WRAPS report summary
Watershed Restoration and Protection Strategy

Blue Earth River Watershed

Watershed approach

Minnesota has adopted a watershed approach to address the state's 80 major watersheds, considering the drainage area in its entirety 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:

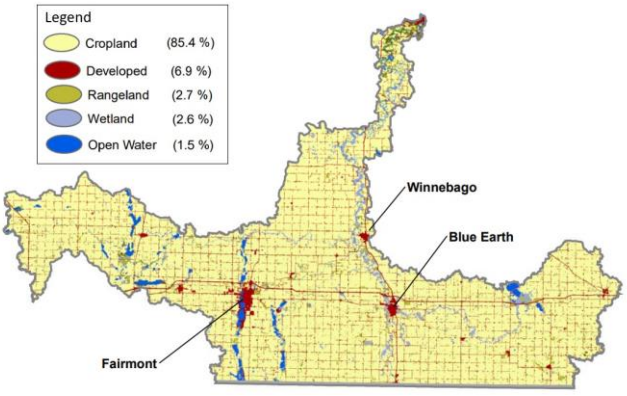
1. Monitoring water bodies and collecting data over two years on water chemistry and biology (2017-2018).
2. Assessing the data to determine which waters are impaired, which conditions are stressing water quality, and which factors are fostering healthy waters (2019-2021).
3. Developing strategies to restore/protect the watershed's water bodies and report them in a document called Watershed Restoration and Protection Strategies (WRAPS) (2021-2023).
4. Coordinating with local One Watershed, One Plan (1W1P) efforts to implement restoration/protection projects (2023-beyond).

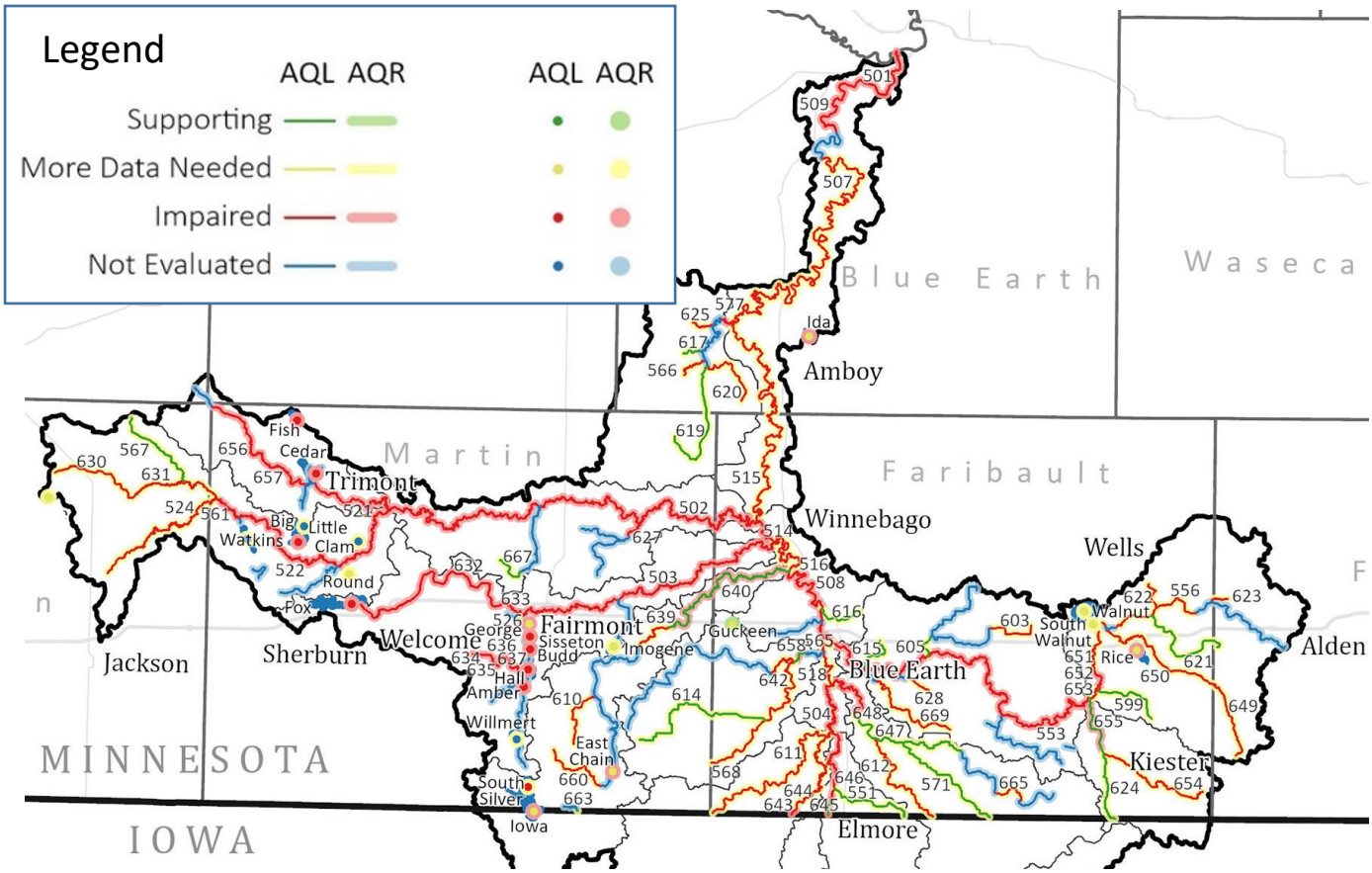
The Minnesota Pollution Control Agency (MPCA) leads the technical watershed assessment work and coordinates and supports strategy development with local, state, and federal partners. Watershed partners are leaders in implementing strategies to restore and protect waters. Their past and current work provides 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 county and soil and water conservation districts (SWCDs) can use it for planning and implementing the best strategies in prioritized locations.

Watershed characteristics

- Size: 1,001,805 acres
- Counties: Martin, Faribault, Blue Earth, Cottonwood, Freeborn, Jackson, Watonwan
- Ecoregions: Western Corn Belt Plains
- Major streams: Blue Earth River; South, Center, Elm, and Cedar creeks
- Towns: Trimont, Alden, Winnebago, Blue Earth, Fairmont, Mankato
- Land cover: Approximately 86% cropland (mostly corn, soybeans), 7% developed, 3% rangeland, 3% wetlands
- The 8-digit hydrologic unit code (HUC): 07020009

Land cover in the Blue Earth River Watershed





Impairments (shades of red) of the beneficial uses of aquatic life (fish and bugs) and aquatic recreation (swimming) dominate streams and lakes across the Blue Earth River Watershed. Only a handful of streams and lakes support these beneficial uses (shades of green). In this image, the inside line color indicates the aquatic life assessment. The outside line color indicates the aquatic recreation assessment. Lake assessment results are indicated by circles, where the inside circle color indicates aquatic life assessment and the outside circle color indicates the aquatic recreation assessment.

Assessments: Are waters meeting standards and providing beneficial uses?

From 2017 to 2018, intensive watershed monitoring (IWM) was conducted across the Blue Earth River Watershed. The majority of monitored streams and lakes are not meeting water quality standards, causing impairments that affect recreation, and fish and aquatic insect communities.

Streams – Biologists assessed 77 of 147 stream reaches for aquatic life (fish and bugs). Of these, only 19 fully supported aquatic life. Aquatic recreation (swimming) was assessed on 28 reaches and none were supporting aquatic recreation, due to high bacteria levels.

Lakes – Twenty lakes were assessed for aquatic life and 24 for aquatic recreation. None fully supported aquatic life and only one supported aquatic recreation, with high levels of phosphorus being a key reason.

A Total Maximum Daily Load (TMDL) study was completed for the watershed which establishes the amount of each pollutant a water body can accept and still meet water quality standards, and the reductions needed to meet the standards. The Blue Earth River Watershed TMDL Study addresses 12 aquatic recreation impairments caused by high levels of bacteria (*E. coli*), another 11 aquatic recreation impairments caused by excessive nutrients (phosphorus), and 6 aquatic life (fish) impairments tied to excessive nutrients.

Major stressors – A stressor identification report was completed for factors affecting fish and aquatic insect communities. The report highlighted river/stream alterations, connectivity (barriers such as perched culverts), lack of physical habitat, low dissolved oxygen, eutrophication (excessive nutrients), suspended solids (excessive sediment), and excessive nutrients (phosphorus, nitrates) as the most common stressors to biologic communities.

Nitrate was among the more common stressors affecting aquatic insects (macroinvertebrates). A nitrate water quality standard designed to protect aquatic life has not been adopted; however, there is a

strong correlation between drops in nitrate-sensitive macroinvertebrates populations as nitrate concentrations in the water increase.

Conditions affecting habitat include stream/landscape alterations that include the straightening of streams and extensive ditching that can increase sedimentation. In addition, high flows associated with spring runoff and summer storms, and extended periods of low flows can negatively affect habitat. The impacts of higher intensity storms and more severe droughts are amplifying these conditions.

Restoration and protection strategies

Priority resources and strategies for the Blue Earth River Watershed were determined based on input and professional judgement from local partners, previous planning work, recreational use priorities, and comparing findings with existing priorities outlined in county water plans.

With approximately 86% of the watershed in cultivated crops, the largest opportunity for water quality improvement is from this land use. The farming community has been and continues to be a vital partner in reducing sediment and nutrient impacts on water resources. State and local governments, working together with farm organizations and individual farmers, will be critical to finding and implementing solutions that work for individual farmers and help achieve the goal of clean water.

The MPCA and its partners identified several strategies to build upon efforts by local partners that have already resulted in water quality and habitat improvements (see MPCA Healthier Watersheds Accountability Report). Additional strategies/projects include:

Point sources – The wastewater sector has made huge improvements in phosphorus reduction over the last two decades, and ammonia concentrations are also largely under control. Nitrate concentrations are not. There are opportunities for progress in wastewater total nitrogen management and treatment. For example, the City of Blue Earth wastewater treatment facility is effectively reducing nitrates in its discharges.

Agriculture BMPs – Reducing pollutants from agricultural sources by implementing additional best management practices is critical to restoration efforts. County and SWCD staff from Blue Earth, Freeborn, Faribault, Jackson, and Martin counties developed many events throughout the watershed focused on growing community capacity to increase adoption of soil health practices and other key restoration strategies.

Drinking water source protection –The main supply of drinking water to the residents and businesses in the Blue Earth River Watershed is groundwater – either from private or community wells. Two communities have particularly vulnerable drinking water sources, as they draw water from a surface source (Fairmont), or a Ranney well with direct connection to surface water (Mankato). The Minnesota Department of Health has developed Source Water Assessments for each of the communities designed to protect the public waters source from point and nonpoint pollution including nitrates and other contaminants.

Many impairments in the Blue Earth River Watershed can be linked to excessive levels of sediment and nitrates, which can be deposited in surface waters via runoff from the landscape as well as in-stream erosion. Examples include, above left: streambank erosion resulting from high flows; above center: concentrated overland flow and, above right: ditch and ravine contributions.

Key conclusions of first cycle of monitoring and WRAPS

- Of 77 stream reaches assessed for aquatic life (fish and bugs) and aquatic recreation (swimming), only 19 fully supported aquatic life. None supported aquatic recreation.
- Twenty lakes were assessed for aquatic life and 24 for aquatic recreation. None fully supported aquatic life and only one supported aquatic recreation.
- Conditions affecting fish and aquatic insect communities the most include: river/stream alterations (ditching, straightening), connectivity issues (barriers such as perched culverts), lack of physical habitat, low dissolved oxygen, eutrophication (excessive nutrients), suspended solids (excessive sediment), and excessive nutrients (phosphorous, nitrates).
- Drinking water sources, including those for Fairmont and Mankato, are at risk of contamination, including nitrates.
- Given the fact approximately 86% of the watershed is cropland, the greatest potential for improving water quality lies in coordinated efforts among state and local governments and farmers and farming groups to increase the use of best management practices across the watershed.

Next steps

The Blue Earth River Watershed approach began in 2017 and was completed in 2023 with publication of the WRAPS report. The restoration and protection strategies listed in the WRAPS report will be the basis for developing comprehensive local water management plans that include implementation efforts to restore and protect water resources. The WRAPS report lays out goals, milestones, and strategies 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, visit the "Blue Earth River Watershed" page on the MPCA website.

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