



# Brown's Creek Total Maximum Daily Load

## Impaired Biota Project Overview

Water Quality/Impaired Water #6.05a • June 2010

**R**ecent assessments by the Minnesota Pollution Control Agency (MPCA) and its partners have revealed that some segments of Brown's Creek are not supporting healthy fish and insect populations. Among the reasons for this condition are excessive sedimentation, excessive copper levels, and increased water temperatures in the creek. As a result of these assessments, the MPCA has placed Brown's Creek on the Minnesota list of impaired waters and prepared a Total Maximum Daily Load

(TMDL) study. A TMDL study calculates the maximum amount of various pollutants that a particular water body can receive without violating water quality standards. Figure 1 shows the segment of the Brown's Creek watershed that is impaired because of Lack of Coldwater Assemblage (Fish) and Macro-invertebrates (insects).

### What does Lack of Coldwater Assemblage mean?

Water bodies that have been identified as lacking a coldwater assemblage have a fish community comprised predominantly of tolerant, warm water species. Primary coldwater species (those that can only survive in a coldwater environment) such as trout and sculpins are absent or lacking. This condition is a significant departure from expectations in coldwater streams in Minnesota and a clear indication of impairment.

### Where is the Brown's Creek watershed?

Brown's Creek is a watershed of approximately 30 square miles (19,000 acres) that includes portions of the cities of Stillwater, Oak Park Heights, Lake Elmo, Grant, and Hugo, as well as parts of May and Stillwater Townships. The wetlands in Hugo and May Township form the headwaters of Brown's Creek, and the creek flows south through the city of Grant. Much of this portion of the drainage way consists of broad, low-lying wetlands. Brown's Creek continues through

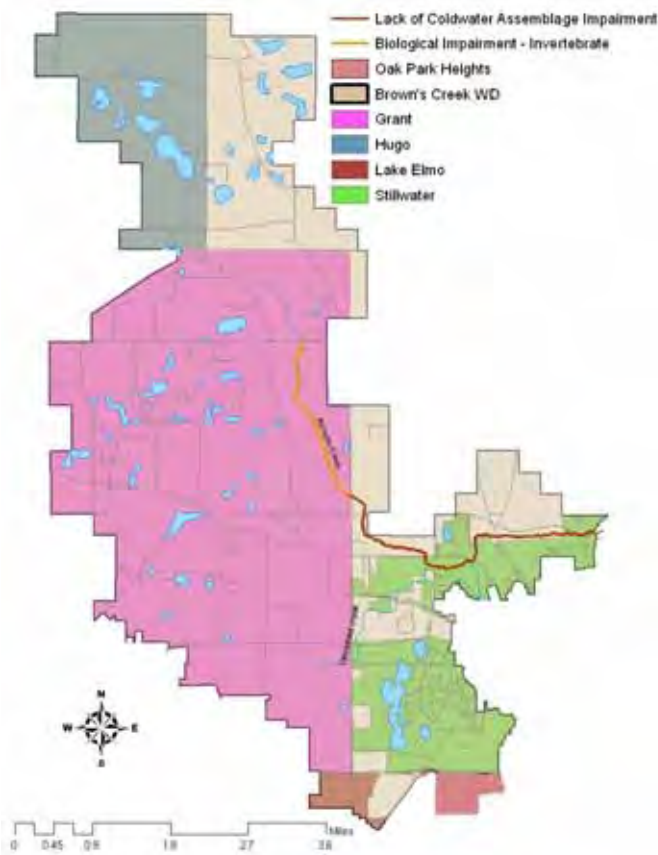
Stillwater Township and the City of Stillwater, its shallow banks transitioning to steep bluffs as it continues to the St. Croix River.



### What sources contribute to the impairments?

A variety of point and nonpoint sources have impaired fish and insect communities in Brown's Creek. The TMDL study showed that the most significant sources of excess sediment were from watershed runoff during high-flow periods. Sedimentation can result from a lack of vegetative buffers that hold soil in place and absorb precipitation. Other factors contributing to sediment load include runoff from row crop agriculture, mismanagement of construction stormwater, and impervious surfaces such as roadways, parking lots, and driveways, which carry sediment toward water bodies.

One reason for increased temperature in the creek is an increase in runoff associated with urban and rural stormwater. Stormwater from impervious surfaces such as roadways, parking lots, and driveways is warmed by the sun and enters the creek



**Figure 1. Location of the Brown's Creek watershed, impaired segments and sources.**

without having cooled off below the surface of the ground. Temperature exceedances were observed mainly during high flow conditions.

Exceedences of the copper standard were also observed; but only during high flow conditions at lower monitoring sites near the point of entry to the St. Croix River. This observation would indicate that runoff from the watershed during rain events is bringing the copper into the creek. The likely sources of the copper in the creek are algacides, herbicides, and fungicides used on lawns and in ponds.

### What actions can residents consider to improve water quality?

Local water quality issues rely on locally-led solutions. Communities in the Brown's Creek watershed may want to consider improved stormwater management practices and streambank rehabilitation. Excessive sediment conditions can be improved by installing buffer zones along the stream banks to prevent the movement of sediment from upland areas into the creek. Local government officials may also want to consider outreach

efforts to educate residents and businesses on the proper application of copper-containing lawn care products and the effects of these products on the watershed. To address water temperature, residents should look for ways to reduce runoff from driveways, roadways, and parking lots, create systems for stormwater infiltration, and improve riparian cover.

This TMDL study will create opportunities for residents in the Brown's Creek watershed to work with local and state agencies to develop projects that can improve the water quality of Brown's Creek. With the implementation of a well-developed improvement plan, local landowners can expect to see better water quality in Brown's Creek as well as economic and health benefits.

### Who can I contact for more information?

For the MPCA Watershed Project Manager for the Brown's Creek TMDL Project in the St. Croix River Basin, go to the following Web site:

[www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesota-s-impaired-waters-and-tmdls/tmdl-projects/st.-croix-river-basin-tmdl-projects/underway-tmdl-browns-creek-lack-of-cold-water-assemblage-and-impaired-biota.html?menuid=&missing=0&redirect=1](http://www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesota-s-impaired-waters-and-tmdls/tmdl-projects/st.-croix-river-basin-tmdl-projects/underway-tmdl-browns-creek-lack-of-cold-water-assemblage-and-impaired-biota.html?menuid=&missing=0&redirect=1)

Brown's Creek implementation activities:

Karen Kill

Brown's Creek Watershed District

651-275-1136 ext: 26 or [Karen.kill@mnwcd.org](mailto:Karen.kill@mnwcd.org)

Jay Riggs

Washington Conservation District

651-275-1136 ext: 20 or [jriggs@mnwcd.org](mailto:jriggs@mnwcd.org)

The draft TMDL report is available

at [www.pca.state.mn.us/water/tmdl/tmdl-draft.html](http://www.pca.state.mn.us/water/tmdl/tmdl-draft.html).