WRAPS report summary
Watershed Restoration and Protection Strategy

Wild Rice River Watershed

Watershed approach

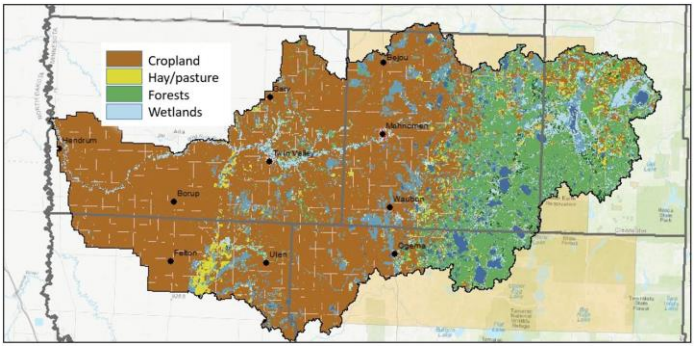
Minnesota has adopted a watershed approach to address the state's 80 major watersheds. This approach looks at the drainage area as a whole instead of focusing on lakes and stream sections one at a time, thus increasing effectiveness and efficiency. This watershed approach incorporates the following activities into a cycle repeated on a regular basis:

1. Monitoring waterbodies and collecting data over two years on water chemistry and biology (2014-2015).
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters (2016-2018).
3. Developing strategies to restore/protect the watershed's waterbodies, and report them in a document called Watershed Restoration and Protection Strategy (WRAPS) report (2019-2021).
4. Coordinating with local One Watershed-One Plan efforts for planning and implementation of restoration/protection projects (2019-2020).

The Minnesota Pollution Control Agency (MPCA) leads the technical work, and coordinates and supports strategy development with local, state, and federal partners. Watershed partners are leaders in implementing strategies to restore and protect waters. Their past and current work provides opportunities for watershed improvement, and will continue to be a critical component to overall water quality. The main purpose of the WRAPS report is to summarize all the technical information so that local partners such as the Wild Rice Watershed District and county soil and water conservation districts can use it for planning and implementing the best strategies in prioritized locations.

Watershed characteristics

Land cover in the Wild Rice River Watershed



- Size: 1,636 square miles
- Counties: Becker, Clay, Clearwater, Mahnomen, Norman, and Polk
- Ecoregions: Lake Agassiz Plains, North Central Hardwood Forests, and Northern Lakes and Forests
- Major streams: Wild Rice River, South Branch Wild Rice River, White Earth River, Spring Creek, Felton Creek, and Coon Creek
- Major towns: Twin Valley, Ulen, Felton, Mahnomen, Bejou, Ogema, Borup, Gary, Hendrum, and Waubun
- Land cover: Cropland 58%, forest 20%, wetlands 13%, developed 2.9%, and others 6.1%
- The 8-digit hydrologic unit code (HUC): 09020108

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Assessments: Are waters meeting standards and providing beneficial uses?

Water quality in the Wild Rice River Watershed is generally good in the eastern third and strategies should be implemented to protect current conditions, while restoration efforts are needed in portions further west where impairments are more common, especially for sediment and *E. coli* bacteria.

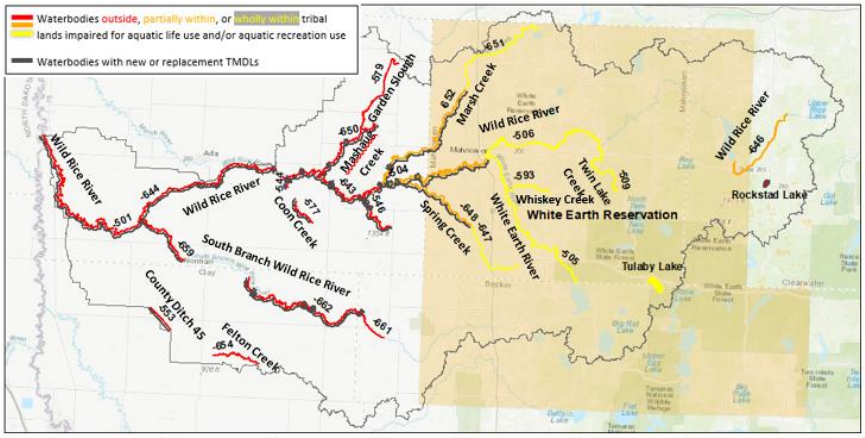
Water quality and proposed restoration and protection strategies reflect the ecology of the watershed, which is very diverse. Land use transitions from largely undeveloped areas in the eastern portion, which is covered mostly by wetlands and forestlands, to a cultivated landscape in the western portion. However, loss of habitat for fish and insects is a concern throughout the watershed due to physical barriers such as faulty culverts, dams, etc., and extensive land/stream alterations.

Monitoring staff assessed 35 stream/river segments in the watershed for aquatic life use (i.e., can they support fish and aquatic insect communities) and 25 of those were also assessed for aquatic recreation use (e.g., swimming, wading). Twenty-one streams supported aquatic life and 10 supported aquatic recreation.

Total maximum daily load (TMDL) studies establish the amount of each pollutant a waterbody can accept and still meet water quality standards, and the amount of reductions needed to meet the standards. TMDLs are required by the federal Clean Water Act. Fifteen TMDL studies were done for 13 streams in the watershed. Ten address excessive *E. coli* and 5 address excessive turbidity or total suspended solids (TSS). Streams impaired by *E. coli*, TSS, and turbidity are consistent with heavy agricultural land use, and efforts to reduce pollutants are likely to have a positive impact on fish and aquatic insect communities.

There are more than 440 lakes greater than 10 acres in size in the watershed. Of 19 lakes with monitoring data, 15 were assessed for aquatic life use and 18 for aquatic recreation use. Ten lakes met aquatic life use standards (five had limited data). Only two lakes, Rockstad and Tulaby, failed to meet aquatic recreation standards due to excessive nutrient levels, which can cause nuisance algae blooms. A TMDL study addresses excessive phosphorus in Rockstad Lake.

Aquatic life use/aquatic recreation use impairments



Reach #	Stream name	Tribal land	Affected use	Indicator/ parameter
501	Wild Rice R.		AQL	Turbidity
504	Wild Rice R.	Partial	AQL	TSS
505	White Earth R.	Wholly	AQL	Turbidity
			AQR	*E. coli*
506	Wild Rice R.	Wholly	AQR	*E. coli*
509	Twin Lake Cr.	Wholly	AQL	TSS
			AQR	*E. coli*
544	Coon Cr.		AQR	*E. coli*
546	Unnamed creek		AQR	*E. coli*
553	County Ditch 45		AQR	*E. coli*
577	Coon Cr.		AQR	*E. coli*
579	Garden Slough		AQL	Fish
593	Whiskey Cr.	Wholly	AQR	*E. coli*
643	Wild Rice R.		AQL	Turbidity
			AQR	*E. coli*
644	Wild Rice R.		AQL	Turbidity
			AQR	*E. coli*
646	Wild Rice R.	Partial	AQL	Fish
647	Spring Cr.	Wholly	AQL	Aquatic insects
648	Spring Cr.	Partial	AQR	*E. coli*
650	Mashaug Cr.		AQL	Aquatic insects
			AQL	Fish
			AQR	*E. coli*
651	Marsh Cr.	Wholly	AQR	*E. coli*
652	Marsh Cr.	Partial	AQL	Turbidity
654	Felton Cr./ County Ditch 45		AQL	Aquatic insects
			AQL	Fish
659	S Br Wild Rice R.		AQR	*E. coli*
661	S Br Wild Rice R.		AQL	Fish
662	S Br Wild Rice R.		AQL	Aquatic insects
			AQR	*E. coli*

Restoration and protection strategies

The WRAPS process includes a means to categorize waterbodies for restoration and varied levels of protection. Most impairments in the Wild Rice River Watershed are located in the central and western areas, where extensive draining and ditching can intensify bank erosion and damage aquatic habitats. Higher peak flows in this area and lower water holding capacity of the landscape result in reduced flows during dry times of the year. The highly variable flows contribute to increased sediment, nutrient, and *E. coli* bacteria loading to ditches, streams, and rivers, and difficult conditions for fish. As water is moved off the landscape more quickly, baseflows required to support aquatic life are low to nonexistent for extended periods.

Some potential restoration strategies include:

- Increase vegetative cover/root duration;
- Improve drainage management;
- Address noncompliant septic systems;
- Remove fish passage barriers;
- Limit livestock access to waterways; and
- Restore stream channels and reconnect floodplains.

The eastern third of the watershed largely maintains its historical water holding capacity and aquatic communities due to fewer lake and stream controls and modifications. However, as development increases along lakeshores, protecting the headwaters region is important to maintaining aquatic life and recreation uses by decreasing sediment, phosphorus, and *E. coli* source runoff that could otherwise result in impairments.

Some potential protection strategies include:

- Protect and stabilize banks and bluffs;
- Protect buffers and natural features;
- Implement volume control/limited-impact development;
- In-water management and species control in lakes;
- Maintain enrollment in conservation programs (e.g. BMPs, CRP, RIM, etc.);
- Mitigate agricultural drainage projects; and
- Maintain good forestry management.

Many streams in the western portion of the watershed, such as Mashaug Creek in the first two pictures above, have been altered in ways that create heavy flows during spring runoff and summer rain events (left), and low flows most other times (the center photo was taken just a few days after the photo on the left). These "flashy" flow regimes can result in in-stream and stream bank erosion (right), which adds excessive sediment to streams and impacts habitat for fish and aquatic insects.

Summary of first cycle

- In general, the headwaters region in the eastern portion of the watershed remains natural with excellent habitat. Altered portions further west have poor habitat and excessive sedimentation.
- Twenty-one streams fully support aquatic life (fish and aquatic insect communities). The main contributors to the aquatic life use impairments include habitat degradation, inadequate flow, and TSS/turbidity (too much sediment) as the result of erosion/runoff from nearby fields as well as from the streambank and streambed during high-flow periods due to snowmelt and heavy rain events.
- Ten streams support aquatic recreation use. In addition to the aquatic life use impairments, 15 river reaches (including sections of the Wild Rice River) have been listed as impaired due to excessive *E. coli* bacteria, a type of bacteria that can indicate the presence of organisms that are pathogenic to people.
- Sixteen TMDLs were developed as part of this WRAPS project: 10 for *E. coli*, 5 for turbidity/TSS, and 1 for total phosphorus.
- Drainage ditch systems are meant to drain the land as quickly as possible, which can lead to lack of water in streams during drought periods. The lack of base flow is a major source of stress on fish and aquatic insect communities. During dryer periods when there is little or no flow, critical habitat may not be submerged, dissolved oxygen is subject to extreme fluctuations, and water temperatures can soar.
- High turbidity and TSS (soil from field runoff and in-stream/bank erosion) increase in western portions of the watershed. Too much sediment can cover stream bottom areas that might otherwise provide good habitat for fish and aquatic insects.
- Nearly all lakes assessed in the watershed (11 of 13) supported aquatic recreation use. A TMDL study was conducted for Rockstad Lake.
- Actions that can protect/promote a higher species diversity include:
  - Restore flow patterns that naturally reduce peak flows and increase base flow; and
  - Create/strengthen buffers along streams and ditches using native vegetation.

Next steps

The Wild Rice River Watershed approach began in 2014, and the first cycle was completed in early 2022 with publication of the WRAPS report. The restoration and protection strategies listed in the WRAPS report have informed comprehensive local water management plans that include implementation efforts to restore and protect water resources. The WRAPS report lays out goals, milestones, and responsible entities to address protection and restoration opportunities in the watershed. The targets are intended to provide guidance and “measuring sticks” to assess the watershed’s health and success of actions taken.

Full report

To view the full WRAPS report, search “Wild Rice River Watershed” on the MPCA website at https://www.pca.state.mn.us.

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