WRAPS report summary
Water Restoration and Protection Strategy

St. Louis River Watershed

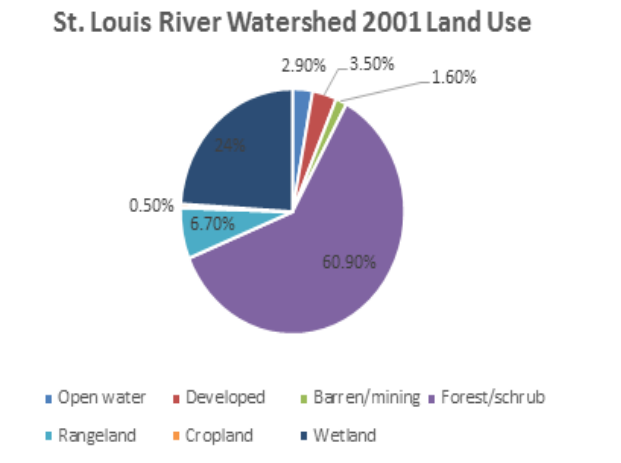
Watershed approach

Minnesota has adopted a "watershed approach" to address the state's 80 "major" watersheds (denoted by 8-digit hydrologic unit code, or HUC). 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:

- Water quality monitoring and assessment
- Watershed analysis
- Civic engagement
- Planning
- Implementation

Watershed characteristics

- Size: 2,926 square miles or 1,872,640 acres
- Water: ~450 lakes >10 acres and ~ 500 perennial river miles
- Counties: St. Louis, Carlton, Pine, Aitkin, and Itasca
- Ecoregions: Northern Lakes and Forests
- Land use: Predominantly forested and wetland, with only about 3.5% developed
- Municipalities in the watershed include Duluth, Hermantown, Proctor, Virginia and Hibbing
- The 8-digit HUC for the St. Louis River Watershed is 0401021



Assessments: Are waters meeting standards and providing beneficial uses?

During the first phase of the watershed approach – intensive watershed monitoring – the Minnesota Pollution Control Agency (MPCA) and local partners collected data about biology, such as fish populations, chemistry, such as pollutant levels, and flow to determine whether lakes and streams are meeting water quality standards.

Twenty-five lakes in the St. Louis River Watershed were assessed for their ability to support aquatic recreation. Eighteen met the recreational standards and are the focus of watershed protection efforts. Seven do not meet the standards and will be the focus of restoration efforts. The MPCA assessed 75 stream segments to identify impaired waters and waters in need of protection. Waters that do not meet targets for fish assemblage, macroinvertebrate assemblage, dissolved oxygen (DO), turbidity, chloride, pH, or ammonia are considered to not meet the aquatic life beneficial use. Waters that do not meet the targets for fecal indicator bacteria do not meet the aquatic recreation beneficial use.

Impairments in the St. Louis River Watershed

The St. Louis River Watershed's stream system's impairments that affect fish and macroinvertebrates include altered hydrology, ammonia toxicity, DO, habitat, iron precipitate, nitrate toxicity, specific conductivity, sulfate toxicity, temperature, and total suspended solids. Many of the identified stressors are not load-based, and there is no pollutant on which to base the Total Maximum Daily Load (TMDL) (i.e., poor habitat, altered hydrology, and low DO in certain cases).

TMDLs were completed for impairments that identify high TSS, high DO flux due to eutrophication, and high temperature as primary stressors. TMDLs were not developed for streams for which specific conductance and/or sulfate toxicity were identified as stressors. Where specific conductance was evaluated, it was not confirmed as a stressor to the biota due to the possibility of confounding stressors (such as habitat quality and high swings in DO concentration) and/or an inconsistent response of the biota to high specific conductance. Where sulfate was evaluated, it was not confirmed as a stressor to the biota, and TMDLs were not developed for sulfate due to the lack of applicable Minnesota water quality standards. Restoration and protection efforts are captured in the implementation table as opportunities for project development.

Restoration strategies

The MPCA and local partners participated in several different approaches to prioritize restoration efforts in the St. Louis River Watershed. In addition, a model was used to help focus on specific areas within the watershed. Our restoration work focused on the Swan River sub-watershed.

Monitoring in the Swan River sub-watershed indicated high sediment and phosphorus concentrations at multiple locations. The river's high sediment is likely due to channel instabilities in Barber and Dempsey Creeks and the East Swan River. *E. coli* concentrations are also high in the Swan River, potentially due to stormwater runoff and aging wastewater collection infrastructure in the watershed's older communities. High nutrients in some waterbodies are also in part due to historical and current municipal wastewater effluent.

There are many aquatic life impairments on the East Swan, West Two, and Little Swan Rivers, Ely, Sand, Skunk, Stony, Elbow, and Manganika Creeks, two unnamed creeks, West Two Rivers Reservoir, Lake Manganika, and McQuade Lake; aquatic life and aquatic recreation impairments were found in East Swan Creek.

These issues will be investigated further in future St. Louis River Watershed WRAPS work.

Protection strategies

The Upper Whiteface sub-watershed is the priority area for protection. Whiteface Reservoir is a regional recreational resource in the Superior National Forest. The dominant land covers in this focus area are forest and wetlands, with pasture/hay land concentrated around the lower portion of the Whiteface River near the small city of Meadowlands, the only city in the focus area.

Nutrient, sediment, and harmful bacteria concentrations are low on average.

Protecting the high-quality waters in this sub-watershed should focus on:

- Restoring the two small lakes that are impaired, Dinham and Strand
- Working with private landowners on pasture/hay land management
- Making improvements to the extensive ditching, restoring natural meander and complexity to stream segments,
- Addressing inadequate stream crossings, such as those that prevent fish passage, and, fixing improperly-sized culverts that restrict sediment transport, if addressed

These protection-oriented strategies will also be investigated further in future watershed's WRAPS work.

Next steps and measuring results

The restoration and protection strategies listed in the WRAPS report will be the basis for developing local implementation plans to restore and protect water resources. The report lays out goals, milestones and responsible entities to address protection and restoration priorities in the St. Louis River Watershed. The targets are intended to provide guidance and "measuring sticks" to assess the watershed's health and success of actions taken.

A priority of Cycle 2 WRAPs work for the St. Louis Watershed is to examine and document the primary headwater streams (1st and 2nd order streams) and their wetlands in the system, understand the land ownership around them, the connectivity to the downstream segments, and overall health of these small streams.

Key conclusions of first cycle

- The WRAPS report data and findings provide a base for developing the One Watershed One Plan.
- The St. Louis River Watershed overall has good to fair water quality, with spotty areas of poor water quality.
- There are many opportunities for conservation easement purchase, and significant amounts county, state, and Federal-owned lands that can be used to protect surface and ground water.
- The Swan River sub-watershed is degraded and has several impairments; the high quality waters of the Upper Whiteface system should be protected.

- Extensive ditching in the St. Louis River Watershed are contributing to decreased habitat and reduced biological function, especially in the mid-watershed areas near Meadowlands.
- The Northern Lakes and Waters ecoregion, which includes St. Louis Watershed, is in need of a shallow lake standard, like other ecoregions of Minnesota.
- High-gradient streams of the Duluth urban area are in need of specific protection and restoration treatments.
- Due to extensive mining on the Iron Range, many headwater streams (1st and 2nd order streams) and wetlands have been eliminated or severely degraded.

Full report

Full report and supporting documents can be found at www.pca.state.mn.us/water/watersheds/st-louis-river

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