



Minnesota
Pollution
Control
Agency

Groundhouse River TMDL for Fecal Coliform Bacteria and Biota (Sediment)

wq-iw6-02a September 18, 2008

What are impairments and how do TMDLs address them?

A waterbody that does not meet water quality standards for a particular pollutant is considered impaired and requires a TMDL to address the impairment. A TMDL study calculates the maximum amount of a pollutant a water body can receive (known as the "loading capacity") without violating water quality standards. The TMDL process identifies all sources of pollutants causing impairments and allocates reductions necessary to meet the water quality standard.

What are fecal coliform bacteria?

Fecal coliform bacteria are found in the intestines of warm-blooded animals (including humans), the presence of fecal coliform bacteria in water suggest the presence of fecal matter and associated harmful bacteria, viruses, and protozoa that are pathogenic to humans when ingested. Minnesota uses fecal coliform bacteria for its standard rather than actual pathogenic organisms because they are more easily sampled and measured.

Local water quality issues rely on locally-led solutions. In the Groundhouse River watershed, local landowners have the opportunity to identify good housekeeping practices and farming improvements that will improve water quality while generating economic and health benefits. This fact sheet discusses the recent efforts by the Minnesota Pollution Control Agency to develop a Total Maximum Daily Load (TMDL) study for the Groundhouse River watershed to address water quality problems and the opportunity for local landowners to lead the next phase – identifying and implementing solutions.

Where is the Groundhouse River watershed?

The headwaters of the Groundhouse River are located in Mille Lacs County, west of the city of Ogilvie. The watershed drains approximately 139 square miles (88,998 acres) and encompasses 14 percent of the Snake River watershed. The upper portions of the Groundhouse River watershed contain forest cover. Further downstream, the Groundhouse River watershed supports agricultural activities, including animal pasture and forage, as well as grain production. Figure 1 shows the location of the Groundhouse River watershed.

What are the impairments?

Recent assessments by the Minnesota Pollution Control Agency and its partners showed that segments of the Groundhouse River watershed are not

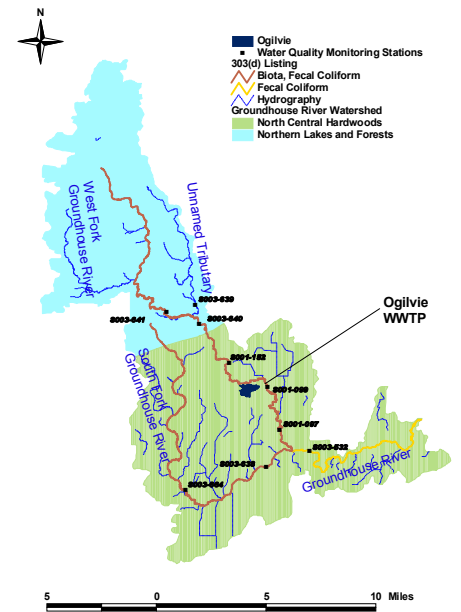


Figure 1. Location of the Groundhouse River Watershed, impaired segments, and sources.

safe for recreational use due to excessive amounts of fecal coliform bacteria and are not supporting healthy communities of fish and aquatic insects due to excessive amounts of sedimentation. Segments in the Groundhouse River watershed are not meeting the numeric water quality standards for fecal coliform bacteria and biota. As a result, the Minnesota Pollution Control Agency placed the Groundhouse River and the South Fork Groundhouse River on the Minnesota list of impaired waters and prepared a TMDL study. In addition to showing the physical location of the watershed, Figure 1 shows the location of the segments of the Groundhouse River watershed impaired by fecal coliform bacteria and biota – which is linked to sediment.

How does sediment cause biological impairment?

Many factors, including pollutants and habitat, can stress a biological community. Through a Stressor Identification process and monitoring, it was determined that fine sediment is the cause of biological impairment in the Groundhouse River watershed. Excessive sediments can make it difficult for organisms to find food, affect gill functions, and blanket gravel beds thus destroying the aquatic habitat. Minnesota uses Index of Biological indicator (IBI) scores as numeric criteria to assess the health of fish communities and macroinvertebrates.

What sources contribute to the impairments?

A variety of point and nonpoint sources contribute to the fecal coliform and biota (sediment) impairments in the Groundhouse River watershed. Sources contributing to sediment loads include erosion from unstable stream banks and adjacent cropland, and gravel pits. The TMDL study showed that among all sources of sediment, streambank erosion and crop production contribute the highest percentage of sediments to the Groundhouse River watershed.

Sources of fecal coliform include runoff associated with feeding operations, pastures used for grazing cattle, improperly stored manure, access of cattle to streams, and failure of septic systems. Fecal coliform exceedances were documented both in high and low flow conditions. In general, the primary sources of fecal coliform during high flows are associated with runoff from agricultural animal operations. Fecal coliform violations during low flows are typically due to failing septic systems and access of animal to streams.

What actions can local landowners consider to improve water quality?

Using the results of the TMDL study, local landowners in the Groundhouse River watershed will have the opportunity to work with local and state agencies to develop property and stream improvement projects that will reduce loads of fecal coliform bacteria and sediment. Through the development of a detailed implementation plan, local landowners can develop a strategy that will not only generate water quality benefits, but also economic and health benefits. Landowners can consider cropland controls to address sediment loads, such as conservation tillage, riparian buffers, filter strips, and cover crops. To address fecal coliform bacteria, landowners can consider

manure storage, alternative watering facilities, livestock exclusion from streams, and improved maintenance of onsite wastewater treatment systems. Many implementation actions have the potential to reduce both fecal coliform bacteria and sediments.



Who can I contact for more information?

For more information on the Groundhouse River fecal coliform bacteria and biota (sediment) TMDL report, contact Chris Klucas, Watershed Projects Manager, Minnesota Pollution Control Agency, at 651-267-8233 or Christopher.Klucas@pca.state.mn.us

For more information on Groundhouse River implementation activities contact Kelly Osterdyk, Chair of the Implementation Planning Committee, at 320-679-3781 ext: 113 or Kelly.Osterdyk@mn.nacdn.net

The draft TMDL report is available at www.pca.state.mn.us/water/tmdl/tmdl-draft.html
General TMDL information is available at www.pca.state.mn.us/water/tmdl/ and www.epa.gov/owow/tmdl/