



Minnesota
Pollution
Control
Agency

Como Lake

Total Maximum Daily Load

Excess Nutrients Project Overview

Water Quality/Impaired Waters #11.5a • April 2010

The State placed Como Lake on the 2002 impaired waters list for aquatic recreation because it exceeds the water quality standard for nutrients. Excess nutrients, such as phosphorus, from stormwater runoff create poor water quality conditions causing frequent summer algal blooms which limit recreational activities.

Como Lake

The Como Lake watershed is located in the north-central portion of the Capitol Region Watershed District (CRWD) and is within the Upper Mississippi Watershed. This area lies entirely within the North Central Hardwood Forest (NCHF) ecoregion. Como Lake is located in the city of St. Paul and the watershed is located within three municipalities in Ramsey County.

Como Lake has a 1783-acre watershed and is defined as a shallow lake according to the Minnesota Pollution Control Agency (MPCA). The majority of the watershed's water contribution to Como Lake is delivered through an extensive piped stormwater system consisting of twenty-two stormsewers discharging directly into the lake. A large portion of the northern runoff, including the golf course, runs through a series of two constructed wetland detention ponds. Gottfried's Pit collects the drainage from parts of Roseville, Falcon Heights, Ramsey County right-of-ways, and the city of St. Paul. Gottfried's Pit is pumped to Como Lake. Como Lake discharges into the Trout Brook stormsewer and on to the Mississippi River.



TMDL background

Based on the federal Clean Water Act, waters that do not meet water quality standards are "impaired". The Clean Water Act requires states to develop a clean-up plan for each impairment affecting a water body. The clean-up plan and the process used to create it is a Total Maximum Daily Load (TMDL). A TMDL must identify all sources of the pollutant causing a water body to violate standards. The TMDL also determines the amount by which each source must reduce its contribution to ensure a water body meets applicable water quality standards.

Como Lake impairment

The goal of this TMDL is to quantify the pollutant reductions needed for Como Lake to meet State water quality standards. The numeric targets for shallow lakes in the North Central Hardwood Forest Ecoregion are summer averages of ≤ 60 $\mu\text{g/L}$ total phosphorus concentration, ≤ 20 $\mu\text{g/L}$ chlorophyll-a concentration, and ≥ 1.0 meter of Secchi depth.

Total Phosphorus concentration growing season means ranged from 100 to 400 µg/L in the years 1993 to 2007, exceeding the ecoregion standard for shallow lakes each year. Chlorophyll-*a* concentration growing season means ranged from 10 µg/L to 60 µg/L in 1993 to 2007, only meeting the NCHF ecoregion shallow lakes standard in 1998, 1999, and 2004. The Secchi depth growing season means ranged from 0.65 m to 3.5 m in 1993 to 2007, meeting the NCHF ecoregion shallow lakes standard in all years except 2005 and 2006.

Pollution sources

The three categories of phosphorus loads to Como Lake are watershed runoff, internal loading, and atmospheric deposition. The watershed load to Como Lake represents approximately 34 percent of the total load to the lake, the internal load represents approximately 65 percent of the load to the lake, and atmospheric deposition represents the remaining 1 percent of the phosphorus load to the lake.

Impervious surfaces in the watershed improve the efficiency of water moving to the lake resulting in increased transport of phosphorus into Como Lake. Phosphorus in stormwater is a result of transporting organic material such as leaves and grass clippings, fertilizers, and sediments to the water body. In addition, phosphorus sources from Como Lake itself from lake sediments are a source.

Pollution reductions needed

A 60 percent reduction in watershed load and a 97 percent reduction in internal load are required in the TMDL to consistently meet water quality standards under average precipitation conditions. In-lake phosphorus load management and the reduction of phosphorus from urban runoff in the watershed by retrofitting Best Management Practices (BMPs) would have the most impact on reducing phosphorus loads and improving water quality in Como Lake.

Implementation strategies

Lake restoration activities can be grouped into two main categories: those practices aimed at reducing external nutrient loads, and those practices aimed at reducing internal loads. The focus of restoration activities depends on the lake's nutrient balance and opportunities for restoration. Watershed reductions can be made through a combination of retrofitting existing areas with BMPs, and installing new BMPs during redevelopment.

Examples of BMPs would be to increase ponding and filtration in the Como Lake watershed through the use of regional ponding, infiltration trenches, rain gardens, native plantings, retrofit detention ponds; encourage shoreline restoration; and educate property owners about proper fertilizer use and low-impact lawn care practices. Additional implementation strategies would also include in-lake reductions of phosphorus loading through strategies such as fisheries management and in-lake treatments.

For more information

The Como Lake Nutrient TMDL Report was prepared for the CRWD and the MPCA by Emmons and Olivier Resources, Inc.

For more information about the Como Lake Nutrient TMDL Report, view the Web page at www.pca.state.mn.us/index.php/water/water-types-and-programs/minnesotas-impaired-waters-and-tmdls/tmdl-projects/upper-mississippi-river-basin-tmdl-projects/project-como-lake-excess-nutrients.html.

800-657-3864 or 651-296-6300.

For general TMDL information, browse MPCA's Impaired Waters Web page at www.pca.state.mn.us/water/tmdl.

For more information about water bodies in the Capitol Region Watershed District, go to www.capitolregionwd.org.