



NONPOINT SOURCE SUCCESS STORY

Minnesota

Installing Restoration Projects Improves Poplar River Water Quality

Waterbody Improved

For more than a decade, the Poplar River Management Board (PRMB), community groups, and local and state partners tackled stormwater runoff, streambank erosion, and slumping bluffs—and won. Work on restoring the river began nearly 10 years ago, with the formation of a dedicated community group in 2006, intensive and focused diagnostic studies conducted from 2007 to 2012, and large-scale targeted restoration projects that began in 2008 and continue today. The Poplar River now meets water quality standards for total suspended sediment and is proposed for removal from the state's impaired waters list in 2018. In addition, the river boasts healthy habitat conditions that support and sustain a diverse population of key fish and macroinvertebrates.

Problem

Poplar River is in northeastern Minnesota. It flows approximately 25.5 miles through a picturesque landscape of boreal forest and steep hills, eventually draining to Lake Superior (Figure 1). The headwaters of the 14-square-mile Poplar River watershed originate within the Boundary Waters Canoe Area Wilderness. The watershed includes a premier Midwest resort area with ski runs, hiking trails, and boating and fishing access sites for recreation. Downstream portions of the Poplar River and watershed are characterized as having significant drops in elevation (i.e., an average gradient of nearly 4 percent). The area contains both forested and non-forested steep slopes that are dominated by soils derived from glacial lake deposits of fine, easily erodible material. Citizen interest in the health of the river is high, whether they are anglers concerned about the native trout fishery or area residents concerned about water quality.

The Minnesota Pollution Control Agency (MPCA) listed a portion of the river as impaired in 2004, which required that a total maximum daily load (TMDL) study be completed. The lower 3 miles was listed as impaired due to exceedances of the turbidity standard (10 nephelometric turbidity units), which was replaced in 2015, with total suspended sediment (TSS) as the applicable water quality standard. Sampling data demonstrated that exceedances occurred frequently at flows greater than 68 cubic feet per second. The TMDL used a variety of technical approaches and analyses to evaluate turbidity and total suspended solids sources in the watershed and near channel areas. Water quality modeling, a

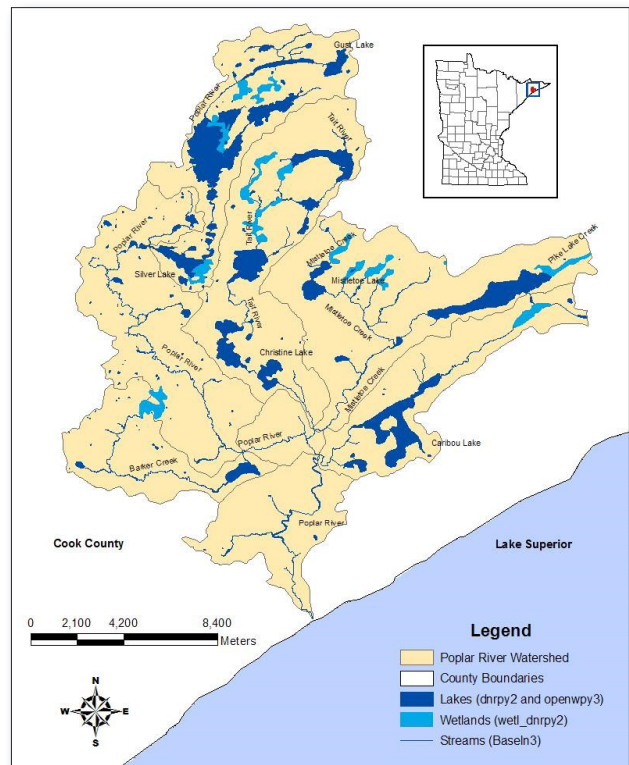


Figure 1. The Poplar River empties into Lake Superior in northeastern Minnesota.

physical channel assessment, field investigations and various statistical techniques were used to define the source, nature, frequency and magnitude of sediment loading in the river. Sediment sources identified by the TMDL investigation included natural and human-influenced land use issues associated with ski runs,

roads, trails, impervious surfaces related to development, and ravines, gullies, and slumping bluffs within the stream corridor.

Story Highlights

Organized in 2005, the PRMB partnership was primarily comprised of area landowners, but also included elected officials, resource agency members, including the Cook County Soil and Water Conservation District (SWCD) and the MPCA. Multiple sediment management projects were implemented to curb the amount of sediment entering the river. Projects targeted highly erodible soils and land uses in the lower watershed. Some projects were new for the immediate area and innovative for northern rivers, such as the area's first very large-scale channel restoration. Also, the "tightline" stormwater management conveyances are more typical in the western mountains than in northeastern Minnesota. Partners installed targeted best management practices (BMPs) near channel sources of erosion and in upland areas to better manage stormwater during high-flow events and to eliminate flow pathways that concentrated runoff. Streambank restoration projects targeted slumping hillsides and repaired significant ravines and gullies using new stormwater management products. Several flow-path mitigation projects closed roads and trails and re-configured those needed for operations with updated BMPs to slow, filter, divert and trap stormwater. Ski runs were evaluated for adequate vegetated cover and proper location of water bar BMPs. New development follows low impact design criteria to minimize impacts.

The project work is currently transitioning from a restoration-focused effort to a protection-focused effort. Other partners in the watershed include lake associations that have worked continuously to ensure the upper watershed remains in good condition.

Results

The average annual sediment load in the river declined by 300 tons from 2000 to 2010. At present, concentrations of TSS are within the state standard 92 percent of the time (Figure 2). Several organizations followed the

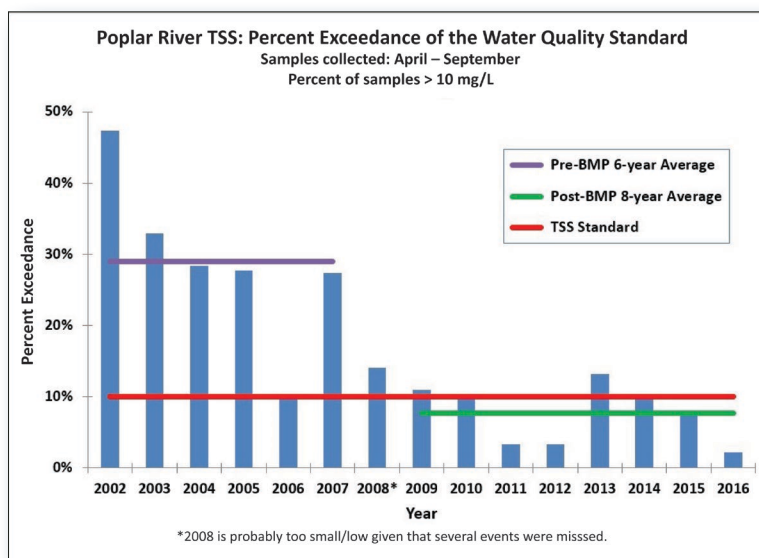


Figure 2. Poplar River estimated daily TSS concentrations (April 2002–September 2016).

story of the river's transition including the Lake Superior Streams web page, the Cook County News Herald, and WTIP, the local radio station. The newspaper and radio station have updated their audiences regularly regarding the status of the river. The resorts and business in this area, especially those part of the PRMB, changed their business practices to improve the river.

The Cook County SWCD has developed more capacity and skill in managing watershed science and monitoring needs for impaired streams. Educational training events for erosion and sediment control are held at the resorts. In addition, resort staff are certified in erosion and sediment management practices.

Partners and Funding

Funds spent on the project have included private money, state grants from the Clean Water Land and Legacy Funds, and federal funding sources, including the Great Lakes Restoration Initiative and the National Oceanic and Atmospheric Administration's Coastal Program. Approximately \$2.8 million have been invested in the river to date: \$874,008 from private funds and the remainder from public funds. Ongoing monitoring by the MPCA will provide the record of this river's change. As runoff reduction efforts mature, water quality will improve and be sustained.



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For additional information contact:

Karen Evens
Minnesota Pollution Control Agency
218-302-6644 • karen.evens@state.mn.us