



# NONPOINT SOURCE SUCCESS STORY

## Minnesota

### Community's Commitment to Installing Management Practices Restores Mitchell Lake

#### Waterbody Improved

Mitchell Lake is a shallow lake used primarily for recreation and fishing. Invasive plants, such as curlyleaf pondweed, grow quickly in the lake and then die back, releasing excess nutrients into the water that encourage algal growth. This lowers the dissolved oxygen, which can affect fish and other aquatic species. Stormwater runoff and upstream contamination of phosphorous also encourages algal blooms. The lake was listed as impaired in 2002 for exceeding eutrophication criteria. Several projects were completed, including stormwater management and in-lake alum treatment of Round Lake (upstream), as well as implementation of various stormwater best management practices (BMPs), shoreland restoration projects and curlyleaf pondweed/Eurasian milfoil removal. The lake now meets water quality standards and was removed from the impaired waters list in 2018.

#### Problem

Mitchell Lake (Waterbody ID #27-0070), is a 114-acre lake in the city of Eden Prairie in Hennepin County, Minnesota (Figure 1), within the Mitchell Lake watershed. It is defined as a shallow lake with a maximum depth of 15 feet. The 980-acre watershed mainly consists of residential and mixed use developed areas. Mitchell Lake is in the North Central Hardwood Forests (NCHF) ecoregion.

During the original assessment period (1999–2002), a data summary showed growing season averages of 107 micrograms per liter ( $\mu\text{g/L}$ ) total phosphorus, 60  $\mu\text{g/L}$  chlorophyll-*a*, and 1.0 meter (m) Secchi disk depth. The shallow lake standards for the NCHF are growing season averages of  $\geq 1.0$  m Secchi disk depth,  $\leq 60$   $\mu\text{g/L}$  total phosphorus, and  $\leq 20$   $\mu\text{g/L}$  chlorophyll-*a*. Because it exceeded eutrophication criteria, the lake was added to the Clean Water Act (CWA) section 303(d) list of impaired waters in 2002.

#### Story Highlights

Actions that contributed to a reduction in phosphorus loading include both in-lake management and external loading reduction by the Riley Purgatory Bluff Creek Watershed District and local partners. Implementation included:

- In-lake alum treatment of upstream Round Lake



Figure 1. In-lake weed harvesting locations (red outlined areas) in Mitchell Lake, Minnesota.

- Stormwater management in Mitchell Lake watershed
- Canada goose management
- Installation of various stormwater BMPs, including rain barrels, rain gardens and pervious pavement
- Shoreland restoration and vegetation projects (Figures 2 and 3)



Figure 2. Native wildflowers were re-established along the lake shore.



Figure 3. New plantings help to stabilize the shoreland zone of Mitchell Lake.

- Curlyleaf pondweed and Eurasian milfoil removal
- Annual lake cleanup events
- Public participation and outreach

In-lake water quality monitoring will continue to evaluate trends over time and to inform the need for modifying in-lake management. Also, opportunities for additional stormwater treatment will continue to be explored.

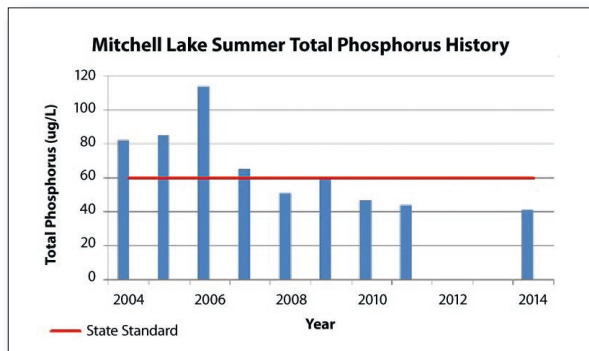


Figure 4. Mitchell Lake phosphorus data (Source: City of Eden Prairie).

## Results

Review of recent data (2006–2013) indicates Mitchell Lake had growing season averages of 57  $\mu\text{g/L}$  total phosphorus, 20.7  $\mu\text{g/L}$  chlorophyll-*a* and 1.3 m Secchi disk depth. Based on these results, Mitchell Lake is meeting water quality standards (Figure 4); therefore, it was approved for removal from the draft 2018 CWA section 303(d) list of impaired waters.

## Partners and Funding

Over 500 local stakeholders were involved in the improvement of Mitchell Lake, including community members, the city of Eden Prairie, Mitchell Lake Association, Riley-Purgatory-Bluff Creek Watershed District, University of Minnesota, and Hennepin County.

Support for these projects came in the form of public participation, landowner cooperation, monitoring, the implementation of BMPs, and more. To keep the progress moving forward, these stakeholders were involved in the planning for the 10-year period that began 2016.



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## For additional information contact:

Chris Zadak  
Minnesota Pollution Control  
651-757-2837 • [chris.zadak@state.mn.us](mailto:chris.zadak@state.mn.us)