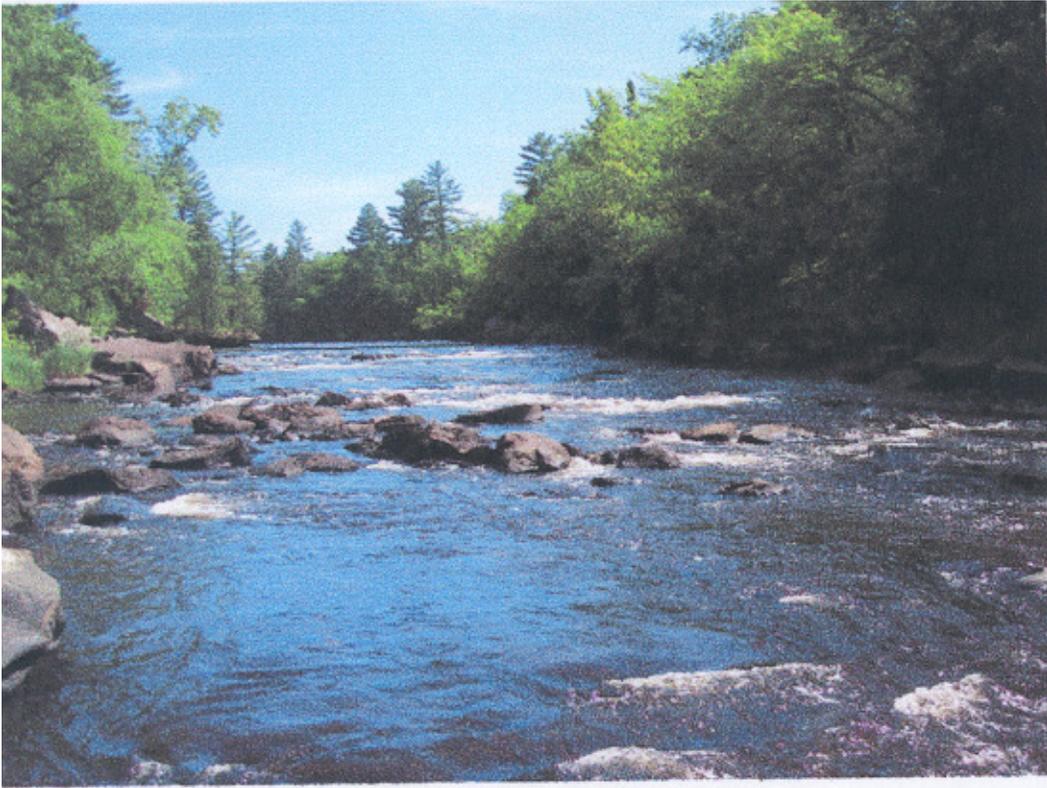


Pine County Local Water Management Plan 2015 – 2020



Prepared by



with the direction and assistance of the
Pine County Local Water Management Task Force,
and Water Plan Working Group

PINE COUNTY COMPREHENSIVE LOCAL WATER MANAGEMENT PLAN

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Water Plan Task Force Mission Statement: Develop goals, objectives and recommend a plan of action for the protection, management, and improvement of water and related land resources.

I. EXECUTIVE SUMMARY

Introduction

This revised plan is the 5 year amendment, completed in 2014 and 2015. Pine County is located in east central Minnesota. The St. Croix River and the State of Wisconsin border Pine County on the east. With Interstate 35 running the entire length from north to south, it is located about half way between the Twin Cities and Duluth. Pine County has 918,112 acres of surface area. 11,596 acres are surface water with 142 lakes 10 acres or bigger. 27 percent of the land is publicly owned, and 73 percent is privately owned. Surrounding counties are Carlton to the north, Aitkin, and Kanabec to the west, Chisago to the south, and Burnett and Douglas in Wisconsin to the east.

There are portions of five major watersheds in Pine County: The Upper St. Croix, Lower St. Croix, Nemadji, Kettle, and the Snake Rivers. Agriculture is still an important part of the county's economy. Forestland is also a valued resource in Pine County. The northern part of the county has higher elevation and is more forested. The southern part of the county is lower and has had more agriculture.

This is the third Local Water Management Plan in Pine County. Input from local citizens, agencies, and the Water Plan Working Group was used to determine the priorities and create the water plan.

The Water Plan Working Group consists of people who represent lake associations, cities, townships, sportsman's groups, river associations, soil and water conservation district staff and supervisors and a county commissioner. The working group has twelve members.

The priority concerns outlined in this plan focus on the water quality; dealing both with impaired and non-impaired waters. Action items are listed to deal with improving the impaired waters in Pine County. Additional action items are listed dealing with ways to protect the non-impaired waters in Pine County. A second priority concern is also listed for educating the citizens of Pine County about conservation and natural resources. The estimated cost of the projects listed in the plan total \$3,906,000.

Purpose

This updated Local Water Management Plan will show the direction in natural resource management the county will proceed in for the next five years. This is the five year amendment to the ten year plan. In five years, the ten year update will occur. The following guidelines will be met in this document:

- The plan must cover the entire county.
- The plan must address problems in the context of watershed units and groundwater systems.
- The plan must be based upon principles of sound hydrologic management of water, effective environmental protection and efficient management.
- The plan must be consistent with local water management plans prepared by counties, watershed districts and watershed management organizations wholly or partially within a single watershed unit or groundwater system.
- The plan must cover a ten year period of time, with a review in five years. The Water Plan Task Force will be given yearly status reports and give their input.
- The full implementation of this plan is dependent on what is economically feasible.

II. DESCRIPTION OF PRIORITY CONCERNS

Input from public meetings, surveys and working group meetings was used to develop the following priority concerns:

1. Water Quality
 - A. Improving Impaired Waters
 - B. Maintaining Unimpaired Waters
2. Natural Resource Conservation, Education and Utilization

These two issues will be the focus in establishment of goals, objectives and a plan for implementation.

Consistency of plan with other pertinent local, state, and regional plans:

This plan is consistent with the following plans, which are incorporated into this plan by reference:

- St. Croix Basin Water Resources Planning Status Report on the Kettle River and the Snake River
- The Snake River Watershed TMDL's and WRAPS Report
- The Nature Conservancy's Conservation Action Plan for the St. Croix Basin
- Kettle River Watershed Phosphorous Reduction Project
- Kettle River Major Watershed Landscape Stewardship Plan

Summary of recommended amendments of other plans and official plans and official controls:

The Water Plan Working Group recommended the Federal Emergency Management Agency (FEMA) should survey and establish more floodplains for the lakes and rivers beside Pokegama and Cross Lakes and the Snake River.

III. ASSESSMENT OF PRIORITY CONCERNS

The Pine County Water Plan Working Group has selected two main priority concerns. They were selected after public input was given and the Water Plan Working Group met and discussed the information obtained.

PRIORITY CONCERN #1: WATER QUALITY

A. Improving Impaired Waters

B. Maintaining Unimpaired Waters

The Federal Clean Water Act (CWA) requires states to adopt water-quality standards to protect waters from pollution. These standards define how much of a pollutant can be in the water and still allow it to meet its designated uses, such as drinking water, fishing, and swimming. The standards are set on a wide range of pollutants, including bacteria, nutrients, turbidity, and mercury. A water body is "impaired" if it fails to meet one or more water quality standards. The Clean Water Act assesses water in terms of three types of use supports: aquatic life, aquatic consumption, and aquatic recreation with each assessed as either:

- fully supporting (FS)
- not supporting (NS)
- insufficient information (IF)
- not assessed (NA)

The Clean Water Act requires the State to conduct a Total Maximum Daily Load (TMDL) study, which identifies all point and nonpoint sources. The Clean Water Act has charged the MPCA with the task of assessing all the waters and cleaning up the impaired lakes and rivers so they meet their designated uses. Every two years the MPCA publishes a new list of lakes and rivers that are not meeting their designated uses. Water quality monitoring and computer modeling show how much a pollutant must be reduced to meet the standard. Lakes and streams may have several different TMDL's for different pollutants. Reduction goals are then set and corrective measures are implemented to meet the goals and restore the waters. They have a timeline in which they are supposed to achieve this. The Clean Water Amendment Funds will be used for this purpose.

The MPCA has, or will be conducting watershed assessments within the major 8 Digit watersheds throughout the state. This will affect the following watersheds in Pine County:

- Kettle River – 2016
- Snake River – 2006/2017
- Lower St. Croix – 2009/2019
- Upper St. Croix – 2016
- Beartrap – Nemadji – 2011/2021

For further information, see this website:

<http://www.pca.state.mn.us/water/monitoring-watersheds.html>

Most of the mercury impairments were addressed through the statewide Mercury TMDL conducted by the MPCA. This document can be found at:

<http://www.pca.state.mn.us/water/tmdl/tmdl-mercuryplan.html>

It is of vital importance that the unimpaired waters and healthy watersheds be protected. Good protection strategies applied now will prevent the need for costly restoration work in the future.

Water quality test site information on Pine County lakes, rivers and streams can be obtained from the Minnesota Pollution Control Agency (MPCA) website, at:

<http://www.pca.state.mn.us/index.php/data/environmental-data-access.html>

Below is a summary of all the activity that has taken, or will take place within the five 8 digit watersheds that overlay Pine County.

Snake River Watershed

As part of the Snake River Watershed TMDL project the Snake River Watershed Management Board, Kanabec SWCD, Pine SWCD, and volunteer's collected water quality samples at following sites from 2010 through 2012:

- Lakes: Cross and Pokegama
- Streams: Pokegama Creek at County Road 14, Bear Creek East of Pine City, Mud Creek near Grasston, Snake River below the Cross Lake Dam, and the Snake River at County Road 107

The water quality data that was collected was then used in the development of the water quality models for the TMDLs and Watershed Restoration and Protection Strategies (WRAPS). Within Pine County the TMDL report addressed two E. coli impairments (Lower Mud Creek and Bear Creek) and two nutrient impaired lakes (Cross Lake and Pokegama Lake). The rest of the data and information was then used to develop the WRAPS report which lays out the strategies necessary to restore the impaired waterbodies, and protect the non-impaired waterbodies. The TMDL report and WRAPS report can be found on the MPCA's site at:

<http://www.pca.state.mn.us/hqzq9ff>

The WRAPS report (<http://www.pca.state.mn.us/index.php/view-document.html?gid=20788>) lays out the actions the county will implement over the next 10 years, and beyond to protect and restore the water quality within the Snake River Watershed.

The TMDL Process is a way to monitor watersheds and to implement projects in impaired watersheds. The Pine SWCD participated in the Snake River Watershed TMDL Work Plan from 2010 through 2013 by doing some monitoring in the county, hosting stakeholder meetings, and serving on the technical advisor team. After all the data was collected, analyzed, and a TMDL report was completed and approved; then a WRAPS report was drafted to act as a guide for restoring and protecting the waters within the Snake River Watershed. This same procedure will be followed in all other TMDL's that are completed. Except for the Grindstone River and Rock Creek, all the impaired streams in Pine County are in the Snake River Watershed.

Kettle River Watershed

The Kettle River, which runs diagonally north to south through most of the county, is a state designated Wild and Scenic and Natural river.

The following waters have been monitored through 2 MPCA Surface Water Assessment Grants:

Lakes: Big Pine, Grindstone, Sturgeon, Island, Sand, Bass, Upper Pine, Eleven, Rock, Dago, Rhine, Elbow, and Oak Lakes.

Rivers: Grindstone River at State Highway 48, Grindstone River at County Road 140, and the North and South Branch of the Grindstone River at Two Rivers, Grindstone River at Friesland Rd, the North Branch of the Grindstone River at North Grindstone Road, Northeast Tributary of Grindstone River, Judicial Ditch #1 at Emma Rd, and Spring Creek at Lone Pine Road, the Kettle River at Highway 23, the Pine River at CSAH 61, The Willow River at Military Rd and the Moose Horn River at CSAH 46.

The data collected as part of the monitoring above as well as the monitoring done in 2016 and 2017 will be used to assess the water quality of the lakes and streams within the county. At this time the county will look for ways to partner with the MPCA, local counties, and other state agencies to develop any TMDLs and the WRAPS Report starting in 2016. All impaired waters will be placed on the 2018 Drafts Impaired Waters List.

Kettle River Watershed TMDL Phosphorous Reduction Project

In 2012, a Clean Water Fund grant was secured by the Carlton SWCD to develop integrated watershed management tools to accelerate on-the-ground conservation projects in the Kettle River Watershed. Specifically, GIS data for the watershed will be compiled, analyzed, and processed for use in an Environmental Benefits Index (EBI) tool, which will identify sites with high value for conservation practice implementation. This project is taking place across the Lake St. Croix Basin of which the Kettle River Watershed is a part of. This watershed project is a partnership between Carlton, Pine, Kanabec, and Aitkin SWCDs, with the Carlton SWCD acting as the project administrator. This project will improve the water quality in the Kettle River Watershed, a designated National and Minnesota Wild and Scenic River and MN DNR Canoe Route, by addressing the Lake St. Croix Basin TMDL phosphorous reduction targets for each 12 digit HUC sub-watershed in the Kettle River Watershed. NRCS staff in these counties are also a partner and will work with landowner contacts for planning and implementation of phosphorous reducing practices through USDA programs. The overall outcome of this project will produce a list of landowners ready to implement phosphorous reducing practices in the watershed. Local, state, and federal funding opportunities will be pursued to assist these landowners in completing their projects.

Upper St. Croix Watershed

At this time there has been no water quality data collected in the watershed. However, in 2016 through 2017 the MPCA will conduct their Intensive watershed monitoring in the watershed. At this time the county and local groups will be eligible for Surface Water Assessment Grants to collect water quality data on several lakes and streams within the watershed. The data collected will be used by the MPCA to assess the water quality in the Upper St. Croix Watershed and determine which waterbodies are impaired and which are in need of protection. At this time the county will look for ways to partner with the MPCA and other local agencies to develop any TMDLs and the WRAPS Report starting in 2016. All impaired waters will be placed on the 2018 Drafts Impaired Waters List.

MPCA's 2014 Draft Impaired Waters List is found in the appendix.

A list of unimpaired waters in Pine County can be found in the appendix.

Most of the waters listed are "potential" trout streams, but only four (4) have trout in them. Beaver dams and their activities are detrimental to a habitat required to sustain a trout population. Springs, ground water supply, shaded areas, spawning passages and water temperature are also important components of a trout stream habitat. Watersheds and the headwaters of trout streams are usually small and sensitive to activities occurring within them. They are not on the protected waters list but should be added due to their sensitivities. The TMDL reports and the MPCA Stressor Identification report should be utilized. Identify culvert crossings that restrict fish passage and replace them when the opportunity arises. Beaver and their dams should be removed from potential and actual trout streams along with in-stream habitat improvements made when and wherever possible to encourage or promote the return of trout to these streams.

The St. Croix River is a nationally designated Scenic and Recreational river that borders the southeast half of Pine County. They should receive special attention by implementing protection and restoration activities to ensure that the water body does not become further impaired. The Pine SWCD will participate in the Conservation St. Croix Group. The Pine SWCD partnered with eight other counties, as well as state agencies and groups from Wisconsin, in the watershed to work on a TMDL for the Lake St Croix TMDL. The Watershed and the Conservation St. Croix group hopes to use the strength in numbers approach to apply for and secure grants to install projects to lower the amount of pollution phosphorus entering the St. Croix River and ultimately Lake St. Croix. The goal of the St. Croix Watershed is to reduce the amount of phosphorus input to the St. Croix River and Lake St. Croix by 20% by 2020. The Pine SWCD will also participate in the Kettle River TMDL.

A TMDL and WRAPS report for the Goose Creek Watershed, which includes the Rock Creek watershed in lower Pine County and upper Chisago County, as being written and will be completed in 2015. This TMDL has been done in conjunction with the Rush Creek Watershed and Goose Creek Watershed TMDLs. All three of these watersheds are in the Lower St. Croix River Watershed. The combined WRAPS will include all three watersheds and outline hundreds of water quality improvement projects within the watershed.

Nemadji River Watershed

There is a Deer Creek/Nemadji River TMDL currently in progress by the Carlton SWCD. All but seven square miles of Pine County's portion of the watershed is in the Nemadji State Forest. The Net River is being monitored as part of the TMDL. Net Lake was sampled through an MPCA Surface Water Assessment Grant (SWAG) that Carlton County received. It was determined to be impaired and is on the 2014 Draft Impaired Waters List.

Through the 2008 MPCA SWAG, Grindstone, Big Pine, Pine, Sturgeon, Island, Sand, Upper Pine, Bass Lake, and Lake Eleven were sampled along with four inlets to Grindstone Lake, Pine and

Strawberry Creeks, Pine River, Judicial Ditch #1, and Spring Creek. Through the 2009 MPCA SWAG, Oak, Rhine, Eleven, Elbow, Dago, and Rock Lakes and the Moose Horn, Willow, Pine and Kettle Rivers were sampled. There is now data for the tributaries to the Kettle River and the rest of the major lakes in the area. The data will be assessed to determine impairments in 2017. The creeks in the northeast part of the county that need to be sampled are Redhorse Creek, Bear Creek, Sand Creek, Hay Creek, Crooked Creek, and Upper and Lower Tamarack River.

For more information, see the Summary of Data Needed for Water Quality in the Appendix.

Aquatic Invasive Species

Invasive species are a very serious threat to our surface waters. Some of our waters already have invasive species. Stopping the spread in infested waters and keeping it out of uninfested waters is of utmost importance. 2014 legislation allocated Aquatic Invasive Species Prevention Aid funds to Pine County, and all counties in the state to do education, watercraft inspections, and signage relating to AIS. Pine County has identified the following areas of concern:

- 1) The Eurasian Watermilfoil and Curly Leaf Pond Weed infestations that are already within some county lakes.
- 2) The future immediate potential for Zebra Mussel infestations because many of the lakes in Pine County have visiting boaters which may come from infested lakes.
- 3) The future threat for Invasive Carp making their way into Pine County, specifically from the St. Croix River.

PRIORITY CONCERN #2: NATURAL RESOURCES CONSERVATION, UTILIZATION, AND EDUCATION

Education, conservation and utilization are very important to the future of our county. The public need to understand conservation to ensure the availability of our resources for future generations. People need to know what conservation practices they should be installing and why they are important. There are many different topics that can be taught to the public. The education component goes hand-in-hand with the water quality priority concern. In order to improve and preserve the waters in the county, the public needs to be educated on how to do this.

Many of the lakes and rivers in the northern part of the county are currently not listed as impaired and need to be protected. Some of the lakes and streams need to be protected before they become impaired. Educating people on native buffers and working on nonpoint sources will help address these issues. Keeping soil and fertilizer on the land and out of the lakes and streams will reduce sediment and nutrient inputs. Keeping phosphorus out of the lakes and rivers will help the St. Croix Basin Team with their goal of reducing the amount of phosphorus in the St. Croix River by 20% by 2020.

IV. GOALS, ACTION ITEMS & IMPLEMENTATION SCHEDULE

PRIORITY CONCERN #1:

WATER QUALITY

A. IMPROVING IMPAIRED WATERS

B. MAINTAINING UNIMPAIRED WATERS

Goal 1: Use existing monitoring information and new information being collected to determine what waters are impaired and which are not					
Action		Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Secure additional grants to monitor waters not assessed like the Upper St. Croix Tributaries	SWCD	2015 – 2020	\$50,000	Upper St. Croix
2.	Utilize data from Surface Water Assessment (SWA) grants	SWCD	2015 - 2020	\$2,000	Kettle River, St. Croix Basin, Snake River
3.	Recruit and train volunteers to assist with monitoring in necessary areas	SWCD	2015 - 2020	\$2,000	Kettle River, St. Croix Basin, Snake River

Goal 2: Participate in TMDL and WRAPS processes that include waters in the county					
Action		Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Serve on technical committee for TMDL's	SWCD	2015 - 2020	\$5,000	St. Croix Basin, Snake River, Kettle River
2.	Do monitoring where needed	SWCD	2015 - 2020	\$5,000	St. Croix Basin, Snake River, Kettle River
3.	Host stakeholder meetings	SWCD	2015 - 2020	\$5,000	St. Croix Basin, Snake River, Kettle River
4.	Install projects listed in the WRAPS document	SWCD	2015 - 2020	\$50,000	Snake River
5.	Install cover crops	Pine County NRCS, SWCD	2015 - 2020	\$300,000	Countywide
6.	Proper containment and management of animal waste	MPCA, Pine County NRCS	2015 - 2020	\$50,000	Countywide
7.	Install vegetative filters strips near barnyards and milkhouses	Pine County NRCS	2015 - 2020	\$10,000	Countywide
8.	Exclusion of livestock from sensitive areas such as riparian areas along lakes and rivers	MPCA and Pine County NRCS	2015 - 2020	\$20,000	Countywide

9.	Installation of rain gardens/wetlands/retention basins that absorb excess runoff and promote ground infiltration	SWCD	2015 - 2020	\$50,000	Kettle River, St. Croix Basin, Snake River
10	Plan and host stakeholder meetings for TMDL.	SWCD	2015 - 2020	\$20,000	Snake River
11	Attend technical advisory committee meetings for TMDL.	SWCD	2015 - 2020	\$5,000	Snake River
12	Develop a process to engage, educate and organize citizens to be local leaders to help accomplish water quality goals	SWCD	2015 - 2020	\$20,000	Snake River – Mud Creek
13	Provide resources/education for soil or manure nutrient testing and spreading in sensitive areas such as riparian areas along lakes and rivers.	Pine County NRCS	2015 - 2020	\$2,000	Pokegama Lake
14	Work with Pokegama and Cross Lakes on Management Plans in an effort to address concerns about curly-leaf pondweed treatments	SWCD	2015 - 2020	\$50,000	Pokegama Lake Lower Snake River
15	Implement pastureland runoff controls, and buffers near streams	Pine County NRCS	2015 - 2020	\$10,000	Countywide
16	Continue to pursue and promote conservation easements	SWCD	2015 - 2020	\$20,000	St. Croix Basin, Kettle River, Snake River
17	Participate in tracking monitoring to see if projects are improving water quality	SWCD	2015 - 2020	\$20,000	Lower Snake River, Upper Kettle River, Rock Creek
18	Participate in development of WRAPS	SWCD	2015 - 2020	\$20,000	Rock Creek, Kettle River
19	Treat 10% of the farmsteads needing manure runoff control and manage storage facilities	Pine County NRCS	2015 - 2020	\$100,000	Rock Creek
20	Target 20% of the unprotected streambanks for restoration and habitat improvement including: bank stabilization, re-meanders, substrate installation, fine sediment removal, etc.	SWCD	2015 - 2020	\$200,000	Rock Creek
21	Develop a process to engage, educate and organize citizens to be local leaders to help accomplish water quality goals	SWCD	2015 - 2020	\$15,000	St. Croix Basin, Kettle River, Snake River
22	Participate in MPCA SWA grants and assist intensive MPCA sampling in the Kettle River Watershed beginning in 2016.	SWCD	2015 - 2020	\$30,000	Kettle River, Upper St. Croix

23	Cooperate with MDH, cities of Finlayson, Willow River and Sturgeon Lake to secure grants to implement their wellhead protection plans.	SWCD	2015 - 2020	\$30,000	Kettle River
24	Support the protection and maintenance of undeveloped and native shorelands	SWCD	2015 - 2020	Unknown	Kettle River
25	Support programs and projects that improve, restore, and maintain wildlife habitat on private lands (EQIP, WHIP, etc.)	Pine County NRCS and SWCD	2015 - 2020	\$100,000	Kettle River
26	Support the development of lake management plans which include the watersheds of the lakes. The DNR can assist in determining lake watershed boundaries in the early stages of lake management planning efforts.	DNR, SWCD	2015 - 2020	\$5,000	Countywide
27	Synchronize watershed priorities with federal/state/regional/local priorities	SWCD	2015 - 2020	Unknown	Kettle River
28	Conduct systematic and comprehensive landowner outreach	SWCD	2015 - 2020	\$60,000	Kettle River
29	Follow recommended actions and apply for funds according to the Kettle River Landscape Stewardship Plan. Implement activities	SWCD	2015 - 2020	Unknown	Kettle River
30	Cooperate with Minnesota Department of Health, Minnesota Rural Water Association, and the city of Askov to secure grants to implement its wellhead protection plan.	SWCD	2015 - 2020	\$10,000	Upper St. Croix
31	Provide agriculture and feedlot BMPs information to farmers and crop producers	SWCD	2015 - 2020	\$5,000	Kettle River, St. Croix Basin, Snake River
32	Participate in the Upper St. Croix TMDL/WRAPS process with writing and outreach meetings and writing the restoration and protection strategies and implementing conservation practices	SWCD	2015 - 2020	\$30,000	Upper St. Croix

Goal 3: Improve Forestry Practices					
	Action	Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Forestry BMP Education – MN Forestry Resource Council	SWCD	2015 - 2020	\$2,500	Kettle River, St. Croix Basin, Snake River

2.	Assist landowners in forestry BMP's and development of sustainable forest management plans	SWCD and DNR Forestry	2015 - 2020	Unknown	Kettle River, St. Croix Basin, Snake River
3.	Secure funding for employee to write forest stewardship plans	SWCD	2015 - 2020	\$50,000	Kettle River, St. Croix Basin, Snake River
4.	Develop forestry management plans	SWCD	2015 - 2020	\$100,000	Kettle River, St. Croix Basin, Snake River
5.	Increase and restore forest land cover	SWCD	2015 - 2020	Unknown	Kettle River
6.	Support the expansion and effectiveness of local conservation groups through their active involvement in private forest management (Kettle River Woodland Owners Association, lake associations, etc.).	SWCD	2015 - 2020	\$60,000	Kettle River
7.	Advocate sound land use planning and the recognition of forest resources in local planning and regulation processes. Seek DNR assistance with incorporating ordinance provisions that encourage healthy watersheds.	Pine County Planning & Zoning, DNR, SWCD	2015 - 2020	Unknown	Countywide
8.	Work with local outdoor recreation groups to increase the awareness of the public about the value of forests and high quality natural resources	SWCD	2015 - 2020	\$15,000	Kettle River
9.	Work with partners and stakeholders to link citizens and businesses in the watershed to support organizations actively working to protect, restore, and improve forest and water resources in the watershed	SWCD	2015 - 2020	\$15,000	Kettle River
10.	Encourage urban forestry in the City of Sandstone	SWCD	2015 - 2020	\$3,000	Lower Kettle River
11.	Promote urban forestry in the City of Hinckley	SWCD	2015 - 2020	\$3,000	Grindstone River
12.	Restore upland forests in the Big Pine Lake and Medicine Creek – Pine River minor watershed	SWCD	2015 - 2020	\$200,000	Pine River

Goal 4: Encourage jurisdictions to adopt stormwater and shoreland ordinances

	Action	Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Encourage cities to implement LID practices	SWCD	2015 - 2020	\$2,000	Kettle River, St. Croix Basin, Snake River

2.	Encourage the LGU adoption and implementation of a County Stormwater Ordinance	Pine County Planning & Zoning	2015 - 2020	<i>Unknown</i>	Countywide
3.	Upgrade the imminent public health threat septic systems and the septic systems failing to protect ground water	Pine County Planning & Zoning	2015 - 2020	\$50,000	Countywide

Goal 5: Educate jurisdictions and the public on erosion and sediment control and LID practices.

	Action	Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Increased exposure to U of M erosion and sediment control classes and National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) stormwater permits	SWCD	2015 - 2020	\$1,000	Kettle River, St. Croix Basin, Snake River
2.	Encourage LID and minimize disturbance, increase contiguous green space on developments, implementing infiltration techniques such as rain gardens, pervious pavements, or green roofs for stormwater control; and education for the community and for agencies as to the techniques, benefits, and long term cost savings of LID	SWCD	2015 - 2020	\$2,500	Kettle River, St. Croix Basin, Snake River
3.	Utilize grants when municipalities are doing stormwater practices like rain gardens, filter strips and other LID Practices	SWCD	2015 - 2020	\$2,500	Kettle River, St. Croix Basin, Snake River
4.	Encourage new techniques for temporary and permanent erosion control	SWCD	2015 - 2020	<i>Unknown</i>	Kettle River, St. Croix Basin, Snake River
5.	Promote the use of conservation tillage and no-till practices	SWCD	2015 - 2020	\$10,000	Kettle River, St. Croix Basin, Snake River
6.	Promote the use of vegetative filter strips and field buffers among row crops	SWCD	2015 - 2020	\$10,000	Kettle River, St. Croix Basin, Snake River
7.	Education on stormwater pollution prevention planning and implementation for small (non-MS4) communities and towns	SWCD	2015 - 2020	\$5,000	Kettle River, St. Croix Basin, Snake River
8.	Promote, educate and install 15 shoreline plantings/buffers/setbacks	SWCD	2015 - 2020	\$20,000	Kettle River, St. Croix Basin, Snake River

9	Proactively educate visitors to the Kettle River Major Watershed about the high quality natural resources in the watershed and their role in protecting them	SWCD	2015 - 2020	\$15,000	Kettle River
10	Promote shoreline restoration with lakeshore owners around lakes of concern in Moose River HUC 12	SWCD	2015 - 2020	\$200,000	Moose River
11	Actively educate stakeholders in the watershed about the watershed/forest land cover connection groups and its role in producing clean water	SWCD	2015 - 2020	\$30,000	Kettle River

Goal 6: Educate and find funding for natural shoreline projects and projects in riparian areas					
	Action	Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Encourage landowners around lakes and rivers to implement best management practices, preserve and restore riparian land, offer incentives for riparian conservation	SWCD	2015 - 2020	\$125,000	Kettle River, St. Croix Basin, Snake River
2.	Secure grant funding for Robinson Park buffer in the City of Sandstone	SWCD	2015 - 2012	\$30,000	Kettle River
3.	Work with homeowners on natural shoreline projects around rivers and second and third tier development around lakes	Pine County Planning & Zoning	2015 - 2020	\$15,000	Countywide
4.	Apply for more beaver damage control grants	SWCD and Pine County Planning and Zoning	2015 - 2020	\$100,000	Kettle River, St. Croix Basin, Snake River
5.	Utilize DNR Clean Water Funded staff to assist natural shoreline and riparian projects	DNR, SWCD	2015 - 2020	\$50,000	Countywide

PRIORITY CONCERN #2:

NATURAL RESOURCES CONSERVATION, UTILIZATION AND EDUCATION

Goal 1: Apply for grant funds to implement projects. Utilize DNR Clean Water Amendment funded staff to assist implementation of successful grants					
Action		Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Apply for grant funding for septic inspections, studies or projects related to water quality in shoreland areas	Pine County Planning & Zoning Department, SWCD	2015 - 2020	<i>Unknown</i>	Countywide
2.	Secure funding to improve public accesses and divert the storm water into infiltration basins where possible and not directly into lakes and streams	DNR, SWCD	2015 - 2020	\$100,000	Countywide

Goal 2: Educate jurisdictions and public on conservation best management practices					
Action		Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Education through projects. Do native planting projects on Pokegama, Grindstone, Sturgeon, Island and Sand Lakes	SWCD	2015 - 2020	\$20,000	Pokegama, Kettle River
2.	Install native buffers in riparian areas	SWCD	2015 - 2020	<i>Unknown</i>	Kettle River, St. Croix Basin, Snake River
3.	Form a county-wide lake association	SWCD	2010 - 2015	\$5,000	Kettle River, St. Croix Basin, Snake River
4.	Encourage best practices for septic systems around lakes	Pine County Land & Zoning and SWCD	2010 - 2015	<i>Unknown</i>	Countywide
5.	Provide homeowners with guidelines for their new or replaced septic systems which require a management plan.	Pine County Planning & Zoning	20/10/2020	\$5,000	Countywide
6.	Encourage buffers around the lakes	SWCD	2015 - 2020	<i>Unknown</i>	Kettle River, St. Croix Basin, Snake River
7.	Education and cost share for abandoned wells	SWCD	2015 - 2020	\$35,000	Kettle River, St. Croix Basin, Snake River
8.	Encourage LID practices in new developments	SWCD	2015 - 2015	\$2,000	Kettle River, St. Croix Basin, Snake River
9.	Assist municipalities with Wellhead Protection Plans	SWCD	2015 - 2020	\$20,000	Kettle River, St. Croix Basin, Snake River

10.	Educate the public about aquatic invasive species through brochures at boat launches	Pine County Land Services Department	2015 – 2020	<i>Unknown</i>	Countywide
11.	Educate the public about aquatic invasive species by having billboard at the southern end of the county.	Pine County Land Services Department	2015 - 2020	<i>Unknown</i>	Countywide

Goal 3: Improve habitat in lakes and streams					
Action		Lead/Supporting Agency	Timeframe	Cost	Watershed
1.	Apply for funds to implement trout stream habitat improvement projects	DNR Fisheries and SWCD	2015 - 2020	\$50,000	Countywide
2.	Continue implementation of Wetland Conservation Act	SWCD	2015 - 2020	\$800,000	Kettle River, St. Croix Basin, Snake River
3.	Education and cooperation on Eurasian Water Milfoil Control – support lake associations’ eradication efforts	Pine County Land Services Department	2015 - 2020	\$7,500	Countywide
4.	Education on controlling Curly Leaf Pondweed – support lake associations’ eradication efforts	Pine County Land Services Department, SWCD	2015 - 2020	\$7,500	Countywide
5.	Education on the preventing the spread of zebra mussels into Pine County lakes	Pine County Land Services Department	2015 - 2020	\$7,500	Countywide
6.	Provide for aquatic invasive species enforcement and watercraft inspection saturation coverage at the public accesses	Pine County Land Services Department	2015 - 2020	\$200,000	Countywide
7.	Purchase 2 decontamination units	Pine County Land Services Department	2015-2020	\$20,000	Countywide
8.	Identify undersized and perched culverts in the watershed, and replace them.	SWCD	2015-2020	75,000	Countywide

ONGOING ACTIVITIES

District Tree Program

Every spring, the Pine SWCD sells approximately 35,000 trees to landowners. This is an opportunity for landowners to purchase small quantities of trees at a low price. It is also a marketing opportunity for Pine SWCD to tell landowners what services we have to offer them.

Education Programs

The Pine SWCD coordinates the Area 3 Envirothon, an outdoor learning competition for high school students and presents at the Freshwater Fair in Pine City. The Freshwater Fair is an outdoor learning event for all fifth graders in the county. Educating young people is important as they are our future. Pine SWCD also does other education workshops including their annual meeting where there is a speaker or panel on an informative topic.

Erosion Control

SWCD assists in writing and reviewing erosion control plans for projects in the shoreland areas when requested to by the LGU.

State Cost Share Program(BWSR)

The Board of Water and Soil Resources provides grants to SWCD's so they can assist local landowners install conservation practices to reduce erosion and improve water quality.

Snake River Watershed Management Board

The Pine SWCD serves on the Technical Advisory Committee and the Citizen Advisory Committee. The Pine SWCD helps coordinate the monitoring and does some of the monitoring in the Pine County portion of the watershed. The Pine SWCD also solicits conservation projects in the watershed, has them designed, and brings them to the Snake River Watershed Management Board for cost share approval. The Pine SWCD also uses State Cost Share funds and solicits lake association funds for projects in the watershed.

Wetland Conservation Act (BWSR)

The Minnesota Wetland Conservation Act exists to achieve no net loss in the quantity, quality, and biological diversity of Minnesota's existing wetlands. If wetland impact is unavoidable, the wetland must be replaced. The Pine SWCD is the Local Government Unit administering WCA and issues exemptions, no-loss, replacement plans and wetland banking determinations.

Floodplain and Shoreland Management

Floodplain and Shoreland Management are DNR Programs that are administered by the County.

Subsurface Sewage Treatment Systems

Pine County Planning and Zoning does the permitting and inspecting for subsurface sewage treatment systems; unless local LGU has adopted its own ordinance. Protecting the public health and the environment by adequate treatment and disposal of sewage from dwellings or other establishments not serviced by a publicly-owned treatment facility are the main goals of the SSTS Program. Pine County and local LGU's enforce "point-of-sale" SSTS certifications countywide.

Public Waters Permits (DNR)

The DNR has the authority to issue or deny permits for proposed projects affecting public waters. Permits are required for any activity affecting the course, current, or cross-section of public waters.

Solid Waste Management

Pine County Planning and Zoning is responsible for the solid waste program.

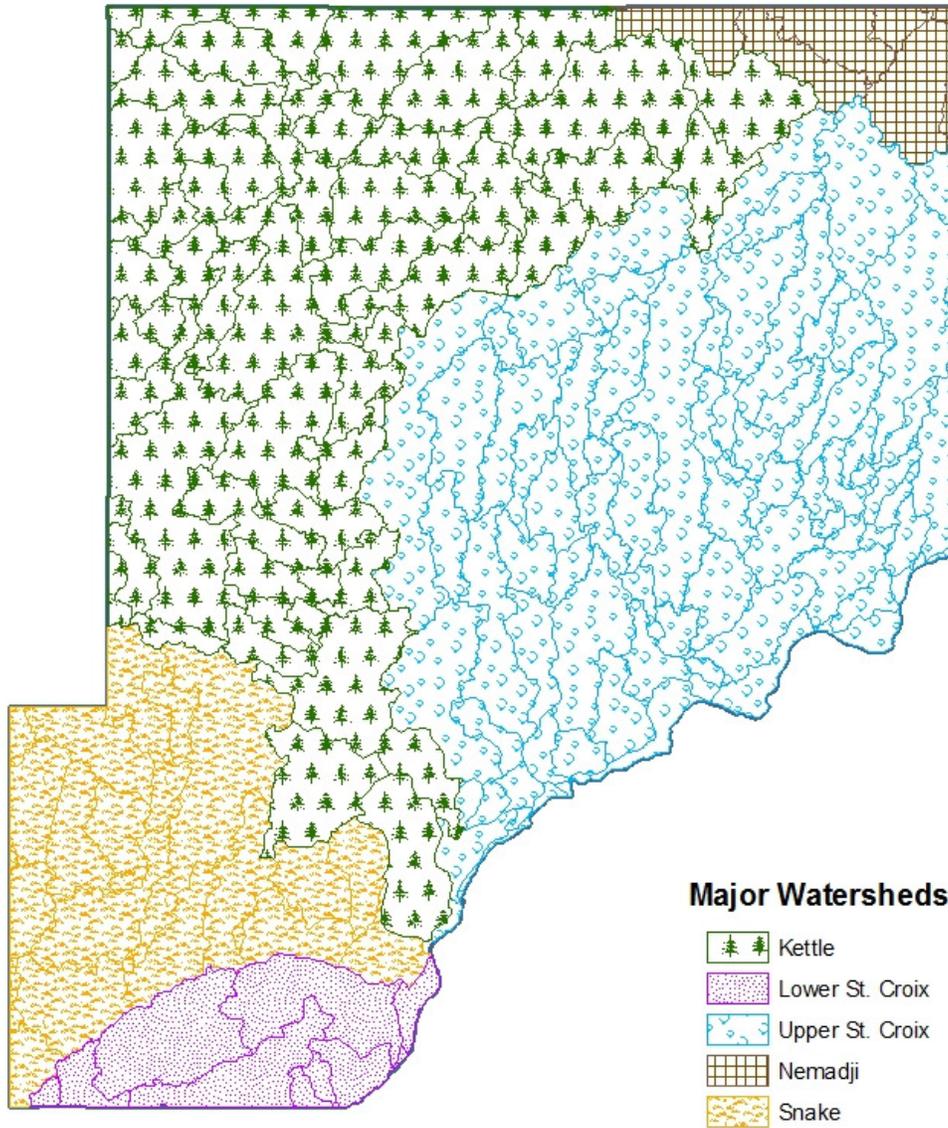
Source Water/Wellhead Protection (MDH)

The MDH administers the Source Water Protection Program. The purpose of Source Water Protection is to help prevent contaminants from entering public drinking water sources, whether the water comes from a well or from surface water. Wellhead Protection Plans have been completed for the cities of Pine City, Hinckley, Sandstone, Askov, Finlayson, and Willow River.

V. APPENDIX

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Major Watersheds in Pine County

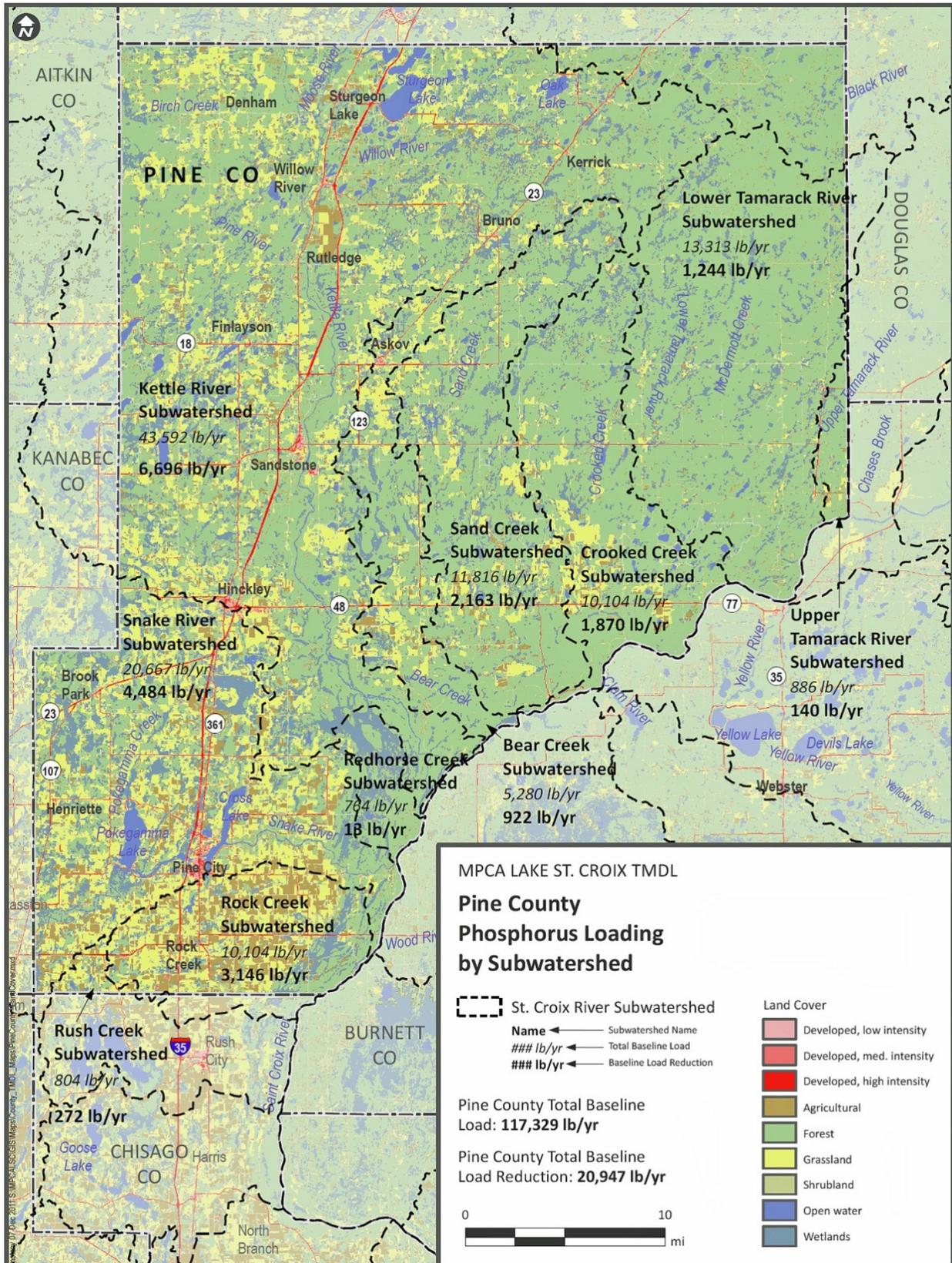


The watershed layers were provided by the Minnesota Department of Natural Resources

Pine County contributing area and baseline phosphorus loading by subwatershed.

Areas (ac) (Within St. Croix Basin)								
County	Total	By landuse (1992 NLCD)						
		Ag	Forest	Grassland	Shrubland	Urban	Water	
Pine	884,545	59,344	558,833	156,161	3,007	5,960	101,239	
Subwatersheds	100%	7%	63%	18%	0%	1%	11%	
Bear Creek	43,381	1,952	26,927	8,530	96	173	5,703	
Crooked Creek	72,574	7,400	57,747	3,824	217	164	3,221	
Kettle River	354,737	14,619	224,205	69,249	1,637	2,973	42,055	
Lower Tamarack River	125,739	5,198	113,105	1,444	90	248	5,652	
Redhorse Creek	12,012	24	7,879	138	68	3	3,901	
Rock Creek	44,264	9,249	11,078	18,669	30	423	4,816	
Rush Creek	3,756	688	915	1,641	1	20	490	
Sand Creek	89,483	7,518	64,242	9,206	828	48	7,643	
Snake River	131,810	12,157	46,952	43,204	39	1,864	27,595	
Upper Tamarack River	6,787	539	5,782	255	2	45	164	
Loading (lb/yr)								
County	Total	By Landuse (1992 NLCD)						TMDL Load Reduction
		Ag	Forest	Grassland	Shrubland	Urban	Water	
Pine	117,329	33,272	49,070	30,751	264	3,341	630	20,947
Subwatershed	100%	28%	42%	26%	0%	3%	1%	18%
Bear Creek	5,280	1,095	2,364	1,680	8	97	36	922
Crooked Creek	10,104	4,149	5,071	753	19	92	20	1,870
Kettle River	43,592	8,196	19,687	13,637	144	1,667	262	6,696
Lower Tamarack River	13,313	2,914	9,932	284	8	139	35	1,244
Redhorse Creek	764	13	692	27	6	2	24	13
Rock Creek	10,104	5,186	973	3,676	3	237	30	3,146
Rush Creek	804	386	80	323	0	11	3	272
Sand Creek	11,816	4,215	5,641	1,813	73	27	48	2,163
Snake River	20,667	6,816	4,123	8,508	3	1,045	172	4,484
Upper Tamarack River	886	302	508	50	0	25	1	140
NOTES:								
*Landuse areas derived from GIS based 1992 NLCD dataset								
*TMDL load reduction= [(lanuse area*P export coefficient)/total subwatershed load]*(total subwatershed reduction) ---> i.e., required reduction is proportional to load contribution per unit area.								
*Load= landuse area * given TMDL phosphorus export coefficient								

Pine County tributary, land cover and phosphorus loading.



**DRAFT 2014 MPCA IMPAIRED WATERS LIST
FOR PINE COUNTY**

Reach	Assessment Unit ID #	Affected Use	Pollutant/ Stressor
Grindstone R Grindstone Reservoir To Kettle R	07030003-501	AQL, AQR	Fish IBI, Fecal Coliform
Kettle R Grindstone R to St Croix R	07030003-502	AQC	Mercury
Kettle R Willow R to Pine R	07030003-503	AQC	Mercury
Kettle R Moose Horn R to Willow R	07030003-505	AQC	Mercury
Kettle R Birch Cr to Moose Horn R	07030003-506	AQC	Mercury
Kettle R Carlton/Pine County Line To Birch Cr	07030003-552	AQC	Mercury
Kettle R Skunk Cr to Grindstone R	07030003-517	AQC	Mercury
Kettle R Former Dam (at Sandstone) To Skunk Cr	07030003-519	AQC	Mercury
Kettle R Pine R to Former Dam (at Sandstone)	07030003-528	AQC	Mercury
Grindstone R, North Branch Headwaters to Grindstone Lake	07030003-541	AQR	E. coli
Grindstone R Grindstone Reservoir to Kettle R	07030003-501	AQR	Fecal Coliform
Grindstone R Grindstone Reservoir to Kettle R	07030003-501	AQL/Fish	Bioassessments
Grindstone R, South Branch Headwaters to Grindstone R	07030003-516	AQR	Fecal Coliform
Grindstone R, South Branch Headwaters to Grindstone R	07030003-516	AQL/Fish	Bioassessments

Grindstone R, North Branch T42N R21W S33, north line to Grindstone R	07030003-544	AQR	Fecal Coliform
Snake R Mud Cr to Mission Cr	07030004-503	AQC	Mercury
Snake R Mission Cr to Cross Lk	07030004-586	AQC	Mercury
Snake R Cross Lk to St Croix R	07030004-587	AQC	Mercury
Pokegama Creek East Pokegama Creek to Unnamed Creek	07030004-532	AQL	Aquatic macroinvertebrate bioassessments
Mission Creek Unnamed Lake (58-0173-00) to T39N R21W S31, west line	07030004-547	AQL	Aquatic macroinvertebrate
Mission Creek Unnamed Lake (58-0173-00) to T39N R21W S31, west line	07030004-547	AQL	Fish Bioassessments
Mission Creek Unnamed Lake (58-0173-00) to T39N R21W S31, west line	07030004-0547	AQL	Oxygen, Dissolved
Mission Creek T39N R22W S36, east line to Snake R	07030004-547	AQL	Fish Bioassessments
Mission Creek T39N R22W S36, east line to Snake R	07030004-547	AQL	Oxygen, Dissolved
Mud Creek (Cty Ditch 10) Mud Lake(Quamba Lk 33-0015-00) to Snake R	07030004-567	AQR	Fecal Coliform
Unnamed creek Headwaters to Cross Lake	07030004-577	AQL	Fish Bioassessments
Unnamed creek Headwaters to Cross Lake	07030004-577	AQR	E. coli
Mission Creek Unnamed Lake (58-0173-00) to T39N R21W S31, west line	07030004-547	AQL	Dissolved Oxygen
Unnamed creek Unnamed creek to Rock Creek	07030005-555	AQL	Aquatic macroinvertebrate bioassessments
Rock Creek Rock Lake to St Croix R	07030005-584	AQL	Aquatic macroinvertebrates bioassessments
Rock Creek	07030005-584	AQL	Fish Bioassessments

Rock Lake to St Croix R

Rock Creek Rock Lake to St. Croix R	07030005-584	AQR	E. coli
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Bear Creek Headwaters to Snake R	07030004-514	AQR	E. coli
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Lakes	Assessment Unit ID#	Affected Use	Pollutant/ Stressor
Cross	58-0119-00	AQR	Nutrient/Eutrophication Biological Indicators
Pokegama	58-0142-00	AQR	Nutrient/Eutrophication Biological Indicators
Net Lake	58-0038-00	AQR	Nutrient/Eutrophication Biological Indicators
Bass Lake	58-0128-00	AQC	Mercury
Big Pine Lake	58-0138-00	AQC	Mercury
Cross Lake	58-0119-00	AQC	Mercury
Grindstone Lake	58-0123-00	AQC	Mercury
Long Lake	58-0107-00	AQC	Mercury
Oak Lake	58-0048-00	AQC	Mercury
Pokegama Lake	58-0142-00	AQC	Mercury
Sand Lake	58-0081-00	AQC	Mercury
Sturgeon Lake	58-0067-00	AQC	Mercury
Tamarack Lake	58-0024-00	AQC	Mercury
Upper Pine Lake	58-0130-00	AQC	Mercury

According to the current data, the following lakes do not meet aquatic recreation use; however, no formal assessment has been made and they are not on the impaired waters list

Rhine Lake	58-0136-00	AQR	Nutrient/Eutrophication Biological Indicators
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Rock Lake	58-0117-00	AQR	Nutrient/Eutrophication Biological Indicators
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Oak Lake	58-0048-00	AQR	Nutrient/Eutrophication Biological Indicators
Big Pine Lake	58-0138	AQR	Nutrient/Eutrophication Biological Indicators

AQL = *Aquatic Life*
AQR = *Aquatic Recreation*
AQC = *Aquatic Consumption*

Besides, improving impaired waters, maintaining unimpaired waters is very important. The following is a list of the **MPCA's 40 Special Waters in Pine County** including Grindstone Lake which is an Outstanding Resource Value Water.

County Waterbody Designation, Township-Range-Section

- Bang's Brook Trout Stream and Tributaries 41-17-15, 20, 21, 22, 29
- Barnes Spring Trout Stream and Tributaries 41-1-81, 12
- Bjork Creek Trout Stream and Tributaries 42-16-2, 9, 10, 11
- Cons Creek Trout Stream and Tributaries 41-17-15, 16, 22
- Crooked Creek Trout Stream and Tributaries 41-17-6, 7, 18, 19, 20, 29, 30
- Crooked Creek Trout Stream and Tributaries 41-18-11, 12, 13
- Crooked Creek Trout Stream and Tributaries 42-17-31
- Crooked Creek, W. Fk. Trout Stream and Tributaries 41-18-11, 12
- Crooked Creek, W. Fk. Trout Stream and Tributaries 42-18-3, 4, 9, 10, 16
- Crooked Creek, W. Fk. Trout Stream and Tributaries 43-18-27, 34
- Crystal Creek Trout Stream and Tributaries 41-16-9, 10, 15
- Grindstone River Trout Stream and Tributaries 42-21-20, 21, 28, 29
- Hay Creek Trout Stream and Tributaries 40-18-6, 7, 8, 18, 19
- Hay Creek Trout Stream and Tributaries 41-18-10, 15, 20, 21, 22, 29, 32, 33
- Hay Creek, Little Trout Stream and Tributaries 40-18-8, 9
- Larson Creek Trout Stream and Tributaries 44-17-5
- Larson Creek Trout Stream and Tributaries 45-17-29, 32
- Lost Creek Trout Stream and Tributaries 40-19-9, 10, 15
- McCullen Creek Trout Stream and Tributaries 42-16-28, 33
- Mission Creek Trout Stream and Tributaries 40-21-1, 2
- Mission Creek Trout Stream and Tributaries 41-20-31
- Mission Creek Trout Stream and Tributaries 41-21-36
- Net River (Carlton) Trout Stream and Tributaries 45-16-6
- Net River (Carlton) Trout Stream and Tributaries 45-17-1
- Pelkey Creek Trout Stream and Tributaries 41-20-33, 34, 35
- Sand River Trout Stream and Tributaries 43-18-4, 5, 7, 8, 18, 19
- Sand River Trout Stream and Tributaries 43-19-24
- Sand River Trout Stream and Tributaries 44-18-33, 34
- Spring Brook Trout Stream and Tributaries 41-20-16, 17, 18, 21
- Unnamed Creek Trout Stream and Tributaries 43-18-2, 3
- Unnamed Creek Trout Stream and Tributaries 44-18-35
- Wilbur Brook Trout Stream and Tributaries 41-18-23, 25, 26
- Wolf Creek Trout Stream and Tributaries 42-18-4, 9, 16
- Wolf Creek Trout Stream and Tributaries 43-18-32, 33
- Kettle River Scientific & Natural 41N-20-15, 22, 23,

Black Lake Bog Scientific & Natural
 Kettle River Wild River Segment Former dam at Sandstone to confluence with Saint Croix River
 Grindstone (123) Lake Trout Lakes
 Saint Croix River Scenic/Rec River
 Kettle River Scenic/Rec River Northern Pine county line to former dam at Sandstone

Listed below are the unimpaired waters in Pine County, with the township/range numbers in which they occur. Most of these waters have not been tested to the extent necessary to determine if they are impaired.

Number and Name	Section	Township	Range	Area Acres
58-1 : Black Lake	19	45	15	11
58-2 : Unnamed	31	45	15	10
Number and Name	Section	Township	Range	Area Acres
58-3 : Billy's Lake	6,7	41	16	13
58-4 : Mallard Lake	16,17	41	16	22
58-5 : Hay Creek Flowage	20,29,30	42	16	66
58-6 : Unnamed	20	45	16	11
58-7 : Rock Lake	6,7,12	41	16,17	81
58-8 : Cranberry Lake	6,1	45	16,17	43
58-9 : Stevens Lake	2	41	17	18
58-10 : Razor Lake	3,4	41	17	110
58-12 : McGowan Lake	8,17	41	17	28
58-15 : Keene Lake	11,14	41	17	10
58-16 : Churchill Lake	12,13	41	17	36
58-17 : Sutton Lake	14	41	17	10
58-19 : Kenney Lake	17	41	17	20
58-24 : Tamarack Lake	4,33	41,42	17	80
58-26 : Crooked Lake	18,19	42	17	94
58-28 : Little Tamarack Lake	33	42	17	58
58-29 : Grace Lake	36	42	17	48
58-31 : Pickerel Lake	1,12	45	17	57
58-34 : Delong Lake	9,10	45	17	41
58-35 : Little Mud Lake	11	45	17	10
58-36 : Wolf Lake	17	45	17	22
58-37 : Walthausen Lake	30,31	45	17	10
58-38 : Net Lake	1,2,35,36	45,46	17	142
58-39 : Headquarters Lake	16	40	18	11
58-40 : Clayton Lake	18,19	40	18	16
58-48 : Oak Lake	10,11,14,15	45	18	444
58-49 : Little Oak Lake	10,15,16	45	18	58
58-50 : Unnamed	16	45	18	25
58-51 : Margaret Lake	26,35	45	18	34
58-52 : Hicks Lake	34	45	18	39
58-54 : Wallace Lake	10	41	19	28
58-58 : McCormick Lake	6,7	44	19	58

58-59 : Stevens Lake	28,33	44	19	53
58-60 : Willow Lake	2,35	44,45	19	24
58-62 : Island Lake	3,4,8,9	45	19	582
58-67 : Sturgeon Lake	9,10,15-17,20,21	45	19	1456
48-68 : Eleven Lake	11	45	19	114
58-69 : Twelve Lake	12	45	19	61
58-73 : Dago Lake	19,30	45	19	107
58-74 : Johnson Lake	21	45	19	37
58-76 : Passenger Lake	28,29,32,33	45	19	75
58-77 : Big Slough Lake	28,33	45	19	59
58-78 : Rush Lake	28,29	45	19	88
58-80 : Unnamed	29,30	45	19	29
58-81 : Sand Lake	4,5,6,31,32	45,46	19	575
58-82 : Unnamed	30,31,25,36	39	19,20	22
58-83 : Second Lake	7,12	44	19,20	42
58-85 : Unnamed	23,26	38	20	10
58-86 : Long Meadows Lake	23,26,27	38	20	82
58-98 : Wolf Lake	27	43	20	30

Number and Name	Section	Township	Range	Area Acres
58-99 : First Lake	1,11,12	44	20	78
58-102: Fox Lake	8	44	20	104
58-103: Mud Lake	9,16	44	20	30
58-104: Clear Lake	9,16	44	20	25
58-106: Little Mud Lake	15,16,21	44	20	19
58-107: Long Lake	15,21,22	44	20	89
58-108: Clear Lake	17	44	20	14
58-109: Rutledge Lake	19	44	20	10
58-111: Stanton Lake	1,2,35	44,45	20	84
58-113: Logan Lake	13	45	20	24
58-115: Mud Lake	18,13	43	20,21	18
58-122: Hinckley Pond	24	41	21	19
58-123: Grindstone Lake	8,9,16,17,21	42	21	520
58-125: Grass Lake	3,26,27,34,35	42,43	21	97
58-126: Elbow Lake	3,4,33,34	42,43	21	108
58-128: Bass Lake	10,11	43	21	32
58-129: Little Pine Lake	10,15	43	21	82
58-130: Upper Pine Lake	20,21,28,29	43	21	216
58-131: Fish Lake	23,24	43	21	82
58-132: Indian Lake	24,25	43	21	72
58-135: Miller Lake	35,36	43	21	75
58-136: Rhine Lake	31,32	44	21	114
58-137: Bass Lake	6,1,31	42,43	21,22	206
58-138: Big Pine Lake	7,8,18,19,13,24	43	21,22	398
58-150: Unnamed	25	42	17	16
58-151: Unnamed	21,22	42	17	12
58-152: Unnamed	12,13	43	17	13.5
58-156: Unnamed	16	43	19	10
58-170: Unnamed	13,24	39	20	70
58-176: Unnamed	14,23	40	19	16
58-194: Unnamed	25,36	42	19	16
58-197: Unnamed	27	42	20	12

58-201: Unnamed	8	44	16	19
58-203: Unnamed	8,9	44	17	20
58-211: Unnamed	25	45	17	33
58-212: Unnamed	15	45	16	12
58-227: Unnamed	9	44	20	10

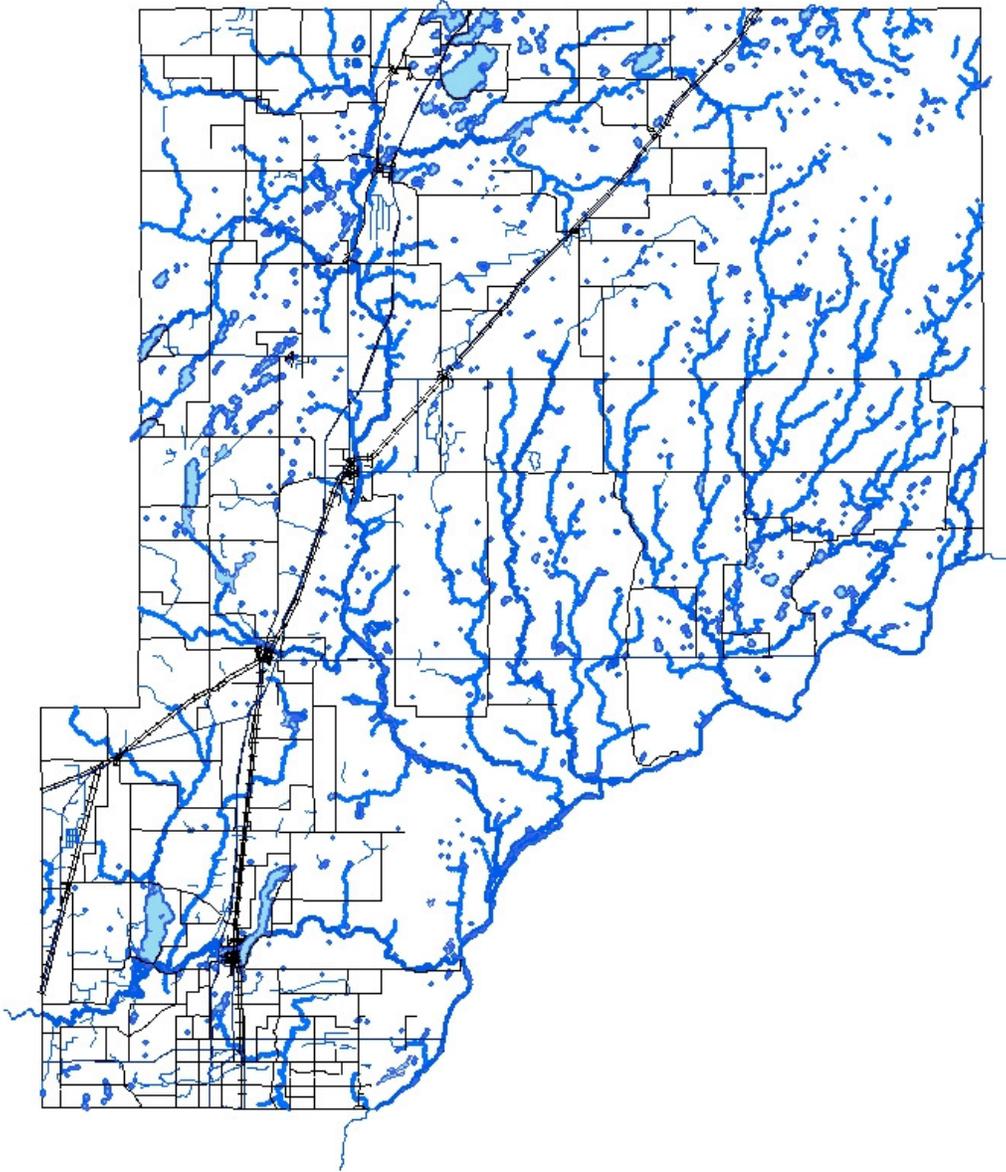
The following natural and altered natural watercourses are protected waters:

Name	From			To		
	Section	Township	Range	Section	Township	Range
St. Croix River (SCR	31	42	15	33	38	20
Upper Tamarack River	6	42	15	36	42	16
Crystal Creek	9(S.F.R.)	41	16	15	41	16
Lower Tamarack River (LTR)	1	44	17	18	41	16
Albrechts Creek	28	42	16	33	42	16
Hay Creek (HC)	18	44	15	31	42	16
Bjorks Creek	2	42	16	9	42	16
Unnamed to Hay Creek	2	43	16	11	43	16
Unnamed to Hay Creek	10	43	16	11	43	16
McDermott Creek (MC)	27	44	16	27	42	17
Squib Creek	28	43	16	12	42	17
Unnamed to MC	20	44	16	4	43	16
Little McDermott Creek	8	43	16	20	43	16
Keene Creek	30	44	16	16	42	17
Ox Creek	35	43	17	34	43	17
Little Ox Creek	4	42	17	9	42	17
Unnamed to LTR	3	43	17	3	43	17
Johnson Creek	16	43	17	21	43	17
Unnamed to LTR	2(Basin 9)	41	17	36	42	17
Crooked Creek	12	41	18	32	41	17
Bangs Brook (BB)	11(Basin15)	41	17	29	41	17
Unnamed to Bangs Brook	16	41	17	22	41	17
Kenney Brook	5	41	17	19	41	17
East Fork Crooked Creek (EFCC)	6	43	17	12	41	18
Unnamed to EFCC	17(Basin25)	42	17	19	42	17
West Fork Crooked Creek (WFCC)	14	43	18	12	41	18
Unnamed to WFCC	1	41	18	12	41	18
Thunder Creek	14	42	18	2	41	18
Strawberry Creek	3	42	18	3	42	18
Wolf Creek	28	43	18	16	42	18
Wilbur Creek	24	41	18	30	41	17
Sand Creek (SC)	19	43	18	19	40	18
Clover Creek	10	41	18	19	40	18
Little Hay Creek	9	40	18	8	40	18
Little Sand Creek	19	42	18	12	40	19
Hay Creek	7	42	18	31	42	18
Unnamed to SC	35	44	18	34	44	18
Partridge Creek	26	43	19	27	42	19
Bear Creek	30	42	19	35	40	19
Lost Creek	9	40	19	22	40	19

Little Bear Creek	33	42	19	9	41	19
Bear Paw Creek	35	40	19	34	40	19
Kettle River (KR)	4	45	20	20	39	19
Kettle River Slough	3	39	19	8	39	19
Kennedy Brook	33	40	19	33	40	19
Fox Brook	2	41	20	9	41	20
		From			To	
Name	Section	Township	Range	Section	Township	Range
Unnamed to KR	12	42	20	15	42	20
Log Drive Creek	12	43	20	14	43	20
Cane Creek	6	43	19	11	43	20
Unnamed to KR	25	44	20	34	44	20
Unnamed to KR	6(Basin58)	44	19	3	44	20
Willow River (WR)	22	45	17	3	44	20
Little Willow River (LWR)	2	44	18	35	45	19
Unnamed to LWR	19	44	18	7	44	18
Unnamed to WR	31(Basin37)	45	17	30	45	17
Larsons Creek (LC)	8	44	17	29	45	17
Unnamed to LC	4	44	17	5	44	17
Hay Creek	5	45	18	25	45	19
Unnamed to WR	22	45	19	33	45	19
Unnamed to Sand Lake	8(Basin62)	45	19	5 (Basin 81)	45	19
Moose River	1	45	20	23	45	20
Birch Creek (BC)	18	45	21	21	45	20
Unnamed to Birch Creek	18	45	20	20	45	20
Pine River (PR)	8(basin 138)	43	21	34	44	20
Unnamed to Pine River	5	44	20	24	44	21
Unnamed tributary	1	44	21	13	44	21
Burman Creek	19	44	21	22	44	21
Little Burman Creek	31	45	21	20	44	21
Rhine Creek	6	43	21	34	44	21
Little Pine Creek	31(Basin 137)	43	21	3	43	21
Unnamed to LPC	31	43	21	31	43	21
Unnamed to Pine River	36	44	21	19	44	20
O'Mix Creek	8	43	20	33	44	20
Wolf Creek	27(Basin98)	43	20	3	42	20
Unnamed to Kettle River	7(Co.Road)	42	20	22	42	20
Deer Creek	5	41	20	9	41	20
Spring Creek	18(R.R)	41	20	21	41	20
Unnamed to Grindstone Lake	8(Co. Road)	42	21	9(Basin 123)	42	21
Pelkey Creek	33	41	20	35	41	20
Cedar Creek (CC)	30(Basin90)	40	20	14	40	20
Unnamed to Cedar Creek	28(Basin89)	40	20	28	40	20
Redhorse Creek	7	39	19	30	39	19
Snake River	7	38	22	31	39	19
Unnamed to EPC	33	41	21	20	40	21
Unnamed to Pokegama Creek	14	40	22	24	40	22
Unnamed to Pokegama Creek	2	39	22	1	39	22
Unnamed to Pokegama Creek	4(Co.Rd 126)	39	22	11	39	22
Unnamed to St. Croix River	15	38	20	26	38	20
Unnamed to unnamed	14	38	20	23	38	20
Stevens Creek	32	38	20	33	38	20

Unnamed to Rock Creek	12	38	21	23	38	21
Unnamed to Rush Lake	34(Basin141)	38	22	34	38	22
Nemadji River	9(Basin33)	45	17	4	45	17
Net River	18	45	16	1	45	17
	1	45	17	6	45	16
Unnamed to Net River	8	45	16	5	45	16
		From			To	
Name	Section	Township	Range	Section	Township	Range
Little Net River	3	45	16	3	45	16

Pine County Lakes and Streams

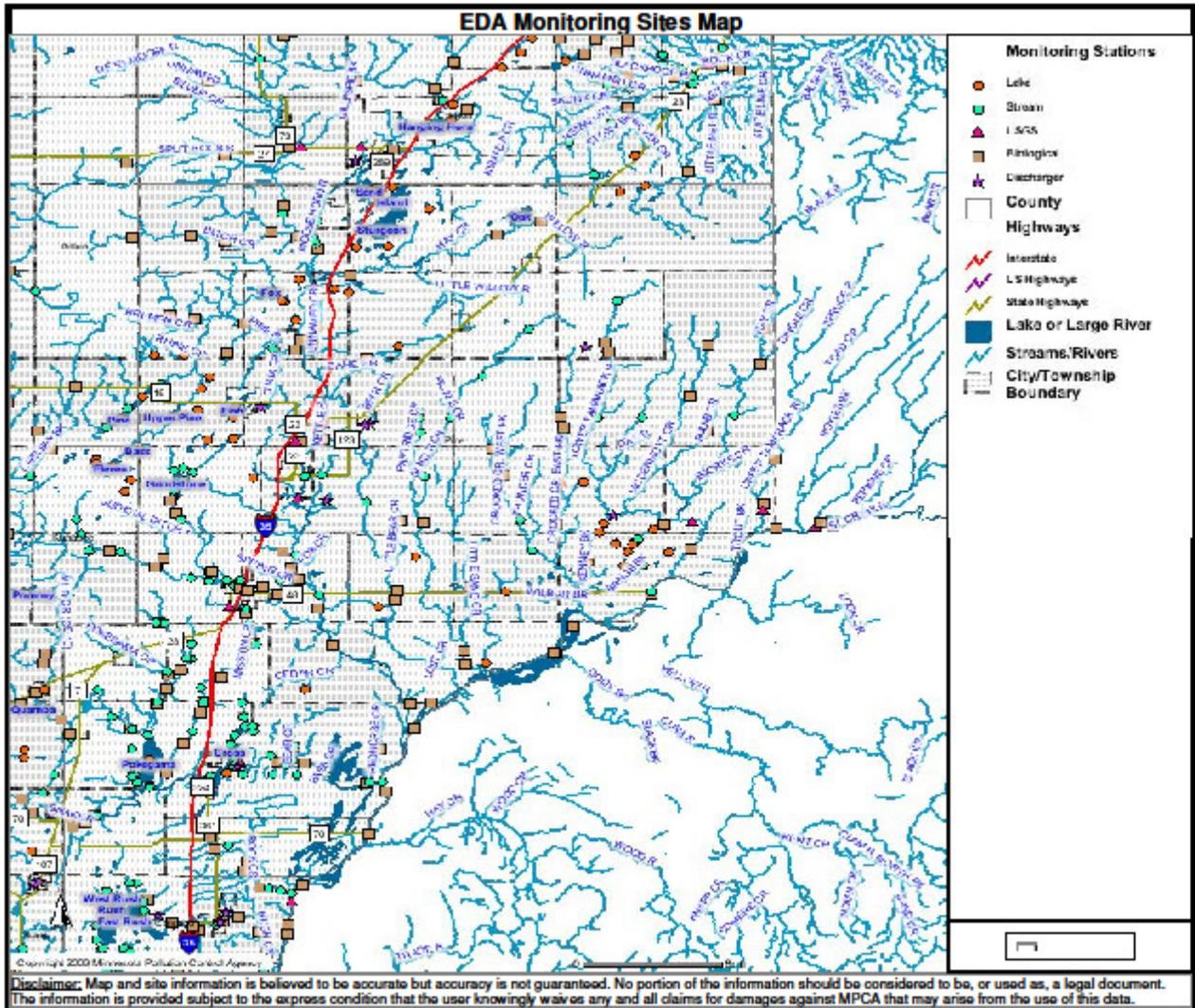


Pine County Major and Minor Watersheds		
Major Watershed	Minor Watershed	# Square Miles
Kettle River (564.5 sq. mi.)	Birch Creek	34.4
	Upper Kettle River	7.1
	Middle Kettle River	89.3
	Lower Kettle River	80.7
	Moose River	24.6
	Willow River	128
	Grindstone River	57.9
	Bear Creek	34.5
	Pine River	108
	Lake Superior (35.6 sq. mi)	North Fork Nemadji
South Fork Nemadji		23.8
St. Croix (563.7 sq. mi.)	St. Croix River Direct	22.1
	Crooked Creek Watershed	110.7
	Sand River	135.4
	Red Horse Creek	18.4
	Rock Creek Watershed	46.6
	Rush Creek	7.1
	Lower Tamarack River	184
	Spruce River	14.6
	Black River	11.2
	St. Croix River Direct	13.6
Snake River (205.3 sq. mi.)	Mission Creek	35.5
	Pokegama Creek	70.3
	Mud Creek	13.3
	Lower Snake River	86.2

Summary of Data Needed for Water Quality Assurance

Pollutant Category	Parameters (or steps)	Period of Record	Minimum Number of Years
Pollutants with toxicity-based standards	Un-ionized ammonia (total ammonia, pH & temperature), chloride	Most recent 10 years	5, within a 3-yr. period
Conventional pollutants and water quality characteristics	Dissolved oxygen, pH, turbidity (including total suspended solids and transparency tube), temperature	Most recent 10 years	20 (over at least 2 years for turbidity, suspended solids and transparency tube)
Swimming safety indicator bacteria	Escherichia coli bacteria impairment determination via monthly geometric mean or individual max. values	Most recent 10 years	5 per month (to calculate mean); at least 3 months
Eutrophication of lakes (effects of excess nutrients)	Total phosphorus (TP), chlorophyll <i>a</i> , Secchi disk transparency	Measurements collected from June to Sept. over the most recent 10-year period	At least one TP, Secchi disk or chlorophyll <i>a</i> measurement
		Measurements collected from June to Sept. over the most recent 10-year period	At least 8 measurements (8 separate sampling dates) for each of TP, Secchi disk & chlorophyll <i>a</i>
Impairment of the biological community	Index of Biological Integrity	Most recent 10 years	Can be based on a single biological monitoring event on a given reach
Supporting water quality data	TSS, total Kjeldahl nitrogen, nitrite-nitrate nitrogen, conductivity, 5-day biochemical oxygen demand, alkalinity, stream TP	Most recent 10 years	As available; These measurements provide supporting information for determining assessments

The guidance for assessments can be found at: <http://www.pca.state.mn.us/water/tmdl/tmdl-waterquality.html>



Environmental Data Access System

The water quality section of MPCA’s Environmental Data Access System allows visitors to find and download data from surface water monitoring sites located throughout the state. Where available, conditions of lakes, rivers, and streams that have been accessed can be viewed. We encourage the citizens to visit this site for water quality monitoring data which may be useful with future water management efforts: www.pca.state.mn.us/data/edaWater/index.cfm

How to Access Water Quality Test Site Information

Information on Pine County Lakes, Rivers, and Streams can be obtained from the Minnesota Pollution Control Agency website.

- Step 1. www.pca.state.mn.us/water/storet.html
- Step 2. Click on ENVIRONMENTAL DATA ACCESS
- Step 3. Click on SURFACE WATER
- Step 4. Click on LAKES & STREAMS
- Step 5. Enter Data/Water Body Name

Each site has an identification number in the database.

Example: Grindstone Lake is an Outstanding Resource Value Water, Station ID 58-0123

Example: Pine County Ditch One Station ID S005-325

Additional information on tested sites can be obtained from staff at the Pine County Soil & Water Conservation District office, located in Sandstone.

Pine Soil & Water Conservation District
1602 Hwy 23 N
Sandstone, MN 55072
Ph: 320-216-4240
Fx: 320-216-4244

WETLANDS - The following are protected wetlands:

Number and Name	Section	Township	Range	Area Acres
58-11 : Lake Five	5	41	17	29
58-13 : Greigs Lake	10	41	17	58
58-14 : Mud Lake	10	41	17	18
58-18 : Lena Lake	15	41	17	50
58-20 : West Kramer Lake	18	41	17	21
58-21 : East Kramer Lake	18	41	17	24
58-22 : Bullhead Lake	21	41	17	32
58-23 : Lake Alma	28,33	41	17	37
Number and Name	Section	Township	Range	Area Acres
58-25 : Dollar Lake	17	42	17	20
58-30 : Mack Lake	7	44	17	12
58-32 : Headquarters Lake	3	45	17	14
58-33 : Maheu Lake	9	45	17	36
58-41 : West Chain Lake	13	41	18	14
58-42 : North Chain Lake	13	41	18	10
58-43 : South Chain Lake	13,24	41	18	14
58-44 : Olive Lake	21	41	18	12
58-45 : Wilbur Lake	23	41	18	47
58-47 : Bartels Lake	21,22	44	18	11
58-61 : East Island	3	45	19	34
58-63 : Lords Lake	6,7,8	45	19	36
58-64 : Unnamed	7	45	19	18
58-65 : Unnamed	8	45	19	14
58-66 : Little North Sturgeon Lake	8,17	45	19	20
58-70 : Lake Thirteen	13	45	19	21
58-71 : Close Lake	18	45	19	34
59-72 : Unnamed	19,20	45	19	16
58-75 : Willow Lake	26,34,35	45	19	64
58-79 : Turtle Lake	29	45	19	33
58-84 : Unnamed	22,23	38	20	11
58-88 : Unnamed	9	40	20	10
58-89 : Cedar Lake	28,29,32,33	40	20	71
58-90 : Mud Lake	30	40	20	12
58-93 : Unnamed	14,15	41	20	100
58-94 : Unnamed	7	42	20	11
58-95 : Unnamed	7,18	42	20	13
58-96 : Unnamed	18	43	20	33
58-97 : Finn lake	18,19	43	20	14
58-100: Unnamed	3	44	20	19
58-101: Shoemaker Lake	3,10	44	20	16
58-105: Unnamed	13	44	20	20
59-110: Cemetery Lake	28	44	20	34
58-112: Zalesky Lake	2,35	44,45	20	12
58-114: Unnamed	28	45	20	10
58-116: Unnamed	18,13	43	20,21	25
58-118: Devils Lake	4,33	38,39	21	19

58-120: Unnamed	32	39	21	10
58-127: Little Bass Lake	10	43	21	18
58-133: Unnamed	25,26	43	21	10
59-134: Unnamed	34	43	21	11
58-139: Unnamed	11,14,15	38	22	17
58-140: Silberg Lake	33	38	22	16
58-141: Stutz Lake	33,34	38	22	23
58-143: Unnamed	35	41	19	18
58-146: Unnamed	4	38	21	8
58-148: Unnamed	23	43	16	12
58-153: Unnamed	34	45	17	10
58-155: Unnamed	20	43	19	13
58-157: Unnamed	29	45	19	50
58-158: Little Lake	31	43	21	25
58-160: Unnamed	12	38	22	10
58-161: Unnamed	33	38	22	10
58-162: Unnamed	1	38	20	16
58-163: Unnamed	14	38	20	11
58-164: Unnamed	23	38	20	16
58-165: Unnamed	32	39	21	11
58-166: Unnamed	7	39	20	27
58-169: Unnamed	17	39	20	30
58-172: Unnamed	33	40	22	10
58-174: Unnamed	3, 10	40	20	18
58-177: Unnamed	34	40	19	19
58-178: Unnamed	5	41	21	21
				Area
Number and Name	Section	Township	Range	Acres
58-179: Unnamed	35	41	21	10
58-180: Unnamed	11	41	20	16
58-181: Unnamed	21	41	20	11
58-185: Unnamed	36	41	19	11
58-186: Unnamed	3	41	18	13
58-187: Unnamed	5	41	18	25
58-189: Unnamed	4,9	41	18	13
58-190: Unnamed	2	41	17	10
58-191: Unnamed	9	41	17	14
58-193: Unnamed	11	42	18	11
58-195: Unnamed	35,36	42	19	43
58-196: Unnamed	2,35	42,43	21	16
58-198: Unnamed	22	43	21	21
58-199: Unnamed	6	43	20	12
58-202: Unnamed	3	44	17	11
58-204: Unnamed	30	44	17	30
58-205: Unnamed	32	44	17	33
58-206: Unnamed	34	44	18	10
58-207: Unnamed	19,24	44	20,21	12
58-208: Unnamed	24	44	21	23
58-209: Unnamed	23,26	45	20	19
58-210: Unnamed	35	45	19	11
58-213: Unnamed	23	41	20	15
58-214: Unnamed	19,24	41	18,19	154.8

58-216: Unnamed	28	44	20	4
58-217: Unnamed	33	39	21	4
58-218: Unnamed	32	39	21	9
58-221: Unnamed	10	44	20	5
58-222: Unnamed	19	43	20	3
58-223: Unnamed	19	43	20	5
58-224: Unnamed	29	43	19	6
58-225: Unnamed	33	44	20	4
58-226: Unnamed	13	43	19	52
58-229: Unnamed	13	43	21	13.5
59-230: Unnamed	7,18	41	17	17
58-231: Unnamed	1,12	40	20	20
13-90 : Unnamed	4,5,32,33	37,38	22	

Major Accomplishments of the 2002 Local Water Management Plan

- Applied for and received Minnesota Pollution Control Agency (MPCA) Surface Water Assessment Grant for ten lakes and nine streams
- Applied for and received Legislative Citizen Commission on Minnesota's Resources(LCCMR) Grant for a county wide soil survey
- Applied for and received Clean Water Legacy Grant for three projects in the Snake River Watershed
- Applied for and received Feedlot Water Quality Grants
- Applied for and received Drought Disaster Assistance Grant
- Applied for and received Beaver Damage Control Grant
- Held Geologic Atlas Workshop and Tour
- Published and sent out a Sinkhole Newsletter to approximately 1,700 landowners in the sinkhole area
- Set up and held shoreline restoration design and planting workshops
- Set up and held rain garden design and planting workshops
- Worked with Extension Service on Community Waste Water Workshops
- Held free nitrate testing clinics at various locations throughout the county every 2 years
- Two staff are presenters at the Freshwater Festival for Pine County Schools
- Conducted stream monitoring on the Grindstone River for baseline data for a TMDL Plan
- Worked with Extension Service on extensive revision of Guide to Rural Living Handbook
- Assisted Wenck and Associates in putting together a TMDL for the Pokegama and Cross Lake Watersheds
- Submitted applications and received funding for monitoring to the Snake River Watershed Management Board for the Pokegama and Cross Lake Associations
- Submitted applications and received funding for projects in the Snake River Watershed to the Snake River Watershed Management Board
- Have used new natural shoreline restoration techniques on shoreland projects
- Worked with Hinckley-Finlayson High School on macroinvertebrate sampling on the Grindstone River
- Gave presentations on natural shoreline restoration and rain gardens

Acronyms

ACE or ACOE - Army Corps of Engineers (federal)

ATV – All Terrain Vehicle

BMP – Best Management Practice

BWSR – Board of Water and Soil Resources

FEMA - Federal Emergency Management Agency (federal)

GIS – Geographic Information System

LCCMR – Legislative Citizen Commission on Minnesota’s Resources

LGU - Local Governmental Unit (local)

LID – Low Impact Development

MDH – Minnesota Department of Health

MDNR or DNR - Minnesota Department of Natural Resources (state)

MPCA or PCA - Minnesota Pollution Control Agency (state)

NEMO – Nonpoint Source Education for Municipal Officials

NPDES/SDS – National Pollutant Discharge Elimination System/State Disposal System

NRCS - Natural Resources Conservation Service, USDA (federal)

PHASE – Pine Habilitation and Supported Employment

RC&D - Resource Conservation & Development, USDA (federal)

SSTS – Subsurface Sewage Treatment Systems

SWA Grant– Surface Water Assessment Grant

SWCD - Soil and Water Conservation District (local)

TMDL – Total Maximum Daily Load

TP – Total Phosphorus

TSS – Total Suspended Solids

UM Ext - University of Minnesota Extension Service (state)

WCA – Wetland Conservation Act

USDA - U.S. Department of Agriculture

USF&WS - U.S. Fish & Wildlife Service (federal)

USGS - U.S. Geological Survey (federal)

VI.

PINE COUNTY SCOPING DOCUMENT

The following Priority Concerns Scoping Document was developed in accordance with the changes to the Comprehensive Local Water Management Act; Statutes: 103B.304-103B.355. This Scoping Document identifies the priority concerns selected by the Pine County Soil and Water Conservation District with assistance from the Pine SWCD Water Plan Working Group, along with a detailed account of how these concerns were identified and chosen.

Pine County Soil and Water Conservation District is the Local Government Unit responsible for administering the Local County Water Management Plan. The county's first Comprehensive Local Water Plan was approved in December 1992. The second Comprehensive Water Plan was approved in November 2003 and it expires on August 28, 2010. On March 4, 2008, the Pine County Board of Commissioners signed the Resolution to Update the Pine County Comprehensive Water Management Plan. This resolution delegates the Pine County Soil and Water Conservation District the responsibility of coordinating, assembling, writing and implementing the revised local water management plan pursuant to MS. 103B.301.

INTRODUCTION

Pine County is located in east central Minnesota. The St. Croix River and the State of Wisconsin border Pine County on the east. With Interstate 35 running the entire length from north to south, it is located about half way between the Twin Cities and Duluth. Pine County has 918,112 acres of surface area. 11,596 acres are surface water with 142 lakes 10 acres or bigger. 27 percent of the land is publicly owned, and 73 percent is privately owned. Surrounding counties are Carlton to the north, Aitkin, and Kanabec to the west and Chisago to the south.

Pine County contains 14 cities and 33 townships. The county seat is Pine City with a population of 3,232. It is also the largest city in the county. The population of the county in 2000 was 26,530. In 2004, the estimated population was 28,116. This is an increase of 5.98%. The estimated population in 2007 was 28,229. According to the State Demographer's Office, the population projection for 2010 is 30,660 and the projection for 2025 is 35,740. These projections were made before the current recession.

From 1996 to 2008, a large amount of development occurred in Pine County; however, development slowed dramatically in 2008 due to the economy. Rural land, and land around lakes and rivers has been developed. During this growth period, agricultural land was converted to residential. Dairy continues to decline and is often replaced with beef or horses. According to Minnesota Agricultural Statistics in 2000, there were 8300 milk cows. In 2008 there were 5,500 milk cows. In 2000 there were 7500 beef cows and in 2008 there were 8900 beef cows. In 1997, there were 1,089 farms in the county and in 2002 there were 1,199. The average size of the farm went from 256 acres in 1997, to 213 acres in 2002. The total cropland acres went from 141,101 in 1997, to 130,846 in 2002. The total farm income including government payments in 2006 was \$43,313,000 and in 1999 it was \$38,592,000. The total land in farms in acres was 279,296 in 1997 and was 254,858 in 2002. Agriculture continues to be an important part of the county's economy.

Forestland is also a valued resource in Pine County. The Department of Natural Resources oversees the 188,086 acres (approximately 21% of the land within the county) of forested lands in State Forests, State Parks, wildlife areas, scientific and natural areas along with other scattered parcels that all provide different types of multiple use recreational opportunities for visitors to the area.

The division of Forestry works with State Forests that were created in the 1930s and 1940s with a goal to produce timber and other forest crops, provide outdoor recreation, protect watersheds, and perpetuate rare and distinctive species of native flora and fauna. Management in the form of time harvest, reforestation,

wildlife habitat improvement, recreational development, and construction of access roads and trails all take place in order to meet the goals set when these forests were created.

The following information comes from the Pine County Assessor's office, as of May 2009.

Land Use Breakdown:

<u>Type</u>	<u># of Acres*</u>	<u>%</u>
Gravel Pits	535.06	.0006
Pasture/Woods	517,473.19	.5810
Roads	10,851.78	.0122
Tillable	116,128.05	.1304
Waste	<u>245,636.58</u>	<u>.2758</u>
Total:	890,624.66	1.000

* The number of acres only includes parcels for which there are deeded acres listed by the Pine County Auditor. Deeded acres are NOT listed for platted property (subdivided into individual lots), so a majority of parcels around lakeshore and within city limits are not included in the totals above. For the most part, this is the acreage for rural parcels within the townships.

Land Ownership Breakdown:

<u>Entity Type</u>	<u># of Acres</u>	<u>%</u>
Private Ownership	639,730.36	.7183
Cemetery	162.80	.0002
Church Property	522.48	.0006
County Property	52,052.29	.0584
Indian Reservation Property	1,155.19	.0013
Municipal Property	2,659.56	.0030
Public Hunting Grounds	1,501.0	.0017
Purely Public Charity Property	1,266.85	.0014
School Property	631.59	.0007
Senior Citizen Property	6.94	N/A
State Property	184,602.20	.2073
Tax Forfeit Property-Private	270.89	.0003
USA Property	6,041.17	.0068
Colleges & Universities	<u>21.34</u>	<u>N/A</u>
Total:	890,624.66	1.00

PHYSICAL FEATURES OF PINE COUNTY

Watersheds

There are five main watersheds in Pine County: the Upper St. Croix, Kettle, the Snake, the Lower St. Croix and the Nemadji. The Kettle River Watershed encompasses a good portion of Pine County from the north-western corner of the county down to south of Hinckley. Most of the river is surrounded by a heavy forest of black spruce, fir, birch, aspen, maple, ash, and elm, as well as red, white and jack pine. The Kettle River is a state "Wild and Scenic" river.

The Snake River Watershed covers a portion of the western to southwestern edge of the county. Logging began in the Snake River Watershed in the mid 1800s. Fishing on the Snake River also adds to the history of the watershed. Huge sturgeon were caught in the 1930's – 1940's. The Snake River has survived

glaciers, floods, droughts, and fires; however, new environmental issues threaten the present and future enjoyment of the river such as off-road vehicles.

The St. Croix Watershed extends from the eastern edge of Pine County down to the southern edge of the county and beyond. The St. Croix is known for its natural beauty. The Lower St. Croix River Watershed includes all the land areas that drain into this portion of the St. Croix and its tributaries. A 1998 data assessment found that within the 195 miles of the basin monitored by the Minnesota Pollution Control Agency, only 46.4% of the water in the St. Croix watershed is safe for full body contact; areas of particular concern are the north branch of the Sunrise and the Grindstone Rivers.

The Pine County portion of the Nemadji River Watershed encompasses approximately forty square miles. The Nemadji State Forest makes up about thirty one square miles and the remaining nine square miles are in private ownership.

Geology

The basalt bedrock runs along the east side of the county in a northeast direction. The Hinckley-Sandstone bedrock runs through the center of the county from southwest to northeast and contains fractures in the bedrock that often form sinkholes at the surface. The Fon du Lac Formation is in the northwest portion and the McGrath Gneiss and Mica schist make up the extreme northwest.

The surface geology of Pine County was influenced by two glaciers. The Superior Lobe came from the northeast, and advanced across Pine County and then retreated. While recessing, it first left behind sand sediment in Hinckley and then more clay sediment by Askov and finally very clay rich sediment by Nickerson that is like the clay deposited in glacial lakes. The Grantsburg Sublobe of the Des Moines Lobe came from the southwest into the area south of Pine City. It deposited low east-west trending moraines that cross the county at Pine City. A drainage system now occupied by the Snake River formed along the front (north) of this glacier, depositing a broad, sandy plain west of Pine City but narrowing to a more defined channel east of Cross Lake. The bedrock west of Pine City is made up of softer and more easily eroded sandstone, whereas east of Pine City the bedrock is composed of harder and less easily eroded basalt. Glacial landforms in the western part of the county (west of I-35) are better developed and more easily recognized. Eskers were formed by the flowing water building channels into the bottom of the ice. The Grindstone Lake tunnel valley was formed by the flowing water carving a broad trough below the ice.

The northern part of the county has higher elevation and is more forested. The southern part of the county is lower and has had more agriculture. The City of Rock Creek, the Pine City area and areas around lakes and rivers have changed to more residential development. The northeastern part of the county and the extreme south drain to the St. Croix. The Snake River drains the southwestern portion of the county. The Nemadji River drains a small portion of the extreme northeast.

PRIORITY CONCERNS HISTORY

Pine County Soil and Water Conservation District advertised and held three public meetings in late-July and August, 2008 to solicit input for the new Water Management Plan.

The first meeting was held at the Sturgeon Lake City Hall on July 24, 2008. Five concerns were brought up at this meeting:

1. Dumping municipal water into lakes and streams. Chemical testing on public septic systems.
2. Residential septics – options other than mound systems which are too costly and don't always work.
3. Sewer systems at lakes – funding for systems, and who should be on it.
4. Invasive aquatics
5. Surface water runoff and drainage ditches - water quality testing needs to be done in order to ascertain current water quality

The second meeting was held at the Askov Community Center on August 2, 2008. Four concerns were brought up at this meeting:

1. Water monitoring around County Ditch #1 and Grindstone Lake. All water going into the lake and coming out of the lake needs to be tested.
2. Eurasian Water Milfoil and BlueGreen Algae
3. Sinkhole area, groundwater pollution coming from city ditch and sinkholes
4. Water power/wind power

The third public meeting was held at the Pine County Courthouse on August 21, 2008. Seven concerns were brought up at this meeting:

1. Runoff into streams, rivers, wetlands, and lakes. Erosion, fertilizer (domestic and farm) getting into groundwater. Phosphorus and E.Coli in Pokegama Lake and Cross Lake
2. Management of ISTS – dumping into lakes, streams and wetlands
3. Storm water management
4. Protect wetlands
5. Pine County Conservation Corp
6. Flood warning system
7. Culverts, railroad bridge and Hwy 53 bridge

A survey was also sent out in an attempt to solicit more public input. All city offices as well as all townships received it. It was also printed in the Pine County Waters newsletter published by Pine County Soil and Water Conservation District, which is mailed to every Pine County landowner (approximately 23,500 copies). Below is a copy of the survey that was distributed along with the responses.

Pine County Citizen Survey

Which watershed is your home/land located in?

- 16 Kettle
- 9 Snake
- 3 Upper St Croix
- 1 Lower St Croix
- 1 Nemadji

What are the top four problems in Pine County?

- Failing septic systems
- Development pressure/impacts
- Declining water clarity
- Storm water/Drainage management
- Contaminated runoff
- Natural habitat destruction
- Lack of environmental education
- Erosion
- Lack of regulations
- Groundwater contamination
- Over-application of fertilizers
- Other
 - 1. Meth
 - 2. Lack of economic opportunity
 - 3. Perception that the review process is too difficult
 - Cattle polluting streams
 - Junk Properties
 - Manure & septic disposal and runoff into streams

Which resource is the most threatened? *(Ranked 1-5, with 1 being the most threatened)*

- 1 Other Climate Change
- 2 Groundwater
- 3 Wetlands
- 4 Streams/Rivers
- 5 Lakes

Additional Comments/Suggestions:

1. Remember the land owner's rights.
2. We are planning on drilling a well on our property. Who can we contact to do it properly?
3. Lakes over run with weeds.
4. Allow more regular septic systems instead of mounds.
5. Stop beaver trapping where it's not needed.
6. Lakeshore owners need shore line buffers.
7. Junk yard regulations, including zoning regulations.
8. Pollution-air /water/noise and gasoline waste from off-road vehicles, ATV's and snowmobiles.
9. Grass clippings in the lake.
10. Bad access maintenance.
11. Heavy boat and jet ski traffic close to shore causing waves and erosion.
12. Septic pumping trucks dumping in fields in the watershed area.
13. Animals grazing in the watershed areas.
14. Lack of regulations for improvement of septic inspection at point of sale.
15. Need clear enforced ordinances to impaired water quality in lakes and streams.

SUMMARY OF AGENCY COMMENTS

Minnesota Department of Natural Resources – Wildlife

- The first priority is shoreland landscaping public education to protect lake and river resources and maintain high quality natural resources in the county.
- The second priority is trout stream management and enhancement.

Minnesota Department of Natural Resources – Forestry

- First priority is voluntary site level forest management guidelines. These guidelines are mandatory for state agencies in all aspects of forest management. Educating the public is needed. Eastern Pine County is high priority.
- The second priority is increasing shoreland development. Action needed is enforcing existing zoning and tougher penalties. Northern Pine County is high priority.

Minnesota Pollution Control Agency

- The first priority is impaired waters. Actions needed are:
 1. Include the list of impaired waters
 2. Identify the priority the county places on addressing the impaired waters and how the county will participate in the TMDL Studies
 3. Address the commitment of the county to put data collected through MPCA Programs into the STORET database
 4. Provide plans of any planned monitoring of unmonitored waters in the county
 5. Describe actions the county plans to take to reduce the pollutants causing the impairment.
- The second priority is feedlots. Action needed is for Pine County to become a feedlot county with a county feedlot officer. This would give the county a systematic way of evaluating and regulating the feedlots in the county.
- The third priority is storm water treatment prior to entering surface waters. Pine County has 40 waters considered special by the MPCA plus the impaired waters list. Actions needed are:
 1. Updating the county storm water ordinance
 2. Increased exposure of county and private organizations to educational programs on erosion and sediment control trainings
 3. Increased communication of NPDES/SDS permit requirements to public entities by local agencies. High priorities are Pokegama Lake, Pokegama Creek and the Snake River.
- The fourth priority is encouraging low impact development (LID) practices and plans for future developments; and to provide mechanisms for expeditious approval of projects that meets LID standards. Actions needed include ordinance or comprehensive plan changes to encourage or require landowners to implement low impact development practices.

Minnesota Board of Water and Soil Resources

- The first priority is the Clean Water, Land and Legacy Amendment. This is dedicated money that will be used to restore and protect natural resources. Actions needed are to incorporate the Amendment initiatives to restore, enhance and protect our natural resources into the water management plan.
- The second priority is water quality. Actions needed are:
 1. Balance development growth with water quality protection initiatives to preserve or restore native buffers in riparian areas that will be or have been developed
 2. Seek opportunities to permanently preserve forested riparian wetlands
 3. Explore zoning options that encourage low impact development (LID) for new developments
 4. Develop a watershed based approach for implementing conservation projects
 5. Group conservation projects within watersheds
 6. Assess forest management practices to determine impacts to water quality
 7. Assist landowners in forest management practices and development of sustainable forest management plans
 8. Continue implementation of the Wetland Conservation Act (WCA).
- The third concern is erosion and sediment control. Development results in the fragmentation and loss of natural habitat providing the retention and treatment of water prior to discharge downstream. The use of effective

temporary and permanent erosion and sediment control practices for development reduces non-point source pollution to downstream waters. Actions needed are:

1. Review development requirements to determine if they address and satisfy the temporary and permanent erosion and sediment control practice requirements and expectations of the County.
2. Consider new technologies or alternative conservation practices for temporary and permanent erosion and sediment control on public and private lands to provide retention and treatment of water prior to discharge downstream.
3. Develop SWCD workshops related to temporary and permanent erosion and sediment control. High priority is municipalities and riparian lands.

PRIORITY CONCERNS FOR THE PINE COUNTY LOCAL WATER MANAGEMENT PLAN UPDATE

All the public comments received were compiled. Our Water Management Plan Working Group met to review the public comment, express their concerns, review the actions not completed in the current water management plan, and came up with two priority concerns:

I. Water Quality:

A. Improving Impaired Waters

- 16 segments on 7 different streams are listed on the MPCA Impaired Waters List. Pokegama and Cross Lakes are Eutrophic Lakes and are on the Impaired Waters List. Much has been done on these two lakes but there is still much to accomplish. Most of the state funding and Clean Water Amendment Funding will be directed to impaired waters.
- After testing in 2008, high levels of phosphorus, nitrogen, and E. coli were found in intermittent streams entering Cross and Pokegama Lakes. High levels of E. coli were also found in the Lower Snake River. The goal of the St. Croix Basin Team is to reduce the amount of phosphorus entering the St. Croix by 20% by the year 2020. The Lake Pepin TMDL is currently underway. The MPCA plans to implement TMDL Studies on the Snake River Watershed and the Grindstone River Watershed in 2010.

B. Maintaining Unimpaired Waters

- Eurasian Water Milfoil is now in Sand and Island Lakes.
- Blue Green Algae is a problem in most lakes in the county. The summer of 2007, many lakes in the county suffered early and lasting blue-green algal blooms
- Most lakes have curly leaf pondweed.
- The MPCA considers Grindstone Lake an “Outstanding Resource Value Water”. After the 1993 MPCA Lake Assessment Program Study, more water quality monitoring was to be conducted. Grindstone Lake is on the MPCA’s “List of 40 Special Waters in Pine County”. The lakes in the central and northern part of the county need to be protected to maintain or improve their current water quality.

II. Natural Resources Conservation, Utilization and Education

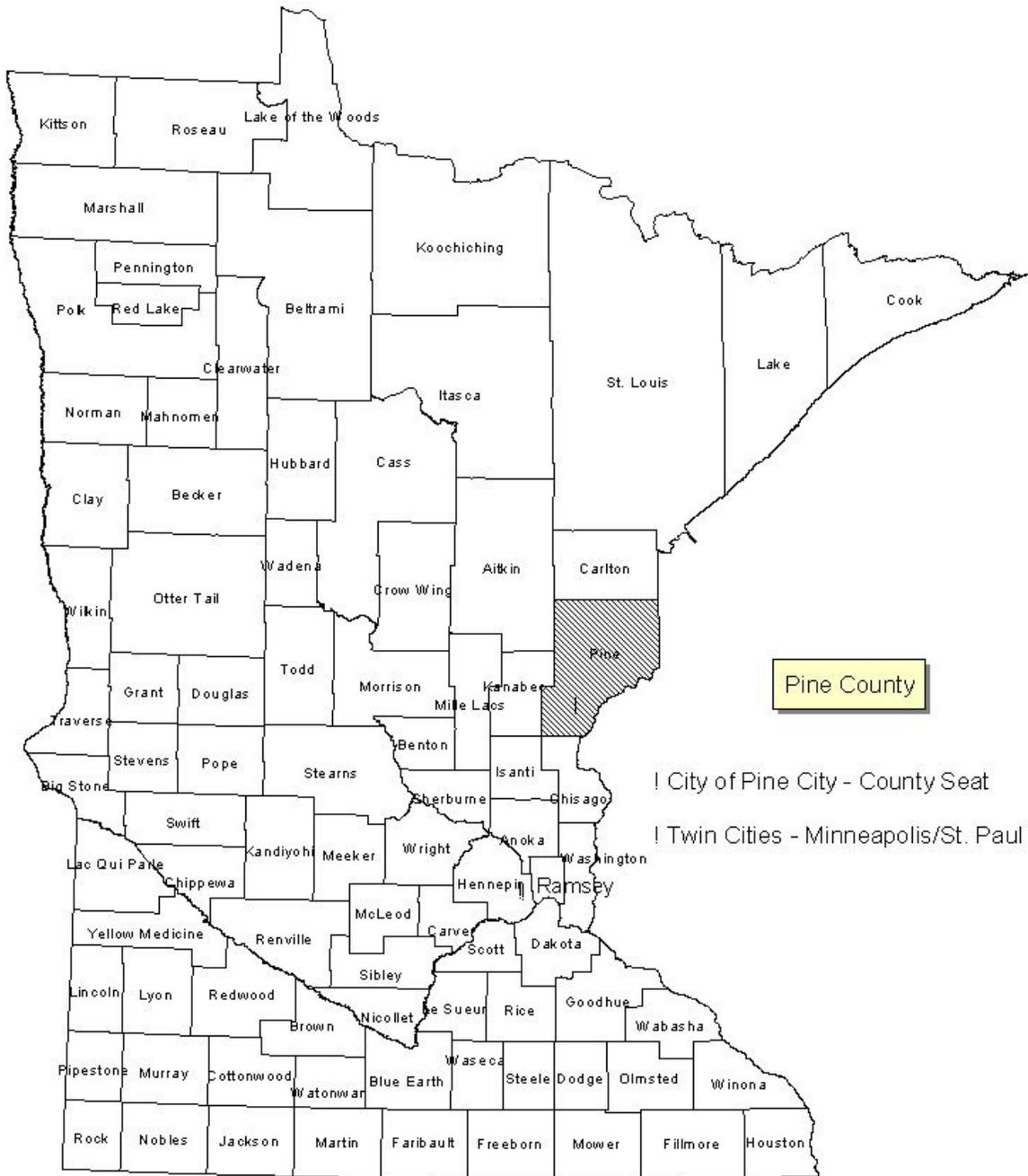
- There is a need to educate people on livestock exclusion, vegetative buffers, and the planting of riparian areas. The preservation and restoration of the riparian land adjacent to inland lakes and streams is critical to maintaining or enhancing the water quality of downstream waters. Protection of riparian lands prevents degradation of water quality through non-point pollution
- Most lake lots do not have buffers. Sediment, nutrients and pollutants are allowed to run directly into lakes and rivers without filtering. The shorelines erode more easily due to lack of stability from long roots of native vegetation.
- Storm water management is important as the three largest cities in the county are located on rivers. Hinckley is located on the Grindstone River, which is impaired. Pine City is on the Snake River and Cross Lake, which are both impaired. Sandstone is located on the Wild and Scenic Kettle River. The Kettle River is also on the MPCA's "List of 40 Special Waters in the County". The cities of Pine City and Sandstone have incorporated rain gardens into their storm water management plans. Need to do Nonpoint Education for Municipal Officials (NEMO) and educate cities on storm water.
- There are many abandoned and hand dug wells in the county. These can be direct conduits for pollutants into the groundwater. There is a need to educate public on need to identify abandoned and hand dug wells.
- Wetlands preservation is very important. Wetlands give many benefits including filtering, groundwater recharge and excess water storage.
- Have worked with cities on Wellhead Protection Plans and will follow their plans and assist them.
- Many people do not practice pollution prevention.
- Water quality can be affected by forest fragmentation or unsustainable forest management practices, which can deteriorate fisheries habitat and increase erosion and sedimentation
- Development results in the fragmentation and loss of natural habitat providing the retention and treatment of water prior to discharge downstream
- Use of effective erosion and sediment control practices for development reduces non-point source pollution to downstream waters
- During the sinkhole study completed by Dr. Calvin Alexander a professor from the University of Minnesota, 300 sinkholes in the Askov area were found. It is believed that about three times that many exist in the area. Need to buffer the areas around sinkholes.
- If the economy picks up again, there will be development pressure in the county. Most of the prime spots on lakes are already developed so second and third tier development around lakes and development on rivers will increase.

Other Agencies:

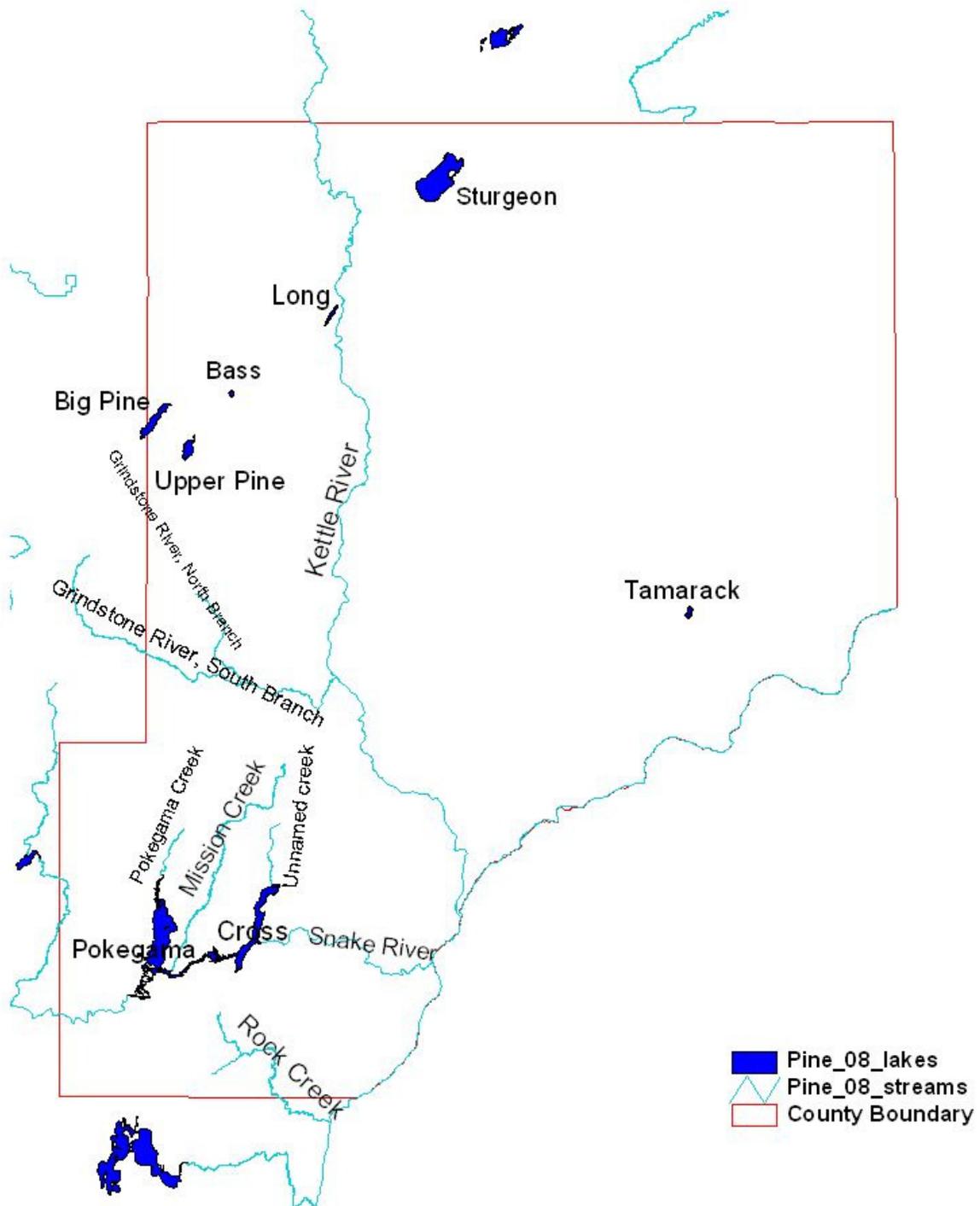
Many of the concerns not addressed by our Water Plan are very important issues but are the responsibilities of other agencies.

- Subsurface Treatment Systems (SSTS's) are regulated by the Planning and Zoning Office. This includes lake homes and mound systems. Some townships have their own septic ordinances.
- Some townships have their own zoning ordinances. The Planning and Zoning Office is working on updating SSTS ordinance, and possibly a junkyard ordinance. The MN DNR deal with the shorelands ordinance.
- The Recycling Shed Programs is currently being handled by Pine Habilitation and Supported Employment (PHASE), under contract with Pine County. The Planning and Zoning Office has held and/or administers the household hazardous waste, pesticide collection, and solid waste recycling programs.
- The Minnesota Pollution Control Agency is responsible for Municipal Wastewater Treatment Plants.
- The MN DNR has an Exotic Species Program.
- The Minnesota Department of Natural Resources – Section of Fisheries does the lake surveys which show numbers of fish in lakes. They would also be responsible for allowing rough fish removal.
- The Minnesota Department of Natural Resources is responsible to ensure activities in the water course do not block fish passage.
- The Minnesota Department of Natural Resources administers snowmobile and ATV laws.
- The MN DNR works with public accesses.
- MN DNR Division of Waters deals with Ordinary High Water Elevations on lakes and rivers.
- The County would the best alternative for establishing a GIS Department.
- Storm water permits are under MPCA's jurisdiction
- The Minnesota Department of Health is responsible for well ordinances
- Flood Warning System would be DNR Waters
- Army Corps of Engineers and the Railroad would be responsible for changing the railroad bridge.

*Attachments: State/county Map
Impaired Waters Map
TMDL Map
TMDL List
Watershed Map
Water Management Advisory Committee Members*



**2008 DRAFT MPCA IMPAIRED WATERS LIST
FOR PINE COUNTY**



**2008 MPCA IMPAIRED WATERS
FOR PINE COUNTY**

Reach	Assessment Unit ID #	Affected Use	Pollutant/ Stressor
Grindstone R Grindstone Reservoir to Kettle R	07030003-501	Aquatic Recreation	Fecal Coliform
Grindstone R Grindstone Reservoir to Kettle R	07030003-501	Aquatic Life/Fish	Bioassessments
Grindstone R, South Branch Headwaters to Grindstone R	07030003-516	Aquatic Recreation	Fecal Coliform
Grindstone R, South Branch Headwaters to Grindstone R	07030003-516	Aquatic Life/Fish	Bioassessments
Grindstone R, North Branch T42N R21W S33, north line to Grindstone R	07030003-544	Aquatic Recreation	Fecal Coliform
Pokegama Creek East Pokegama Creek to Unnamed Creek	07030004-532	Aquatic Life	Aquatic macroinvertebrate bioassessments
Mission Creek Unnamed Lake (58-0173-00) to T39N R21W S30, west line	07030004-547	Aquatic Life	Aquatic macroinvertebrate
Mission Creek Unnamed Lake (58-0173-00) to T39N R21W S30, west line	07030004-547	Aquatic Life	Fish Bioassessments
Mission Creek T39N R22W S36, east line to Snake R	07030004-548	Aquatic Life	Fish Bioassessments
Mission Creek	070300040548 2,5	Aquatic Life	Oxygen, Dissolved
Mud Creek (Cty Ditch 10) Mud Lake to Snake R	07030004-567	Aquatic Recreation	Fecal Coliform
Mud Creek (Cty Ditch 10) Mud Lk to Snake R	07030004-567	Aquatic Life	Fish Bioassessments
Unnamed creek Headwaters to Cross Lake	07030004-577	Aquatic Life	Fish Bioassessments
Unnamed creek Unnamed creek to Rock Creek	07030005-555	Aquatic Life	Aquatic macroinvertebrate bioassessments

Rock Creek Rock Lake to St Croix R	07030005-584	Aquatic Life	Aquatic macroinvertebrates bioassessments
Rock Creek	07030005-584	Aquatic Life	Fish Bioassessments
Bear Creek Headwaters to Snake R	07030004-514	Aquatic Life Aquatic Recreation	

Lakes	Assessment Unit ID#	Affected Use	Pollutant/ Stressor
Cross	58-0119-00	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators
Pokegama	58-0142-00	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators

Water Management Advisory Committee Members

Water Plan Working Group Members

Jill Carlier, Pine SWCD	Sam Martin, Pine SWCD
Al Johnson, Pokegama Lake Assoc	Dean Yorston, Cross Lake Assoc
Doug Odegard, Pine SWCD Supervisor	Sam Griffith, City of Sandstone
Joan Westerlund, Grindstone Lake Assoc	Don Slama Sr., Sandstone
Don Razskazoff, Finlayson/Geise Sportsmans Club	

Water Plan Task Force Members

Jill Carlier	Sam Martin	Doug Odegard
Dean Yorston	Skip Thomson	Tom Swaim
Joan Westerlund	Don Slama Sr.	Don Razskazoff
Curt Rossow	Steve Chaffee	Joe Luedtke
Steve Hallan	Jerry Telker	Mitch Pangerl
David Slama	David Koland	Matt Ludwig
Steve Chaffee	Don Lindquist	

Assisting Agencies

NRCS, Julie Salmon	DNR Waters, Heidi Lindgren
Pine County Zoning, Kelly Schroeder	DNR Fisheries, Roger Hugill
MPCA, Chris Klukas	BWSR, Ryan Hughes
U of M Extension, Terry Salmela	Pine County Coordinator, David Minke

2014 Pine County Soil & Water Conservation District Board

Skip Thomson, Chairman	Doug Odegard, Vice Chair
Joe Luedtke, Secretary	Tom Swaim, Treasurer
Jerry Telker, Public Relations	

2014 Pine County Board of Commissioners

Steve Hallan	Steve Chaffee
Curt Rossow	Mitch Pangerl
Matt Ludwig	