



Mississippi River-Sartell Watershed (MRSW)

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 10-year cycle:

1. Monitoring water bodies and collecting data over two years on water chemistry and biology. (2016, 2017)
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters. (2017-2018)
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). (2018-2020)
4. Coordinating with local One Watershed-One Plan efforts for implementation of restoration and protection projects. (2020-beyond)

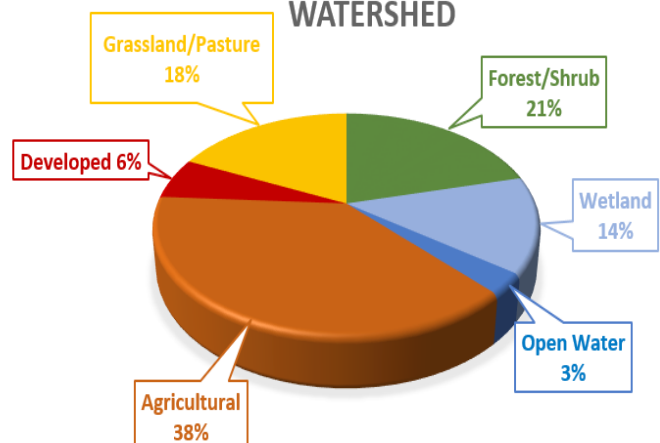
The Minnesota Pollution Control Agency (MPCA) leads the technical work and coordinates and supports strategy development with local partners. The main purpose of the WRAPS report is to summarize all the technical information so that local partners like Soil and Water Conservation Districts can use it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



Watershed characteristics

- Size: 1,020 square miles
- Counties: includes portions of Benton, Crow Wing, Mille Lacs, Morrison, Stearns, and Todd counties in central Minnesota
- Ecoregions: Northern Lakes and Forest & North Central Hardwood Forest
- The land use of the watershed is predominantly agricultural
- 232 lakes and 879 miles of streams
- The 8-digit hydrologic unit code (HUC): 07010201

LAND USE - MISSISSIPPI RIVER-SARTELL WATERSHED



Assessments: Are waters meeting standards and providing beneficial uses?

During the first phase of the watershed approach — intensive watershed monitoring — the MPCA and local partners collect data about biology such as fish populations, chemistry such as pollutant levels, and flow. Waters are “impaired” if they fail to meet standards.

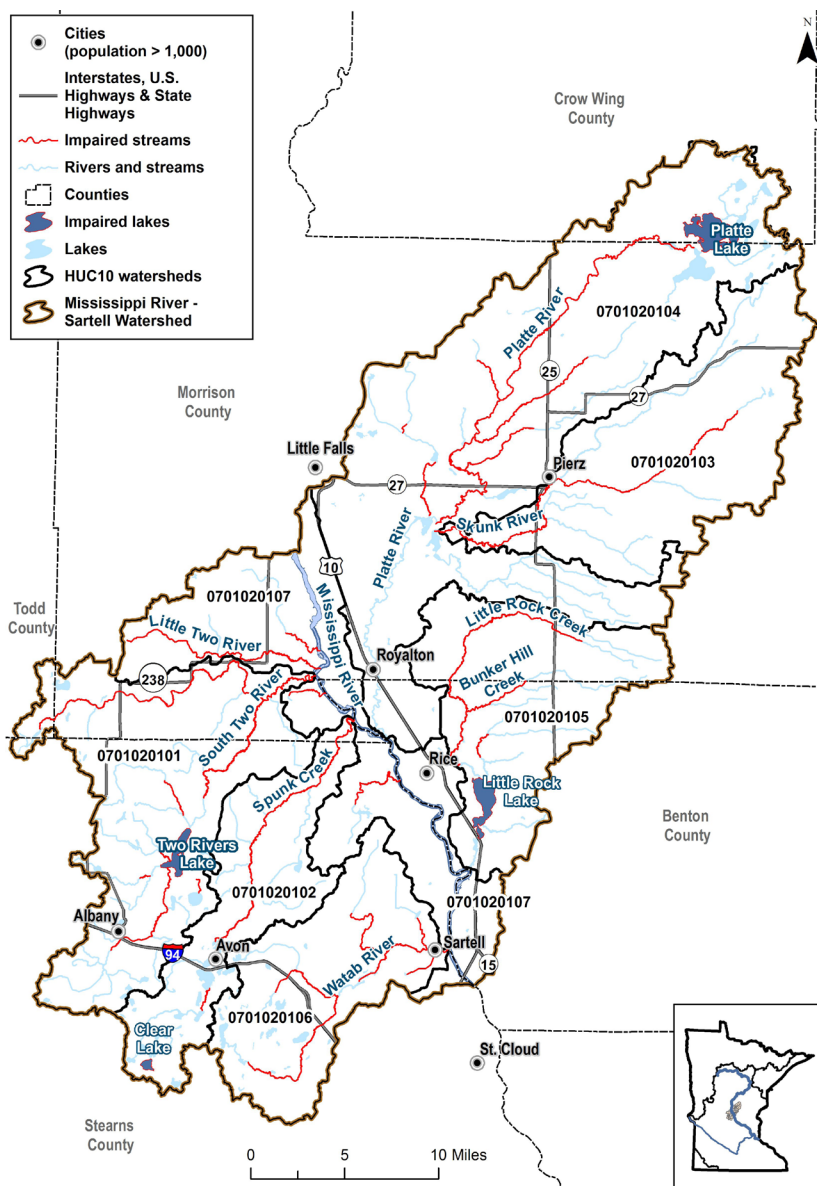
The map to the right shows all of the aquatic life and recreation impairments in the MRSW, including those determined to be impaired prior to the latest assessment cycle.

Streams

The monitoring and assessment report evaluated 49 stream reaches for aquatic recreation and/or aquatic life within the MRSW. Sixteen (16) of those reaches are not meeting water quality standards for aquatic life use and 24 reaches were found not to meet the aquatic recreational use standard.

Lakes

The monitoring and assessment report evaluated 51 lakes for aquatic recreation within the MRSW. Three of those lakes were found not to meet the aquatic recreational use standard due to excess nutrients.



Conditions stressing fish and bugs, and affecting water quality

Stressors of biologically impaired stream reaches were determined in the Mississippi River–Sartell Watershed Stressor Identification Report (SID). Primary stressors analyzed included temperature, longitudinal connectivity, streamflow alteration, lack of habitat, suspended sediment, nutrients (nitrate toxicity/eutrophication) and low dissolved oxygen (DO). The most common stressors identified in the SID are lack of habitat, streamflow alteration, and low DO. Streamflow alteration, resulting from changes in land use, vegetation and precipitation was often an indirect driving factor behind the lack of habitat and low DO.

Of the stream reaches with assessment data available, 20 fully support aquatic life and one stream fully supports aquatic recreation. In contrast, 16 stream reaches do not support aquatic life. Of the assessed streams reaches found to be not supporting aquatic life, ten were found to have an impaired fish assemblage, while six streams were found to have an impaired macroinvertebrate assemblage, in three instances a reach was listed for both fish and macroinvertebrate assemblage. The chart on the next page is a summary of aquatic life impairments and stressors in the MRSW.

Summary of aquatic life impairments and stressors in the Mississippi River-Sartell Watershed

Table 1. Summary of aquatic life impairments and stressors in the Mississippi River – Sartell Watershed. All WID numbers have a unique, three-digit identifier after the MRS Watershed HUC8 number (07010201).

CS = Conclusive Stressor, I = Inconclusive, MS = Minor Stressor (stressor is present, but is not primary cause of impairment)

FIBI = Fishes Index of Biotic Integrity, MIBI = Macroinvertebrate Index of Biotic Integrity

Denotes Morrison County

Denotes Stearns County

Denotes Benton County

WID (07010201-###)	Impairment indicator	Temperature	Longitudinal connectivity	Streamflow alteration	Lack of habitat	Suspended sediment	Nitrate toxicity	Eutrophication	Low dissolved oxygen	Metals- iron
Trib to Platte (-634)	FIBI		CS						CS	I
Big Mink Cr (-647)	MIBI			I	CS	I	I	I	CS	I
Little Mink Cr (-645)	MIBI			I	CS	I	I	I	CS	I
Platte R (-507)	FIBI		CS		MS/I					
Rice Cr (-618)	MIBI			I		I		I	CS	
Unnamed Cr (-651)	FIBI & MIBI		CS	CS	CS				I	
Hazel Cr (-569)	FIBI		CS	I			I			
South Two R (-643)	FIBI			I	CS	I		I	I	
Watab R, South Fork (-554)	FIBI		CS	I	CS				I	I
Watab R (-528)	FIBI			CS	CS	I				
Little Rock Cr (-652)	FIBI		MS	CS	CS	I	I	I	I	
Little Rock Cr (-653)	FIBI & MIBI	CS	MS	CS	CS	I	CS	I	CS	
Bunker Hill Cr (-511)	FIBI & MIBI	CS	MS	CS	CS	I	CS	I	I	
Zuleger Cr (-539)	FIBI & MIBI	I	MS	CS	CS	I	I	I	I	

Restoration and protection strategies

New Total Maximum Daily Load (TMDL) studies were developed concurrently to the MRS WRAPS effort for 15 *E. coli* impaired stream segments and 2 phosphorus impaired lakes: Two Rivers Lake and Platte Lake. These studies identify known and likely sources of the pollutants and reductions needed to bring these waterbodies back into compliance with state standards.

Restoration strategies in the MRS WRAPS focus on addressing *E. coli* bacteria impairments in several stream reaches, eutrophication and excess nutrients in lakes, and biological impairments summarized in the SID. Strategies to address sources of *E. coli* to streams include feedlot management practices, septic system maintenance and upgrades, pasture management, and stormwater control measures in urbanized areas. Restoration practices for phosphorus reduction to impaired lakes include internal lake and shoreline management, cover crops and living cover, tillage management, nutrient and fertilizer management, buffers, pasture management, and septic system maintenance and upgrades. Strategies to address biologically impaired streams were developed based on recommendations and assessments from the SID and include activities such as re-meandering streams using natural design principals, reconnecting flood plains, and instream and riparian habitat creation.

All waters in the MRSW require protection in some capacity, including those listed as impaired and those with insufficient data. It is important to prioritize areas for protection, however, to better focus implementation of the WRAPS. Protection considerations were given for high value and high quality waters, and waters at risk of impairment.

Groundwater and drinking water protection was also included in the WRAPS. Watershed wide protection strategies, or strategies applicable to all streams, impaired and unimpaired, were developed based on local partner team feedback and participation.



Nutrient restoration project - Little Rock Lake/Sartell Dam drawdown – summer 2019 (Photo courtesy Amanda Guertin, Benton SWCD)

Key conclusions of Monitoring and Assessment and the WRAPS process

- Overall the biological communities found throughout the MRSW are in fair to good condition. However, of the 49 stream reaches evaluated for aquatic recreation and/or aquatic life within the MRSW, 16 of those reaches are not meeting water quality standards for aquatic life use and 24 reaches were found not to meet the aquatic recreational use standard.
- The majority of lakes in the MRSW have good water quality to support recreation and healthy aquatic communities; however, two lakes were found to be failing aquatic life standards.
- Increasing water quality clarity trends are found in 10 lakes and 3 streams with decreasing trends noticed in 4 lakes.
- Potential stressors found throughout the MRSW include: habitat degradation due to livestock access to the stream and riparian corridors, stressful riparian land uses (i.e. uses causing erosion), and dams and improperly installed culverts, which can create a loss of stream connectivity. Going forward, significant work should be done cooperatively with landowners where possible to reduce livestock access to streams and/or reduce erosion issues.
- The SID study revealed some systemic issues in the MRSW. Streamflow alteration (ditching, channelization) is one of the systemic stressors; it was concluded to be the cause of at least six aquatic life impairments and was an inconclusive stressor in six other instances.
- In order for impaired lakes and streams to meet water quality standards, the majority of pollution reductions will need to come from non-point sources.
- Water quality and conditions of the MRSW are important to the downstream receiving waters and drinking water supplies for the city of Saint Cloud and the Twin Cities metropolitan area. Restoration and protection of the MRSW is crucial in helping to maintain this vital drinking water source while maintaining public health and safety for many Minnesota residents.
- The MRSW has primarily low to moderate groundwater pollution sensitivity overall, however, a large zone of high pollution sensitivity is seen along the Mississippi River corridor. Groundwater protection should be considered both for quantity and quality.
- The strategies which are implemented in the MRS WRAPS will maximize the impacts of best management practices whenever possible, in order to achieve multiple benefits in water quality, soil health, flood management, habitat improvement, and others.



Full report

Full reports as well as supporting documents can be found at: <https://www.pca.state.mn.us/water/watersheds/mississippi-river-sartell> or search "Mississippi River Sartell Watershed" on MPCA's website.

Contacts

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