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Watershed Achievements Report

2011 Annual Report to the U.S. Environmental Protection Agency

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

Minnesota Pollution Control Agency

Minnesota Pollution
Control Agency

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www.pca.state.mn.us

wq-cwp8-13

Cover photo: Cuyuna Country State Recreation Area near Crosby and Ironton, Minnesota — Kimberly Laing, MPCA

Watershed Achievements Report

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Minnesota Pollution Control Agency

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Introduction

Cuyuna Country State Recreation Area near Crosby and Ironton, Minnesota — Kimberly Laing, MPCA

Minnesota's citizens have deep cultural, social and economic connections to water. In this land of over 10,000 lakes — water is central to daily life. The 2008 passage of the Clean Water, Land and Legacy Amendment reflects the true depth of commitment by Minnesota's citizens to ensuring water restoration and protection efforts remain funded well into the future. Minnesotans are clearly not alone in their commitment to water. A strong concern about water is also being echoed across the country. Results of a March 2011 Gallup Poll survey show that 79 percent of Americans worry about pollution of rivers, lakes, and reservoirs. Worry about water pollution tied as the top concern from a list of nine environmental issues — www.gallup.com/poll/146810/water-issues-worry-americans-global-warming-least.aspx.

Clean Water Act Section 319 funding received from the U. S. Environmental Protection Agency (USEPA) is also instrumental in bringing action to Nonpoint Source (NPS) water quality concerns in Minnesota. NPS pollution continues to be the biggest threat to water quality. The Minnesota Pollution Control Agency's (MPCA) NPS activities are outlined in the recently submitted and approved Continuing Planning Process document — www.pca.state.mn.us/index.php/view-document.html?gid=15647. The MPCA is working to align its NPS and point-source water quality efforts in a manner that will generate greater impacts on a watershed-wide scale. A watershed approach to achieving water quality restoration and protection means working more deliberately and comprehensively on water protection, management and restoration functions within the MPCA and at the local level. This new approach to water-related activities helps the agency prioritize and focus efforts to effectively manage water resources throughout the state.

Fully implementing the watershed approach for water restoration and protection is one of the top priorities of the MPCA. Key action items were recently identified by the MPCA as necessary to achieving and implementing the watershed approach throughout the agency — using monitoring and assessment information to target agency activities; developing strategies for restoration, protection and implementation plans; integrating the agency's watershed data; measuring, tracking and reporting results and outcomes; and communicating progress.

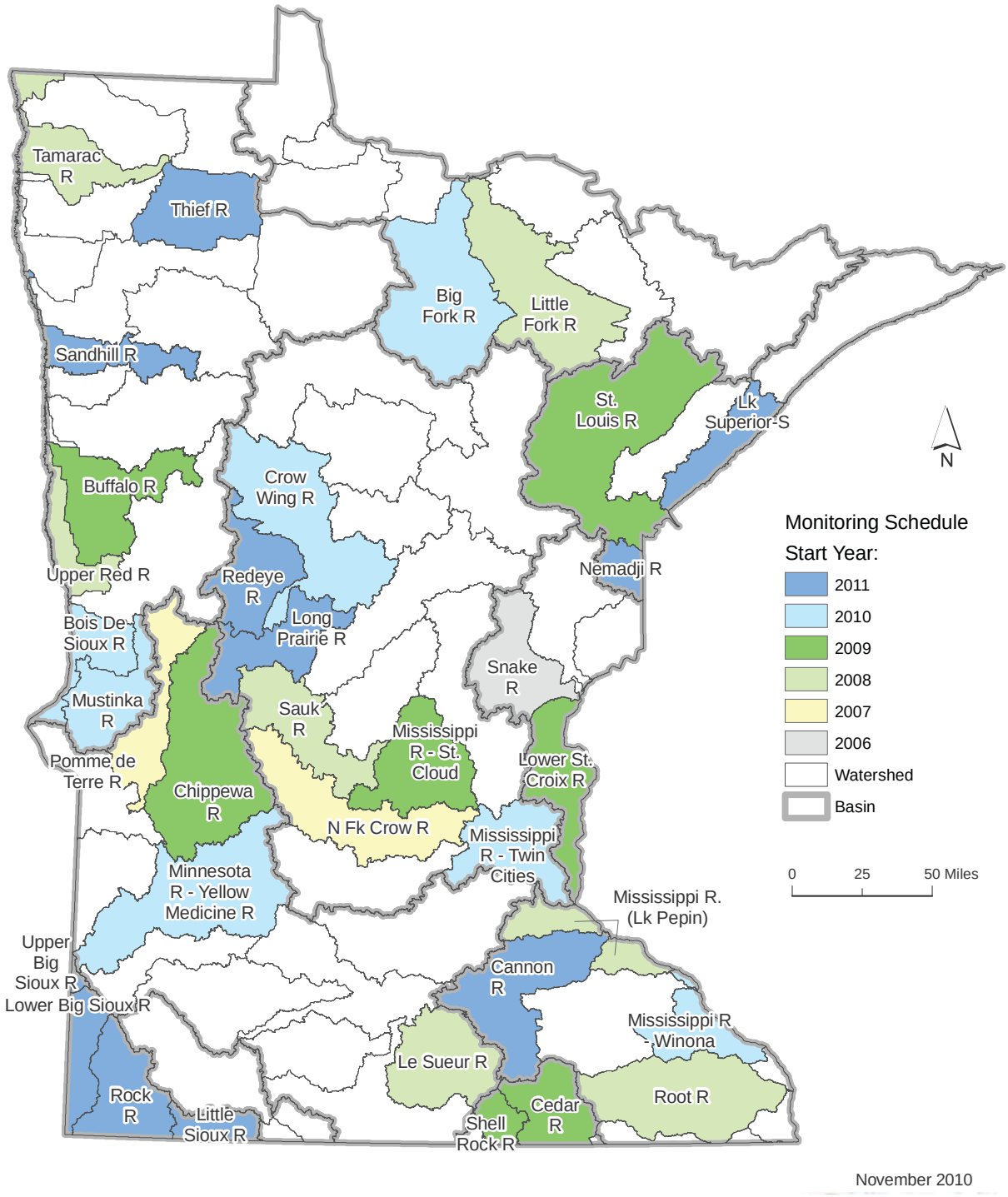
Measuring and communicating our results has been a particularly active area of development during the past year and will continue to take form in the short term. Minnesota State Agencies that receive Clean Water Amendment Funding are working together to ensure the flow of dollars is transparent and that the results of our work are readily available and easily accessible to all Minnesotan's. A new website recently went live to bring the public full access to projects funded with Amendment dollars — www.legacy.leg.mn. Additionally, the MPCA has developed a new website link that delivers real-time data to the finger tips of those who are searching online for water restoration and protection efforts within specific watersheds — www.pca.state.mn.us/jsrid8f. State agencies also continue to refine a suite of specific tracking items and measurements that will be required for reporting on water quality work; and the MPCA has begun revising our own approach to tracking and measuring water efforts throughout the Agency.

List of acronyms

annAGNPS Annualized Agricultural Nonpoint Source Model
BATHTUB Army Corps of Engineers Lake Model
BERBI Blue Earth River Basin Initiative
BMP best management practice
BOD biochemical oxygen demand
BWSR Minnesota Board of Water and Soil Resources
CAC Citizen Advisory Committee
CCA certified crop advisor
COD chemical oxygen demand
CROW Crow River Organization of Water
CRP Conservation Reserve Program
CREP Conservation Reserve Enhancement Program
CRWP Chippewa River Watershed Project
Citizen Stream Monitoring
CSM or CSMP Citizen Stream Monitoring / Citizen Stream Monitoring Program
CWA Clean Water Act (1987)
CWLA Clean Water Legacy Act
CWP Clean Water Partnership
DNR Minnesota Department of Natural Resources
DO dissolved oxygen
ESD Environmental Services Department
FLEval Feedlot Evaluation Model
FLUX input inflow model for BATHTUB
GBERBA Greater Blue Earth River Basin Alliance
GIS geological information systems
GPS global positioning system
HSPF Hydrologic Simulation Program FORTRAN
HUC hydrologic unit code
IBI index of biological integrity
IPHT imminent public health threat
ISTS Individual Sewage Treatment System
LCMR Legislative Commission on Minnesota Resources
LiDAR Light Detection and Ranging
LID low impact development
MDA Minnesota Department of Agriculture
MMP manure management plan
MPCA Minnesota Pollution Control Agency
MS4 Municipal Separate Storm Sewer System
NCED National Center for Earth-surface Dynamics
NMP National Monitoring Program
NO^3 nitrate/nitrogen
NPS nonpoint source
NPSP nonpoint source pollution
NRCS Natural Resource Conservation Service
OLCP Open Lot Certification Program
P Phosphorus
PFA Public Facilities Authority
PPB parts per billion
QA/QC Quality Assurance/Quality Control
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 (now EQuIS)
SWAT Soil And Water Assessment Tool
SWCD soil and water conservation district
TAC Technical Advisory Committee
TMDL total maximum daily load
TP total phosphorus
TSS total suspended solids
TT transparency tube
U of M University of Minnesota
USDA-ARS United States Department of Agriculture – Agricultural Research Service
USEPA United States Environmental Protection Agency
USGS United States Geological Survey
VSS volatile suspended solids
WAR SSS Watershed Assessment of River Stability and Sediment Supply
WD watershed district
WLA waste load allocation
WNC Well Network Coordinators

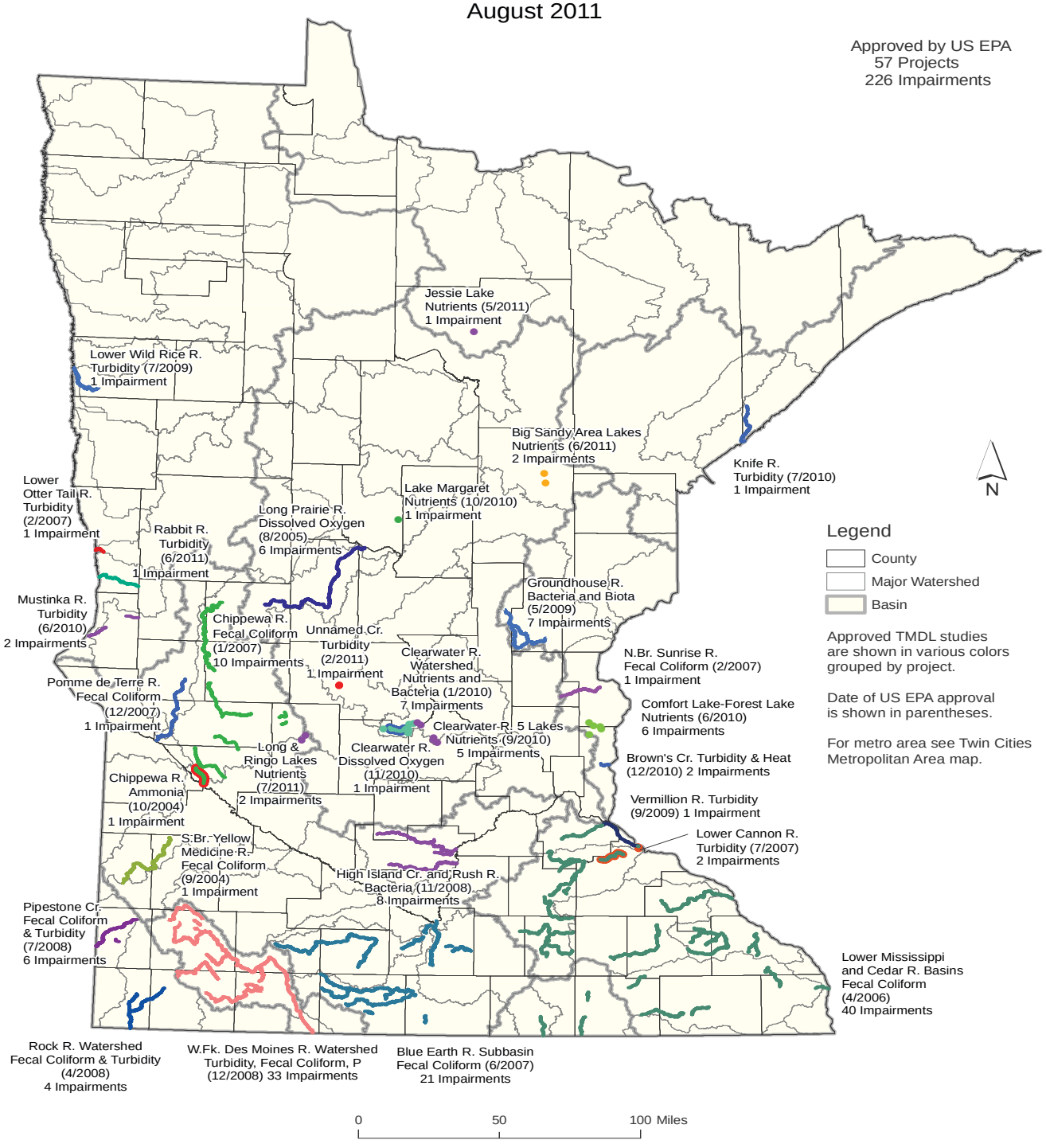
Monitoring progress

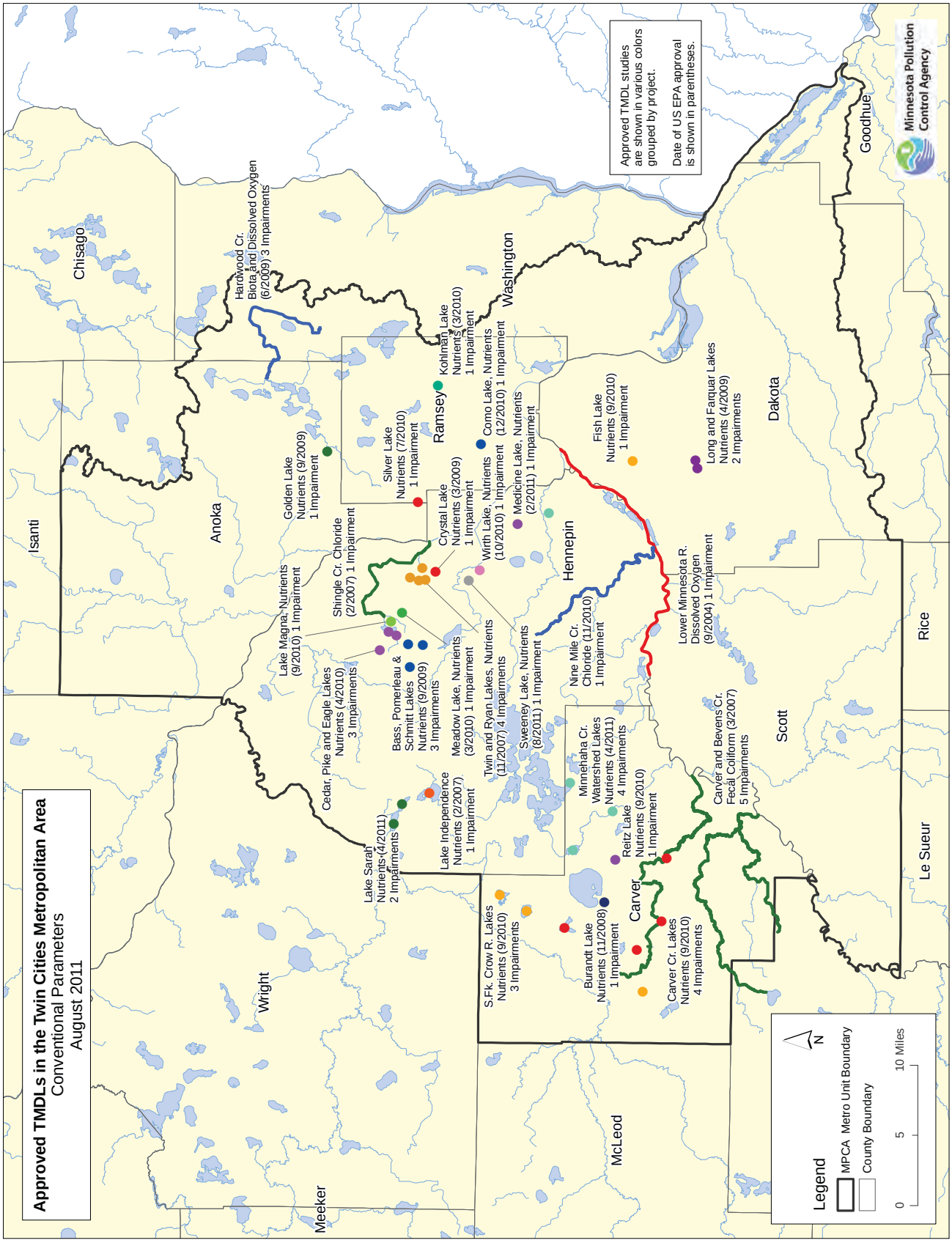
The MPCA has now initiated or completed Intensive Watershed Monitoring (IWM) in 35 of the state's 81 major watersheds — that's over 43 percent of the state's watersheds. The level of effort of this monitoring and the amount and types of data being collected in this Watershed Approach is well beyond that of past monitoring efforts. Marrying MPCA monitoring efforts with other local monitoring efforts, Minnesota is well on its way to a comprehensive assessment of the waters of the state on a 10-year cycle wrapping up in 2018. Effectiveness monitoring will continue after 2018.



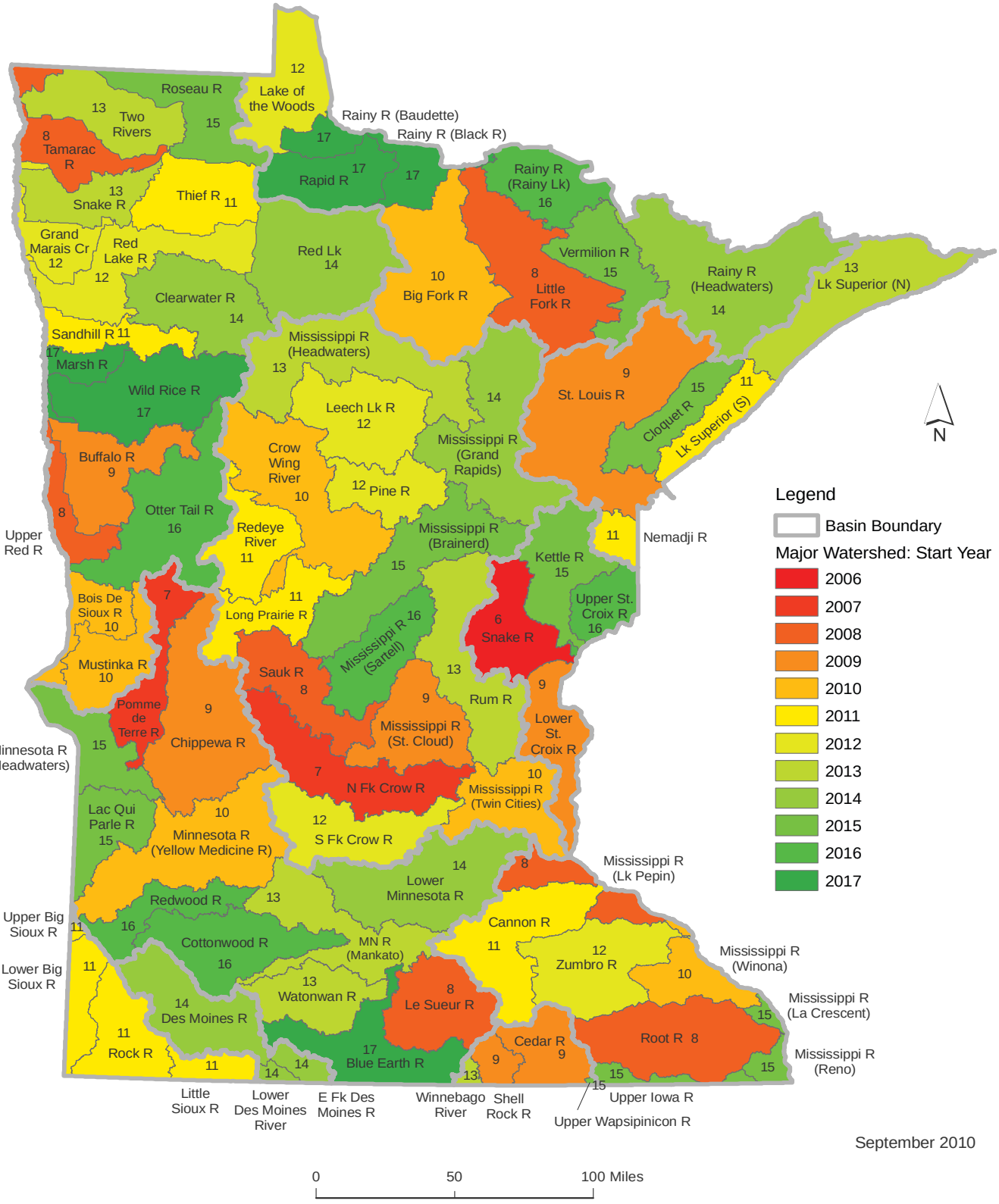
Approved TMDLs in Minnesota

Conventional Parameters
August 2011



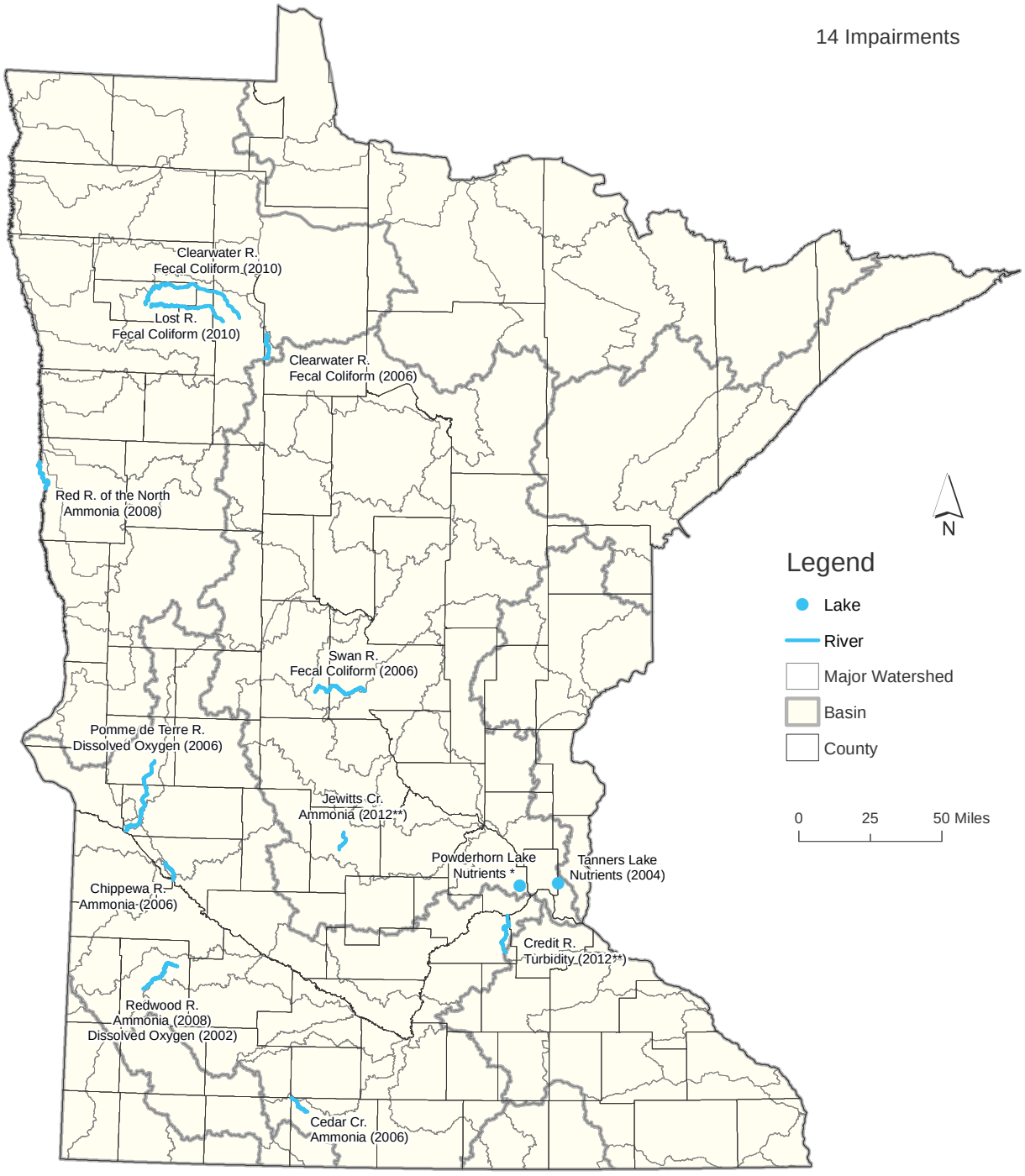

Approved TMDLs in the Twin Cities Metropolitan Area
Conventional Parameters
August 2011
Approved TMDL studies are shown in various colors grouped by project.
Date of US EPA approval is shown in parentheses.
Minnesota Pollution Control Agency
Legend
MPCA Metro Unit Boundary
County Boundary
0 5 10 Miles
N
Chisago
Isanti
Anoka
Ramsey
Washington
Goodhue
Wright
Hennepin
Dakota
Carver
Scott
Rice
Le Sueur
McLeod
Meeker
Hardwood Cr. Biota and Dissolved Oxygen (6/2009) 3 Impairments
Kohlman Lake Nutrients (3/2010) 1 Impairment
Como Lake, Nutrients (12/2010) 1 Impairment
Golden Lake Nutrients (9/2009) 1 Impairment
Silver Lake Nutrients (7/2010) 1 Impairment
Crystal Lake Nutrients (3/2009) 1 Impairment
Wirth Lake, Nutrients (10/2010) 1 Impairment
Medicine Lake, Nutrients (2/2011) 1 Impairment
Fish Lake Nutrients (9/2010) 1 Impairment
Long and Farquar Lakes Nutrients (4/2009) 2 Impairments
Shingle Cr. Chloride (2/2007) 1 Impairment
Lake Magna, Nutrients (9/2010) 1 Impairment
Cedar, Pike and Eagle Lakes Nutrients (4/2010) 3 Impairments
Bass, Pomerleau & Schmitt Lakes Nutrients (9/2009) 3 Impairments
Meadow Lake, Nutrients (3/2010) 1 Impairment
Twin and Ryan Lakes, Nutrients (11/2007) 4 Impairments
Sweeney Lake, Nutrients (8/2011) 1 Impairment
Nine Mile Cr. Chloride (11/2010) 1 Impairment
Lower Minnesota R. Dissolved Oxygen (9/2004) 1 Impairment
Minnehaha Cr. Watershed Lakes Nutrients (4/2011) 4 Impairments
Reitz Lake Nutrients (9/2010) 1 Impairment
Carver and Bevens Cr. Fecal Coliform (3/2007) 5 Impairments
Lake Sarah Nutrients (4/2011) 2 Impairments
Lake Independence Nutrients (2/2007) 1 Impairment
S.Fk. Crow R. Lakes Nutrients (9/2010) 3 Impairments
Burandt Lake Nutrients (11/2008) 1 Impairment
Carver Cr. Lakes Nutrients (9/2010) 4 Impairments

Watershed Approach Projects



Previous Impairments now Meeting Water Quality Standards due to Management Actions

December 2010

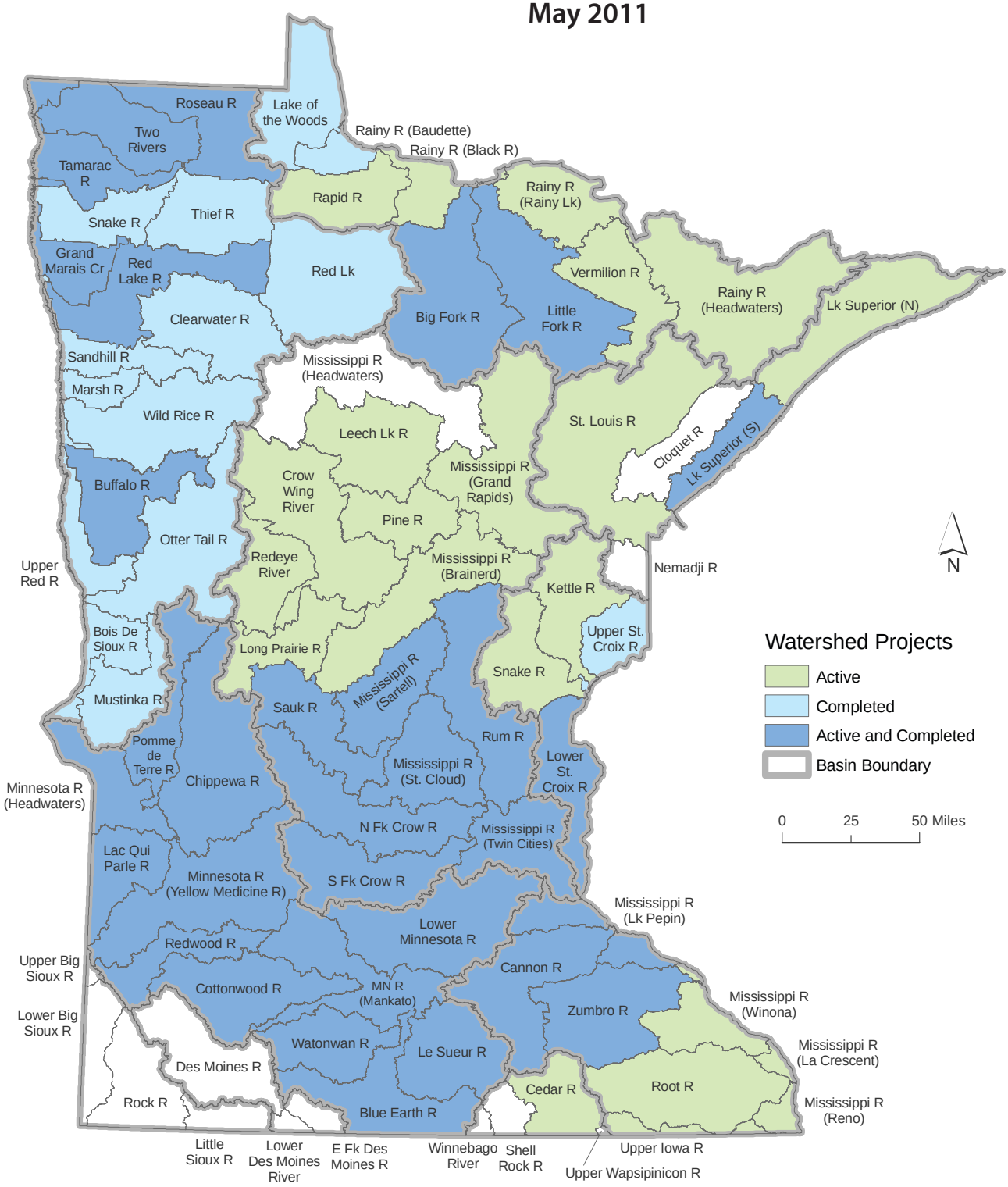


* To be proposed by MPCA for delisting following continued attainment of water quality standards.
** To be proposed by MPCA for delisting in the next listing cycle.
Delisting proposals are subject to public comment and EPA approval.

Clean Water Legacy

Active and completed projects

May 2011



Clean Water Legacy projects active in 2011

Project Title	Watershed	Project Sponsor	Project Manager	Amount
Cedar River				
Alternative Ditch TMDL	Cedar River	Mower County Soil and Water Conservation District	Joseph Magner	$149,194.47
Cedar River Turbidity/Nutrients TMDL	Cedar River	Mower County Soil and Water Conservation District	Bill Thompson	$361,823.00
Lake Superior				
Poplar River Watershed	Lake Superior - North	Cook County Soil and Water Conservation District/University of Minnesota	Karen Evens	$172,830.21
Knife River Watershed TMDL Part 3	Lake Superior - South	South St. Louis County Soil and Water Conservation District	Gregory Johnson	$27,715.00
Lake Superior Basin Miller Creek TMDL Part 2	St. Louis River	South St. Louis County Soil and Water Conservation District	Tom Estabrooks	$70,000.00
Lower Mississippi				
Crystal/Keller/Lee/Earley Lakes Nutrient TMDL	2 watersheds including Mississippi River - Lake Pepin	Black Dog Water Management Commission	Barbara Peichel	$174,102.00
Cannon River Watershed One Water Strategy	Cannon River	Cannon River Watershed Partnership	Justin Watkins	$98,668.00
Root River Basin Turbidity TMDL	Root River	Fillmore County	Shaina Keseley	$300,000.00
Upper Cannon Lakes Nutrients TMDL	Cannon River	Minnesota State University Mankato	Shaina Keseley	$240,000.00
Whitewater River Watershed Turbidity TMDL	Mississippi River - Winona	Whitewater Joint Powers Board	Bill Thompson	$57,444.00
Sediment Work for Lower Mississippi Basin TMDL Support	8 watersheds including Zumbro River	Winona State University	Justin Watkins	$15,000.00
Minnesota				
Chippewa River Watershed Turbidity TMDL	Chippewa River	Chippewa County	Katherine Pekarek-Scott	$140,000.00
Pope County Eight Lakes TMDL	Chippewa River	Pope County Soil and Water Conservation District/Emmons and Olivier Resources	Tim James	$269,727.26
Long Lake Nutrient TMDL	Minnesota River - Yellow Medicine River	Kandiyohi County	Darrell Schindler	$70,704.00
Lac qui Parle-Yellow Bank River TMDL Assessment/Implementation Plan	Minnesota River - Headwaters	Lac qui Parle Yellow Bank Watershed District	Katherine Pekarek-Scott	$137,021.00
Lake Crystal Excess Nutrients TMDL	Minnesota River - Mankato	Minnesota State University Mankato	Paul Davis	$39,698.85
Lura Lake Nutrients TMDL	LeSueur River	Minnesota State University Mankato	Paul Davis	$33,484.00
Rush River and High Island Creek Turbidity/Biota TMDL	Lower Minnesota River	Minnesota State University Mankato	Scott MacLean	$155,000.00
Cottonwood River Turbidity TMDL	Cottonwood River	Redwood-Cottonwood Rivers Control Area	Mark Hanson	$145,000.00
Redwood River Turbidity TMDL	Redwood River	Redwood-Cottonwood Rivers Control Area	Mark Hanson	$120,000.00

Clean Water Legacy projects active in 2011 (continued)

Project Title	Watershed	Project Sponsor	Project Manager	Amount
Credit River Turbidity TMDL Development	Lower Minnesota River	Scott County	Brooke Asleson	$125,000.00
Pomme de Terre River Watershed Turbidity TMDL	Pomme de Terre River	Stevens County Soil and Water Conservation District	Katherine Pekarek-Scott	$120,000.00
LeSueur River Basin Sediment Study - National Center for Earth-Surface Dynamics	LeSueur River	University of Minnesota - Water Resources Center	Larry Gunderson	$589,903.00
Lake Pepin Watershed TMDL Full Cost Accounting	31 watersheds including Watonwan River	University of Minnesota	Norman Senjem	$385,699.81
Rainy				
Jessie Lake Nutrients TMDL	9 watersheds including - Rainy River	Itasca Soil and Water Conservation District	Nolan Baratono	$97,789.00
Red				
USGS Real Time Monitoring in the Red River	Red River of the North	US Geological Survey	Cary Hernandez	$9,870.00
Red River Basin Soil and Water Assessment Tool Modeling	5 watersheds including Red River of the North	University of North Dakota	Michael Vavricka	$250,000.00
St. Croix				
Ann River Watershed	Snake River	Kanabec Soil and Water Conservation District	Christopher Klucas	$44,860.00
Lake St. Croix Water Quality Monitoring & Phosphorous Reduction	Lower St. Croix River	St. Croix River Association	Christopher Klucas	$500,000.00
Statewide				
DNR Stream Gaging (CWLA & Section 319)		Department of Natural Resources	Tim James	$200,000.00
Statewide Sediment		US Geological Survey	Gregory Johnson	$258,000.00
Upper Mississippi				
Big Sandy Area Lakes Nutrients TMDL	Mississippi River - Grand Rapids	Aitkin County/Barr Engineering	Bonnie Finnerty	$232,682.02
Sweeney Lake TMDL Phase 2	Mississippi River - Twin Cities	Bassett Creek Watershed Management Commission	Brooke Asleson	$78,650.00
Crow River South Fork Buffalo Creek Turbidity TMDL	South Fork Crow River	Crow River Organization of Water	Margaret Leach	$109,778.00
Elm Creek Watershed - Wide TMDL	Mississippi River - Twin Cities	Elm Creek Watershed Management Commission	Brooke Asleson	$183,000.00
Crow River Middle Fork Diamond Lake TMDL	South Fork Crow River	Middle Fork Crow River Watershed District	Margaret Leach	$176,215.00
Rice Lake Nutrient TMDL	North Fork Crow River	North Fork Crow River Watershed District	Margaret Leach	$138,871.00

Clean Water Legacy projects active in 2011 (continued)				
Project Title	Watershed	Project Sponsor	Project Manager	Amount
Lake Sarah Nutrient TMDL	South Fork Crow River	Three Rivers Park District	Barbara Peichel	$34,912.00
Ann & Emma Lakes Nutrients TMDL	South Fork Crow River	Wright County Soil and Water Conservation District	Margaret Leach	$141,218.00
Little Rock Lake Nutrients TMDL	Mississippi River - Sartell	Benton Soil and Water Conservation District	Margaret Leach	$150,224.54

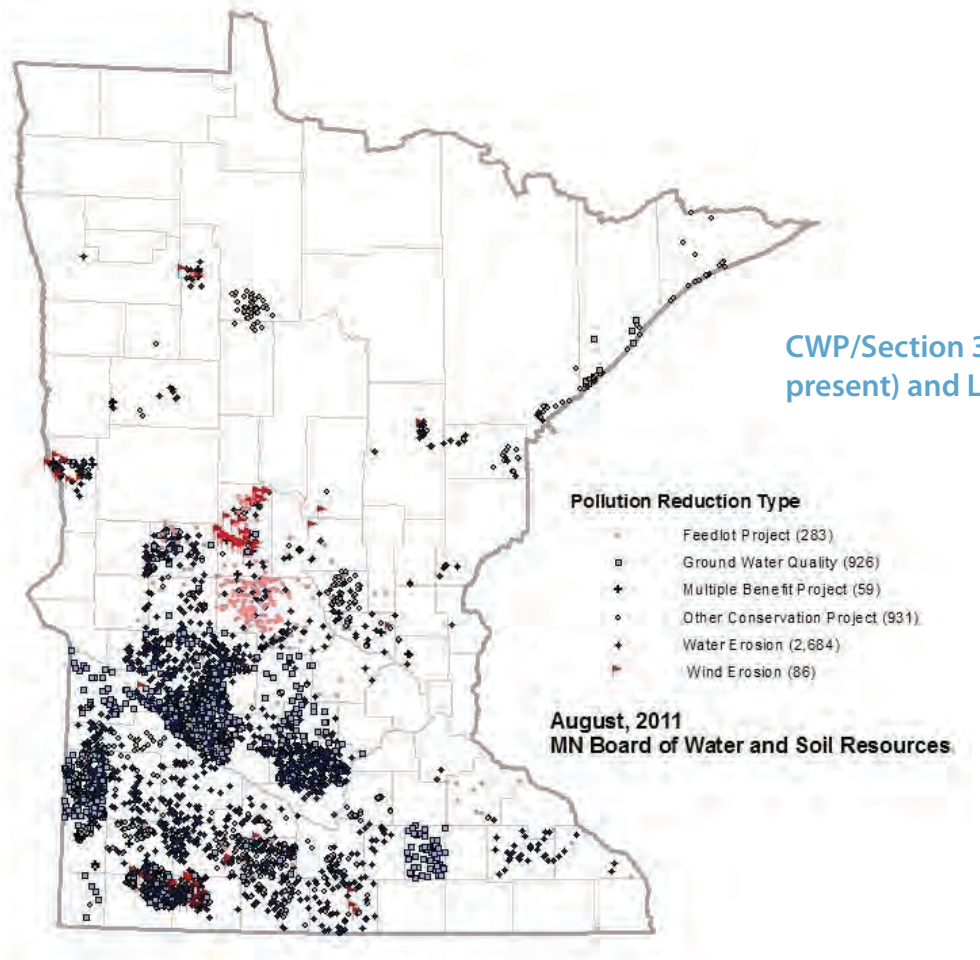
Cuyuna Country State Recreation Area near Crosby and Ironton, Minnesota — Kimberly Laing, MPCA

LARS and eLINK results from Section 319 and CWP projects 1997–August 2011

The following table shows progress through August 2011 based on previous Local Annual Reporting System (LARS) reporting (1997–2002) and reporting data from eLINK(2003–August 2011). Based on LARS/eLINK reporting by CWP and Section 319 project partners, these projects have reduced soil loss from 1998 through August 2011 by approximately more than 268,748 tons/year. During the same period, sedimentation was reduced by approximately more than 110,305 tons/year. Phosphorus loading was approximately reduced by more than 308,800 pounds/year.

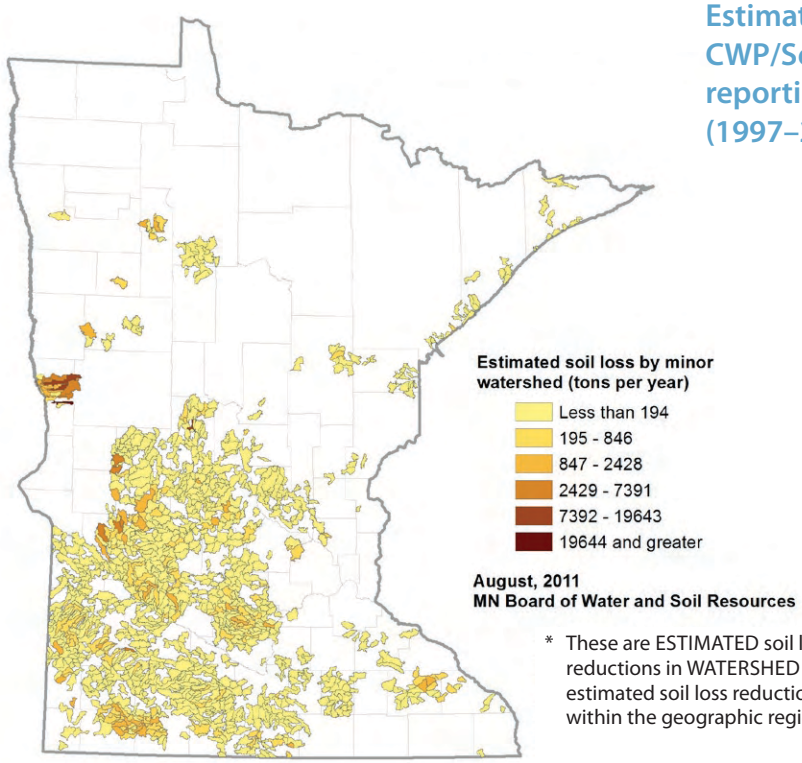
Pollution reduction estimate type	# of BMPs	Estimated soil loss reduction (tons/yr)	Estimated sediment reduction (tons/yr)	Estimated phospho-rus reduction (pounds/yr)	Estimated nitrogen reduction (pounds/yr)*
Feedlot project	286	0	0	44,745	89,489
Groundwater quality	926	0	0	5,105	10,209
Multiple benefit project	220	18,274	3,113	3,949	7,899
Other conservation projects	982	17,881	3005	135,823	271,646
Water erosion	4,623	230,339	104,144	118,547	237,093
Wind erosion	86	2,253	44	632	1,263
Total	7,123	268,748	110,305	308,800	617,600

* Estimated nitrogen calculated from doubling estimated phosphorus



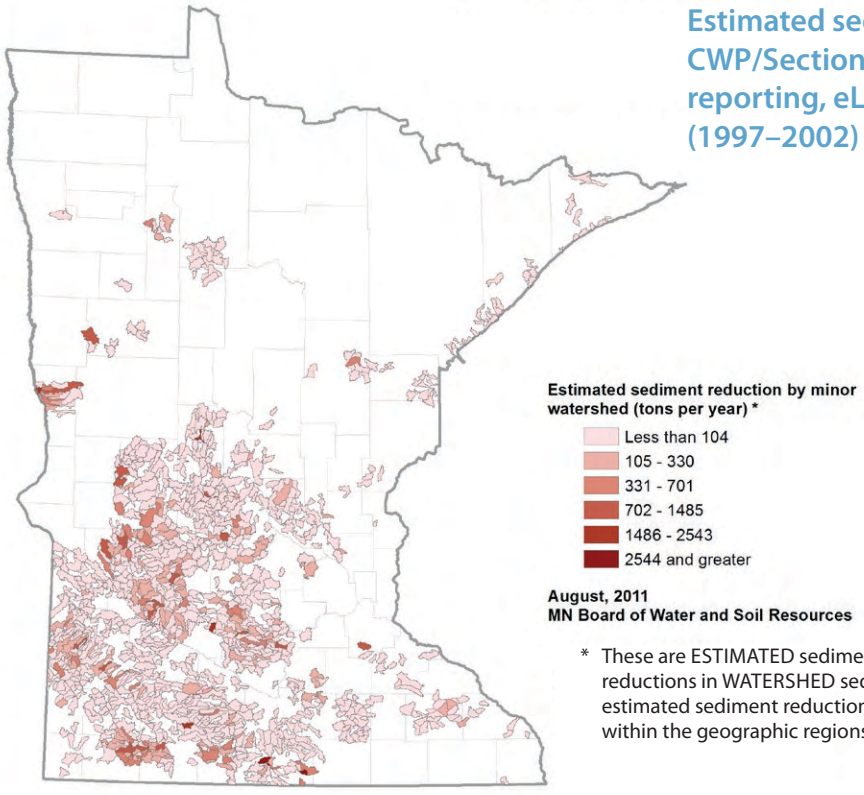
CWP/Section 319 BMPs eLINK (2003–present) and LARS (1997–2002)

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



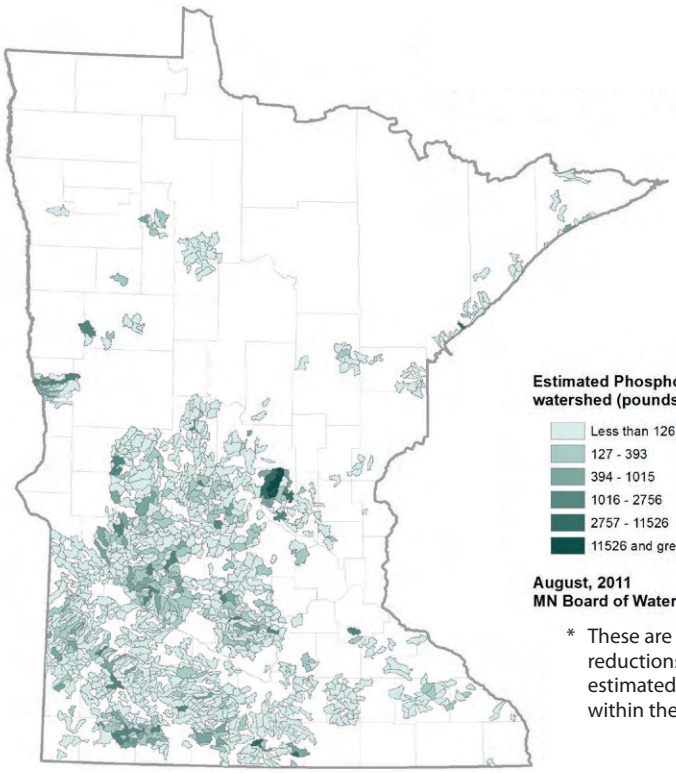
* These are ESTIMATED soil loss reductions. They DO NOT represent reductions in WATERSHED soil loss yield. They represent the sum of estimated soil loss reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

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



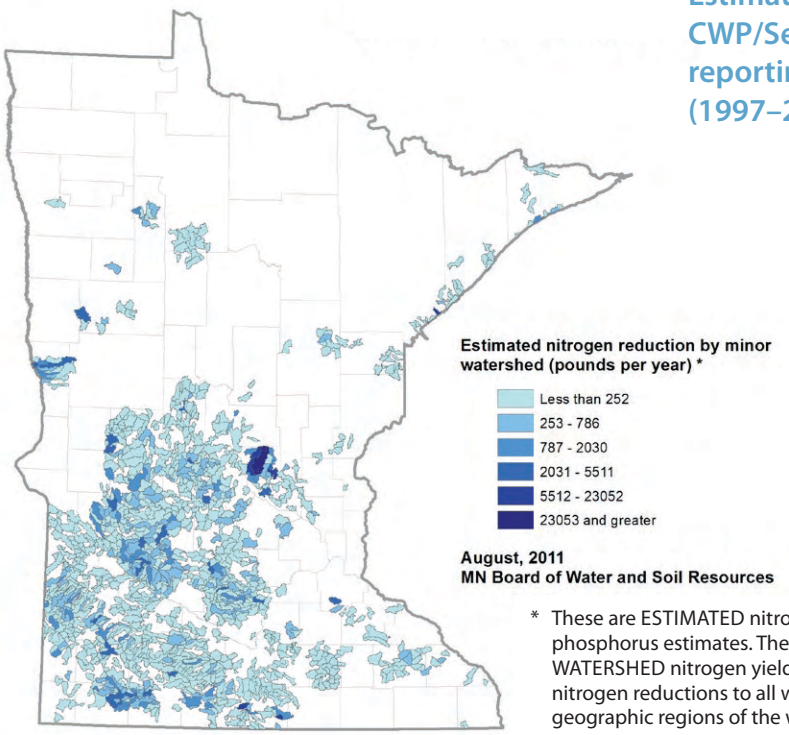
* These are ESTIMATED sediment reductions. They DO NOT represent reductions in WATERSHED sediment yield. They represent the sum of estimated sediment reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

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



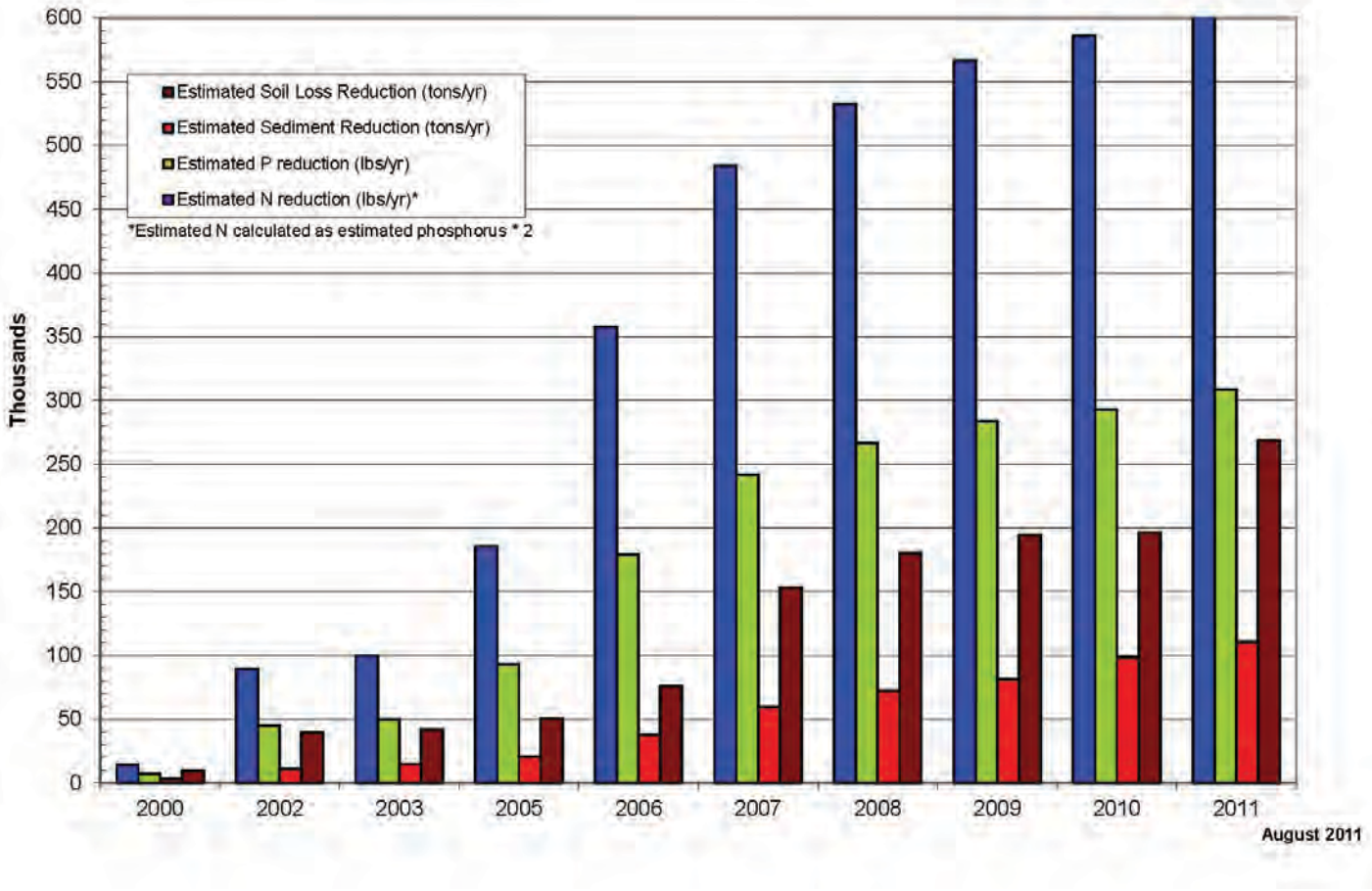
* These are ESTIMATED phosphorus reductions. They DO NOT represent reductions in WATERSHED phosphorus yield. They represent the sum of estimated phosphorus reductions to all water bodies (even isolated ones) within the geographic regions of the watershed.

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



Projects completed for 2010–2011

Statewide
eLINK and Section 319 Partnership for eLINK Support Staff

Des Moines and Missouri River Basins
Alternative Tile Intake Cost-Share Program

Lake Superior River Basin
None completed for 2010–2011

Lower Mississippi and Cedar River Basins
Lower Mississippi Feedlot Runoff Control

Upper Cannon Assessment

Lower Vermillion River Effectiveness Monitoring

Minnesota River Basin
Ravine, Bluff, and Stream Erosion Project

Blue Earth River Channel Modifications

Greater Blue Earth Basin Turbidity TMDL

Chippewa River – Dry Weather, Lines and Spring Creeks

Chippewa River Lower Main Stem Sub-basin

Cobb River Drainage

Greater Blue Earth River Watershed BMPs on the Big Cobb

Hawk Creek Project "Land of the Lost" Work Area Continuation

Yellow Medicine River Watershed Dissolved Oxygen

Seven Mile Creek Glacial Sediment Study

Fish and Schwanz Lakes Nutrient TMDL

Middle Minnesota Watershed Monitoring

Nine Mile Creek Watershed TMDL

Sand Creek Watershed TMDL Resource Investigation

Interpreting a Century of Sediment in Redwood Lake

Rainy River Basin
Lake of Woods Nutrient Budget Water Quality Modeling

Williams Creek Dissolved Oxygen TMDL

Red River Basin
Buffalo River Major Watershed

Lower Otter Tail Sediment Reduction

Thief River Watershed Sediment Investigation

St. Croix River Basin
Browns Creek Impaired Biota TMDL

Forest Lake (Sub-watershed F144) Assessment

Healthy St. Croix Waters Training and Best Management Practices

Lake St. Croix TMDL

Lake St. Croix TMDL — Coordinator

Little Comfort Lake Watershed Load Assessment

Sunrise River North Branch Fecal Coliform TMDL Implementation

Sunrise Watershed SWAT Modeling

Upper Mississippi River Basin
Crow River North Fork Dissolved Oxygen, Turbidity and Fecal Coliform Phases 2 and 3

Elk River Watershed Priority Lakes 2

Getchell, Stony, Unamed Creeks Turbidity TMDL

Lake Winona Phase 3

Pearl Lake/Mill Creek/Lower Sauk River TMDL

Stearns County Manure Basin Abandonment

Swan River Watershed Management Plan Implementation

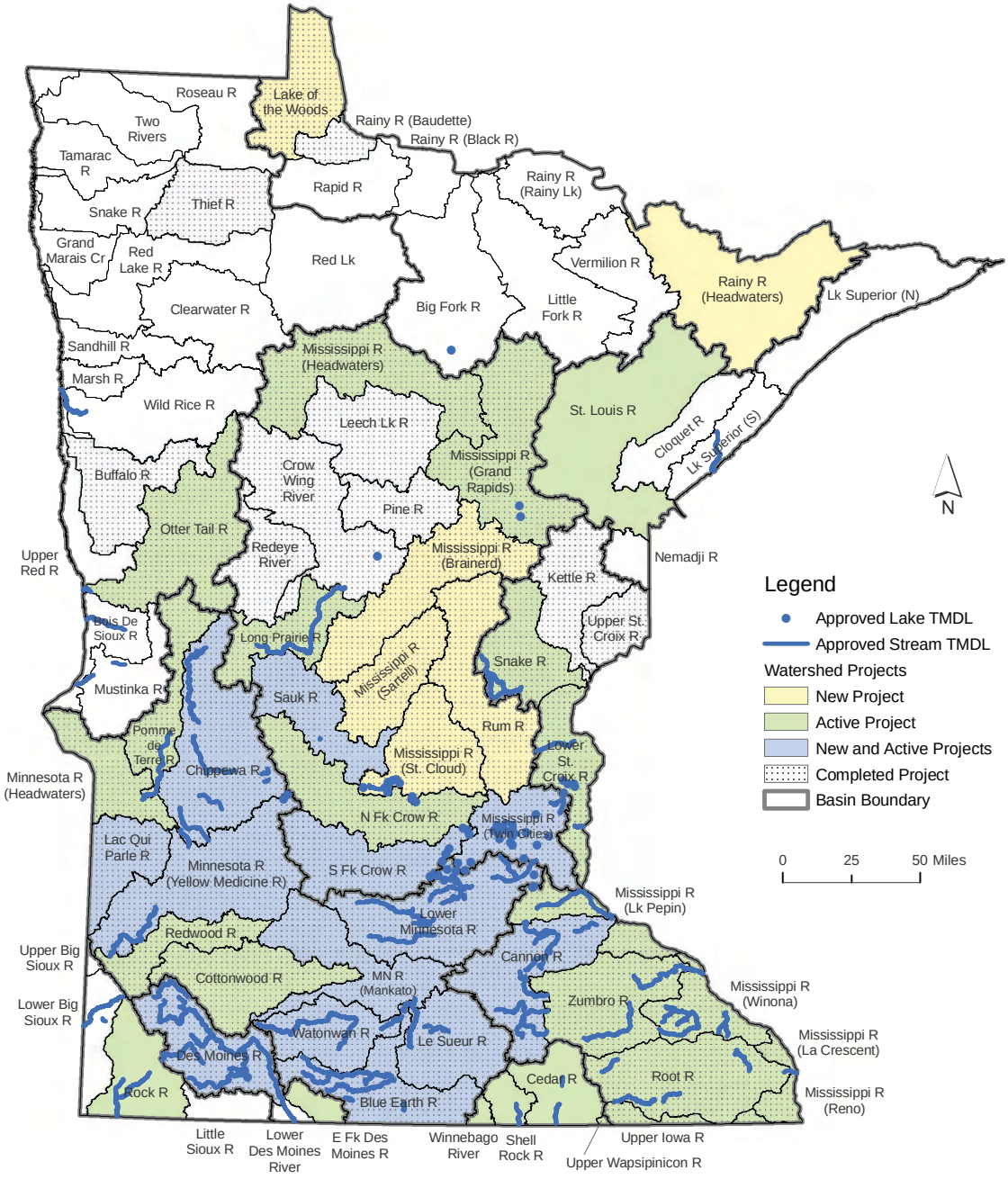
Targeted Implementation/Compliance Activity within Impaired and Ecologically Sensitive Areas

Upper Mississippi River Source Water Protection

Summary of statewide watershed project activity

Projects completed, currently active and awarded

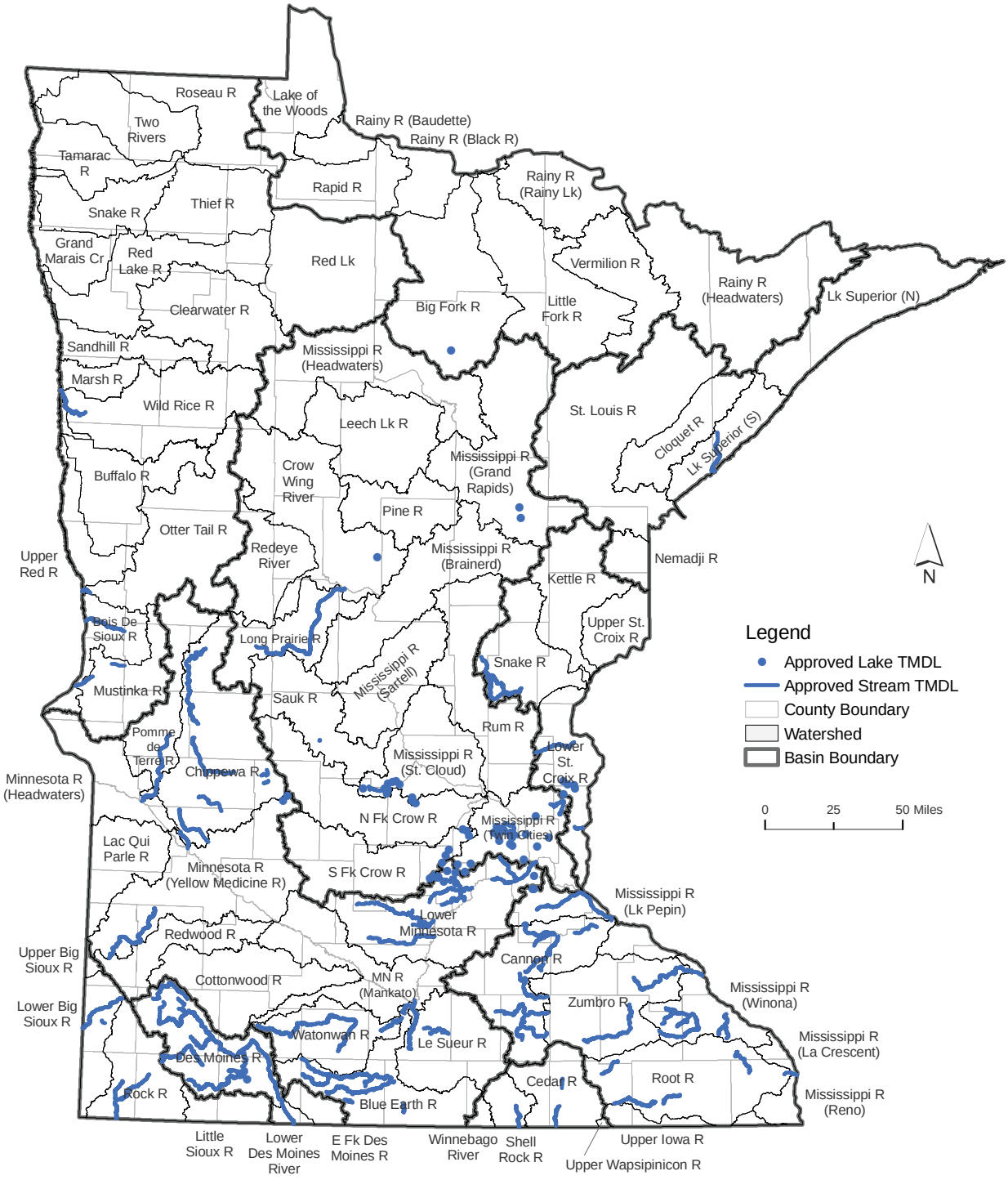
Made possible through a variety of funding sources (USEPA Section 319 grants, CWLA and CWP) and the dedication and hard work of our agency partners, the following map represents major watersheds where water quality improvement projects are currently underway, ready to begin or recently completed in the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



Statewide

Projects completed

eLINK and Section 319 Partnership for eLINK Support Staff



eLINK and Section 319 Partnership for eLINK Support Staff

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

Specifically, this project provides financial support for BWSR staff to maintain and support the eLINK system. This includes a variety of tasks such as computer server administration, database administration, GIS administration, eLINK configuration, eLINK report management, eLINK account administration, user support, and user training. These support tasks are ongoing through out the year.

Currently, there is a desire to integrate the reporting requirements for Section 319 and state grants. This has been difficult because of differences between state and federal grant requirements. We continue to focus on collecting information about BMPs which affect water quality and soil erosion. Specifically, eLINK provides a good way for local governments to report state estimated quantitative numbers about pollution reduction achieved through BMP installation, along with mapped project locations and funding information.

Goals

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

Results that count

- Local government staff have submitted information about their BMP installations and associated pollution reductions via eLINK. There are roughly 4,000 landowner BMP Section 319 implementations recorded in eLINK going back to 2004.
- MPCA staff have set up information about the Section 319 grants that were awarded. This sets the stage for local governments to begin reporting in eLINK.
- MPCA received data and maps out of the eLINK database upon request.

Financial information

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

Contact information

Tim Ogg
Minnesota Board of Water and Soil Resources
520 Lafayette Road North
St. Paul, MN 55155
651-297-8024
MPCA Project Manager: Sara Johnson

Statewide

Projects active and awarded in 2011

Assessing Enhanced Swales for Pollution Prevention — 2011

Sponsor: University of Minnesota – Twin Cities

Funding: Section 319 (Grant) $400,000

Purpose: This research will demonstrate the effectiveness of a new stormwater treatment system developed specifically for capturing dissolved phosphorus and heavy metals from roadway runoff. This new technology is relatively inexpensive to install compared to standard stormwater treatment practices and will fit within the limited roadway right-of-way, making it applicable to public and private roadways throughout the State of Minnesota and beyond. With approximately 290,954 lane-miles of public roadways in Minnesota and an approximate annual phosphorus load of 1.87 pounds per lane-mile, the potential reduction in phosphorus load to receiving water bodies is (at a 90 percent capture rate) approximately 488,800 pounds per year. The result would be a substantial improvement in water quality wherever this novel technology is installed.

Stormwater professionals will be informed of these results through workshops, a technical advisory panel, and UPDATES (a stormwater research newsletter with distribution to more than 2,000 interested parties). We will also seek inclusion in the on-line document, "Minnesota Stormwater Manual," www.pca.state.mn.us/index.php/view-document.html?gid=8937.

eLINK Database Support — 2010

Sponsor: Minnesota Board of Water and Soil Resources

Funding: Section 319 (Grant) $75,000

Purpose: Provide eLINK database support to MPCA staff, local units of government and grant sponsors. The goal of eLINK is to record soil and water conservation project BMPs and load reductions. Geographic project locations can be entered into eLINK. Also, BWSR provides a section for the annual Watershed Achievements report showing estimated load reductions.

Enhanced Filter Media for Removal of Dissolved Heavy Metals and Phosphorus from Stormwater Runoff — 2010

Sponsor: University of Minnesota – Twin Cities

Funding: Section 319 (Grant) $404,000

Purpose: Provide an important step in improving stormwater treatment to remove dissolved nutrients and heavy metals by developing technology that is applicable to urban and agriculture environments. The new technology, enhanced soil and sand filter media, will be available for use in stormwater sand filters, infiltration systems, rain gardens, buffer strips, and other treatment systems.

Outcomes: Design standards for using the technology in new and renovated stormwater treatment practices may be published in the Minnesota Stormwater Manual. Educational outreach will occur through webinars, incorporation into University of Minnesota Extension Services Stormwater U classes, and publication in UPDATES (a stormwater research newsletter with distribution to more than 2,000 interested parties). This technology will also be used in pilot studies with cities, watershed districts, and/or local governments. Implementation of the technology will result in significant removal of the dissolved fraction of heavy metal and nutrient loads from stormwater runoff.

Side Inlet Controls to Improve Water Quality — 2010

Sponsor: Minnesota Board of Water and Soil Resources

Funding: Section 319 (Grant) $341,605

Purpose: Side inlets serve as surface runoff outlets from agricultural land into drainage ditches and are very common wherever surface drainage ditches are present. These side inlets contribute sediment and concomitant nutrients and pesticides to Minnesota's waters. Side inlet controls such as culverts and drop pipes can prevent gully erosion, control the rate of flow to ditches, and create sedimentation areas to improve water quality. Current design practice does not consider water quality impacts, which this project would address. Research and demonstrations are needed to quantify the benefits of this BMP on sediment, nutrient, and pesticide loading to receiving waters and to develop design guidance and outreach so that side inlet controls can be implemented on a widespread basis.

Outcomes: Develop a Light Detection and Ranging (LiDAR)-based method for identifying side inlets to aid in implementation prioritization, estimate the cumulative benefits of adopting side inlet controls at different scales, optimize side inlet control design to provide water quality benefits while minimizing negative impacts to agricultural production, develop technical guidance for side inlet controls to be used by SWCDs, engineers, and other water resources professionals, and build research and demonstration projects at selected key locations across the state.

Social Indicators — Development and Testing — 2010

Sponsor: University of Minnesota, Water Resources Center

Funding: Section 319 (Grant) $200,000

Purpose: The Social Indicators (SI) project is in the final phase of testing. Further work will be done to test the Social Indicators Planning and Evaluation System (SIPES) and Social Indicators Data Management and Analysis (SIDMA) system. Pilot partners will create survey questionnaires using SIDMA for their pre and post project work to assess changes in behavior and practices, as well as for planning future project work. Partners will also follow the SIPES evaluation process using the SI handbook in an effort to help provide feedback to MPCA and USEPA on the usefulness and effectiveness of the evaluation tools and methodology. Project data will be entered in SIDMA and compared regionally to other SI efforts. Supplemental social outcomes evaluation methodologies, such as KAP (Knowledge, Attitude and Practices) will be developed and tested with local partners.

Outcomes: The MPCA will train stakeholders on how to use SI tools and operationalize social outcomes evaluation methodologies for the Agency's nonpoint water quality grant work. A solid foundation of experiential data related to the effectiveness of SIPES and SIDMA will be made available to USEPA.

Watershed Specialist Training, Phase II – 2011

Sponsor: University of Minnesota, Water Resources Center

Funding: Section 319 (Grant) $193,029

Purpose: The University of Minnesota, through its Water Resources Center, proposes to develop Minnesota's Watershed Specialist Training Program. The program is in partnership with other training providers and watershed organizations including the MPCA, academic departments, and other state and local governmental and non-governmental conservation organizations. This training program will ensure that those leading and involved in watershed planning and implementation involving impaired waters understand the legal framework, the programmatic requirements, and the resources and tools needed to complete TMDLs, develop watershed plans, and lead implementation efforts. The goal is to help managers go beyond their specialized skills to be able to integrate a broad set of natural and social science skills.

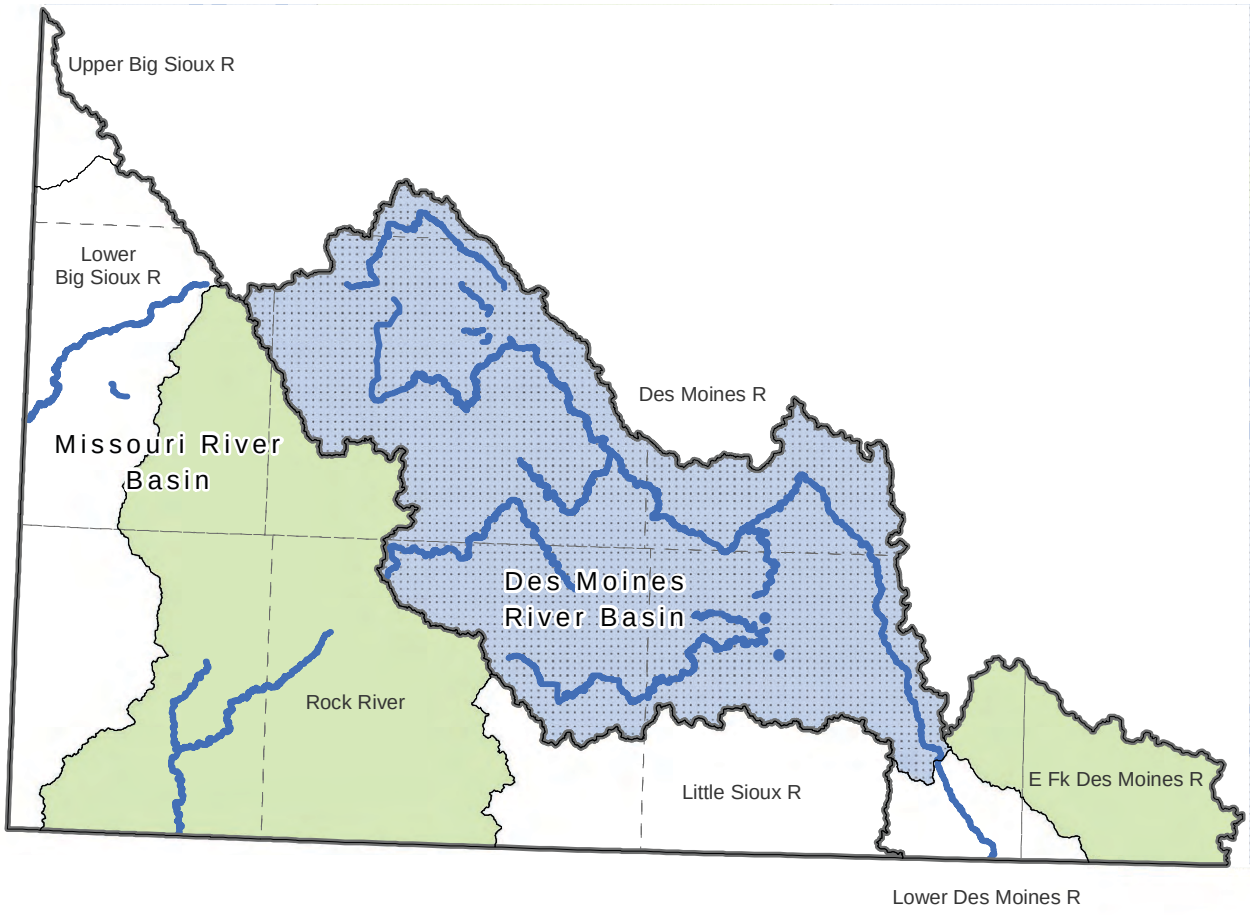
We will develop and implement an online training program for watershed professionals that will improve their management skills and their ability to effectively and holistically address water quality issues.

Des Moines and Missouri River Basins

Projects completed

Des Moines River – Headwaters

Alternative Tile Intake Cost-Share Program



Legend

- Approved Lake TMDL
- Approved Stream TMDL

Watershed Projects

- New Project
- Active Project
- New and Active Projects
- Completed Project
- Basin Boundary
- County Boundary

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0 10 20 Miles

Alternative Tile Intake Cost-Share Program

The Heron Lake watershed has many of the same problems as seen in other agricultural areas in Minnesota. A diagnostic study completed in 1992 indicated the watershed's major problems are a direct result of drainage and the resulting higher peak and base flows, urban sources of pollution and storm water runoff, and intensive agricultural land use. These same problems are prevalent throughout the four counties within the project area.

Farmers within Nobles, Jackson, Murray, and Cottonwood counties have been receptive to programs available for installing filter strips, waterways, terraces, and wetland restorations. Increasing the soil conservation practices within the watershed is a vital component for water quality improvement. To address the water quality concerns that arise from phosphorus loading, erosion, and sedimentation, this project hoped to increase public awareness of pollution problems, provide cost-share for landowners and farm operators to replace open tile intakes with rock inlets, and monitor for changes and improvement.

The Heron Lake Watershed District and Soil and Water Conservation District staff provided first-hand information about the program requirements through direct mailing, one-on-one contact, watershed-wide newsletters, and reports to the general public and local officials. These efforts proved successful in that there were a total of 136 open tile intakes replaced with rock inlets in the four-county project area. Operators were enthusiastic about the program and commented that the rock inlets were convenient for their farming operation and helped to improve water quality.

An estimated 68 pounds/year reduction in phosphorus and 54,400 pounds per year reduction in sediment have resulted from the 136 rock inlet projects. An overall analysis of water quality, as a result of all the landscape changes throughout the Heron Lake watershed, shows a 13,154 pound/year reduction in total phosphorus and a 1,162 ton/year reduction in total suspended solids (TSS).

Goals

- Reduce sediment and phosphorus entering open tile intakes by replacing with subsurface intakes.

Results that count

- The eLINK program estimates a 68 pound/year reduction in phosphorus and a 54,400 pound/year reduction in sediment from the 136 rock inlet projects. An overall analysis of water quality, as a result of all the landscape changes throughout the Heron Lake watershed, shows a 13,154 pound/year reduction in total phosphorus and a 1,162 ton/year reduction in TSS.

Financial information

Funding type: CWP

Grant amount: $23,192.72

In-kind: $31,107.38

Total project costs: $54,300.10

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Des Moines and Missouri River Basins

Projects active and awarded in 2011

Des Moines River Basin

Des Moines River – Headwaters

Alternative Tile Intake Cost-Share Program Continuation — 2009

Sponsor: Heron Lake Watershed District

Funding: CWP (Grant) $36,000

Purpose: Heron Lake Watershed District (HLWD) and local Soil and Water Conservation District (SWCD) staff will promote the alternative tile intake program. They will explain the program, review the design specifications with each landowner, and answer questions. Rock inlet design and specifications will be provided to each contractor performing the actual installation of these structures. All contractors must be checked in the field as they install the first rock inlet to determine that each inlet will be constructed according to specifications determined by the HLWD/SWCD. Landowners will be contracted with a general survey asking for feedback on the performance of these structures.

BMP Program For Alba Township — 2007

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) $40,800

Purpose: 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.

Clean Water Partnership Continuation — 2008

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 BMP 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.

Conservation Tillage Demonstration Plot — 2008

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) $20,547

Purpose: 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.

Fulda Lakes Project — 2007

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) $55,800

Purpose: The Heron Lake watershed is rural and agricultural. In a watershed such as this, agricultural 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.

Fulda Phosphorus Reduction Initiative – 2011

Sponsor: Heron Lake Watershed District (HLWD)

Funding: Section 319 (Grant) $12,600

Purpose: Through this effort, project sponsors will conduct a rain garden demonstration project to work with the community to address pollution concerns. This will be done by providing educational opportunities for students and the community to learn about native

vegetation, water quality improvement, pollution reduction, and environmentally-friendly landscaping. This project will provide opportunities for students to learn about the importance of water quality improvement and how they can play a part in pollution reduction efforts.

The community is concerned about their lake system and has requested assistance from the HLWD. The majority of landowners and operators in this sub-watershed are concerned about soil health and water quality. These residents have been involved in a redetermination of benefits of filter strip installation, and other conservation efforts. Landowners are receptive to conservation practices along the ditch system. This effort will provide landowners with funding for conservation tillage incentives and shoreline restoration demonstration projects.

Fulda Lakes 1 and 2 were placed on the impaired list in 2008 for nutrient and eutrophication biological indicators. Stormwater runoff contributes to these impairments.

The City of Fulda residents were invited to participate in a Social Indicators Pilot Project in 2009 by completing a survey. This was an effort to gauge public opinion regarding water quality efforts conducted in the Fulda Lakes' project area.

Heron Lake Sediment Reduction Demo — 2010

Sponsor: Heron Lake Watershed District

Funding Section 319 (Grant) $16,500

Purpose: Heron Lake Watershed District (HLWD) proposes demonstrations of two effective, yet relatively inexpensive methods of streambank erosion control, a tree revetment and a J-hook weir. A tree revetment is a bioengineering method that uses whole trees, cabled tightly together in giant bundles, which are then secured to eroding streambanks. A J-hook weir is an upstream directed, gently sloping structure composed of natural materials designed to guide water away from the streambank. Both are new to southwestern Minnesota and landowners are unaware of the benefits of these practices.

Education and outreach would be the most time-intensive portion of the project. Site visits and bus tours, one at the beginning of the project and one upon completion, would be included. Photos and videos would be used for presentations and posted on the website. Project progress would be documented by videos and photographs, and disseminated via newsletters, news articles, public presentations and the HLWD website.

West Fork Des Moines River TMDL Implementation Project - 2011

Sponsor: Heron Lake Watershed District

Funding: Section 319 (Grant) $198,248

Purpose: In December 2008, the USEPA approved a TMDL study encompassing 32 impairments in the West Fork Des Moines River (WFDMR) watershed. This project is unique in that it addressed several impairments on a basin-wide scale, worked with local partners, and developed an advisory stakeholder committee early in the process. The local stakeholder advisory committee that provided input and received project updates during the development of the TMDL Report provided a foundation for developing an implementation plan. A cooperative effort of local, state, and federal representatives from conservation agencies and the advisory committee led to the development of the WFDMR and Heron Lake TMDL Implementation Plan, approved by the MPCA on September 22, 2009.

Goals are to enhance partnerships between Murray, Nobles, Jackson, and Cottonwood Counties and the HLWD through the continued employment of a watershed coordinator to assist with obtaining current feedlot information through onsite inspections and project promotion. Also to increase the knowledge of 50 feedlot operators through a one-day workshop and increase public awareness of the WFDMR TMDL Project through the development of a brochure and website.

A major portion of this project is dedicated toward educating watershed residents, obtaining feedlot information, and promoting the overall watershed project. The following measures of success and methods will ensure that the projects goals are met.

- The number of Level III feedlot inventories completed in the four counties.
- The increase of knowledge of at least 50 feedlot operators about proper manure management
- The number of website viewers
- The increase in the number of people who are aware of the project
- Future funding mechanisms in place for the continuation of the project

East Fork Des Moines River

Des Moines River, East Fork Monitoring Project — 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.

Shell Rock River

New Tools to Support TMDL Phosphorus Reduction Plans — 2009

Sponsor: University of Minnesota Water Resources Center

Funding: Section 319 (Grant) $298,175

Purpose: The goals of this project are to (1) develop a whole-watershed P balance for a case study watershed (Albert Lea Lake), (2) develop a simple approach for determining the source of water to streams (groundwater vs. surface runoff), and (3) develop an approach to integrate these new ideas into TMDL implementation plans. The P balance will be developed for the entire Albert Lea Lake watershed to determine forms and amount of P entering the watershed, being transferred among "compartments" (e.g., hog farms, crop farms, soil system) within the watershed, being lost via stream export, and being accumulated. Hydrologic studies will be conducted to determine the source of water (groundwater vs. surface runoff) and P. Results will be integrated with the conventional modeling approach. Outcomes will include an online guidance manual, local workshops, and statewide workshops.

Missouri Basin

Rock River

Reducing Fecal Coliform in the Rock River Watershed with Manure Management — 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.

Rock River Replacement Subsurface Sewage Treatment System (SSTS) Loan Program — 2009

Sponsor: Rock County

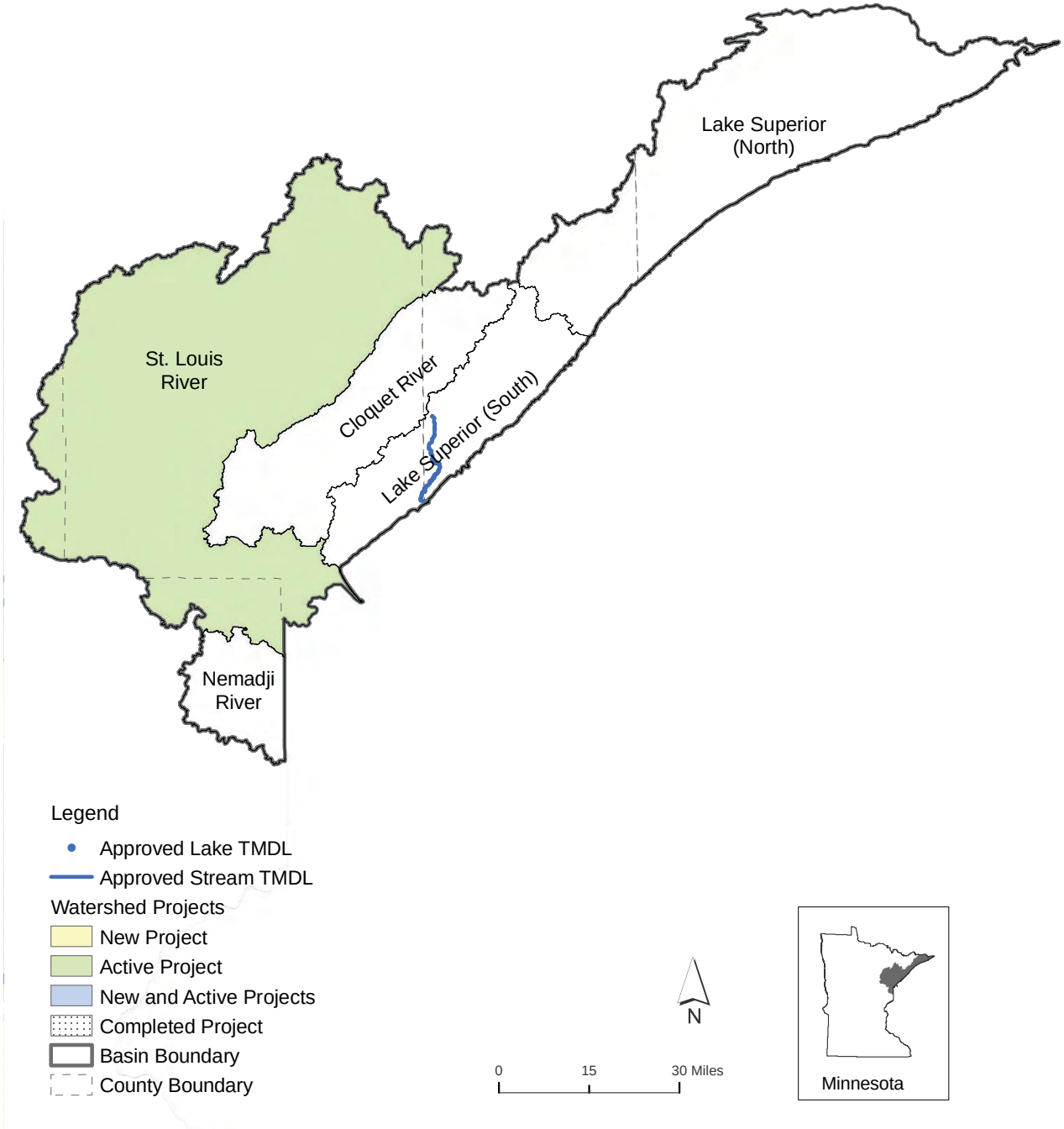
Funding: CWP (Loan) $650,000

Purpose: The Rock River is located in the southwest corner of Minnesota and is a main tributary to the Missouri River Basin. This project would provide a low interest loan option for financing replacement of approximately 75 SSTSs in the three-year grant period. Replacement of failing SSTSs was chosen by the committees as one of the main concerns in this area.

Lake Superior Basin

Projects completed

None completed for 2010–2011.



Lake Superior Basin

Projects active and awarded in 2011

St. Louis River

East Swan River Watershed Protection Strategy — 2009

Sponsor: North St. Louis Soil and Water Conservation District

Funding: CWP (Grant) $147,000

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.

Lower Mississippi and Cedar River Basins

Projects completed

Projects involving multiple watersheds

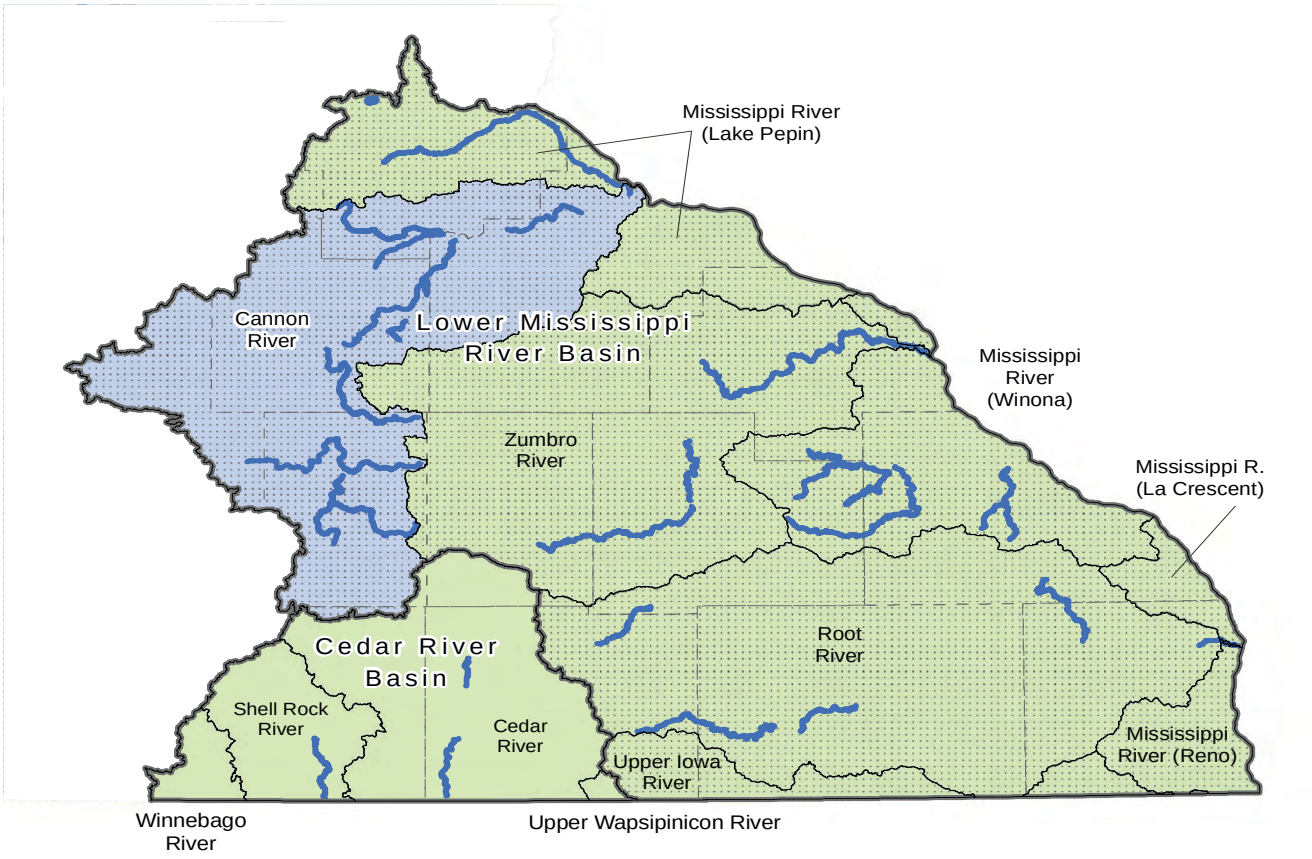
Lower Mississippi Feedlot Runoff Control

Cannon River

Upper Cannon Assessment

Mississippi River – Lake Pepin

Lower Vermillion River Effectiveness Monitoring



Legend

- Approved Lake TMDL
- Approved Stream TMDL

Watershed Projects

- New Project
- Active Project
- New and Active Projects
- Completed Project
- Basin Boundary
- County Boundary

N

0 10 20 Miles

Lower Mississippi Feedlot Runoff Control

This project was part of a basin-wide response to the findings of the Regional TMDL study that identified the streams of the Lower Mississippi River Basin in Minnesota as posing a risk of human illness from excessive levels of fecal coliform bacteria. The TMDL study found that runoff from feedlots, or manure stockpiles without runoff controls, comprises an estimated 17 percent of loading of fecal coliform bacteria to streams during a wet spring and 37 percent during a wet summer. In order to reach water quality standards, the Regional TMDL Implementation Plan calls for reducing bacteria impairments from all major sources by an average of 65 percent. One of several strategies for reaching this goal includes providing assistance for accelerated compliance with the state feedlot rules.

Approximately 8,358 (87 percent) of feedlots in the basin are feedlots with less than 300 animal units. According to county surveys, approximately 3,115 of these smaller feedlots are likely to pose a pollution hazard. A successful strategy used in the basin to reach runoff reduction goals has been to build capacity of local producers to make modifications to their feedlots. Employing this strategy in four previous regional feedlot projects, 2,295 producers in the region signed up for the Open Lot Agreement. By the end of 2008, 1,471 feedlots completed runoff reduction designs, and of those, 324 fixes were implemented. This left more than 1,100 feedlot owners awaiting technical and cost-share assistance before implementing improvements.

This project provided cost share and technical assistance to livestock producers with less than 300 animal units. Technical assistance funds enabled 10 counties to hire or retain technicians to design simple, low-cost (average $10,000) runoff reduction solutions. Technicians worked under supervision of county feedlot officers and feedlot design engineers to design low-cost measures. Through this grant 13 diversions, 36 filter strips, 34 drainage controls, 5 roof gutters, 3 storage facilities and 6 livestock exclusions were installed on a total of 57 feedlots. In addition, grant funding allowed counties to build local staff capacity to continue assistance to producers as they implement their feedlot designs.

Goals

- Provide technical assistance to producers for feedlot runoff improvements.
- Provide cost-share to producers for feedlot fixes.

Results that count

- Technical assistance in the form of designing feedlot fixes was provided to local producers by county technical staff.
- Cost-share funding was utilized to implement fixes 97 fixes on 57 feedlots.

Financial information

Funding type: Section 319

Grant amount: $279,273

In-kind: $284,000

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Upper Cannon Assessment

The goal of the project was to understand the water quality and pollutant sources within the Upper Cannon River watershed to identify priority areas for restoration and protection. The project stemmed from the request of the Waterville Lakes Association to improve the water quality of Lake Tetonka and Sakatah Lake. Addressing upstream degradation improves the quality of impaired waters downstream.

This was a diagnostic study of the Upper Cannon River Watershed which included monitoring five stream sites for flow and water quality parameters as well as in-lake monitoring, aggressive educational

Photograph by Steve McComas, Blue Water Science

component, GIS mapping, stormwater monitoring and project management. The project area consisted of the headwaters of the Cannon River at Shields Lake in Rice County to the Cannon River crossing in Morristown. The Upper Cannon River Watershed is about 212,733 acres in size. The lakes monitored in the watershed included Shields, Rice, Gorman, Sabre, Tetonka and Sakatah. The Lake Francis Association monitored Lake Francis as in-kind for the project.

The water quality concerns include sedimentation, eutrophic status, low oxygen levels and habitat loss. In order to understand the water quality problems, the following parameters were measured: Temperature, Total Phosphorus (TP), Orthophosphorus, Total Suspended Solids (TSS), Turbidity, Nitrite Nitrate Nitrogen, Total Kjeldahl Nitrogen, E. coli, Chlorophyll-a, Dissolved Oxygen (DO), Biological Oxygen Demand, and Macroinvertebrates. Priority areas and lakes were identified. Gorman and Sabre lakes were identified as top priorities due to extremely high TP levels. Shields, Tetonka, Sakatah and Rice lakes follow closely with high TP. Lake Francis had the lowest levels of TP.

Site 5a, County Rd 16, Morristown, MN — August 2009 Facing downstream with monitoring station set-up and river conditions.

Goals

- Characterize water quality in the lakes, streams and rivers in the Upper Cannon River Watershed.
- Increase understanding on nonpoint source pollution among residents of the watershed.

Results that count

- Monitored five sites for flow and water quality 20 times/year; monitored macroinvertebrates on five sites one time; in-lake monitoring completed at six lakes for TP, Chlorophyll-a and Secchi; monitored stormwater at three sites for TSS and Phosphorus; and increased citizen stream and lake monitors by 10 volunteers.
- Completed GIS mapping of the Upper Cannon with major land use, soil type, slope, priority subsheds, pollutants and other determined layers; and increased water quality knowledge and awareness of at least 3,000 people.

Financial information

Funding type: CWP

Grant amount: $181,202

In-kind: $305,261

Matching funds: $6,400

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Lower Vermillion River Effectiveness Monitoring

The state of Minnesota listed the Lower Vermillion River as impaired for turbidity in 1994, meaning the water is too cloudy to meet state water quality standards. Since then, the MPCA and local partners completed a TMDL study for this impairment. The monitoring plan includes efforts to collect long-term water quality data to determine if implementation strategies are effective in addressing turbidity concerns in the watershed. Project activities included site selection, property access discussions, equipment purchases, equipment installation, equipment maintenance, water quality sampling, and data reporting. All sampling results were organized and relayed to the STORET database, and continuous monitoring data were housed in state databases. This project will also be of potential benefit to the Lake Pepin TMDL, as some management strategies, such as temporarily lowering the water level of river pools to jump-start plant growth, could affect both the Lower Vermillion system and Lake Pepin.

Goals

- Purchase automated equipment, identify monitoring locations, and install equipment.
- Collect samples and automated data from three consecutive monitoring seasons.
- Develop turbidity/Total Suspended Solids regression for future automated equipment use.

Results that count

- Automated equipment purchased, landowner cooperation established, and monitoring stations constructed.
- Samples were collected and automated equipment generated valuable monitoring data.
- Results from these monitoring efforts have generated suitable datasets to calibrate automated equipment.

Financial information

Funding type: CWLA

Grant amount: $31,739

In-kind: 0

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Lower Mississippi and Cedar River Basins

Projects active and awarded in 2011

Cedar River Basin

Cedar River Watershed

Alternative Designs for Drainage Ditches — 2010

Sponsor: University of Minnesota, Department of Bioproducts and Biosystems Engineering

Funding: Section 319 (Grant) $286,128

Purpose: Finding a balance between the benefits of drainage and protecting water bodies is a difficult challenge. This proposal will study the effectiveness of innovative ditch designs as a BMP solution to water quality concerns related to artificial agricultural drainage. This BMP addresses water quality concerns and TMDL impairments related to highly drained agricultural areas of Minnesota. Minnesotans need to make advances now in alternative ditch designs. Ditches comprise many miles of the rivers and streams on the impaired waters list. As TMDLs are completed, ditches and tile drainage will be targeted as sources and receive a load allocation to be remediated. Alternative ditch designs are viable options for reducing targeted load allocations without requiring major changes in current farming practices. This project builds on previous work completed at the U of M and includes development of tools to identify high priority ditches or landscapes that would benefit from the use of this BMP.

Lower Mississippi River Basin

Multiple watersheds in the basin

Assistance for Unsewered Communities in the Lower Mississippi/Cedar River Basin — 2008

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 percent 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.

Southeast Minnesota Volunteer Nitrate Monitoring Network — 2009

Sponsor: Southeast Minnesota Water Resources Board

Funding: CWP (Grant) $143,600

Purpose: To maintain the established network of 675 homeowner volunteers whose wells are annually sampled in order to evaluate condition and trends of area drinking water sources. The overall goal is to provide long-term data counties need to focus on their implementation efforts for groundwater protection.

Sustaining Progress Toward Reducing Runoff from Open Lot Feedlots — 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.

Cannon River Watershed

Lower Cannon River Turbidity Reduction Project – 2011

Sponsor: Cannon River Watershed Partnership

Funding: Section 319 (Grant) $178,120

Purpose: The Lower Cannon River Turbidity TMDL study, completed in July 2007, sets significant load reductions for sediment in the Lower Cannon River watershed. The water quality goal is a Total Suspended Solid (TSS) value of 44 mg/L or less. At high flows, a reduction in TSS values ranging from 49 percent to 82 percent is needed in the Cannon River system depending on the reach. The implementation plan, completed in October 2009,

established a short term goal of achieving a 30 percent reduction in sediment sources by 2020.

Project Goals:

- Identify the major sources of sediment to the Little Cannon River and Belle Creek that are contributing to the pollution of these streams and the Cannon River.
- Implement BMPs to reduce sediment delivery to the streams with the support of local landowners.

The water body is considered of high public value, having been designated a Wild and Scenic River in order to afford it additional protection from potential degradation. It is located less than an hour's drive from the Twin Cities Metropolitan Area, along a popular bicycle path which brings thousands of Minnesotans close to the water.

North Cannon River Bacteria Reduction Project — 2010

Sponsor: Dakota County Soil and Water Conservation District (SWCD)

Funding: Section 319 (Grant) $66,000

Purpose: The purpose of the North Cannon River Bacteria Reduction Project is to identify, target and work with rural landowners to install filter strips and other BMPs that reduce bacteria, nutrients and sediment contributions to surface waters within the North Cannon River Watershed.

Rice Creek Assessment Project — 2011

Sponsor: Bridgewater Township

Funding: CWP (Grant) $110,197

Purpose: Rice Creek is a 7-mile-long stream with 1.3 miles designated as trout stream located in Bridgewater Township. This project will develop the project work plan; complete a watershed and stream characterization; conduct stream and watershed water quality monitoring; collect fish and macroinvertebrate population information; construct food web structure and function data; host and promote Rice County SWCD education programs and workshops through local newspaper articles; hold public meeting and open houses; develop the FLUX model to calculate annual and seasonal loads, and flow-weighted mean concentrations for sediment and nutrients of interest; manage the project administration; develop a final report.

Southeast Regional Grant for Water Quality — 2010

Sponsor: Southeast Minnesota Water Resources Board

Funding: Section 319 (Grant) $900,000

Purpose: This project forms part of a larger regional effort to comprehensively address sources of fecal coliform bacteria tied to the Regional TMDL Implementation Plan. We will secure two experienced wastewater facilitators to work with 13 additional small Southeast Minnesota communities to find solutions to inadequate wastewater treatment. We will also conduct an inventory of individual on-site sewage treatment systems on a county or small watershed scale, followed by replacement of 450 Imminent Threats to Public Health. Finally, local feedlot staff will provide technical and engineering assistance to design and implement 100 small feedlot fixes to treat polluted runoff.

Mississippi River – Winona

Whitewater Watershed, South Branch – Bacteria Reduction Project Continuation — 2009

Sponsor: Whitewater Joint Powers Board

Funding: CWP (Grant) $214,028

Purpose: Decrease the number of failing septic systems in the shoreland area, educate producers about sensitive feature setbacks and increase adoption of Manure Management Plans, improve management of heavily grazed stream banks and shoreland areas by hosting field days and promoting cost-share opportunities and grazing plans, achieve complete compliance with the shoreland vegetated buffer ordinance and continue monitoring efforts, adding bacteria monitoring sites in the North and Middle Branch.

Mississippi River – Lake Pepin

Dakota County Nonpoint Source Reduction Project — 2009

Sponsor: Dakota County

Funding: CWP (Grant) $172,700

Purpose: This continuation grant will enable Dakota County to continue and expand a successful agricultural outreach program. Through the coordinated efforts of an increased 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 City 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 — 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

Projects involving multiple watersheds

Ravine, Bluff, and Stream Erosion Project

Blue Earth River

Blue Earth River Channel Modifications

Greater Blue Earth Basin Turbidity TMDL

Chippewa River

Chippewa River – Dry Weather, Lines and Spring Creeks

Chippewa River Lower Main Stem Sub-basin

Le Sueur River

Cobb River Drainage

Greater Blue Earth River Watershed BMPs on the Big Cobb

Lower Minnesota River

Fish and Schwanz Lakes Nutrient TMDL

Middle Minnesota Watershed Monitoring

Nine Mile Creek Watershed TMDL

Sand Creek Watershed TMDL Resource Investigation

Minnesota River — Mankato

Seven Mile Creek Glacial Sediment Study

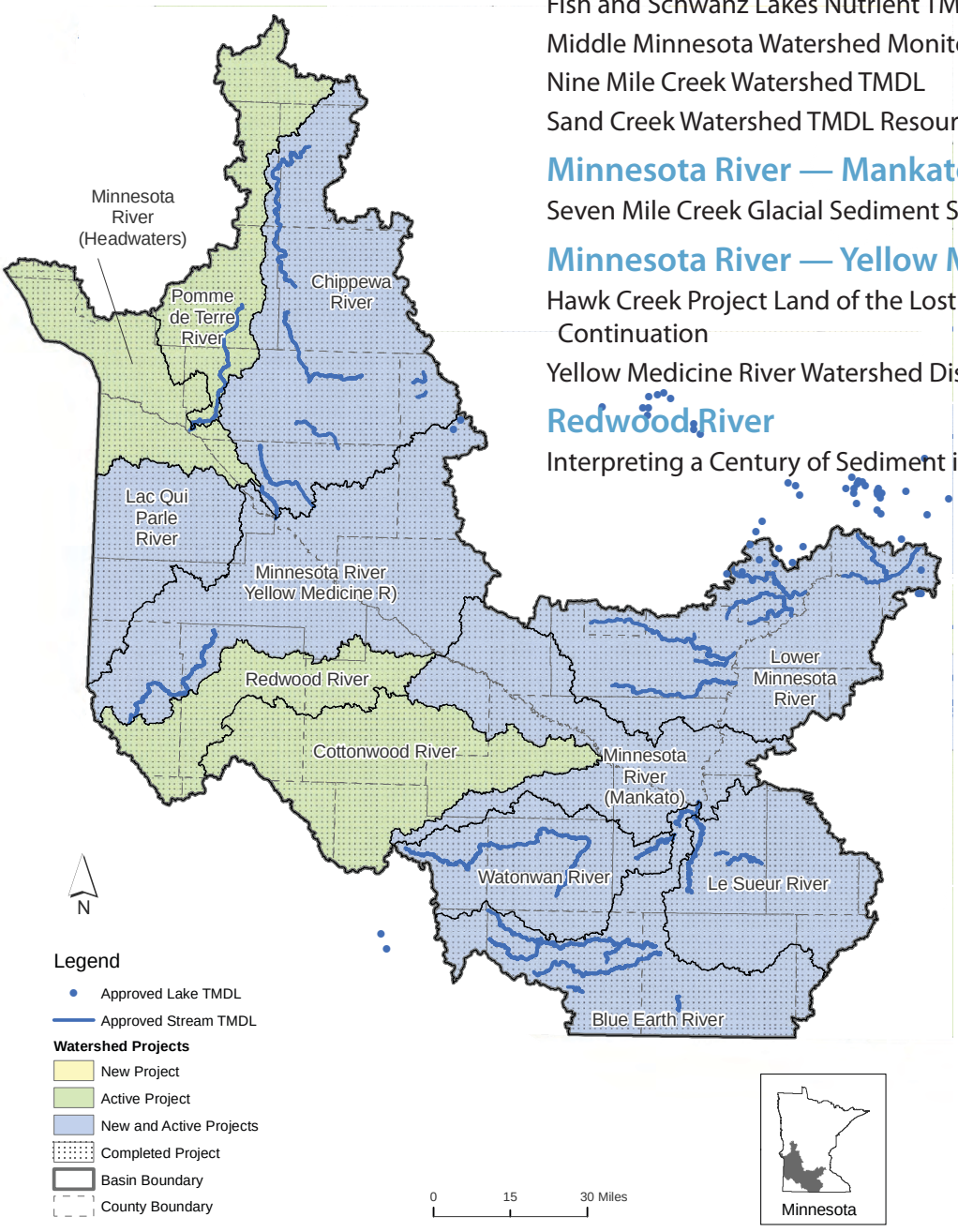
Minnesota River — Yellow Medicine River

Hawk Creek Project Land of the Lost Work Area Continuation

Yellow Medicine River Watershed Dissolved Oxygen

Redwood River

Interpreting a Century of Sediment in Redwood Lake



Ravine, Bluff, and Stream Erosion Project

Sediment dynamics change considerably following the path of sediment from the far headwaters of western Minnesota to the lower Minnesota River at St. Paul. In the headwaters of Elm Creek, field sources of sediment delivery to wetlands and tributaries can be as high as 40 percent of the total annual load (TAL); and is the dominant pathway compared to ravines, bluffs and streambanks (RBS). However, in the lower LeSueur River (Knick zone), bluffs are the dominant source of sediment into the LeSueur River (>67 percent of the TAL).

Ravine sediment contributions vary across the Minnesota River Basin (MRB), generally accounting for about 10 percent TAL. Streambank erosion was most pronounced in the Minnesota River. Typically, large rivers balance erosion with deposition, but in the Minnesota River, bank erosion is larger resulting in channel enlargement compared to pre-European settlement or even pre-1938 bank erosion rates. Managing these sources of sediment will require better upland water storage and targeting of "at risk" landscape features, i.e., ravines that have a new water source and increased contributing drainage area, or streams that have migrated into a steep valley wall; accelerating toe slope erosion and bluff failure.

Goals

- Determine spatial extent of RBS in the Minnesota River Basin
- Determine the relative contribution of RBS sources in the Minnesota River Basin
- Provide suggestions for restoration and sediment management

Results that count

- GIS layers were created to provide information on the relative extent of ravines and bluffs.
- Estimates of sediment loss/delivery were made for each sources type to tributaries and the Minnesota River.
- Recommendations were provided to guide the next phase of non-field sources of sediment to the Minnesota River.

Financial information

Funding type: CWLA

Grant amount: $303,439.98

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Blue Earth River Channel Modifications

Watershed and channel improvements were done in portions of the Elm Creek watershed in southern Minnesota to mitigate turbidity, sediment, nutrient, and biota impairments. Perennial vegetation and wetland complexes were established in upland watersheds of Elm Creek as land use treatments to reduce the flow of water, sediment and nutrients in contrast to annual croplands.

The Perennial vegetation-wetland complexes reduced:

- Peak flow runoff from upland crops by 85-100 percent
- Flow volumes by more than 30 percent
- TSS by more than 50 percent

Also, nitrate-nitrite loading from annual crops of 20 kg/ha to less than 5 kg/ha and phosphorus was less affected because of high levels of residual P in soils underlying the restored wetlands.

High turbidity in Elm Creek is caused by total suspended solids (TSS) during high flows and volatile suspended solids (VSS) during summer low flows that are nutrient driven. A highly eroded channel-riparian section of Elm creek was restored as a demonstration site for further comparisons of channel stability and erosion along Elm creek; a monitoring program is underway to determine and follow over several years the effectiveness of structural channel modifications and establishment of riparian vegetation to protect stream banks.

Goals

- Identify source areas and landscape actions to reduce pollutant levels in the river; determine contributions of channels as sources for TSS, nutrients and turbidity.
- Determine non-traditional BMPs — perennial vegetation and wetlands — as methods of mitigating turbidity and nutrient impairment.
- Assess effects of restoring hydrologic function of channel-riparian systems to help meet TMDLs.

Results that count

- Determined that mitigating turbidity impairment requires reductions in both TSS and VSS; source areas include cropland and streambank erosion for TSS and are principally croplands that contribute nutrients that affect VSS.
- Perennial vegetation (wetland complexes situated between upland annual crops and stream channels) represent BMPs that reduce stormflow volumes and peaks, TSS and nitrate loading into Elm Creek.
- Perennial vegetation complemented downstream channel restoration that included riparian planting of willow and perennial grasses, re-connecting the stream to its floodplain, and reducing stream slope; in combination, these practices have potential to reduce flow volumes and velocities to help stabilize channels and reduce channel erosion, TSS and related turbidity.

Financial information

Funding type: Section 319

Grant amount: $296,060

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Greater Blue Earth Basin Turbidity TMDL

The Greater Blue Earth River Basin (GBERB) consists of the Watonwan, LeSueur, and Blue Earth River major watersheds in south-central Minnesota. The Watonwan and LeSueur Rivers both join the main-stem of the Blue Earth River just upstream of the City of Mankato, where the Blue Earth joins the Minnesota River.

The GBERB contains 39 stream reaches that have been listed for aquatic life impairments from turbidity. Due to these listings, a TMDL study is required. This study considers all state and federal requirements of the CWA while providing information relevant to the project area, including a framework to reduce turbidity levels and improve water quality in the immediate watershed as well as areas downstream.

Efforts to improve water quality in the Minnesota River have long recognized the importance of the GBERB. Various monitoring projects across the GBERB have revealed that it contributes a "disproportionally" high pollutant load when compared to other major watersheds in the Minnesota River Basin. With additional TMDL studies being conducted for turbidity on the mainstem of the Minnesota River, Lake Pepin, and other major watersheds contributing to the Minnesota River, as well as related studies within the Le Sueur and Lake Pepin watersheds, initiating this TMDL was a priority at both the local and state levels.

Target dates for beginning TMDL assessments on the above-listed reaches range from 2004 to 2012. General estimates for completion of the assessments is four-five years, therefore, target end dates range from 2008 to 2017. This project addresses all of the reaches through a comprehensive watershed approach.

Goals

- Development of a Turbidity TMDL study based on the various projects, existing studies, sample and flow data along with input from the technical and stakeholder groups.
- The TMDL study will be a summary of the trends and offer reductions necessary to meet water quality standards.
- This TMDL will then be used in the development of an implementation plan which can be used to address the issue basin wide.

Results that count

- Developed and submitted TMDL to the MPCA and USEPA, satisfying all requirements set forth in the protocols.
- Utilized existing data sets and trend information to develop load allocation tables needed to meet water quality standards.
- Developed a basic list of suggestions for the implementation plan, included within the TMDL report.

Financial information

Funding type: Section 319

Grant amount: $150,000

Contact information

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Dry Weather, Lines and Spring Creeks Sub-basin of the Chippewa River

The Dry Weather, Lines and Spring Creek sub-basin represents the lower 132,059 acre portion of the 1.3 million acre Chippewa River watershed directly above the confluence of the Chippewa and Minnesota rivers. This sub-basin was identified as a priority sub-basin in the Chippewa River Watershed Diagnostic Study Report and Implementation Plan to be targeted for installation of implementation projects, education and monitoring activities. The primary land use of agriculture covers 94 percent of these acres, the other six percent is comprised of grassland, forest, urban and wetlands, which points to pollution coming from nonpoint sources.

This project was created with the goal of enhancing and protecting the Chippewa River and achieving water quality improvements pertinent to the scheduled TMDLs both in the Chippewa River and the Minnesota River. Through the cooperation of landowners, project participating partners, and the Chippewa River Watershed Project staff, this project worked to abate or prevent NPS pollution by implementing BMPs that included:

- side inlets for gully erosion
- grassed waterway
- rain gardens
- rain barrels
- critical tree plantings
- alternative tile intakes
- streambank stabilization
- conservation water drainage management

Goals

- Install BMPs
- Educate watershed residents
- Upgrade individual septic systems in Chippewa County

Results that count

- Established the following BMPs: 27 side inlets for gully erosion, 1 grassed waterway, 1 rain garden, 220 rain barrels, 1 critical tree planting, 10 alternative tile intakes, 500 stream bank stabilization, and 1 conservation water drainage management project
- A bus tour of BMPs was held with 50 attendees, canoe trips were taken with over 100 participants, water shed information and education was presented to 900 fifth graders through conservation field days, conducted macro invertebrate education with high school students, presented watershed information and education to over 4,500 people at the local county fair booth in cooperation with project partners. BMP ads were placed on the local radio station
- 26 individual septic systems upgraded in Chippewa County

Financial information

Funding type: Section 319

Grant amount: $243,449.11

In-kind: $241,325

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Chippewa River Lower Main Stem Sub-basin

The Lower Main Stem Chippewa River sub-basin covers 195,443 acres of the greater Chippewa River basin and was identified as a priority sub-basin in the Chippewa River Watershed Diagnostic Study Report and Implementation Plan to be targeted for installation of implementation projects. The primary land use of agriculture covers 90 percent of these acres, the other 10 percent is comprised of grassland, forest, urban and wetlands. It is located in the middle to lower section of the greater Chippewa River Watershed.

This project was created with the goal of enhancing and protecting the Chippewa River and to achieve water quality improvements pertinent to the scheduled TMDLs and also targeted for pollutants to address the TMDL for Dissolved Oxygen on the Lower Minnesota River. The Chippewa River Watershed impairments include: fecal coliform bacteria, turbidity, excess nutrients, fish IBI and mercury.

Through the cooperation of landowners, project partners and the Chippewa River Watershed Project staff, this project helped to abate or prevent NPSP by implementing BMPs that included buffer strips, drainage water management, terraces, alternative tile intakes, side inlet pipes and rain barrels.

Goals

- Install BMPs
- Educate watershed residents
- Upgrade individual septic systems in Swift and Stevens Counties

Results that count

- Established 589.60 acres of buffer strips, 2 terraces, 18 alternative tile intakes, 2 drainage water management projects, 3 side inlet pipes with rural landowners. Distributed 110 rain barrels to urban residents.
- A bus tour of BMPs with 50 attendees was held, canoe trips were taken with 70 participants, watershed information and education was presented to 600 fifth grades through conservation field days, annual meetings were held each years with 100 attendees each year, conducted macro invertebrate education with high school students and project staff participated at county fairs in cooperation with project partners

- Upgraded 11 septic systems in Swift County, CWP loan program for ISTS continuing until June of 2011 in these Counties.

Financial information

Funding type: CWP

Grant amount: $389,639

In-kind: $366,348

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Cobb River Drainage

This project was developed to address problems with drainage systems in the Big Cobb Watershed. The watershed covers 198,294 acres in South Central Minnesota. The Big Cobb drains portions of Blue Earth, Waseca, Faribault and Freeborn Counties. Agriculture is the primary land use, covering approximately 168,000 acres or 85 percent of the watershed.

Six partner agencies (Greater Blue Earth River Basin Alliance, Minnesota Department of Agriculture, Blue Earth SWCD, Waseca SWCD, Waseca NRCS, Minnesota Land Improvement Contractors of America) worked together to install a woodchip bioreactor and upgrade an existing sediment basin. The use of a woodchip bioreactor is one method for removing nitrate from large volumes of drainage water. Drainage water is diverted into a trench filled with woodchips. Nitrate is removed from the drainage water in the anoxic environment by denitrification in which nitrate is converted to nitrous oxide and nitrogen gas. The bioreacator will be treating tile water from the adjacent 66 acres of tiled fields. The sediment basin into which the bioreactor empties also captures overland runoff allowing for sediment to settle before entering the LeSueur River. The installation of the bioreactor was used as a training field day for local SWCDs. Very few of these bioreactor projects have been installed in Minnesota, and this one is an excellent example of partners coming together to accomplish conservation in critical areas. This is the largest bioreactor installed in Minnesota to-date.

Additionally drainage system management upgrades occurred with the four counties involved in the Cobb River watershed. These upgrades will help with future planning and research by the county drainage authorities.

Goals

- Remove nutrients from drainage water through drainage modification/wetland restorations.
- Improve public drainage system management in the Greater Blue Earth River Watershed.
- Increase project coordination.

Results that count

- During the Project timeline the largest woodchip bioreactor in Minnesota to date was installed treating 66 acres of tiled agricultural land.
- Four counties were able to upgrade their public drainage management systems. Blue Earth and Faribault counties upgraded plotters to make digital drainage records more visually accessible at drainage authority meetings. Freeborn and Waseca counties were able to upgrade their hard copy public drainage records to a digital format, so that GIS layers of ditch data can be integrated with other information for the drainage authorities.
- The project technician provided communication and leadership through projects that had multiple partners. One project alone involved six agencies in a successful partnership.

Financial information

Funding type: Section 319

Grant amount: $74,000

In-kind: $123,164

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Greater Blue Earth River Watershed BMPs on the Big Cobb

The Big Cobb watershed, covers 198,294 acres in South Central Minnesota. It drains portions of Blue Earth, Waseca, Faribault and Freeborn Counties. Agriculture is the primary land use, covering approximately 168,000 acres or 85 percent of the watershed. The Big Cobb River watershed lies within the Le Sueur River Watershed, which is a tributary to the Blue Earth River.

The Big Cobb River has been listed on the 2004 – 2010 303(d) impaired waters lists for biota, turbidity and E. coli. These impairments will be addressed in a comprehensive LeSueur Watershed TMDL study. The focus of the Project was to begin implementation of conservation practices in the Big Cobb prior to TMDL development. The Project provided up to 75 percent cost share to landowners for installing targeted BMPs. Because the Big Cobb is a tributary to the LeSueur River and the LeSueur is a major watershed of the Minnesota River Basin, the conservation practices promoted and installed were taken from the Lower Minnesota TMDL implementation plan for low dissolved oxygen.

The Project timeline was from October 1, 2005 to August 31, 2010. During that time, two grade stabilization structures, two upland wildlife habitat management projects, two pond structures, one bioreactor, and five waterways were installed through eleven BMP cost-share contracts. 216 tons of sediment and 733 pounds of phosphorus will be reduced per year. 123 acres of habitat were created. 3,628,987 gallons of water storage were created. The bioreactor and ponds will be reducing nitrogen in the stored water, but a reduction number is hard to pinpoint without specific site sampling.

Goals

- Begin the process towards de-listing the Cobb from the 303(d) list
- Increase technical assistance for SWCD staff in the Cobb Watershed
- Increase project coordination

Results that count

- During the Project timeline, two grade stabilization structures, two upland wildlife habitat management projects, two pond structures, one bioreactor, and five waterways were installed through eleven BMP cost-share contracts. 216 tons of sediment and 733 pounds of phosphorus will be reduced per year. 123 acres of habitat were created. 3,628,987 gallons of water storage were created.
- The Cobb River Technician offered a great deal of technical assistance to Soil and Water Conservation District staff and South Central Technical Service Area. The technician helped with surveys and designs on eighteen projects in four counties.
- The Project Technician increased communication and coordination between landowners and state and local agencies. This coordination resulted in established projects and increased awareness of watershed issues. One project alone involved seven agencies in a successful partnership. Without strong coordination this project would not have been possible.

Financial information

Funding Type: Section 319

Grant Amount: $256,459

In-kind: $187,966

Contact information

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Fish and Schwanz Lakes Nutrient TMDL

MPCA listed Fish and Schwanz Lakes as impaired in 2006 due to total phosphorus (TP) that exceeded state standards. In 2008, the USEPA approved Minnesota's revised deep-and shallow-lake standards, each of which include a TP concentration with linked standards for Secchi depth and chlorophyll-a. Consequently, historical TP concentrations and Secchi depths in shallow Schwanz Lake met or exceeded the revised standards, and MPCA removed the lake from the 2010 impaired waters list. Project resources for Schwanz Lake TMDL were then shifted to help develop plans for BMPs to decrease TP loads from nearby "direct-drainage" sub-watersheds identified during the Schwanz Lake TMDL assessment process.

The project's main objectives were: 1) determine TP sources, 2) estimate TP loading and TP reductions that support state standards, 3) evaluate strategies to achieve TP reductions, and 4) develop implementation plans to remove the lakes from the impaired waters list. USEPA approved the TMDL report September 9, 2010, and MPCA approved the Fish Lake TMDL Implementation Plan November 24, 2010.

Goals

- Determine TP sources
- Develop TMDL that supports state standards
- Develop TMDL implementation plan to remove lakes from impaired waters list

Results that count

- Fish Lake total existing TP load = 436 lb/yr from the following sources: City of Eagan (348 lb/yr); City of Inver Grove Heights (1.0 lb/yr); Dakota County (18 lb/yr); MnDOT (1.9 lb/yr); internal (59 lb/yr); atmospheric (7.7 lb/yr)
- TMDL report (approved by USEPA 9/9/10): Fish Lake TMDL (407 lb/yr) = WLA (285 lb/yr) + LA (67 lb/yr) + MOS (55 lb/yr)
- Fish Lake TMDL Implementation Plan (approved by MPCA 11/24/10) includes 5-yr (2011-2015) schedule of BMPs with estimated total of $1,133,500 by City of Eagan.

Fish Lake

Financial information

Funding Type: Section 319

Grant Amount: $74,000

In-kind: $123,164

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Middle Minnesota Watershed Monitoring

This project was the result of years of intensive monitoring, assessment, and coalition building. The project was developed to continue the promotion and expand the effectiveness monitoring of conservation programs such as the federal Conservation Reserve Program (CRP), the Farmed Wetlands Reserve Program, conservation drainage, ravine erosion protection structures and septic system upgrades. Conservation efforts within the Middle Minnesota Watershed will positively influence water quality and continue to address the Seven Mile Creek and Little Cottonwood River TMDL impairments for turbidity and fecal coliform. Additionally, part of the project area is of state and regional significance. The DNR classified Seven Mile Creek as a designated trout stream in 1985 making it a unique resource for South Central Minnesota. The 640-acre County Park located at the mouth of Seven Mile Creek is used by thousands of visitors throughout the year and the Little Cottonwood River offers additional recreational activities.

This project also represents extensive collaboration and leveraging of financial and technical support from project partners. Project results demonstrate the complex influence that economic factors of the grant time line had on the adoption rate of conservation practices and innovations and the application for continuation funding.

There is, and will continue to be, great pressure on the land to produce more. Marginal crop areas will be used to boost this production. Because of this, our project activities were revised to target promotion of conservation efforts that minimized the amount of land to be taken out of production, yet maximize soil and water conservation. This project used information gained from field data, watershed assessments, modeling and detailed elevation data to target these conservation efforts.

Goals

- Place an additional 1,500 acres of targeted CRP practices in the Middle Minnesota Watershed and demonstrate innovative BMPs.
- Continue effectiveness monitoring of installed conservation practices at a field, sub-watershed and watershed scale.

Installation of ravine stabilization structure in Seven Mile Creek Watershed

- Develop and compare conservation targeting tools that can be applied to the Middle Minnesota Watershed.

Results that count

- Ten CRP contracts were developed, and as a result 157 acres of land were enrolled. This project was also successful at developing and providing for the installation of an innovative ravine erosion stabilization structure and a solar powered pump that will provide wetland treatment of tile water.
- Field data and water quality samples were collected from established sites and new "secondary sites" were added to enhance the data set.
- Through the use of newly acquired LiDAR data, provided by the MDA, and the completion of HSPF modeling of the Seven Mile Creek Watershed, our ability to target conservation practices to help define the most effective methods to address surface water impairments was improved.

Financial information

Funding: CWP

Grant amount: $269,720

In-kind: $860,089.50

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Nine Mile Creek Watershed TMDL

Nine Mile Creek watershed covers 44.5 square miles and is fully developed with various urban land uses, several large open areas and numerous lakes and large wetland complexes. Portions of six cities are in the watershed: Bloomington, Eden Prairie, Edina, Hopkins, Minnetonka and Richfield.

Excessive chloride in streams can harm aquatic life, including fish, invertebrates and aquatic plants. Monitoring data suggest that chloride levels in the creek are generally highest in the winter and likely only exceed the standard following snow melt runoff. Chlorides are present in road salts, which most road authorities and commercial and private applicators in the metropolitan area use extensively in the winter. A network of freeways, highways, and local roads, all of which eventually drain to the creek, are distributed throughout the watershed along with significant areas of high density development.

The TMDL report indicates that chloride loading in Nine Mile Creek must be reduced by 62 percent in order to meet the water quality standard. This will require improved management of road salt inputs from both road authorities and commercial and private applicators. The overall approach for implementation is expected to include a pilot-scale chloride loading study to better determine the sources and potential improvement measures for chloride load reductions. Other strategies will include public education and training/information exchange for municipal staff and private/commercial salt applicators, and potentially a cost-sharing initiative for retrofitting and upgrading salt application equipment.

In addition to chloride this project included evaluating the stressors responsible for the biota impairment. An analysis indicated that low dissolved oxygen during some parts of some years is the likely the chief cause. This condition is likely due to wetlands that the creek flows through as well as low flow conditions during drier times of the year.

Goals

- Evaluate chloride sources and stressors for biota impairment
- Complete a TMDL
- Evaluate strategies for addressing chloride impairment

Results that count

- Sources were estimated and stressors were identified
- A TMDL was completed for chloride and approved by USEPA
- Strategies were identified though further planning will be needed to address the chloride impairment

Financial information

Funding: State Match Funding

Grant amount: $149,843

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Sand Creek Watershed TMDL Resource Investigation

This project was a partnership between Scott County, the Scott Watershed Management Organization, Rice County and Le Sueur County, Scott SWCD, Le Sueur SWCD, the Cedar Lake Improvement District, the Cedar Lake Sewer District, and the Metropolitan Council. The project area consisted of the Sand Creek watershed which covers portions of Scott, Rice and Le Sueur Counties. The project addressed the water quality concerns of Sand Creek, Cedar Lake, and McMahon Lake, and an unnamed tributary to the Minnesota River in Scott County.

Early parts of 2009 focused on reducing data that was collected in previous years, analyzing QA/QC results, and developing rating curves and hydrographs. FLUX load modeling, loading rates and maps, and stream power analyses were also completed.

Goals

- Prepare Draft TMDLs for Cedar and McMahon Lakes and portions of Draft TMDLs for Sand Creek and the unnamed tributary.
- Develop TMDL-related report sections for the IBI listing for Sand Creek and the unnamed tributary based on the Stressor Identification process from USEPA (2000).

Results that count

- Created Cedar and McMahon Lakes (Draft) TMDL studies, which include draft TMDLs and draft Implementation Plans for the lakes along with specific goals. Sand Creek Impaired Waters Diagnostic Study written. Section 1 provides a description of project goals and objectives for Sand Creek and its tributaries, and an assessment in Section 5 of whether the goals of this particular project were met. In general, all the goals of this particular project were met or exceeded.
- Section 1 of the Sand Creek Impaired Waters Feasibility Study provides a description of refined project goals and objectives for Sand Creek and its tributaries, and an Implementation Plan ("methods") addressing stressors.

Financial information

Funding: CWP

Grant amount: $277,150

Match: $460,597

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Seven Mile Creek Glacial Sediment Study

Seven Mile Creek is Nicollet County's most visible natural resource with a 630-acre county park situated at the mouth of this designated trout stream. Staff from the Brown-Nicollet- Cottonwood Water Quality Board and Environmental Health Service have monitored Seven Mile Creek since 2000 and continue to work with watershed partners to improve the water quality of this creek which is currently listed as impaired for turbidity.

The primary goal of this project was to inform the turbidity TMDL allocation by apportioning the suspended sediment monitored in Seven Mile Creek to specific geologic source areas within the watershed using geological and geochemical techniques. Geologists sampled the glacial sediments in the Seven Mile Creek watershed and characterized the various glacial sediment sources by texture and lithology. The geologists further used this information to construct a surficial geologic map and formulated a geologic history which gave rise to the present day distribution of glacial sediment in the watershed. Isotope geochemists, using the geological information, located necessary sediment sampling locations.

Subsequently, the geochemists were able to characterize the isotopic signatures of sediment derived from shallow erosional processes associated with upland fields as well as sediment derived from the scour of large ravines, which dominate the most downstream portion of the watershed. Using the isotopic fingerprints of the field-derived and ravine-derived sediment, it was determined that approximately 75 percent of the suspended sediment in the Seven Mile Creek originates from deep scour processes consistent with ravine formation. This conclusion is consistent with total suspended solids data collected throughout the watershed. Given this information, it is clear that an implementation plan to reduce turbidity in Seven Mile Creek must address the sediment load from ravines, the dominant source of suspended sediment, as well as include BMPs designed to reduce upland sediment sources.

Goals

- Characterize the landforms and determine the current distribution of potential sediment sources in the Seven Mile Creek watershed.

- Identify the historical erosional processes which shaped the present landscape in Seven Mile Creek watershed.
- Identify the current sources of sediment to Seven Mile Creek

Results that count

- A surficial geologic map was completed for the Seven Mile Creek watershed.
- A geologic history of Seven Mile Creek watershed was constructed using geological and geochemical techniques.
- Radioisotope and cosmogenic analyses were used to determine the relative importance of sediment loadings from field and ravine sources of sediment for Seven Mile Creek.

Financial information

Funding type: Section 319

Grant amount: $84,749.36

In-kind: $86,681.56

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MPCA Project Manager: Charles Regan

Hawk Creek Project "Land of the Lost" Work Area Continuation

The primary goal of the project was 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 region. Prompted by concern over suspected and known water quality issues in the Hawk Creek Watershed, a group of concerned citizens and local, state and federal representatives from the three counties in the watershed began meeting in February of 1997 to work together to address these water quality issues in the basin. Known as the Hawk Creek Watershed Committee, the group determined their long-term goal to be "improving the water quality/quantity issues in the watershed while also promoting a healthy agricultural, industrial and recreation-based economy for the region."

This priority area drains 197,765 acres (309 square miles) of land with over 191 miles of watercourses. It is unique among their project work areas in that it consists of several small streams that flow directly into the Minnesota River, rather than draining to a single major tributary of the Minnesota River. Water quantity, and high velocity, a result of excessive drainage compounded by a lack of buffered areas, presents challenges in reducing loads of both sediment and nutrients.

Throughout the duration of this grant 39 BMPs were installed using cost-share funds from this grant. An aggressive education campaigned reached a diverse audience and public awareness and concern for improving water quality in the region was enhanced through these efforts. Water quality monitoring efforts allowed the Project to evaluate the effectiveness of implemented BMPs and to pinpoint locations where BMP efforts should be focused.

Goals

- Determine specific pollutants and the processes affecting their passage through the Hawk Creek Watershed, and implement BMPs with the ultimate goal of bringing these streams into the 50 percent percentile of Western Corn Belt Plains (WCBP) eco-region values for the pollutants of concern.
- Involve citizens and maximize public input and ownership of the Project. This includes, but is not limited to, the identification of and solutions to the aforementioned water quality and quantity issues within the watershed.
- 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 region.

Results that count

- Water quality monitoring revealed sediment and phosphorus loading are slowly trending downward in the watershed. Nitrogen levels remain high throughout the watershed.
- The Hawk Creek Watershed Project (HCWP) participated in educational events to increase public awareness of water quality issues and how best to improve the water quality condition of the lakes and streams in the area. Educational events and materials reached more than 99,920 people. In addition, several schools invited HCWP staff to speak in the classrooms. A citizen monitoring network of 27-41 participants has been actively maintained over the last three years. This participation in the monitoring efforts of the project led to a sense of "ownership" among those engaging in the citizen monitoring.
- The 39 BMPs were installed during this grant period. The 39 BMPs treated 1030.70 acres and resulted in a reduction of 994.67 lbs/year of phosphorus, 670.05 tons/year of sediment loss, and 830.12 tons/year of soil saved.

Financial information

Funding type: CWP

Grant amount: $177,437

In-kind: $250,617.75

Contact information

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Yellow Medicine River Watershed Dissolved Oxygen

Phosphorus was identified as one of the pollutants in the Minnesota River Basin. A source of phosphorus is through agricultural cropland run-off of sediments from these acres. The projects that were funded through this grant will assist in reduction of phosphorous from upland sources by controlling runoff through the implementation of the following projects:

- Grassed waterways/3.6 acres, 2 projects
- Mulching, 1 project
- Critical area planting, 1 project
- Terraces/2.7 acres, 2 projects
- Water and Sediment Control Basins/5 projects

There were a total of 11 BMPs installed and the total pollution reduction from the grant was: Soil Loss reduction: 338.03 tons/year.

Sediment reduction to water: 175.11 tons/year, and Phosphorous Reduction: 192.55 lbs/year.

Goals

- Reduction of phosphorus from agricultural land in crop production
- Promotion of additional projects through landowner interaction after completion of projects
- Education of public through promotion of reduction results and benefits to water quality

Results that count

- Reduction of phosphorus totaling 192.55 lbs per year
- Additional projects produced a reduction in soil loss of 338.03 tons and sediment by 175.11 tons per year.
- Education resulted in working with 7 landowners on: grassed waterways/3.6 acres – 2 projects; mulching - 1 project; critical area planting – 1 project; terraces/2.7 acres – 2 projects; and Water and Sediment Control Basins – 5 projects.

Yellow Medicine River Watershed – installation of a two acre waterway

Financial information

Funding type: Section 319

Grant amount: $31,150.00

In-kind: $52,252.30

Contact information

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Interpreting a Century of Sediment in Redwood Lake

The Redwood River watershed is formed in the glacial sediment of the Des Moines lobe, the parent material for much of the agricultural area of the state. This is also the region that contributes high concentrations of suspended sediment to Lake Pepin. The sediment is typically 60 percent or more fine sediment (clay and silt). Although it is usually very tightly packed and cohesive, if it is broken up by surface activities, it is easily removed by water and wind because the particles are so small. Part of the Redwood

Map of Redwood Lake

River occupies the broad, sandy valley of a former glacial stream that was hugging the former ice front. The gradient of the river is unusually low for this reason and did not quickly drain the nearby upland fields, approximately half of which were originally poorly drained. The gradient has been steepened by ditching shorter channels that lead more directly to the Minnesota River, which did not exist when the Redwood was formed.

This project was a collaborative effort between Redwood-Cottonwood Rivers Control Area (RCRCA), the U of M and the St. Croix Watershed Research Station (SCWRS). Dr. Carrie Jennings was responsible for the technical aspects including site selection, core collection and data interpretation. She is the state expert on the glacial geologic history of southwestern Minnesota. Dr. Daniel Engstrom and SCWRS staff performed the chemical analyses. Dr. Invanka Stefanova and Herbert E. Wright, Jr. described the core and performed the pollen interpretation. The overall goal of this project was to enable RCRCA staff to effectively manage the current resources of Redwood Lake and Redwood River by: 1) collecting a comprehensive sediment core; 2) extracting the sedimentation history of Redwood Lake using several methods; 3) communicating these results to RCRCA staff and other interested local units of government. Lastly, the immediate goal of making a more informed water management decision regarding the proposed dredging and future TMDL efforts will be facilitated as part of the study.

Goals

- Collection of a comprehensive set of sediment cores.
- Determine the sedimentation history of Redwood Lake through a list of methods.
- Communication of study results to RCRCA and other interested local units of government.
- Making more informed water management decisions with relation to proposed dredging and TMDL efforts.

Results that count

- Retrieved and archived sediment cores from 1 comprehensive sediment core of ≈ 6 meters in 2 cm intervals
- Compiled a history of the Redwood Lake sediment through the analysis of the sediment core including a magnetic profile, Pb-210/Cs-137 core dating, grain size analysis, spore and pollen analysis, mass spectrometry, and organic/non-organic and carbon analysis
- Meetings were held for public information with presentation and explanation of the results of the lake core study and how it relates to other studies around the Minnesota River Basin and fits into the big picture of describing the overland/bank and bed/ravine sediment contribution ratio.
- Reports and final study materials have been relayed to RCRCA for future use in water management decision-making and public outreach.

Financial information

Funding type: Section 319
Grant amount: $84,786.68
In-kind: $88,639.69

Contact information

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Minnesota River Basin

Projects active and awarded in 2011

Multiple watersheds in the basin

A Decision Support Tool to Restore Impaired Waters — 2010

Sponsor: University of Minnesota, Department of Forest Resources

Funding: Section 319 (Grant) $719,468

Purpose: This education and applied research project expands upon earlier work estimating impacts of restored wetlands, stream channel restoration and targeted conversion to perennial crops and adds an outreach component. The project integrates existing research, fills in research gaps, and will prepare and disseminate a decision support tool to assist managers in selecting practices with the greatest potential for restoring impaired waters. An advisory group composed of agency personnel will be formed to assist with tool development.

The planned activities include: 1) hydrologic research on the impact of perennial plantings and stream channel —riparian restoration on improving the quality of impaired waters; 2) research on the agronomic aspects of producing energy crops in riparian areas to address impairments; 3) developing a decision support tool for managers; and 4) education and outreach to train managers to use the tool and landowners to implement practices and land use options.

The long term goal of this project is restoring impaired waters through the provision of a research based decision support tool that allows agencies and stakeholder groups to concentrate their efforts on supporting programs and targeting effort to areas with the greatest chance of restoring impaired waters. Outcomes/products include: 1) A decision support tool for managers; 2) Field days for the general public and trainings for managers; 3) Measurements of the impact of stream channel restoration and continuous monitoring of pilot watershed areas; 4) Decision support tool that can estimate potential environmental results of BMPs and land use changes.

Cottonwood/Redwood River Project — 2008

Sponsor: 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 to 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 — 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.

Greater Blue Earth and Des Moines River SSTS Loans — 2009

Sponsor: Watonwan County

Funding: CWP (Loan) $1,200,000

Purpose: Initiate and re-establish the CWP loan program in southern Minnesota counties to demonstrate the influence low interest SSTS loans has on the rate of SSTS compliance. 30-40 non-compliant or failing existing systems, as determined by inspection in each of four counties, will be replaced by new single sewage

treatment systems. It is anticipated that 120-160 new systems will be installed. Each of these systems will be financed through low interest loans which will be administered by the individual counties: Blue Earth, Cottonwood, Jackson and Watonwan.

Minnesota Pollution Reduction and Economics Test with Nutrient Trading Tool — 2011

Sponsor: Minnesota River Board

Funding: Section 319 (Grant) $172,916

Purpose: The Conservation Marketplace of Minnesota (CMM) project collaborators will be among the first groups to work with the Nutrient Trading Tool (NTT) in Minnesota upon its nationwide release in 2011. CMM is a collaboration of public and private conservation professionals developing a market-driven approach to advance conservation efforts and agricultural sustainability with a crediting system that provides multiple environmental benefits with measurable outcomes in participating watersheds. We will identify BMP sites to evaluate and validate the Nutrient Trading Tool, incorporate a farm economic model, develop curriculum, provide outreach events and train natural resource professionals. This project will professionally validate and demonstrate the NTT to evaluate land management scenarios and provide measureable outcomes for conservation practices designed to reduce nonpoint source pollution in watersheds across the state.

Minnesota River Community Clean-Ups for Water Quality — 2010

Sponsor: Friends of the Minnesota Valley

Funding: Section 319 (Grant) $110,000

Purpose: The Community Clean-Ups for Water Quality have a direct, measurable, and significant impact upon the water quality of the Minnesota River and its watershed by measurably and significantly reducing phosphorus pollution. In addition to the physical results, the Clean-Ups result in an educational process of area citizens that motivates them to take action and that instills within them an ongoing commitment to their communities and to the long-term health of the Minnesota River.

Outcomes:

Five 20-25-pound bags of debris contain about one (1) pound of phosphorus.

Some project outcomes and results may include, but are not limited to:

1. Identify a minimum of 30 target communities to host clean-ups.

2. Quantify, publish and publicize the results of community clean-ups through printed and electronic media, including our annual report, newsletter and website. We will also work with our partners to publish and publicize the results in this manner as well.

3. Achieve pollution reduction figures of an estimated 15,000 pounds of phosphorus and 30,000 pounds of trash.

Motivate the involvement of 1,800 volunteers, sustained over the grant period total of three years, to actively participate in the project.

Redwood and Cottonwood Rivers Watershed Conservation and Nutrient Reduction Projects —2009

Sponsor: RCRCA

Funding: Section 319 (Grant) $253,440

Purpose: The goal of this project is to continue best management implementation according to the phase I implementation plans and implement phosphorus reducing conservation practices that will help achieve the Lower Minnesota River dissolved oxygen TMDL. This project is expected 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 work plan will administer grant funds from 2009 through 2013 to achieve the implementation goals through these objectives: 1. BMP technical assistance and implementation, and 2. Grant facilitation.

Blue Earth River

Blue Earth Basin Small Community Stormwater Management Project — 2007

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 to assist 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 Basin Restoration Positions — 2009

Sponsor: Greater Blue Earth River Basin Alliance

Funding: CWP (Grant) $227,600

Purpose: To continue funding four specialist positions.

The Urban Outreach Specialist position provides communities with assistance in developing and delivering presentations, education campaign materials, educates about alternative stormwater management practices, and assists communities with the implementation of stormwater projects.

The Nutrient Management Specialist position develops nutrient management plans and conducts outreach and education to area livestock producers and the general public. These plans are designed to help manage the amount, source, placement, form and timing of the application of nutrients and soil amendments.

The Conservation Agronomist position focuses on education and applied research around sustainable farming systems that promote higher levels of nonpoint source pollution mitigation practices. This position works with local and regional educators to conduct applied research and uses demonstration of appropriate principles and practices to meet these goals.

The Cobb River Watershed Technician position provides the landowners with guidance on BMP project implementations and programs to help improve water quality.

These positions will continue to utilize available state Clean Water Legacy, BWSR State Cost-Share, Section 319 and NRCS Environmental Quality Incentives Program (EQIP) funds to initiate the installation of BMPs in the watershed.

Blue Earth River-East Branch Watershed Approach — 2009

Sponsor: Faribault County

Funding: CWP (Grant) $250,000, CWP (Loan) $200,000

Purpose: Faribault County will utilize a systematic approach to identify principal sources, or "hot-spots", of sediment contributions and work with individual landowners, county drainage officials, and municipalities to coordinate and implement critical BMPs, establish demonstration sites, and provide education and outreach efforts. This project will also establish baseline watershed data with the addition of site specific information and determine high priority watersheds. Appropriate practices will be identified and mapped utilizing GPS and GIS equipment and software. The project will promote side inlets with buffers, incentives for filter strips or establishment of harvestable filter strips, water storage areas, inline ditch treatment, crop residue, open intake alternatives, controlled drainage projects, along with other structural and innovative practices.

GBERBA Dissolved Oxygen TMDL Application — 2009

Sponsor: Greater Blue Earth River Basin Alliance (GBERBA)

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. Reducing sediment also reduces the phosphorus bound to the soil, thereby addressing the low dissolved oxygen problem identified in the Lower Minnesota River TMDL. The cost-share is an incentive to landowners wishing to conserve their land. A healthier river system is the goal, which increases the value of the river as a resource.

Chippewa River

Dry Weather, Lines and Spring Creeks Sub-basin of the Chippewa River Continuation — 2011

Sponsor: Chippewa County

Funding: CWP (Grant) $347,833 CWP (Loan) $200,000

Purpose: The Dry Weather, Lines and Spring Creeks sub-basin is one of six priority sub-basins of the Chippewa River Watershed. This project is designed to continue project administration; water quality monitoring; summer intern program assistance; education and information activities; and BMPs to be implemented, including critical tree plantings, nutrient management, residue management, alternative tile intakes, conservation drainage, and may include sediment basins, wetland restorations, stream bank stabilization, grassed waterways, pasture management, livestock exclusion, agricultural waste management systems, buffer strips, urban BMPs, side inlets, and terraces.

Shakopee Creek Headwaters Project (SCHP) Continuation — 2009

Sponsor: Kandiyohi County

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

Purpose: The focus of this continuation 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 continue to monitor the water quality of the streams and lakes in the Shakopee Creek Watershed.

The SCHP will continue to partner with other agencies and individuals over the next three years to encourage the installation or adoption of BMPs such as buffer strips, livestock exclusions, alternative tile intakes, watershed-wide septic system upgrades and lakeshore naturalizations. The project will continue to 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 — 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

Cottonwood River Watershed Nonpoint Pollution Reduction Project — 2007

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 dissolved oxygen TMDL. This work plan 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 Continuation — 2009

Sponsor: RCRCA

Funding: CWP (Grant) $343,000, CWP (Loan) $545,000

Purpose: Replace 73 non-compliant eminent health threat (EMHT) SSTS systems, provide technical assistance to install SSTS and BMPs watershed wide, continue monitoring and sampling analysis and provide grant facilitation and administration during the project period.

Cottonwood River Native Vegetation Water Quality — 2010

Sponsor: Minnesota Department of Agriculture

Funding: Section 319 (Grant) $183,766

Purpose: TMDL protocols include load allocations for natural background contributions. These allocations are often lumped with other nonpoint source loads because the data characterizing natural background conditions are very limited. Many TMDL implementation plans include the establishment of native prairie vegetation to remediate pollution in the agricultural landscapes of southern Minnesota; however, the quantification of the water quality benefits of such programs as the Conservation Reserve Program (CRP) at the landscape scale is lacking. This study will be conducted at a field scale site comprised of native prairie vegetation with no history of conventional row crop production agriculture to assess the soil and water characteristics of this system. This system will be compared to alternative management scenarios at the field scale using a paired watershed design to evaluate water quality differences.

Outcomes:

- Water quality and quantity characterization of native prairie systems.
- Quantification of natural background contributions from soil and native prairie vegetation to current water quality impairments related to turbidity, excess nutrients, and bacteria.
- Comparison of water quality characteristics among differing land management practices including: native prairie vegetation; conventional row crop agriculture; and targeted placement of native vegetation in critical landscape positions.
- Development of management guidelines for CRP lands converted to cropland to minimize impacts on soil and water resources while maintaining agricultural productivity.

Lac qui Parle River

Lac Qui Parle River Main Stem Water Quality Enhancement Project Continuation — 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 sewage systems.

Ten Mile Creek Protection Plan for Turbidity

Sponsor: Lac qui Parle – Yellow Bank Watershed District

Funding: CWP (Grant) $141,850

Purpose: Ten Mile Creek is the only tributary on the east side of the Lac qui Parle River. This protection plan will install BMPs, such as buffer strips, harvestable buffer strips, open tile intakes replaced with either a rock inlet or pattern tile design, rain gardens, wetland restorations and other urban BMPs as the need may arise; develop and compile results of a Ten Mile Creek watershed survey; hold small group meetings in the watershed to encourage landowner conversations; prepare and send regular newsletters; develop additional information and education activities as needed and provide project fiscal management and administration.

Lower Minnesota River

Assessing Iron Enhanced Filtration Trenches — 2011

Sponsor: City of Prior Lake

Funding: Section 319 (Grant) $240,000

Purpose: The purpose of this project is to quantify the performance of full-scale, field-installed, iron-enhanced filtration trenches which will provide critical design, construction, and performance information for a practice that could be used to significantly reduce the dissolved phosphorus load entering wetlands, rivers, and lakes in Minnesota.

This project will investigate the design of a new treatment system that utilizes a sand filter enhanced with iron shavings or steel wool around the perimeter and near the outlet of a wet detention basin. When stormwater enters the basin, the water level will increase and stormwater will begin flowing into the filtration trenches. Significant particulate removal occurs through settling within the wet detention basin and additional particle and dissolved pollutant capture occurs by filtration and adsorption within the enhanced media trench. The technology was tested during the summer of 2010 through funding provided by the City of Prior Lake, the Prior Lake Spring Lake Watershed District, and the Scott County Watershed Management Organization.

Bevens and Silver Creeks SSTS Project — 2009

Sponsor: Sibley County

Funding: $9,770 CWP (Grant), CWP (Loan) $273,000

Purpose: To reduce the current level of fecal coliform bacteria by initiating the CWP loan program in Sibley County. It is expected that, through low interest loans which will be administered by the county, 21 non-complaint or failing existing systems as determined by inspection or landowner interest will be replaced by new single sewage treatment systems.

Blackhawk Lake and Thomas Lake Management Plans — 2011

Sponsor: City of Eagan

Funding: CWP (Grant) $55,276

Purpose: Blackhawk and Thomas Lakes' are considered high priority lakes in the suburban city of Eagan. The project will evaluate Blackhawk and Thomas Lakes' in-lake water quality; assess the TP loads affecting each system; develop implementation plans based on priority system improvement projects and develop activities to protect and improve these lakes.

Carver, Bevens and Silver Creek Fecal Coliform TMDL Implementation Plan — Phase II — 2008

Sponsor: Carver County Land and Water

Funding: Section 319 (Grant) $148,420

Purpose: Continue phase I work. This includes bringing up to 100 direct discharge SSTSs into compliance, installing 26 miles of buffer strips and 80 alternative tile intakes, and writing 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

Sponsor: Carver County

Funding: Section 319 (Grant) $300,000

Purpose: Carver, Bevens, and Silver Creek's are on Minnesota's list of impaired waters (303d) for fecal coliform. The TMDL goal is to quantify the pollutant reductions 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.

High Island Creek implementation Project Continuation) — 2008

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 that 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.

High Island Creek TMDL Project for Fecal Coliform — 2011

Sponsor: Sibley County

Funding: Section 319 (Grant) $300,000

Purpose: The water quality issues and concerns of the High Island Creek Watershed grew from past surface water monitoring completed within the watershed and the Minnesota River Basin. The Minnesota River Basin is a major source of pollution to the Mississippi River, as determined by the Minnesota River Assessment Project (MRAP, 1994). Results from the Agricultural Drainage and Pesticide Transport model by the University of Minnesota (Dr. David Mulla), shows that the Lower Minnesota River watershed contributes a large percentage of the sediment and nutrients that enter into the Mississippi River. This has put pressure on the rural watersheds of the Lower Minnesota to improve their surface water quality.

The desired environmental outcome for this project is to make significant progress on or achieve the TMDL for fecal coliform bacteria. To work toward reaching the TMDL for fecal coliform in High Island Creek, project activities will be focused to on-the-ground implementation practices that reduce fecal coliform bacteria levels and educational activities. By applying significant implementation practices, this project will also increase wildlife habitat and improve aquatic habitat. The project will continue to strive to create a sense of watershed stewardship and community pride in clean water, a social goal from previous grants.

Lower Minnesota River Dissolved Oxygen Elevation Project — 2010

Sponsor: Renville County — Hawk Creek Watershed Project

Funding: Section 319 (Grant) $205,186

Purpose: The HCWP is offering cost-share assistance and incentives for implementing BMPs such as, but not limited to: buffer strips, wetland restorations, side inlets, alternative tile intakes, wood chip bioreactors, conservation drainage systems, grassed waterways, water and sediment control basins, terraces, grade stabilization structures, feedlot waste reduction projects, rain gardens, and lake shoreline buffers. An Engineering Technician would be added to the staff to enhance the current BMP delivery process. Practice survey and design has frequently proven to be a factor limiting the implementation of BMPs within the watershed and this position would address that issue.

The final outcome of this project will be a reduction of phosphorus entering the Minnesota River from the HCWP work area. This goal would be accomplished by implementing BMPs in strategic locations within the watershed. This is a multi-BMP grant that would focus on BMPs that have proven to be effective in reducing phosphorus. One focus of this project would be to accelerate enrollment of lands that are currently in row crop production into wetland restoration practices. Wetlands are visibly lacking throughout the watershed and there is a desperate need to restore the natural hydrology in key areas of the watershed.

Lower Minnesota River Low Flow Dissolved Oxygen TMDL — 2007

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. This work plan is 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).

Lower Prior Lake Diagnostic Study — 2011

Sponsor: Prior Lake-Spring Lake Watershed District

Funding: CWP (Grant) $48,417

Purpose: Lower Prior Lake is located in the Prior Lake-Spring Lake Watershed District (PLSLWD) in Scott County, in the Minnesota River Basin. This project will include an assessment of the spatial variability in water quality in Lower Prior Lake; an evaluation of the internal loading potential of the lake; a watershed assessment of the direct drainage area (approximately 1900 acres) that will identify areas of highest nutrient loading to the lake and will evaluate the load reduction potential of proposed BMPs; meetings with interested parties including the Prior Lake Association, PLSLWD Board of Managers, communities, and others to set goals for lake water quality and develop implementation strategies; and the development of the overall diagnostic study and implementation plan.

Minnesota River Tributary Phosphorus and Flow BMPs — 2010

Sponsor: Scott Watershed Management Organization

Funding: Section 319 (Grant): $475,000

Purpose: Per the Lower Minnesota River DO TMDL Implementation Plan phosphorus needs to be reduced, and recharge and baseflows increased. To deal with additional turbidity impairments in the Minnesota River sediment needs to be reduced and channel forming flows moderated. This project accelerates implementation of BMPs specifically listed in the DO TMDL Implementation Plan for the benefit of Minnesota River impairments and local impairments. The goals are to: 1) reduce phosphorus, 2) moderate channel forming flows, and 3) increase recharge.

What makes this project unique is: 1) the robust existing program from which to accelerate implementation; and 2) an emerging demand for an alternative grass crop for biofuel at the Koda electric facility in Scott County. This demand for grass biofuel makes it easier to promote grass filter strips, and native grass plantings. Both practices are listed in the TMDL implementation plan.

Deliverables include the installation of additional BMPs called for in the Minnesota River DO TMDL Implementation Plan, and monitoring to document effectiveness. BMPs to be implemented include filter (harvestable) strips, tile intake controls, alternative crops, critical area plantings, grade control structures, water and sediment basins, native grasses and restored wetlands. The amount budgeted is sufficient to create about 150 acres of grass or between 12 and 24 miles of filter strips (depending on the width of the filter strip), install 3 to 5 grade/water control structures, 5 to 10 surface tile intake controls, and restore 25 to 30 acres of wetland or riparian buffers.

Quantifying Phosphorus Load Reductions from Street Sweeping — 2010

Sponsor: Water Resources Center, University of Minnesota

Funding: Section 319 (Grant) $285,970

Purpose: Soon it will necessary for cities to quantify load reductions in order to receive credit for TMDL programs. The proposed project would develop an approach for calculating street sweeping P load reductions under a

variety of conditions, so cities can reliably estimate these reductions.

The City of Prior Lake will continue an aggressive street sweeping program, providing U of M researchers with street sweeping records and samples. The U of M team will analyze approximately 1000 samples, and a subset for bioavailable P. The project will also determine the timing of P release from tree leaves experimentally, to provide guidance on the timing of street sweeping. A database of 5,300 trees will be used to develop scenarios for a variety of conditions throughout Minnesota. Outcomes will be disseminated via a web-based guidance manual and six workshops held throughout the state.

The main outcomes will be a web-based report, targeted to municipal public works departments, that will provide guidance on calculating the effect of street sweeping under various conditions (extent and species of tree canopy; type of sweeper; timing) on reducing stormwater P loadings. This will be supported by six workshops held throughout Minnesota. Other technical products will include a masters thesis, and one or more peer-reviewed publications.

Rush Lake Watershed Implementation Project Continuation (Minnesota River) — 2008

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. The 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. It will continue activities related to education and outreach, including workshops, brochures, surveys, displays, tours, demonstrations and newsletters. The 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.

Rush River TMDL Implementation Project for Fecal Coliform — 2010

Sponsor: Rush River Watershed

Funding: Section 319 (Grant) $340,000

Purpose: Fecal Coliform bacteria is a significant concern in the Rush River Watershed with the mainstem and south branch listed as impaired on the 303(d)list. To work towards reaching the TMDL for fecal coliform in the Rush River, project activities will be focused to on-the-ground implementation practices and educational activities. This project will prioritize implementation activities to areas of the watershed that contribute the largest fecal coliform bacteria loads and sites of direct surface water contamination. Implementation activities will include structural practices to reduce feedlot runoff, pasture management plans, manure management plans, manure application calibrations, open intake removals and low income financial aid for septic system upgrades. Educational activities will include manure management workshops, manure management field days and a quarterly newsletter. The project will continue to strive to create a sense of watershed stewardship and community pride in clean water, a social goal from previous grants.

Outcomes: The desired outcome for this project is to make significant progress on, or achieve, the TMDL for fecal coliform bacteria. By applying significant on the ground implementation practices, this project will also increase wildlife habitat and improve aquatic habitat. The success of the project will be measured by the participation of citizens in the project's activities. A continuation of water quality monitoring will be utilized to determine if bacteria reduction goals are being achieved by implementation activities. At minimum, the project will aim for a 30 percent reduction in the monthly fecal coliform geometric means from the fecal coliform TMDL assessment study.

Minnesota River – Mankato

Middle Minnesota Watershed, Implementation of Conservation Practices — 2011

Sponsor: Cottonwood County

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

Purpose: Coordinate the CWP loan program in southern Minnesota counties to demonstrate the influence low interest SSTS loans has on the rate of SSTS compliance. It is anticipated that 120-160 new systems will be installed. Each of these systems will be financed through low

interest loans which will be administered by individual counties: Blue Earth, Brown, Cottonwood, Nicollet, Redwood, Renville and Sibley.

Middle Minnesota-Brown and Redwood Counties First Order Streams Phase I Diagnostic Study — 2009

Sponsor: RCRCA

Funding: CWP (Grant) $200,000

Purpose: The project area lies between two major watershed confluences, the Redwood and Cottonwood Rivers. This area is included by designation as a part of the Middle Minnesota River Basin, but for the most part been overlooked by major watershed initiatives. The 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.

Minnesota River – Yellow Medicine River

Hawk Creek Watershed Accelerated Phosphorus Reduction Effort — 2009

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

Funding: Section 319 (Grant) $148,525

Purpose: The HCWP mission 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 Continuation — 2011

Sponsor: Renville County

Funding: CWP (Grant) $442,697, CWP (Loan) $800,000

Purpose: The Hawk Creek Watershed 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. This project is planned to continue staffing; administration; water quality monitoring; education and information activities; septic system upgrades and activities related to the installation of BMPs, including technical assistance for resource assessments, practice selection, survey, and design, which is the single top priority for the project.

Hawk Creek Watershed Project "Beaver Tales" Continuation (Minnesota River) — 2008

Sponsor: Renville County

Funding: CWP (Grant) $180,839

Purpose: "Beaver Tales" continues 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 — 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 and 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 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.

South Branch of the Yellow Medicine River TMDL Fecal Coliform Reduction Project — 2007

Sponsor: Yellow Medicine River Watershed District

Funding: Section 319 (Grant) $238,500

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.

Pomme de Terre River

Pomme de Terre Fecal Coliform Implementation Plan — 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 bacteria Section 319 grant, and their impact on the E. coli levels in the Pomme de Terre River.

Redwood River

Redwood River Watershed Nonpoint Pollution Reduction Project — 2010

Sponsor: RCRCA

Funding: Section 319 (Grant) $175,575

Purpose: Long-term monitoring has identified encouraging trends of sediment and phosphorus reduction associated with the restoration that has taken place in the Redwood River watershed, but the current (2008) TMDL impaired reach designations show that the work is not finished. With the TMDL plan approved on the lower Minnesota River for phosphorus reduction, it is important to continue the implementation of BMPs that will reduce the total phosphorus contribution from the Redwood River Major Watershed and work to de-list the lower Minnesota River Dissolved Oxygen TMDL impairment. This organization has the benefit of a long history of monitoring data and the personnel and reputation in the community to make the proposed plan a successful project.

Outcomes: Through the funding of this project, the goal is to reduce phosphorus reaching the Minnesota River by 1,943.17 pounds annually or 777,268.00 pounds of aquatic plant growth annually (plus 350 tons of sediment).

Redwood River Watershed Phosphorus TMDL Compliance Project Continuation — 2007

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 BMPs and other conservation practices. It will also coordinate information and education activities.

Rainy River Basin

Projects completed

Lake of the Woods

Lake of the Woods Nutrient Budget Water Quality Modeling

Rainy River – Baudette

Williams Creek Dissolved Oxygen TMDL

Lake of the Woods Nutrient Budget Water Quality Modeling

The U portion of Lake of the Woods was placed on the 303(d) Threatened and Impaired Waters List due to high phosphorus concentrations. This condition, and the increased presence of blue-green algal blooms, has caused concern that the overall water quality of the lake has deteriorated in recent years.

Two water quality modeling programs, FLUX and BATHTUB, were used to estimate nutrient loads for tributaries and reservoirs and establish a preliminary Lake of the Woods TMDL. Estimates were based upon measured data from the main tributary, and a combination of measured and estimated data from other tributaries entering the lake. Results indicated that internal loading in the United States basins may represent a major phosphorus source and represent a significant challenge to reduce phosphorus levels in an environmentally-relevant manner.

St. Cloud State University conducted the modeling project over a 24-month period. All known data for the system was collected and centralized; this data was used to identify poorly studied aspects of the system limiting the model's utility, and, to produce a preliminary model with the data.

Further investigation is needed to identify the role of internal phosphorus loading in the system.

Goals

- Develop a preliminary total phosphorus budget for Lake of the Woods.
- Assess total phosphorus loads to Big Traverse Bay and the Rainy River.
- Develop water quality modeling of phosphorus management scenarios.

Results that count

- A BATHTUB model developed phosphorus loading estimate.
- Data was used to produce estimates of phosphorus loads into Big Traverse Bay from Lake of the Woods. Estimates for the Rainy River inputs were conducted using 2005, 2008, and 2009 data individually and the combined 20 year data set. Apparent from this data is a clear negative trend in phosphorus inputs from Rainy River into Big Traverse Bay.
- The water quality model helped determine that internal phosphorus loading must be addressed if the system is to be managed.

Financial information

Funding type: CWLA

Grant amount: $50,000

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Williams Creek Dissolved Oxygen TMDL

Williams Creek, from its headwaters to Zippel Creek, was placed on the Impaired Waters list in 1996 for low dissolved oxygen (DO) affecting aquatic life. The low DO exceedances were identified at two monitoring sites in 1984.

As of the initial listing, possible causes of low oxygen in the area were high BOD discharges and bypasses from the Williams Wastewater Treatment Facility, hydrologic modifications, wetland influences, agricultural practices and groundwater inflow. When the Williams WWTF was replaced in 2000, there was an expectation that the BOD loading would be corrected.

Data from a 2004 comprehensive watershed monitoring project indicated that during normal flows, DO is not a problem. Subsequent monitoring data indicated that Williams Creek no longer has an impairment.

Goals

- Determine whether the suspected stressors identified in 1984 were still causing dissolved oxygen exceedances at two STORET monitoring locations.
- Determine whether the 2000 replacement of the Williams WWTF removed the stressors.
- Collect the data necessary for a use assessment determination from two sites on the West Branch of Zippel Creek. Depending upon the results, the data would either be submitted for a delisting review or SWCD staff would begin a new investigation into possible causes.

Results that count

- The data show that the impairment no longer exists.

Financial information

Funding type: CWLA

Grant amount: $20,000

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Rainy River Basin

Projects active and awarded in 2011

Lake of the Woods

Bostic and Zippel Watershed Assessment — 2011

Sponsor: Lake of the Woods County

Funding: CWP (Grant) $53,000

Purpose: Bostic and Zippel are two Lake of the Woods minor watersheds within the Rainy River Basin where significant erosion and sedimentation is taking place, thereby negatively effecting water quality and creating detrimental economical and ecological impacts. This project is designed to provide monitoring, assessment, additional data collection and analysis to determine the primary causes of erosion and sedimentation; substantiate the water quality impacts and develop an implementation plan that will identify major sources of sediment within these watersheds; identify the causes of ditch systems' instabilities and erosion (i.e. flooding and peak flows, land use practices); quantify the sedimentation damages (monetary, ecological, and environmental) and identify BMPs for reducing nutrient loads and sediment transport within the watersheds.

Rainy River – Headwaters

Kawishiwi Watershed Protection — 2011

Sponsor: Lake County

Funding: CWP (Grant) $174,500

Purpose: The Kawishiwi Watershed, a large part of which is within the Boundary Waters Canoe Area Wilderness, is an important water resource regionally and nationally, providing drinking water sources and recreational facilities. The goals of this project are to continue and expand current water quality monitoring programs; integrate and coordinate water monitoring activities; prepare and evaluate a Beneficial Uses Survey; prepare and evaluate a Aquatic Invasive Species (AIS) Assessment and Survey; complete a comprehensive study of Subsurface Sewage Treatment Systems (SSTS) on surface waters; conduct public outreach and education activities; develop an implementation plan; build a long term water quality plan; conduct and inventory the watershed's subsurface sewage treatment facilities; conduct a GIS analysis of development potential; soil erosion and sediment control; and land use and provide necessary project administration.

Red River Basin

Projects completed

Buffalo River

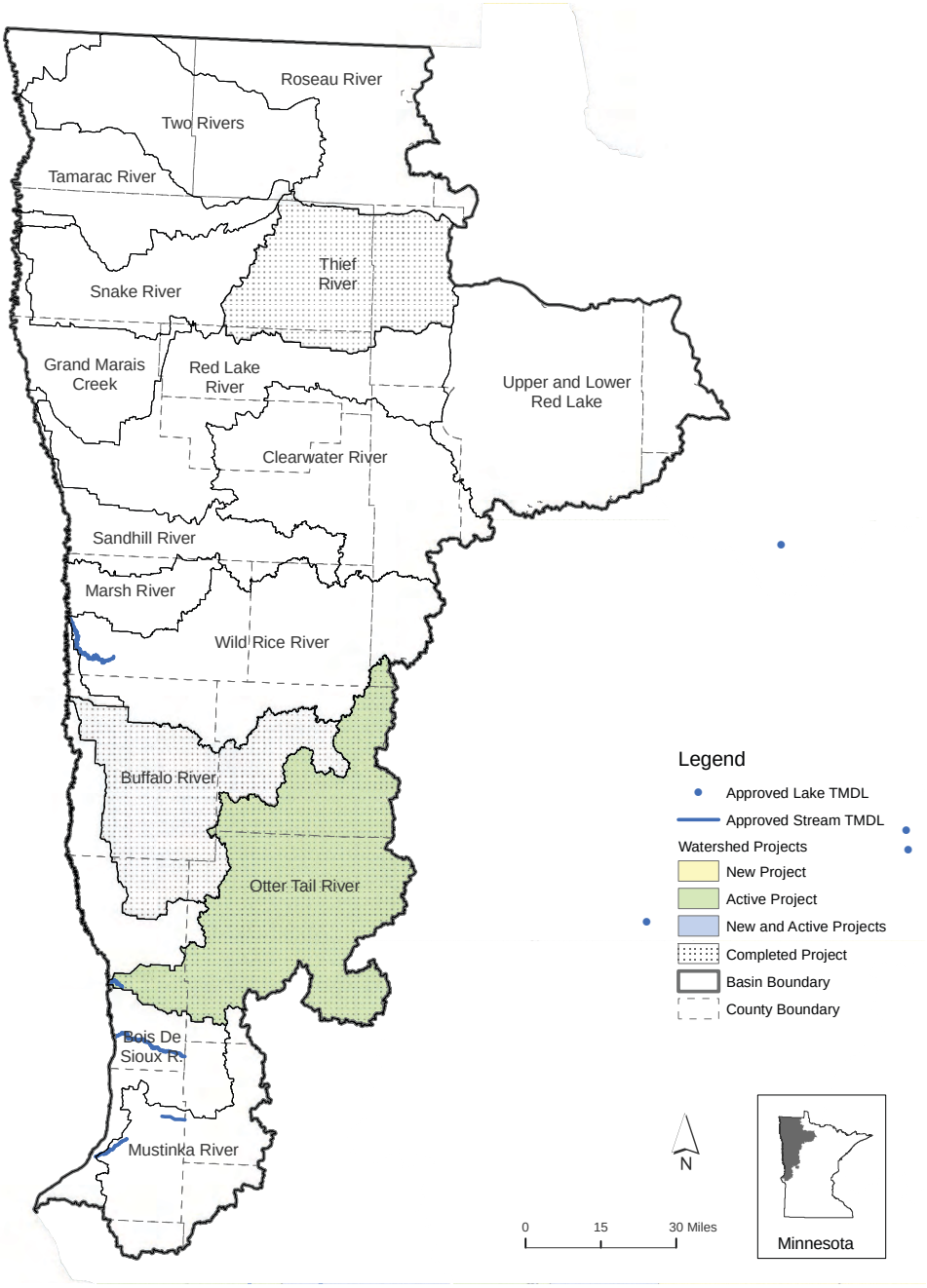
Buffalo River Major Watershed

Otter Tail River

Lower Otter Tail Sediment Reduction

Thief River

Thief River Watershed Sediment Investigation



Buffalo River Major Watershed

The Buffalo River Watershed Pilot Project is one of two pilots in Minnesota (the other is the Cannon River Watershed) that was designed to develop a watershed approach for managing Minnesota's surface waters.

The MPCA collaborated with the Buffalo-Red River Watershed District to guide the watershed's surface water quality management. It is designed to protect areas where conditions are excellent and restore areas where conditions are impaired.

The plan will supplement the Buffalo-Red River Watershed District's 10-year plan of identifying the watershed's water quality management activities. It will also define the state and local resource management organizations' roles within the watershed.

This project is Part 1 of a multi-phased process designed to develop the watershed approach for managing Minnesota's surface waters.

Goals

- Develop a watershed description
- Develop a process to advance watershed-based water quality management and TMDL
- Develop methods to identify water quality pollution sources for selected sub-watersheds

Results that count

- Watershed conditions report created
- Began developing processes and methods to complete watershed-wide TMDLs in cooperation with MPCA
- Completed Part 2 scope and budget

Financial information

Funding type: CWLA

Grant amount: $87,910

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Lower Otter Tail Sediment Reduction

Fifteen miles of water control structures and 138 side inlet structures were installed in 15 miles of county ditches. Installation of these structures will provide 1,758 tons of soil savings per year and 440 tons of sediment reduction per year.

Five and a quarter miles of field windbreaks and 1,000 feet of streambank stabilization measures were installed. The windbreaks will provide 2,540 tons of soil savings and 30 tons of sediment reduction annually. The streambank stabilization projects will provide 465 tons of soil savings and 465 tons of sediment reduction annually.

Lower Otter Tail Sediment Reduction

Goals

- Install 15 miles of water control structures and 75 side inlets in county ditches that discharge to the Lower Otter Tail River.
- Install 5 miles of windbreaks in erosion prone areas in the project area.
- Install 1,000 feet of stream bank stabilization measures in the project area.

Results that count

- Installed 15 miles of water control structures and 138 side inlet structures.
- Installed 5.25 miles of windbreaks in erosion prone areas in the project area.
- Installed 1,000 feet of stream bank stabilization measures in the project area.

Financial information

Funding type: Section 319

Grant amount: $100,000

Contact information

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Thief River Watershed Sediment Investigation

The Thief River flows to the Red Lake River, a drinking water source for the cities of Thief River and East Grand Forks.

Regular condition monitoring results indicated that there were water quality problems within the Thief River watershed. The watershed's sediment investigation offered an opportunity to intensively monitor and model the watershed to gain a better understanding of water quality conditions and problem sources.

The project used sampling, continuous water quality monitoring, continuous stage monitoring and water quality modeling to accomplish its goals. Project partners were a large part of its success: the Marshall County Water Planner helped with water quality sampling and the US Fish and Wildlife Service partnered with the US Geological Survey to study water quality within Agassiz National Wildlife Refuge.

This watershed study involved investigative water quality monitoring of field parameters, sediment and nutrients at more than 11 sites to verify the impairments and find new ones. Stage and flow were continuously monitored at each monitoring site. A Soil and Water Assessment Tool (SWAT) model was developed to estimate pollutant loads and evaluate pollutant-reduction strategies. Data was submitted to the STORET and HYDSTRA databases. Specific and general project ideas for water quality improvement were identified. Sediment budgets were derived from SWAT modeling results.

Another project goal was to create a TMDL work plan. The MPCA has allocated money for the watershed-based TMDL's completion and the watershed assessment project. A comprehensive final report is available on the Red Lake Watershed District website at www.redlakewatershed.org.

Goals

- Characterization of water quality and flow.
- Create a SWAT model for the Thief River Watershed.
- Develop a work plan for a TMDL study.

Results that count

- In addition to the sampling, continuous monitoring and continuous stage monitoring data analyzed for the final report, this data can also be used to answer future water quality/quantity related questions.

- The SWAT model was used to characterize base conditions and estimate the effectiveness of several BMP scenarios.
- Concurrent to this project, the MPCA had selected the Thief River for the development of a watershed-based TMDL. The TMDL work plan was able to be developed as a part of this project and we will be able to transition into the TMDL from the CWP project much sooner than we had expected.

Financial information

Funding type: CWP

Grant amount: $96,500

In-kind: $119,541.58

Contact information

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Red River Basin

Projects active and awarded in 2011

Otter Tail River

Lake Alice Resource Investigation Project — 2009

Sponsor: City of Fergus Falls

Funding: CWP (Grant) $98,500

Purpose: Lake Alice is a 39-acre urban lake located near the center of Fergus Falls with a drainage basin of approximately 230 acres. Presently, a significant stormwater system flow is discharged into the lake from which it is discharged into the Otter Tail River, a tributary to the Red River. The investigation of these resources includes determining in qualitative and quantitative manners, the nutrients and other pollutants (including sediments) being transported into the lake by stormwater flows, the characteristics of the sediment present in the lake bottom and the effects of water quality on wildlife and of wildlife on water quality. The data collected in this phase will provide the information necessary to establish water quality goals, and will provide the basis upon which the success of the implementation measures in the second phase will be measured.

Lower Otter Tail River Sediment Reduction Project — 2009

Sponsor: Wilkin Soil and Water Conservation District

Funding: Section 319 (Grant) $66,750

Purpose: The MPCA has listed a stream reach, Assessment Unit ID (AUID) 09020103-502 in the Lower Otter Tail River, as impaired for exceeding the turbidity standard for aquatic life, 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.

Pearl Lake Diagnostic Study — 2009

Sponsor: Pelican River Watershed District

Funding: CWP (Grant) $47,188

Purpose: Pearl Lake is a relatively small water body on the western edge of the Pelican River Watershed District. It is the District's desire to conduct an exhaustive diagnostic study on Pearl Lake and the surrounding watershed area. Planned investigation and diagnostic activities include, but are not limited to: quantifying water quality conditions by increasing in-lake water chemistry testing, monitoring sub-watershed runoff and loadings, gathering historical data on land use, assessing septic conditions, further assessing shoreline conditions, modeling external and internal nutrient loading, engaging public participation and conducting sediment core analysis of the lake bottom. The desired outcome of this project will be to diagnose Pearl Lake's water quality problems and prescribe BMPs to reduce runoff and runoff impacts.

St. Croix River Basin

Projects completed

Projects involving multiple watersheds

Lake St. Croix TMDL

Lake St. Croix TMDL Coordinator

Lower St. Croix River

Browns Creek Impaired Biota TMDL

Forest Lake (Sub-watershed FI44) Assessment

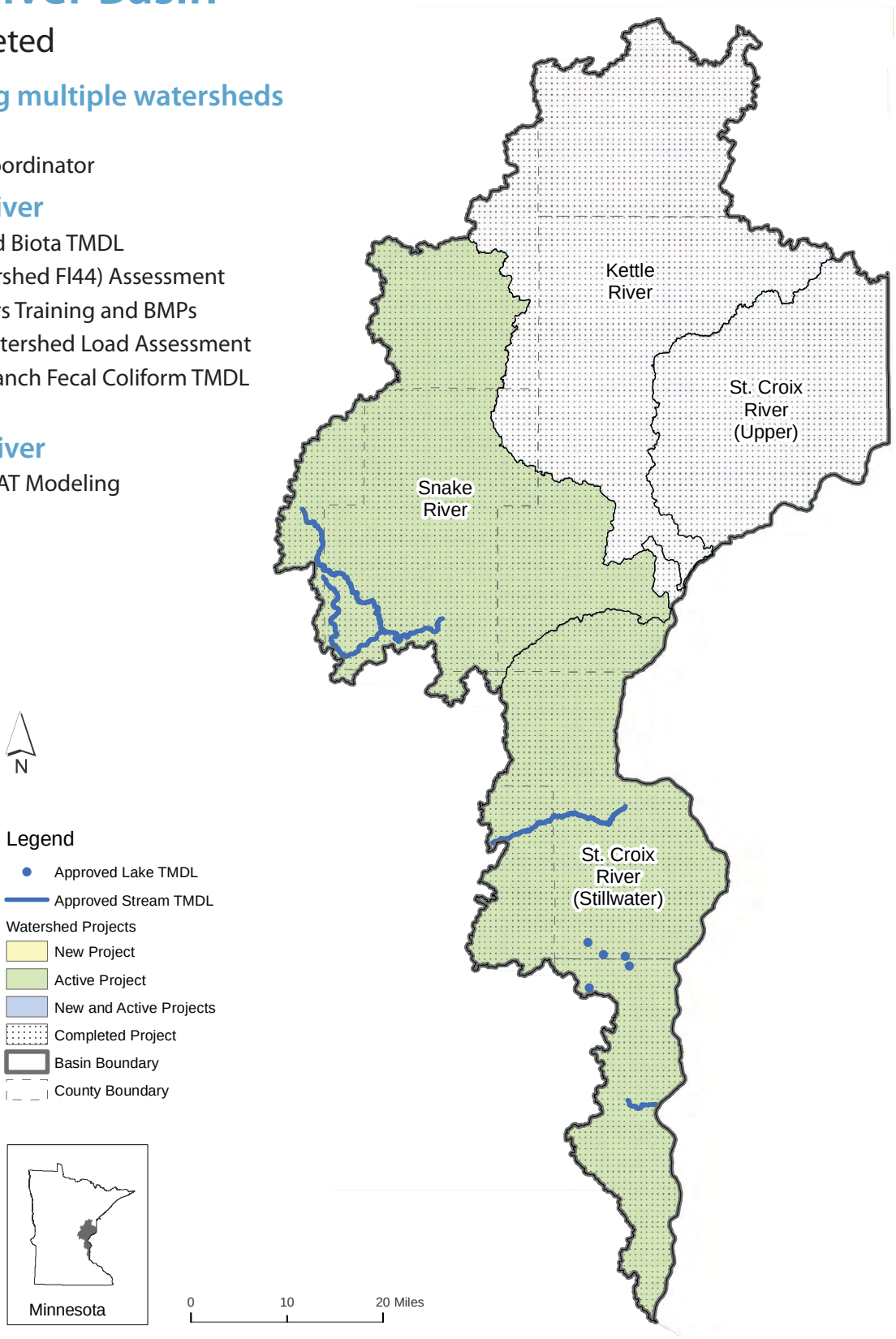
Healthy St. Croix Waters Training and BMPs

Little Comfort Lake Watershed Load Assessment

Sunrise River North Branch Fecal Coliform TMDL Implementation

Upper St. Croix River

Sunrise Watershed SWAT Modeling



Lake St. Croix TMDL

The water resources of the St. Croix River Basin, including Lake St. Croix and the St. Croix National Scenic Riverway, provide scenic beauty, havens for a variety of wildlife, and a wide range of recreational opportunities to the millions of nearby residents of the states of Minnesota and Wisconsin. However, rapid population growth and accompanying land-use changes have adversely affected the water quality and biological diversity of Lake St. Croix and the water resources of the St. Croix River Basin.

In 1993, the MPCA, the Wisconsin Department of Natural Resources, the Minnesota Department of Natural Resources, and the St. Croix National Scenic Riverway (of the National Park Service) officially signed a Memorandum of Agreement establishing the St. Croix Basin Water Resources Planning Team (Basin Team). A commitment was made to draft a joint water quality management plan that outlines how they will work together on river protection efforts.

Since that time, these partners and other state and federal agencies, as well as other interested groups, have worked cooperatively to coordinate planning and management efforts for the protection and improvement of the St. Croix River and the water resources in the St. Croix Basin.

In 2009, Barr Engineering Company was hired by the MPCA to draft a TMDL report, largely drawing on previous completed studies and plans. This was completed in 2010. Since that time this draft has been revised by MPCA staff and is projected to be finalized for public notice and the USEPA approval in spring of 2011.

Goals

- Compile all relevant data, information and findings from previous studies
- Complete a TMDL report in accordance with state and federal requirements

Results that count

- All relevant data, information and findings from previous studies were compiled and organized
- Draft TMDL was completed

Financial information

Funding type: CWLA

Grant amount: $79,692

Contact information

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Lake St. Croix TMDL Coordinator

Since 1968, and as amended in 1972, the St. Croix River corridor has been protected under the National Wild and Scenic Rivers Act. This thin ribbon of protection provided by the National Park Service north of Stillwater, Minnesota, and by the states of Wisconsin and Minnesota south of Stillwater, has been helpful in protecting and preserving the scenic, recreational, and biological values of the Riverway. However, those agencies with an interest in the St. Croix River realized that to protect the water quality of the St. Croix River required a broader, basin-wide approach to water resource management. To that end, a Memorandum of Understanding was signed in the early 1990's between the MPCA, the National Park Service, the Wisconsin Department of Natural Resources, and the Minnesota Department of Natural Resources that initiated a planning process to better protect the water quality of the St. Croix River Basin. In the ensuing years, other partner agencies with an interest in protecting the St. Croix have joined this planning group (Basin Team).

The Basin Team has been active since 1994. Its member subcommittees, particularly the Nutrient Subcommittee, have been extremely productive in providing guidance and direction to the water quality protection efforts. The Basin Team itself is a model partnership in information sharing and in unifying agency efforts in protecting the St. Croix River Basin.

The MPCA signed a Nutrient Reduction Agreement (Agreement) with the Wisconsin Department of Natural Resources in 2006. The MPCA pledged to work with the Basin Team to reduce nutrient inputs to the St. Croix Basin by 20 percent by 2020. Part of the Agreement calls for the MPCA and the Wisconsin Department of Natural Resources to seek out and provide funding to meet this goal, and support the functioning of the Basin Team. In the late 1990s, it was evident that the workload of the Basin Team required the assistance of a coordinator who could focus his or her energy on the tasks of the Basin Team while its regular members performed the myriad of other duties their jobs involved. This grant supported the work of a Basin Team Coordinator.

Goals

- Coordinate and oversee the Lake St. Croix TMDL meetings as a representative of the Basin Team
- Develop a Stakeholder Strategy Report
- Develop the St. Croix Basin Planning Status Report

Results that count

- Attended all stakeholder meetings held for the TMDL and represented the Basin Team at each one
- Developed and submitted a final Stakeholder Strategy Report to the MPCA
- Drafted and submitted a final 2009 Basin Status Report to the MPCA. Report was reviewed and approved by the MPCA and the Basin Team.

Financial information

Funding type: CWLA

Grant amount: $14,985

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Brown's Creek Impaired Biota TMDL

Brown's Creek is located in the Brown's Creek Watershed District (BCWD) in the St. Croix River basin in eastern Minnesota. Brown's Creek has an approximate 19,000-acre watershed that includes a significant portion of rural and agricultural areas. The watershed includes portions of the City of Stillwater, City of Oak Park Heights, City of Lake Elmo, City of Grant, City of Hugo, May Township, and Stillwater Township.

The project addressed two impairments on the stretch of Brown's Creek from Highway 15 to the St. Croix River — aquatic life impairment due to a lack of a cold water fish assemblage and high turbidity impairment. The TMDL study entailed analysis of existing data, intensive water quality and biological surveys of the creek, completion of the stressor identification process, watershed modeling, and the development of implementation strategies to meet the goals of the TMDLs.

Through the stressor identification process, the primary stressors to the biota in the impaired reach of Brown's Creek were high suspended solids, high temperatures, and high copper concentrations. The TMDL is based on total suspended solids (TSS), which also serves as the surrogate measure for turbidity impairment; and thermal load, which addresses the temperature stressor. Due to uncertainties related to the reliability of the copper monitoring data, copper loading allocations were not developed. The water quality targets for this TMDL are 23 mg/L TSS and 18.3°C (65°F).

The average annual TSS load to the creek will need to be decreased by 74 percent to reach the target TSS concentration. The average thermal load will need to be decreased by six percent. Sediment and thermal load reductions will be achieved through a combination of stormwater management, riparian habitat enhancement, and groundwater management. Stormwater management will consist of a combination of regulatory controls, urban stormwater retrofits, agricultural BMPs, wetland restoration, and education.

Goals

- Identify stressors
- Develop load allocations
- Prepare TMDL report

Results that count

- Stressors identified
- Load allocations developed
- TMDL report prepared and approved

Financial information

Funding type: CWLA

Grant amount: $263,901

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Forest Lake (sub-watershed FL44) Assessment

Forest Lake has an 8,160 acre watershed that, as part of a recent watershed-wide load allocation modeling effort, was broken down into 87 separate sub-watersheds. The modeling effort led to the development of a district-wide Capital Improvement Program (CIP) to address nutrient loading issues. One of the projects included in the CIP includes a cattle exclusion/wetland restoration project in a sub-watershed of Forest Lake, identified as sub-watershed FL44.

The modeled loading from FL44 was estimated to be 539 pounds per year. One of the most concentrated estimated loads to the lake (156 lbs), is from the livestock operation at the northeast end of FL44, which outlets to the lake through a former DNR fish-rearing pond. The wetland at the center of FL44 is rather inaccessible and the ditches through the wetland have not been maintained. The overall proposed project includes the development of a buffer along the wetland edge with exclusion fencing to keep cattle out of the wetland, as well as a feasibility study of the old DNR fish-rearing pond to determine what influence the pond has on the site's loading (the modeling effort was unable to determine the load coming from the pond).

The feasibility study of the pond will confirm the loading from FL44, as well as measure the effect of the pond on phosphorus concentrations as water flows through. If high loads and concentrations are identified upstream of the rearing pond, the wetland may need to be investigated further. Options to be considered in the feasibility study may include alum treatment of pond sediments if internal loading is determined to be an issue; excavation to increase volume and retention time; or removal of high-nutrient soils. In addition, the feasibility and benefit of a rough fish barrier will be studied.

Goals

- Estimate phosphorus and sediment load contribution to Forest Lake from the sub-watershed FL44 wetland.
- Evaluate the potential to reduce phosphorus and sediment load to Forest Lake from the sub-watershed FL44 wetland through alterations to the former fish rearing pond.
- Complete FL44 Assessment and Feasibility Report.

Results that count

- Monitoring of wetland and outlet resulted in determination of load during drought conditions.
- Need and analysis of remedial alternatives was completed and included in final report.
- A final report was completed and presented to the CLFLWD Board of Managers.

Financial information

Funding type: CWP

Grant amount: $14,829.66

In-kind: $7,488 (plus matching cash $7,178.70)

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MPCA Project Manager: Christopher Klucas

Healthy St. Croix Waters, Training and Best Management Practices

The Healthy St. Croix Waters, Training and Best Management Practices project was built on a partnership between Great River Greening, Washington Conservation District (WCD) and Chisago Soil and Water Conservation District to implement BMPs in the Lower St. Croix River Watershed. Goals of the project were:

1) reductions in phosphorus, nitrogen and suspended solids within the Lower St. Croix basin
2) implementation of BMPs with a water quality benefit as demonstration sites
3) technical assistance to landowners related to BMPs
4) promotion of BMPs among citizens of the basin, local government officials and other watersheds interested in the model

Over the course of the project, 19 BMPs were installed (7 on private lands and 12 on public lands) and 4,500 members of the community were engaged through volunteerism (7 events), training (1 event) and outreach (2 events). Total annual pollutant reductions for the 19 projects are estimated at 31 lb. Total Phosphorus (TP), 46 lb. Total Nitrogen (TN) and 55,000 lb.Total Suspended Solids (TSS). Thirteen project sheets, a web-based BMP tour, two posters, a boat launch assessment guide, and other products were produced and made available through an array of venues.

Goals

- Reduction of phosphorus/nutrients within the St. Croix basin.
- Implementation of BMPs with a water quality benefit.
- Technical assistance and training to landowners related to BMPs.
- Promotion of BMPs among citizens of the Basin, local government officials and other watersheds interested in this model

Results that count

- Installed BMPs, as modeled, will result in a cumulative annual reduction in 31 lbs of total phosphorous per year, 46 lbs of total nitrogen per year, and 54,918 lbs of suspended solids per year.
- Nineteen BMP projects were implemented over the course of the grant, 12 on public land and seven on private land; 19 designs and plans for implemented projects were completed; 19 landowners agreed to long-term monitoring and maintenance of project sites.
- Eight events were held involving 469 individuals, including one landowner training event and seven public volunteer events. Three technical assistance projects were completed.
- Two events were held, reaching a total of 4,025 people; 16 project sheets were completed; three presentations were given; seven partner organizations collaborated over the duration of the grant.

Financial information

Funding type: Section 319

Grant amount: $207,500

In-kind: $19,000 (plus $221,880 cash)

Contact information

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Little Comfort Lake Watershed Load Assessment

Little Comfort Lake has a 4,410-acre watershed, starting at the Bone Lake outlet. A recently completed watershed-wide load allocation modeling effort further broke the watershed down into 52 separate sub-watersheds (Wenck 2007).

Past monitoring plus the recently completed load allocation modeling effort has revealed increased phosphorus loading between the outlet of Bone Lake to the inlet of Little Comfort Lake. The load allocation modeling effort led to development of a District-wide Capital Improvement Program (CIP) to address nutrient-loading issues (including those along the Bone Lake to Little Comfort Lake stretch). The District's CIP discusses two potential wetland restoration projects, but would need further study to determine the siting of project(s) in order to address the location of the loading and provide the most "bang for the buck" in phosphorus load reduction.

To determine phosphorus and suspended sediment loads, two continuous flow monitoring sites were set up between Bone Lake and the Comfort Lake inlet (one on July Avenue and one on Manning Avenue) to collect 20 grab samples throughout the year at each of the three sites (including the Little Comfort Lake inlet site). In addition, Bone, Little Comfort, and School lakes were monitored by volunteers as part of the Metropolitan Council's Citizen-Assisted Monitoring Program (CAMP). The lakes were monitored 14 times between mid-April through mid-October, and analyzed at the Metropolitan Council Environmental Services Laboratory for total phosphorus, total Kjeldahl nitrogen, chlorophyll-A and Secchi transparency. There is historic data available for all three stream and lake sites.

Goals

- Estimate the phosphorus and sediment load contribution to Little Comfort Lake from the sub-watersheds between Bone and Little Comfort lakes.
- Pinpoint the area(s) of loading between the Bone Lake outlet and Little Comfort Lake inlet, in order to better site potential projects to achieve the best load reduction to meet the lake's short- and long-term goals.
- Complete Little Comfort Lake Watershed Load Assessment and Feasibility Report

Results that count

- Succeeded in monitoring at three continuous flow monitoring sites between Bone Lake and the Comfort Lake inlet (one on July Avenue, one on Manning Avenue, and one at Little Comfort Lake inlet) to determine phosphorus and suspended sediment loads.
- Need and analysis of remedial alternatives and locations was completed and included in final report.
- A final report was completed and presented to the CLFLWD Board of Managers.

Financial information

Funding type: CWP

Grant amount: $17,085

In-kind: $10,070 (plus $7,511.59 in cash)

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Sunrise River North Branch Fecal Coliform TMDL Implementation

The overall project goal is to reduce fecal coliform loading in the North Branch of the Sunrise River by 52 percent. The three primary sources are: runoff from livestock, Imminent Health Threat Septic Systems (IHT) and pet waste. This Section 319 grant is one of several funding sources being used to achieve the goal.

SWCD staff from Chisago County contacted livestock landowners in both Chisago and Isanti Counties and explained the project. With permission, they visited farms, consulted with landowners to determine necessary modifications in practices (i.e., waste storage facilities, clean water diversions, vegetated filter strips, rotational grazing, livestock exclusions and nutrient management plans), offered available incentives, and monitored progress. To date, only a minimal number of landowners have taken actions to reduce fecal coliform loading.

Through Chisago County's SSTS Pilot Program, both Chisago county and city of North Branch staff have inspected all SSTSs within the North Branch Sunrise River area. When IHT systems were identified, county or city staff worked with homeowners on the process required to bring their systems into compliance with the septic ordinance. The program was expanded into Isanti County, inspecting all SSTS within the shoreland district and upgrading those systems identified as IHT. Pet waste receptacles were installed within city of North Branch parks. Project activities will continue over the next several years.

Goals

- Reduce fecal coliform from livestock.
- Reduce fecal coliform from Imminent Health Threat Septic systems.
- Reduce fecal coliform from pets.

Results that count

- Three landowners have installed BMPs to reduce fecal coliform from their livestock.
- All IHT septic systems found have been upgraded.
- Pet waste receptacles have been installed in North Branch city parks.

Financial information

Funding type: Section 319

Grant amount: $20,019

In-kind: $6,400 (plus $149,730.78 cash)

Contact information

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Sunrise Watershed SWAT Modeling

The Sunrise River watershed, largely in Chisago County, contains a number of water bodies listed as impaired by the MPCA. The listing includes at least four river reaches with impairments related to turbidity, dissolved oxygen, fish diversity, invertebrate diversity, pH, and fecal coliform. At least 10 lakes are listed as impaired, principally for nutrients and consequent eutrophication. In addition, the Sunrise River watershed was identified as having the largest yields of phosphorus and sediment of 16 major tributary watersheds in the St. Croix Basin. Even though the St. Croix River has been federally recognized for its scenic beauty and recreational value, the water quality of the river has been impacted by loads of sediment and nutrients from its tributaries.

The project constructed a computer watershed model to the Sunrise River watershed. The model was calibrated to the data collected by the US Geological Survey for water year 1999 and validated against new data to be collected thereafter as available from Chisago County and the MPCA. Following calibration and validation, each sub-basin (30 to 50 within the Sunrise watershed) was assessed for yield of sediment and phosphorus. Loads and yields were also assessed for selected control points in the watershed corresponding to currently listed impaired stream reaches.

Goals

- Assess and compile spatio-temporal data sets for the Sunrise River watershed.
- Construct and calibrate a SWAT computer model of the watershed.
- Calculate sub-basin-wide yields of sediment and phosphorus.

Results that count

- Assessed and compiled data sets. Improved interpretation understandings of the transport of sediment and nutrients in the watershed.
- Constructed and calibrated a SWAT model. The model incorporates the understanding gleaned from the data sets.
- Calculated subbasin yields of sediment and phosphorus delivery from uplands to receiving waters.

Financial information

Funding type: CWLA

Grant amount: $86,545

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St. Croix River Basin

Projects active and awarded in 2011

Snake River

Groundhouse Fecal Coliform and Biota (Sediment) Implementation Project — 2010

Sponsor: Kanabec County SWCD

Funding: Section 319 (Grant) $109,750

Purpose: The focus of the project will be to reduce the sediment and FC loading to impaired reaches of the Groundhouse River watershed through the implementation of BMPs. The TMDL study indicated that crop production and streambank erosion contribute 86 percent of the sediment load, with an additional 10 percent originating from pastures. The majority of the FC comes from livestock.

The purpose of the project is twofold. First, Kanabec and Mille Lacs County SWCDs along with their partners will work directly with landowners to increase awareness, identify areas of concern and initiate conservation planning to address these concerns. Second, BMPs will be implemented using cost-share money made available through the project. Anticipated practices include: livestock exclusion, filter strips, stream bank stabilization, sediment basins, manure management, feedlot runoff control, and other practices where appropriate. Priority will be given to projects that have the greatest potential impact on reducing sediment and FC loading.

Project outcomes include:

- Increased water quality awareness (through public outreach and education) for 80 percent of the landowners living in the watershed
- Identify and map areas of concern in the watershed
- Contact landowners individually and develop individualized information packets that include aerial photographs of property, BMP information, and information about assistance programs.
- Install 16 BMP practices that target sediment and FC loading.
- Reduce sediment loading by 210 tons/ year and begin working to achieve the FC standard of 200 org./100ml or E. Coli standard of 160 org./100ml at the monitoring stations in the watershed.
- See an overall improvement in the water quality and IBI.

Sunrise River North Branch TMDL Implementation Plan — 2010

Sponsor: Chisago County

Funding: Section 319 (Grant) $190,000

Purpose: Chisago County has an approved TMDL study and implementation plan for the North Branch of the Sunrise River which is impaired due to excessive levels of fecal coliform bacteria. The county received Section 319 and CWLA grants to address this problem and are in the first full year of implementation. There continues to be more work to achieve the water quality goals.

Funds are needed to continue working with livestock owners to provide 75 percent cost share to implement BMPs.

Outcomes: Livestock management – a number of BMPs will be installed to reduce FC loading from animal agriculture, such as installation of waste storage facilities, clean water diversions, vegetative filter strips, moved fencing, livestock exclusion, rotational grazing, manure application setbacks, and nutrient management plans.

Snake River Enhancement Project Continuation — 2008

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.

Lower St. Croix River

Sand and Long Lake Diagnostic Studies — 2009

Sponsor: Carnelian-Marine-St. Croix Watershed District

Funding: CWP (Grant) $39,000

Purpose: Evaluate existing conditions of Sand and Long Lakes to determine pollutant reductions needed to meet established water quality goals; analyze available data collected as part of a multi-lake TMDL that originally included Sand and Long Lakes; set numeric goals for lake water quality; develop watershed and in-lake models to determine the effect of existing and future total phosphorus loads on the lakes; develop implementation strategies; and complete the overall Diagnostic Study and Implementation Plan for each lake.

Square Lake Implementation Plan Refinement — 2009

Sponsor: Carnelian-Marine-St. Croix Watershed District

Funding: CWP (Grant) $58,000

Purpose: Square Lake, within the St. Croix River basin in northern Washington County, is of regional significance due to its very high water quality and unique recreational opportunities including trout fishing and scuba diving. This proposed project will gather new data on transparency, aquatic macrophytes, plankton and fisheries data to identify trends and determine relationships between biologic fisheries and water quality; complete groundwater monitoring and assessment to determine total P sources within the contributing groundwatershed; gather additional relevant information to identify changes in the lake from 2002 to present; complete an aquatic plant survey and develop an aquatic plant management plan; and develop site-specific and action-specific activities to protect the water quality in Square Lake.

Upper Mississippi River Basin

Projects completed

Projects involving multiple watersheds

Upper Mississippi River Source Water Protection

Long Prairie River

Lake Winona Phase 3

Mississippi River — Brainerd

Swan River Watershed Management Plan Implementation

Mississippi River — St. Cloud

Elk River Watershed Priority Lakes 2

North Fork Crow River

Crow River North Fork Dissolved Oxygen, Turbidity and Fecal Coliform Phases 2 and 3

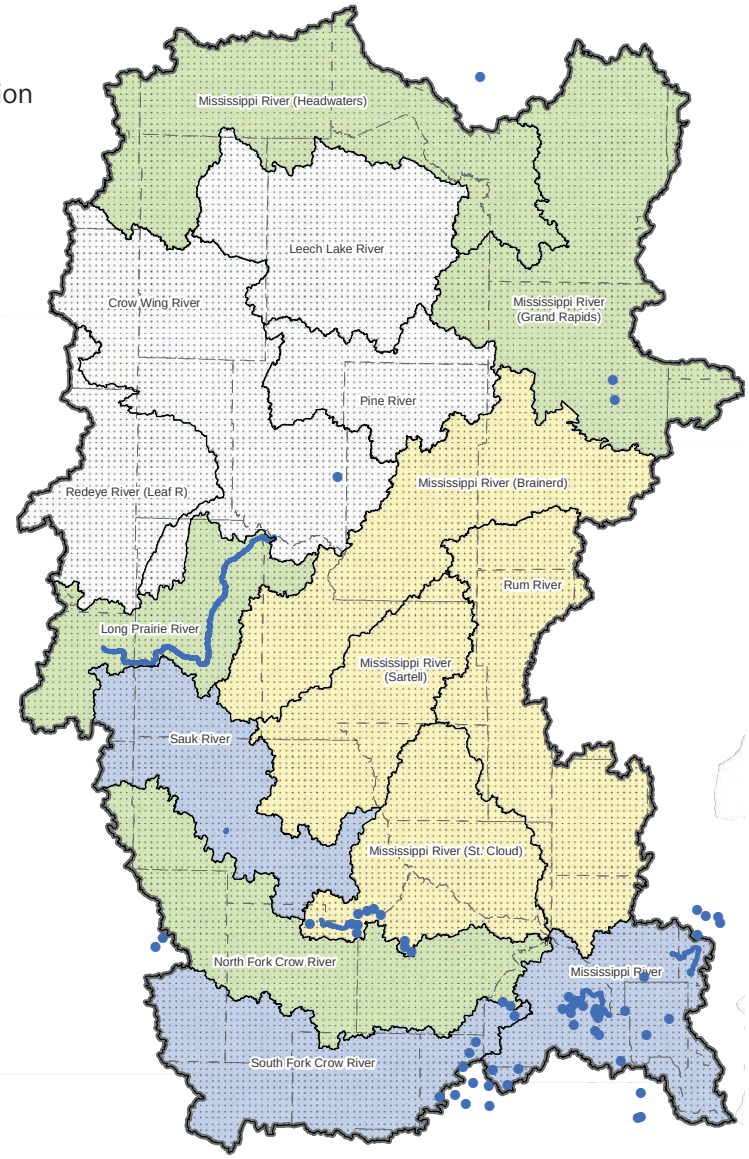
Sauk River

Getchell, Stony, Unnamed Creeks Turbidity TMDL

Pearl Lake/Mill Creek/Lower Sauk River TMDL

Stearns County Manure Basin Abandonment

Targeted Implementation/Compliance Activity within Impaired and Ecologically Sensitive Areas



Upper Mississippi River Source Water Protection

The Mississippi River is the sole source of drinking water for St. Cloud and Minneapolis, and the primary source for St. Paul. Through the Upper Mississippi River Source Water Protection Project (UMRSWPP), water utilities for the three cities have worked jointly to prepare and start implementing their Source Water Protection Plans ("Plans"). Working with grant funds and support from the MPCA, the water suppliers were joined in this project by the Minnesota Department of Health, the Minnesota Rural Water Association, and the Metropolitan Council. Other participants include the St. Croix Water Research Station, the US Geological Survey, the Minnesota Geological Survey, and local units of government in the project area.

Each Plan includes 1) a delineated Source Water Protection (SWP) Area, 2) a potential contaminant source inventory within this area, and 3) strategies and objectives in response to these potential contaminant sources. The combined SWP Areas are approximately 7,700 square miles. Following the submission of the Plans to the state of Minnesota for review, the Minnesota Department of Health endorsed each of the Plans. The Plans, and related project information and links, are available on the project website at www.umrswpp.com.

Major products of the UMRSWPP are:

- Time of travel estimates for several Mississippi River tributaries in the project area
- Mississippi River main stem time of travel charts for low, medium, and high flow conditions
- Identification of sources of sediment within the watershed of the South Fork of the Crow River, which empties into the Mississippi River upstream of the St. Paul and Minneapolis intakes
- Education and outreach activities
- Development of contaminant and geographic priorities
- Establishment of collaborative relationships with local units of government within the SWP Areas

During the 10-year Plan term, the water suppliers will continue their Plan implementation activities.

Goals

- Develop a means of protecting the Mississippi River intakes of St. Cloud, St. Paul and Minneapolis by identifying 1) the areas of concern that drain to the intakes, and 2) contaminant threats within this area
- Establish working relationships with local units of government with the "Source Water Protection Areas" to provide the basis for addressing the identified contaminant threats
- Create and participate in education/outreach activities to 1) deliver source water protection information to various audiences, and 2) integrate source water protection into water and land management at the federal, state and local levels in Minnesota

Results that count

- Source Water Protection Plans were developed by St. Cloud, St. Paul and Minneapolis and were endorsed by the Minnesota Department of Health on behalf of the state of Minnesota.
- The following participated in the UMRSWPP: Central Minnesota Water Education Alliance, Coon Creek Watershed District, Crow River Organization of Water, Elk River Watershed Association, Rice Creek Watershed District, Upper and Lower Rum River Water Management organizations, Sauk River Watershed District, Stearns Soil and Water Conservation District, and Vadnais Lake Area Water Management Organization.
- The UMRSWPP undertook many education/outreach activities.

Financial information

Funding type: CWP

Grant amount: $425,000

In-kind: $454,758.59 (plus $182,802.75 cash)

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Lake Winona Phase 3

A draft nutrient TMDL was prepared for Lake Winona during the project. Project steps included water quality modeling of nutrients for lakes Winona, Agnes and Henry using the model Bathtub to support development of a nutrient TMDL. The model WinSLAMM was used to model urban stormwater nutrient loads to Lake Winona. Point source loading data, primarily for the Alexandria Area Sanitary District (which owns a domestic wastewater treatment plant that discharges to Lake Winona) was obtained and used as input to the Bathtub model. Internal cycling of nutrients, primarily from lake sediments, was estimated from sediment testing completed earlier in the project and Bathtub model results. A series of phosphorus load reduction scenarios was analyzed with Bathtub to develop alternatives for reducing phosphorus loading of the lake and initial TMDL allocations. Results of the analysis were used to prepare a draft Nutrient TMDL Report for Lake Winona.

Goals

- Complete water quality modeling of Winona, Agnes and Henry lakes
- Complete analysis of a range of nutrient reduction scenarios
- Prepare a draft TMDL report

Results that count

- The phosphorus load of Lake Winona was five times greater than the lake's assimilative capacity.
- Large reductions in phosphorus loadings would be needed for restoration of Lake Winona.
- Chlorophyll and Secchi depth were determined to be important factors to include.

Financial information

Funding type: Section 319

Grant amount: $48,116

Contact information

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Swan River Watershed Management Plan Implementation

The Swan River Watershed was placed on the MPCA's Impaired Waters list for fecal coliform impairments in 1996. In 2001, a diagnostic study was begun by the MPCA's Brainerd office to determine the source/sources of the pollutants. At the same time, a number of BMPs were implemented in the watershed with the assistance of the Morrison and Todd SWCDs; these probably impacted the status of the impaired classification. A reduction in animal waste on multiple sites may have led to the conclusions in the diagnostic phase, finding no impairments existing. As part of the proposal for delisting, a long-term management and implementation plan was completed to further improve the water quality and to address concerns identified in the diagnostic phase.

The main purpose of this grant was to continue to reduce the nutrient and bacteria levels within the watershed to keep the Swan River off the impaired waters list.

Goals

- Provide information and education to targeted landowner partners.
- Develop and implement nutrient management plans.
- Enroll lands in conservation programs and implement filter/buffer strips.

Results that count

- We held five nitrate clinics, eight radio programs and submitted three news articles.
- Four nutrient management plans were written and four implemented.
- Four sediment basins, one terrace system, one sediment pond, two agricultural waste systems, one gully stabilization system and four nutrient management plans.

Financial information

Funding type: Section 319

Grant amount: $70,000

In-kind: $84,985.75 (plus $75,036.87 cash)

Contact information

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Elk River Watershed Priority Lakes 2

Surface waters within the watershed have documented water quality problems. Our focus was the installation of BMPs and promotion of these practices to achieve long-term adoption. Thirty-two BMP test plots were established on agricultural fields. These plots demonstrated that reduced nutrient application rates protect water quality and are economically feasible. These plots achieved a 6,568-pound phosphorus reduction and a 7,810-pound nitrogen reduction. In additional to improving water quality, these reductions saved farmers money, which ensures adoption of the BMP in future years. We restored and created 2 wetlands. Both wetland projects are located in riparian areas that were formerly pastured. Wetland projects will reduce stream peak flows and, subsequently, soil erosion, sedimentation and nutrient loads. We worked with agricultural producers to install buffer strips along pastured ditches. The buffer strips totaled 95.5 acres and required farmers to install additional fences in most cases.

Due to the fact that most lakes in the watershed are located in urban settings, most lakeshores are 80 to 90 percent developed . Therefore, most natural vegetation has been removed from shorelines. In these areas, we demonstrated projects that reduce runoff using shoreland buffers and stormwater BMPs. BMP sites were promoted and selected to maximize coverage and accessibility to the public. Interpretive signs were installed at these sites to inform the public of the projects. Twelve shoreland buffers were installed as a result of this project. In addition, the project motivated the Briggs Lake Chain Association to create its own shoreland buffer program; it currently promotes and provides financial assistance to property owners on the chain of lakes. Furthermore, 6 stormwater BMP sites were installed and provide long-term sites for property owners to view and learn about stormwater BMPs, including rain gardens, filter strips, vegetated swales and infiltration trenches.

Goals

- Install agricultural nutrient management BMP demonstration plots
- Agricultural BMPs: install riparian pasture buffer strips, filter strips and wetland restoration or creation projects

- Residential and urban BMPs: install shoreland re-vegetation projects and stormwater runoff projects

Results that count

- 32 nutrient management BMP demonstration plots were established for a total of 282.9 acres
- Five riparian buffers (95.5 acres) were established on pasture land; two filter strips (23.7 acres) were established; two (13.9 acres) wetland restoration, enhancement and creation projects were completed
- 12 shoreland re-vegetation projects were completed, six stormwater BMPs were installed

Financial information

Funding type: Section 319

Grant amount: $182,034.65

In-kind: $175,417.29 (plus $13,965 cash)

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Crow River North Fork Dissolved Oxygen, Turbidity, and Fecal Coliform Phases 2 and 3

The Crow River Organization of Water (CROW) was awarded a grant to collect field data, work with a consultant that provided Technical Memorandums of preliminary findings, modeling methods and results that were reviewed at public meetings to inform stakeholders about the TMDL process. CROW worked with the MPCA to provide a true measure of how the project collected and assessed water quality for the North Fork Crow River Watershed TMDL Project.

Prairie Country Resource Conservation and Development (RC&D) Council served as fiscal agent and Wenck served as consultant for this project. CROW's Technical Committee is comprised of 10 local counties, SWCDs, NRCSs, and water planners in the watershed, watershed districts, cities and state agencies. Technical assistance and recommendations from these entities and citizen/stakeholder input ensured time was spent efficiently with no unnecessary duplication of effort. Technical Committee members regularly attend meetings to track, evaluate and measure the effectiveness of the project.

A comprehensive monitoring network was established to collect information on water dynamics including precipitation, chemical parameters, stream flows and physical parameters. A technician was hired to assist with monitoring, data entry and education outreach. A streambank erosion assessment was conducted by canoeing stretches of the Crow River, filling out assessment worksheets, and documenting erosion with digital pictures and GPS locations. Data was used to set up models and load allocations for reaches within the project area. Wenck provided technical memoranda for bacteria, turbidity and DO. In addition, Wenck developed allocations for fecal coliform , DO load allocations and calibrated models for Phase III of the TMDL project.

CROW conducted four public meetings for the Technical Committee and interested citizens. Regular updates on the CROW website, articles in an electronic newsletter and staff attendance at local stakeholder meetings to discuss water quality issues and the TMDL process informed stakeholders and made the project an overall success.

Goals

- Collect field data in order to characterize the condition of the resources and watershed
- Engage the public in the participation and outreach for the TMDL project
- Provide project coordination, reporting and financial tracking and overall management

Results that count

- Compiled data to develop modeling and load allocation for Phase II of the TMDL project
- Organized four public stakeholder/technical committee meetings to review results, provide directions and modeling approach of the analyses
- Provided overall management and coordination between partners to achieve project activities and deliverables

Financial information

Funding type: Section 319

Grant amount: $230,000.12

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Getchell, Stony, Unnamed Creeks Turbidity TMDL

This project focused on the creation of a turbidity TMDL for Getchell, Stony and Unnamed Creeks — three stream tributaries in the Sauk River Watershed River in Central Minnesota. The Sauk River Watershed lies in the heart of the north central hardwood forest ecoregion and discharges to the Upper Mississippi River. Land use in the watershed is primarily agricultural, with the majority of land in corn/soybean rotation and pasture land. Unnamed Creek was included on Minnesota's 2008 303(d) TMDL list for excess turbidity. Neither Stony nor Getchell Creeks are currently on this list, but were included for turbidity assessment due to the significant proportion of loading into the Sauk River from these two watersheds.

Turbidity is a measure of the cloudiness or haziness of water caused by suspended and dissolved substances in the water column. Turbidity can be caused by increased suspended soil or sediment particles, phytoplankton growth, and dissolved substances. Since turbidity is a measure of light scatter and adsorption, loads need to be developed for a surrogate parameter. Total suspended solids (TSS) is a measurement of the amount of sediment and organic matter suspended in water, and is often used as a turbidity surrogate to define allocations and capacities in terms of daily mass loads.

The TMDL was established for Getchell, Stony and Unnamed Creeks using the load duration curve approach (Cleland 2002). It was estimated that, to meet current state standards, a 35 – 95 percent reduction in TSS is required for Unnamed and Stony creeks during higher flows and 7 – 66 percent reduction during lower flows. The only load reduction required for Getchell Creek is during the high flow category, where a 26 percent reduction is needed to comply with state standards.

Goals

- Determine the load allocation sources.
- Determine the loading reductions.
- USEPA approval of TMDL.

Results that count

- Completed load allocations
- Loading reductions were identified.
- TMDL study was developed and submitted to USEPA for approval.

Financial information

Funding type: CWLA

Grant amount: $80,000

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Pearl Lake/Mill Creek/ Lower Sauk River TMDL

Pearl Lake (DNR ID 73-0037) is currently listed on the MPCA's 2010 303(d) Impaired Waters List due to excessive nutrients (phosphorus). Pearl Lake is located in Stearns County, Minnesota, and is within the North Central Hardwood Forest (NCHF) ecoregion. Pearl Lake is a relatively shallow, eutrophic lake approximately 750 acres in size, with a maximum depth of 18.2 feet and a mean depth of 8.2 feet.

To meet the overall load capacity of the lake (i.e., achieve an average summer total phosphorus concentration of less than 40 µg/L), a 25 percent decrease in phosphorus load (based on 2008 existing conditions) will be required. This will be achieved through a combination of external and internal phosphorus load reductions: (1) a 31 percent reduction of internal phosphorus load in Pearl Lake through management of curlyleaf pondweed and sediment phosphorus loading, and (2) loading from the tributary watershed will be reduced by 20 percent through BMPs.

From its headwaters to the Sauk River, Mill Creek is impaired and does not meet Minnesota water quality standards for pathogen indicator bacteria *Escherichia coli* (*E. coli*). This reach was placed on the 303(d) list because monitoring data indicate that *E. coli* levels typically exceed the monthly geometric mean standard of 126 *E. coli* organisms per 100 mL. This TMDL study uses a load duration curve approach to determine the bacteria loading capacity of Mill Creek under a variety of flow regimes. The duration curve is used to determine the general allocations necessary to meet water quality standards.

Overall *E. coli* load reductions of between 59 and 93 percent are required in order to meet water quality standards, depending on the flow conditions. The primary implementation strategies recommended to address the *E. coli* loading from agricultural sources are agricultural BMPs such as riparian pasture management, manure management, and feedlot runoff protection.

Goals

- Determine the load allocation sources
- Determine the loading reductions
- Prepare TMDL for USEPA approval

Results that count

- Completed load allocations
- Basic implementation plan developed
- USEPA approval of TMDL study

Financial information

Funding type: CWLA

Grant amount: $80,410

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Stearns County Manure Basin Abandonment

This project investigated possible risks posed by manure basins to water resources upon their closure . Eight abandoned basins in Stearns County, Minnesota were utilized for the project — they are also part of ongoing research by the Stearns County SWCD to evaluate the effectiveness of two alternative manure basin closure techniques. There is demand for practical, low-cost closure methods that can minimize comparative risk to soil and groundwater resources. Soil and groundwater sampling at each of the sites aided in identifying the level of risk posed by the abandoned basins. Background, in-basin, and downgradient samples were collected to analyze contaminant levels

The comparative risk posed by abandoned manure storage basins based on soil and groundwater investigation appears to be minimal. Background contaminant concentrations in soil and groundwater were at times higher than in basin concentrations, indicating other sources of contamination near the sites. The comparative risk of nitrogen was generally located in the upper portions of the soil profile (above 2.44 m), where plant roots may reach to remediate the concern. Statistical analysis comparing contaminant concentrations generally revealed a lack of difference between any of the sampling locations. The few differences detected are cations which will likely be adsorbed to soils with moderate clay content (found at nearly all sites).

Goals

- Quantify contaminant concentrations in soil and groundwater at eight abandoned manure storage basins.
- Quantify the comparative risk at each site.
- Determine the overall comparative risk.

Results that count

- Soil and groundwater sampling at each of the sites aided in identifying the level of risk posed by the abandoned basins. Soil profiles generally indicated contaminants were present at elevated levels.
- The comparative risk posed by abandoned manure storage basins based on soil and groundwater investigation appears to be limited. Statistical analysis comparing contaminant concentrations from three locations of interest at each site from different depths generally revealed a lack of difference between any of the sampling locations.
- Soil contaminants (NH3-N, NO3-N, total P, Cl-, and TOC) were found at elevated concentrations, relative to all other sampling locations. Although the concentrations do not necessarily exceed a standard contaminant concentration level, their relatively elevated concentrations deep within the soil profile may indicate potential contaminant leaching concerns. Additionally, groundwater sample data that exceeds primary or secondary drinking water standards are highlighted. The alternative closure techniques discussed in this study may be a viable solution to the closure of abandoned manure storage basins. A closure technique with little disturbance to the contaminated soil should be utilized.

Financial information

Funding type: Section 319

Grant amount: $57,150

In-kind: $42,769.94 (plus $41,629.87 cash)

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Targeted Implementation/Compliance Activity within Impaired and Ecologically Sensitive Areas

Stearns County has approximately 2,600 livestock operations with 2,000 of these operations having 300 animal units or less. Proper manure management and storage within and near ecologically sensitive and impaired areas will enhance or sustain surface and groundwater quality.

The objective to accelerate implementation of nonpoint BMPs to reduce identified pollutants resulted in fifteen feedlot animal waste control facilities, one manure storage facility abandonment, one wetland restoration, and one lakescaping project. These projects provided a 973 lb/yr reduction in phosphorous, and a 116 ton/ac/yr reduction in soil loss.

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

Spring and fall Certified Crop Advisor (CCA) update workshops were held in 2008, with 130 agriculture professionals attending. The workshops provided the latest agronomic information, including updates on conservation practices that can impact water quality.

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; therefore, measuring improvements in water quality is more difficult to quantify, unless more than 10 years of data is available to determine a trend.

Goals

- Reduce surface and groundwater pollution from livestock feedlots and related nonpoint activities
- Investigate unpermitted manure storage basins for pollution potential, and target failing systems for repair or closure

- Increase technical assistance, provide education of BMPs to agriculture professionals, and water quality monitoring

Results that count

- The BMPs implemented provided a 973 lb/yr reduction in phosphorous, and a 116 ton/ac/yr reduction in soil loss.
- Twenty-five sites had their unpermitted manure storage basins investigated, with 11 of them failing to meet MPCA specifications; these producers will be targeted in future with technical and financial assistance to address their pollution problems.
- One hundred thirty agriculture professionals attended two CCA update workshops. Nine additional manure management plans were developed by CCA. The SRWD has summarized water quality monitoring data. A TMDL study for the Sauk River Chain of Lakes is nearing completion.

Financial information

Funding type: Section 319

Grant amount: $300,000

In-kind: $204,775 (plus $1,380,903.10 cash)

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Upper Mississippi River Basin

Projects active and awarded in 2011

Multiple watersheds in the basin

Improving Rural Water Quality in the Crow River Basin Project — 2008

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.

Long Prairie River

Long Prairie River Dissolved Oxygen TMDL Implementation Project — 2007

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 certain 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 Nonpoint Implementation Project — 2009

Sponsor: Todd County Soil and Water Conservation District

Funding: Section 319 (Grant) $300,000

Purpose: The primary goal for the nonpoint implementation project is to continue and expand the Long Prairie River TMDL Nonpoint Implementation Plan, 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) resulting in the reduction of biochemical oxygen demand (BOD) from all sources during low flow conditions. In addition, improvement of the dissolved oxygen 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.

Mississippi River – Brainerd

Serpent Lakeshed Protection Investigation Study — 2011

Sponsor: Crow Wing County

Funding: CWP (Grant) $42,744

Purpose: Serpent Lake is located between the City of Crosby and Deerwood, in Crow Wing County and covers 1,103 acres. This project will monitor major inflows and outflows of Serpent Lake; monitor Serpent, Unnamed Cranberry, Unnamed/Peterson, and Cascade Lakes; gather additional physical and morphological data about the lakes in the lakeshed; determine phosphorus and nutrient loads associated with the inflows and outflows; using BATHTUB modeling, determine the transport of nutrients, water quality conditions, and responses to nutrient loads; coordinate and host community stakeholders meetings and create a report that identifies and prioritizes areas of concern along with corresponding corrective actions to be implemented within the lakeshed.

Mississippi River – Grand Rapids

Demonstrating Shoreline Buffers in Big Sandy Lakes Watershed — 2009

Sponsor: Aitkin County SWCD/Big Sandy Lakes Management 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 tools to implement successful shoreline buffers on their property, reducing erosion, and managing runoff.

Mississippi River – Headwaters

Deer and Pokegama Lakes: A Diagnostic Study — 2009

Sponsor: Itasca County

Funding: CWP (Grant) $249,986

Purpose: Pokegama Lake was chosen for the proposed study to represent lakes with large hydraulic connections to surface waters (the Mississippi in this case), whereas Deer Lake has a small watershed relative to the lake area and is likely groundwater dominated. This project will oversee the year-round collection and analysis of water samples from Pokegama and Deer lakes; determine the current nutrient and suspended sediment concentrations; define the sources of nutrients and sediments; assess the distribution of sources and losses across watersheds; and develop an implementation plan to address possible impairments to the two lakes.

Mississippi River – St. Cloud

Kingston Wetland Feasibility Study and Restoration — 2011

Sponsor: Clearwater River Watershed District

Funding: Section 319 (Grant) $404,300

Purpose: The Kingston Wetland Complex is a riparian wetland of the Clearwater River Chain of Lakes. The MPCA found that the Clearwater River between Clear Lake and Lake Betsy is impaired and does not meet Minnesota water quality standards for dissolved oxygen (DO). This reach was placed on the 303(d) list in 2004 because monitoring data have revealed that DO concentrations sometimes fall below the state standard of 5 milligrams per liter, which can impair aquatic habitat. The TMDL study completed for this reach (January 2009) showed that the sediment oxygen demand (SOD) and altered wetland hydrology in the Kingston Wetland were contributing to the DO impairment. The study further showed that a reduction in the Kingston Wetland SOD, and possibly a change in hydrology would be necessary to meet the state standard.

The project will be considered successful if the following specific targeted outcomes are achieved:

- Sixty percent reduction in wetland SOD.
- Annual nutrient loads to the lakes downstream are reduced by 20 percent. Wetland and riverine habitat is restored to support a wider range of wildlife.
- Recreational opportunities in the Clearwater River are enhanced by the restoration, providing a corridor to connect the upper agricultural watershed with the lower recreational lakes watershed. Kiosks are installed to mark the project and educate users about the impacts of ditching on water quality and habitat, and specifically the evolution of the Kingston Wetland through the various stages and its role in protecting downstream water quality.

Local partners are engaged to cooperate in the project, measured by attendance at project meetings and educational curriculum developed in coordination with local school district for use at local schools.

Mississippi River – Sartell

Pelican Lake of St. Anna Diagnostic Study — 2011

Sponsor: Stearns County Environmental Services

Funding: CWP (Grant) $39,100

Purpose: Pelican Lake is located approximately five miles north of Avon, Minnesota, drains to the Two River Lake watershed and eventually to the Mississippi River near Bowlus. This project will conduct lake and stream water quality monitoring; data analysis; watershed assessment; information and education activities; determine nonpoint source pollution areas in the Pelican Lake watershed; prioritize possible implementation projects and develop an implementation plan.

Mississippi River – Twin Cities

Burandt Lake Excess Nutrient Implementation Plan — 2009

Sponsor: Carver County Land and Water

Funding: Section 319 (Grant) $82,500

Purpose: Burandt Lake was listed for excess nutrients in 2004 and the final TMDL and implementation plan were recently approved. Identified in each of those was the need to limit both internal and external sources of phosphorus entering the lake. This is a unique project in that it can meet state standards relatively quickly if funds are granted. The implementation plan identified the need for urban stormwater management as well as a chemical (possible ALUM) treatment to bring the lake into compliance. At this point the county and city started to implement the plan by addressing the nonpoint run-off sources with the installation of several rain gardens and educating landowners in the area. This project will build on that by gaining resources necessary to install several

more rain gardens and complete chemical (possible ALUM) treatment, while also actively monitoring the lake and tributaries as outlined in the work plan.

Outcomes: Based on the TMDL Implementation Plan and modeling that was used to complete both we feel that by continuing to limit runoff from entering the lake, treating the lake with chemical (possible ALUM) to control the large internal source of phosphorus, and combined with the clean water entering from Lake Waconia, that Burandt Lake could potentially meet state standards by the end of the grant cycle in 2014.

Clear Lake Water Quality Diagnostic Study — 2009

Sponsor: Rice Creek Watershed District

Funding: CWP (Grant) $20,100

Purpose: Clear Lake is located within the City of Forest Lake in Washington County. This project proposes to collect and analyze detailed water quality data that will be used to calibrate watershed and in-lake models. A final report will summarize the methods and present the loading estimates and will also include a Management Action Plan (MAP) that will consist of a list of possible BMPs, along with feasibility and cost/benefit assessment of each BMP. Pollutant removal potential will be estimated for each BMP, and the cost/benefit analysis will be used to prioritize management actions.

Crosby Lake Management Plan — 2009

Sponsor: Capitol Region Watershed District

Funding: CWP (Grant) $50,000

Purpose: Situated in the floodplain of the Mississippi River in Saint Paul, Crosby Lake is divided into two separate waterbodies by a bog trail, forming Crosby Lake and Little (or Upper) Crosby Lake. This project will review and evaluate available data and studies from relevant sources and determine gaps in data; obtain/collect additional data and synthesize all information on Crosby Lake; develop a hydrologic regime for Crosby Lake as well as a simple water quality model to analyze current and future conditions of the lake and watershed; identify implementation activities; identify the management goals, objectives and activities to address the high priority issues of Crosby Lake; and prepare the Crosby Lake Management Plan.

Crystal Lake Nutrient TMDL Alum Treatment — 2010

Sponsor: Shingle Creek Watershed Management Commission

Funding: Section 319 (Grant) $82,500

Purpose: Crystal Lake in Robbinsdale is impaired by high concentrations of nutrients. The 2008 TMDL identified both internal and external phosphorus loading as contributing to poor water quality. This project would apply an alum treatment to Crystal Lake to address internal load and improve water clarity, while a separate project would construct a facility to treat the stormwater runoff from about 25 percent of the lakeshed that currently is untreated.

This internal load project will accomplish 90 percent of the internal load reduction required. The separate external load reduction project will accomplish about half the external load reduction required. Together, these projects will significantly improve water quality and clarity in Crystal Lake.

Outcomes: This project will significantly improve water quality and clarity in Crystal Lake, which will be beneficial in helping to restore appropriate aquatic vegetation, fish, and zooplankton communities. The project will accomplish about 90 percent of the internal phosphorus load reduction required by the Crystal Lake Nutrient TMDL.

Enhanced TP Removal in an Urban Wetland System — 2009

Sponsor: Capitol Region Watershed District

Funding: CWP (Loan) $430,000

Purpose: This project will dredge wetland cells of the Villa Park system to remove sediment, develop watershed volume reduction BMPs, enhanced sand filter, alum treatment system or low flow filtration treatment that will enhance phosphorus removal at an inlet to Lake McCarrons. This project will publish a summary report on the project that includes the historical information on the Villa Park Wetland System, pre- and post-project monitoring and performance data, design and construction documents.

Hardwood Creek TMDL Implementation Project — 2010

Sponsor: Rice Creek Watershed District

Funding: Section 319 (Grant) $344,200

Purpose: The Rice Creek Watershed District (RCWD) will lead a coordinated effort to improve the biological integrity and DO levels in Hardwood Creek to meet the goals of the TMDL. Average TSS concentration will need to be decreased 14 percent from approximately 22 mg/L to 19 mg/L to address biological integrity. The average BOD concentration will need to be decreased 30 percent from approximately 4.6 mg/L to 3.2 mg/L to address dissolved oxygen levels. The TMDL study found that altered habitat and altered hydrology were both found to be negatively impacting the biotic community.

To achieve the goals for reductions in TSS and BOD concentrations, a variety of measures, including streambank stabilization, in-stream habitat improvements, re-establishment of stream meanders, and livestock exclusion, will be implemented across the watershed as part of the project. The project is unique in its ability to reconnect the stream to the adjacent floodplain with the use of re-meanders.

Outcomes: By addressing the sources of sediment and phosphorus, this project will contribute to overall water quality improvements in Hardwood Creek. The completion of projects identified in the TMDL Implementation Plan will result in decreased TSS and BOD loading, leading to the restoration of biological integrity (IBI score) and DO levels.

Measureable outcomes, as identified by the TMDL, include a 14 percent reduction in TSS and 30 percent reduction in BOD.

Kohlman Lake TMDL Nutrient Reduction Phase III – 2011

Sponsor: Ramsey-Washington Metro Watershed District

Funding: Section 319 (Grant) $500,000

Purpose: This Section 319 TMDL Implementation Project is a unique opportunity to target a significant source of phosphorus to one of Minnesota's Impaired Waters (Kohlman Lake) while also providing a demonstration of retrofit stormwater infiltration features in a high-profile urban environment.

The goals of this project are:

1. Reducing phosphorus (by 60 percent – 80 percent) from the site's stormwater runoff by capturing and infiltrating (or filtering) up to the first 2 inches of rainfall on the site.

2. Educating the public on stormwater quality (through strategic placement and design of features and interpretive signage that patrons see as they walk to and from their cars at a nearby mall).

3. Inspiring nearby commercial area owners to implement similar projects in the watershed (through demonstration of how these aesthetically pleasing features can be retrofit into the urban environment).

Lake Harriet Diagnostic Study and Management Plan — 2011

Sponsor: Minneapolis Park and Recreation Board

Funding: CWP (Grant) $55,000

Purpose: Lake Harriet, located within the Chain of Lakes Regional Park, is one of the premier recreational destinations in the Minneapolis Park and Recreation Board (MPRB) system. The current CWP grant provides an opportunity to update and intensify existing studies at the lake and provide guidance toward implementing a second phase of improvements in water quality. The goal of the project would be to develop actions that will protect and improve conditions at the lake and prevent future impairment from nutrient pollution. The plan development would include a public participation component, with residents, elected officials, Minnehaha Creek Watershed representatives, state agencies and others interested invited to participate in a discussion of issues and solutions with the MPRB and Minneapolis Public Works.

Lake Johanna/Oasis Pond Water Quality Treatment — 2009

Sponsor: Rice Creek Watershed District

Funding: CWP (Grant) $110,200

Purpose: Repair and upgrade of a water control structure and water quality enhancement measures on Oasis Pond in Roseville, Minnesota in an effort to reduce phosphorus pollutant loads to Lake Johanna and protect the quality of downstream receiving waters. In addition, monitoring will occur to determine how loads of nutrients, suspended solids and turbidity are affected.

Lambert Creek Retrofit ID and Design Project — 2009

Sponsor: Vadnais Lake Area Watershed Management Organization

Funding: CWP (Grant) $15,000

Purpose: Lambert Creek discharges into Vadnais Lake, which is the final impoundment reservoir containing the potable water supply that the Saint Paul Regional Water Services (SPRWS) distributes to the cities of St. Paul, Arden Hills, Falcon Heights, Lauderdale, Little Canada, Maplewood, Mendota Heights, Roseville and West St. Paul. This project aims to analyze the wealth of existing data, identify locations within Lambert Creek's sub watersheds that contribute the greatest to water quality degradation, engage local partners and decision makers and determine which BMP retrofit designs would be the most cost effective and efficient to install for removing pollutants. An administrative outcome of this work will be a database of construction-ready projects to guide future BMP installations throughout the sub-watersheds of concern and for a few pilot installation projects.

Modular Green Roof Retrofit System Development — 2011

Sponsor: Shingle Creek Watershed Management Commission

Funding: Section 319 (Grant) $27,140

Purpose: Shingle Creek, which drains the watershed, is impaired by excess chloride, low dissolved oxygen, and has an impaired biotic community as well. Thirteen of the sixteen lakes in the watershed are impaired due to excess nutrients. This project is based on the hypothesis that development of a light-weight, easily installed extensive green roof system suitable for installation on existing flat or gently sloping roofs can substantially reduce runoff volume from highly developed urban and suburban areas that represent some of the greatest challenges in urban stormwater management.

Permeable Reactive Barriers for Phosphorus Removal — 2010

Sponsor: Ramsey-Washington Metro Watershed District

Funding: Section 319 (Grant) $89,200

Purpose: This project will determine the effectiveness of using "Spent Lime" to reduce phosphorus in stormwater. Spent Lime is created by water utilities (e.g. St Paul Water Utility) and is a byproduct of the water clarification process. Spent Lime contains calcium, iron, and/or aluminum, all three of which bind phosphorus in the natural environment. Currently, Spent Lime must be disposed or transported for use on agricultural fields. Because of its potential for high phosphorus binding capacity, Spent Lime could be beneficially reused in a permeable reactive barrier system to remove phosphorus from stormwater runoff. As the water flows through the permeable reactive barrier containing the Spent Lime, phosphorus would be actively stripped from the water, decreasing the overall phosphorus load to the receiving surface water body. Because of the low cost, small footprint, and passive nature of the system, the Spent Lime permeable reactive barrier has wide ranging applicability.

Outcomes: The project will result in detailed information on the phosphorus removal capacity of Spent Lime under different scenarios (e.g. flow rate). The potential for secondary effects such as metal leaching and toxicity will also be studied. Additionally, pilot scale testing (based on the laboratory results) will be conducted in the field to assess the function and effectiveness of the Spent Lime permeable reactive barrier for phosphorus removal. The project's main outcome will be detailed information that can be used for design and implementation of permeable reactive barriers for the purpose of reducing the available phosphorus load from stormwater runoff.

Sand Creek Stormwater Retrofit — 2011

Sponsor: Coon Creek Watershed District

Funding: CWP (Grant) $83,650

Purpose: Retrofit a new regional stormwater treatment pond and a network of 10 strategically placed curb-cut rain gardens that will reduce phosphorus, total suspended solids, and stormwater runoff volumes in Sand Creek, which is a major tributary to Coon Creek and flows to the Mississippi River in Anoka County.

Shingle Creek Porous Pavement Paired Intersection Study — 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.

Twin Lake Wetland 639 Nutrient Export Reduction — 2010

Sponsor: Shingle Creek Watershed Management Commission

Funding: Section 319 (Grant) $300,000

Purpose: This project is the reduction of phosphorus export from Wetland 27-639W, which is a major external phosphorus source to Impaired Water 27-0042-01, North Twin Lake, which is severely impaired by excess nutrients. North Twin Lake is the first in a chain of connected lakes, and the nutrient-rich outflow from North Twin is a significant source of phosphorus to the downstream lakes, which are also impaired.

A feasibility study has concluded that the export is primarily caused by drawdown and drying in the wetland through evapotranspiration by the extensive cattail vegetation in the central wetland during the growing season. Large precipitation events then sheet flow through the wetland, mobilizing phosphorus and transporting it through Twin Creek to North Twin Lake. The project would construct a weir to increase storage and keep the wetland wetter, and create a bypass route for high flows to and through an adjacent channel.

Outcomes: Reduction in phosphorus export from Wetland 27-639W into North Twin Lake resulting in improved water quality and clarity and reduced frequency of severe algae blooms in North Twin. Reduction of phosphorus discharged from North Twin into Middle and Lower Twin Lakes and resulting improvements to water quality and clarity in those lakes. More natural hydrology and improved vegetative diversity in Wetland 27-639W.

West Moore Lake Water Quality Enhancements — 2011

Sponsor: Rice Creek Watershed District

Funding: CWP (Grant) $86,210

Purpose: East and West Moore Lakes, located along Highway 65 in suburban Fridley, are designated as deep and shallow lakes, respectively. This project involves the design and construction of up to three water quality BMPs designed to capture and infiltrate stormwater runoff from Fridley Middle School's parking lots and adjacent residential streets; the performance all fiscal management and administrative tasks; the incorporation of stormwater management into Fridley Middle School environmental education curriculum, including using the rain gardens (infiltration basins) as demonstration projects on campus and the completion of water quality monitoring and flow measurements during the open water season throughout the project timeline.

Wetland 639W Restoration — 2008

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

North Fork Crow River

Crow River Basin Sediment Reduction — 2009

Sponsor: Crow River Organization of Water

Funding: CWP (Grant) $250,000

Purpose: The Crow River Watershed, made up of two major sub-watersheds, the North Fork and the South Fork, is located in south-central Minnesota and has its confluence with the Mississippi River near Dayton, Minnesota in Wright County. This project focuses on preventing and reducing sediment related turbidity problems throughout the Crow River Watershed and contains three main tasks; BMP installation, public outreach and administration. BMP activities include four streambank or lakeshore erosion control projects, six filterstrips, waterways or sediment basins, a wetland restoration, seven shoreline naturalizations, rain gardens and a modern storm water control mechanism in new or existing developments. Public outreach will include a shoreline naturalization workshop, a Storm Water Task force, webpages and advertisements, and other media for use by every municipality in the Watershed.

Green Lake Eurasian Water Milfoil (EWM)/Stormwater Study — 2009

Sponsor: Middle Fork Crow River Watershed District

Funding: CWP (Grant) $33,000

Purpose: Green Lake is a 5,500 acre mesotrophic lake located in Kandiyohi County, in west central Minnesota. Its clear waters and excellent fishing represent an outstanding recreational and economic resource for the City of Spicer, the county, and the entire region. This research investigation project will examine the relationship between the location of stormwater inlets and stands of Eurasian water milfoil; the hypothesis is that stormwater inlets provide a means for nutrient and sediment loading that previously did not exist, and that the nutrients and sediment are providing an environment more hospitable for the propagation of EWM. 30 total sites will be examined. Multiple sediment cores will be collected. Water samples will be collected and analyzed for patterns and relationships to answer the research question. A final report will be completed and an implementation plan developed for the future management of EWM and stormwater improvements.

Improving Stormwater Management in Ecologically Sensitive Watersheds — 2008

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 the imperviousness.

Middle Fork Crow River Watershed Restoration and Enhancement Project — 2008

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 resources, implementing BMPs to reduce nonpoint source pollution and targeting specific lake management projects that harness internal loading in lakes. Activities will focus on citizen information (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.

Middle Fork Crow River Watershed Restoration and Enhancement Project Continuation — 2009

Sponsor: Middle Fork Crow River Watershed District

Funding: CWP (Grant) $350,000 CWP (Loan) $150,000

Purpose: The proposed project continues and expands upon the activities initiated by the Middle Fork Crow River Watershed Restoration and Enhancement Project. This project focuses on continued protection of high quality lakes and improvement of lakes with poor water quality by: working to restore the hydraulic regime by restoring wetlands, continuing to provide educational opportunities that link people to the resources, implementing BMPs in areas identified as ecologically sensitive to reduce nonpoint pollution sources, targeting specific lake management projects identified in the diagnostic studies and expand the monitoring efforts established during recent years.

North Fork Crow River Septic System/ Feedlot Upgrades — 2009

Sponsor: North Fork Crow River Watershed District

Funding: CWP (Loan) $750,000

Purpose: The CWP State Revolving Fund (SRF) will finance ongoing efforts to upgrade 60-70 noncompliant septic systems in the watershed area of Rice and Koronis Lakes and undertake two to three cooperative feedlot manure management projects such as manure pit upgrades, installing storage ponds, pumps, liners, and clean water diversions.

Working Together to Improve Water Quality Continuation — 2009

Sponsor: Crow River Organization of Water

Funding: CWP (Grant) $314,000 CWP (Loan) $750,000

Purpose: Provide financial incentives to landowners to reduce sediment and nutrient loading through wetland restorations, filterstrips, grassed waterways, nutrient and residue management plans, livestock and milkhouse waste management systems, manure tests, alternative tile intakes, raingardens, rainbarrels, installation/upgrade of outlet structures, sediment basins, lake shore and streambank stabilized by rip rap, bioengineering or a combination of practices, increase education initiatives, promote other related BMPs and maintain water quality

monitoring and analysis in the Buffalo Creek and South Fork Lower Reach Management Areas. Renville, Sibley, McLeod and Meeker Counties receive loan dollars to upgrade noncompliant ISTS systems.

South Fork Crow River

Crow River Watershed Surface Water Runoff Reduction Project — 2011

Sponsor: Crow River Organization of Water

Funding: CWP (Grant) $495,911.85
CWP (Loan) $1,200,000

Purpose: This grant will focus on preventing and reducing sediment/turbidity caused by surface water runoff throughout the Crow River Watershed. This project contains three main tasks; public outreach, administration, and BMP installation. BMPs identified as having significant water quality benefits for these priority areas include: subsurface septic system upgrades, filterstrips, grassed waterways, nutrient and residue management plans, livestock waste management systems, alternative tile intake systems and stormwater control.

Lake Independence Channel Stabilization Project — 2008

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 phosphorus and sediment loading. The TMDL Implementation Plan included recommendations to stabilize these eroding channels. A series of 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.

Pine River

Pine River Watershed Stream Baseline Water Quality — 2009

Sponsor: Cass County

Funding: CWP (Grant) $105,712

Purpose: The Pine River is a major walleye spawning river and is the major stream source for the Whitefish Chain of recreational lakes. The area under consideration has not been adequately addressed to determine any water quality impairments. This project defines a two year program of weekly chemical and physical sampling from 20 sites to characterize the three priority streams and the six lakes they influence in the Pine River Watershed. In addition, physical stream measurements, for which no baseline data exists, will be taken in order to provide input data for modeling. A final report will be prepared summarizing data and conclusions and providing information on BMPs to continue or improve the water quality for Pine River.

Rum River

Mille Lacs Lake Watershed Protection — 2011

Organization: Aitkin County

Funding: CWP (Grant) $145,000

Purpose: Mille Lacs Lake is one of Minnesota's crown jewels, recognized as one of the premier walleye producing lakes in the world. This project will distribute shoreland homeowners guides; maintain a project website; prepare and distribute media news releases; host public official forums / public meetings; participate in community events; conduct an inventory of the Mille Lacs Lake shoreline; implement 5 shoreline stabilization/ revegetation projects; implement 3 rain gardens; implement several BMPs, including exclusion fencing, alternate water sources, filter strip establishment, clean water diversions, pasture and hayland improvements, and others as needed; develop conservation easements; conduct soil fertility analyses at 50 sites; implement appropriate planning and zoning controls; conduct tributary and lake water quality monitoring; financially support watershed coordinator positions and provide grant support and administration.

Sauk River

Lower Sauk River Water Quality Protection — 2011

Sponsor: Sauk River Watershed District

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

Purpose: Conduct hydrologic assessments in urban and rural target areas of the Lower Sauk River; install conservation BMPs throughout the Lower Sauk River watershed; increase public awareness on water quality protection through public outreach efforts; conduct water quality monitoring and analysis for identified stormwater outlets and manage project by tracking activities and expenditures, and submit required reports.

Middle Sauk River Water Quality Restoration Project Continuation — 2009

Sponsor: Sauk Lake Watershed District

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

Sponsor: Sauk River Watershed District

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.

Osakis Lake Enhancement Continuation Project — 2011

Sponsor: Sauk River Watershed District

Funding: CWP (Grant) $114,839.17 CWP (Loan) $75,000

Purpose: This continuation assists eight landowners in designing and funding their shoreland restoration and rain garden projects; assists sixteen stormwater management and restoration projects along Osakis Lake and three stormwater management projects within the City of Osakis; informs Crooked Lake residents of the available funds for wetland establishment; identifies strategic areas for minor excavation to maximize water storage and sediment reduction; assists the Douglas SWCD in re-establishing 250 acres of cropland into an open water wetland; properly closes two abandoned manure pits according to MPCA standards; excludes livestock from one stream site that drains into Osakis Lake to reduce nutrient concentrations to the lake; develops additional feedlot abatement projects if funding is available; conducts 3 hands on educational events for targeted topics: invasive species, shoreland restoration, rain gardens, rain barrels and shoreland reforestation; utilizes the local media to publicize the available funding and upcoming education events; conducts two follow-up maintenance workshops to provide individuals the tools to protect their lakeshore long-term; posts all information on the SRWD website for general public review; conducts effectiveness monitoring of Judicial Ditch 2 (JD2) and Osakis Lake and the outlet; manages the project through activity and expenditures tracking and generates reports.

Restoring Water Resources of the Sauk River Chain of Lakes — 2008

Sponsor: Sauk River Watershed District

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 Project Continuation — 2009

Sponsor: Sauk Lake Watershed District

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 River Water Quality Protection Phase III — 2011

Sponsor: Sauk River Watershed District

Funding: CWP (Grant) $235,000 CWP (Loan) $175,000

Purpose: Publicize this project, upcoming education events and available funding; conduct two education events on "Backyard BMPs"; install two demonstration projects; conduct four education events; complete three radio programs allowing local residents an opportunity to call in and ask questions; provide assistance; design and install five rain gardens; design and install twenty "Backyard BMPs"; assist in the design and installation of four stormwater BMPs for two schools and two municipalities; select one city street to conduct project and specific BMP installation points; monitor stormwater runoff from snowmelt and rain events for baseline data; design and install stormwater BMPs; collect stormwater runoff samples and analyze to determine BMP effectiveness; generate report from results; share the information with the community to quantitatively explain the impacts of stormwater and the benefits of urban BMPs; design and install one erosion control project along the Sauk River; complete three additional land use BMP projects along the Sauk River to minimize sediment and nutrients delivered to the river; evaluate nutrient and soil loss before and after each project; conduct water quality monitoring and analysis to quantify water quality changes in the Sauk River; manage the grant project; conduct the necessary tracking and complete required reports.

Sauk River Watershed District Watershed-wide Groundwater Protection — 2011

Sponsor: Sauk River Watershed District

Funding: CWP (Grant) $40,000 CWP (Loan) $250,000

Purpose: Conduct two education events; distribute two news articles in local papers; host one radio public service program expressing the importance of groundwater protection, septic system maintenance, and available funding; conduct two additional education workshops watershed wide focusing on groundwater protection, proper septic maintenance and well sealing; provide the Minnesota Department of Health (MDH) and county agencies information regarding the available cost share funds and cost share two well sealing projects; cost share eight additional well sealing projects; inform the associated counties of the available loan dollars and upgrade five septic systems to meet current standards; upgrade an additional seventeen septic systems to meet current state standards and provide each associated county with a list of completed sites; distribute operation and maintenance manuals for newly installed systems; manage project by tracking activities and expenditures and submit required reports.

Targeted Implementation Activity Within Impaired and Ecologically Sensitive Areas in Stearns County — 2007

Sponsor: Stearns County Soil and Water Conservation District

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 BMP Implementation within Impaired Areas in the Upper Mississippi Basin Continuation — 2008

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.

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