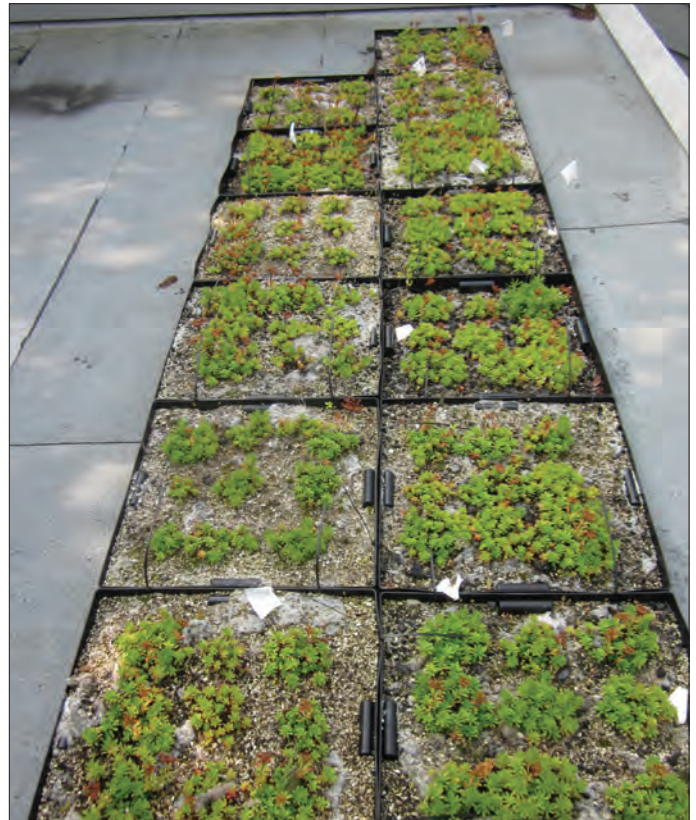
This project was a research project to design and test a new type of BMP and was not targeted to a specific waterbody.

Project highlights

- Different types and mixes of growing media were tested in the lab and in the field to find the lightest weight mix with the best soil moisture retention. The modules were assembled, filled with the most promising soil media, planted with Sedum, and field tested for three growing seasons to evaluate plant viability. The final outcome of the project was a “How To” guidance brochure providing specifications for designing a modular system, sources of materials, planting mix, and types of plants, and instructions for assembling, installing, and maintaining the system.

Results that count

- This project demonstrated that it is possible to build do-it-yourself, cost-effective green roof modules from commonly-available materials that can sustain plants



Modular trays on the roof of a Three Rivers Park District building at the field test location in Brooklyn Park, Minnesota.

hardy in Minnesota climates, at a cost that is less than those that are commercially available. These modules can be easily fabricated and installed by homeowners, maintenance staff, and other stakeholders with basic gardening skills and once established require minimal maintenance.

Financial information

Funding type: Section 319

Grant amount: \$22,936

Final in-kind: \$9,720

Matching funds: \$10,005

Contact information

Tina Carstens

Shingle Creek Watershed Management Commission

3235 Fernbrook Lane

Plymouth, MN 55447

763-553-1144, judie@jass.biz

MPCA Project Manager: Rachel Olmanson

Sauk River Watershed

Lower Sauk – Metro Area Water Quality Protection

The last 20 mile stretch of the Sauk River is impacted by stormwater runoff from a vast urbanized watershed prior to discharging into the Mississippi River. The water quality of the Sauk River affects not only the local residents but public water supplies for urbanized areas (St. Cloud and Minneapolis) downstream from the Sauk River confluence with the Mississippi River. The 2006 diagnostic study conducted on the Lower Sauk River watershed area identified suspended solids as a concern for sections of the lower Sauk River. The goal of the Lower Sauk River – Metro Area Water Quality Protection Project was to protect the Sauk River from degrading to the point where it becomes listed as impaired for turbidity or for excessive nutrients.

The Sauk River benefited from the BMP implementation efforts of this Clean Water Partnership (CWP) project. The reduction in sediment and total phosphorus will help reduce the risk of the Sauk River becoming listed as impaired for turbidity and other nutrient pollutants.

Project highlights

- This CWP project focused on the stormwater runoff concerns identified in the Wenck 2011 Municipal Assessment reports and provide public awareness to the local residents on the impact of urban land use activities. CWP funds were utilized to install six rain gardens, three infiltration trenches along city streets in the Seberger Park neighborhood, implement a targeted street sweeping regimen and initiate an extensive stream bank restoration along the Sauk River at Whitney Park by funding the engineering design cost and permitting cost through the DNR and COE.

Results that count

- CWP funds were used for one riparian restoration, six rain gardens, three infiltration trenches and sump and a vacuum street sweeper to address stormwater and sediment loading to the Sauk River. These projects reduced and an estimated 328 pounds of total phosphorus and 574 tons of sediment per year from reaching the Sauk River. The Sauk River was monitored to determine stormwater contribution to the River. Data was submitted into Environmental Quality Information System (EQIS) and used for targeting BMP



Aurora Park – Before



Aurora Park – After

efforts. Education events were held in the lower Sauk region to encourage rain gardens and rain barrels in the urban areas. The youth education events and multiple classroom visits were well received by areas schools and students.

Partnerships

- City of St. Cloud – landowner and technical staff for stormwater BMP implementation, funding for BMPs
- Stearns County SWCD – technical assistance for stormwater BMP and riparian BMPs
- Short, Elliot, Hendrickson Inc. – engineering consultant
- Area Two Technical Service Engineers – technical assistance and engineering for riparian projects
- Individual landowners
- Stearns County Environmental Services – technical assistance
- DNR – technical assistance, permitting

- Friends of the Sauk River – volunteers, education events
- St. Cloud State University – volunteers, education events
- City of St. Cloud – volunteers, and funding
- City of Waite Park – volunteers- education events
- City of St. Joseph – volunteers- education events
- U of M Extension Service – education events

Financial information

Funding type: CWP
 Grant amount: \$289,953
 Final in-kind: \$115,632
 Matching funds: \$300,000

Contact information

Lynn Nelson, Water Resource Manager
 Sauk River Watershed District
 524 4th Street South
 Sauk Centre, MN 56378
 320-352-2231
Lynn@srwdmn.org
 MPCA Project Manager: Scott Lucas



Central Park – Before



Central Park – After



Madison Park – Before



Madison Park – After

Upper Mississippi River Basin

Active projects

None were awarded in 2016

Clearwater River Watershed

Clearwater River Watershed Alternative Tile Intakes Project – 2014

Sponsor: Clearwater River Watershed District

Funding: Section 319 (Grant) \$45,000

Purpose: This project will install up to 120 open tile intakes that filter out nutrients and sediments, providing 700 pounds per year of total phosphorus load reduction from priority crop land. It will also document reduction in farmer and tile contractor resistance to the use of alternative tile intakes. Educational materials will be produced, demonstrating the benefits, effectiveness and utility of alternative tile intakes from environmental and economic standpoints, as well as applicability throughout the state.

Long Prairie River

Long Prairie River Dissolved Oxygen TMDL Implementation – 2013

Sponsor: Todd SWCD

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

Purpose: Implement 25-30 BMP's in the Long Prairie Watershed and increase DO levels such that they are consistently above 5 mg/l. This would delist the Long Prairie as an impaired water body. Morrison, Douglas, and Todd SWCDs will be the primary partners on the project since they are the primary counties with land in the watershed. It is anticipated that projects implemented will annually reduce 1,409 pounds of phosphorus, 716 tons of sediment and 6,771 pounds of nitrogen from reaching the Long Prairie River system. These reductions will decrease algae growth and result in higher DO readings.

Mississippi River – Brainerd

Platte River Restoration/Protection Project – 2015

Sponsor: Morrison SWCD

Funding: Clean Water Partnership (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.

Swan River Headwaters Subwatershed Restoration – 2015

Sponsor: Todd SWCD

Funding: Clean Water Partnership (Grant) \$38,650

Purpose: Grant dollars would be used to install riparian buffers and restore a series of sediment ponds to keep nutrient rich runoff from flowing into several local lakes and the Swan River. Riparian landowners in this area, both agricultural producers and shoreland residents, have agreed that work is needed and are willing to implement these strategies to restore water quality in this area. These projects would improve conditions for fish and invertebrate communities. The efforts outlined in these projects would increase cooperation between the shoreland and agricultural communities and encourage a conservation ethic throughout this area.

Mississippi River – Grand Rapids

Big Sandy and Minnewawa Lakes Phosphorus Reduction – 2014

Sponsor: Aitkin County SWCD

Funding: Section 319 (Grant) \$86,100

Purpose: This project will implement phosphorus reduction strategies for the Big Sandy Lake Watershed, as outlined in the Big Sandy Lake and Lake Minnewawa TMDL Implementation Plan. BMP demonstration projects will be installed, including 2 rain gardens and 5 shoreline stabilization projects. We estimate a reduction in phosphorus pollution of 9,145 lbs/yr, and a reduction in sedimentation of 5,165 tons/yr. One hundred rain barrels will be distributed at a reduced cost to critical landowners. Septic system inventories will provide county staff, as well as lake residents,

with critical information needed to further address the issues related to improper septic system maintenance. Education activities will increase awareness of and concern about consequences of landuse practices that have environmental impacts. Water quality data will be collected on nine lake sites within the Big Sandy Watershed.

Mississippi River – St. Cloud

Clearwater River Restoration & Protection Phase II – 2015

Sponsor: Clearwater River Watershed District

Funding: Clean Water Partnership (Grant) \$72,000

Purpose: District staff will update an existing bacteria and TSS source inventory through a desktop survey and field reconnaissance to identify and prioritize project locations to reduce sediment and bacteria loading to the River. Projects will be prioritized for preliminary design based on their potential for load reduction to the Clearwater River. The district will finalize design and permitting for projects with signed agreements and high cost benefit in terms of bacteria and TSS load reductions. Construction will be complete by spring of 2018. The District will use the projects as demonstrations to promote participation in agricultural programs and projects

NE St. Cloud Mississippi River Protection Project – 2015

Sponsor: City of St. Cloud

Funding: Clean Water Partnership (Grant) \$200,000

Purpose: The proposed project will increase pervious surfaces, create disconnection of impervious areas prior to entering the storm sewer system (i.e. Mississippi); implement alternative “green” landscaping, and bioretention facilities. Alternative landscaping techniques/BMPs will be implemented throughout the drainage area where site characteristics make sense. This may include, but is not limited to; incorporating trees into landscaped areas, tree boxes, pervious pavement, grass swales, vegetated filter strips, etc. Targeted areas include: areas where the City plans to re-stabilize pervious surfaces; areas where the City plans to install bioretention or other volume reduction BMPs; areas adjacent to reconstructed catch basins and/or retrofit sump catch basins (tree boxes); areas where the City plans to landscape existing paved and/or gravel areas. The education of property owners and citizens will also be an important aspect of the project to ensure long term function of the BMPs and future participation

by other property owners. Projects implemented as part of this grant will be promoted and highlighted to educate and encourage participation in future projects for this area. Furthermore, the projects will improve the aesthetics of the old rundown industrial/commercial area bringing additional attention and educational efforts. The City plans to submit follow-up presentations on the implemented BMPs and the impacts to the Mississippi River to area stakeholder and citizen groups.

Pleasant Lake Stormwater Quality Improvements – 2014

Sponsor: City of Annandale

Funding: Clean Water Partnership (Grant) \$164,800

Purpose: The City of Annandale intends to plan and implement stormwater infiltration systems, including trenches, sump manholes and perforated pipes, to settle out solids, to increase water detention times, to reduce stormwater discharge volumes and to prevent the discharge of nutrients and sediment from urban runoff into local water bodies. Water quality results will help determine effectiveness of BMP's.

Targeted Fertilizer Application Reduction Project – 2012

Sponsor: Clearwater River Watershed District

Funding: Section 319 (Grant) \$245,475

Purpose: Clearwater River Watershed District will identify and recruit fertilizer application participants; prepare, distribute and present materials for education and outreach; collect soil samples from participants' fields on a 2.2 acre grid across up to 16,000 acres of critical crop land to determine the fertilizer needs for each field; use global positioning system (GPS) - aided fertilizer application technology to apply fertilizer at variable rates consistent with field needs, avoiding tile intakes and providing a 50 lineal foot buffer where no fertilizer is applied; conduct water quality monitoring at drain tile outlets from selected fields, including both farms that are and are not participating in the program; annually report the extent of program application and reductions in fertilizer application over standard practice, but also corresponding water quality results; provide recommendations to optimize the program implementation and achieve the maximum load reduction possible; and track, manage, and report on project results and finances as necessary and required.

Mississippi River – Twin Cities

Bald Eagle Lake TMDL Implementation – 2013

Sponsor: Rice Creek Watershed District

Funding: CWP (Loan) \$500,000

Purpose: This project proposes to use aluminum sulfate (“alum”) to control internal phosphorus loading to Bald Eagle Lake. Over the lifespan of the alum treatment, expected to be 15-20 years, 1,195 pounds of phosphorus will be removed from the budget each year.

Lake McCarrons Sub-watershed BMP Project – 2012

Sponsor: Capitol Region Watershed District

Funding: CWF (Grant) \$275,000

Purpose: Capitol Region Watershed District will compile and review previously conducted studies and will prioritize BMPs based on a cost-benefit analysis of their pollutant load reductions and life cycle costs; will conduct a sub-watershed analysis to determine optimal BMP locations and types to maximize volume and pollutant removal; solicit and consider stakeholder input in prioritizing BMPs; will design and construct BMPs, such as rain gardens and infiltration practices, within the Villa Park sub-watershed of the Lake McCarrons watershed to meet phosphorus load reduction goals to the Villa Park Wetland System and ultimately maintain the long term water quality of Lake McCarrons.

Northwood Lake Water Quality Improvement Project – 2015

Sponsor: Bassett Creek Watershed Management Commission

Funding: Clean Water Partnership (Grant) \$300,000

Purpose: This project will treat stormwater runoff from over 110 acres of currently untreated urban land. At the east end of the lake project components include a structural treatment device for pre-treatment of runoff, underground stormwater re-use chamber (160,000 gallons capacity), pump house, distribution system to irrigate 6.4 acres of adjacent ball fields, and finally a system overflow directed into a series of linear rain gardens prior to discharging into Northwood Lake. At the west end of Northwood Lake, a wet ponding basin will be constructed in a green space area between Trunk Highway 169 and Jordan Avenue. Stormwater runoff from rear yard areas and Jordan Avenue draining from the south will be directed into the pond for treatment before discharging into an existing storm sewer pipe

tributary to Northwood Lake. This project is expected to remove 22 pounds of phosphorus per year in addition to other pollutants associated with stormwater runoff and snowmelt. Additional benefits of the project include water conservation through the storage and use of stormwater as irrigation water for adjacent ballfields. It is estimated that up to 3.8 million gallons of drinking water may be conserved annually due to irrigation using stormwater captured through this project.

Shingle Creek DO Reaeration Improvements – 2014

Sponsor: Shingle Creek Watershed Management Commission

Funding: Section 319 (Grant) \$93,500

Purpose: Design and construct reaeration structures and stream improvements and conduct preconstruction and post construction water quality and biological monitoring to document improved water quality and biotic integrity of the stream. The desired outcome would be a stream that meets the state DO standard downstream of each project area. This will be analyzed by completing pre- and post-construction longitudinal DO and continuous DO surveys. Documenting a post-construction macroinvertebrate community composition that includes more sensitive taxa would be an indication of the desired response to improved DO conditions. The education and outreach component will be measured based on hits to the project’s website and social media accounts.

North Fork Crow River

Crow Lakes Protection and Resource Investigation – 2013

Sponsor: Crow River Organization of Water

Funding: CWP (Grant) \$124,200

Purpose: The Project’s “virtual TMDL” studies will evaluate lake water quality relative to MPCA eutrophication standards, assess external and internal TP loads, quantify maximum TP allocations, and identify TP reduction (or stabilization) plans or strategies for source areas. The Project will focus on 10 lakes: Minnie Belle, Manuella, Stella, Washington, Francis, West Sylvania, East Sylvania, John, Charlotte, and Martha. These lakes are located throughout Meeker and Wright County, are highly used recreational lakes with adjacent park land, and are significant contributors to the North Fork Crow River. These key lakes are parts of lake chains in which the whole chain is not impaired, and the protection strategies developed through this project will complement the TMDL implementation efforts to focus on comprehensively managing the chain as a system.

Crow River Middle Fork Watershed Resource Investigation – 2013

Sponsor: Middle Fork Crow River Watershed District

Funding: CWP (Grant) \$63,250

Purpose: This project will continue a monitoring program for the purpose of tracking the long term changes in the 8 lakes of the watershed, assist the District Board and staff in identifying key areas for BMP implementation, offer two water quality education workshops per year to area residents providing information of our investigation and many ways to protect these resources, visit area schools nine times per year to implement water quality classes into school curricula, provide one volunteer training workshop per year, informing 10-12 citizens of the fine points of stream and lake data collection to supplement our resource investigation, continue to submit regular columns and news releases for existing local newsletters and newspapers and continue the promotion of BMP and educational programs through the District website, which will also contain monitoring information on local lakes and streams.

Lake Koronis Subwatershed Protection Project – 2013

Sponsor: Stearns County SWCD

Funding: CWF (Grant) \$197,871

Purpose: This project will evaluate and prioritize approximately 13,000 lineal feet of Lake Koronis shoreline for shoreline erosion and vegetative buffer condition. Those property owners with the most erosion, stormwater and vegetative buffer issues will be targeted to stabilize, infiltrate and buffer their shoreline. This project will also evaluate an additional 300 properties in the subcatchment area and target those properties that are best able to capture and treat stormwater from impervious surfaces. Education/Outreach efforts will include a field day demonstrating the installation of typical BMPs which will be installed in the project area as well as on-site tours of practices after installation.

MFCRWD Loan Program for BMPs/Septic Upgrades – 2015

Sponsor: Middle Fork Crow River Watershed District

Funding: Clean Water Partnership (Grant) \$10,000 and Clean Water Partnership (Loan) \$100,000

Purpose: This project's 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 State Revolving Fund (SRF) 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.

Targeting BMPs in the Crow River Watershed – 2012

Sponsor: Crow River Organization of Water

Funding: CWP (Loan) \$1,100,000

Purpose: This project will promote and install 110 SSTs, agricultural and rural BMPs in the Crow River watershed.

Rum River

Mille Lacs Lake Protection – Stormwater Control – 2014

Sponsor: Aitkin County SWCD

Funding: Clean Water Partnership (Grant) \$85,520

Purpose: This project will implement five stormwater control demonstration BMPs and educate watershed landowners regarding stormwater control. These projects will serve to change behavior and perceptions of how stormwater may be managed, and demonstrate how easy changes may have a positive impact on land stewardship and water quality protection. One hundred rain barrels will be distributed at a reduced cost to critical landowners. These will serve as examples to numerous area residents, resulting in benefits that include control of stormwater runoff and increased awareness of the water quality impacts of untreated stormwater runoff. Education activities will increase awareness of and concern about consequences of improper stormwater management practices and their environmental impacts. Participants will become knowledgeable regarding stormwater and water quality BMPs developing a new understanding of their environment. All efforts combined will engage the local citizens and further the project

goal of protecting the water quality of the Mille Lacs Lake Watershed. Involvement of citizen volunteers will increase their confidence and ability to address stormwater management and water quality concerns. Support of their efforts will lead to long term involvement of the citizens and foster their continued leadership in the local community.

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).

Middle Sauk River Targeted Reduction and Outreach – 2014

Sponsor: SRWD

Funding: Clean Water Partnership (Grant) \$332,214.50 and Clean Water Partnership (Loan) \$150,000

Purpose: A Farmer-led Council will be developed and meetings will be held up to four times to guide the SRWD in the development of the Hayed Buffer Program and participate in public outreach efforts to promote the program. The project will install 40-50 acres of vegetative buffers under the established Hayed Buffer program, reducing an estimated 126.6 tons of sediment per year. Landowners participating in the Hayed Buffer program will supply feedback on the program by completing the Hayed Buffer Survey developed by the Farmer-led Council. The project will implement 2 streambank restorations and four erosion control practices to target an estimated sediment reduction of 3.3 to 6.6 tons per year. Stream samples will be collected and compared to archived data. Stream modeling will be completed to determine load reduction and the success of the CWP project.

Osakis Lake Nutrient Reduction – Crooked Lake – 2014

Sponsor: SRWD

Funding: Section 319 (Grant) \$286,652

Purpose: Entice landowners, using additional incentives, to secure their enrollment into the Reinvest in Minnesota

(RIM) program, or other similar programs to restore the Crooked Lake basin. Approximately 1,200 acres would be restored to a standing water basin. Under management, a restored Crooked Lake would provide 3,291 acre-foot of storage, resulting in increased storage, decreased nutrient transport, flood mitigation and increase wildlife habitat. The restored basin would enhance the quality of water flowing through JD2, which directly outlets to Osakis Lake. A fully restored shallow lake would have a potential load reduction of 2,135 lbs/yr of TP and 562,575 lbs/yr of TSS. Seventy-two lakes samples and 30 stream samples will be collected and compared to archived data. Data from the JD2 sites and lakes sites will be compiled and submitted to MPCA for EQuIS and posted on SRWD's website for public review. Stream modeling will be completed to determine load reduction and the success of the restoration project.

SRWD Groundwater Protection Project – 2015

Sponsor: SRWD

Funding: Clean Water Partnership (Grant) \$10,000 and Clean Water Partnership (Loan) \$250,000

Purpose: Educate the local residents of the importance of groundwater protection and provide financial assistance to those who need to properly abandon their unused well or to upgrade their nonconforming septic system to prevent nutrients and other contaminants from impacting groundwater and surface water through groundwater permeation. Agencies within each of the five counties will take the lead on conducting the septic inspections throughout the Sauk River watershed. Incentive dollars (grant funds) will be offered to watershed residents that have an unused well, cistern or underground reservoir to properly abandon the system. The SRWD will work with the local county agencies to provide public outreach to watershed residents informing them of the impact that unused wells and substandard septic systems have on drinking water and surface water.

South Fork Crow River

Ardmore Avenue Stormwater Retrofit – 2015

Sponsor: City of Medina

Funding: Clean Water Partnership (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 chlorophyll-a concentrations in-lake, an indirect measure of the amount of algae within these lakes. Lower phosphorous and chlorophyll-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: Clean Water Partnership (Grant) \$10,000 and Clean Water Partnership (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.



Minnesota Pollution Control Agency

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 Rochester Office

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

MPCA Marshall Office

504 Fairgrounds Road
Suite 200
Marshall, MN 56258
507-537-3001 or
toll-free 800-657-3864

MPCA Willmar Office

1601 East Highway 12 East
Suite 1
Willmar, MN 56201
320-441-6965 or
toll-free 800-657-3864

