WRAPS report summary
Watershed Restoration and Protection Strategy

Lac qui Parle River Watershed

Watershed approach

Minnesota has adopted a watershed approach to address the state's 80 major watersheds. It looks at the drainage area as a whole instead of focusing on lakes and stream sections one at a time, increasing effectiveness and efficiency. The following activities occur in a 10-year cycle:

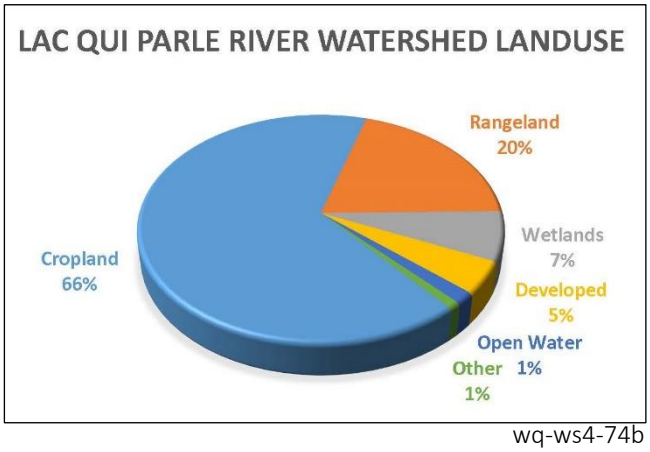
1. Monitoring water bodies and collecting data over two years on water chemistry and biology. (2015, 2016)
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters. (2017)
3. Developing strategies to restore and protect the watershed's water bodies, and report them in a document called Watershed Restoration and Protection Strategies (WRAPS). (2018-2021)
4. Coordinating with local One Watershed-One Plan efforts for implementation of restoration and protection projects. (2021-beyond)

The Minnesota Pollution Control Agency (MPCA) leads the technical work, and coordinates and supports strategy development with local partners. The main purpose of the WRAPS report is to summarize all the technical information, so that local partners like Soil and Water Conservation Districts and the Lac qui Parle-Yellow Bank Watershed District can use it for planning and implement the best strategies in prioritized locations.

Watershed characteristics

The Lac qui Parle River Watershed straddles Minnesota's western border with South Dakota. It covers about 1,100 square miles (704,000 acres), with about 70% in the Minnesota counties of Lac qui Parle, Yellow Medicine, and Lincoln. Cropland and row crop farming account for 66% of total watershed area. Rangeland (pasture and grasslands) covers 20%.

The majority of monitored stream reaches and lakes in the watershed are not meeting water quality standards for aquatic life (fish and aquatic bugs) and aquatic recreation (like swimming and watercraft use).



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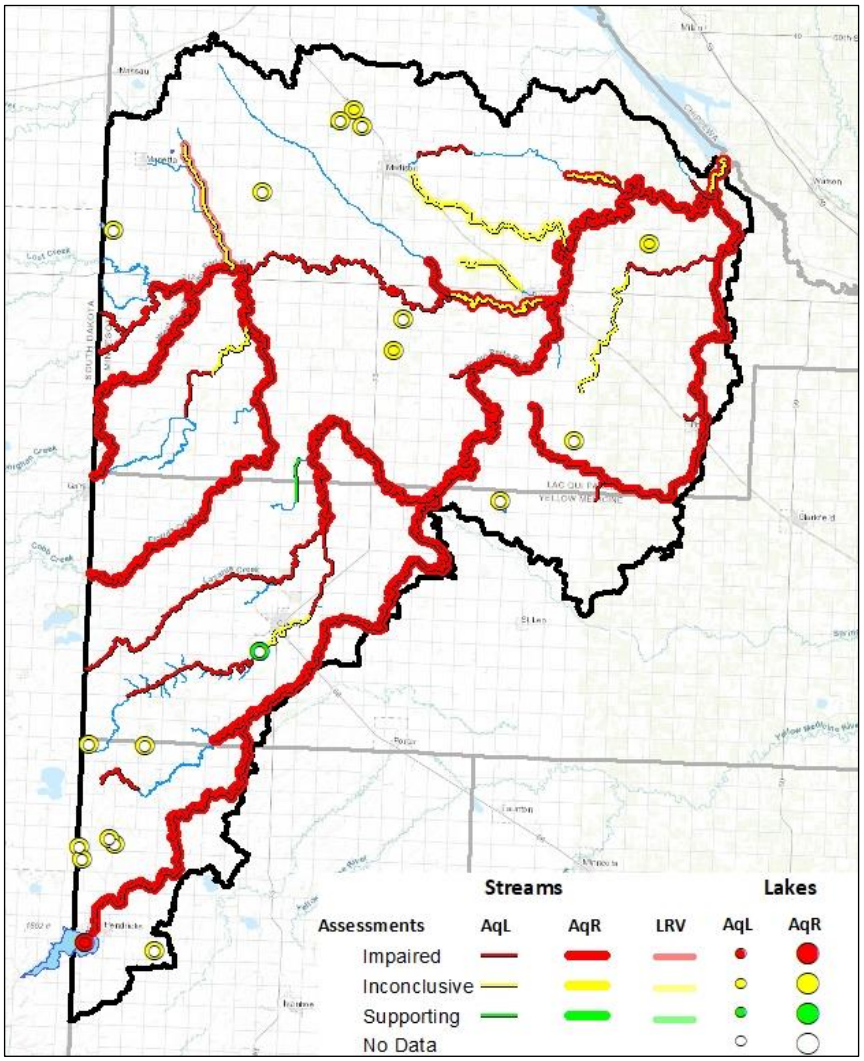
Assessments: Are waters meeting standards?



In the Lac qui Parle Watershed, 38 of the 80 defined stream reaches were assessed for aquatic life use, aquatic recreation use, or both. Only one stream was considered fully supporting of aquatic life; no streams were fully supporting of aquatic recreation. Three stream reaches classified as limited resource waters were assessed. None were fully supporting and one is impaired. The remaining two reaches were inconclusive.

Throughout the watershed, 32 stream reaches are non-supporting for aquatic life and/or recreation. Of those reaches, 28 are non-supporting for aquatic life and 17 are non-supporting for aquatic recreation.

In 2013, a Total Maximum Daily Load (TMDL) report addressed 19 water quality impairments from turbidity, bacteria, and low dissolved oxygen in sections of the Lac qui Parle and Yellow Bank rivers. A 2020 TMDL report addresses nine impairments in eight stream reaches, including eight bacteria impairments and one total suspended solids impairment.

Lake Hendricks is the highest profile lake within the watershed, with considerable data available for this assessment effort, resulting in identification of a new aquatic life use impairment and a confirmed recreation use impairment. Lake Hendricks does show small signs that water quality may be improving. A TMDL study on Lake Hendricks was completed in 1999. Despite heavy land use modification and altered hydrology within the contributing watershed, Del Clark Lake is highlighted as meeting recreation use criteria.

Stressors and pollutants: What factors are affecting fishing and swimming?

A total of 27 streams were listed as having impaired aquatic life use based on fish and/or macroinvertebrate community assessments. Eight are impaired based on aquatic macroinvertebrate bioassessments, five are a result of fish bioassessments, and 14 are impaired based on both.

Eight common stressors were investigated to determine the causes of the biologically-impaired communities: dissolved oxygen, eutrophication, nitrate, total suspended solids, habitat, flow alteration, connectivity, and temperature.

Sources of pollutants and stressors can be grouped into two categories: point sources and nonpoint sources. Point source examples include discharge from a wastewater treatment plant or an industrial discharger. These are typically regulated to ensure any discharge does not degrade water quality conditions. While the overall impact of these point sources on the total pollutant loads is minimal, they can be substantial sources at times of low flow.

Nonpoint sources are the dominant source of pollutants/stressors in the Lac qui Parle River Watershed. Nonpoint sources are pollutant or stressor sources that run off the landscape and typically come from diffuse locations. They contribute the majority of phosphorus, nitrogen, and sediment in the watershed, contributing about 99% for all three pollutants.

Restoration and protection strategies

The WRAPS report presents strategies that estimate the total changes necessary for all waters to be restored and protected. Effective restoration and protection practices are fairly well-understood. Farm nutrient management practices, conservation tillage, cover crops, grassed waterways, and buffers will substantially reduce pollutants/stressors reaching surface waters. City stormwater systems can be designed and built for zero or minimal runoff depending on the size and intensity of the rain event.

The largest water quality risk associated with feedlots is from land-applied manure. Deferring manure application until soils have thawed decreases overland runoff during precipitation events. Incorporating manure into the subsoil is a preferred best management practice (BMP) to reduce bacteria and nutrient runoff, as incorporated manure reduces the risk of surface runoff associated with large precipitation events.

Stressor/Pollutant	Current Status	Watershed-wide Goal	10-year Target
Habitat	Stressor in 22 stream reaches	54% increase in the average habitat score to 66	15% increase in MSHA score
Phosphorus/Eutrophication	Stressor in 18 stream reaches; impaired in 1 lake and supporting in 1 lake	35% reduction	10% reduction
Altered Hydrology	Stressor in 17 stream reaches; inconclusive in 3	Increase storage by 0.39 inch (20,986 acre-ft) across watershed	Increase storage by 0.1 inch (3,329 acre-ft) across watershed
Bacteria	17 stream reach impairments	14%-86 % reduction of Bacteria, average 52%	10% reduction
Sediment	1 stream reach impaired for TSS; 6 impaired for turbidity; stressor in 8 streams reaches	0%-72% reduction, average of 25%	10% reduction
Nitrogen	Stressor in 4 stream reaches	45% reduction	20% reduction
Connectivity	Stressor in 6 stream reaches	Address identified barriers	Address identified barriers
Macroinvertebrate Bioassessments	22 stream reaches impaired	Because these are in response to (caused by) the above pollutants/stressors, the other watershed-wide goals are the (indirect) goals for these parameters	Meet other 10-year targets
Fish Bioassessments	19 stream reaches impaired		
Dissolved Oxygen	2 stream reach impairments; stressor in 8 reaches		

Local County, Soil and Water Conservation District, and Lac qui Parle Yellow Bank Watershed District partners will continue working together to implement practices on the land designed to protect and improve water quality. Future restoration and protection work in the area will benefit from continued relationships among counties, Soil and Water Conservation Districts, cities, and landowners, building on previous successes. Challenges with political boundaries (MN-SD border) could hamper restoration efforts. The Lac qui Parle River Watershed needs to develop working groups with its partners in South Dakota to develop protection and restoration approaches within the whole watershed and ensure many sources of pollutants are reduced and managed.

Key conclusions of WRAPS process

The dominant agricultural land use in the Lac qui Parle River Watershed contributes sediment, bacteria, and nutrients, resulting in water quality impairments beyond natural background or pre-settlement levels. The balancing of agricultural production and environmental conservation can be better managed with increased diversity in cropping systems, reduced

tillage, better nutrient and manure management, and improved hydrology with more water storage and managed artificial drainage. These can be achieved with available technology, financial incentives, and increased voluntary efforts by landowners. An example of this success is seen in the successful management of Del Clark Lake, which exhibits good water quality in an agricultural region.

A key prerequisite for successful strategy development and on-the-ground implementation is meaningful civic engagement. Given this, the civic engagement process included holding workshops to gain input from citizens and local partners and also providing information to the public through education events and radio programs. Since the land in the Lac qui Parle River Watershed is nearly all privately owned and will require citizen involvement to see improved water quality, strategies include social practices such as relationship building and continued education and demonstrations. .

Paddlers prepare to launch on the West Fork Lac qui Parle River in Dawson

Next steps

Goals for the Lac qui Parle River Watershed (Table on Page 3) were set after analyzing the monitoring and assessment data, model results, Total Maximum Daily Load studies, and state-wide reduction goals. The goals integrate multiple levels into one watershed-wide goal.

Progress towards meeting the protection and restoration goals, including the TMDL goals, will be measured by regularly monitoring the water quality and tracking total BMP implementation in the watershed. The Intensive Watershed Monitoring program collects water quality and biological data at roughly 64 stream and 2 lake monitoring stations across the watershed for 1 to 2 years, every 10 years. To measure pollutants across the watershed the MPCA will re-visit and re-assess the watershed, as well as have capacity to visit new sites in areas with BMP implementation activities. The Lac qui Parle River Watershed is scheduled for the next cycle of Intensive Watershed Monitoring starting in 2026. During the time between intensive monitoring, information is collected every year through the Citizen Water Monitoring Program and the Watershed Pollutant Load Monitoring Network.

Full report

To view the full report, go to www.pca.state.mn.us/water/watersheds/lac-qui-parle-river, or search "Lac qui Parle River" on the MPCA website at www.pca.state.mn.us/.

Contact

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