Watershed Achievements Report

2009 Annual Report to the U.S. Environmental Protection Agency

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

Minnesota Pollution Control Agency

Minnesota Pollution
Control Agency

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Contents

Introduction

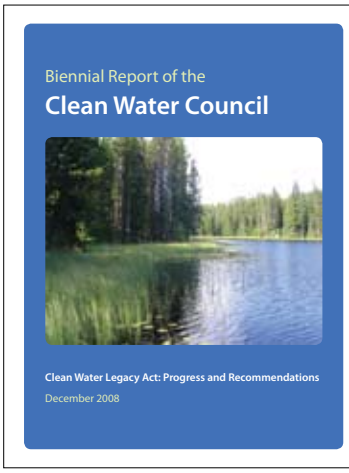
Clean water funding for watershed management continues to persist and grow

Late 2008 and into 2009 has been a difficult time economically all over the world. Global recession, widespread unemployment, home foreclosures, bank collapse and so many other economic problems sent the world economy into a tailspin.

As the crisis was mounting, a Minnesota constitutional amendment was placed on the ballot in November 2008 for the voters to consider raising the sales tax 3/8ths of 1% to raise revenue dedicated to clean water, parks and trails, habitat preservation, and the arts. Many people felt the amendment was doomed to fail, if for no other reason, due to the struggling economy. Surprisingly, Minnesota voters passed the Clean Water, Land, and Legacy Amendment (Amendment) by a significant margin, most citing the clean water portion of the amendment as the reason for their support. Minnesotans spoke loudly by their vote about their concern for water quality in the "Land of Sky Blue Waters."

The Legislature and Governor ultimately decide how the revenue generated will be spent. For the clean water fund portion, revenues will be about $80–$90 million per year, depending on the economy and spending. A portion of the Amendment clean water funds are being directed to the Minnesota Pollution Control Agency (MPCA) for the water quality management efforts it oversees, making permanent (at least for the next 25 years, according to the term of the Amendment) the temporary funding provided to implement the Clean Water Legacy Act (CWLA) for the previous three years since its passage.

This funding will continue the good work that is already underway: monitoring and assessing the quality of water in Minnesota lakes, streams, and wetlands; and the development of Total Maximum Daily Load (TMDLs) to determine how to clean up polluted waters. Allocations of other clean water funds to partner agencies like the Board of Water and Soil Resources (BWSR), the Department of Natural Resources (DNR) and the Department of Agriculture (MDA) will enable water restoration and protection implementation activities to continue and expand as well.

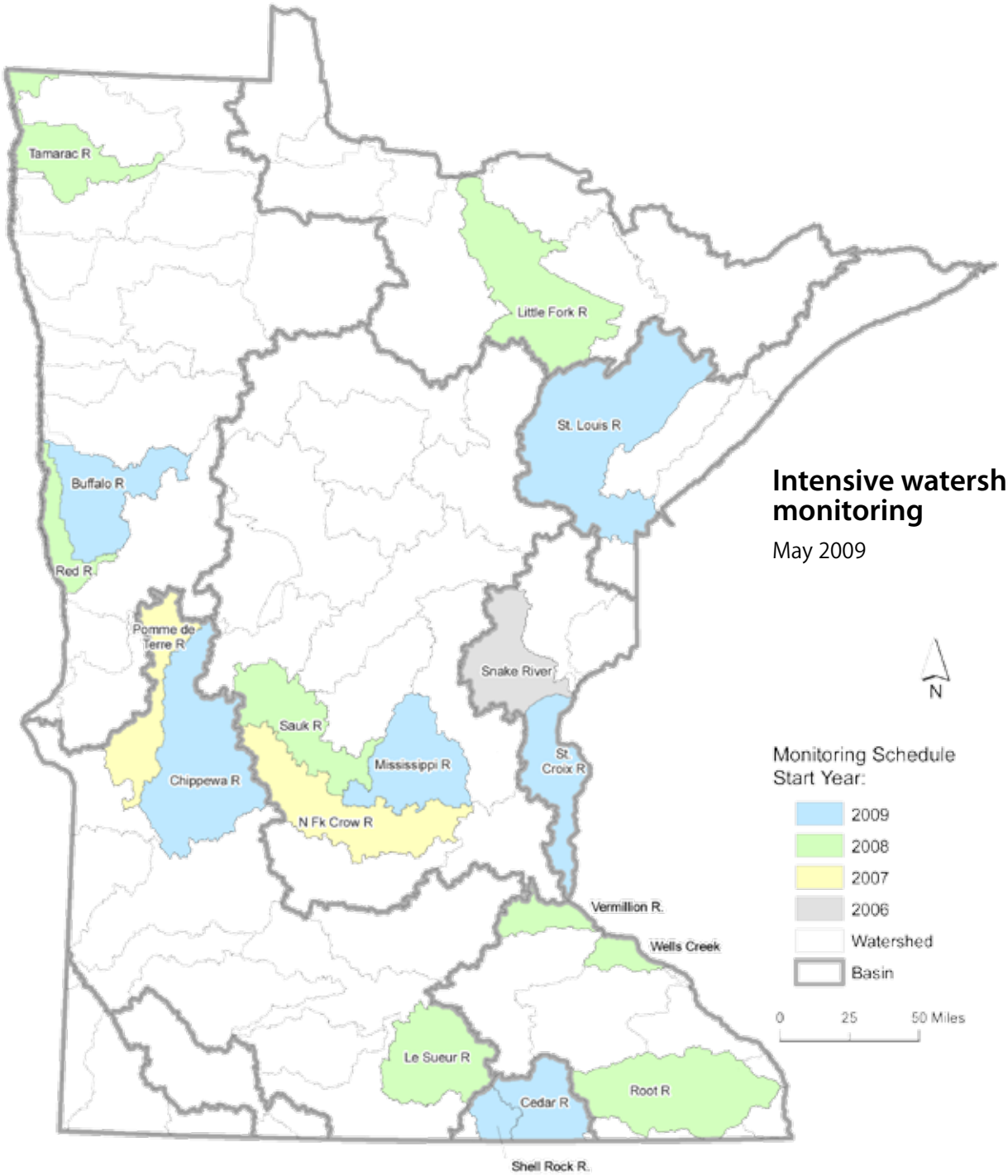


Further implementation of the watershed approach

The MPCA began implementation of a basin management approach on the larger scale of the 10 major drainage basins of the state in the mid-1990s. In the last three years, the MPCA has been working to convert those efforts to the smaller 81 major watershed scale. This shift to the watershed approach was affirmed by the state Clean Water Council (CWC), created by the passage of the Clean Water Legacy Act. The CWC completed its first report to the legislature in December 2008 (see the full report at www.pca.state.mn.us/publications/reports/lrwq-s-lsy09.pdf). Recommendation 1 in the report is to "*Develop a statewide watershed approach to prioritize and integrate monitoring and assessment, TMDL, and restoration and protection activities.*" Recommendations 2, 3 and 4 call for stable funding for these efforts. Passage of the Amendment now provides the opportunity for this stable funding, which is enabling the MPCA to continue to implement the watershed approach.

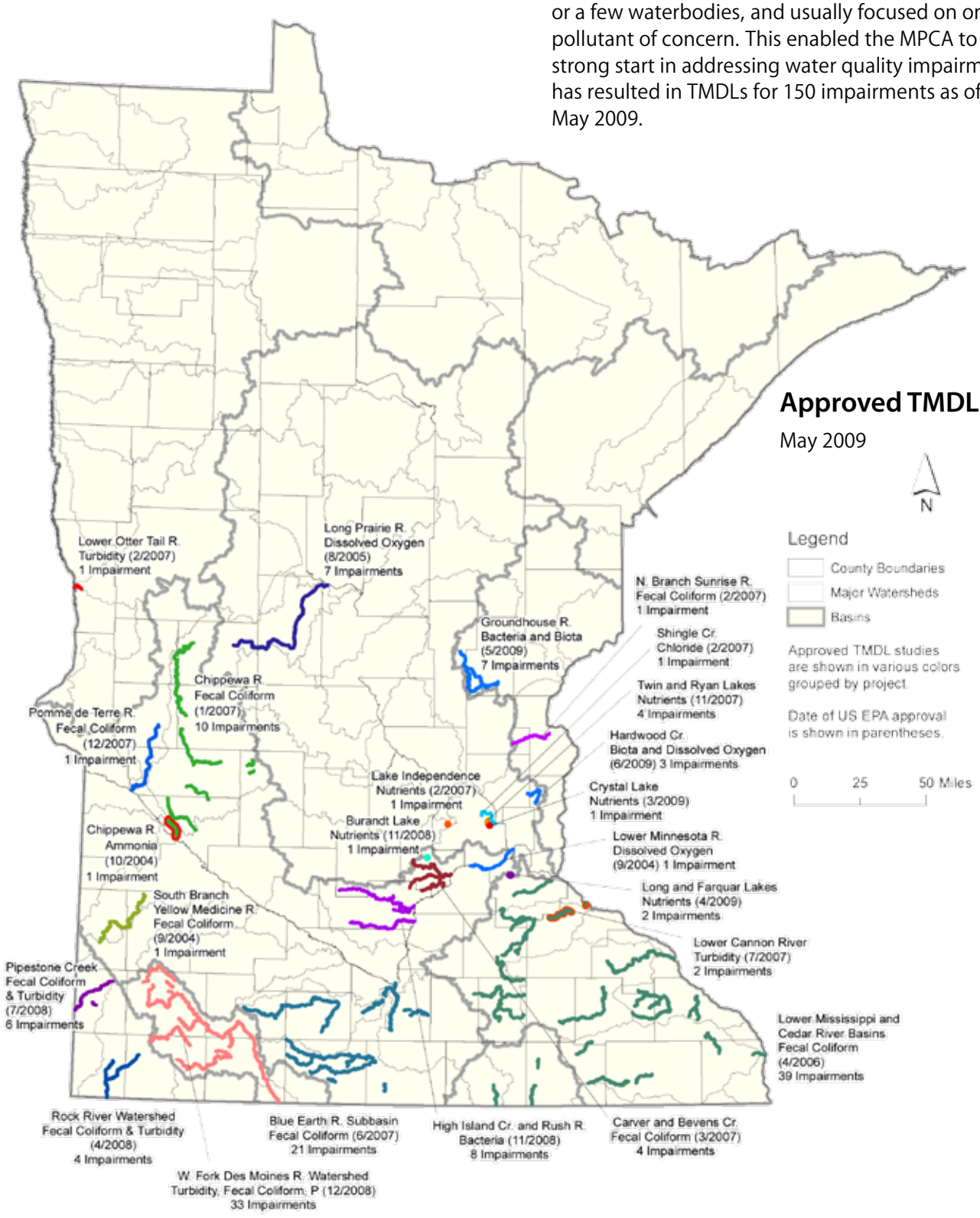
Monitoring and assessment progress

The MPCA has now initiated or completed Intensive Watershed Monitoring (IWM) in 18 of the state's 81 major watersheds. Twenty-one percent of the state's 81 watersheds have IWM completed or underway. This keeps the MPCA on track to begin IWM in all 81 watersheds on a 10-year schedule.



TMDL development progress

In the past, most MPCA efforts were focused only on TMDLs and restoration needs, often were limited to one or a few waterbodies, and usually focused on only one pollutant of concern. This enabled the MPCA to make a strong start in addressing water quality impairments and has resulted in TMDLs for 150 impairments as of May 2009.

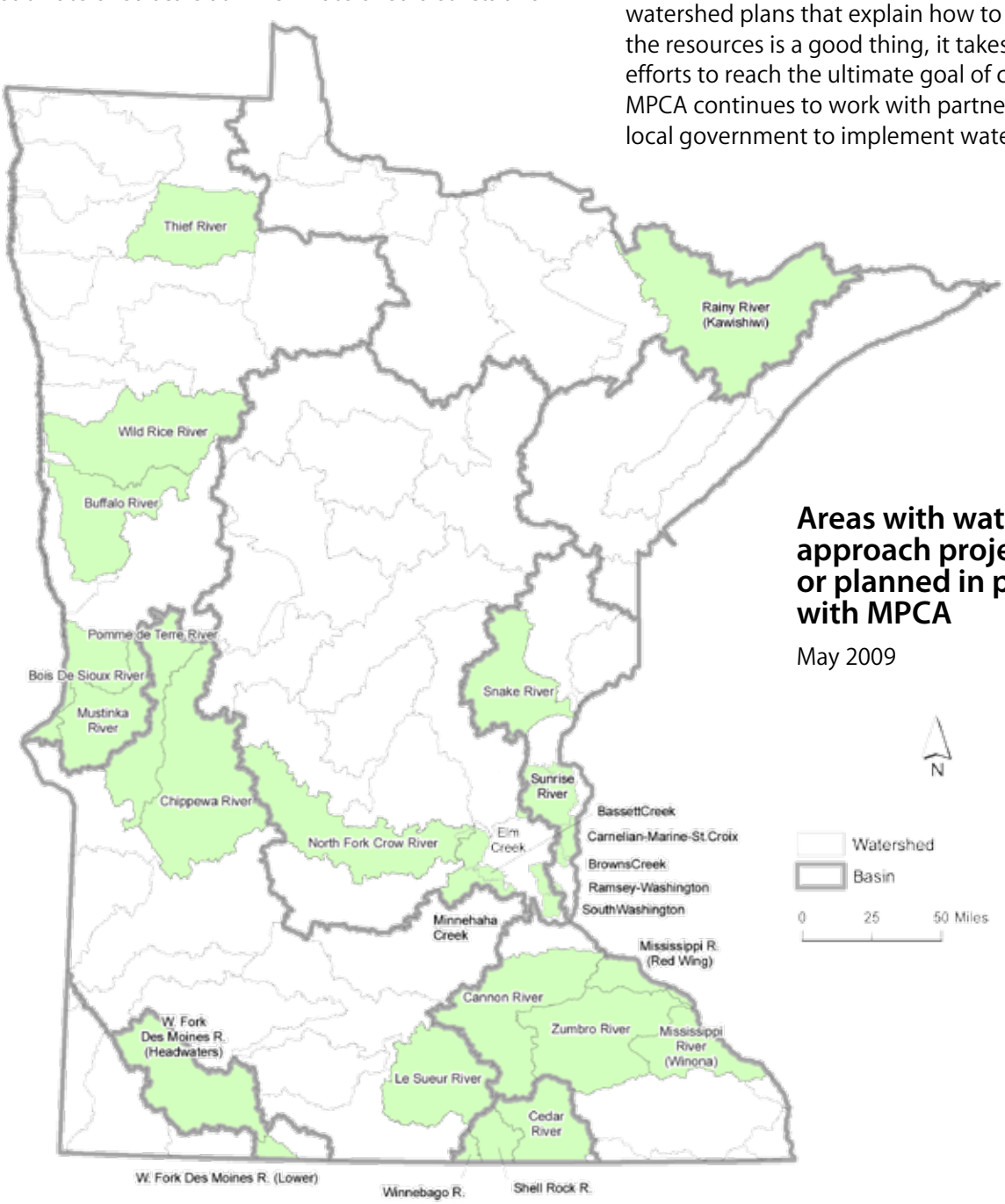


The MPCA is now coordinating with local partners to develop watershed planning efforts that are more holistic, following the watershed approach. The MPCA and its local water management partners have many watershed planning efforts underway or in development that deal with multiple pollutants and address protection of unimpaired waters and TMDLs for impaired waters.

In the Twin Cities Metro Area, efforts are at the smaller subwatershed scale at which watershed districts and management organizations operate, while outside the Metro, efforts are at the major watershed scale. As the MPCA determines how to allocate Amendment funds for future TMDL studies, priority will be given to holistic watershed planning efforts that go beyond the more limited TMDL approach of the past.

Implementation progress

Of course, while knowing the state of our waters based on monitoring is a good thing, and having TMDLs and watershed plans that explain how to protect and restore the resources is a good thing, it takes implementation efforts to reach the ultimate goal of clean water. The MPCA continues to work with partner agencies and local government to implement water protection and

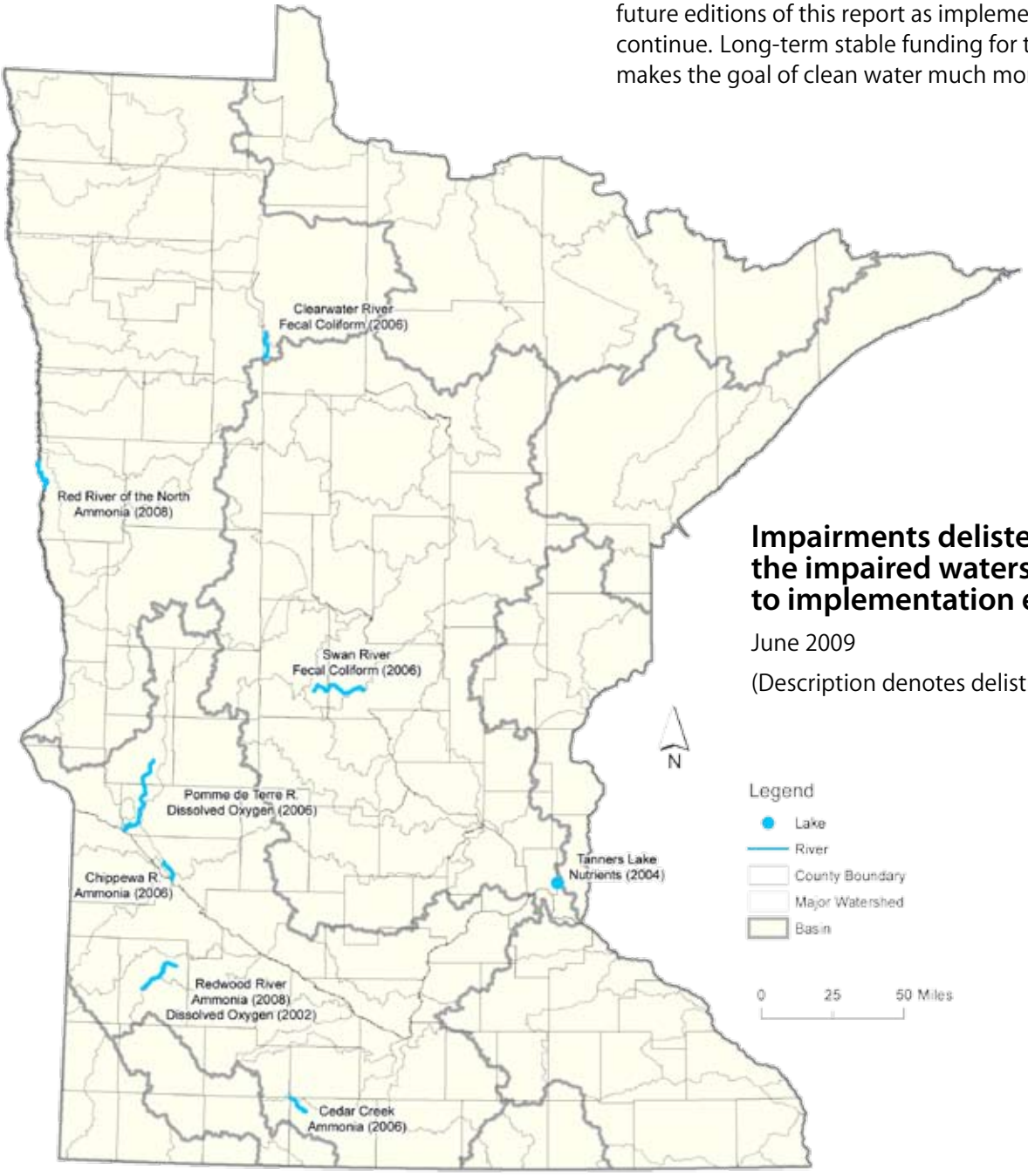


Areas with watershed approach projects underway or planned in partnership with MPCA

May 2009

improvement projects. Funding for projects can come from a variety of sources, but the MPCA oversees state Clean Water Partnership (CWP) and federal Clean Water Act (CWA) Section 319 implementation funds. Projects funded from these two sources are spotlighted in this report. These funds, coupled with state Clean Water Legacy funds administered by the BWSR, the DNR, and MDA, are being used to make progress toward that ultimate clean water goal. Federal farm program dollars and other sources also contribute greatly to implementation efforts.

Minnesota's waters have become polluted gradually over the course of many years, and likewise, restoration of their water quality will take some years to accomplish. Nine water quality impairments have been restored in the past. MPCA looks forward to being able to report additional restoration in our water quality in near-future editions of this report as implementation efforts continue. Long-term stable funding for these efforts makes the goal of clean water much more probable.



Impairments delisted from the impaired waters list due to implementation efforts

June 2009

(Description denotes delistment year)

Resources for water quality improvement projects

TMDL training materials developed for local government officials and other water resource professionals

Over the past several years, MPCA TMDL program staff has collaborated to create 18 PowerPoint® training modules that address development of TMDL studies. The modules provide a wide range of information pertaining to TMDL studies. The modules were developed primarily for local government officials who are developing a TMDL study for the first time. The modules reflect the combined wisdom and experience of technical and planning experts in the TMDL program. The modules are not intended to be "a cookbook" for developing a TMDL study. Instead, they integrate important information, advice and lessons learned from previous watershed projects and other TMDL projects around the state.

In addition to the 18 Powerpoint® modules, there is an accompanying manual, as well as project planning worksheets which can be used to help project managers plan and execute their projects.

The MPCA has now placed all modules and the accompanying manual on its website, at www.pca.state.mn.us/water/tmdl/tmdl-training.html.

For more information, contact Lynne Kolze at 651-757-2501

Clean Water Partnership protection emphasis continues

In 2008, the MPCA held the first ever CWP competitive funding round focused solely on protection projects. Five projects were awarded a total of more than $425,000 to perform diagnostic studies focusing on protection of unimpaired waters. The balance of CWP funds were used for the continuation of current implementation projects.

In the 2009 Legislative Session, the Legislature affirmed this emphasis for CWP. The CWP appropriation language for the fiscal 2010–11 biennium states that in the use of CWP funds, "Priority shall be given to projects preventing impairments and degradation of lakes, rivers, streams, and groundwater."

The MPCA will be determining how to best integrate this prevention priority for CWP into the holistic watershed approach it is advancing.

Introducing MPCA Impaired Waters Viewer: iWAV

Now you can "Google" a Minnesota town and see the nearest impaired water with a new tool created for MPCA's website.

In 2009, the MPCA developed a new web-based mapping application called the Impaired Waters Viewer or iWAV. The iWAV provides access to basic, essential information about impaired waters in Minnesota in an easy to use geospatial context. The application was designed for the general public but should also be useful for experienced water resource professionals with an interest in the state's impaired waters.

The iWAV uses the MPCA impaired waters spatial data layers for streams, lakes and wetlands together with base map data from Google maps. The result is a visually appealing mapping application that can be viewed in a standard web browser. The iWAV can be found at: www.pca.state.mn.us/water/tmdl/tmdl-maps.html. It opens with a view of Minnesota and includes:

- Pan and zoom tools
- A search tool: When the user types in the name of a city, town or county and clicks the 'map search' button, the map zooms in to the specified location
- An identify tool: When the user clicks their cursor on an impaired stream, lake or wetland, a window opens with information about the water body including name, description, ID number, water quality problems that need a TMDL, and water quality problems that have an approved TMDL.

To find more detailed information about surface water conditions in Minnesota, the MPCA Environmental Data Access (EDA), launched in 2003, is also available on the MPCA internet site at www.pca.state.mn.us/data/edaWater/index.cfm.

Clean Water Legacy projects currently active in 2009

Basin Major watershed	Project title	Project sponsor	Encumbrance amount
Statewide			
Statewide	Alternative ditch TMDL project	University of Minnesota	$149,994.46
	DNR stream gaging	Minnesota Department of Natural Resources	$125,000.00
	Minnesota River turbidity/Lake Pepin nutrient TMDL	Minnesota State University Mankato	$336,502.00
	Sediment transport at selected MN sites	US Geological Survey	$123,000.00
Cedar			
Cedar River (Headwaters)	Cedar River TMDL	Barr Engineering Co	$214,725.00
Lake Superior			
Lake Superior (MN North)	Poplar River watershed project	Cook County SWCD	$107,000.00
Lake Superior (MN South)	Deer Creek & Nemadji River turbidity TMDL	Carlton County SWCD	$176,419.00
	Knife River watershed TMDL part 3	South St Louis County SWCD	$20,000.00
St. Louis	Lake Superior Basin Miller Creek TMDL part 2	So. St. Louis SWCD	$70,000.00
Lower Mississippi			
2 watersheds including Mississippi River (Red Wing)	Crystal/Keller/Lee/Earley Lakes nutrient TMDL	Black Dog Water Management Commission	$174,102.00
8 watersheds including Zumbro River	Sediment work for LMB TMDL support	Winona State University	$15,000.00
Cannon River	Cannon River watershed one water strategy	Cannon River Watershed Partnership	$98,668.00
	Upper Cannon Lakes nutrients TMDL	Minnesota State University Mankato	$240,000.00
Mississippi River (Red Wing)	Lower Vermillion River effectiveness monitoring	Dakota County SWCD	$31,739.00
Mississippi River (Winona)	Whitewater River watershed turbidity TMDL	Whitewater Joint Powers Board	$57,444.00
Root River	Root River Basin turbidity TMDL	Fillmore County	$300,000.00
Minnesota			
12 watersheds including Watonwan River	Minnesota River Basin RBS erosion project yr 2/3	Univ of MN, Sponsored Projects Admin	$29,593.23
12 watersheds including Watonwan River	Lake Pepin TMDL sediment source apportionment	University of Minnesota	$250,000.00
31 watersheds including Watonwan River	Lake Pepin watershed TMDL full cost accounting	University of Minnesota	$261,126.00
Chippewa River	Chippewa River watershed turbidity TMDL	Chippewa County	$140,000.00
	Pope County eight lakes TMDL	Emmons and Olivier Resources, Inc	$94,373.87
Cottonwood River	Cottonwood River turbidity TMDL	Redwood-Cottonwood Rivers Control Area	$145,000.00
	Cottonwood River watershed fecal coliform TMDL	Redwood-Cottonwood Rivers Control Area	$50,000.00
LeSueur River	LeSueur River Basin sediment study-NCED	University of Minnesota	$668,332.42
	Lura Lake nutrients TMDL	Minnesota State University Mankato	$33,484.00
	Minnesota River sediment source research	Peter Wilcock	$5,000.00
Minnesota River (Headwaters)	Lac qui Parle-Yellow Bank River TMDL imp. plan	Lac qui Parle Yellow Bank Watershed Dist	$60,000.00

Basin Major watershed	Project title	Project sponsor	Encumbrance amount
(Minnesota basin cont'd)			
Minnesota River (Granite Falls)	Hawk Creek/Beaver Creek bacteria TMDL	Renville County	$61,660.58
	Long Lake nutrient TMDL	Kandiyohi County	$70,704.00
Minnesota River (Mankato)	Lake Crystal excess nutrients TMDL	Minnesota State University Mankato	$39,698.85
Minnesota River (Shakopee)	Bluff Creek turbidity/fish biota TMDL	Barr Engineering Co	$111,333.46
	Credit River turbidity TMDL development	Scott County	$125,000.00
	Fish/Schwanz Lakes nutrient TMDL	City of Eagan	$90,000.00
	Rush River and High Island Creek turb/biota TMDL	Minnesota State University, Mankato	$155,000.00
Pomme de Terre River	Pomme de Terre River watershed turbidity TMDL	Stevens County SWCD	$120,000.00
Redwood River	Redwood River fecal coliform TMDL	Redwood-Cottonwood Rivers Control Area	$35,000.00
	Redwood River turbidity TMDL	Redwood-Cottonwood Rivers Control Area	$120,000.00
Rainy			
9 watersheds including Vermillion River (Rainy River)	Jessie Lake nutrients TMDL 2008-2009	Itasca SWCD	$97,789.00
Lake of the Woods	Lake of the Woods nutrient budget WQ modeling	St Cloud State University	$50,000.00
Rainy River (Baudette)	Williams Creek DO TMDL	Lake of the Woods SWCD	$20,000.00
Red			
5 watersheds including Red River of the North	Red River Basin SWAT modeling	University of North Dakota	$250,000.00
12 watersheds including Wild Rice River (MN)	USGS real time stations	US Geological Survey	$19,450.00
17 watersheds including Wild Rice River (MN)	Red River Valley biotic assessment	Emmons and Olivier Resources, Inc	$140,165.30
Buffalo River	Buffalo Red watershed approach to water quality	Buffalo-Red River Watershed District	$87,910.00
	Red River Basin multi-parameter TMDL monitoring	Red River Watershed Management Board	$80,138.00
Red River of the North (Upper)	Clearwater River DO impairment eval (Red Rvr)	Bemidji State University	$80,304.00
	Clearwater River DO/fecal coliform TMDLs (Red Rvr)	Red Lake Watershed District	$100,000.00
St. Croix			
4 watersheds including St. Croix River (Upper)	Lake St. Croix TMDL	Barr Engineering Co., Science Museum of Minnesota	$89,692.00
8 watersheds including St. Croix River (Lower)	Metro area chloride impairments feasibility study	Wenck Associates Inc	$29,925.15
St. Croix River (Lower)	Browns Creek impaired biota TMDL	Washington Conservation District	$263,901.00
	Carnelian Marine St. Croix 12 lakes TMDL	Washington Conservation District	$106,111.50
	Comfort & Forest Lakes watershed TMDL	Comfort Lake Forest Lake Watershed Dist	$57,191.00
	Sunrise River watershed SWAT	Science Museum of Minnesota	$86,545.00
	Typo & Martin Lakes TMDL update	Anoka Conservation District	$5,293.00
Snake River (St. Croix River)	Ann River watershed	Kanabec SWCD	$44,860.00

Basin Major watershed	Project title	Project sponsor	Encumbrance amount
Upper Mississippi			
8 watersheds including Sauk River	Upper Mississippi River bacteria TMDL	Emmons and Olivier Resources, Inc	$129,917.16
Crow River South Fork	Ann & Emma Lakes nutrients TMDL	Wright County SWCD	$141,218.00
	Crow River Middle Fork Diamond Lake TMDL	Middle Fork Crow River Watershed District	$176,215.00
	Crow River South Fork Buffalo Crk turb TMDL	Wenck Associates Inc. and Crow River Organization of Water	$140,883.00
	Lake Sarah nutrient TMDL	Pioneer-Sarah Creek Watershed Mgmt Comm	$34,912.80
Mississippi River (Grand Rapids)	Big Sandy Area Lakes nutrients TMDL	Aitkin County	$63,749.00
	Big Sandy TMDL project	Barr Engineering Co.	$201,263.00
Mississippi River (Sartell)	Little Rock Lake nutrients TMDL	Benton SWCD	$180,224.54
Mississippi River (St. Cloud)	Clearwater River Five Lakes nutrients (Upper Miss)	Clearwater River Watershed District	$62,423.00
	Clearwater River ongoing TMDL studies (Upper Miss)	Clearwater River Watershed District	$66,832.00
	Elk River watershed association TMDL	Sherburne SWCD	$251,918.00
Mississippi River (Twin Cities)	Elm Creek watershed-wide TMDL	Elm Creek Watershed Management Comm	$35,000.00
	Golden Lake TMDL	Emmons and Olivier Resources, Inc	$4,183.48
	Hardwood Creek biological impairment	Rice Creek Watershed District and Emmons and Olivier Resources Inc.	$30,337.06
	Medicine Lake nutrients TMDL	Three Rivers Park District, Limno Tech, and CR Planning	$47,100.12
	Minnehaha Creek Lake Hiawatha TMDL	Tetra Tech Inc.	$95,826.00
	Minnehaha Creek watershed lakes TMDL	Emmons and Olivier Resources, Inc	$143,772.61
	Shingle Creek watershed lake TMDL imp. plans	Wenck Associates Inc	$3,146.00
	Shingle/Bass Creeks DO/biota TMDL phase 1	Shingle Creek Watershed Mgmt Commission	$94,100.00
	Sweeney Lake TMDL phase 2	Bassett Creek Watershed Mgmt Commission	$78,650.00
	Wirth Lake nutrients TMDL development	Barr Engineering Co	$31,194.64
Sauk River	Getchell/Stony/Unnamed Creeks turbidity TMDL	Sauk River Watershed District	$80,000.00
	Osakis/Faille/Clifford/Smith Lake nutrient TMDL	Sauk River Watershed District	$20,000.00
	Pearl Lake/Mill Creek/ Lower Sauk River TMDL	Sauk River Watershed District	$75,000.00
	Sauk Lake nutrient TMDL project	Sauk River Watershed District	$60,000.00

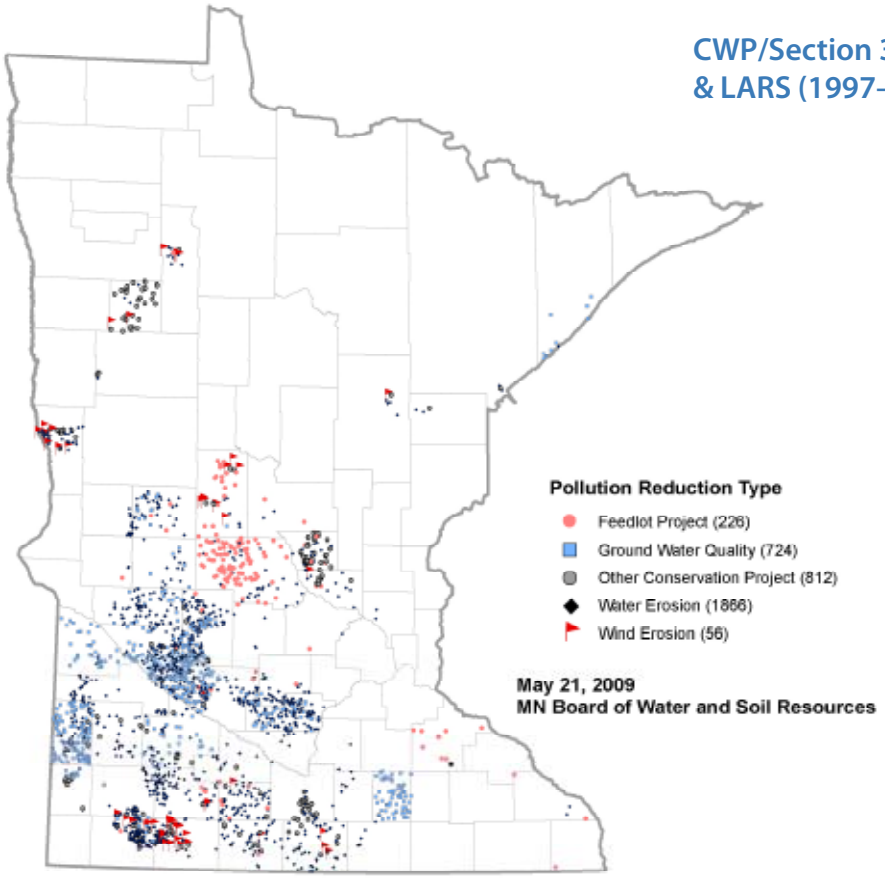
LARS and eLINK results from Section 319 & CWP projects 1997–May, 2009

The table following shows progress through May 2009 based on previous Local Annual Reporting System (LARS) reporting (1997–2002) and reporting data from eLINK(2003–May 2009). Based on LARS/eLINK reporting by Clean Water Partnership (CWP) and Section 319 Project Partners, these projects are estimated to have reduced soil loss from 1998 through May 2009 by more than 194,000 tons/year. During the same period, sedimentation was estimated to have been reduced by over 81,000 tons/year. Phosphorus loading was estimated to have been reduced by over 283,000 pounds/year.

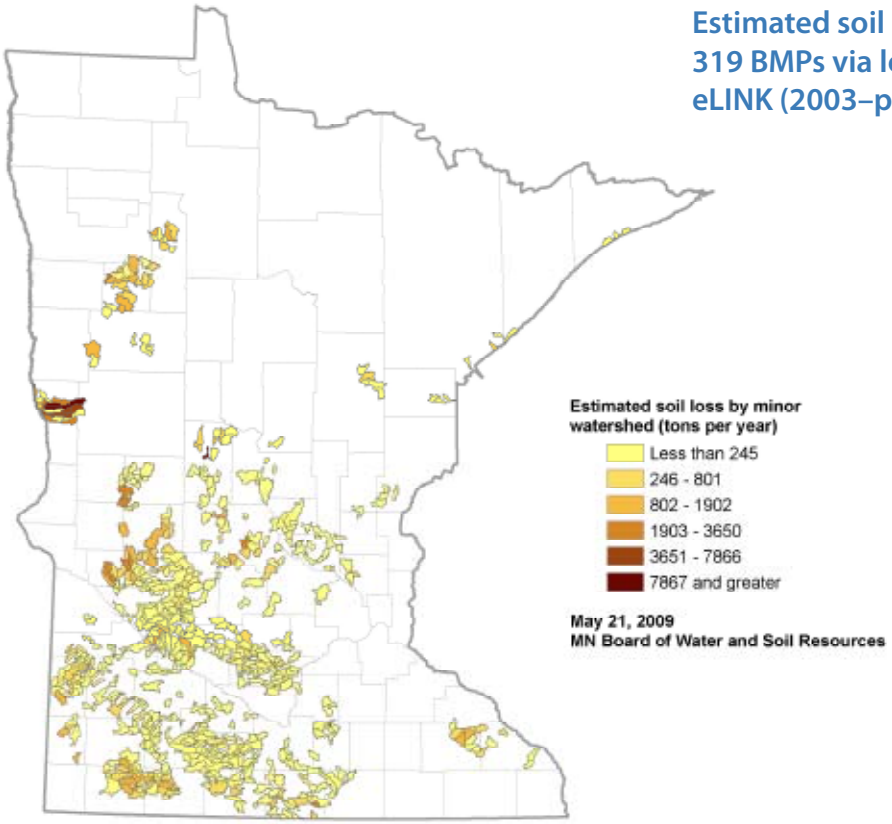
Pollution reduction estimate type	# of BMPs	Estimated soil loss reduction (tons/yr)	Estimated sediment reduction (tons/yr)	Estimated phosphorus reduction (pounds/yr)	Estimated nitrogen reduction (pounds/yr)*
Feedlot project	226	0	0	43,609	87,218
Groundwater quality	724	0	0	3,509	7,018
Other conservation projects	812	35,627	8,351	144,381	288,762
Water erosion	1866	156,110	72,960	91,217	182,434
Wind erosion	56	2,922	59	657	1,313
Total	**3,684**	**194,660**	**81,371**	**283,373**	**566,746**

* Estimated nitrogen calculated from doubling estimated phosphorus

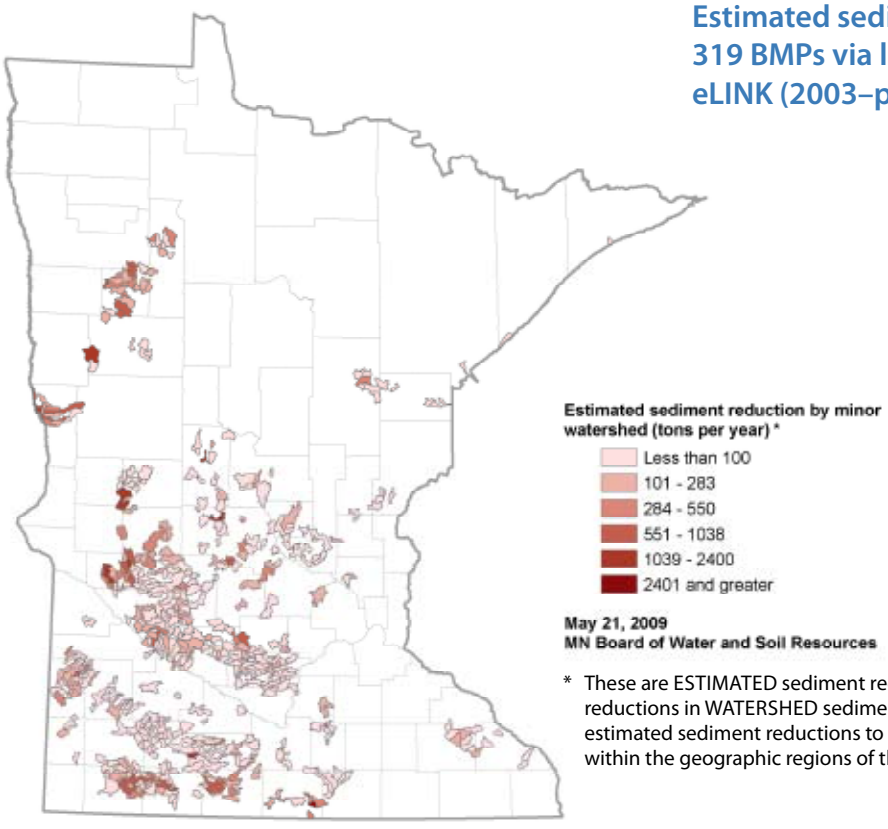
CWP/Section 319 BMPs eLINK (2003–present) & LARS (1997–2002)



Estimated soil loss reduction — CWP/Section 319 BMPs via local government reporting, eLINK (2003–present) & LARS (1997–2002)

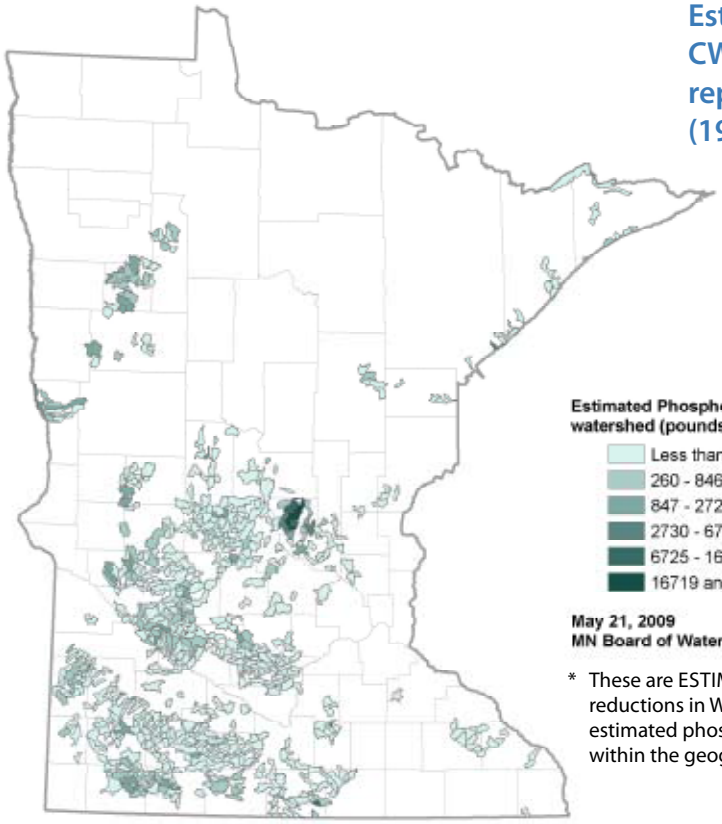


Estimated sediment reduction — CWP/Section 319 BMPs via local government reporting, eLINK (2003–present) & LARS (1997–2002)



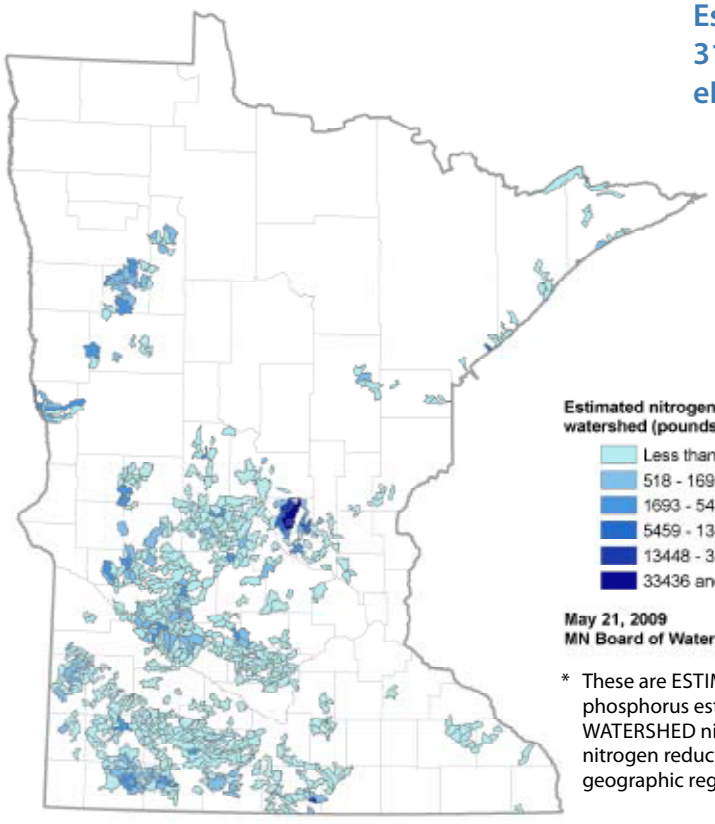
* These are ESTIMATED sediment reductions. They DO NOT represent reductions in WATERSHED sediment yield. They represent the sum of estimated sediment reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

Estimated phosphorous reduction — CWP/ Section 319 BMPs via local government reporting, eLINK (2003–present) & LARS (1997–2002)



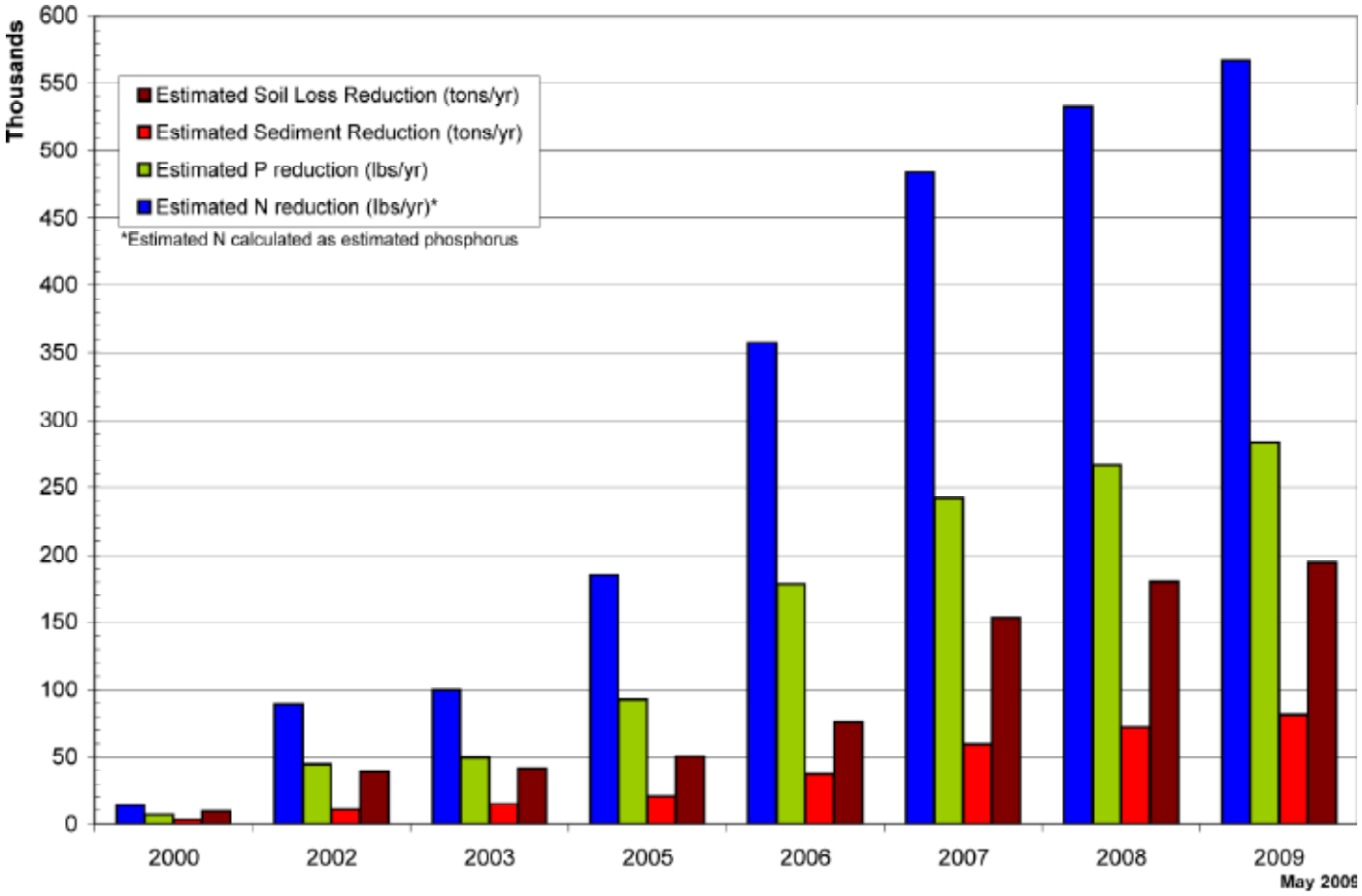
* These are ESTIMATED phosphorus reductions. They DO NOT represent reductions in WATERSHED phosphorus yield. They represent the sum of estimated phosphorus reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

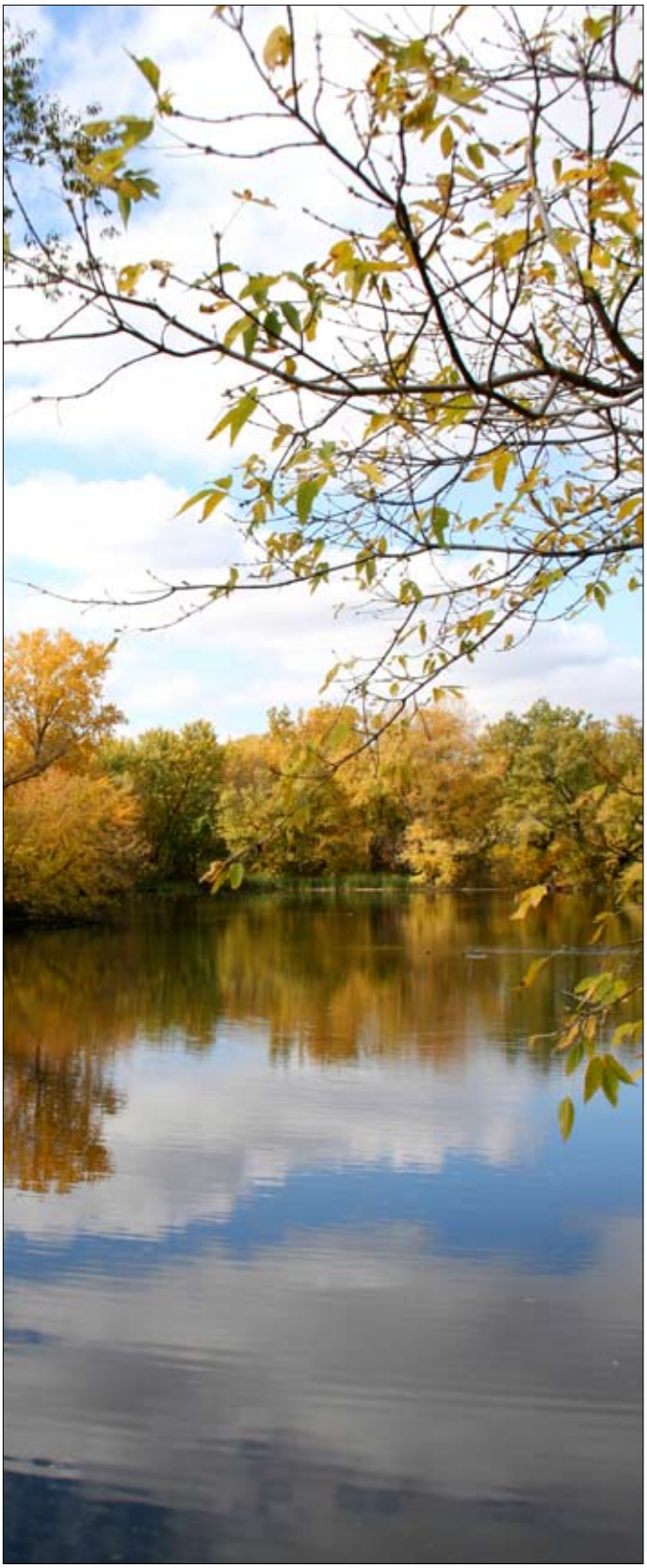
Estimated nitrogen reduction — CWP/Section 319 BMPs via local government reporting, eLINK (2003–present) & LARS (1997–2002)



* These are ESTIMATED nitrogen reductions calculated by doubling phosphorus estimates. They DO NOT represent reductions in WATERSHED nitrogen yield. They represent the sum of estimated nitrogen reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

CWP/Section 319 cumulative estimated pollution reduction benefits via local government reporting, LARS (1997–2002) and eLINK (2003–present)





Report organization

Currently, some existing projects are watershed-wide, while others focus on specific pollutants or issues. As the MPCA moves toward implementing the statewide watershed approach, more projects will begin encompassing entire watersheds. During this transition period, MPCA is making some changes to the organization of this year's report to give a clear vision of all of the work that is taking place in each major watershed.

The 2009 Watershed Achievements Report is organized by basins as in previous years, but please note the following changes:

- Each basin will have a map at the beginning of its section, indicating which major watersheds had projects completed in the past year.
- At the end of each section, another map will indicate currently active and awarded projects by watershed.

More information can be found about MPCA's watershed approach at: www.pca.state.mn.us/publications/wq-s1-26.pdf.

Projects completed for 2008–2009

Statewide

DNR stream flow gauging

Expansion of the Red Top farm demo concept

On-farm manure management demonstrations

Des Moines River Basin

West Fork Des Moines River watershed TMDL and Heron Lakes excess nutrients

Lake Superior Basin

Miller Creek TMDL

Poplar River watershed project

Lower Mississippi River Basin

Cost share incentives for small feedlot fixes

Dakota County nonpoint source reduction project

Designing feedlot improvements in targeted areas under the open lot agreement

Jefferson-German lakes improvement project

Lake Pepin water quality modeling — year 3

Lower Vermillion River turbidity TMDL

South Branch Root River watershed fecal coliform bacteria reduction project

Southeast Minnesota milk house wastewater treatment demonstration

Steele County septic system loan project

Targeted feedlot open lot implementation engineering assistance

Minnesota River Basin

Chippewa River upper main stem

Conservation drainage symposiums

Greater Yellow Medicine River phase II Clean Water Partnership

Hawk Creek watershed project — "Hawk TMDL"

Lac Qui Parle River main stem water quality enhancement project

Lake Shaokatan TMDL Project

Little Cottonwood River restoration project continuation

Pomme de Terre River fecal coliform TMDL implementation

Redwood River/Lincoln County restoration continuation

Rush River implementation project

Seven Mile Creek watershed continuation

Shakopee Creek headwaters

Watonwan River watershed implementation plan continuation

Rainy River Basin

Jessie Lake Watershed TMDL Project

Rainy River Basin International Lake of the Woods water quality forum

Red River Basin

Tea Cracker Lake monitoring study

St. Croix River Basin

Carnelian Marine St. Croix Watershed District 12 lakes TMDL project

Groundhouse River TMDL project for fecal coliform and biota (sediment) impairments

Groundhouse River watershed TMDL project

Typo & Martin Lakes TMDL update

Updating land cover & impervious surface maps of the Twin Cities Metro Area & St. Croix River Basin

Valley Creek repair and rehabilitation program

Upper Mississippi River Basin

Hardwood Creek biological impairment

Middle Sauk River rehabilitation — continuation

Minnehaha Creek Lake Hiawatha TMDL gap analysis

Osakis Phase 3 water management — continuation

Peltier Lake and Centerville Lake nutrient impairment TMDL

Restoring water resources of the Sauk River Chain of Lakes

Sauk Lake Basin restoration continuation

Sauk River Chain of Lakes Basin restoration continuation project

Sauk River Chain of Lakes — Lake Margaret contingent valuation / willingness-to-pay economic study

Targeted implementation/compliance TMDL eco-sensitive areas

Upper Mississippi River modeling above Ford Dam

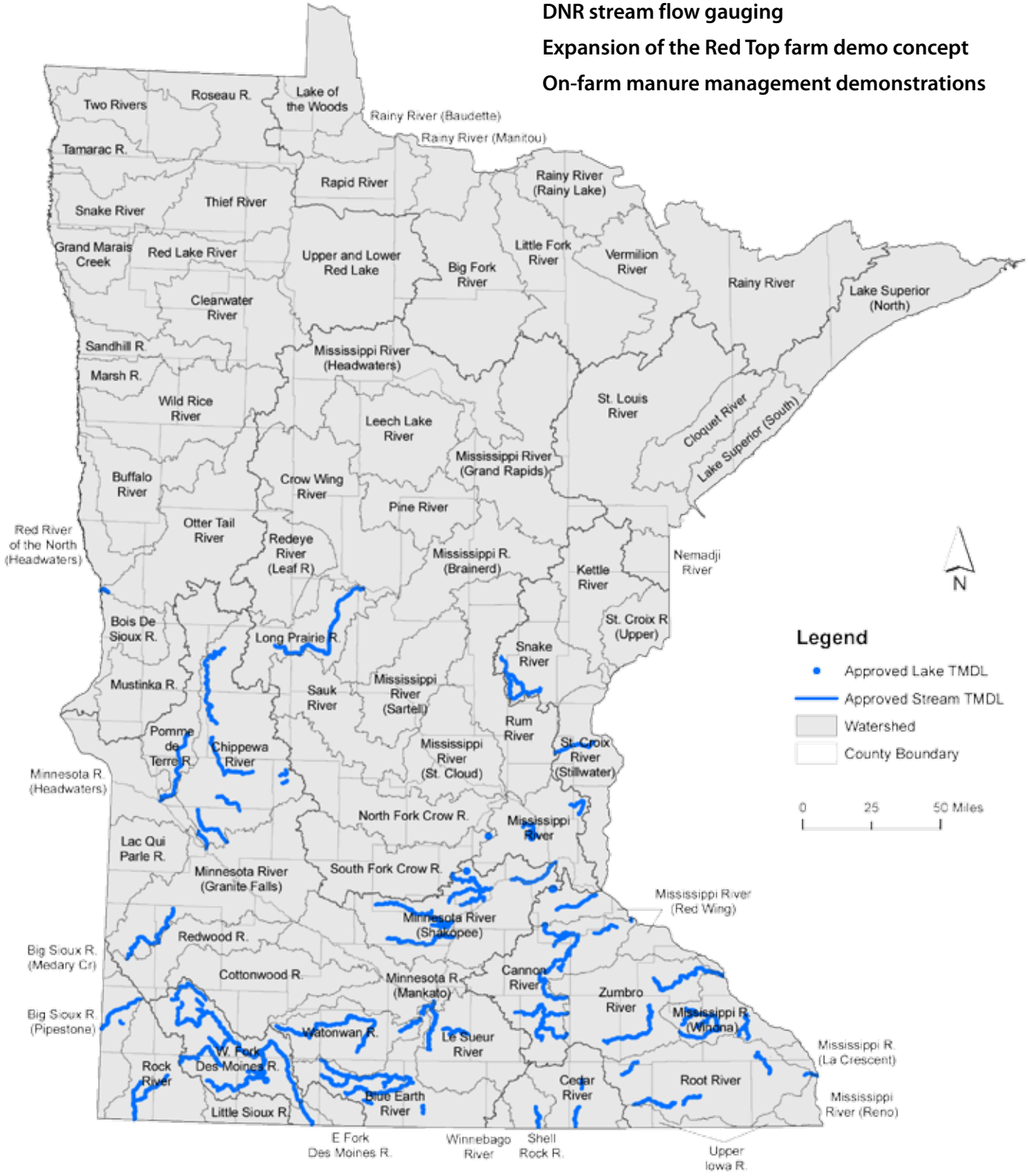
Statewide

Projects completed

DNR stream flow gauging

Expansion of the Red Top farm demo concept

On-farm manure management demonstrations



DNR stream flow site.

DNR stream flow gauging

This is an interagency agreement that allows the DNR to support MPCA's watershed work. The services provided by DNR include: (1) discharge measurements for rating curve development or verification and stage (2) data compilation and storage (3) site selection and maintenance.

The MPCA provides a prioritized list of locations and the tasks that are required at each location, and the time frame desired for completion. The list includes a MPCA staff contact for each location of work.

Goals

- Discharge measurements for rating curve development or verification and stage – discharge relation development.
- Data compilation and storage – streamline data to our shared database (Hydstra).
- Site selection and maintenance – work with MPCA project staff to plan flow gauging work.

Results that count

- DNR flow work has been an integral part of a number of TMDLs – some completed and some still underway.
- Hydstra continues to be a nation-leading example of a database that successfully stores and serves time-series data. DNR has regularly maintained records for sites that have been established by way of this agreement.
- DNR staff has offered their expertise and advice in designing flow gauging and monitoring networks for numerous surface water quality projects and TMDLs.

Financial Information

Funding type: Section 319 technical assistance grant
Grant amount: $100,000
Matching funds and in-kind: $100,000
Total project cost: $200,000

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Monitoring stations at the Hwy 90 demonstration site located in Blue Earth County Minnesota, south of Mankato, Minnesota.

Expansion of the Red Top farm demo concept

The Minnesota Department of Agriculture partnered with Minnesota State University-Mankato, USDA-Three Rivers Resource Conservation and Development, and a host of agricultural professionals to successfully establish the Highway 90 (Hwy 90) drainage demonstration site. Work at the Hwy 90 site complements long-term drainage water quality work conducted at the Red Top demonstration site in Nicollet County since 1998. Funding enabled instrumentation of monitoring equipment, side-by-side nutrient application comparisons, educational outreach opportunities, and graduate studies through Minnesota State University-Water Resource Center.

The involvement of agricultural sector organizations, producers and consultants in the planning, installation and interpretation significantly strengthened the educational and outreach component of the project. Results from the project have provided a platform to educate farmers, agricultural professionals, and the non-agricultural community about challenges production agriculture faces with water quality improvements. Educational outreach activities have included presentations at educational meetings, conferences, field day tours, media coverage, and direct mail information.

Goals

- Establish a water-quality demonstration site with the ability to evaluate side-by-side nutrient application methods, best management practices, and economic outcomes for producers.
- Provide a better understanding of field-scale of water quality associated with normal crop management practices. Demonstrate agricultural management strategies to encourage water quality improvements.
- Continue operation of the demonstration site long-term to understand crop management influences, crop rotations, and environmental impacts.

Results that count

- The original Red Top demonstration site has provided 10+ years of water quality monitoring history. The Hwy 90 demonstration site will complement work already completed and provide comparable results to the Red Top demonstration site data set. Producers and ag-professionals are included in decision-making process for management and education outreach strategies.
- Demonstration sites provide a platform for educational outreach activities related to water quality and agricultural production. Outreach activities have included newsletters to more than 5,200 farmers and crop consultants, successful field days in cooperation with industry, and annual educational meeting attended by 150 farmers.
- Water quality results at the Hwy 90 demonstration site have raised questions about phosphorous movement through sub-surface drainage system. Continued work will help understand the soil potential water quality concerns associated with phosphorus movement to sub-surface drainage water.

Financial information

Funding type: Section 319 Grant
Grant amount: $87,000
Matching funds and in-kind: $106,319
Total project cost: $193,319

Contact information

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On-farm manure management demonstrations

The purpose of the on-farm manure management demonstrations project was to reduce delivery of pathogens, phosphorus, nitrogen and organic materials from livestock manure to impaired surface waters of Minnesota. It included:

- Conducting two years of on-farm trials measuring corn yield response to a range of rates of liquid swine and dairy manure with and without addition of fertilizer nitrogen, and a similar experiment with compost dairy barn manure.
- Literature review and preparation of a publication on best management practices for control of pathogens in manure application.
- Field days and workshops over three years to demonstrate new technologies in manure application, and convey research-based information on rates, timing, and placement of manure.

The 13 on-farm trials with liquid manure and nitrogen additions demonstrated that the University of Minnesota (UM) predictions of nitrogen availability at individual sites were significantly more accurate for injected than for broadcast/incorporated manure. Nitrogen from compost dairy barn manure with sawdust bedding, however, was less available than predicted and adjustments will need to be made in recommendations. The UM Extension publication on control of pathogens from applied manure emphasizes the necessity of addressing pathogens throughout the livestock production system on the farm in order to reduce the chance of contamination of surface waters from applied manure. Practices are outlined for control of pathogens ranging from diets, animal to animal transmission, and vaccinations to manure treatment and application. Post-workshop surveys indicate that research results and subsequent information dissemination through workshops, field days, and publications has increased farmer confidence in UM recommendations for rates of manure application.

Goals

- Increase farmer and agricultural professional confidence in UM recommended manure and nutrient application rates in order to reduce excess "insurance" applications.
- Increase use of improved application technology and adoption of manure application BMPs.
- Increase farmer and agricultural professional knowledge about survivability and transport of manure-borne pathogens as affected by manure application practices.

Results that count

- Based on thirteen farm trials over two years, the primary conclusion in the resultant UM Extension bulletin is that injection is highly recommended over broadcast or broadcast/incorporation. This information is being distributed to livestock producers as UM Extension bulletin *"Nitrogen availability from liquid swine and dairy manure: results of on-farm trials in Minnesota"* (www.extension.umn.edu/distribution/livestocksystems/DI8583.html).
- Seven manure management field days showed new technology allowing lower and more accurate rates of application was demonstrated and being used. Other demonstrations at some sites included manure spreader calibration and manure spill response.
- UM Extension bulletin *"Best Management Practices for Pathogen Control in Manure Management Systems"* (www.extension.umn.edu/distribution/livestocksystems/DI8544.html) was prepared to address pathogen control in the whole livestock production system at the farm level. This information is distributed through county feedlot officers, UM Extension and others.

Financial information

Funding type: Section 319 Grant
Grant amount: $279,600
Matching funds and in-kind: $284,786
Total project cost: $564,386

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Des Moines and Missouri River Basin

Projects completed

West Fork Des Moines River Watershed

West Fork Des Moines River watershed TMDL and Heron Lakes excess nutrients

West Fork Des Moines River watershed TMDL for turbidity & Heron Lakes excess nutrients

This TMDL development project encompasses the West Fork Des Moines River (WFDMR) watershed in southwest Minnesota. Agricultural land dominates this watershed, which measures about 1,300 square miles. This project addresses 33 impaired waters listings, including fecal coliform bacteria, turbidity, pH, and excess nutrients in North and South Heron Lakes. The project began in late 2003 with the EPA approving the TMDL study in December 2008. Barr Engineering's role in the project was to serve as technical lead for the turbidity and excess nutrients portion of the TMDL. Key contributions included data analysis, modeling, TMDL report drafting, and participation in public meetings and presentations.

Goals

- Complete the TMDL report, including determination of pollutant reductions needed for both point and nonpoint sources and general implementation strategies.
- Complete data analysis and modeling for turbidity and excess nutrients.
- Hold public meetings and presentations to convey the study findings and address public concerns.

Results that count

- A TMDL was completed for 33 impaired waters listings.
- Data analysis and modeling were completed, producing an improved understanding of the primary factors responsible for the impaired waters throughout the watershed.
- Broad, watershed-wide communication was conducted about impaired waters and the need for restoration.

Financial information

Funding type: Section 319 Grant
Grant amount $71,021

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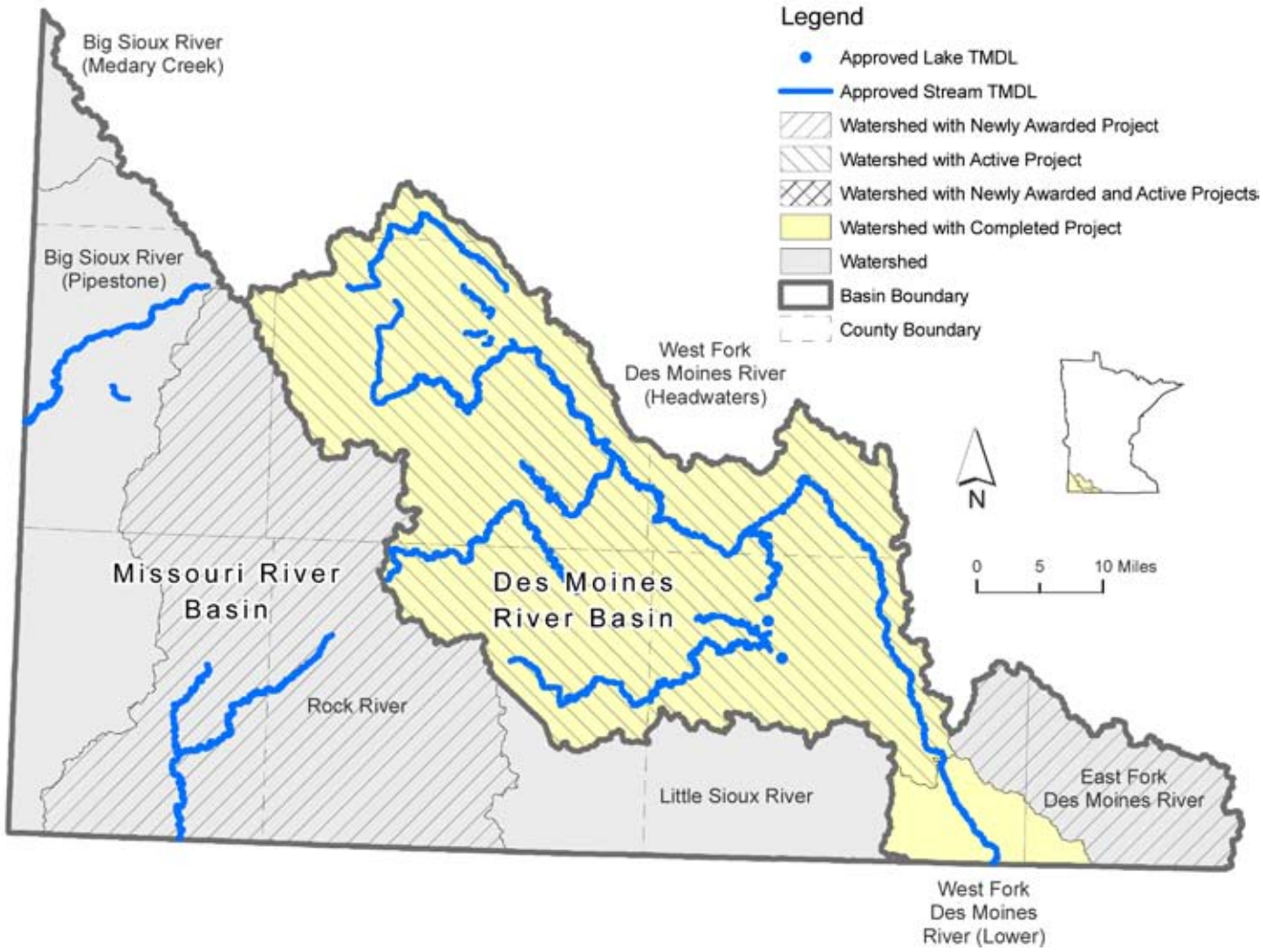
Des Moines and Missouri River Basins

Projects active and awarded in 2009



West Fork Des Moines River (Headwaters) Watershed

Beaver Creek watershed improvement project continuation — 2005 (active in 2009)

Sponsor: Murray County

Funding: CWP (Grant) $62,122; CWP (Loan) $178,800

Purpose: Develop manure management plans, design and implement grass waterways, restore wetlands, complete sediment control/water retention structures, prepare demonstration plots for fertilizer applications, protect priority lands, upgrade septic systems, establish stream bank protection and continue monitoring, outreach and education.

Elk Creek conservation tillage incentive program — 2006 (active in 2009)

Sponsor: Heron Lake Watershed District

Funding: CWP (Grant) $28,200

Purpose: This project will enlist landowners within the project area to change their tillage practices. Options include no-till, strip-till, minimum-till, ridge-till and forage residue management, which will prevent further soil and nutrient loss and decrease nonpoint source pollution in the watershed.

Heron Lake alternative tile intake cost-share program — 2006 (active in 2009)

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) $36,000

Purpose: Reduce sediment in runoff from farm fields by replacing open tile intakes with subsurface rock intakes.

Heron Lake watershed district — BMP program for Alba Township — 2007 (active in 2009)

Sponsor: Heron Lake Watershed District

Award: Section 319 (Grant) $40,800

The goal of this project is to decrease water movement, reduce erosion, and improve water quality throughout approximately 23,000 acres in Alba Township through changing tillage methods from conventional tillage to conservation tillage. Conventional tillage is the main practice undertaken on the silty clay loam soils. Creating awareness among landowners about the relationship between soil conservation and water quality will be critical to the project's success.

Heron Lake watershed district: Clean Water Partnership continuation — 2008 (active in 2009)

Sponsor: Heron Lake Watershed District

Funding: CWP (Grant) $428,752.50

CWP (Loan) $500,000

Purpose: This implementation project will continue to increase public awareness of water quality issues. The watershed district will establish cost-share, incentive, and loan programs for best management practice (BMPs) installation. Conservation tillage equipment purchase will continue. This project will control water flow in the watershed through the installation of alternative surface tile intakes and water/sediment control basins, wetland restoration, storm water retention ponds, critical area plantings, and riparian easements. The monitoring effort will ensure timely completion of the watershed treatment strategies and their effectiveness in improving the stream and lake water quality. Installation of BMPs such as filter strips and wetland restorations will provide habitat for resident and migrant wildlife species.

Heron Lake watershed district — conservation tillage demonstration plot — 2008 (active in 2009)

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) $20,547

This grant will allow continued research in conservation tillage used on the demonstration plot developed in 2005. The economic and environmental benefits of six treatments of reduced tillage, including strip till, will be evaluated. This project will demonstrate 1) several tillage practices that have the potential to reduce sediment delivery to surface waters and preserve agricultural soils through increased crop residue cover on row-cropped fields, and 2) economic and environmental benefits of reduced tillage systems.

Heron Lake watershed district — Fulda lakes project — 2007 (active in 2009)

Sponsor: Heron Lake Watershed District

Award: Section 319 (Grant) $55,800

The Heron Lake watershed is rural and agricultural. In a watershed such as this, agricultural best management practices (BMPs) are crucial. Landowners are hesitant to try new methods. The goal of this project is to improve the water quality in Fulda lakes through the use of cost share and incentive programs, and education of residents and landowners.

East Fork Des Moines River Watershed

Des Moines River, East Fork monitoring project (awarded in 2009)

Sponsor: Martin County Soil and Water Conservation District

Funding: CWP (Grant) $40,000

Purpose: The intent of this phase 1 project is to provide an inventory of resource needs and fill in the gaps in water quality data within the East Fork Des Moines River Watershed, to expand on the work already underway in the Tuttle Lake water quality assessment project and to complete a diagnostic study and implementation plan for this watershed.

Rock River Watershed

Reducing fecal coliform in the Rock River watershed with manure management (awarded in 2009)

Sponsor: Rock River TMDL Organization

Funding: Section 319 (Grant) $147,372

Purpose: Reduce bacteria contributions by 60 percent to the Rock River through correct management of land application of manure. The overall goal will be accomplished through the following four goals:

1. Increase the number of operations utilizing calibrated manure application equipment to at least 50 solid manure applicators and 25 liquid manure applicators.
2. Utilize incentive payments to encourage 25 producers to develop and maintain a manure management plan. These producers will also be required to complete a survey to understand behavior and operation changes.
3. Increase operator and agronomist knowledge by providing a field day (at least 100 attendees) that displays a field size plot of varying manure applications.
4. Increase commercial manure applicator knowledge by offering continuing education opportunities to at least 25 commercial applicators.

Lake Superior Basin

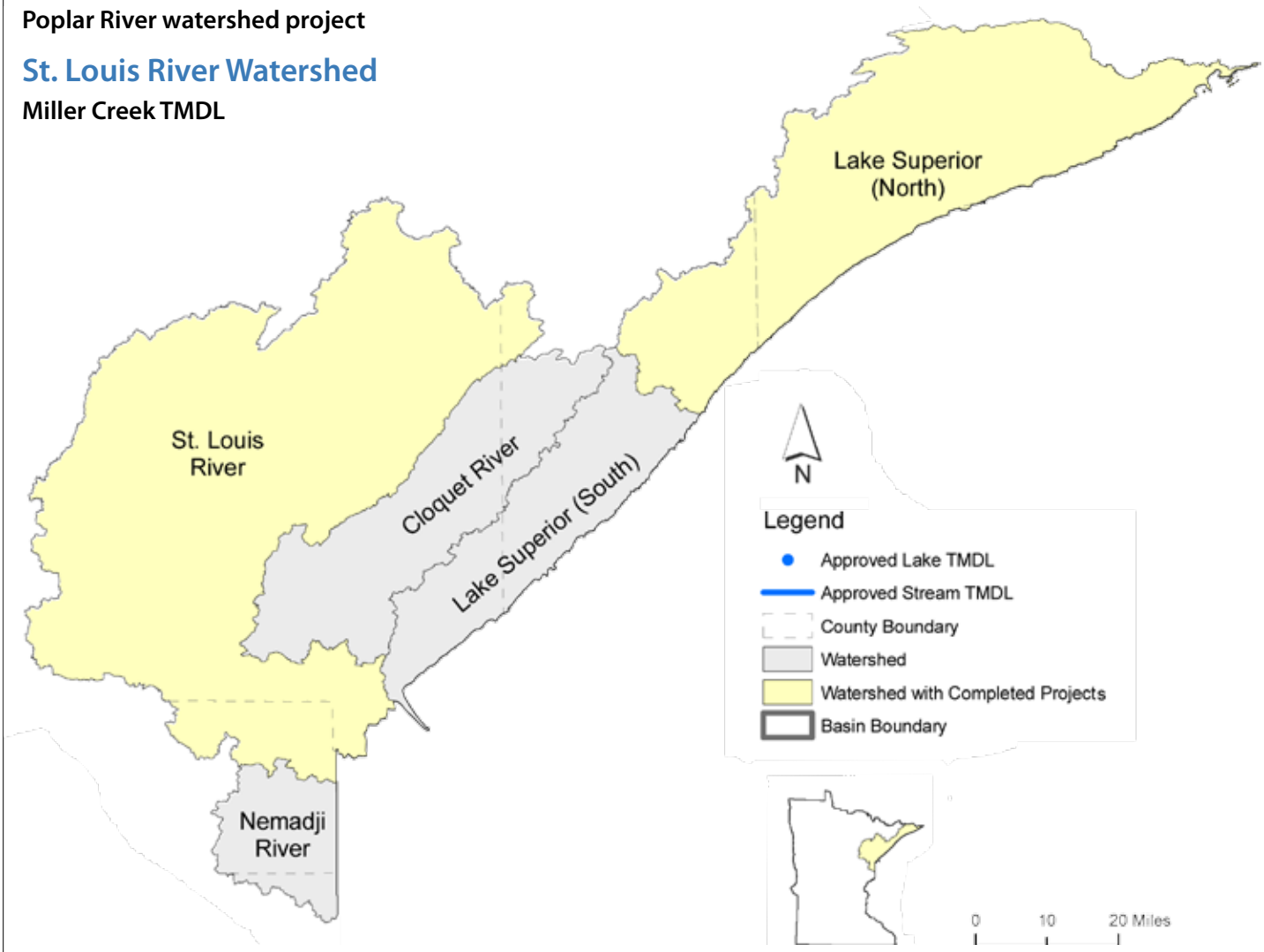
Projects completed

Lake Superior North Watershed

Poplar River watershed project

St. Louis River Watershed

Miller Creek TMDL



Poplar River watershed project

In 2004, the Poplar River was included on Minnesota's 303 (d) list of impaired waters for aquatic life due to turbidity. The river was listed again in 2006 and during that same year a TMDL study was initiated. The project included work done by various contractors and the local Soil and Water Conservation District (SWCD) office, and was overseen by the MPCA under guidance from the Environmental Protection Agency (EPA). Two major contracts were involved in the Poplar River TMDL project.

The first was a contract between MPCA and a group of consultants led by RTI International, an independent non-profit research and development organization. This team was charged with completing the majority of the technical work needed to evaluate sediment loading to the Poplar River in order to complete a TMDL study.

The second was a contract between MPCA and the Cook County SWCD for review of the EPA contractor work, biological monitoring, water quality monitoring and local involvement in the process. The SWCD subcontracted the UM Natural Resources Research Institute (NRRI) to complete a quality assurance project plan (QAPP) and biological monitoring of the river, and Minnesota Sea Grant to assist in public outreach and education.

A turbidity assessment report and a biological monitoring report were the two major deliverables from this project. Tasks that SWCD reviewed in the EPA contract included a summary of existing water quality, a data summary, an existing watershed model, a physical channel assessment and source identification summary, and the Poplar River turbidity assessment.

Goals

- Determine the impact of turbidity on the aquatic life and designated uses of the Poplar River.
- Compare the impact of turbidity in the Poplar River to Minnesota's water quality standard for turbidity.
- Determine the correlation, if any, between turbidity and other pollutants of concern, such as sediment, pH, temperature and mercury. If a correlation exists, determine how to measure loads for calculating a TMDL for turbidity.

Sediment build-up on the bottom of the Poplar River.

Results that count

- Turbidity does have an impact on the fishing and swimming designated uses on the Poplar River, particularly during high flows. During high flow events, the turbidity level in the river exceeds Minnesota's water quality standard. The MPCA is determining the applicability and achievability of this standard.
- A strong correlation exists between turbidity and total suspended solids (TSS) in the Poplar River, and this water quality parameter was used to calculate loads. A load duration curve was used to determine loads and the MPCA is evaluating this procedure.

Financial information

Funding type: CWLA
Grant amount: $80,000

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Miller Creek flooding during a storm June 6, 2008.

Miller Creek TMDL

Miller Creek is located within the St. Louis River watershed, in the Lake Superior Basin in northern Minnesota. The Miller Creek TMDL project addresses two impairments, for temperature and for absence of trout, from the headwaters of Miller Creek to the St. Louis River, flowing into Lake Superior. The South St. Louis County SWCD is partnering with the MPCA to develop the TMDL. The project consists of three parts:

- Part 1, which has been completed, included gathering of existing data, collecting data over three years of stream monitoring (ongoing), generating needed GIS map layers (ongoing), and gathering geomorphology data (completed in Part 2).
- Part 2, which has been completed, included most of the data collection, public involvement, and some analysis.
- Part 3 will include more monitoring, data processing/ analysis, regular meetings with the technical advisory group, informational meetings with the public, and completion of the Draft TMDL Report, followed by the TMDL implementation plan.

This project started in 2005 and is expected to be completed in 2009. More information is available at: www.pca.state.mn.us/water/tmdl/project-millercreek.html.

Goals

- Gather all existing data and collect necessary data to complete TMDL.
- Use area resource professionals and public to help lead the TMDL and keep all informed during the process.
- Analyze and submit processed data to MPCA.

Results that count

- Collected two years of monitoring data necessary to complete TMDL.
- Held several meetings with public, stakeholders, and Technical Advisory Group.
- Processed and submitted data from 2007 and 2008.

Financial information

Funding type: Section 319 Grant and CWLA
Grant amount: $24,749

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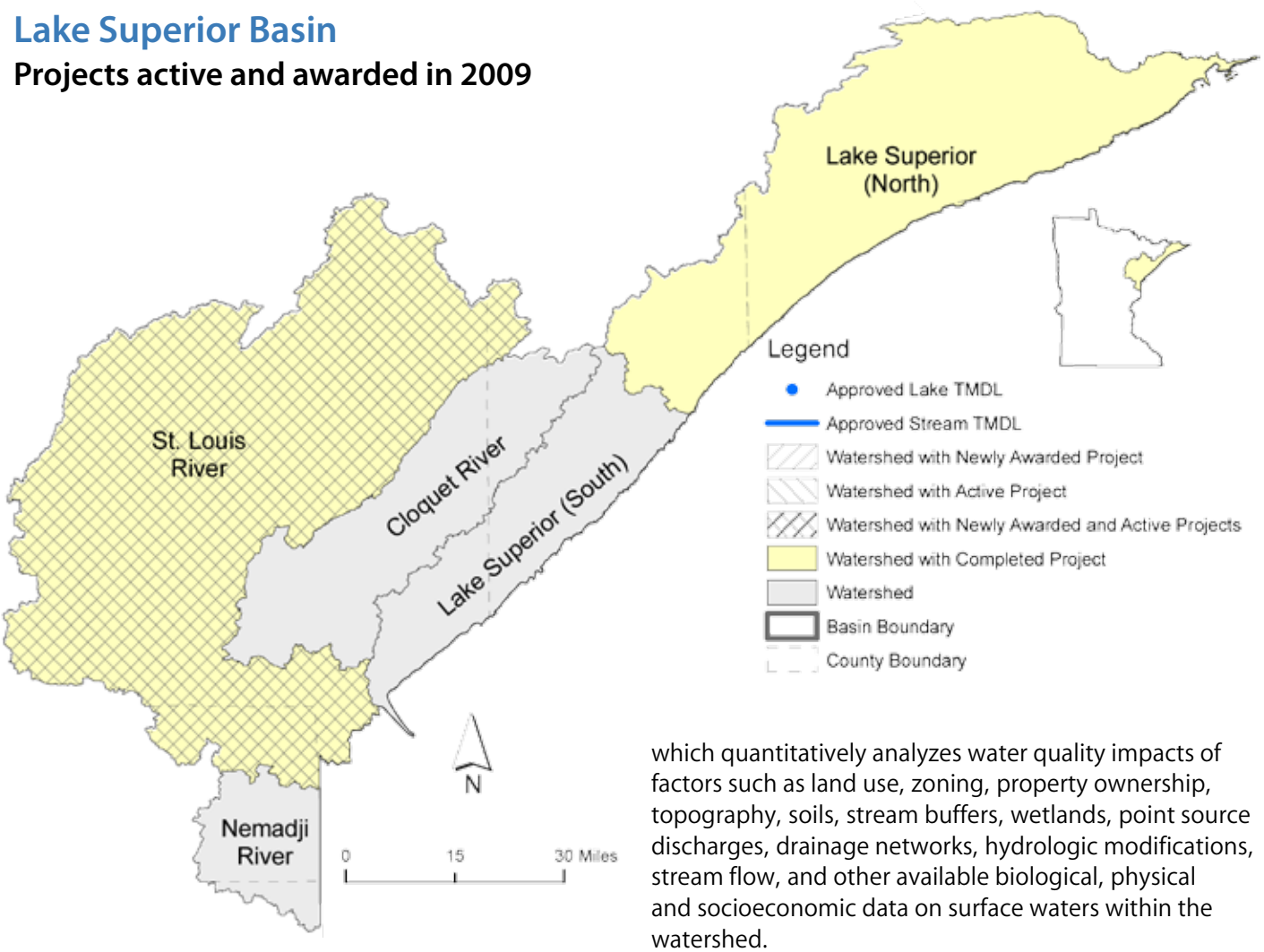
Lake Superior Basin

Projects active and awarded in 2009



St. Louis River Watershed

East Swan River watershed protection strategy (awarded in 2009)

Sponsor: North St. Louis SWCD

Funding: CWP (Grant) $147,000

Purpose: No water quality or biological monitoring programs exist within the watershed at this time, and the current water quality of the East Swan River and its tributaries are largely unknown. The initial focus of this phase 1 project will be building community coalitions, consolidating the technical infrastructure required, developing a watershed monitoring plan, collecting and assessing watershed data and developing a diagnostic study and implementation plan to protect the watershed from degradation. The project will also develop a GIS watershed management database and analysis tool which quantitatively analyzes water quality impacts of factors such as land use, zoning, property ownership, topography, soils, stream buffers, wetlands, point source discharges, drainage networks, hydrologic modifications, stream flow, and other available biological, physical and socioeconomic data on surface waters within the watershed.

Miller Creek watershed implementation — 2006 (active in 2009)

Sponsors: City of Duluth and South St. Louis SWCD

Funding: CWP (Grant): $31,000 grant

Purpose: Funding for this project continues tree planting to prevent solar radiation from reaching the stream, installation of streambank stabilization and stream habitat structures, completion of annual stream trout surveys and habitat assessments, and installation of an innovative stormwater practice; provides information regarding BMPs and Miller Creek's water quality for Miller Hill-area businesses and the public; maintains the sediment trap installed in Miller Creek in 2004; and removes sediment via street sweeping before it reaches the stream.

Lower Mississippi and Cedar River Basins

Projects completed

Projects involving multiple watersheds

Cost share incentives for small feedlot fixes

Designing feedlot improvements in targeted areas under the open lot agreement

Lake Pepin water quality modeling — year 3

Targeted feedlot open lot implementation engineering assistance

Cannon River Watershed

Jefferson-German lakes improvement project

Steele County septic system loan project

Mississippi River (Red Wing) Watershed

Dakota County nonpoint source reduction project

Lower Vermillion River turbidity TMDL

Mississippi River (Winona) Watershed

Southeast Minnesota milk house wastewater treatment demonstration

Root River Watershed

South Branch Root River watershed fecal coliform bacteria reduction project

Cost share incentives for small feedlot fixes

The Hiawatha Valley resource conservation and development area is comprised of 11 counties in southeast Minnesota. Since October 2000, livestock producers having open feedlots with fewer than 300 animal units (AU) had the option to sign an open lot agreement (OLA) with the MPCA. Under this agreement, the feedlots agreed to correct their open lot runoff problems in exchange for a flexible time schedule for compliance and a conditional waiver from enforcement of penalties for past violations of water quality standards. An estimated 92 percent of these feedlots in the Lower Mississippi Basin are located in the Hiawatha Valley area.

This project provided cost-share dollars to fix feedlot runoff problems. The project provided 50 percent cost-share, up to $1,000 of the implementation cost, of OLA feedlot fixes that achieve the phase I 50-percent runoff reduction criteria. Priority was given to feedlots that fell in one of the three priority categories based on environmental risk as outlined in 4.2.3 regional TMDL implementation plan.

The Hiawatha Valley Resource Conservation and Development (RC & D) Council, a 501(c)(3) non-profit organization, administered the project on behalf of the county and SWCD sponsors in the counties of Dodge, Fillmore, Freeborn, Goodhue, Houston, Mower, Olmsted, Rice, Steele, Wabasha and Winona.

Goals

- Sub-recipient agreement signed by all 11 SWCDs and counties.
- Feedlots in the Hiawatha Valley area should undergo total and partial fixes in order to be compliant with open lot agreements.

Results that count

- Sub-recipient agreement was signed by all 11 SWCDs and counties.
- Ninety feedlots completed total and partial fixes to be compliant with their open lot agreements.
- Reduced amount of fecal coliform leaving farms by 50 percent or more on 90 feedlots.

Financial information

Funding type: Section 319 Grant
Grant amount: $148,823.68
Matching funds and in-kind: $464,239.52
Total project cost: $613,063.20

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Designing feedlot improvements in targeted areas under the open lot agreement

"Designing feedlot improvements in targeted areas under the open lot agreement" was part of a basin-wide response to the regional TMDL study that identified the streams of the Lower Mississippi River Basin in Minnesota (the Basin) as impaired by fecal coliform bacteria. The regional TMDL implementation plan calls for reducing major sources of bacteria by 65 percent. One key strategy is providing assistance for accelerated compliance with the OLA to reduce runoff from smaller feedlots.

This project used $300,000 to assist 10 counties in the basin to hire technicians to design simple, low-cost — $5,000 average — run reduction solutions. The assistance was available to producers who signed the OLA, which gives producers time to comply with state regulations on water quality. The project partners estimated that at the requested funding level over three years, from 270 to 300 feedlots would complete projects, which is about 10 a year for each of the 10 counties participating. Technicians worked under supervision of county feedlot officers and feedlot design engineers to design such low-cost measures as:

- Reducing lot size
- Reducing amount of time animals are on the lot
- Establishing grass buffer areas
- Installing a series of gravel berms to create sheet flow in buffer strips
- Regrading lot area or buffer area
- Creating clean water diversions
- Installing roof gutters
- Extending roofs
- Installing picket fences to hold back solids
- Installing filter strips with solids settling area
- Building runoff storage basins

Final results showed that a total of 530 producers representing 56,227 animal units received feedlot design assistance as a result of the grant pass-through funding to county staff. In addition, the funding allowed counties to build local staff capacity to continue assistance to producers as they implement their feedlot designs.

Goals

- Identify low-cost solutions to reduce runoff in order to reduce fecal coliform levels in surface waters.
- Design feedlot runoff improvements for 270 to 300 producers who signed the OLA.
- Build capacity of county staff in working with feedlot operators.

Results that count

- Runoff reduction solutions averaged $5,000 in costs.
- 530 producers, representing 56,227 animal units, received technical assistance in designing feedlot runoff improvements.
- County feedlot officers continue to assist producers across the 10 counties in the Lower Mississippi River Basin.

Financial information

Funding type: Section 319 Grant
Grant amount: $300,000
Matching funds and in-kind: $403,718
Total project cost: $703,718

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Lake Pepin water quality modeling — year 3

To simulate natural occurrences in the Lake Pepin watershed and to estimate the impact of pollutant reductions on the lake's water quality, Limno-Tech developed a model called the ECOM-SED/RCA.

This modeling framework was developed to support a combined TMDL for turbidity and nutrient enrichment. Model domain extends from lock and dam 1 to lock and dam 4 on the Mississippi River. This modeling system was calibrated to data from 1997 to 2006 and confirmed with data from 1985 to 1996. The MPCA, Lake Pepin TMDL science advisory panel and Lake Pepin TMDL stakeholder advisory committee have used the model to evaluate 19 scenarios for load reductions of total suspended solids (TSS) and total phosphorus (TP) from upstream tributaries and direct discharges. These scenarios have been incorporated into a viewer tool which the MPCA is using to evaluate how to meet TMDL end points. As an additional task, Limno-Tech used a U.S. Army Corps of Engineer model to estimate the response of submersed aquatic vegetation to increased water clarity. Limno-Tech provided training on both models to MPCA staff and others.

The ECOM-SED/RCA model provides a detailed level of resolution to examine relationships that contribute to turbidity and eutrophication impairments. The model has helped to clarify and quantify the:

- Magnitude and significance of internal loading of sediment and nutrients
- Role of different algal species in affecting chlorophyll a concentrations at different times of the year,
- Impact of source reductions ranging from 20 to 90 percent of historical loads, the latter providing a rough estimate of pre-settlement conditions.

Researchers, scientists and stakeholder advisory committee members have heavily scrutinized and tested the equations for light penetration and dispersion, addressed questions of changes in river morphology in lower pool 2, and the model has been applied to evaluate the effect of possible water level drawdowns on water temperature in pool 3, and consequences for industrial wastewater discharge permit limits.

Goals

- Develop suitable modeling framework for Lake Pepin-Mississippi TMDL.
- Apply model to evaluate alternative scenarios against TMDL targets.
- Use model to address technical issues that arise in the development of the TMDL.

Results that count

- A modeling system has been developed to support the TMDL process.
- The model has been used to evaluate the impact of alternative scenarios on water quality relative to TMDL targets.
- The model has been used to address several technical issues in the TMDL, including the relative impact of direct wastewater discharges at different loads, the effect of TSS load reductions on re-suspension in lower pool 2, and the relative impacts of point and nonpoint source pollutant loads.

Financial information

Funding type: Section 319 Grant
Grant amount: $305,480

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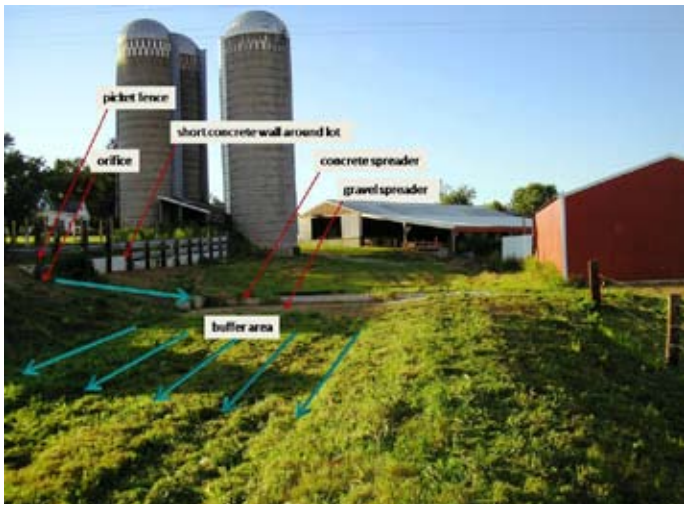

Feedlot runoff treatment system, Elmira Township, Olmsted County.

Targeted feedlot open lot implementation engineering assistance

This project was part of a basin-wide response to the regional TMDL study that identified the streams of the Lower Mississippi River basin in Minnesota as posing a potential risk of human illness from excessive levels of fecal coliform bacteria, with feedlot runoff as the single greatest source during summer wet periods.

The plan was to retain additional engineering assistance for three years. Two additional staff members focused on small feedlots that were eligible for the MPCA OLA fixes within 11 member counties. These projects typically include a runoff control system and possible storage that requires an engineer's sign-off.

This program resulted in a net increase of the availability of engineering and technical assistance. One staff member assisted an average of 60 feedlot producers per year. Roughly 12 of these projects needed practices that required an engineer in the design phase. In addition, these new positions empowered existing feedlot technicians to help on even more of the "low-tech" open lot feedlot practices.

The second engineer and technicians worked on feedlot projects submitted by the 11 SWCD members, and leveraged their time with assistance by SWCD staff. EPA Section 319 funds were only used to assist open lot eligible feedlot projects. Most feedlot projects were complicated, involving steep sloping sites, shallow soils, fractured limestone bedrock geology, and close proximity to streams and sinkholes.

Goals

- Employ a second professional engineer and technician to provide engineering assistance.
- Build local technical capacity within each SWCD.
- Implement feedlot BMPs within the 11 counties of southeastern Minnesota.

Results that count

- A second professional engineer was employed throughout the grant period. A feedlot technician was employed starting Jan. 3, 2006.
- Staff completed 264 feedlot site investigations; 106 site surveys, some with multiple open lots; 135 cost estimates; and designs for 133 feedlot BMPs.
- Each of the 11 SWCD members of the Joint Powers Board (JPB) assisted on projects within their borders. All three staff (including the two funded by this grant) continue to be employed by the JPB from a combination of local contributions and state grants. In addition, several SWCDs have hired feedlot technicians to help with their workload. This enhanced professional engineering has allowed local SWCDs to receive significantly more state feedlot cost-share funding.

Financial information

Funding type: Section 319 Grant
Grant amount: $300,000
Matching funds and in-kind: $613,400
Total project cost: $913,400

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MPCA project manager: Norman Senjem

A shoreline native garden.

Jefferson-German lakes improvement project

In a four-year project period, Le Sueur County implemented several BMPs in both residential and agricultural areas. The Jefferson-German Lakes improvement project, located in Le Sueur County, Minnesota, began Oct. 1, 2004, and ended on Sept. 30, 2008. The watershed received $55,000 to put BMPs on the ground along with monitoring the water quality of the lakes.

The highlight of the project was the increase in interest about rain gardens and native plantings on urban shoreline. Two neighborhood associations used grant funds for cost-share on restoring their access lots. One homeowner on the second tier of shoreland installed a rain garden in a highly visible spot along a walking trail. Six rain gardens were installed on shoreline properties.

In agricultural areas, soil grid sampling was done on agricultural fields that had livestock manure applied. Four livestock producers participated in this project. After meeting with the SWCD representative, the farmers agreed to not apply manure to the areas in their fields that were mapped to have excessive phosphorus. In addition, property owners upgraded 73 on-site sewer systems.

The county distributed information about the projects through news releases, public meetings, lake association meetings and a lake association quarterly newsletter. Citizen lake monitoring volunteers continued to participate in the MPCA Citizen Lake Monitoring Program.

Goals

- Reduce pollutant loadings through implementation of shoreland BMPs.
- Reduce pollutant loadings through implementation of agricultural and on-site sewer system BMPs.
- Increase public awareness of water quality issues.

Results that count

- For shoreland BMPs, six rain gardens were installed on home shoreline properties.
- For agricultural and on-site sewer system BMPs, property owners upgraded 73 on-site sewer systems.
- For increased public awareness of water quality issues, the project coordinator met with the lake association annually with project updates; the county wrote news releases for the quarterly lake association newsletter and for local newspapers; and Le Sueur County, working with Minnesota State University, Mankato Water Resources Center, educated the public about aquatic plant issues through an organized presentation and discussion.

Financial information

Funding type: CWP Grant
Grant amount: $55,000
Matching funds and in-kind: $540,723
Total project cost: $595,723

Contact information

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Steele County septic system loan project

The Straight River watershed has several reaches listed as impaired waters for fecal coliform bacteria. The Straight River TMDL study was completed in 2002 and provides the diagnostic basis for this implementation project. The Section 319/CWP project was an implementation initiative to address one of the major sources of fecal coliform bacteria in the watershed: individual sewage treatment systems.

Because of the cost involved with individual septic system installation, financial assistance is imperative when it comes to correcting non-conforming septic systems. This project has provided the financial assistance needed to assist individual landowners in complying with existing wastewater regulations.

Steele County has used existing programs and staff to maximize the efficiency of project administration for the loan application process, publicity, and reporting. Steele County environmental services, planning and zoning, auditor, and recorder's offices have each contributed to the coordination of this low-interest loan project. Each office was assigned a role and communication among the departments was tracked using an internal routing sheet.

The septic system loan project has been so successful that Steele County has applied for and received a continuation CWP loan amount of $500,000.

Goals

- Establish a local loan program to finance septic system replacement projects.
- Replace approximately 70 failing or non-complying septic systems.
- Reduce fecal coliform bacteria levels in the Straight River watershed.

Results that count

- Steele County established a local loan program in 2004 within existing county departments.
- 57 septic systems were replaced from 2004 to 2007.
- Steele County is continuing to monitor the watershed, but it is too early in the implementation process to show significant fecal coliform reduction.

Financial information

Funding type: Section 319
Final Grant amount: $66,000

Contact information

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Dakota County nonpoint source reduction project

The Dakota County nonpoint source pollution prevention project has developed a model program for local, state and federal collaboration for improving water quality. The program has executed the strategies developed in the implementation plan for the Clean Water Partnership project, the Hastings area nitrate study, phase I (HANS).

Dakota County, in partnership with several agencies, conducted the HANS phase I diagnostic study to determine the cause and extent of nitrate contamination in the drinking water aquifers supplying Hastings and the surrounding townships. The National Groundwater Association recognized HANS as its outstanding project in groundwater protection for 2003.

The nonpoint source pollution prevention program has laid the foundation for addressing the area's groundwater contamination issues by implementing the strategies developed in phase I. With this grant, a new agricultural outreach program was developed, in cooperation with the UM Extension. The program has supported Dakota County efforts to protect water quality and open space through permanent conservation easements, and it has continued to monitor groundwater and surface water conditions within the study area. In doing so, Dakota County has expanded its collaborative efforts with multiple state, federal, and local agencies.

Goals

- Decrease levels of nitrate, pesticides, and organic wastewater compounds in private drinking water wells.
- Gain farmer participation in outreach programs.
- Place acres in permanent conservation easements.

Results that count

- Pesticide levels are decreasing; nitrate levels are increasing; organic wastewater compound results are pending. However, the current recommended nitrogen fertilizer rates are relatively new (2006), so the effect of the new, lower rates have not yet had time to show up in groundwater.
- 350 farmers are receiving the "Focus on Ag" newsletter and the response has been positive. The number of farmers participating in on-farm demonstrations has increased each year.

Tour of low-flow crop irrigation system during 2005 Field Day.

- This grant has helped protect 40 acres of natural area, with 2,774 feet of Vermillion River frontage with a permanent conservation easement. In all, the Dakota County farmland and natural areas program has 772 acres permanently protected as natural areas in the Vermillion River Watershed (an additional 1,264 acres are pending) and 360 acres permanently protected from development as farmland (an additional 218 acres are pending).

Financial information

Funding type: Section 319 Grant
Grant amount: $185,239
Matching funds and in-kind: $199,914 cash & $103,053 in-kind
Total project cost: $488,206

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Lower Vermillion River turbidity TMDL

This TMDL development project addressed one of the first listed turbidity impairments in Minnesota. The Lower Vermillion River (LVR) extends from Hastings, Minn., to the confluence of the Vermillion River and the Mississippi River south of lock and dam 3. The state of Minnesota listed this river as impaired in 1994 as a result of assessment of data provided by the long term resource monitoring program (LTRMP). The LVR system is hydrologically complex, with the LVR having a naturally low gradient and occupying the floodplain of the Mississippi River. Flow enters this system from the Upper Vermillion River at Hastings, via local tributaries, through movement of groundwater, and by interflow with the Mississippi River. Thus, to understand the system and compute a TMDL for the impaired reach, a consultant (Tetra Tech) was contracted to apply the CE-QUAL-W2 model in an effort to provide a more complete description of the movement of water and sediment in the LVR system. An additional purpose was to link sediment sources with turbidity impacts. From 2004 to 2008 Tetra Tech provided three significant components that will allow for completion of this TMDL:

- Phase I: Data gathering and conceptual model development report
- Phase II: Sampling and model setup report
- Phase III: Agency draft of Lower Vermillion River turbidity TMDL

The MPCA completed a draft TMDL for Lower Vermillion River turbidity in 2009 with a public comment period closing on April 22. The next step is to submit the draft report to the EPA for approval.

Goals

- Gather all data relevant to Lower Vermillion River turbidity impairment (phase I report).
- Conceptualize and develop model for use in TMDL.
- Apply model and develop TMDL.

Lower Vermillion River at Etter Bridge during low flow.

Results that count

- Completed phase I report and conceptual model development.
- Completed model development and report of results.
- Completed draft of TMDL report.

Financial information

Funding type: Section 319 Grant
Grant amount: $168,825.78

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Southeast Minnesota milk house wastewater treatment demonstration

The southeast Minnesota milk house wastewater demonstration project built on a previous project to install, monitor and evaluate milk house wastewater treatment systems for dairy farms with pipeline or flat parlor milking systems. Eight dairy operation owners in Goodhue and Winona counties cooperated with the project. Funding for the project came from U.S. EPA Section 319 funds administered by the MPCA with significant matching funds from other state and local agencies, as well as the cooperating producers.

Four different types of systems, replicated in each county, were studied:

- Bark beds
- Irrigation
- Recycling media filters
- Aerobic treatment units

The eight systems were monitored for two years. Results indicate that all four types of systems were effective. Experience and monitoring results were used to develop design and management guidelines for these systems. Many materials are available at the project Web site: www.manure.umn.edu/applied/milkhouse_waste.html.

Goals

- Install, monitor and evaluate eight milk house wastewater treatment systems.
- Develop a milk house wastewater treatment design guide.
- Develop fact sheets and outreach materials on milk house wastewater treatment options.

Results that count

- Eight systems were installed and monitored for over two years.
- A design guide was developed, reviewed and is available on the web.
- Many fact sheets and popular press articles on milk house wastewater were prepared and distributed.

Financial information

Funding type: Section 319 Grant
Grant amount: $183,822
Matching funds and in-kind: $188,057
Total project cost: $371,879

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The fence holds back the solids from the feedlot and allows the liquids to go through an area of crushed rock to diffuse the flow. The liquids then enter a 50-foot grass buffer and additional crop ground before reaching an area of concentrated flow.

South Branch Root River watershed fecal coliform bacteria reduction project

The project began in 1998 with a CWP phase I diagnostic study, which was completed in 2002. The South Branch had fecal coliform bacteria levels almost three times the state water quality standard. These levels were consistent with other streams in the region. Fillmore County received notice in December 2003 that the state awarded it a Section 319 implementation grant of $299,420 and a CWP low-interest loan fund of $300,000, with the loan agreements signed in 2005. Implementation began in August 2005 and continued to September 2008.

Preliminary conclusions from four years of data indicate that fecal coliform bacteria concentrations have dropped by about 40 percent from 553 org/100 ml (the 1999–2002 geometric mean measured at Forestville) to 328 org/100 ml in 2005–2008. The project's goal was a 20-percent reduction. Contributing to the decrease were:

- Fillmore County processing loans for 19 on-site sewer systems, representing 8,550 gallons of sewage now being properly treated each day.
- Five of seven open feedlots implemented practices or repairs to comply with water quality standards.
- The number of registered feedlots has dropped by about 40 percent county-wide according to the county feedlot officer.
- About 80 percent of cropland in the watershed is now in no-till or mulch-till (> 30 percent of crop residue), an increase from 65 percent in 2004.

The project has also been a springboard for other projects in the entire Root River watershed.

Goals

- Complete 30 feedlot fixes by providing cost share of 50 percent, up to a maximum of $1,000.
- Enroll 500 acres in buffer bonus program in conservation tillage, cover crops, or nutrient management.
- Enroll 10 cooperators or 200 acres in the hay set-aside program.

Results that count

- Five feedlot fixes were completed out of 7 identified as needing fixes; number of registered feedlots dropped significantly since 2005.
- 580 acres enrolled in no-till or cover crops (381 acres of no-till and 199 acres of cover crops).
- Nine cooperators enrolled 105 acres in hay set-aside program.

Financial information

Funding type: Section 319 Grant
Grant amount: $190,480
Matching funds and in-kind: $56,931 + $135,342 in CWP loans for septic systems
Total project cost: $382,753

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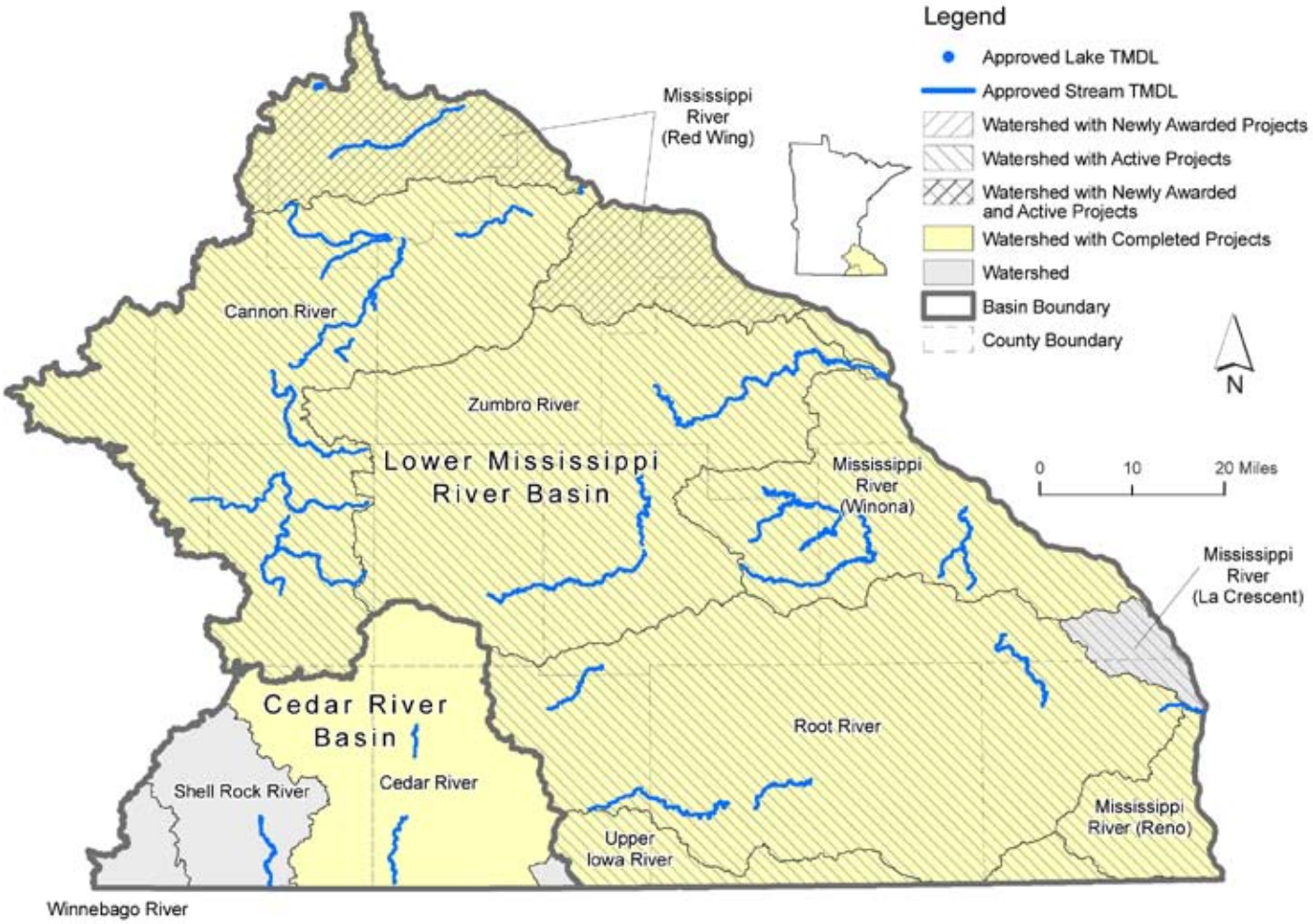
Lower Mississippi and Cedar River Basins

Projects active and awarded in 2009



Projects involving multiple watersheds

Assistance for unsewered communities in the Lower Mississippi/Cedar River Basin — 2008 (active in 2009)

Sponsor: Southeast Minnesota Water Resources Board

Funding: Section 319 (Grant) $272,080

Purpose: This project will be implemented within the boundaries of the thirteen counties in the basin. The regional TMDL study identified streams in the basin posing a risk of human illness from excessive levels of fecal coliform bacteria. This study also found that failing septic systems and unsewered communities comprised an estimated 52% of the bacteria load during spring and summer, making it the single greatest pollutant source. In order to achieve a 65 percent reduction of this load by 2012, this project will assist those small communities with expertise and resources needed to achieve a wastewater solution.

Lower Mississippi feedlot runoff control — 2006 (active in 2009)

Sponsor: Southeast Minnesota Water Resources Board

Funding: Section 319 (Grant) $300,000

Purpose: Hire technicians to assist eligible open livestock feedlot owners and provide some funds for low-cost improvements to reduce runoff.

Sustaining progress toward reducing runoff from open lot feedlots (awarded in 2009)

Sponsor: Southeast Minnesota Water Resources Board

Funding: Section 319 (Grant) $300,000

Purpose: Local staff or contractors will provide open lot agreement signers with technical assistance in designing low-cost fixes to correct and treat polluted runoff (average cost of a low-cost fix is $5000) and to trouble-shoot implementation challenges where runoff reduction is not completely abated despite feedlot design implementation.

Volunteer nitrate monitoring network in target areas demonstration — 2005 (active in 2009)

Sponsor: Southeast Minnesota Water Resources Board

Funding: Section 319 (Grant) $275,000

Purpose: Develop and test a process for obtaining long-term trend data for nitrate occurrence in private drinking water supplies by training homeowners to sample for nitrates and ship their samples to specified county locations.

Cannon River Watershed

Cannon River wastewater project — 2005 (active in 2009)

Sponsor: Cannon River Watershed Partnership

Funding: Section 319 (Grant) $300,000

Purpose: Provide financial incentives for assessment and engineering feasibility studies of current septic wastewater conditions.

Steele County septic system loan program continuation (Lower Mississippi River) (active in 2009)

Sponsor: Steel County

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

Purpose: Steele County is continuing its septic system loan program that began in 2004. Landowners with failing or noncomplying septic systems are eligible for the loan program and may use the loan to replace existing septic systems that are contributing to fecal coliform pollution in the Straight River watershed, which has completed a TMDL study.

Upper Cannon assessment project — 2007 (active in 2009)

Sponsor: Le Sueur County

Funding: CWP (Grant) $184,588 grant

Purpose: This is a diagnostic study which will include monitoring selected stream sites for flow and water quality parameters, in-lake monitoring, aggressive educational components, GIS mapping, a point source inventory and stormwater monitoring. In addition, an implementation plan will be developed to understand the water pollutant sources, identify priority areas and develop strategies and activities for improvement of the water quality in the Upper Cannon River watershed

Vermillion River and Chub Creek ISTS inspection and upgrade program — 2006 (active in 2009)

Sponsor: Dakota County

Funding: Section 319 (Grant) $160,500

Purpose: Inspect individual sewage treatment systems near streams, provide incentives for improvements.

Mississippi River (Winona) Watershed

South Branch Whitewater River watershed bacteria reduction project — 2005 (active in 2009)

Sponsor: Whitewater Joint Powers Board

Funding: Section 319 (Grant) $174,660

Purpose: Upgrade septic systems, implement best management practices to reduce bacteria runoff, complete managed grazing plans, bring feedlots into compliance with state rules, install vegetative buffers along river corridors, and provide education and outreach.

Mississippi River (Red Wing) Watershed

Dakota County nonpoint source reduction project (awarded in 2009)

Sponsor: Dakota County

Funding: CWP (Grant) $172,700

Purpose: The continuation grant will enable Dakota County to continue and expand a successful agricultural outreach program. Through the coordinated efforts of an Extension Educator position and the multiple agencies involved in this effort, the project will be able to involve more farmers and more acreage in demonstration projects and outreach activities, while continuing the existing efforts such as the twice-yearly "Focus on Ag" newsletter, annual spring Crops Day and annual summer Field Day. The county will provide assistance and incentives to private well owners and the county itself to seal unused wells. It will also continue programs to monitor groundwater and surface water quality in the study area.

Stream cooling demonstrations in the Vermillion River watershed (awarded in 2009)

Sponsor: Vermillion River Watershed Joint Powers Organization (VRWJPO)

Funding: Section 319 (Grant) $260,000

Purpose: The VRWJPO and its partners have accumulated data that suggest that the trout reaches of the Vermillion River are at risk of warming, despite a trout population that is thriving and has even expanded in recent years. The VRWJPO wants to maintain temperatures in the watershed's trout streams sufficient to preserve the brown trout population and other cold-water species.

Minnesota River Basin

Projects completed

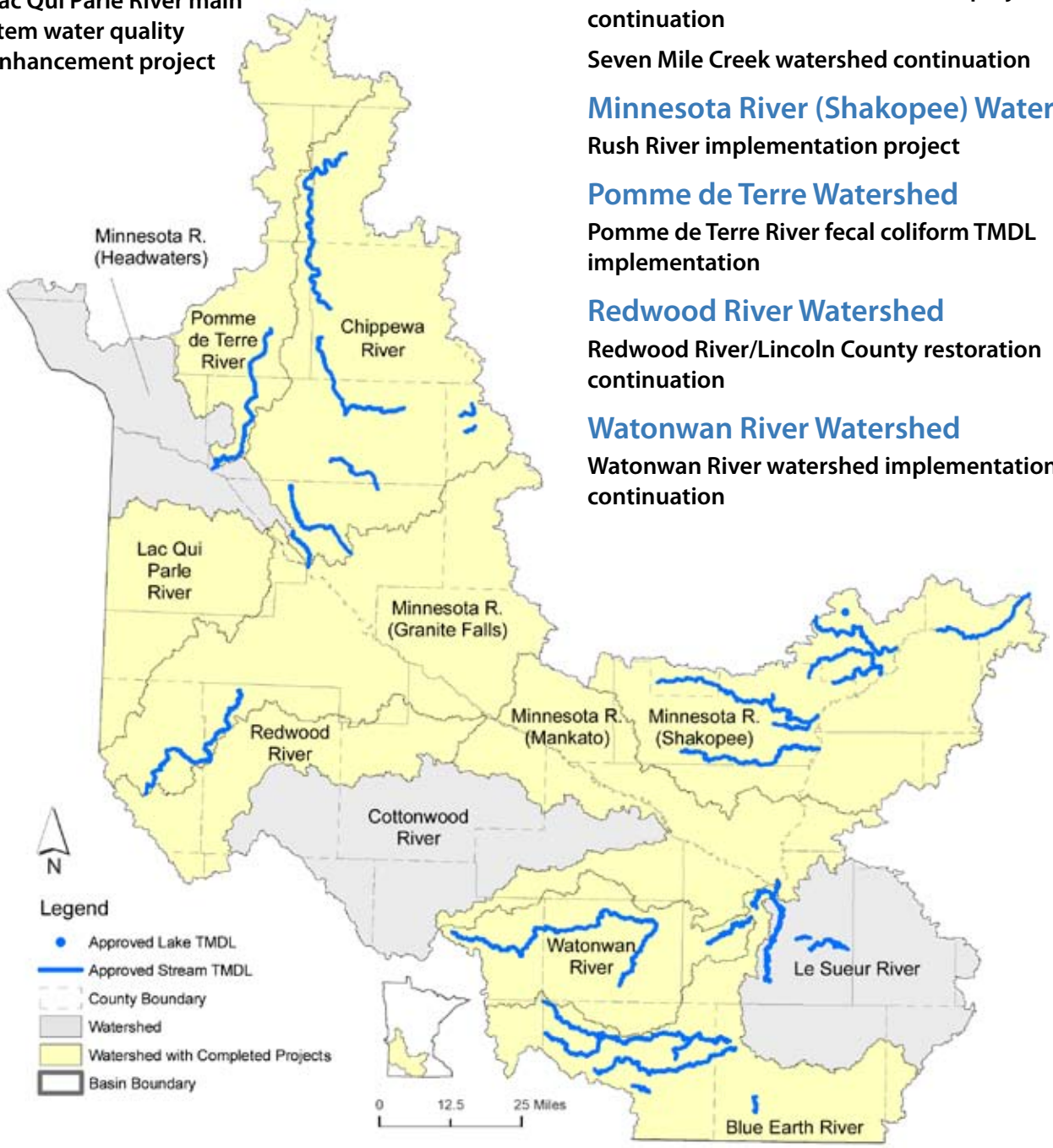
Chippewa River Watershed

Chippewa River upper main stem

Shakopee Creek headwaters

Lac Qui Parle River Watershed

Lac Qui Parle River main stem water quality enhancement project



Minnesota River (Granite Falls) Watershed

Greater Yellow Medicine River phase II Clean Water Partnership

Hawk Creek watershed project — "Hawk TMDL"

Lake Shaokatan TMDL project

Minnesota River (Mankato) Watershed

Conservation drainage symposiums

Little Cottonwood River restoration project continuation

Seven Mile Creek watershed continuation

Minnesota River (Shakopee) Watershed

Rush River implementation project

Pomme de Terre Watershed

Pomme de Terre River fecal coliform TMDL implementation

Redwood River Watershed

Redwood River/Lincoln County restoration continuation

Watonwan River Watershed

Watonwan River watershed implementation plan continuation

Chippewa River upper main stem

The upper main stem Chippewa River sub-basin covers 199,076 acres of the 1.3 million acre Chippewa River watershed. This headwaters region of the Chippewa River has many lakes amidst a landscape of traditional agriculture. Water quality monitoring was conducted at Chippewa River watershed project (CRWP) Site 2. Additional sediment and nutrient assessment show the highly erodible land in this region is beginning to negatively impact many lakes in this sub-basin. The upper main stem is one of the six priority management areas of the Chippewa River watershed. Through the cooperation of landowners, participating project partners and CRWP staff this project worked to abate or prevent non-point source pollution by implementing BMPs that included buffer strips, streambank protection, sediment blocks, erosion control, shoreline restoration, terraces, ag waste pit closures, alternative tile intakes, feedlot runoff improvements and individual septic system inspections.

Goals

- Install BMPs.
- Educate citizens within the subwatershed.
- Inspect 150 Individual Septic System Inspections throughout Douglas County.

Results that count

- Established 519.8 acres of buffer strips, 43 sediment blocks and two terraces, one streambank protection, one erosion control project, two shoreline restorations, two ag waste pit closures, two alternative tile intakes and one feedlot runoff improvement. Also upgraded 18 individual septic systems.
- Held an annual meeting, attended by 100 watershed citizens, and presented water quality data and BMPs. Participated in Douglas County Water Festival, where the project presented the watershed concept to 400 fifth-graders.
- Complications developed within Douglas County that resulted in the inability to complete 150 sewer inspections. Even with these complications, 43 septic system inspections were completed, which resulted in 18 upgraded systems.

Financial information

Funding type: Section 319 Grant
Grant amount: $150,775.95
Matching funds and in-kind: $225,242.57
Total project cost: $376,018.52

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Sediment block in Douglas County.

Shakopee Creek headwaters

The goals and objectives for the Shakopee Creek headwaters project are based on water quality monitoring, land use assessments, and reasonable expectations for the lakes and streams in this area. Because monitoring revealed that the water quality needs to be improved, objectives to reduce nutrients, sediment, and bacteria were:

- Implement best management practices by providing cost-share, incentives and technical assistance.
- Continue monitoring at the previously established monitoring stations.
- Implement educational outreach to encourage active landowner participation in developing strategies that create a sustainable environment.

The following BMPs were implemented with either cost share or incentive programs: riparian buffer strips, shoreline naturalization, wetland restoration, livestock exclusion and feedlot management.

Goals

- Install BMPs throughout the watershed.
- Educate citizens of the watershed about water quality issues.
- Improve water quality by reducing coliform, phosphorus and sediment entering the lakes and streams of the watershed.

Results that count

- Completed 215.7 acres of filter strips, 17 alternative tile intakes, two wetland restorations, one shoreline restoration, one stream bank stabilization, and one special project.
- Worked with 38 landowners to implement BMP projects, coordinated with citizen monitors throughout the watershed, and participated in public outreach events that helped to educate hundreds of area residents.
- Achieved a reduction in the average level of fecal coliform bacteria, total suspended solids and turbidity at several of the priority monitoring sites since the beginning of the project.

Holme streambank stabilization: The project is located on a reach of the Shakopee Creek just south of the outlet of Lake Andrew. The streambank was highly eroded from years of grazing, and experiencing major sloughing. The Shakopee Creek Headwaters Project partnered with the Kandiyohi County SWCD and the DNR to cost-share on this project, which involved reshaping the banks.

Financial information

Funding type: Section 319 Grant
Grant amount: $217,863
Matching funds and in-kind: $983,377.02
Total project cost: $1,201,240.02

Contact information

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Lac qui Parle River main stem water quality enhancement project

The middle reach of the south branch of the Lac qui Parle River from Canby to Dawson was a high priority due to high levels of suspended solids and high turbidity readings. This targeted watershed is agricultural with primarily row crops of corn and soybeans. A unique feature of the watershed is the tremendous drop in elevation. From the highest point in the watershed to the Minnesota River, there is an elevation change of 1,070 feet. This elevation change affects water flow and transports sediment, nutrients and bacteria downstream quickly. The goals and objectives for the project were based on results from water quality monitoring, land use assessments and reasonable expectations for rivers in the northern glaciated plains ecoregion. Consideration was given to the unique characteristics of the watershed. The project was designed to reduce suspended solids, turbidity and bacteria in the river, addressing the turbidity and fecal coliform standards that resulted in an impaired waters listing while keeping the local economic factors in perspective.

Goals

- Improve water quality in the middle reach of the Lac qui Parle River.
- Provide educational opportunities for residents in the watershed.
- Install BMPs in the priority area.

Results that count

- Achieved a reduction in the average level of bacteria at all of the monitoring sites. Turbidity and total suspended solids decreased at three of the five monitoring sites.
- Educational opportunities were provided through the following: women's workshops with 46 in attendance; biweekly news column in county newspaper read by several hundred residents; school presentations to about 1,000 K-6 students over three years; canoe trips for partners and citizen monitors, totaling about 35 to 40 people; manure management workshops for 65 producers in Lac qui Parle and Yellow Medicine counties; and an educational bus tour for 54 people.
- Installed 132.6 acres of buffer strips, six water and sediment control basins, 3,930 feet of grass waterway, one grade stabilization structure, 3,250 feet of terraces, and two water diversions.

Financial information

Funding type: Section 319 Grant
Grant amount: $298,000
Matching funds and in-kind: $30,032.08 matching funds, $312,281.70 in-kind and $705,202.91* loan
Total project cost: $1,345,516.69
*Loan program continues until August 29, 2009.

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Canoe trip explored the middle reach of the South Branch Lac qui Parle in Providence Township of Lac qui Parle County that is agriculture based with row crops of corn and soybeans.

Spring runoff of the Greater Yellow Medicine River.

Greater Yellow Medicine River phase II Clean Water Partnership

The Greater Yellow Medicine River phase II CWP 2005–2008 technical and executive committees set a goal of a 25-percent reduction in total phosphorus (TP), total suspended solids (TSS), and nitrates at the river outflow. The committees also agreed to focus on the designated priority sites when searching for cooperators, and designing and installing BMPs. In addition, the committees resolved to intensify their focus on the installation of BMPs within a one-mile corridor of the Yellow Medicine River and its tributaries.

The Greater Yellow Medicine River (GYMR) watershed phase II 2005–2008 continuation plan also focused on incentives to promote the installation of conservation practices, with emphasis on addressing the conservation reserve program (CRP) lands along the corridors of the Yellow Medicine River. The project team completed a filter strip survey of all land along the river, and identified those in CRP by working with the Farm Service Agency (FSA).

Both the GYMR phase II 2001–2004 and GYMR phase II 2005–2008 implementation programs included an individual sewage treatment system (ISTS) loan for each of the three counties. The counties used these loans to offer landowners in the watershed an opportunity to upgrade their septic systems. The phase II CWP implementation plan provided financing for septic system upgrades, with Lincoln, Lyon and Yellow Medicine County environmental offices acting as project partners. During the grant period, property owners installed a total of 67 septic systems, and $558,971.27 of the project's $650,000 loan funds were distributed throughout the watershed district.

Spending $167,087.38 on implementation projects, the project team installed a total of 32 BMPs, 333 acres of filter strips, and 5,700 feet of waterways, reducing as much as 4,737 tons of sediment loss or more in a three-year period. The project team is proud of the accomplishments achieved during this project, and values the working relationships developed with land owners and other agencies during this time.

Goals

- 25 percent reduction in phosphorus, nitrates, and total suspended solids (TSS).
- Bring the public to an understanding and recognition of environmental concerns.
- Make the Yellow Medicine River cleaner than the point where it enters the Minnesota River.

Results that count

- Pending the result of the diagnostics of the monitoring data, the project team estimates that it has reduced the nutrient loading in many locations, potentially meeting the goal of 25 percent reduction.
- The project team has developed stronger working relationships with landowners and project partners. Landowner comments suggest that, in general, the public is more aware of BMPs and water quality monitoring projects and that support is growing.
- The project team estimates that as much as 4,478 tons of soil loss was prevented in a three-year period due to BMPs. Additionally, 67 failing septic systems were replaced using low-interest loan funds.

Financial information

Funding type: Section 319 Grant
Grant amount: $251,608.01
Matching funds and in-kind: $57,629.07 and $663,016.26
Total project cost: $972,253.34

Contact information

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Hawk Creek watershed project — "Hawk TMDL"

The Hawk Creek Watershed drains 623,424 acres (974 square miles) of land. It is unique among the other major watersheds of the Minnesota River in that it is comprised of a main tributary (Hawk Creek) and several other streams that flow directly into the Minnesota River. Hawk Creek originates in Kandiyohi County and flows approximately 65 miles to the Minnesota River.

Extensively drained agriculture is the primary land use. Nearly 98 percent of the original wetlands in the watershed have been drained to increase agricultural opportunities. Corn, soybeans and sugarbeets are the primary crops. Livestock production includes dairy, beef, swine and poultry. A diagnostic study found sediment and nutrients well over the 50th percentile of the western corn belt plains eco-region.

The ultimate goal of the Hawk Creek watershed project is to implement land use changes that improve water quality and quantity issues while also promoting a healthy agricultural, industrial, and recreation based economy for the region.

Goals

- Implement BMPs.
- Continue monitoring water quality.
- Continue public information and education program.

Results that count

- Sediment and nutrient loss continue to be a major concern in the watershed. Since this project began in 2005, a total of 61 BMPs were installed affecting 2,511.7 acres. BMPs provide estimated soil loss reductions of 928.72 tons per year and phosphorus reductions by 2,808.19 pounds per year.
- Water quality monitoring included bi-weekly grab sampling at six primary sites. This sampling was done in combination with sampling at four sites funded by other grants. Sampling at primary sites included flow measurements. Flow-weighted mean concentrations were calculated for each site.

Hawk Creek side inlet.

- Developing and maintaining cooperative working relationships are fundamental to this project. Sound, trusting relationships with agency personnel and private citizens have led to promoting BMPs and providing education opportunities throughout the watershed.

Financial information

Funding type: Section 319 Grant
Grant amount: $247,509.00
Matching funds and in-kind: $412,741.41
Total project cost: $660,250.41

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Lake Shaokatan is located in sections 22 and 23 of Shaokatan Township, Lincoln County, Minnesota.

Lake Shaokatan TMDL project

The focus and primary intent of the Lake Shaokatan project is to better characterize phosphorus levels, probable sources, and estimated reductions required to meet water quality standards. The development of the Lake Shaokatan phosphorus TMDL assessment was the driver for these activities. Water samples were collected throughout the watershed to determine phosphorus concentrations in 2005–2007. Surveys, GIS data and personal contact was undertaken to quantify the individual nonpoint sources of phosphorus.

Several partnerships were developed and strengthened through this project. The lake association and sportsman's club are concerned about the health of Lake Shaokatan and are motivated to increase awareness and protect the lake. These partners along with landowners, local, state and federal entities will be instrumental in developing an implementation plan to reach the water quality standard.

Goals

- Quantify phosphorus loading from the watershed.
- Determine the lake response to watershed loading.
- Determine necessary reductions to meet the lake water quality goals.

Results that count

- Determined that the annual watershed load is 4,575 kg/yr as total phosphorus (average conditions).
- The average lake phosphorus concentration is about 150 µg/L currently.
- A 67-percent reduction of all watershed phosphorus sources and a 90 percent inhibition of lake sediment phosphorus fertilization are required to meet the water quality goal.

Financial information

Funding type: Section 319 Grant
Grant amount: $62,804.00
Matching funds and in-kind: $1,602.50
Total project cost: $64,406.50

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Conservation drainage symposiums

This project was an opportunity for the public to learn how progressive elements of the farmland drainage industry are using conservation drainage technology to increase farm profitability while addressing water quality and quantity issues in the Minnesota River Watershed. In addition, the public events were designed to build relationships among production farmers, citizens and government agencies to work toward finding common ground by establishing trust and constructive interaction.

Goals

- Educate the public on conservation drainage, a relatively new technology for holding water on the land and providing water quality benefits such as reduced levels of nutrients and sediment.
- Build relationships among farmers, citizens and government agencies.

Results that count

Three conservation drainage symposiums were held in the upper, middle and lower areas of the Minnesota River Watershed:

- April 8, 2008 at the Chippewa County Courthouse assembly room in Montevideo,
- April 9, 2008 at the Holiday Inn in New Ulm, and
- April 10, 2008 at the Bloomington Civic Plaza in the city council chambers.
- All three public events were well attended, with more than 50 people at the Montevideo and New Ulm symposiums, and 20 people at the Bloomington symposium.

Financial information

Funding type: Minnesota River
Grant amount: $540.00

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Little Cottonwood River watershed project

The Little Cottonwood River watershed is a long narrow area spanning three counties and covering 170 square miles in south-central Minnesota. Nearly 90 percent of the watershed is comprised of row-crop cultivation.

A phase I diagnostic study (1997–2000) indicated reductions in non-point sources of sediment, nutrients and pathogens throughout the watershed would contribute to improvements in the main stem of the Little Cottonwood and Minnesota rivers. In addition to water quality impairments, watershed residents indicated that increased flooding frequency was their biggest water resource issue. The technical committee identified several actions to help lower non-point sources of pollution in the watershed while reducing the impacts of flooding.

In 2001, a phase II Clean Water Partnership implementation grant addressed the water quality impairments within the watershed. Project staff used a variety of financial, technical and educational initiatives with a major emphasis placed on providing additional staff to promote and deliver already existing conservation programs. Two positions were created to help facilitate the adoption of conservation practices. These positions were instrumental in leveraging the skills of conservation partners, new and existing conservation programs, and ultimately increasing conservation adoption rates.

Goals

- Establish 1,500 acres of permanent conservation easements (CREP) within the 100-year floodplain to address water quality and quantity issues.
- Increase the adoption of conservation buffers and wetlands along the main stem of the Little Cottonwood and its tributaries.
- Achieve a sediment load reduction of 25 percent, phosphorus reduction of 30 percent, and a reversal of increasing nitrate levels and pathogen such as E. coli bacteria.

Results that count

- The project surpassed its CREP goal, enrolling 2,835 acres, of which 45 percent was located within the floodplain.

A landowner explains why he enrolled this 15-acre field into Conservation Reserve Enhancement Program (CREP) along the Little Cottonwood River in south-central Minnesota.

- The project resulted in about 1,500 acres of additional wetlands and 60 more additional miles of buffer strips.
- The project achieved a11-percent decrease in sediment. However, nutrient levels appear to continue an increasing trend, at 23 percent higher, including nitrate levels, which increased by 61 percent.

Financial information

Funding type: CWP Grant
Grant amount: $157,695.24
Matching funds and in-kind: $59,856.91 in-kind plus $105,100.67 loan
Total project cost: $322,652.82

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Seven Mile Creek watershed project

Restoring wetlands to intercept sub-surface drainage and installing conservation buffers along environmentally sensitive cropland areas were two practices that were promoted heavily during the project. The federal Continuous Conservation Reserve Program was the primary program used for this effort. At the end of the six-year project, a total of 168 acres of tile intercepting wetlands and wetland buffers were restored. The wetlands are expected to remove 6,300 pounds of nitrate per year from the drainage tile system. Sixty acres of conservation buffers were installed.

Prior to the project start, the length of drainage ditches and cropland ravine interface considered protected was 10 percent and zero percent, respectively. Through the combined efforts of the watershed project and its partners, conservation buffer protection increased to 21 percent for drainage ditches and 15 percent for the cropland ravine interface.

Other accomplishments included the installation of three grade stabilization structures, installation of targeted grassed waterways, 12 on-farm nitrogen rate demonstrations, replacement of 13 open intakes, installation of a 100-acre conservation drainage demonstration farm, three grade-stabilization structures, and 1,000 feet of stream bank stabilized.

Goals

- Increase the adoption of wetland restorations and conservation buffers.
- Ensure that at least 50 percent of the homes in the watershed have a compliant septic system.
- Achieve a sediment and phosphorus load reduction of 25 percent and reverse the increasing nitrate and E. coli trends.

Results that count

- A total of 168 acres of tile intercepting wetlands and wetland buffers were restored.
- Fifty-one septic systems were upgraded during the project. This increased the compliance rate from 41 percent to 67 percent.
- It may be too early to accurately assess whether there are any watershed scale water quality improvements associated with the project, but the watershed project did clearly demonstrate the effectiveness of BMPs on water quality at the sub-watershed scale. For instance, edge of field monitoring of a septic system upgrade reduced E. coli concentrations by more than 95 percent. In addition, a 22-acre wetland restoration reduced nitrate loads from a public tile draining 200 acres by 40 to 70 percent.

Three restored wetlands in close proximity. A total of eight wetlands covering 168 acres were restored in the watershed. Special emphasis was placed on intercepting sub-surface drainage tiles.

Financial information

Funding type: CWP Grant
Grant amount: $225,812
Matching funds and in-kind: $164,957.58 matching and $105,100.67 loan
Total project cost: $495,870.25

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Rush River watershed implementation project

The Rush River watershed (RRW) is a rural watershed that drains 257,770 acres (403 square miles) in Sibley, Nicollet and McLeod counties. There are three branches to the Rush River: the north, middle and south branches. The watershed contains a population of slightly more than 9,000 people (47 percent rural) and has four towns, including Gaylord, Gibbon, Lafayette and Winthrop. The Rush River watershed's primary land use is agriculture, with 90 percent of the watershed acreage used for producing crops such as corn, soybeans, small grain and forage.

The 2004 Rush River assessment project determined the water quality concerns of the Rush River watershed to be fecal coliform bacteria, total suspended solids (TSS), total phosphorus (TP) and nitrate-nitrite-N (NO2+NO3-N). The study also listed excessive stream flows and flooding as further water quality concerns for the watershed. Concurrently with this implementation project, a fecal coliform Total Maximum Daily Load (TMDL) study was completed in partnership with the Water Resources Center at Minnesota State University-Mankato. The elevated levels of fecal coliform bacteria have resulted in the main-stem and south branch of the Rush River being listed on the 303(d) Impaired Waters list. In addition, the main-stem of the Rush River had been listed as impaired for turbidity due to excessive TSS concentrations.

Goals

- To increase BMPs within the watershed by promoting and implementing a variety of conservation practices: conservation tillage, cover crop, filter strips, grassed waterways, riparian buffers, rock tile inlets, slotted risers, terraces, water and sediment control basins and wetland restorations.
- Educating watershed residents on the fecal coliform TMDL study results; developing and holding education and information-based activities to increase awareness and adoption of BMPs throughout the Rush River watershed; holding workshops for feedlot operators on how to develop manure management plans and increasing the adoption of nutrient and manure management planning.

The main-stem of the Rush River is located three miles south of Henderson, Minn., on Highway 93 before the river outlets in the Minnesota River.

Results that count

- A total of 175 best management practices were installed including: 9 cover crops, 10 filter strips, 107 open intake alternatives, 8 terraces, 2 water and sediment control basins, 2 wetland restorations and 40 septic system upgrades.
- Ten *River Watcher* newsletters were distributed to around 1,250 residents on a quarterly basis; a field demonstration on the installation of two different types of rock tile inlets was held; two small-group manure and nutrient management planning workshops were held; a public survey for the fecal coliform TMDL was conducted; three public open houses were held for the fecal coliform TMDL and the project included a yearly Sibley County Fair informational booth display board.

Financial information

Funding type: Section 319 Grant
Grant amount: $95,440
Matching funds and in-kind: $10,638.13 matching funds, $50,949.79 in-kind and $350,000 loan
Total project cost: $507,027.92

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Pomme de Terre River fecal coliform TMDL implementation plan

The Pomme de Terre River was listed in 1994 as impaired for aquatic recreation from Muddy Creek to Marsh Lake. The fecal coliform bacteria level is the reason for the impairment. A fecal coliform bacteria TMDL was developed and received EPA approval in December 2007.

The supporting TMDL data show a strong positive correlation between precipitation and fecal coliform bacteria concentration. According to the TMDL, the river's water quality failed to meet state standards primarily during rain events, which points to weather-driven sources.

With this information in mind, stakeholder meetings were held in February, March and April of 2008 to develop an implementation plan. A facilitated visioning session was held to determine priority issues and desired outcomes from these issues. Information from these meetings was presented to the technical advisory committee for local agency input. The fecal coliform TMDL implementation plan was approved by the MPCA at the end of September 2008. Priority management measures were determined, in order of stakeholder preference: 1. Riparian buffers. 2. On-site sewer systems. 3. Manure management. 4. Pasture management. 5. Urban stormwater management.

The fecal coliform bacteria TMDL implementation plan overall goal is to reduce the fecal coliform levels in the river by 39 percent.

Goals

- Develop an implementation plan to reduce fecal coliform levels with MPCA approval.
- Develop a fecal coliform stakeholder group.
- Hold public informational and outreach meetings.

Results that count

- The fecal coliform implementation plan was developed and received MPCA approval.
- A fecal coliform stakeholder group formed, consisting of 20 members.
- The project held three stakeholder meetings, two technical advisory committee meetings, and nine Joint Powers Board meetings

Stakeholders, local SWCDs and state agencies are working to reduce fecal coliform levels in the Pomme de Terre River, shown here one-half mile south of 60th Street in Swift County in western Minnesota.

Financial information

Funding type: CWLA
Grant amount: $8,500

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Redwood River/Lincoln County watershed restoration project continuation

The Redwood-Cottonwood Rivers Control Area (RCRCA) Joint Powers Organization received this grant to address the narrative goals in the "CWP phase I Redwood River implementation plan/diagnostic study" published in 1993. The purpose of this grant was to accomplish the activities of the final three years of a six-year implementation plan, following the success of the first three years.

The grant portion was broken down into technical assistance and a 75-percent cost-share of best management practices. Landowner matching funds of 25-percent per BMP totaled $15,875.57 by the end of the project.

Because of rising land values and cash grain prices, the project experienced a reduction in participation rates in 2006 and 2007. In concert, some of the projects initially used to gauge the need for this grant moved from treating the environmental problem to an expansion of production ag facilities. These expansions fell under mandated state rules and regulations, meaning they were ineligible for cost-share from this grant. Thus, the project failed to meet expected timelines and the state reduced the grant by $100,000.

Goals

- Bring 73 identified non-compliant septic systems into compliance.
- Implement 10 grassed waterways, 10 terraces, 24 sediment control basins, and four livestock operation pollution abatement projects.
- Continue to identify problem areas and implement additional non-point pollution controls, using state and federal programs.

Results that count

- Brought 14 non-compliant septic systems in to compliance, complementing the 82 implemented in the previous grant, and reducing 575 pounds of phosphorus per year from the Redwood River and Lake Benton.

Installation of a septic system in Lincoln county.

- Implemented eight sediment control basins, 12 acres of buffer strips, one alternative tile inlet, one outlet control structure, and one livestock operation water diversion, saving an estimated 153.7 tons of sediment and 177.52 pounds of phosphorus per year from entering the Redwood River system.
- Continued partnership to service Lincoln County through septic loans and non-point pollution reduction structure incentives.

Financial information

Funding type: CWP Grant
Grant amount: $145,421.27
Matching funds and in-kind: $63,340.11 matching funds and $108,992.74 loan
Total project cost: $317,754.12

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Watonwan River watershed project continuation

The Watonwan River watershed is 851 square miles in area (544,543 acres). The watershed lies in south-central and south-western Minnesota, and includes a major portion of Blue Earth, Watonwan, and Cottonwood counties and smaller portions of Jackson, Brown and Martin.

Water sample collection near the mouth of the Watonwan River (near Garden City) has been done consistently from 2000–2008. Flow data at the outlet monitoring site was provided by the USGS. Additionally, the efforts of an active and enthusiastic citizen's stream monitoring group have provided other stream water quality data from various stream sites up and down the watershed.

The project structure and management was comprised of a work group that included staff from the five county's SWCDs and Natural Resources Conservation Service (NRCS) offices working in the counties. Political leadership and staff turnovers affected the overall number of BMPs installed, causing a downward trend compared to the initial implementation project.

Goals

- Reduce pollutant loading from non-point source pollution through targeted, planned implementation of management strategies.
- Increase public awareness of water quality and water quantity issues throughout the watershed.
- Assess and evaluate project's effectiveness through stream water quality monitoring, land use management changes and tracking implementation of management strategies

Results that count

- 481 water quality related projects were completed, creating reductions of 4,107 tons/yr in soil loss, 8,899 tons/yr of sediment and a reduction in phosphorus of 15,703 lbs/yr.
- Twenty self-designed and determined school grants were supported during the project involving nine schools. There were thirteen educational events (county fairs, Green Saturdays, etc.) supported by the project. The prairie ecology bus was also sponsored as a part of the school grant program.
- Water quality and water quantity monitoring during the four year project indicated no increased or decreased trends in pollutant levels for bacteria, nitrate-nitrogen, total suspended solids and total phosphorus.

Financial information

Funding type: CWP Grant
Grant amount: $256,820.07
Matching funds and in-kind: $1,660,864.73
Total project cost: $1,917,684.80

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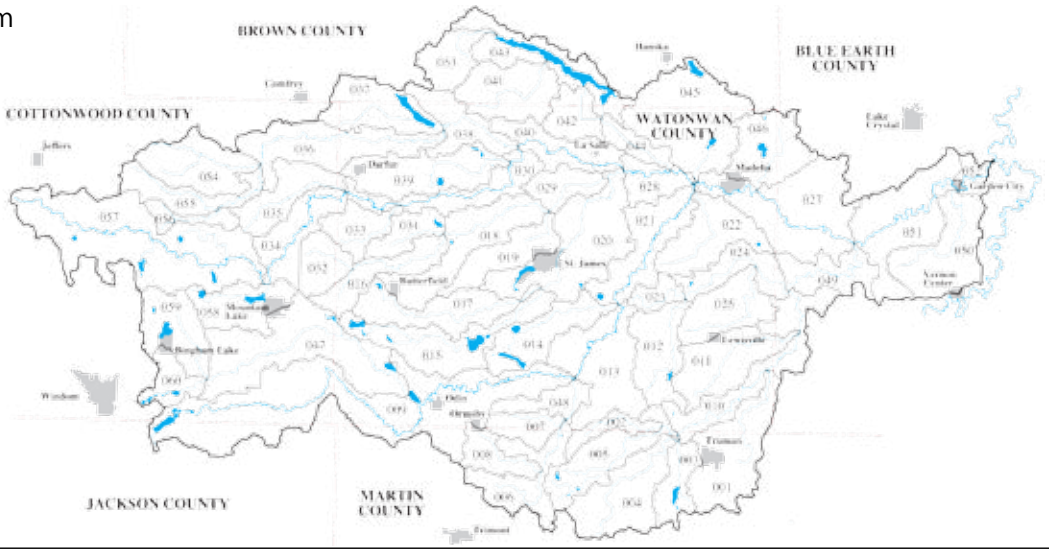
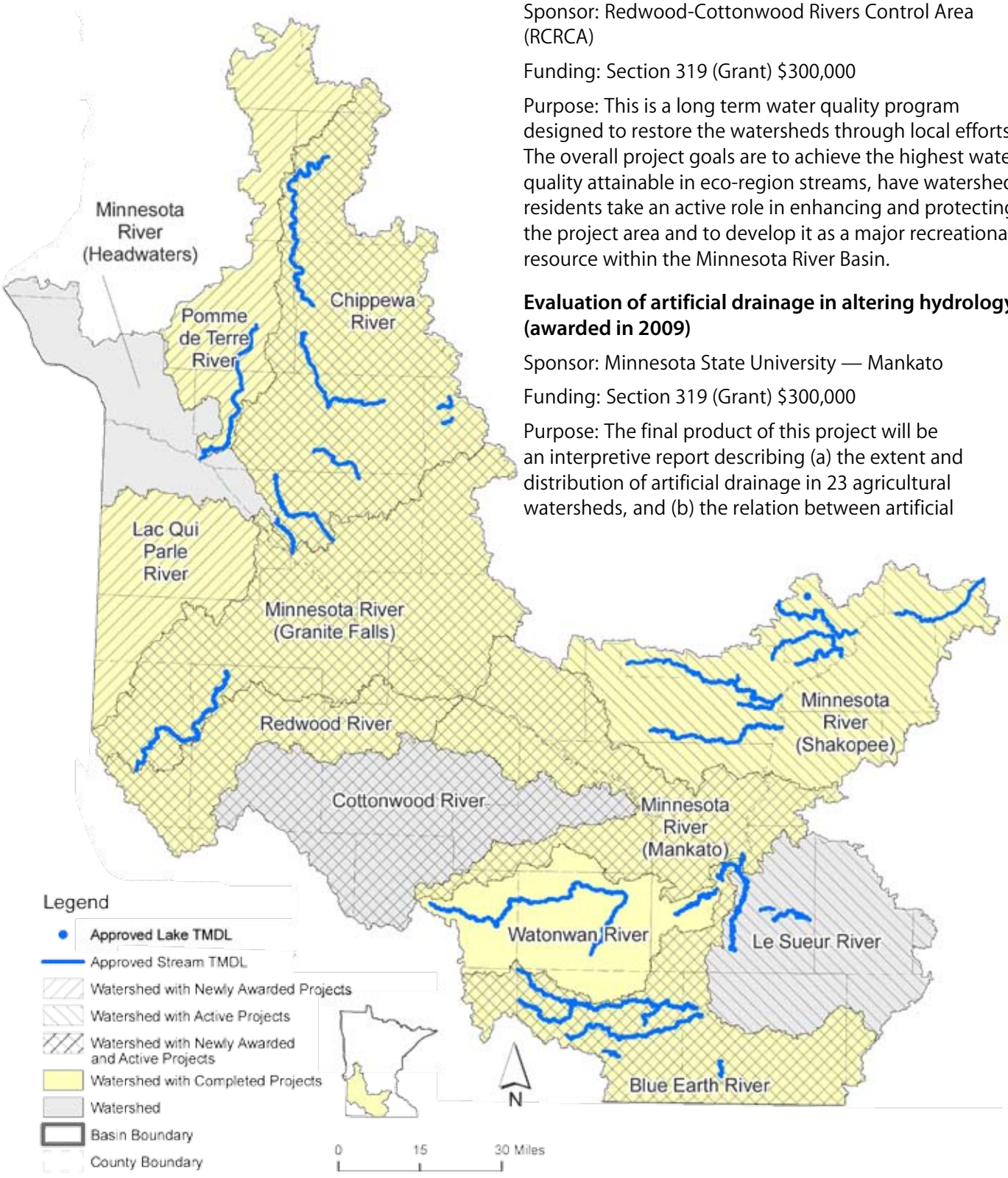
Watonwan River major watershed
Minor watersheds and ID numbers



Minnesota River Basin

Projects active and awarded in 2009



Projects involving multiple watersheds

Cottonwood/Redwood River project — 2008 (active in 2009)

Sponsor: Redwood-Cottonwood Rivers Control Area (RCRCA)

Funding: Section 319 (Grant) $300,000

Purpose: This is a long term water quality program designed to restore the watersheds through local efforts. The overall project goals are to achieve the highest water quality attainable in eco-region streams, have watershed residents take an active role in enhancing and protecting the project area and to develop it as a major recreational resource within the Minnesota River Basin.

Evaluation of artificial drainage in altering hydrology (awarded in 2009)

Sponsor: Minnesota State University — Mankato

Funding: Section 319 (Grant) $300,000

Purpose: The final product of this project will be an interpretive report describing (a) the extent and distribution of artificial drainage in 23 agricultural watersheds, and (b) the relation between artificial

drainage and changes in the hydrologic conditions in these 23 watersheds. The proposed outcomes from this project include:

1. Assessment of hydrologic changes from 1940 to present in 23 agricultural watersheds based on 14 hydrologic parameters.
2. Estimation of present day artificial drainage density in the same 23 agricultural watersheds using surveys of two surrogate metrics.
3. Quantitative comparison of the effect of artificial drainage and precipitation on hydrology.
4. Detailed quantification of trends in installation of artificial drainage using multiple assessment tools for six watersheds.
5. Analysis of relationship between temporal trends in artificial drainage density and changes in hydrology.
6. Analysis of model results to seek causal relations between climate, tiling, and runoff in a selected watershed.
7. Correlation between trends in artificial drainage and continuing increases in Lake Pepin sediment accumulation rates.

Middle Minnesota-Brown and Redwood Counties first order streams phase I diagnostic study (awarded in 2009)

Sponsor: Redwood- Cottonwood Rivers Control Area

Funding: CWP (Grant) $200,000

Purpose: The project area lies between two major watershed confluences, the Redwood and Cottonwood Rivers. This area has been included by designation as a part of the Middle Minnesota River Basin but for the most part been overlooked by major watershed initiatives. This phase 1 project will establish six long term monitoring sites, compile and analyze water quality data, develop an implementation plan that will prioritize each of the watersheds and implement BMPs geared to maintain or improve water quality and keep these first order streams off of the 303d list.

Redwood and Cottonwood Rivers watershed conservation and nutrient reduction projects (awarded in 2009)

Sponsor: Redwood-Cottonwood Rivers Control Area (RCRCA)

Funding: Section 319 (Grant) $253,440

Purpose: The goal of this project is to continue BMPs implementation according to the phase I implementation plan and implement phosphorus reducing conservation practices that will help achieve the Lower Minnesota River dissolved oxygen (DO) TMDL. This work plan is projected to reduce phosphorus reaching the Minnesota River by 1.139 tons annually or 911,683 pounds of aquatic plant growth annually (plus 1,960.50 tons of sediment). This grant will achieve the implementation goals through these objectives: 1. BMP technical assistance and implementation, and 2. Grant facilitation.

Blue Earth River Watershed

Blue Earth Basin small community stormwater management project - 2007 (active in 2009)

Sponsor: Faribault and Martin Counties

Funding: Section 319 (Grant) $91,000

Purpose: This project will concentrate on small, non MS4 communities within Faribault and Martin Counties where a need has been identified to assist small communities with improved stormwater management. The success of this project will be demonstrated through proactive and voluntary prevention and protection actions, and will be measured through the implementation and promotion of cost effective alternative stormwater strategies and solutions.

Blue Earth River channel modifications and nutrients in the Blue Earth River Basin — 2006 (active in 2009)

Sponsor: University of Minnesota

Funding: Section 319 (Grant) $296,060

Purpose: Advances the work begun by the Blue Earth River Basin Initiative to reduce levels of sediment, turbidity, and nutrients in the river to meet the goals of the TMDL being developed for the basin.

Dissolved oxygen TMDL application (awarded in 2009)

Sponsor: Greater Blue Earth River Basin Alliance

Funding: Section 319 (Grant) $108,000

Purpose: The goal of the project is to reduce the amount of sediment entering the Blue Earth and Le Sueur rivers by providing cost-share to landowners who wish to install agricultural BMPs designed to reduce erosion. By

reducing sediment, we will also reduce the phosphorus bound to the soil, thereby addressing the low DO problem identified in the Lower Minnesota River TMDL. The cost-share will be an incentive to landowners wishing to conserve their land. A healthier river system is the goal, which will increase the value of the river as a resource.

Greater Blue Earth River watershed BMPs focus on the Big Cobb — 2006 (active in 2009)

Sponsor: Greater Blue Earth River Basin Alliance

Funding: Section 319 (Grant) $299,988, CWP (Loan) $100,000

Purpose: Hire part time staff for public outreach and technical assistance. Provide cost-share for installation of conservation practices to reduce phosphorus from .26 lbs/acre to .21 lbs/acre and sediment from 200 lbs/acre to 180 lbs/acre by 2010. Evaluate BMP reduction of soil loss and phosphorus using eLINK, use existing monitoring data to evaluate changes in the water quality, and strengthen partnerships within the basin. News releases and updated web information will also be done.

Lily and Center Creeks — Blue Earth River Clean Water Partnership — 2006 (active in 2009)

Sponsor: Martin County

Funding: CWP (Grant) $450,000, CWP (Loan) $300,000

Purpose: This continuation project expands the activities of the original Center and Lily Creeks implementation project. Two technical positions are funded to promote all the conservation programs available to the Blue Earth Watershed and will assist with cost-share programs such as grassed waterways, filter strips, sediment control basins, tile intake buffers or conversions, alternative easements, and easements through CRP and EQIP. Septic-system upgrades are another part of this project. The grant also provides funds for water-quality monitoring and data analysis to assure effectiveness of improvements and get a better understanding of nonpoint-source water pollution in the area. Education activities such as newsletters, an annual canoe trip, community education classes, the Ecology Bus, and special projects that schools provide their students will continue.

Chippewa River Watershed

Chippewa River lower main stem sub-basin implementation project continuation — 2007 (active in 2009)

Sponsor: Chippewa County

Funding: CWP (Grant) $499,998, CWP (Loan) $375,000

Purpose: This project provides continued water-quality monitoring and data analysis, upgrading of individual septic systems, cost-share or incentive programs for buffer strips, shoreline naturalization projects, livestock exclusion, nutrient management, residue management, wetland restoration, water and sediment control basins, grassed waterways, streambank restoration/erosion control, terraces, and alternative tile inlets. Education activities to heighten awareness of local water quality, pollution, and proper BMPs will continue.

Dry weather/lines/spring creek sub-basin of the Chippewa River — 2006 (active in 2009)

Sponsor: Chippewa County

Funding: Section 319 (Grant) $264,100, CWP (Loan) $300,000

Purpose: Reduce nutrients, sediment and bacteria through tree plantings, nutrient and residue management, alternative tile intakes, septic system improvements, and nutrient insurance.

East Branch Chippewa River continuation project — 2006 (active in 2009)

Sponsor: Chippewa County

Funding: CWP (Grant) $175,000, CWP (Loan) $135,000

Purpose: Provides continued water-quality monitoring and data analysis, upgrading of individual septic systems, and cost-share or incentive programs for buffer strips, shoreline naturalization projects, livestock exclusion, nutrient management, residue management, wetland restoration, water and sediment control basins, grassed waterways, streambank restoration/erosion control, terraces, and alternative tile inlets. Education activities to heighten awareness of local water quality, pollution, and proper BMPs will continue.

Little Chippewa River implementation project — 2007 (active in 2009)

Sponsor: Chippewa County

Funding: CWP (Grant) $298,515, CWP (Loan) $300,000

Purpose: Funding for this project will be used to install agricultural BMPs, including shoreline naturalization/ stabilization, j-hook stream barbs, sediment blocks, cattle exclusion, grass buffers/filters, nutrient/manure management, grassed waterways, terraces, ag waste management systems, wetland restoration, alternative tile inlets, stormwater practices, septic-system upgrades, and other technical assistance. This grant will also fund continued water-quality monitoring and data assessment and will continue information and education activities, especially for appropriate BMPs.

Red Rock Lake watershed BMP project — 2007 (active in 2009)

Sponsor: Douglas Soil and Water Conservation District

Funding: Section 319 (Grant) $25,350

Purpose: Red Rock Lake is a shallow 708 acre lake located in Douglas County, west of Alexandria. This project will attempt to reduce nutrient loading and fecal coliform levels in the Red Rock Lake watershed. Funding will be made available to livestock producers within the watershed for fencing, alternative water sources, and reseeding degraded shoreline. Priority will be given based on the proximity to the lake, current farming practices, and risk potential of contributing fecal coliform, sediment, and/or phosphorous to the water body.

Shakopee Creek headwaters project (SCHP) continuation — 2005 (active in 2009)

Sponsor: Kandiyohi County

Funding: CWP (Grant) $254,346; CWP (Loan) $200,000

Purpose: Continue information and education, water quality monitoring and evaluation, BMPs promotion and implementation and project administration.

Shakopee Creek Headwaters Project (SCHP) continuation (awarded in 2009)

Sponsor: Kandiyohi County

Funding: CWP (Grant) $222,241; CWP (loan) $450,000

Purpose: The focus of this project is on implementing practices or techniques that prevent or reduce nonpoint source pollution in the watershed to reach surface water quality standard goals. This project will monitor the water quality of the streams and lakes in the Shakopee Creek Watershed. The SCHP will partner with other agencies and individuals to encourage the installation or adoption of best management practices (BMPs) such as buffer strips, livestock exclusions, alternative tile intakes, watershed-wide septic system upgrades and lakeshore naturalizations. The project will participate in activities to educate the public about the quality of the watershed's resources and the implications that their actions can have on the area's lakes and streams.

Upper main stem Chippewa River project continuation (awarded in 2009)

Sponsor: Chippewa County

Funding: CWP (Grant) $251,474; CWP (Loan) $100,000

Purpose: This continuation project will work to abate or prevent nonpoint source pollution by implementing agricultural BMPs that were begun in the upper main stem Chippewa River work plan, adding rain gardens and manure management plans. This project will continue the ongoing monitoring component for the upper main stem Chippewa River. Education outreach efforts will also be continued to inform citizens in the watershed of the ongoing project activities and their impact on watershed water quality and quality of life.

Cottonwood River Watershed

Cottonwood River watershed non-point pollution reduction project — 2007 (active in 2009)

Sponsor: RCRCA

Funding: Section 319 (Grant) $300,000

Purpose: The goal of this project is to continue best management implementation according to the Cottonwood River phase I implementation plan approved in 1999 and implement phosphorus reducing conservation practices that will help achieve the Lower Minnesota River DO TMDL. This work is projected to reduce phosphorus reaching the Minnesota River by 3.47 tons annually or 2,776,064 pounds of aquatic plant growth annually (plus 2,504.41 tons of sediment).

Cottonwood River watershed phosphorus reduction project — 2005 (active in 2009)

Sponsor: RCRCA

Funding: Section 319 (Grant) $290,000

Purpose: Upgrade septic systems, restore stream banks and create grassed waterways, terraces and sediment control basins.

Little Cottonwood River restoration project continuation — 2005 (active in 2009)

Sponsor: Brown, Nicollet and Blue Earth Counties

Funding: CWP (Grant) $157,696, CWP (Loan) $150,000

Purpose: Continue funding staff positions responsible for targeting, marketing, creating relationships and enrolling environmentally sensitive agricultural lands into state and federal programs. Nutrient management demonstrations, EQIP funding for polluting feedlots, and upgrading noncompliant septic systems are also priorities for this project. Continued watershed monitoring, data analysis, maintaining an interactive watershed Web site, newsletters, and other educational efforts will round out the work of this continuation project.

Lac qui Parle River Watershed

Lac qui Parle River main stem water quality enhancement project continuation (awarded in 2009)

Sponsor: Lac qui Parle-Yellow Bank Watershed District

Funding: CWP (Grant) $280,150; CWP (Loan) $512,000

Purpose: This continuation project focuses on several practices designed to enhance water quality. These BMPs include filter/buffer strips, grass waterways, streambank restorations, terraces, diversion, alternative tile inlets, water and sediment control basins, feedlot upgrades and special urban projects. In order to raise citizen awareness of the degraded state of the rivers, education opportunities and outreach materials will be provided that will increase implementation of BMPs including newsletters, promotional material, and advertising. A network of monitors will continue to provide stream monitoring data throughout the watershed. The low interest loan program will continue throughout the watershed to upgrade out of compliance septic systems.

Le Sueur River Watershed

Lower Maple River watershed project — 2006 (active in 2009)

Sponsor: Blue Earth County

Funding: CWP (Grant) $474,100, CWP (Loan) $100,000

Purpose: Funding for this project will be used for cost-share in installing rock inlets, grass buffers, terraces, waterways, sediment basins, harvestable buffer strips, crop residue management, nutrient management, septic-system upgrades and other technical assistance. This grant will also fund continued water-quality monitoring, data assessment and macroinvertebrate sampling, and will continue information and education activities, especially for appropriate BMPs and education for tomorrow's water-quality stakeholders.

Minnesota River — Granite Falls Watershed

Hawk Creek watershed accelerated phosphorus reduction effort (awarded in 2009)

Sponsor: Renville County — Hawk Creek Watershed Project (HCWP)

Funding: Section 319 (Grant) $148,525

Purpose: The mission of the HCWP is to implement land use changes that will improve the water quality and quantity issues in the watershed, while also promoting a healthy agricultural, industrial, and recreation-based economy for the Minnesota River region. Specific goals for the Hawk Creek Watershed are based on sampling results, watershed assessments, and reasonable expectations regarding the condition of rivers and streams in this region of the state, as described in a diagnostic study completed in 1999. This project will focus on implementation of BMPs that reduce phosphorus in agricultural and urban areas. Eligible BMPs include, but are not limited to: terraces, waterways, sediment retention basins, buffer strips, alternative intakes, wetland restorations, side inlet controls, livestock exclusions, waste storage facilities, feedlot runoff controls, and urban runoff practices such as rain gardens and other practices.

Hawk Creek watershed project continuation (Minnesota River) — 2008 (active in 2009)

Sponsor: Renville County

Funding: CWP (Grant) $180,839

Purpose: Continue to reduce erosion and nutrient loading in the Hawk Creek watershed by enrolling riparian areas into the reinvest in Minnesota program, improving agricultural drain-tiling systems, developing alternative tile inlet projects, installing buffer strips, supporting drainage ditch bank stabilization and implementing other priority BMPs. This project also continues water quality monitoring activities from previous projects to evaluate the effectiveness of BMPs. Educational activities include the recruitment and support of watershed assessment teams and coordination of promotional events, displays, tours and demonstrations.

Hawk Creek watershed project continuation (Minnesota River) — 2008 (active in 2009)

Sponsor: Renville County

Funding: CWP (Grant) $177,437

Purpose: Continue to reduce erosion and nutrient loading in the Hawk Creek watershed by enrolling riparian areas into the Reinvest in Minnesota Program, improving agricultural drain-tiling systems, developing alternative tile inlet projects, installing buffer strips, supporting drainage ditch bank stabilization and implementing other priority BMPs. This project also continues water quality monitoring activities from previous projects to evaluate the effectiveness of BMPs. Educational activities include the recruitment and support of watershed assessment teams and coordination of promotional events, displays, tours and demonstrations.

Hawk Creek watershed project "Hawk TMDL" continuation (awarded in 2009)

Sponsor: Renville County

Funding: CWP (Grant) $151,809

Purpose: This project will continue the technical assistance for resource assessments and installation of BMPs including, livestock waste management systems, filter strips, grassed waterways, nutrient & residue management plans, livestock exclusions, alternative tile intake systems, terraces, and wetland restorations. Monitoring on a regular basis will continue to provide important baseline data as well as information to show pollutant reduction progress. This continuation project also includes the recruitment and support of watershed assessment teams, such as the citizen monitoring network, the coordination of promotional events, displays, tours, demonstrations and staff training and administration activities for the overall coordination of local activities.

Hawk Creek watershed project — 2006 (active in 2009)

Sponsor: Renville County

Funding: Section 319 (Grant) $300,000, CWP (Loan) $900,000

Purpose: Implement practices to reduce phosphorus: Promote alternative tile intakes, improve septic systems, develop ditch buffers, urban storm water management, and education.

South Branch of the Yellow Medicine River TMDL fecal coliform reduction project — 2007 (active in 2009)

Sponsor: Yellow Medicine River Watershed District

Funding: Section 319 (Grant) $238,500

Purpose: The South Branch of the Yellow Medicine River is impaired for swimming. A study revealed frequent violations of state water quality standards for fecal coliform bacteria. The fecal coliform concentrations within this reach of the Yellow Medicine River pose an unacceptable health threat to human body contact recreation. The goal is to reduce the fecal coliform concentrations to healthy levels through manure management, ISTS management, urban stormwater management, and stream buffer initiative.

Yellow Medicine watershed dissolved oxygen project — 2007 (active in 2009)

Sponsor: Lyon Soil and Water Conservation District

Funding: Section 319 (Grant) $31,150

Purpose: One significant water quality risk in the Minnesota River Basin is phosphorus, which encourages algae growth that results in lower DO levels. Here, 14 percent of the phosphorus comes from the runoff from agricultural cropland. During low-flow conditions, there is little rainfall and most rainwater soaks in rather than running off the land. Although large reductions of phosphorus from this source cannot be achieved during low-flow conditions, our project will work to install

practices such as sediment control basins and buffer areas along water courses to improve the water quality during periods of run-off.

Minnesota River— Mankato Watershed

Crystal, Loon Mills implementation program — 2007 (active in 2009)

Sponsor: City of Lake Crystal

Funding: CWP (Grant) $210,500

Purpose: This implementation project targets phosphorus transport reductions from the watershed to the lakes by implementing agricultural BMPs, such as wetland stabilizations, buffer strips, open tile intake alternatives, nutrient management, cover crops for canning ground, shoreland stabilization and promoting non-compliant septic system upgrades. Effectiveness monitoring will assess changes in water quality. Education-based activities will include workshops, tours, demonstrations, newsletters, brochures, surveys and displays that focus on residue management, tillage practices, nutrient management and manure management.

Seven Mile Creek glacial sediment fingerprinting — 2006 (active in 2009)

Sponsor: Brown-Nicollet-Cottonwood Water Quality Board

Funding: Section 319 (Grant) $84,930

Purpose: Determine what portion of sediment and nutrient pollution in Seven Mile Creek is due to such natural processes as stream-bank erosion.

Seven Mile Creek watershed project continuation — 2005 (active in 2009)

Sponsor: Brown, Nicollet and Cottonwood Counties

Funding: CWP (Grant) $225,812; CWP (Loan) $395,000

Purpose: Continue information, education and outreach, water quality monitoring and assessment, BMPs promotion and implementation and project administration.

Minnesota River (Shakopee) Watershed

Carver, Bevens and Silver Creek fecal coliform TMDL implementation plan — phase II — 2008 (active in 2009)

Sponsor: Carver County Land and Water

Funding: Section 319 (Grant) $148,420

Purpose: To continue work begun in phase I — including bringing into compliance up to 100 direct discharge SSTSs, install 26 miles of buffer strips, install 80 alternative tile intakes, and write 15 manure management plans in the targeted sub-watershed areas of Carver, Bevens and Silver Creek watersheds.

Carver, Bevens and Silver Creek watershed fecal coliform TMDL implementation plan — 2007 (active in 2009)

Sponsor: Carver County

Funding: Section 319 (Grant) $300,000

Purpose: Carver, Bevens, and Silver Creeks have been placed on Minnesota's list of impaired waters (303d) for fecal coliform. The goal of the TMDL is to quantify the pollutant reductions needed to meet the water quality standards for fecal coliform. An implementation plan was developed to achieve the state standard for fecal coliform. The top priorities are to update, identify, and bring into compliance up to 100 direct discharge ISTSs, install 26 miles of buffer strips, install 80 alternative tile intakes, and write 15 manure management plans.

Carver County turbidity and excess nutrients TMDL project — 2005 (active in 2009)

Sponsor: Carver County

Funding: Section 319 (Grant) $179,800

Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop total maximum daily loads for turbidity and excessive nutrients.

High Island Creek implementation project continuation) — 2008 (active in 2009)

Sponsor: Sibley County

Funding: CWP (Grant) $500,00; CWP (Loan) $500,000 loan

Purpose: This project continues activities related to the installation, planning and design of BMPs in the watershed, with funding which includes cost-share monies, incentive payments and loan dollars. This project will continue the water quality and quantity monitoring plan established during the diagnostic study. It will also include additional watershed monitoring (streambank and aquatic surveys) to further define priority areas. This project will continue activities related to education and

outreach, including workshops, brochures, surveys, displays, tours, demonstrations and newsletters. This project will provide GIS analyses to estimate potential sediment and nutrient reductions of BMPs. Monitoring data will be evaluated to examine trends in sediment and nutrient concentrations and loads. Agricultural surveys will be utilized to evaluate the effectiveness of educational based activities. Septic system loans will be provided for systems in need of upgrade.

Lower Minnesota River low flow dissolved oxygen TMDL — 2007 (active in 2009)

Sponsor: RCRCA

Funding: Section 319 (Grant) $150,000

Purpose: The implementation phase of this project will facilitate watershed land-use changes that will lead to reductions necessary to meet state goals. The locally developed Implementation Plans for the Redwood River and the Cottonwood River were created to direct restoration activities in the watersheds until individual TMDL(s) are created and approved. The goal of this project is to continue best management implementation according to the Phase I Implementation Plans and implement phosphorus reducing conservation practices. Activities in this work plan are projected to reduce phosphorus reaching the Minnesota River by 2 tons annually or 1,601,200, pounds of aquatic plant growth annually (plus 2,354.70 tons of sediment).

Middle Minnesota watershed implementation of conservation practices and effectiveness monitoring — 2007 (active in 2009)

Sponsor: Brown, Nicollet, Cottonwood Water Quality Joint Powers Board

Funding: CWP (Grant) $269,720; CWP (Loan) $500,000

Purpose: This project involves three objectives. The first objective will assist local landowners to implement targeted BMPs by funding a technical service representative and conservation liaison. Targeted BMPs include Conservation Reserve Enhancement Program and Conservation Reserve Program practices, wetland restorations, septic system upgrades, conservation tillage and alternative crops. Objective two will continue effectiveness monitoring of the recent conservation practices. The final objective will develop and compare conservation targeting tools for the watershed, in order to determine the most efficient strategy for implementing conservation practices.

Rush Lake watershed implementation project continuation (Minnesota River) — 2008 (active in 2009)

Sponsor: Sibley County

Funding: CWP (Grant)$500,000; CWP (Loan) $500,000

Purpose: This project continues activities related to the installation, planning and design of BMPs in the watershed, with funding which includes cost-share monies, incentive payments and loan dollars. This project will continue the water quality and quantity monitoring plan established during the diagnostic study. It will also include additional watershed monitoring (streambank and aquatic surveys) to further define priority areas. This project will continue activities related to education and outreach, including workshops, brochures, surveys, displays, tours, demonstrations and newsletters. This project will also provide GIS analyses to estimate potential sediment and nutrient reductions of BMPs. Monitoring data will be evaluated to examine trends in sediment and nutrient concentrations and loads. Agricultural surveys will be utilized to evaluate the effectiveness of educational based activities. Septic system loans will be provided for systems in need of upgrade

Sand Creek watershed TMDL and impaired waters resource investigation — 2007 (active in 2009)

Sponsor: Scott County Watershed Management Organization

Funding: CWP (Grant) $277,150

Purpose: This project will compile watershed information, such as land cover, feedlot locations, geomorphology, drained wetland inventories, erosions surveys, collect two years of water quality data, develop water quality models and complete a diagnostic study and implementation plan for Sand Creek.

Pomme de Terre River Watershed

Pomme de Terre fecal coliform implementation plan (awarded in 2009)

Sponsor: Pomme de Terre Watershed Project

Funding: Section 319 (Grant) $286,322

Purpose: The long term goal of the fecal coliform implementation plan is to reduce the amount of bacteria entering the Pomme de Terre River and its tributaries to

levels that enable it to be removed from 303(d) impaired waters list. The objective of this monitoring plan is to evaluate effectiveness of BMP projects implemented under this Section 319 grant, and the impact on the E. coli levels in the Pomme de Terre River.

Redwood River Watershed

Interpreting a century of sediment in Redwood Lake — 2006 (active in 2009)

Sponsor: RCRCA

Funding: Section 319 (Grant) $89,140

Purpose: Redwood Lake is filled with up to 27 feet of sediment that has accumulated behind the dam in Redwood Falls, and has been proposed for dredging and restoration. This project will sample the sediment to help analyze the long-term impacts of land use on water resources.

Redwood River watershed phosphorus TMDL compliance project continuation — 2007 (active in 2009)

Sponsor: RCRCA

Funding: CWP (Grant) $400,000, CWP (Loan) $900,000

Purpose: This project continues current activities for water quality monitoring and assessment, upgrading non-compliant individual septic systems, providing cost share funds and technical assistance for agricultural best management practices and other conservation practices. It will also coordinate information and education activities.

Rainy River Basin

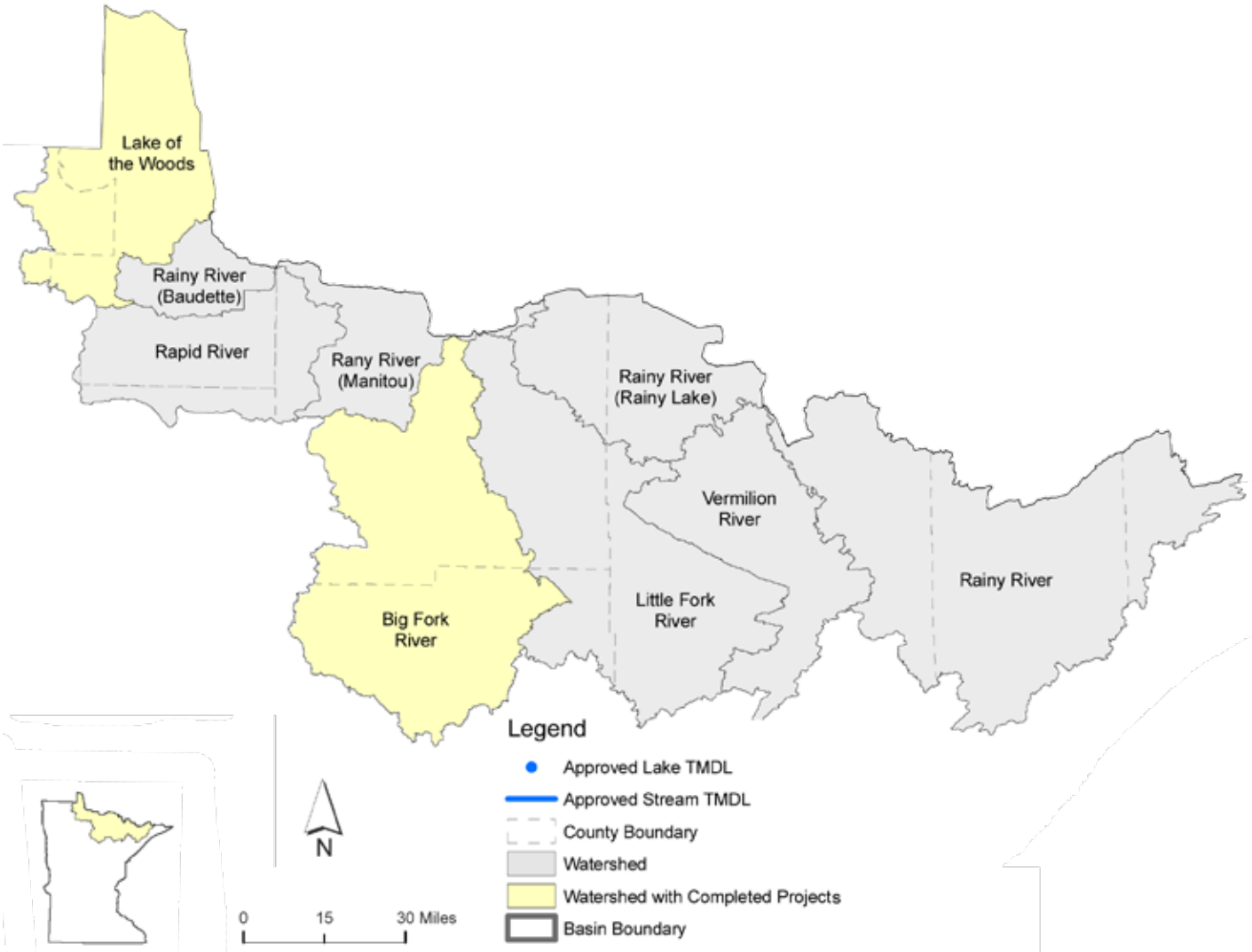
Projects completed

Big Fork River Watershed

Jessie Lake watershed TMDL project

Lake of the Woods Watershed

Rainy River Basin International Lake of the Woods water quality forum



Jessie Lake watershed TMDL project

Jessie Lake has experienced severe episodes of poor water quality over the past 10 years exceeding levels that should be reasonably expected, given its size, depth, watershed size, and ecoregion. To better understand the situation, water quality testing was conducted and the water quality was found to be extremely poor for Jessie Lake. During 1998, thick algal blooms discouraged fishing and recreation on the lake and resulted in a summer fish kill due to diminished oxygen levels. These events during the summer of 1998 triggered serious concerns from both lake users and resource managers.

The culmination of these events led to a CWP grant comprehensive nutrient diagnostic study for Jessie Lake watershed. The results from the study show: (A) that this is an extremely sensitive lake from a nutrient-eutrophication perspective; (B) the lake has historically received a succession of cumulative impacts from logging, agriculture, and development; (C) the lake has significant and worsening internal phosphorus loading from its sediments; (D) the lake is polymictic from both a temperature and oxygen perspective leading to increased internal loading rates; and (E) the lake can be improved significantly over time, through reductions in external and internal phosphorus sources.

In 2004, Jessie Lake was listed on the Federal CWA 303(d) list of impaired waters for aquatic recreation due to excess nutrients. This project involved developing a TMDL for nutrients for Jessie Lake based on results of the CWP phase I study and guidance from the technical advisory committee.

Goals

- Assemble available information and develop webpage to display data.
- Reestablish the technical advisory committee.
- Develop a request for proposals to complete the Jessie Lake TMDL.

Results that count

- Webpage developed and data/reports compiled — available to the public: www.itascaswcd.org/Jessie_Lake_TMDL.htm.
- The technical advisory committee refocused and is confident in making the necessary decisions to complete the Jessie Lake TMDL.
- Request for proposals developed and applicant selection process already completed. Contracts currently being worked on.

Financial information

Funding type: Section 319 Grant
Grant amount: $23,000

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Rainy River Basin International Lake of the Woods water quality forum

Funds were provided to St. Cloud State University to accomplish two sets of goals and a series of tasks. The first goal involved the gathering and compiling of U.S. and Canadian water quality information dealing with systems in the Lake of the Woods watershed. Information compiled was to be aggregated into a database for future augmentation and use in constructing a nutrient mass balance estimate for Lake of the Woods. This estimate was to focus particularly on phosphorus inputs into the system. The second goal involved the administrative sponsorship of the 2008 International Lake of the Woods water quality forum.

Goals

- Gather historical phosphorus concentration and flow data for all sites with direct input into Lake of the Woods or the Rainy River and enter data into an Access database.
- Determine data gaps and submit a report to the MPCA including database and listing of the data gaps and recommendations for additional data needed to populate and run mass balance analysis for phosphorus loading to Lake of the Woods.
- Administration and reporting of Lake of the Woods water quality forum.

Results that count

- "Data mining" was conducted using existing publicly available data sources including US EPA (STORET), USGS, MPCA, DNR, Environment Canada, and the Lake of the Woods Foundation. Data was not able to be obtained from Gartner Lee Ltd., which has an ongoing nutrient modeling project involving Lake of the Woods.
- Environment Canada produced a preliminary phosphorus mass balance model for presentation at the 2008 Lake of the Woods Forum. The authors were asked for the data and agreed to provide it, but have failed to do so after repeated requests. Data for this analysis may be present in information gathered from Environment Canada's public database, but this is not known for certain. In each of these instances efforts will continue beyond the duration of this contract to acquire these datasets. Data harvested was compiled into an access database.

Rainy River basin coordinator Nolan Baratono offered Lake of the Woods Forum attendees insights into international and inter-agency partnerships.

- Submitted a report to the MPCA including database and listing of the data gaps and recommendations for additional data needed to populate and run mass balance analysis for phosphorus loading to Lake of the Woods

Financial information

Funding type: Environmental Fund
Grant amount: $17,500

Contact information

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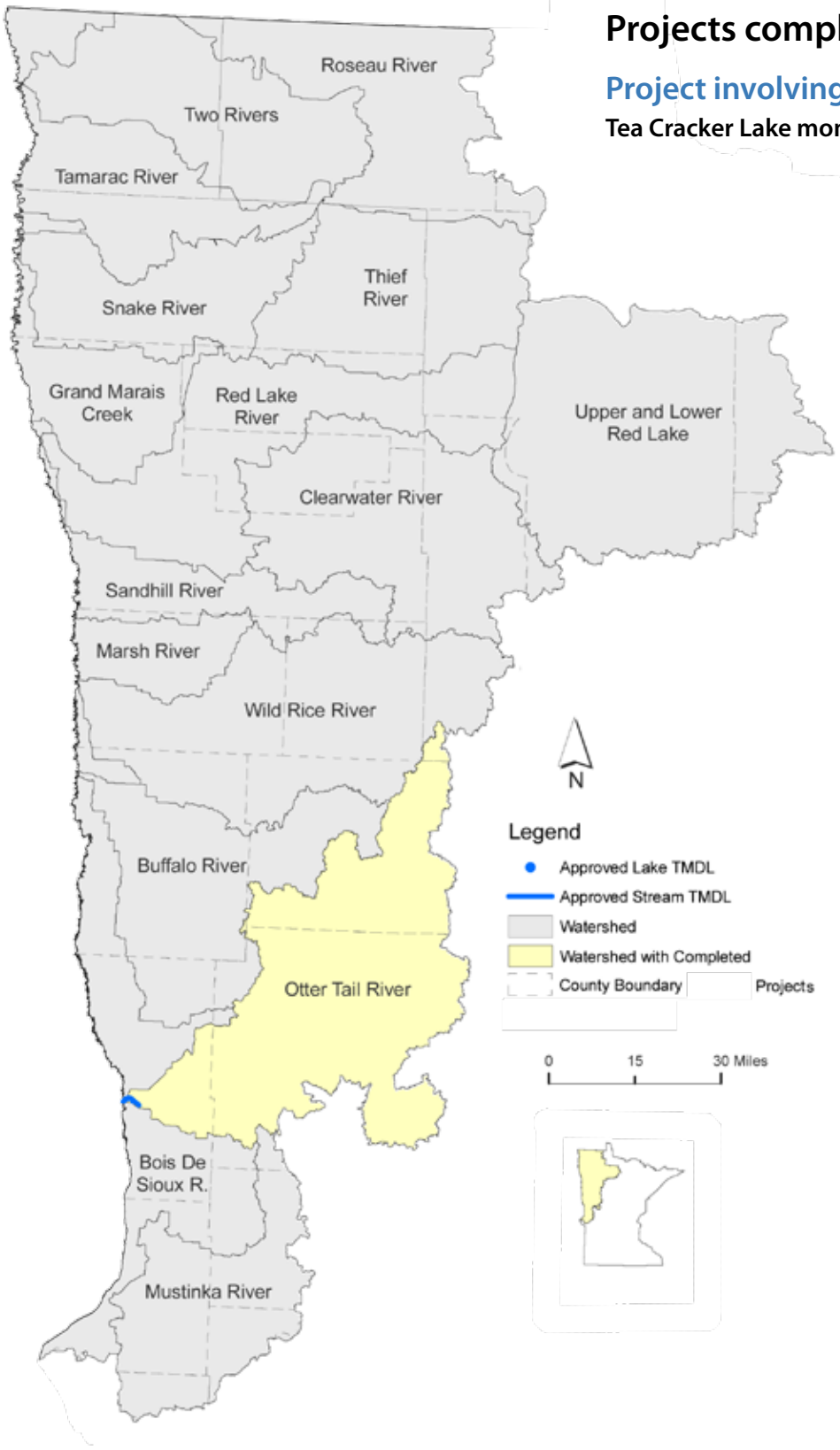
Red River Basin

Projects completed

Project involving multiple watersheds

Tea Cracker Lake monitoring study



Tea Cracker Lake, Becker County.

Tea Cracker Lake monitoring study

This report provides baseline data on the biological and physical characteristics of Tea Cracker Lake, Becker County, to determine the long-term effects of development along the shoreline and in the watershed.

The surface area of Tea Cracker Lake is relatively small — 122 acres — and the lake is protected from intense wind action by surrounding topography and vegetation. Development in the watershed has the potential to substantially alter the littoral zone due to erosion and runoff carrying nutrients and/or pollutants into the lake. A shallow zone partitions Tea Cracker Lake into a north and a south basin with potentially different water chemistry and biotic communities. Data from the lake will provide the state and county the opportunity to track changes in water quality, shoreline characteristics, and overall ecology as a result of the cumulative impacts of change.

Detailed analysis of several biological and physical components of the lake has not been performed to date and is the basis for this study. This work fits several categories of interest to the MPCA, including monitoring, special reports/studies, protection strategy, and emerging issues. The study is a cooperative effort between the MPCA, Bemidji State University (BSU), Becker County, White Earth Indian Reservation Department of Natural Resources (WEDNR), and the Tamarac National Wildlife Refuge (TNWR). Project management has been provided by Bemidji State University Faculty and the MPCA.

Goals

- Provide a baseline of data relating to water quality, shoreline characteristics, zooplankton and aquatic macrophyte populations.
- Work cooperatively with local resource agencies.
- Establish erosion model with targets for minimizing water quality degradation.

Results that count

- Data was collected and analyzed for water quality parameters, zooplankton populations, aquatic vascular plant populations, tree falls and erosion sites.
- Cooperative working relationship has been developed between MPCA, BSU, WEDNR, and TNWR, and Becker County.
- Universal soil loss equation was calibrated for the watershed of Tea Cracker Lake and a protection level for soil erosion was established.

Financial information

Funding type: CWLA and Environmental Fund
Grant amount: $30,000.00

Contact information

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Red River Basin

Projects active and awarded in 2009

Buffalo River Watershed

Buffalo Red River watershed (BRRWD) sediment modeling for BMP implementation — 2007 (active in 2009)

Sponsor: Buffalo Red River Watershed District

Award: Section 319 (Grant) $30,940

Purpose: Under another grant, a computer model, the annualized Agricultural Non-Point Source Model (annAGNPS), was developed for estimating the amount of sediment leaving the landscape, reaching the waterways, and accumulating in the South Branch of the Buffalo River. The focus of this study is to expand upon the work. The annAGNPS computer model will be used to develop sediment water quality goals, and practical measures to achieve these goals, for the entire BRRWD.

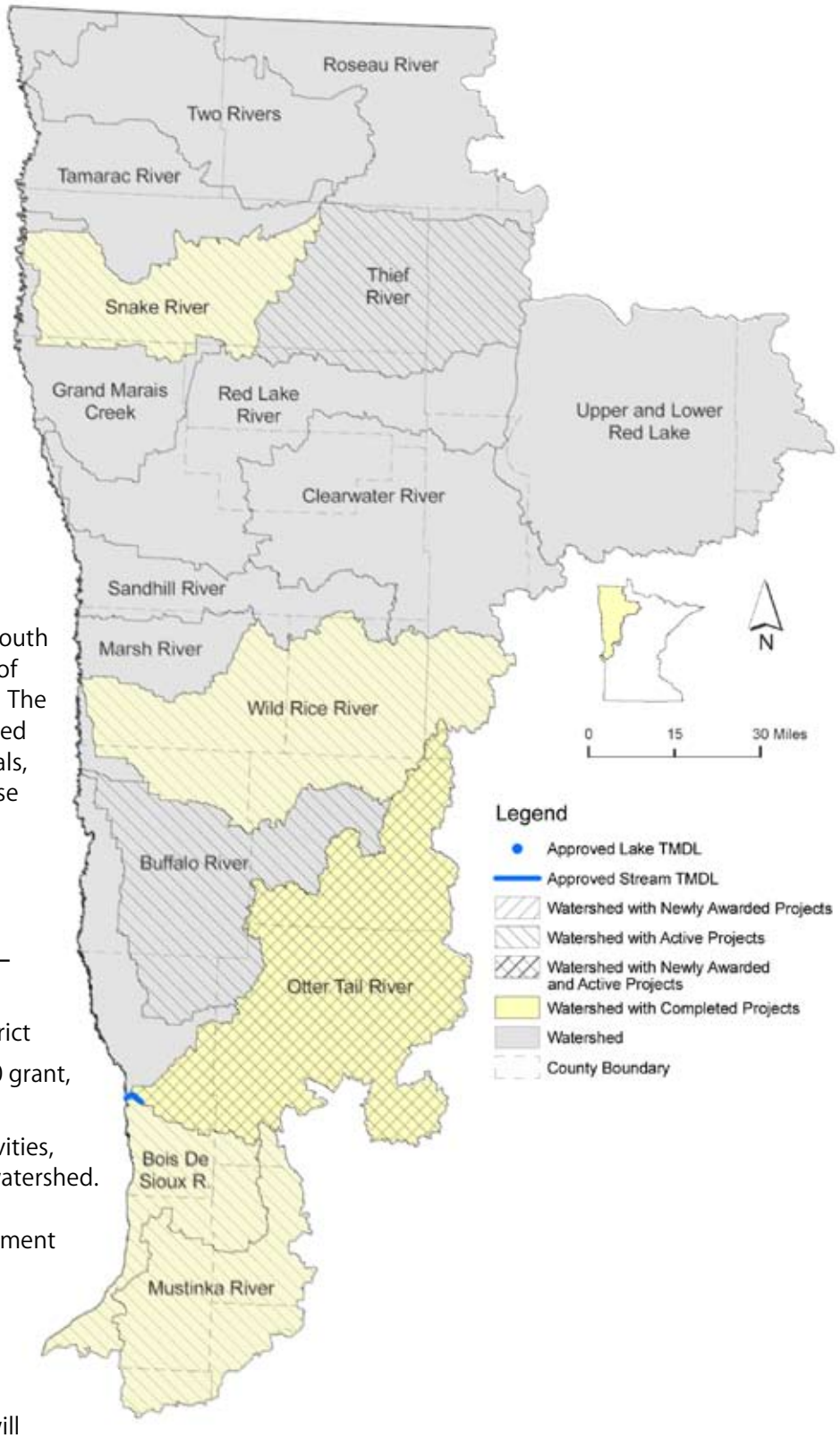
Otter Tail River Watershed

Detroit Lake water-quality improvement nutrient reductions — 2006 (active in 2009)

Sponsor: Pelican River Watershed District

Funding: CWP (Grant) Award: $50,000 grant, $450,000 loan

Purpose: To enhance educational activities, monitoring, and data analysis in the watershed. Emphasis is on nutrient and sediment reductions, identifying methods, treatment options, designs and implementation. Sites will be determined for grazing and feedlot management practices, stormwater treatment, biomass reductions, and aquatic plant management. Cost-share incentives will be provided for shoreline restorations and improved erosion and sediment control.



Lower Otter Tail River sediment reduction project — 2008 (active in 2009)

Sponsor: Wilkin Soil and Water Conservation District

Funding: Section 319 (Grant) $100,000

Purpose: The project is a continuation of our 2006 Clean Water Legacy restoration project which addresses turbidity in the Lower Otter Tail River. The objective of this grant is to reduce sedimentation in the Otter Tail River through education, cultural and structural best management practices. We will target four sediment sources identified in the TMDL approved plan. They are wind erosion, water erosion, streambank erosion, and in-stream erosion.

Lower Otter Tail River sediment reduction project — 2008 (awarded in 2009)

Sponsor: Wilkin Soil and Water Conservation District

Funding: Section 319 (Grant) $100,000

Purpose: The MPCA has listed a stream reach, Assessment Unit ID (AUID) 09020103-502, in the Lower Otter Tail River (LOTR) as impaired for exceeding the turbidity standard for aquatic life, which is currently set at 25 Nephelometric Turbidity Units (NTU). The goal of this project is to reduce turbidity levels in the Otter Tail River by reducing sediment and erosion by 2,000 tons per year in the project area.

Thief River Watershed

Thief River watershed sediment investigation (Red River) — 2007 (active in 2009)

Sponsor: Red Lake Watershed District

Award: CWP (Grant) $96,500

Purpose: This study will perform investigative water quality, sediment and flow monitoring, as well as data analysis, at up to 11 sites to diagnose the impact of hydrologic modification, other anthropogenic and natural factors influencing water quality in the Thief River watershed. This study will also develop a diagnostic study and implementation plan to address impairments discovered in the watershed.

St. Croix River Basin

Projects completed

Projects involving multiple watersheds

Updating land cover & impervious surface maps of the Twin Cities Metro Area & St. Croix River Basin

St. Croix River (Stillwater) Watershed

Carnelian Marine St. Croix watershed district 12 lakes TMDL project

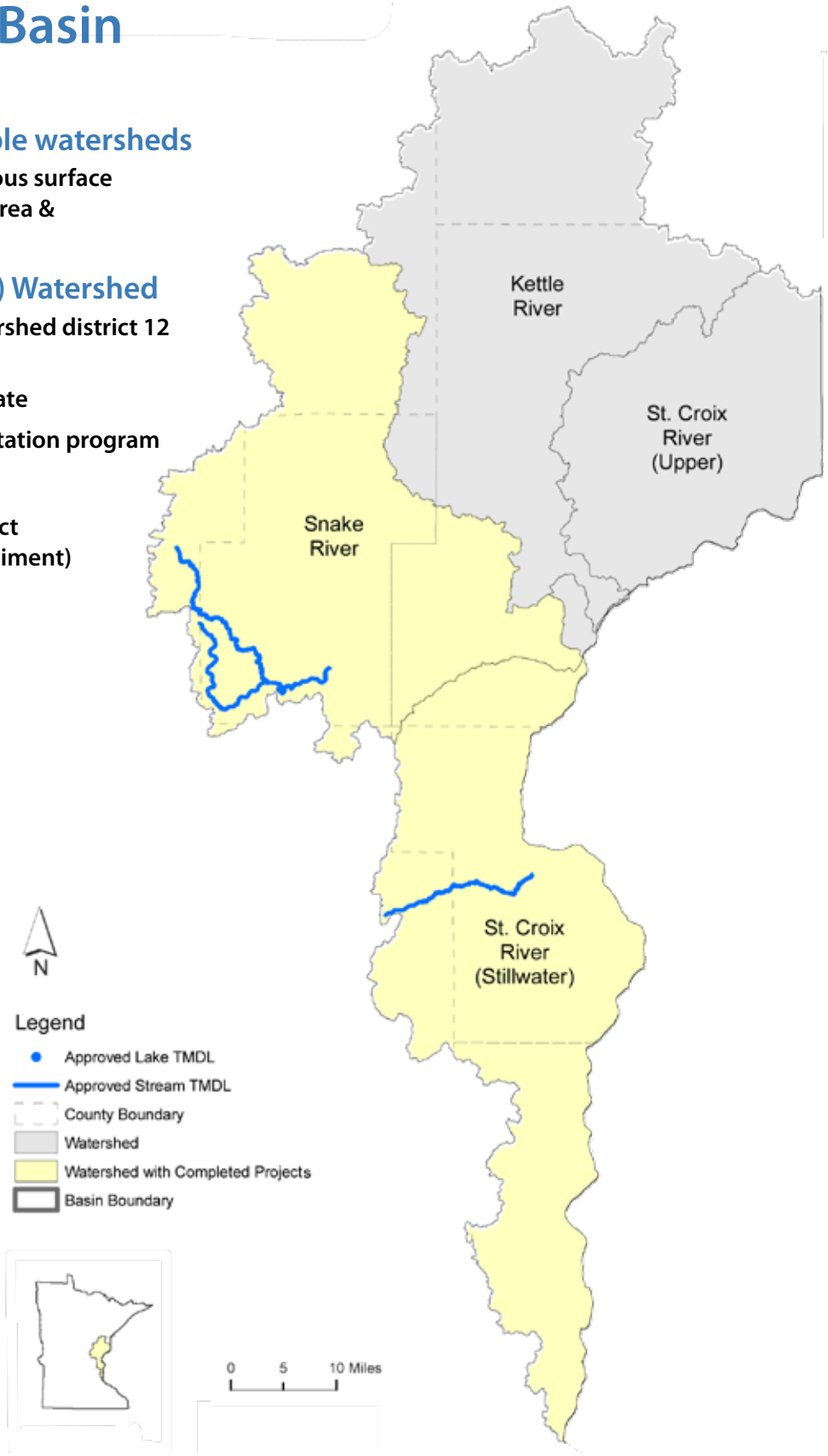
Typo & Martin Lakes TMDL update

Valley Creek repair and rehabilitation program

Snake River Watershed

Groundhouse River TMDL project for fecal coliform and biota (sediment) impairments

Groundhouse River watershed TMDL project



Updating land cover & impervious surface maps of the Twin Cities Metro Area (TCMA) & St. Croix River Basin

Minnesota is undergoing rapid land use and land cover changes. Current data are needed to update land cover and impervious maps for inputs to land and water resource management. The most recent previous classification of this area was with 2002 imagery of the TCMA and 2000 for statewide.

This project uses recent (2007) Landsat Thematic Mapper (TM) imagery to generate land cover and impervious surface area classifications of the counties of the Minneapolis-St. Paul Metropolitan statistical area and the St. Croix River Basin of Minnesota and Wisconsin. The classifications include agricultural cropland, forest, wetland, shrubland, grassland, water and wetland as level 1 classes with more specific level 2 classes for cropland and urban. The urban/developed class was classified into percent impervious surface area, on a scale of 0–100.

Goals

- Update the current land cover and impervious surface information for the TCMA & St. Croix Basin.
- Evaluate the current system and recommend ways to enhance the capabilities developed last year for acquisition and processing of small format digital images. Because so many images can be acquired in a single mission, a more efficient means of geo-referencing images is required to incorporate them into the existing GIS workflow.
- Investigate alternative systems for acquisition of digital multi-spectral imagery to improve upon the fairly basic capability now available in the state agencies.

Results that count

- Work was completed which delineated the current land use types for the TCMA & the St. Croix Basin based on 2007 Landsat images. This information was provided to the MPCA and will allow others to view the rapidly expanding land use changes in the areas and to observe the increase in impervious cover.
- An evaluation was completed on the MPCA's current aerial imagery technologies and recommendations were made to improve on the current technologies used to acquire digital imagery.
- Based on the MPCA's current needs for aerial imagery, recommendations were made on new technology which could improve on the technology that is already being used.

Financial information

Funding type: Section 319 Grant
Grant amount: $75,000

Contact information

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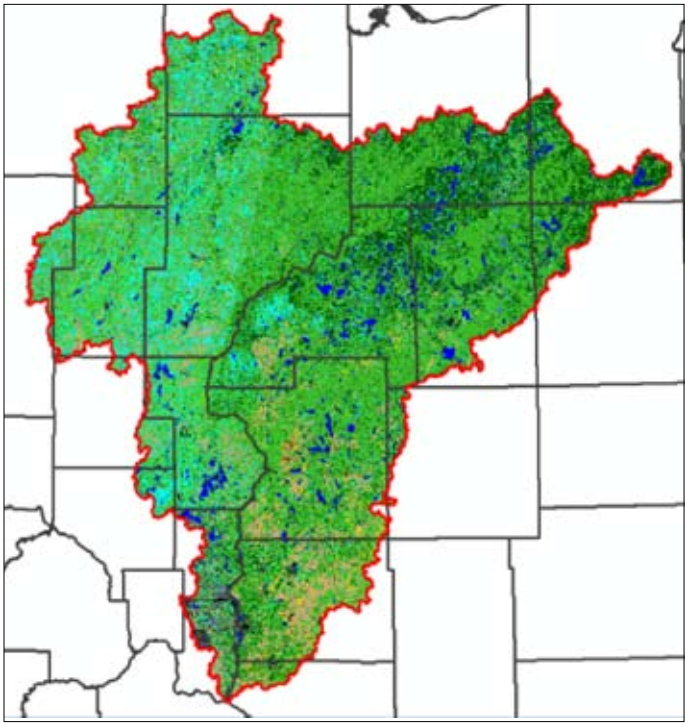

Landsat 2007 Land Cover and Impervious Surface Classifications of the St. Croix River Basin.

Carnelian Marine St. Croix Watershed District 12 lakes TMDL project

A TMDL process is underway to develop a load allocation model and implementation plan for 12 lakes within the Carnelian St. Croix Watershed District. These lakes are impaired for nutrients and include: Loon (DNR ID # 82-0015), Silver (DNR ID # 82-0016), Louise (DNR ID# 82-0025, East Boot (DNR ID# 82-0034), Jellum's (DNR ID # 82-0052), Fish (DNR ID # 82-0064), Long (DNR ID# 82-0068), South Twin (DNR ID# 82-0019), Sand (DNR ID # 82-0067), Long (DNR ID # 82-0030), Goose (DNR ID # 82-0059) and Hay (DNR ID # 82-0065).

Phase 1 of the TMDL process included data collection, watershed assessment, beginning the TMDL model development, and initial public input. Phase 2 will work toward completion of the TMDL. Efforts are being made to integrate the TMDL process with the watershed plan update. This includes combining advisory committees and preparing a coordinated implementation plan.

Goals

- Review and assemble available information.
- Complete watershed assessment.
- Initiate public involvement process.

Results that count

- Necessary data was assembled.
- Data was input into TMDL model and implementation plan was generated.
- Public process was initiated.

Financial information

Funding type: CWLA
Grant amount: $41,198.50

Contact information

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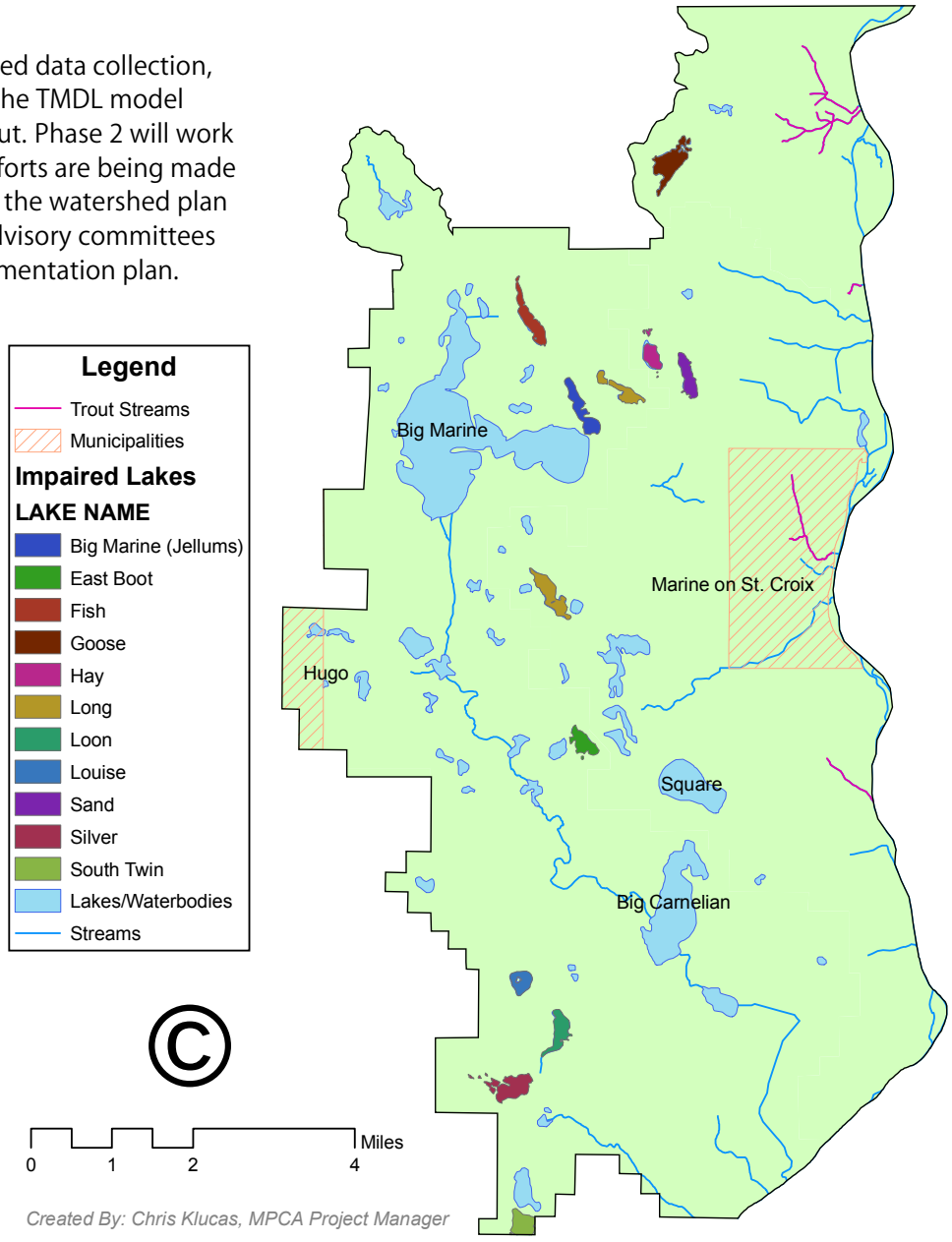
MPCA project manager: Chris Klucas

Carnelian Marine Watershed District



Typo & Martin Lakes TMDL update

A draft TMDL for Martin and Typo Lakes was completed during 2003–2006 by the Anoka Conservation District (ACD) with assistance from the MPCA, Sunrise River Watershed Management Organization (SRWMO), and other cooperators. Final reviews and approvals of the TMDL were postponed until updated shallow lakes standards could be finalized by the MPCA (completed in early 2008). In the interim, the ACD and SRWMO did additional work to improve the understanding of phosphorus sources and which management options would be most effective.

Most of this new work was done to fine-tune phosphorus source diagnosis for Typo Lake's major inlet, Data Creek, and its ditch tributaries. Water quality in each lake was also monitored in 2007, lending new insight into internal loading mechanisms, phosphorus retention, climate variability, and how the lakes might react to various management techniques. The purpose of this project was to update the TMDL with this new information, as well as to make other aspects of the report consistent with MPCA guidance that was developed since 2006.

Goals

- Update the Typo and Martin Lakes draft TMDL with new information on phosphorus sources and possible management alternatives.
- Make the TMDL consistent with MPCA guidance developed since the writing of the current draft regarding formatting and contents.
- Produce a TMDL with ample scientific understanding to guide development of the Implementation Plan.

Results that count

- Revisions to the TMDL have been made and submitted to the MPCA.
- Awaiting review by MPCA.
- New information is included in the TMDL that has resulted in notable changes to recommended management strategies. A plan is in place to have the implementation plan drafted by September 2009.

Financial information

Funding type: CWLA
Grant amount: $2,900

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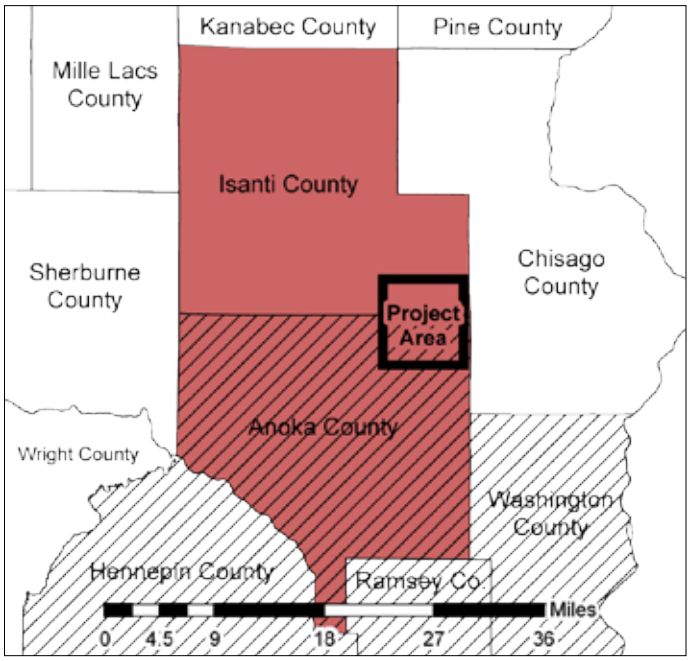

Valley Creek repair and rehabilitation program

Valley Creek is one of 13 trout streams within the Twin Cities metropolitan area and is one of only a few that has a naturally reproducing population of brook trout, the only trout species native to Minnesota. The Valley Branch Watershed District (VBWD) implemented its Valley Creek repair and rehabilitation program (program) to help protect Valley Creek from siltation, which can destroy trout spawning habitat.

The program is the current step in a decade-long process. In 1999, the VBWD completed a natural resources inventory (NRI), which identified natural resource features including landscape and water resource features and provided a level-of-severity ranking for streambank and sediment delivery (gully) erosion. In 2004, the VBWD used the 1999 NRI data to identify areas that warranted further examination and to conduct detailed investigations of gullies, streambank erosion sites, and roadway runoff areas that have the potential to contribute significant amounts of sediment into Valley Creek. The 2004 investigation also determined whether restoration efforts are needed and provided specific recommendations to fix priority erosion areas.

This program focuses on prevention of water quality impacts rather than more expensive remedial action. So far, the program has provided educational materials to landowners and implemented several improvement projects, including three major projects in 2008. The Oakgreen Avenue infiltration basin is the first phase of a project that will stabilize an actively eroding ravine that drains directly into Valley Creek. The upstream Valley Creek stabilization project stabilized 2,500 feet of the south fork of Valley Creek. The downstream Valley Creek stabilization project stabilized 2,200 feet of the main stem of Valley Creek.

Goals

- Promote the adoption of BMPs.
- Reduce sediment loading into Valley Creek.
- Reduce in-stream erosion.
- Preserve native brook trout habitation and population in Valley Creek.

Results that count

- Information is posted on the VBWD website and was included in newspaper articles and sent to targeted landowners. Targeted landowners were also contacted via telephone. Applications for 36 BMP cost share projects were submitted to the VBWD. The VBWD approved 31 projects and 11 were complete as of the end of 2008.
- A 0.4-acre infiltration basin was constructed at the top of an actively eroding ravine that drains directly into the south fork of Valley Creek. The ravine is the source of an estimated 24.4 tons of sediment that enter the creek each year. Reducing runoff flowing down the ravine is the first phase in stabilizing the ravine.
- The upstream Valley Creek stabilization project stabilized 2,500 feet of the south fork of Valley Creek on three properties and stabilized one road runoff site on a fourth property. The downstream Valley Creek stabilization project stabilized 2,200 feet of the main stem of Valley Creek on two properties.

Financial information

Funding type: Section 319 Grant
Grant amount: $150,000
Matching funds and in-kind: $546,806
Total project cost: $696,806

Contact information

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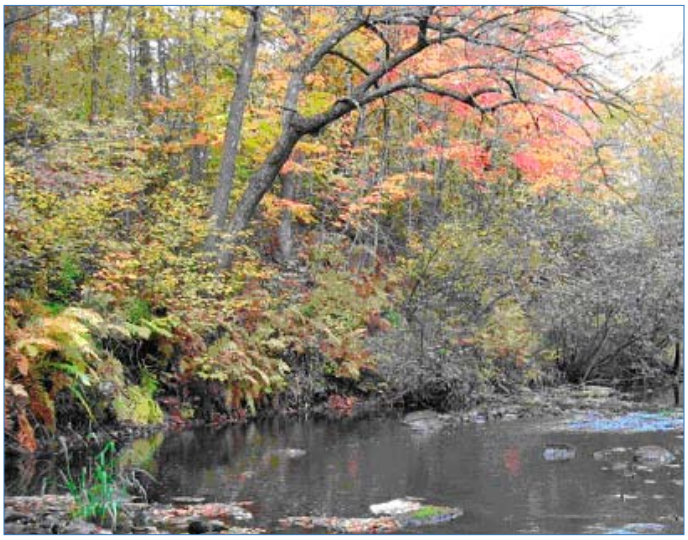

View of the Groundhouse downstream of the 150th Avenue crossing (first site visited south of Ogilvie). Despite the eroding streambanks observed at the next upstream site (at the Hwy 23 crossing), this wide reach (25–50 feet) contained cobble/boulder substrates with only minor sandy deposition.

Groundhouse River TMDL project for fecal coliform and biota (sediment) impairments

The Groundhouse River drains approximately 139 square miles in east-central Minnesota in the Snake River watershed, primarily in Kanabec and Mille Lacs counties. The Groundhouse River and the South Fork Groundhouse River are listed as being impaired due to not supporting their designated aquatic life and aquatic recreation uses. An evaluation of potential stressors indicates that excessive fine sediment (primarily the sand component) is the most likely cause of the impairment. Natural features, such as low gradient streams and soils prone to erosion, may also be playing a role in certain reaches. Fecal coliform counts were found to exceed both the monthly geometric mean and the daily not-to-exceed components of Minnesota's water quality standards.

Various techniques were used to estimate the most significant sources of sediment and fecal coliform, including the application of a watershed model. The most significant sources of sediment were found to be erosion from cropland and streambank erosion, and the most significant sources of fecal coliform were found to be animal operations and failing on site wastewater treatment systems.

Various BMPs to address the sources of sediment and fecal coliform are identified and described in the TMDL report and include riparian buffers, filter strips, fencing, manure management, conservation tillage, and the fixing of failing on site wastewater systems. Following approval of the TMDLs, a draft implementation plan was developed to identify the most practical and cost-effective BMPs for this watershed. The draft implementation plan was handed off to local stakeholders to be finalized and then acted upon.

Goals

- Address EPA comments on draft Groundhouse River TMDL report.
- Prepare a detailed implementation plan.
- Prepare a TMDL fact sheet.

Results that count

- All EPA comments were addressed and an updated TMDL report was prepared.
- A draft detailed implementation plan was developed to identify the most practical and cost-effective BMPs for this watershed. The draft implementation plan was handed off to local stakeholders to be finalized and then acted upon.
- A final TMDL fact sheet was prepared.

Financial information

Funding type: Section 319 Grant
Grant amount: $10,668

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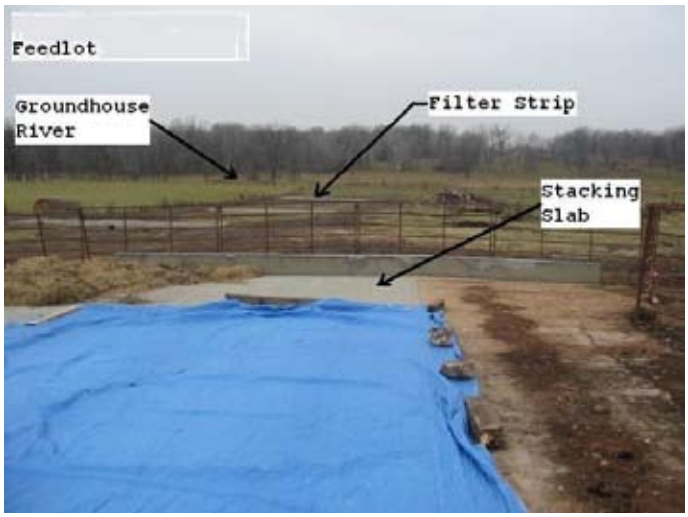

A feedlot runoff treatment project was installed near the Groundhouse River. The project included diversions for clean and dirty water, tile intakes and outlets, concrete stacking area and vegetative filter strips for final treatment of phosphorus and nutrient reduction.

Groundhouse River watershed TMDL project

In March of 2006, the Kanabec SWCD began meeting with MPCA staff, local partners, and technical team members to begin addressing the goals, objectives and work tasks for the study. The SWCD staff and local partners began collecting land use data such as feedlot locations, numbers of animals and animal types, gravel pit operations, septic system permit records in shoreland areas, soils information, wetlands, ditch systems, erosion areas and topography.

News releases were prepared for local stakeholder meetings to inform the local citizens, township and county officials, of the listed river impairments. Presentations by MPCA staff and local partners were given to address the problems and explain BMPs for water quality improvements.

Comments, concerns, and questions were addressed at stakeholder meetings. As a follow up, site visits were completed to look at specific problem areas. An implementation plan was prepared by project partners to address the impairments in the study, explain the benefits of BMPs and develop a plan of action, identify project partners, and address the costs and timelines for implementation.

Goals

- Work with MPCA to develop a technical team, identify local partners and stakeholders.
- Gather and submit land use information and hold stakeholder meetings for education and local input.
- Assist in the development of an implementation — plan of action.

Results that count

- Developed a technical team, local partners and stakeholder group.
- Developed GIS mapping layer for land use information and presented benefits of using BMPs at local stakeholder meetings. Asked local stakeholders to speak on behalf of projects they installed with water quality benefits.
- Developed implementation plan of action for TMDL.

Financial information

Funding type: Section 319 Grant
Grant amount; $22,417

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St. Croix River Basin

Projects active and awarded in 2009

Snake River Watershed

Snake River enhancement project continuation — 2008 (active in 2009)

Sponsor: Snake River Watershed Management Board

Funding: CWP (Grant) $500,000, CWP (Loan) $400,000

Purpose: The Snake River Watershed Management Board will assist local technical people working with landowners to identify issues, find solutions to problems and provide technical and engineering assistance for appropriate BMPs targeted to impaired waters. The CWP loan program is targeted to identify, repair or replace non-compliant systems in shoreland areas.

St. Croix River (Stillwater) Watershed

Forest Lake (Subwatershed FL44) assessment project (awarded in 2009)

Sponsor: Comfort Lake — Forest Lake Watershed District

Funding: CWP (Grant) $23,333

Purpose: The monies applied for as part of this phase 1 grant application will allow the District to conduct a diagnostic/feasibility study on the former DNR fish rearing pond in order to confirm the nutrient and sediment loading from FL44 as well as evaluate the potential to reduce phosphorus and sediment loads to Forest Lake from the FL44 wetland. The proposed feasibility study will measure the effect of the fish rearing pond on loads. If high loads and concentrations are identified upstream of the rearing pond, the wetland may need to be investigated further. The proposed project will also evaluate the feasibility of reducing the load through options such as restoration of wetland hydrology, alterations to the fish rearing pond to increase nutrient and sediment capture, alum treatment of the pond sediments, and control of rough fish.

Little Comfort Lake watershed load assessment project (awarded in 2009)

Sponsor: Comfort Lake — Forest Lake Watershed District

Funding: CWP (Grant) $17,085

Purpose: This phase 1 project will conduct a diagnostic/ feasibility study on the loading between the outlet of Bone Lake and the inlet of Little Comfort Lake. The proposed feasibility study will determine areas of phosphorus and suspended sediment loading. An implementation plan will be completed to outline steps to further protect and improve the watershed.

Upper Mississippi River Basin

Projects completed

Projects involving multiple watersheds

North Central Lakes collaborative coordinator position

Sauk River Chain of Lakes – Lake Margaret contingent valuation / willingness-to-pay economic study

Upper Mississippi River modeling above Ford Dam

Mississippi River Watershed

Hardwood Creek biological impairment

Minnehaha Creek Lake Hiawatha TMDL gap analysis

Peltier Lake and Centerville Lake nutrient impairment TMDL

Restoring water resources of the Sauk River Chain of Lakes

Sweeney Lake TMDL

Sauk River Watershed

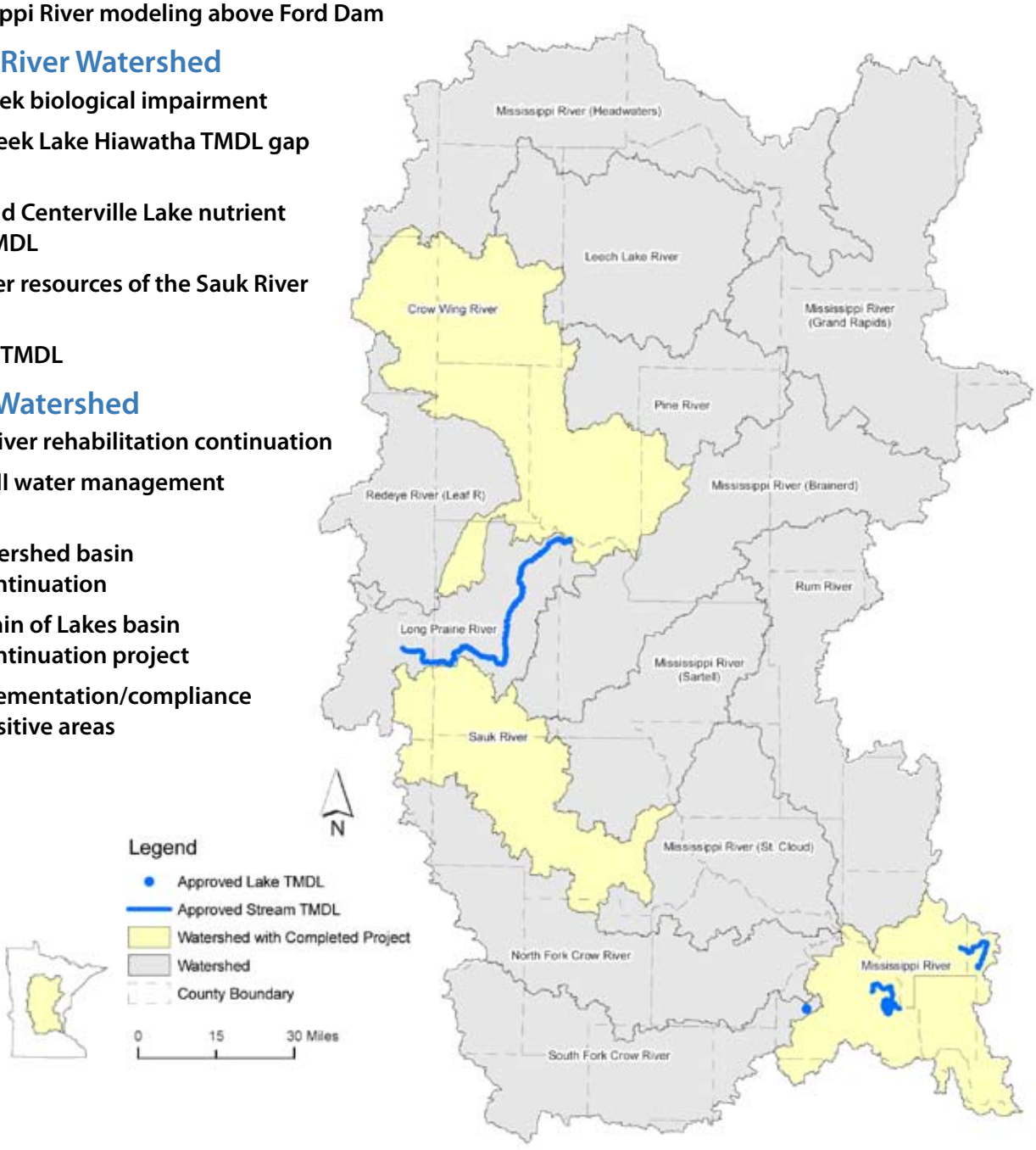
Middle Sauk River rehabilitation continuation

Osakis Phase III water management continuation

Sauk Lake watershed basin restoration continuation

Sauk River Chain of Lakes basin restoration continuation project

Targeted implementation/compliance TMDL eco-sensitive areas



North Central Lakes Collaborative coordinator position

The following is a brief summary of the accomplishments of the North Central Lakes Collaborative (NCLC) Coordinator. All work items from the job description were attempted, but through unavoidable circumstances, not all were able to be completed.

The NCLC coordinator coordinated and facilitated the NCLC steering team and stakeholder meetings throughout the span of the Section 319 funds. Included in these tasks were: setting and maintaining a regular meeting schedule, completing meeting logistics, developing agendas, facilitating all meetings, and compiling meeting summaries for distribution to internal and external NCLC members. The NCLC coordinator also provided outreach and communications coordination for the NCLC, including: serving as "point of contact" for internal and external NCLC members and interested stakeholders, representing NCLC at public events, and developing fact sheets and marketing pieces describing the role of the NCLC. The NCLC coordinator also assisted in ongoing NCLC projects, including: Lake Waves, the conservation design scorecard, steps toward developing a conservation easement options portfolio, and the educational event business women for better waters.

While the NCLC coordinator attempted to engage LGUs in the five-county NCLC region, this work plan item did not develop as was hoped. On the positive side, several letters regarding NCLC meetings and updates were mailed out to a number of county employees in each of the five counties of the NCLC region, as well as several adjacent counties.

Another work plan item that was attempted but not successful was the development of a NCLC website. The goal was to have a stand-alone website for NCLC members to access to find information, updates, upcoming meetings, etc. Due to the fact that NCLC has no funding base, and development of such a website was somewhat costly, this work plan item was not able to be accomplished. However, the NCLC coordinator worked with a web specialist with the MPCA and found some other options for the NCLC to pursue in the future (e.g. wikis).

Goals

- Improve NCLC internal and external communication.
- Re-engage the LGUs within the five-county NCLC area.
- Increase awareness of the NCLC through marketing and outreach.

Results that count

- NCLC internal and external communication was improved and organized.
- Increased awareness of the NCLC through marketing and outreach.

Financial information

Funding type: Section 319 Grant
Grant amount: $57,484
Matching funds and in-kind: $45,270.00
Total project cost: $102,754

Contact information

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Sauk River chain of lakes — Lake Margaret contingent valuation / willingness-to-pay economic study

This project will use methods of economic analysis and survey to determine the contingent valuation and willingness-to-pay in monetary terms of residents or stakeholders of two impaired lakes (Sauk River chain of lakes and Lake Margaret), in different lake regions in the Upper Mississippi River Basin, with different causes of the impairments. These dollar values will then be used by policy makers at all levels in determining the social benefits and costs of various water quality projects.

Restoration of impaired waters is gaining attention across the state. Improving the quality of impaired waters will yield environmental benefits that will also translate into economic and social benefits. The estimation of the economic value of these environmental benefits by assessing the total willingness-to-pay (WTP) of property owners for restoring water quality in impaired lakes is the primary objective of this study.

Goals

- Identify the social, demographic, and economic characteristics of each lake's residents and users/ stakeholders.
- Determine in dollars the study lakes' resource value, both use and non-use, to residents and users/ stakeholders.
- When restoration and protection costs are completed, conduct a benefit-cost analysis of each project. Develop model(s) for evaluating the monetary impact of management practices and rehabilitation alternatives for water quality.

Results that count

- The analysis demonstrates that the watersheds are different in terms of how property owners in the watershed relate to the impaired lakes. Many property owners are not residents of the watersheds (67 percent) and are wealthier and older than the average residents of the area. The pattern is less severe in the Sauk River chain of lakes watershed, as about 11 percent of the property owners have mailing addresses outside of the watershed and Stearns County.

  The Margaret-Gull chain has a high degree of surface water as percentage of watershed acreage compared to Sauk chain of lakes, and consequently a high proportion (64 percent versus 16 percent of respondents per watershed respectively) of lakeshore owners relative to the overall population of property owners in the watershed. The Margaret-Gull Chain also has many highly-valued lake properties owned by people with high incomes and a large amount of recreational use by lake owners and visitors.
- For the Sauk River watershed the mean WTP is $17.00 and for the Lake Margaret area the mean WTP is $260.00. The stark differences between Margaret-Gull and Sauk chain of lakes fulfill the methodological goal of studying watershed property owners that are at opposite ends of the spectrum. While the estimated equations for the two watersheds have slightly different coefficients, the extreme differences in WTP result from huge differences in the mean values for the variables between the watersheds.
- Respondents provided a great deal of feedback on which land-use management options they would or would not support. While respondents indicated a willingness to participate in BMPs, there is also a strong tendency to want others (those who benefit the most or contribute the most pollution) to make changes or pay for activities that improve water quality.

Financial information

Funding type: Environmental Fund
Total project cost: $40,629.49

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Upper Mississippi River modeling above the Ford Dam

To support the Lake Pepin TMDL, a one-dimensional water quality model has been developed for the Upper Mississippi River (UMR) extending from lock and dam 1 to Brainerd. The purpose of the model is to assess the fate of nutrient loadings in the UMR watershed from various point and nonpoint sources. The model has been applied to understand the impact of the sources on loadings passing lock and dam 1 and subsequently impacting Lake Pepin. The model combines FEQ, a hydrodynamic modeling framework, with RCA, the water quality modeling framework being used downstream for the Lake Pepin TMDL. This modeling framework is designed to handle two forms of phosphorus — dissolved inorganic phosphorus, and particulate phosphorus — and later can be modified to address additional water quality issues including algal growth, fecal coliform bacteria, etc. The model was calibrated on data for 2004 to 2006, and has been applied to estimate phosphorus discount factors — i.e., the percentage of point source phosphorus that reaches lock and dam 1 from various cities' discharges along the main stem Mississippi. The model will be used to further evaluate the impact of phosphorus discharges from tributaries and main stem locations on pollutant loads and lock and dam 1 under various river flow conditions.

Goals

- Develop and calibrate an operational model for the UMR above lock and dam 1.
- Apply the model to determine phosphorus discount factors for wastewater dischargers to main stem.
- Develop report on model for MPCA.

Results that count

- A one-dimensional model was established for the Upper Mississippi from lock and dam 1 through Brainerd.
- The model was applied to develop discount factors for wastewater dischargers on the Upper Mississippi.
- A report has been submitted to MPCA on the model and the discount factors.

Financial information

Funding type: Section 319 Grant
Grant amount: $87,715.88

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Hardwood Creek biological impairment

The list of impaired waters developed by the MPCA includes Hardwood Creek, located in the Rice Creek watershed in Washington and Anoka counties. Hardwood Creek is listed as having impaired biota (fish) on the lower portion of the creek (downstream of Highway 61), and low DO for the full length of the creek. The natural background level of DO is used as the water quality endpoint above Highway 61 due to naturally low oxygen levels occurring in that wetland-dominated part of the watershed. A TMDL study began in 2004, and it is a collaborative effort between the MPCA, Rice Creek Watershed District and Emmons and Olivier Resources, Inc.

A stream listed for "impaired biota (fish)" means that the stream is not supporting an appropriate quantity and/or diversity of native fish. Through a stressor identification process, the primary causes of the impairment in the creek were identified as excess sedimentation and low DO. The TMDL for the biological impairment is based on TSS loads, which address sedimentation. Various candidate mechanisms affecting DO were identified and ultimately may all play a role in DO levels to varying degrees. However, the low DO TMDL focuses on biochemical oxygen demand loading, which was identified as a significant stressor during 2004. Biochemical oxygen demand is a measure of oxygen-consuming organic matter additions to the water body (e.g., manure, top soil, leaves, etc.).

This study used a variety of methods to evaluate the current loading, contributions by the various pollutant sources, as well as the allowable pollutant loading capacity of the creek. It is estimated that the average TSS concentration will need to be decreased approximately 14 percent, and the average biochemical oxygen demand concentration will need to be decreased approximately 30 percent.

Goals

- Utilize CONCEPT modeling to relate biological impairment to pollutant loading.
- Complete the draft TMDL.
- Complete the final TMDL.

Results that count

- Modeling to relate biological impairment to pollutant loading was completed using the CONCEPTS model.
- The draft TMDL was completed.
- The final TMDL was completed with some edits to a near-final draft still needed.

Financial information

Funding type: CWLA & Environmental Fund
Total project cost: $80,857

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Financial information

Funding type: CWLA
Total project cost: $17,338

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Minnehaha Creek-Lake Hiawatha TMDL study gap analysis

Minnehaha Creek and Lake Hiawatha are important water resources in the Minnehaha Creek watershed. Minnehaha Creek is listed for impaired biota (fish), chloride and fecal coliform bacteria; Lake Hiawatha is listed for excess nutrients. These water bodies have been extensively studied over the years so the purpose of this early phase of the project was to compile the available data and information, perform preliminary analysis and identify gaps in the data and information set in order to complete the TMDL and implementation plan.

Goals

- Compile the available data and information.
- Perform preliminary analysis.
- Identify gaps in the data and information set.

Results that count

- Extensive data and information was compiled.
- Preliminary data analysis was completed which provided clear direction for the TMDL.
- Various gaps in the data set were identified, in some cases resulting in recommendations for additional monitoring. That monitoring has been initiated.

Peltier Lake and Centerville Lake nutrient impairment TMDLs

Peltier Lake and Centerville Lake were listed as impaired waters by the MPCA on the 2002 303d list. The impaired use is aquatic recreation, with the stressor identified as "nutrient/ eutrophication biological indicators."

The Centerville Lake watershed lies entirely within the Peltier Lake watershed. The Peltier Lake and Centerville Lake watersheds are located in the central portion of the Rice Creek Watershed District (RCWD) and the north central hardwood forest ecoregion. Portions of 13 cities/ townships and three counties are contained in the Peltier Lake watershed, while the Centerville Lake watershed contains portions of two cities and one county.

Peltier Lake ranges from eutrophic to hypereutrophic, with relatively higher total phosphorus and chlorophyll concentrations compared to transparency. Centerville Lake is a eutrophic lake, with relatively higher chlorophyll concentrations compared to TP, and slightly better transparency.

Phosphorus was identified as the main pollutant causing the impairment. The state eutrophication standards were used to calculate the TMDL for both lakes. In addition, a natural background condition standard was requested for Peltier Lake based on a study that reconstructed historical environmental change in the lake using paleolimnological analysis. This request is currently being considered by the U.S. EPA. The Peltier Lake TMDL will consider both the eutrophication standard for shallow lakes and the requested natural background condition standard as dual endpoints, to allow for either to be implemented after Peltier Lake's standard is finalized.

The categories of phosphorus loads to Peltier and Centerville Lakes are watershed runoff, point sources, internal loading, Peltier Lake backflow, groundwater discharge, and atmospheric deposition. Phosphorus loads from each of these sources were estimated and used as input into the lake response model.

Goals

- Identify phosphorus sources to each lake.
- Calculate the assimilative capacity and loading allocations of the lakes.
- Develop an implementation plan.

Results that count

- Phosphorus loads have been identified for each lake.
- The assimilative capacities have been calculated as follows: Peltier (at state standard) = 15 lbs TP/day; Centerville (at state standard) = 0.8 lbs TP/day.
- An implementation plan has been developed.

Financial information

Funding type: CWLA
Grant amount: $74,730.62

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Restoring water resources of the Sauk River chain of lakes

The Sauk River chain of lakes is an important lake system in the Sauk River Watershed District (SRWD) and is a major economic asset to this region. Local residents have been concerned about its water quality for several decades. Degradation can be expected to detract from the economic values that these lakes provide unless strong efforts are made to reverse its current "Impaired Waters" status. This project is a continued effort in achieving the state's targeted goals set for the Sauk River and the Sauk River chain of lakes.

The SRWD, its project partners and local residents have recognized the changes occurring in the Sauk River chain of lakes and have made a strong commitment to improve this important water resource. The local citizens and resource professionals were instrumental in the implementation of this restoration project and its overall accomplishments. The SRWD is the official project sponsor and coordinating agency for this Section 319 implementation project.

This project had a three year implementation plan designed to address pollution contributions in the Sauk River chain of lakes and its tributaries. Priority was given to feedlots and cropland located adjacent to the Sauk River, Getchell Creek, Unnamed Creek, Stoney Creek, Kinzer Creek, Kolling Creek and Schnieder Creek, along with drainage ditches and other small tributaries that discharge into these creeks.

Goals

- Further reduce water quality degradation in the Sauk River chain of lakes.
- Emphasize education as a major priority in achieving water quality goals.
- Develop BMPs that will reduce water quality degradation.

Results that count

- Water quality protection efforts appear to have reduced TP and TSS concentrations in the Sauk River and the Sauk River chain of lakes. However, the monitoring data determined a decline in water quality as shown in the trophic status Index values. The decline is believed to be associated with the heavy runoff in 2005, especially the flowage lakes and internal loading in the nonflowage lakes during the 2006-2007 back to back dry summers.
- Hired a full-time education coordinator to focus on educational needs of the local residents; generated and distributed four editions of the project newsletter to the area watershed residents; offered two volunteer monitoring training sessions to local residents.
- Completed four feedlot abatement projects; developed 75 landowner manure management plans; restored a large wetland by blocking a small ditch outlet and reestablishing the native plants; installed approximately 150 acres of filter strips and riparian forest buffers and enrolled approximately 500 acres in CRP in Stearns County.

Financial Information

Funding type: Section 319 Grant
Grant amount: $250,000.00
Matching loan funds: $148,785.03
Other matching in-kind: $499,033.47
Total project cost: $897,818.50

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Sweeney Lake TMDL

Sweeney Lake is a 67-acre water body within the City of Golden Valley. Sweeney Lake has a contributing drainage area of approximately 2,360 acres that is essentially fully-developed. The watershed boundaries are located primarily in Golden Valley, but also extend to portions of St. Louis Park. Sweeney Lake has been subject to fairly extensive previous studies including a watershed and lake management plan completed for the Bassett Creek Watershed Management Commission (BCWMC) and water quality monitoring dating back to at least 1977.

In 2004, Sweeney Lake was designated as an "impaired water body" by the MPCA for phosphorus based upon its water quality history. Previous work by the BCWMC described in the Sweeney Lake watershed and lake management plan (Barr, 1994) identified priorities and guidelines for the cities of St. Louis Park and Golden Valley and residents in these cities for meeting BCWMC water quality goals for Sweeney Lake. Recommendations of the 1994 plan included shutting the aeration system down and monitoring lake response along with implementation of several watershed-wide BMPs (i.e., wet detention basins for new and redevelopment projects; phosphorus fertilizer ban; education efforts; and ordinance enforcement). The Sweeney Lake TMDL work plan represents an initial phase of work with the intent of making significant progress towards a TMDL study report and implementation plan.

Goals

- Successfully conduct a first year of monitoring with the aerators turned off.
- Complete modeling watershed best management implementation scenarios (P8 Model) to determine the expected impact on lake loading.
- Begin response modeling of Sweeney Lake to evaluate the likely impact of changes in loading rates on the in-lake water quality.

Results that count

- Sampling and monitoring according to the work plan was conducted in-lake every-other week throughout the growing season and through October 23, 2007.
- A P8 model for the Sweeney Lake watershed was developed for runoff volume and water quality (phosphorus). The model was calibrated using flow and water quality data collected by the Minnesota Department of Transportation at two locations within the Sweeney Lake watershed.
- Preliminary FLUX computations were made and a preliminary BATHTUB model has been initiated.

Financial information

Funding type: Section 319 and Environmental Fund
Grant amount: $84,000

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Middle Sauk River rehabilitation continuation

The Middle Sauk River region located in central Stearns County has been impacted by nutrient and sediment loading as a result of land use management practices and changes. The SRWD's monitoring data from 1995–2005 indicates that improvements have been made since the 1985 and 1993 diagnostic studies, however more BMP implementation efforts are needed. The ten years of data indicates that nutrient concentrations in the Middle Sauk River area more closely resembles ecoregion averages during "dry" years. However, these tributaries spike to levels up to 4 times higher than the desired goal of 100–150 µg/L for TP and 7–16 mg/L for TSS during the "wet" years. Additionally the SRWD's monitoring anchor sites installed on the Sauk River identified a significant pulse of nutrients and sediment occurring from the Sauk Lake outlet to the County Road 12 station near St. Martin. This identified area makes up the Middle Sauk River region which includes Getchel, Unnamed, Stoney and Adley Creeks.

Within the SRWD there are 1744 registered feedlots, of which 1081 feedlots are within the Middle Sauk River area. The objective of the Middle Sauk river rehabilitation continuation project is to work with the agricultural producers in the middle Sauk River region and assist them in applying conservation practices. Efforts also focused on riparian restoration and stormwater runoff concerns.

Goals

- Implement an interactive education program for adult and youth within the watershed.
- Implement a water monitoring program to determine the effectiveness of the BMPs installed during the project. Reduce flow weighted mean average TP concentrations of the Sauk River (in-flow) to <150µg/L. Reduce in-flow average TSS concentrations to approximately 18mg/L. Obtain baseline water quality data for Little Birch, Sylvia and St. Anna's lakes. Increase compliance with county ordinance septic tank rules.
- Install BMPs within the Middle Sauk River watershed and the Getchell, Unnamed, Stony and Adley subwatersheds including feedlot improvements, bank stabilization activities, land retirement programs, buffers strips and urban stormwater abatement.

Middle Sauk River rehab

Middle Sauk River water festival — macro sampling.

Results that count

- Launched the SRWD's middle school outdoor water quality education curriculum offering students a hands-on opportunity to collect water samples and conduct analysis, conduct physical riparian assessments, biological assessments and evaluations. SRWD staff attended school presentations, and hosted the Middle Sauk River water festival for all 4th graders within the middle Sauk River region.
- Expanded monitoring efforts to include Lake Sylvia, Little Birch Lake and St. Anna's Lake, which are the headwaters of Adley and Getchel Creek tributaries to the Sauk River. Data was used as a baseline for TMDL studies.
- Seven feedlot abatement projects, two abandoned manure pit projects and two stormwater runoff projects were completed using cost share funds and seven additional feedlot abatement projects were completed using the SRF loan dollars (with local SWCDs cost share). Twelve septic systems were completed using the SRF funds.

Financial information

Funding type: CWP
Grant amount: $237,000
Matching funds and in-kind: $707,239.36
Total project cost: $944,239.36

Contact information

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Osakis Lake watershed management phase III continuation

Osakis Lake is a large, popular, recreational water body located in central Minnesota and is the headwaters of the Sauk River. The water quality of Osakis Lake sets the stage for the overall water quality of the Sauk River which directly impacts the water bodies downstream. The primary focus for the Osakis Lake watershed management project is to prevent Osakis Lake from further degradation and to improve its current condition.

Osakis Lake is classified as eutrophic and has been on the state list of impaired waters since 2004 due to its high nutrient concentrations. High levels of nutrients and sediments contribute to algae blooms and reduced transparency within the lake. As lake transparency decreases, citizens perceive a decline in water quality and are less likely to swim or use the lake for water-based recreation. Unless a major reduction in nutrient and sediment loading occurs, "swimming impaired" conditions will likely continue on Osakis Lake and "no recreation" conditions may be encountered. This would cause immediate economic consequences to the local area, particularly the city of Osakis.

The objective of this ongoing watershed management project is to work with area landowners and city officials to address the water quality concerns and assist them in implementing best management and conservation practices to reduce nutrient concentration levels in Judicial Ditch 2, Clifford and Faille Lake, Osakis Lake and intermittent tributaries. Priority was given to feedlots, erosion issues, shoreland and stormwater concerns.

Goals

- Implement an interactive education program for adult and youth within the watershed.
- Implement a water monitoring program to determine the effectiveness of the BMPs installed during the project. Reduce average epilimnetic whole lake total phosphorus to less than 50µg/L, Chlorophyll A 15 µg/L +/-8, Summer transparency 5 feet +/-1.5ft.
- Work with local residents to implement BMPs to reduce nutrient loading to Osakis Lake.

Shoreland restoration project installation.

Results that count

- Launched the Sauk River Watershed District's middle school outdoor water quality education curriculum offering students a hands-on opportunity to collect water samples and conduct analysis, conduct physical riparian assessments, biological assessments and evaluations.
- Monitored Osakis Lake 2005–2007 and its tributaries. Osakis Lake recorded an increase in summer average TP concentrations in 2006 and 2007 which is attributed to the dry season and internal loading.
- Completed nine shoreland restoration projects totaling 1655 feet of lakeshore, three rain gardens, closed an unpermitted earthen pit, installed 1 tree buffer, and one stormwater retention basin in the city of Osakis.

Financial information

Funding type: CWP
Grant amount: $235,000
Matching funds and in-kind: $542,688.95
Total project cost: $777,688.95

Contact information

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Sauk Lake watershed basin restoration continuation

Sauk Lake has experienced decreasing water clarity and increased problems with aquatic vegetation and algae growth since the early 1980s. Sauk Lake is listed as impaired by the MPCA for excess nutrients. The north basin receives surface water inflows from the Sauk River, which is listed as impaired due to severe oxygen depletion. The south basin receives surface water inflows from Ashley Creek, also listed as impaired due to low DO, Hoboken Creek and stormwater from the City of Sauk Centre. Sauk Lake is non-supportive to swimming, and unless a major reduction in nutrient and sediment loading is accomplished, "swimming impaired" conditions will likely continue and "no recreation" conditions may be encountered which would cause immediate economic consequences to the local area, particularly to the City of Sauk Centre (i.e. major revenues are generated from the local city park and campgrounds located along Sauk Lake).

The Big Sauk Lake basin restoration project continuation focused on reducing sediment and phosphorus loading from the watershed through educating and assisting land owners to implement BMPs to address these nutrient concerns. Monitoring continued to monitor these tributaries with continuous electronic equipment and chemical sampling to determine long term trend analysis and BMP improvement efforts on the creeks.

Goals

- Implement an interactive education program for adult and youth within the watershed.
- Implement a water monitoring program to determine the effectiveness of the BMPs installed during the project.
- Work with local residents to implement BMPs to reduce nutrient loading to Sauk Lake.

Results that count

- Launched the SRWD's senior high outdoor resource education (SHORE) curriculum offering students a hands-on opportunity to learn about water quality by collecting samples, conduct physical riparian assessments, biological monitoring and native restoration.

Gully erosion to Sauk River: before (top) and after (bottom).

- Monitored Sauk Lake 2005–2008 and its tributaries. Sauk Lake recorded an increase in summer average TP concentrations in 2006 which is attributed to the dry season and internal loading.
- Completed four lake shoreland restoration projects and one river bank restoration totaling 450 feet of riparian area, one rain garden, closed five earthen pits and one abandoned well, installed one pasture management project, 12 septic system upgrades (SRF loan monies) and two stormwater infiltration projects.

Financial information

Funding type: CWP
Grant amount: $267,200
Matching funds and in-kind: $374,206.73
Total project cost: $641,406.73

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Sauk River chain of lakes basin restoration continuation project

The Sauk River chain of lakes is a series of lakes located on the Sauk River. The Sauk River chain of lakes is an important lake system in the Sauk River watershed district and is a major economic asset to this region. Local residents have been concerned about its water quality for several decades. Degradation can be expected to detract from the economic values that these lakes provide unless strong efforts are made to reverse its current "Impaired Waters" status. The Sauk River chain of lakes watershed basin restoration project's primary focus was to prevent the chain of lakes from further degradation and to attempt to improve its current condition. This Sauk River chain of lakes basin restoration continuation project is a continued effort in achieving the state's targeted goals set for the Sauk River and the Sauk River chain of lakes.

The SRWD, its project partners and local residents have made a strong commitment to improve this important water resource. The local citizens and resource professionals were instrumental in the implementation of this restoration project and its overall accomplishments. The SRWD is the official project sponsor and coordinating agency for this MPCA CWP project.

The Sauk River chain of lakes basin restoration continuation project had a three year implementation plan designed to address pollution contributions in the Sauk River chain of lakes and its tributaries. Priority was given to feedlots and cropland located adjacent to the Sauk River and Getchell Creek, Unnamed Creek and Stoney Creek, along drainage ditches, and other tributaries that discharge to these creeks.

Goals

- Maintain 2002–2004 water quality conditions, at a minimum, allowing for natural year to year variability.
- Implement manure management plans.
- Reduce nutrient contribution from septic sources.

Results that count

- Samples were collected across the project area and due to the short time period no significant differences had been seen. The chain of lakes has a history of significant improvements to average water quality values.
- 75 landowners developed manure management plans from 2005–2008. These plans guide the local farmers in protecting the area water resources plus capitalize on the nutrients generated from animal waste.
- Non-conforming or sub-standard septic systems were addressed through financial assistance from the SRWD. Six individual sites were upgraded utilizing the SRWD's SRF loan program.

Financial information

Funding type: CWP
Grant amount: $224,700
Matching funds and in-kind: $753,429.53
Total project cost: $978,129.53

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Targeted implementation/ compliance activity within TMDL and ecologically sensitive area

Stearns County has approximately 2,900 livestock operations with 2,000 of these operations having 300 animal units or less. The remaining 900 operations are between 300 and 999 animal units. Proper manure management and storage within and near ecologically sensitive and impaired areas will enhance or sustain surface and groundwater quality throughout the county.

The Stearns County Environmental Services has identified and prioritized additional livestock producers with pollution potential. Twenty-seven sites had their unpermitted manure storage basins investigated, resulting in 15 sites failing to meet the MPCA specifications. These producers will be targeted in the future with technical and financial assistance.

Goals

- Implement BMPs at priority locations.
- Monitor water quality to see if TP and TSS is being reduced.
- Educate about the importance of BMPs to local professionals, who then pass on the information to landowners.

Results that count

- Eighteen feedlot animal waste control facilities were constructed. The BMP implementation projects provided a 733.35 lbs/yr reduction in phosphorous and a 356.7 ton/ac/yr reduction in soil loss.
- The latest modeling results indicate that TP and TSS reductions are progressing in the Sauk River and the three primary tributaries. The past two monitoring seasons were relatively "dry". Nutrient and sediment concentrations generally improve during dry years, and therefore measuring improvements in water quality becomes more difficult to quantify unless several years (10+years) of data is available to determine a trend.
- One hundred fifty-five professionals attended the BMP workshops. The workshops provided additional promotion and awareness of the BMPs, which will continue to sustain or improve water quality. The 155 professionals will have the opportunity to educate a multitude of landowners in BMPs that can protect water quality.

Financial information

Funding type: Section 319
Grant amount: $300,000
Matching funds and in-kind: $569,951.84
Total project cost: $869,951.84

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Upper Mississippi River Basin

Projects active and awarded in 2009

Projects involving multiple watersheds

Improving rural water quality in the Crow River Basin project — 2008 (active in 2009)

Sponsor: Crow River Organization of Water (CROW)

Funding: Section 319 (Grant) $272,480, CWP (Loan) $770,000

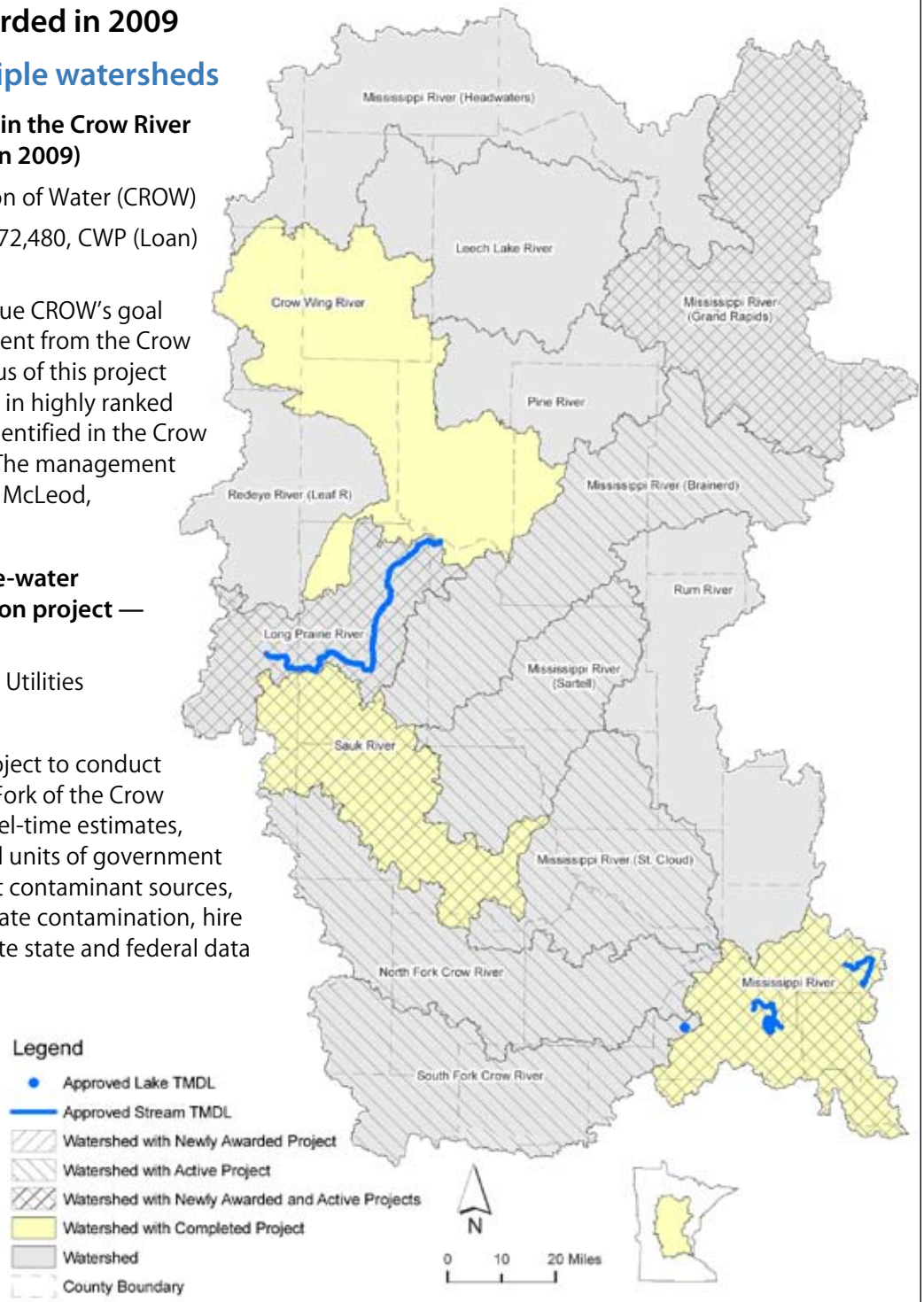
Purpose: This project will continue CROW's goal of reducing nutrients and sediment from the Crow River and its tributaries. The focus of this project includes implementation efforts in highly ranked priority management areas as identified in the Crow River Phase I Diagnostic Study. The management areas cover portions of Renville, McLeod, Kandiyohi and Meeker counties.

Upper Mississippi River source-water protection plan implementation project — 2006 (active in 2009)

Sponsor: City of St. Cloud Public Utilities

Funding: CWP (Grant) $425,000

Purpose: Funding allows the project to conduct a dye-trace study on the South Fork of the Crow in order to refine the earlier travel-time estimates, obtain locational data from local units of government on potential point and nonpoint contaminant sources, identify areas susceptible to nitrate contamination, hire a project data specialist to update state and federal data files and incorporate the data into the project data base, quantify tributary inflows and in-stream flows (allowing for estimates of groundwater contributions to and losses from the Mississippi River), identify areas of potential contaminant transport between ground and surface waters, support the delineation of wellhead protection areas for ground water-based suppliers, identify areas of high sediment loading potential, implement local source water protection plans, and continue administration and education activities.



Long Prairie River Watershed

Long Prairie River dissolved oxygen TMDL implementation project — 2007 (active in 2009)

Sponsor: Todd County Soil and Water Conservation District

Funding: Section 319 (Grant) $150,000

Purpose: The MPCA has observed DO concentrations below the 5-mg/L standard near Motley and Browerville, and during the summer months near Carlos. The primary goal for the project is to use BMPs to keep nutrient levels at or below the standard. The BMPs to be constructed include, but are not limited to, riparian buffers, contour cropping, grassed waterways and others, along with the use of alternative water sources, seed varieties, rotations, cover crops and fertilizers.

Long Prairie River TMDL non-point implementation project (awarded in 2009)

Sponsor: Todd County Soil and Water Conservation District

Funding: Section 319 (Grant) $300,000

Purpose: The primary goal for the non-point implementation project is to continue and expand the Long Prairie River TMDL non-point implementation plan. This will occur through installation of BMPs in priority sub-watersheds targeted by the SWAT model, used in the TMDL study to bring or maintain nutrient levels at or below the eco-region median values (McCollor & Heiskary, 1993). This will result in the reduction of BOD from all sources during low flow conditions. In addition, improvement of the DO levels will also help resolve the fish bioassessment impairments in several reaches of the Long Prairie River as noted on the 2008 MPCA list of impaired waters.

Long Prairie River TMDL project — 2005 (active in 2009)

Sponsor: Todd County Soil and Water Conservation District

Funding: Section 319 (Grant) $300,000

Purpose: Provide cost share, install and maintain best management practices with a focus on riparian buffers, manure and nutrient management, and grassed waterways.

Mississippi River Watershed (Twin Cities)

Shingle Creek chloride reduction project — 2007 (active in 2009)

Sponsor: City of New Hope

Funding: Section 319 (Grant) $15,000

Purpose: Shingle Creek, an 11-mile stream located in northwestern Hennepin County, was designated an Impaired Water by the MPCA and USEPA for chloride concentrations that exceed State established standards. A TMDL analysis determined that the majority of chloride in the watershed is derived from non-point sources including road salt deicing. The TMDL concluded that an overall 71% reduction in chloride load must be achieved to meet State chloride concentration standards. The use of a new deicing product, ClearLane, is identified by the City of New Hope as a BMP to reduce chloride levels in Shingle Creek in the Implementation Plan for the Shingle Creek Chloride TMDL. The City intends to implement this proposed BMP by replacing standard road salt applications with ClearLane for the next deicing season.

Shingle Creek porous pavement paired intersection study (awarded in 2009)

Sponsor: Shingle Creek Watershed Management Commission

Funding: Section 319 (Grant) $282,000

Purpose: The goals of this project are to estimate the effectiveness of porous asphalt on residential streets in reducing the need for salt as a deicer; to determine whether porous asphalt is a BMP that can hold up to rigors of regular city street use; to determine short term and likely long term maintenance requirements; and to measure the water quality and quantity benefits of porous asphalt in a residential street application in both sandy and clay/loam subgrades.

Wetland 639W restoration — 2008 (active in 2009)

Sponsor: Shingle Creek Watershed Commission

Funding: Section 319 (Grant) $60,000

Purpose: This project is a feasibility study and design for the restoration of Wetland 27-639W, which is a major external phosphorous source to Impaired Water 27-0042-01, North Twin Lake. This wetland restoration is the highest priority implementation action in the Twin and Ryan Lakes Nutrient TMDL Implementation Plan. Wetland 639W contributes an estimated 730 pounds of total

phosphorous per year into North Twin Lake. The goal is to identify and evaluate options to reduce or eliminate phosphorous discharge to the lake, and design and prepare construction plans for the future construction of the design.

Mississippi River (Brainerd) Watershed

Swan River watershed management plan implementation — 2006 (active in 2009)

Sponsor: Morrison County Soil and Water Conservation District

Funding: Section 319 (Grant) $70,000

Purpose: Identify and work with smaller feedlots to reduce over-application of manure to cropland with nutrient management plans, buffer strips and other conservations practices.

Mississippi River (Grand Rapids) Watershed

Big Sandy Area Lakes watershed management project — 2006 (active in 2009)

Sponsor: Aitkin County

Funding: CWP (Grant): $260,000

Purpose: The project continues funding for water-quality monitoring, staffing for project administration and local ordinance coordination, and lake and agricultural BMPs such as shoreland revegetation, lakeshore protection, riparian livestock operations, streambank stabilization, riparian buffer strips, conservation easements, and implementation of operation and maintenance plans. Information and education activities will include watershed-wide newsletters, education of school children, lake associations, and county boards, new landowner contacts, small neighborhood meetings, and participation in information fairs.

Demonstrating shoreline buffers in Big Sandy Lakes watershed (awarded in 2009)

Sponsor: Aitkin County SWCD/Big Sandy Lakes Mgmt Project

Funding: Section 319 (Grant) $37,400

Purpose: Promote the implementation of Shoreline Buffers through the use of demonstration projects, cost-share funding, and education efforts. Landowners in the Big Sandy Area Lakes Watershed will be provided the tools that they need to implement successful Shoreline Buffers on their property, reducing erosion, and managing runoff.

Elk River watershed priority lakes II — 2006 (active in 2009)

Sponsor: Elk River Watershed Association

Funding: Section 319 (Grant): $185,187

Purpose: Re-establish shoreland vegetation around area lakes, reduce phosphorus and nitrogen applications on farmland, improve and create wetlands.

Mississippi River (Sartell) Watershed

Little Rock Creek TMDL project — 2005 (active in 2009)

Sponsor: Benton County Soil and Water Conservation District

Funding: Section 319 (Grant) $82,000

Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a TMDL for biota.

North Fork Crow River Watershed

Improving stormwater management in ecologically sensitive watersheds — 2008 (active in 2009)

Sponsor: Middle Fork Crow River Watershed District

Funding: Section 319 (Grant) $140,000, CWP (Loan) $100,000

Purpose: This project's goal is to reduce the impacts of stormwater runoff into the Middle Fork Crow River, Nest Lake and Green Lake by implementing a variety of stormwater treatment options, including retrofits, in areas that are already highly impervious or rapidly increasing in imperviousness.

Middle Fork Crow River watershed restoration and enhancement project — 2008 (active in 2009)

Sponsor: Middle Fork Crow River Watershed District

Funding: CWP (Grant) $242,000, CWP (Loan) $200,000

Purpose: This project focuses on protecting high quality lakes and restoring lakes with poorer water quality by restoring wetlands, providing educational opportunities that link people to the resources, implementing BMPs to reduce non-point source pollution and targeting

specific lake management projects that will harness internal loading in lakes. Activities will focus on citizen information (a new district website, workshops, newsletters, and volunteer training), continued water quality monitoring and evaluation, agricultural and rural land use BMPs, wetland, streambank and shoreland restoration, stormwater and urban BMPs and septic system upgrades.

Water quality improvement project continuation — 2005 (active in 2009)

Sponsor: North Fork Crow River Watershed District

Funding: CWP (Grant) $85,000; CWP (Loan) $450,000

Purpose: Continue feedlot and manure upgrades, agriculture and rural BMPs, septic system upgrades and water quality monitoring and evaluation.

South Fork Crow River Watershed

Lake Independence channel stabilization project — 2008 (active in 2009)

Sponsor: Three Rivers Park District

Funding: Section 319 (Grant) $119,500

Purpose: The Lake Independence TMDL study identified numerous eroding channels adjacent to the lake as significant sources of phosphorous and sediment loading. The TMDL Implementation Plan included recommendations to stabilize these eroding channels. A series of these eroding channels are in the Baker Park Reserve Campground adjacent to Lake Independence. The main objective of this project is to repair and stabilize four of these ravines to reduce phosphorous and sediment loading to the lake.

Working together to improve water quality — 2005 (active in 2009)

Sponsor: Crow River Organization of Water

Funding: Section 319 (Grant) $300,000

Purpose: Upgrade septic systems, install alternative tile intakes, enroll filter or buffer strips, stabilize shore land erosion, work with cities on stormwater/water quality issues, provide financial incentives to landowners to reduce sediment and nutrient loads and increase education efforts.

Sauk River Watershed

Feedlot runoff pollution removal by organic bio-filter demonstration — 2005 (active in 2009)

Sponsor: Stearns County Soil and Water Conservation District

Funding: Section 319 (Grant) $150,000

Purpose: Develop a demonstration project to utilize a carbon-rich bio-filter to treat feedlot runoff and produce technical information so that Natural Resources Conservation Service can approve this as a BMP.

Middle Sauk River rehabilitation project continuation — 2005 (active in 2009)

Sponsor: SRWD

Funding: CWP (Grant) $237,000; CWP (Loan) $500,000

Purpose: Continue information and education, water quality monitoring and evaluation, agricultural and urban BMP, shore land and riparian restoration, project administration, upgrading septic systems, and reducing erosion and sediment.

Middle Sauk River water quality restoration project — 2007 (active in 2009)

Sponsor: SRWD

Funding: CWP (Grant) $216,892, CWP (Loan) $500,000

Purpose: The objective of this project is to assist agricultural producers in applying conservation practices, such as riparian restoration, feedlot management and buffer strip installation. This project will also work with local municipalities to address stormwater runoff concerns and local septic system upgrades. In addition, this project will expand the current monitoring program to investigate new sources of pollution and to assess the effectiveness of current and future BMPs. Information and education will focus on changing behaviors to reduce nutrient loading in the watershed. Activities will include, school visits, elementary student water festivals and hands-on workshops in areas such as shoreline restoration and maintenance, citizen monitoring training and stormwater runoff alternatives.

Middle Sauk River water quality restoration project continuation (awarded in 2009)

Sponsor: SRWD

Funding: CWP (Grant) $376,130; CWP (loan) $350,000

Purpose: This continuation project will provide administrative and technical assistance that will increase public awareness of water quality issues. This project will continue to work with the local governmental units to hold educational field events to address stormwater runoff and implement urban BMPs. Newsletters and brochures will be generated and distributed to local residents. This project will expand its current youth programs by launching its Lake Ecology curriculum to middle and high school students in the local schools, encouraging teachers to develop hands on curriculum and field days for students to better understand their environment and why we need to protect it. The project will be developing an adult speaker series to get the general public more involved in water resource management within the Sauk River Watershed. We will continue to focus on citizen volunteer monitoring by providing training for area volunteers to enhance our monitoring plan. Website updates will continue as well to provide information on upcoming seminars, meetings and available cost share funding as well as monitoring information on local lakes and streams. This project will continue to focus on BMPs for agricultural and rural land use, stormwater and urban uses, well sealing, shoreland/riparian restorations, septic systems upgrades and erosion and sediment reduction.

Osakis Lake shoreland enhancement project — 2008 (active in 2009)

Sponsor: SRWD

Funding: Section 319 (Grant) $160,000; CWP (Loan) $100,000

Purpose: Osakis Lake is on the MPCA's Impaired Waters list for excess nutrients. To reduce in-lake TSS concentrations, the Osakis Lake Shoreland Enhancement Project will primarily focus on restoring the 24 miles of lakeshore to a more natural state to reduce shoreland erosion and sediment loading. The education component will set the stage by offering area residents information on the benefits of lakescaping and "how to" workshops. The incentive program is designed to encourage lakeshore owners to convert their high maintenance and manicured lakeshore to native vegetations to protect the lakeshore, improve water quality and provide better aquatic habitat.

Restoring water resources of the Sauk River chain of lakes — 2008 (active in 2009)

Sponsor: SRWD

Funding: Section 319 (Grant) $200,000, CWP (Loan) $200,000

Purpose: This restoration project proposes a three year implementation plan. The first year will involve installing monitoring equipment and attaining baseline monitoring data, comprehensive stream bank assessments, feedlot inventories, stormwater assessments and begin a tailored education program. The following years will focus on implementing stormwater, urban and Ag BMPs. Monitoring and education programs will continue until project completion.

Restoring water resources of the Sauk River chain of lakes — 2004 (active in 2009)

Sponsor: SRWD

Funding: Section 319 (Grant) $250,000; CWP (Loan) $500,000

Purpose: Continue to carry out the goal of phosphorus reduction and loading by following the recommendations made in the CWP Phase IIA Final Report.

Restoring water resources of the Sauk River chain of lakes project continuation (awarded in 2009)

Sponsor: SRWD

Funding: CWP (Grant) $138,050; CWP (Loan) $150,000

Purpose: This project will continue to educate the local citizens on the immediate and long-term impact of agricultural, shoreland and urban stormwater management. The sponsor will work with local units of government to hold educational events and seminars based on local needs targeted to adult, youth and volunteer audiences. Stream monitoring will continue at the Sauk River Chain of Lakes inlets, as well as beginning research of the physical and biological characteristics of the inlets. BMP activities continue, including agricultural and rural land use, stormwater and urban uses, well sealing, shoreland/riparian restorations, septic systems upgrades and erosion and sediment reduction. This project begins a process to develop a water quality trading program within the watershed of the Sauk River Chain of Lakes.

Sauk Lake basin restoration project continuation — 2005 (active in 2009)

Sponsor: SRWD

Funding: CWP (Grant) $267,200; CWP (Loan) $500,000

Purpose: Continue information and education activities, water quality monitoring and evaluation, agricultural, rural land use, stormwater and urban BMPs, shore land and stream bank restoration, project administration and upgrading septic systems.

Sauk River chain of lakes TMDL Project — 2005 (active in 2009)

Sponsor: SRWD

Funding: Section 319 (Grant) $125,000

Purpose: Monitor, model and develop land use data to identify potential pollutants in order to develop a TMDL for excessive nutrients.

Stearns County manure basin abandonment project — 2006 (active in 2009)

Sponsor: Stearns County

Funding: Section 319 (Grant) $57,150

Purpose: Evaluate ground water beneath six abandoned manure basins, with the aim of learning more about the effect of such facilities on regional ground-water resources.

Targeted BMP implementation within impaired areas in the Upper Mississippi Basin — continuation II — 2008 (active in 2009)

Sponsor: Stearns County Soil and Water Conservation District

Funding: Section 319 (Grant) $300,000

Purpose: This project will address the following items: Unpermitted manure storage basin investigations and feedlot evaluations, nonpoint BMPs educational initiatives, manure management plan development, animal waste management systems, erosion control and promotion of other related BMPs. In addition, water quality monitoring from the Sauk River Watershed District will be used to identify impaired areas and improvements to designated impaired waters.

Targeted implementation activity within impaired and ecologically sensitive areas in Stearns County — 2007 (active in 2009)

Sponsor: Stearns County SWCD

Funding: Section 319 (Grant) $300,000

Purpose: This project targets livestock producers and landowners located in and near wellhead protection areas and drinking water supply management areas, designated lakesheds and shoreland areas. Funds would be made available to encourage livestock producers to work with a Certified Crop Adviser in developing a comprehensive Manure Management Plan, and to correct feedlot pollution problems and soil erosion for producers within the ecologically sensitive areas.

Targeted implementation/compliance activity within impaired and ecologically sensitive areas in the Upper Mississippi River Basin in Stearns County (continuation) — 2006 (active in 2009)

Sponsor: Stearns County SWCD

Funding: Section 319 (Grant) $300,000

Hire inspector and technician to investigate unpermitted earthen manure storage basins, conduct feedlot evaluations, develop manure management plans.

Targeted implementation/compliance activity within TMDL and ecologically sensitive areas, phase II — 2005 (active in 2009)

Sponsor: Stearns County Soil and Water Conservation District

Funding: Section 319 (Grant) $300,000

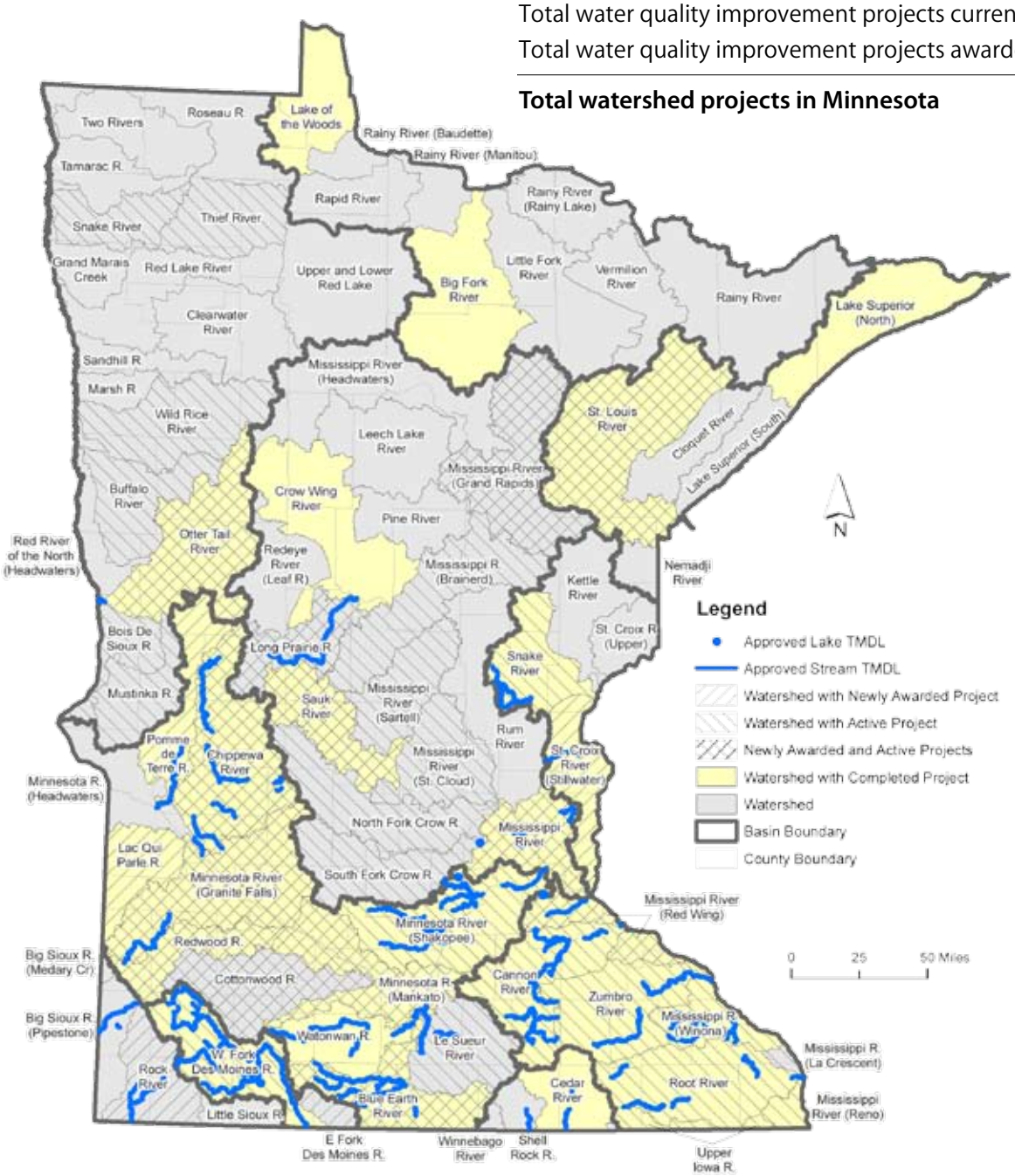
Purpose: Accelerate BMPs adoption by providing technical and financial assistance to producers, investigate unpermitted earthen manure storage basins; identify feedlots in need of pollution abatement, reconstruction or abandonment; develop manure management plans and implement soil erosion BMPs.

Summary of statewide watershed project activity

Projects completed, currently active and awarded

Made possible through a variety of funding sources (EPA Section 319 grants, CWLA and CWP) and the dedication and hard work of our agency partners, the following represents the water quality improvement projects that are currently underway, ready to begin or already completed in the state.

CWLA projects (primarily TMDL projects)	80
Total water quality improvement projects completed	49
Total water quality improvement projects currently active	82
Total water quality improvement projects awarded	24
Total watershed projects in Minnesota	**235**



Glossary of acronyms

annAGNPS—annualized Agricultural Non Point Source model

BERBI—Blue Earth River Basin Initiative

BMP—best management practices

BOD—biochemical oxygen demand

BWSR—Board of Water and Soil Resources

CCA—certified crop advisor

COD—chemical oxygen demand

CROW—Crow River Organization of Water joint powers board

CRP—Conservation reserve program

CREP—conservation reserve enhancement program

CRWP—Chippewa River Watershed Project

CSM—citizen stream monitoring

CSMP—citizen stream monitoring program

CWA—Clean Water Act (1987)

CWLA—Clean Water Legacy Act

CWP—Clean Water Partnership

DNR—Department of Natural Resources

DO—dissolved oxygen

EPA or **USEPA**—Environmental Protection Agency or United States Environmental Protection Agency

ESD—Environmental Services Department

FLEval—Feedlot evaluation model

GBERBA—Greater Blue Earth River Basin Alliance

GPS—global positioning system

IBI—index of biological integrity

IPHT—imminent public health threat

ISTS—individual sewage treatment system

LCMR—Legislative Commission on Minnesota Resources

LID—low impact development

MDA—Minnesota Department of Agriculture

MMP—manure management plan

MPCA—Minnesota Pollution Control Agency

NMP—national monitoring program

NO^3—nitrate/nitrogen

NPS—non point source

NPSP—non point source pollution

NRCS—Natural Resource Conservation Service

OLA—open lot agreement

OLCP—open lot certification program

P—Phosphorus

RCRCA—Redwood-Cottonwood Rivers Control Area

Section 319—section of Clean Water Act

SHEP—Stream Health Evaluation Program

SRF—state revolving fund

SRWD—Sauk River Watershed District

SSC—suspended sediment contamination

SSTS—Subsurface Sewage Treatment System

STORET—storage and retrieval system—EPA database

SVS—Suspended volatile solids

SWAT—surface water assessment tool

SWCD—Soil and Water Conservation District

TMDL—total maximum daily load

TP—total phosphorus

TSS—total suspended solids

TT—transparency tube

UM—University of Minnesota

USEPA—United States Environmental Protection Agency

USGS—United States Geological Survey

WD—watershed district

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