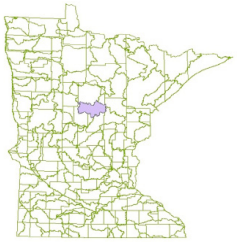
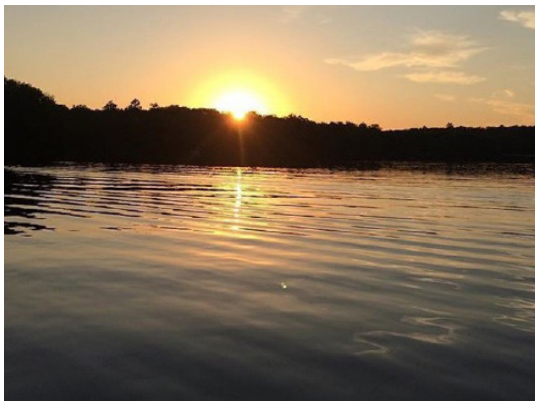
Pine River

Watershed Restoration and Protection Strategies (WRAPS) Report Summary



Minnesota has adopted a "watershed approach" to address the state's 80 "major" watersheds (denoted by 8-digit hydrologic unit code or HUC). This approach looks at the drainage area as a whole instead of focusing on lakes and stream sections one at a time, thus increasing effectiveness and efficiency. This watershed approach incorporates the following activities into a 10-year cycle:

- Water quality monitoring and assessment
- Watershed analysis
- Civic engagement
- Planning
- Implementation
- Measurement of results



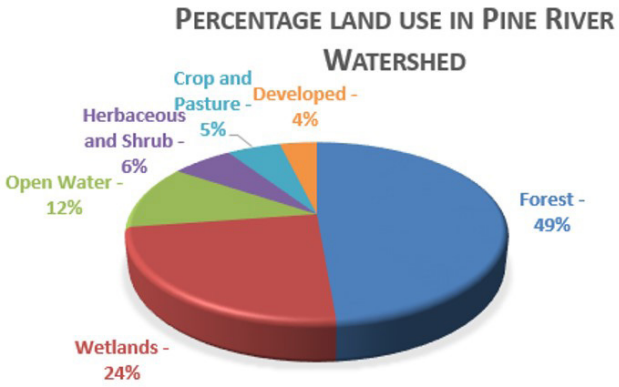
Lake Emily in the eastern portion of the Pine River Watershed. Photo by Pam Roden

The Pine River Watershed process began in 2012. It was the first time watershed assessments incorporated biology (fish and macroinvertebrates) along with the traditional chemistry and flow for a comprehensive watershed health assessment. The watershed approach adds a protection component for water resources that currently meet standards rather than focusing entirely on restoration of impaired waters.

Watershed characteristics

- Size: 783 square miles or 501,180 acres.
- Water: ~Over 400 lakes >10 acres and 500 perennial river miles.
- Counties: Crow Wing, Cass, Aitkin and Hubbard.
- Ecoregions: Northern Lakes and Forests
- Land use: Predominantly forested, with only about 4% developed.
- Municipalities in the watershed include Pine River, Backus, Breezy Point, Manhattan Beach, Crosslake, Emily, Jenkins, and Chickamaw Beach.
- The 8-digit hydrologic unit code (HUC) for the Pine River Watershed is 7010105.

Land use in the Pine River Watershed

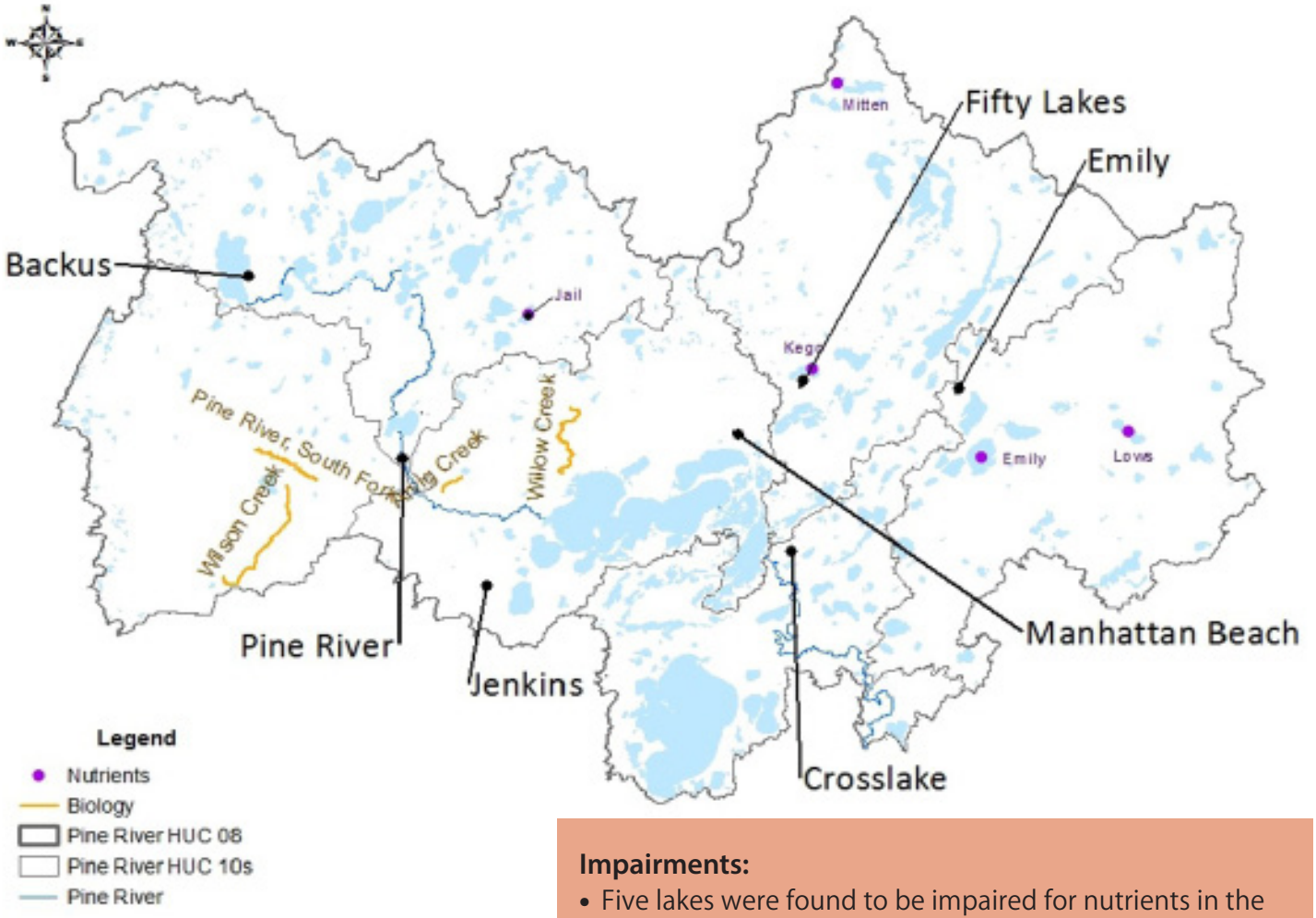


Assessments: Are waters meeting standards and providing beneficial uses?

During the first phase of the watershed approach – intensive watershed monitoring – the Minnesota Pollution Control Agency (MPCA) and local partners collect data about biology such as fish populations, chemistry such as pollutant levels, and flow to determine if lakes and streams are meeting water quality standards.

Waters are "impaired" if they fail to meet standards. The map below shows the impairments for streams and lakes in the Pine River Watershed. Under federal and state laws, impaired waters must have Total Maximum Daily Load (TMDL) studies to determine reductions of pollutants needed to meet water quality standards. In this first WRAPS cycle, the MPCA and local partners completed TMDL studies for Kego and Jail Lakes, both of which had been listed as impaired prior to the current WRAPS process.

Impairments in the Pine River Watershed



Impairments:

- Five lakes were found to be impaired for nutrients in the Pine River Watershed.
- Four stream sections were found to have biology impairments.

Stressors: What factors are affecting fish and bugs?

To develop strategies for restoring or protecting water bodies with biological impairments, agencies and local partners must first identify the possible causes, or stressors, of the impairments. The table below summarizes the predominant stressors of the indicated streams in the Pine River Watershed.

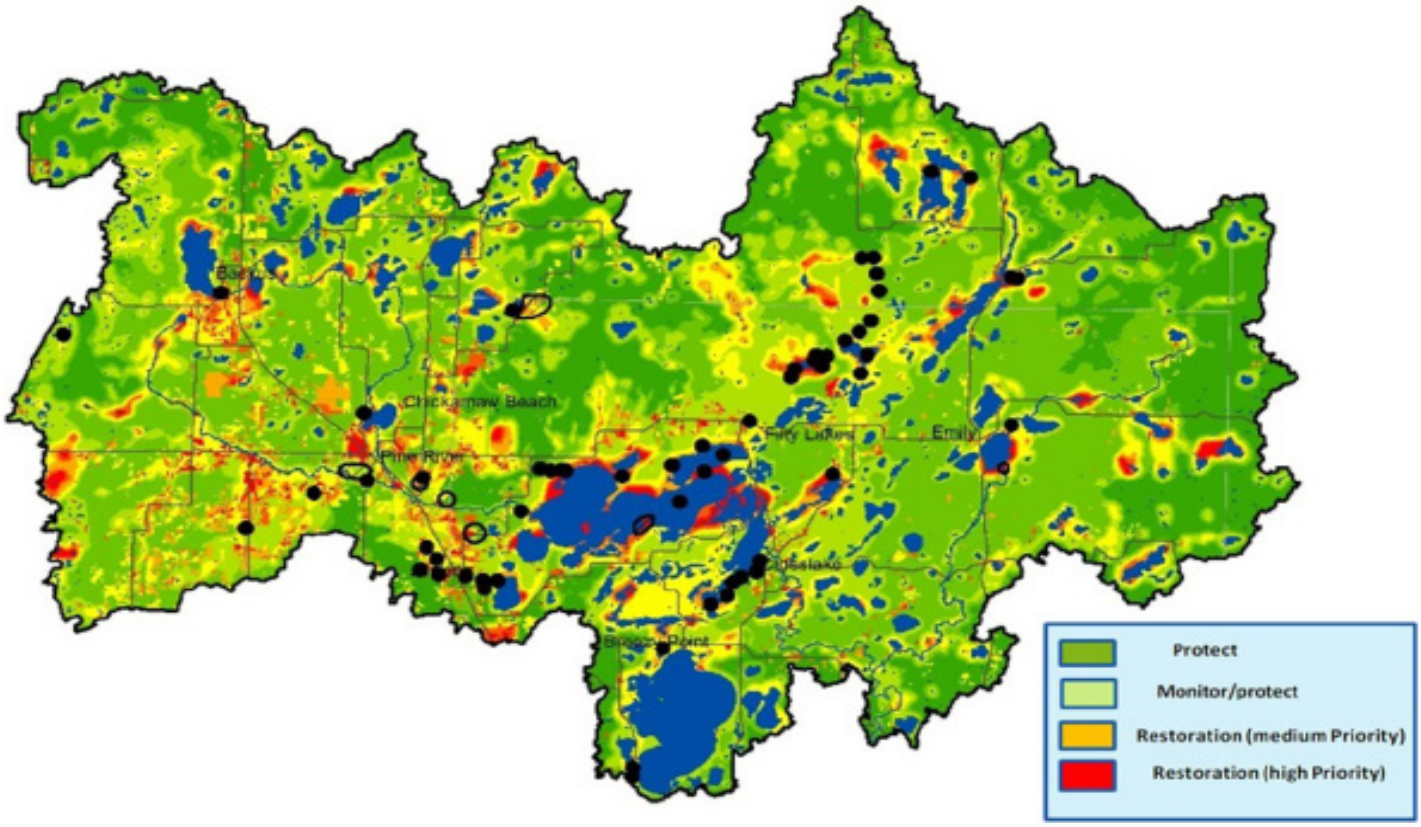
HUC 10 Watershed	Stream Name	AUID #	Low Dissolved Oxygen	Increased Bedded Sediment	Lack of Physical Habitat	Physical Connectivity
South Fork Pine River	Wilson Creek	07010105-529		X	X	
South Fork Pine River	South Fork Pine River	07010105-531		X	X	X
Whitefish Lake	Arvig Creek	07010105-509	X	X	X	
Whitefish Lake	Willow Creek	07010105-631		X	X	X

Restoration and protection strategies

The MPCA created the strategy map below using HUC-12 subwatersheds – drainage areas within the larger HUC-8 Pine River Watershed – to help identify priority areas for targeting actions to improve water quality. Multiple sources of data, maps and analysis tools including HSPF were combined to create this map. The colors on the map indicate:

- Red – High priority restoration or protection (multiple benefits for restoration or protection)
- Orange – Medium priority restoration or protection (water is Impaired)
- Light green – Protection/monitoring (water quality is good but declining or faces threats-fewer multiple benefits)
- Dark green – Protect (water quality is good and little need of action at this time)

Other maps of individual pollutants, such as phosphorus and nitrogen, can be found in the full report.



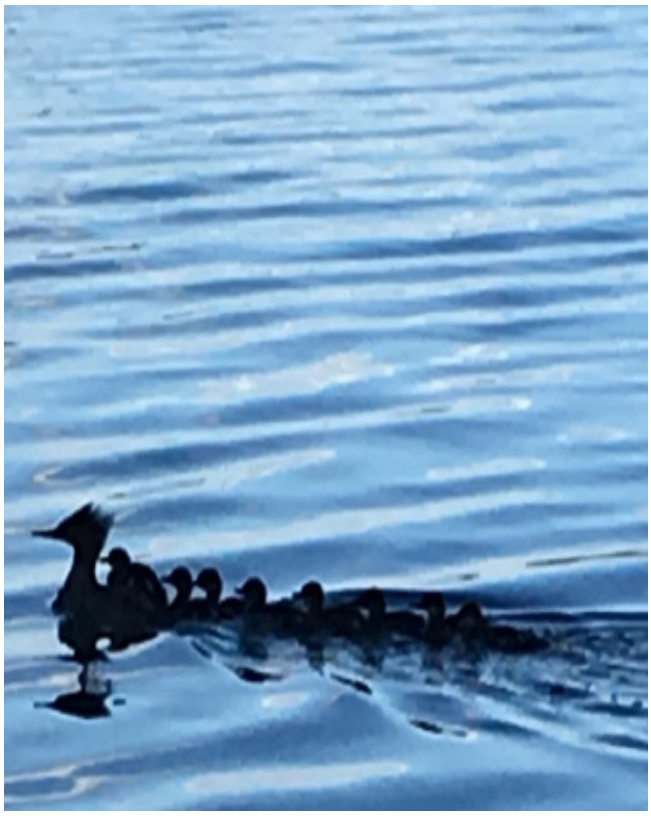
Next steps and measuring results

The restoration and protection strategies listed in the WRAPS report will be the basis for developing local implementation plans to restore and protect water resources. The report lays out goals, milestones and responsible entities to address protection and restoration priorities in the Pine River Watershed. The targets are intended to provide guidance and "measuring sticks" to assess the watershed's health and success of actions taken.

Water quality in some areas in Minnesota has declined over many decades. While restoration activities continue, new problems develop, such as converting land to intensive cropping that negatively impacts water quality. The perpetual challenge is to make improvements and keep up with new problems. Impacts from other factors such as climate change are still not completely understood. Consequently, it may take decades to fully restore impaired waters. For these reasons, it is much more cost-effective to protect clean waters while we can, such as those in the Pine River Watershed.

Key conclusions of first cycle

- The WRAPS report data and findings provide a base for developing the One Watershed One Plan.
- The Pine River Watershed overall has very good water quality and to preserve it, forest protection is critical .
- There are many opportunities for conservation easement purchase, and significant amounts state owned land that can be used to protect surface and groundwater.
- Because it flows to the Mississippi, the Pine River Watershed is a source of drinking water for municipalities such as St. Cloud and the Twin Cities downstream .
- Primary impairments to streams are biological; lack of fish or bugs that one would expect to find in clean waters. Habitat restoration key to improving biology in streams.
- Groundwater in the Pine River Watershed is largely vulnerable and consideration must be given to groundwater protection as well as surface water protection when choosing best management practices for implementation.
- The next WRAPS project cycle for the Pine River Watershed is expected to begin in 2021.



A Merganser family taking a swim. Photo by Justin Burslie

Full report

Full report as well as supporting documents can be found on the MPCA's Pine River Watershed webpage at www.pca.state.mn.us .

Contacts

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- Pine River Watershed Alliance- (http://www.prwa.us/)
- Whitefish Area Property Owners Association- (http://minnesotawaters.org/whitefishareapropertyowners/)

Minnesota Pollution Control Agency

The Clean Water, Land and Legacy Amendment is funding a large part of the MPCA's watershed approach.

CLEAN WATER LAND & LEGACY AMENDMENT