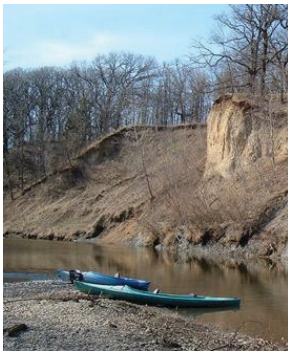
WRAPS report summary
Water Restoration and Protection Strategy

Watonwan 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 10-year cycle:

1. Monitoring water bodies and collecting data over two years on water chemistry and biology.
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters.
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).
4. Coordinating with local On Watershed-One Plan efforts leading to implementation of restorations and protection project.

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: 878 square miles or 562,000 acres
- Counties: Watonwan, Cottonwood, Blue Earth, Brown, Martin, and Jackson; 11 towns and cities including St. James, Madelia, Mountain Lake. Total population approximately 18,000.
- Ecoregion(s): Minnesota River prairie subsection of the Western Corn Belt Plains Ecoregion.
- Land use: Dominated (85%) by annual, cultivated row crops; corn and soybeans most common.
- Topography: Reflecting the effects of glaciers, varies from nearly level to gently rolling hills. The western, southern, and eastern boundaries contain hilly moraines, ridges made by glacial movement and rock and sediment deposition. Remnants of a glacial lake bed in the southeastern portion makes this area particularly flat.
- Hydrologic unit code (HUC): 07020010. Tributary to Blue Earth River.

Just as the topography of the watershed reflects the effects of glacial activity, the soils are glacial deposits ranging from very poorly drained to moderately drained soils and tend to be a mixture of clay, silt, sand, and gravel. The former glacial lake bed is dominated by poorly drained clay and silt soils.

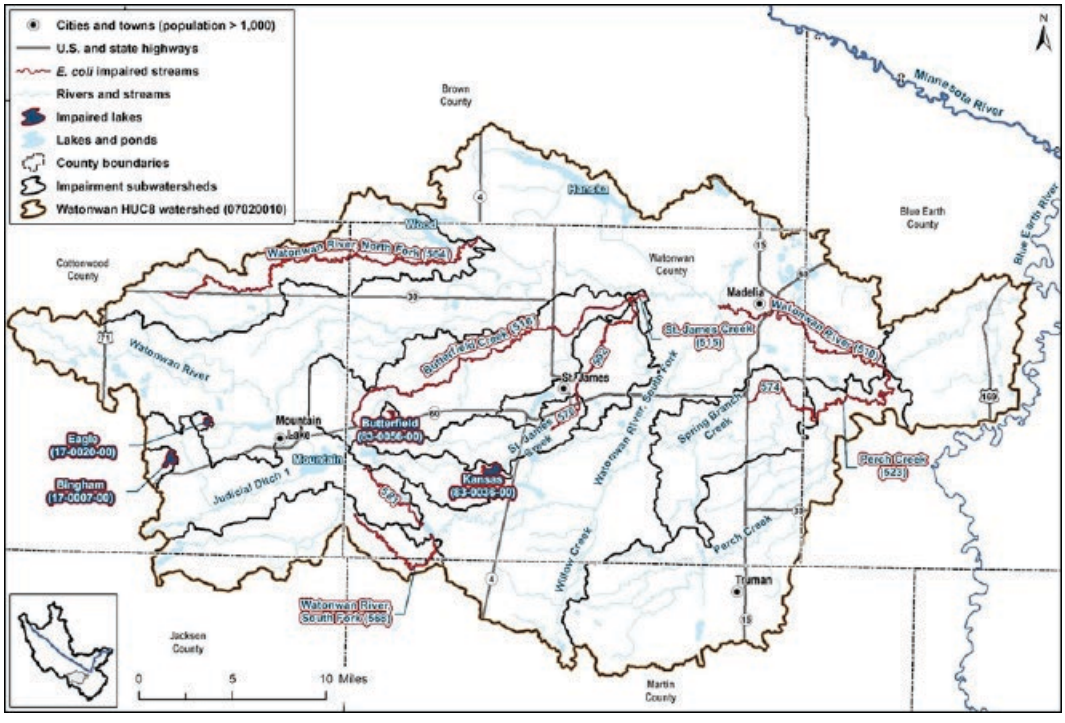
Assessments: Are waters meeting standards?

The Watonwan River Watershed Total Maximum Daily Load report addresses four impaired lakes and ten impaired stream sections. The lakes have aquatic recreation impairments due to eutrophication (phosphorus), and the stream impairments affect aquatic recreation or limited resource value designated uses based on high levels of pathogens (*E. coli*).

Of the 79 stream reaches in the watershed, monitoring was conducted on 39 reaches for aquatic life (fish and bugs) and 16 reaches for aquatic recreation (swimming). Of the 35 assessable lakes, monitoring was conducted on 11 lakes for aquatic life and 15 lakes for aquatic recreation.

Many of the monitored stream reaches and lakes are impaired for aquatic recreation and/or aquatic life. Only five stream reaches are supporting aquatic life; one stream reach is supporting aquatic recreation; one lake is supporting aquatic life; and two lakes are supporting aquatic recreation. Several reaches and lakes need more data to make a scientifically conclusive finding.

The annual flow in the Watonwan River has increased between 1977 and 2013. While Total Suspended Solids and Total Phosphorus concentrations show some improvement, because the total flow has increased and the pollutant load is the product of flow and concentration, the total pollutant load delivered by the river may have increased.



Conditions stressing water quality

Non point sources are the dominant source of pollutants/stressors in the watershed. While the impact of point sources on the total load is minimal, they can be substantial pollutant sources at times of low flow. Primary non-point stressors in the watershed include:

- Habitat: Degraded habitat reduces aquatic life's ability to feed, shelter, and reproduce.
- Altered hydrology: Too much and too little stream flow directly harms aquatic life by creating excessive speeds in the water or reducing the amount of water.
- Nitrogen: Excessive nitrogen can be toxic to fish and bugs.
- Connectivity: A lack of connectivity can obstruct the movement of migratory fish and bugs, causing a negative change in the population and community structure.
- Sediment: Sediment and other suspended solids directly impact aquatic life by reducing visibility, which reduces feeding; clogging gills, which reduces respiration; and smothering substrate, which limits reproduction.
- Dissolved oxygen: Low or highly fluctuating concentrations of DO can have detrimental effects on many fish and bug species.
- Phosphorus: Excess phosphorus can lead to excessive algae growth and eutrophication.
- Fecal bacteria: Fecal matter can make aquatic recreation unsafe because contact with fecal matter can lead to potentially severe illnesses.

Restoration and protection strategies

To address the widespread water quality impairments in agriculturally-dominated watersheds such as the Watonwan River Watershed, comprehensive and layered Best Management Practices suites are likely necessary.

Wide-scale stabilization of eroding streambanks and ravines is cost-prohibitive. Instead, first addressing altered hydrology (e.g. excessive, concentrated flows) within the landscape can help decrease wide-scale stream and ravine erosion problems. In some cases, however, high value property may need to be protected or a ravine/streambank may be experiencing such severe erosion that stabilizing the streambank or ravine is deemed necessary.

Strategies to protect and restore lakes include both strategies to minimize pollutant contributions from the watershed and strategies to implement adjacent and in the lake. Cities and watershed residents also impact water quality. Failing and unmaintained septic systems can pollute waters. Key strategies in the Watonwan River Watershed are:

- Manage nutrients: Carefully planning for and applying phosphorus fertilizers decreases the total amount of phosphorus runoff from cities and fields.
    - Examples: Crop nutrient management, city rules on phosphorus fertilizer use, etc.
- Reduce erosion: Preventing erosion keeps sediment (and attached phosphorus) in place.
    - Examples: Construction controls, vegetation.
- Increase vegetation: More vegetative cover on the ground uses more water and phosphorus and decreases the total amount of runoff coming from fields and cities.
    - Examples: Cover crops, grass buffers, wetlands, prairie gardens/restorations, channel vegetation, etc.
- Install/restore basins: Capturing runoff and decreasing peak flows in a basin allows the sediment (and attached phosphorus) to settle out.
    - Examples: Water and sediment control basins, wetlands, etc.
- Improve soil health: Soils that are healthy need less fertilizer and hold more water.
    - Examples: Reduce/no-till fields, diversified plants in fields and yards.

Key conclusions of first cycle

Water quality conditions in the Watonwan River Watershed reflect general water quality across southern and western Minnesota: The majority of monitored stream reaches and lakes are not: meeting water quality standards for aquatic life (fishing) and aquatic recreation (swimming). Non-point sources are the dominant source of pollutants/stressors in the watershed.

Impaired waters should be restored through higher adoption of best management practices (BMPs). However, some localized areas in the watershed do meet water quality standards, and the land uses and BMPs that enable this clean water should be protected.

Watershed restoration depends on substantially higher adoption of BMPs, including the following high priority practices: decreased fertilizer use, cover crops, decreased tillage, cropland surface runoff treatment, cropland tile drainage treatment, and improved manure application.

To achieve clean water in the voluntary-adoption system in place, a citizen-based approach is the most feasible approach. Specifically, the transition to more sustainable practices must be developed, demonstrated, and spread by trusted leaders within the community.

Social strategies to accelerate BMP adoption include: Education and outreach, networking and relationships, conservation practice targeting, flexible and available funding, and more technical staff time. High priority strategies for protecting waters include maintaining perennial vegetation and BMPs on the landscape and mitigating future changes to hydrology.

Full report

To view the full report, go to www.pca.state.mn.us/water/watersheds/watonwan-river or search for “Watonwan River Watershed” on the MPCA website.

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