

Shallow lake restoration balances water quality and recreation



Keller Lake in Ramsey County is one of more than 5,000 shallow lakes in Minnesota. **Photo Credit:** Ramsey-Washington Metro Watershed District

Shallow lakes are abundant across Minnesota, making up nearly half of the state's total lakes. According to the Minnesota Department of



Natural Resources (DNR), a shallow lake is defined as any lake with a maximum depth of 15 feet or with 80 percent or more of the lake area shallow enough to support emergent and submerged rooted

aquatic plants. They provide critical habitat for wildlife, and offer a range of angling and recreational opportunities.

The unique ecological makeup of shallow lakes requires different management and restoration practices. To maintain a shallow lake, conservationists must balance efforts to sustain clean water, aquatic plant life and recreational activities.

The Ramsey-Washington Metro Watershed District (RWMWD) recently produced an educational video, [Getting to Know Shallow Lakes](#), to explain the characteristics and needs of urban shallow lakes in Minnesota. This video serves as a primer on shallow lakes ecology and includes perspectives on the value of clean water and healthy habitat.

The idea for the video came

from RWMWD Natural Resource Specialist Bill Bartodziej, who recognized that some lake users may not have understood shallow lakes' unique ecology.

"By explaining how shallow lakes are inherently different from deep lakes, we can help folks appreciate these important ecosystems," Bartodziej said.

Shallow lakes exist in one of two states: turbid (clouded) or clear-water.

Lakes in a turbid state tend to be dominated by algae and are often home to large populations of common carp, which can have a detrimental effect on water quality. Water quality tends to be poorer in

turbid lakes.

Shallow lakes in a clear-water state mostly contain rooted aquatic plants. A shallow lake that is in a clear-water state may have abundant aquatic plants from shore-to-shore, providing habitat for fish and aquatic insects.

When it comes to restoring a shallow lake, lake managers generally need to take the following steps to balance water quality, fish and aquatic plants and recreation.

Identify phosphorus sources. Lake managers gather water-monitoring data to identify potential sources of excess phosphorus, a key nutrient that influences algae growth. Identifying phosphorus sources helps in the selection of best management practices needed to address watershed runoff and internal nutrient loading within the lake.

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– Bill Bartodziej, Natural Resource Specialist, Ramsey-Washington Metro Watershed District

Reduce phosphorus entering the lake. Best management practices vary based on whether the lake is urban or rural. To reduce phosphorus entering a lake, practices can include limiting the use of fertilizers, planting raingardens or native vegetation



Kohlman Lake in Ramsey County is a 74-acre shallow lake in the Phalen Chain of Lakes. Over the past 10 years, water quality has improved thanks to conservation efforts. Photo Credit: Ramsey-Washington Metro Watershed District

to filter nutrients, or constructing stormwater retention ponds or water and sediment control basins to settle out nutrient-rich sediments. Choosing the right practice may also depend on whether most of the phosphorus is dissolved in the water or attached to sediment.

Immobilize phosphorus in the lake sediments. Once the amount of phosphorus coming into the lake is reduced, lake managers may need to reduce in-lake phosphorus loads. One best management practice used is reducing common carp populations because these fish stir up lake sediments (releasing phosphorus) and destroy lake plants. Another practice used is adding aluminum sulfate to the lake, which binds to phosphorus in the lake sediments and keeps it from being released and contributing to algae blooms.

Manage expectations. Once the lake water is cleaned up, managing

the expectations of those who use shallow lakes for recreation can be challenging. A healthy shallow lake in a clear-water state should have abundant aquatic plant life throughout most of the lake. But thick beds of plants can make it challenging to swim, water-ski and boat.

Bartodziej recommends sharing straightforward information to help lake users understand what types of recreation a given lake can reasonably support.

A significant challenge in restoring and maintaining shallow lakes remains balancing healthy aquatic plant life with water quality and recreation. The best way to ensure a smooth restoration process is to ensure everyone involved at the local level is well informed of the challenges and trade-offs that come with managing shallow lakes.