

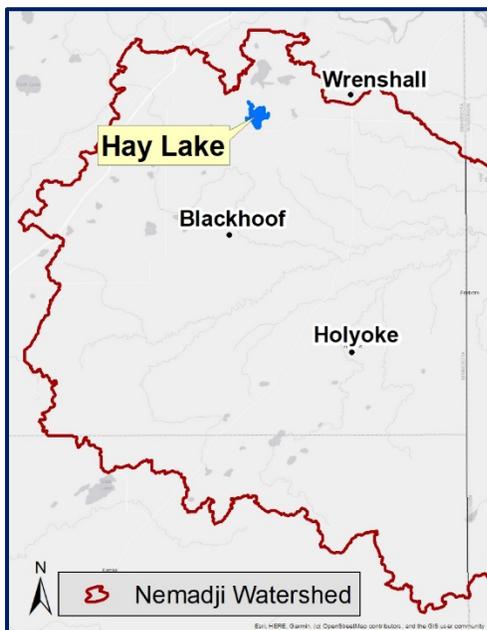


Hay Lake Implementation Plan

In 2019-2020, Carlton and Pine Counties and Soil and Water Conservation Districts (SWCDs) partnered to develop the Nemadji River Comprehensive Watershed Management Plan.

The planning process consisted of:

- ✦ topic-focused stakeholder meetings that included citizens, businesses, state agencies, local experts, and local officials;
- ✦ prioritizing issues and concerns for the watershed;
- ✦ developing action items for specific watershed areas; and
- ✦ local agencies adopting a ten-year watershed plan for 2021-2031.



Hay Lake Implementation Plan is based on the Nemadji River Comprehensive Watershed Management Plan.

In this plan, Hay Lake is a priority for reducing phosphorus to the lake because it contains wild rice.

The next few pages explain priority projects that will work to improve Hay Lake in the future.



Why Does it Matter?

Want to learn more about taking care of lakes?
Watch a video here:
<https://youtu.be/dwjAoRwLrmM>



Property Values

What is your lake home worth? Studies on Minnesota lakes show that lake property values are directly tied to water quality. For a three-foot decrease in water clarity, prices were reduced up to \$594 per shoreline foot. For a three-foot increase in clarity, prices increased up to \$423 per shoreline foot. This change in value can be a significant financial loss or gain to an individual property owner as well and a community.



Fishing & Recreation

Do you enjoy fishing and swimming? Minnesota's native gamefish, such as walleyes, need clear water to see their prey, aquatic plants to hide and spawn in, and shade to keep cool. Keeping native plants in the lake and trees along the shoreline provide shade, spawning habitat, and protection for the game fish we love to catch. These plants and trees also help stop runoff and keep the lake clear for swimming and recreational activities.

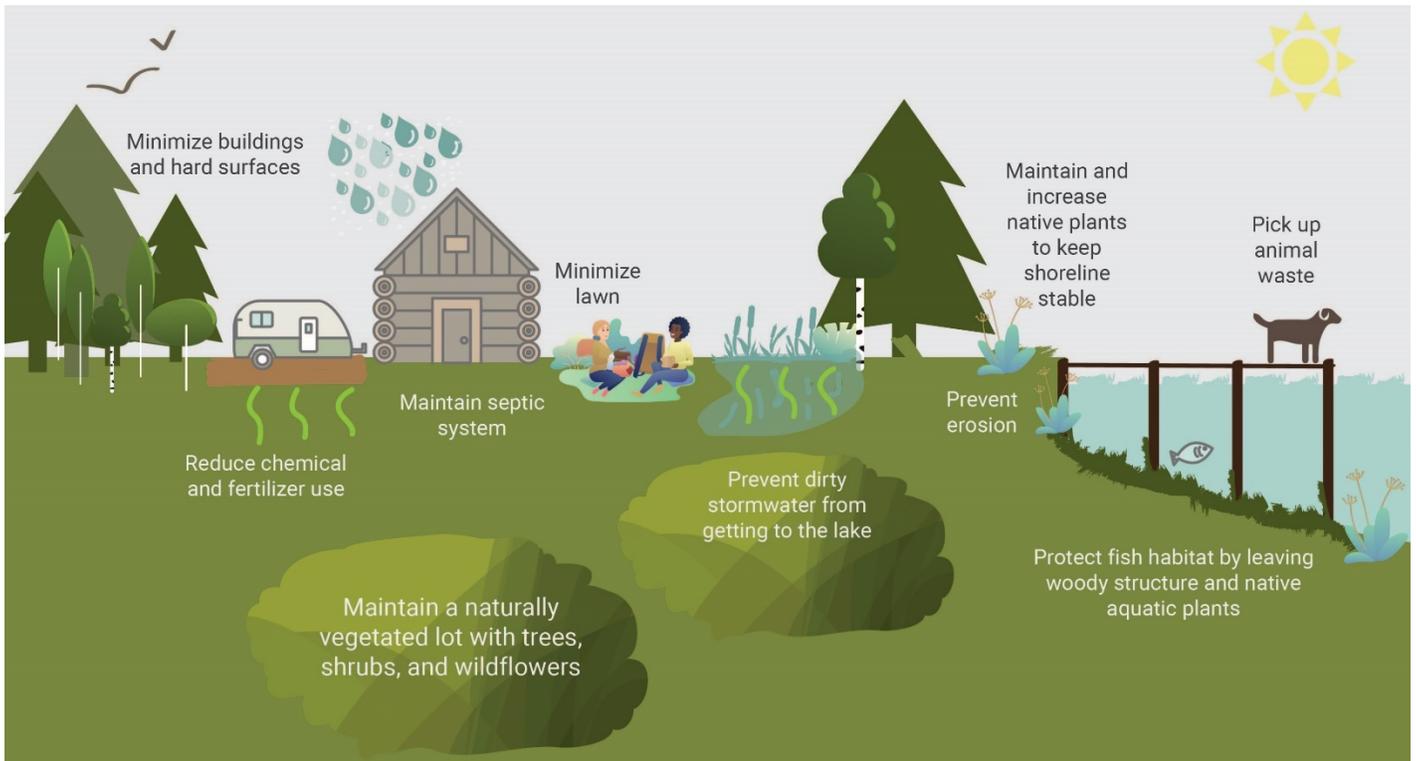


Habitat

Do you enjoy watching loons, bald eagles, turtles, butterflies, songbirds and other wildlife at the lake? These animals depend on shoreline plants for nesting and cover, trees and forests for their homes, and native plants and flowers for pollinating. Keeping some of your yard natural enhances the habitat for these animals, ensuring their survival.



Be a good steward • Leave a legacy • Take care of your lake!



Understanding Hay Lake

Lake Characteristics	
Size	140 acres
Maximum Depth	14 feet
Average Depth	4 feet
Shoreline Length	4.5 miles
Public Access	Yes

Hay Lake is a small shallow lake located in Carlton County southwest of Wrenshall, MN. It is called Hay Lake because it was actually cut for hay years ago. The immediate shoreline has some lake homes and seasonal cabins along the shore.

Hay Lake Timeline

A lake reflects what has been done to it over time. Logging, shoreline development, roads, and fire all have the potential to affect the water quality of the lake. Below is a timeline of what has occurred around Hay Lake over time.



We know that:

- ✦ Water clarity has declined on average about one foot from 2009-present
- ✦ Hay Lake is an important wild rice lake as determined by the 1854 Treaty Authority and the Minnesota DNR.
- ✦ Water levels were historically low in the 2000s (4 feet below the ordinary high water mark) and since 2013 have been closer to the ordinary high water mark.
- ✦ Because of the shallow depth it has the potential to freeze out in winter, affecting the fish population.
- ✦ Common fish include Walleye (stocked by the DNR), Northern pike, Largemouth bass, Black crappie, Bluegill, and Yellow perch.

What can we do?

Private landowners can help improve lake water quality and achieve watershed plan goals by implementing the following projects below. Technical and financial assistance is available to help with these projects through the local Soil and Water Conservation Districts. This assistance includes site visits, project design, plant advice, and cost share funding.



Contacts

Carlton SWCD 218-384-3891 https://carltonswcd.org	Pine SWCD 320-216-4240 www.pineswcd.com
Carlton County 218-384-9176 www.co.carlton.mn.us	Pine County 320-216-4220 www.co.pine.mn.us
Minnesota Land Trust 877-MLT-LAND https://mmland.org	DNR Forests www.dnr.state.mn.us/forests_tewardship/plan-writers.html

Watershed Plan Goal	Implementation Action	Minimum 10-year goal	Annual Goal	Where	Who
Phosphorus Reduction (18 lbs/yr)	Install rain gardens and stormwater management practices to capture rainwater and let it infiltrate instead of running off into the lake.	10 projects	1 projects/year	Map 1	Carlton SWCD, Lake Association, Landowners
	Monitor lake water quality.	Trend Analysis	5 water samples/yr	middle of the lake	Lake Volunteers
Shoreline Restoration	Install shoreline buffers of native plants to protect the shoreline from erosion and provide habitat for fish and wildlife.	1 project	1 project in 10 years	Map 1	Carlton SWCD, Lake Association, Landowners
Land Protection	Develop a Forest Stewardship Plan (minimum 20-acre area).	4 forest plans	1/year	Map 2	Carlton SWCD, DNR, Private Foresters, Landowners
	Sign up for Sustainable Forest Incentive Act (SFIA) to receive payments to keep wooded areas undeveloped (minimum 20-acre area).	604 acres	40 acres/year	Map 2	Carlton SWCD, Landowners
	Permanently protect undeveloped land and shoreline with conservation easements.			Map 2	Carlton SWCD, DNR, MLT, Landowners

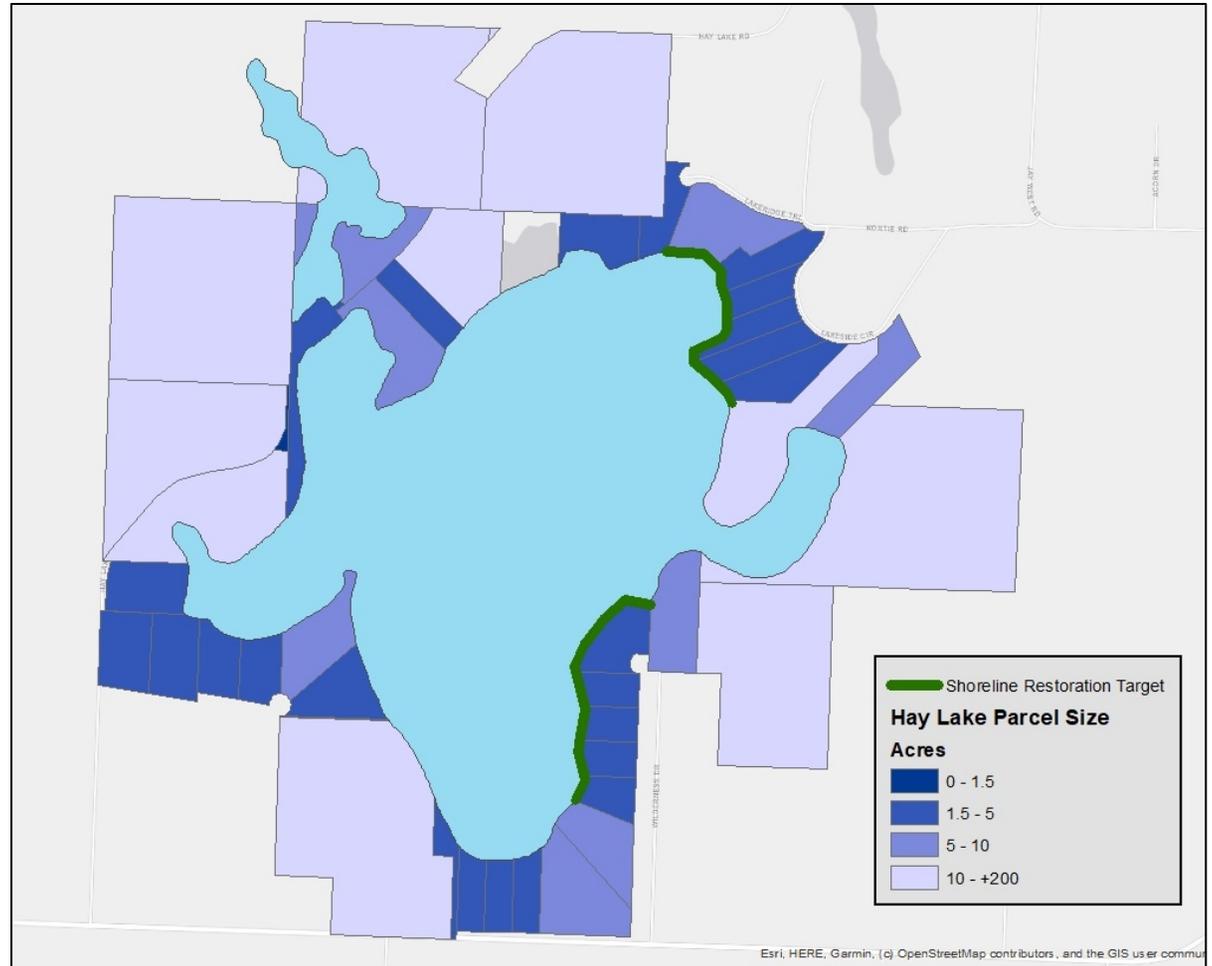
Acronyms: SWCD = Soil and Water Conservation District • MLT = Minnesota Land Trust • DNR = Department of Natural Resources

Map 1. Stormwater Best Management Practices

Impervious surface is where rain cannot soak into the ground and therefore runs over the surface, which includes roofs, driveways, sidewalks, and patios. When rainwater soaks into the ground it gets filtered; when it runs off the land into the lake it carries with it dirt and chemicals that can harm the lake.

The Carlton County shoreline ordinances allow up to 25% of a lake lot to be impervious (total square footage of impervious items such as the house, shed, sidewalks, etc divided by the total lot size). For example, a 100 ft wide x 1,000 ft deep lot = 100,000 sq. ft. To stay under 25% impervious, the total house + garage + sidewalk + driveway must remain below 25,000 square feet. Contact the Carlton County Planning and Zoning Department with any questions.

This map shows each parcel around the shoreline and its size. Smaller parcels are likely to be developed and be closest to the 25% impervious limit. Parcels that are navy blue are the highest priority for stormwater management such as rain gardens, shoreline buffers and tree planting to minimize runoff into the lake. Large parcels that are light blue could be candidates for permanent protection.



Want to learn more about rain gardens?
Watch a short video at:
<https://youtu.be/ZHeY6CUAS8s>

Map 2. Forest and Protection Priorities

DNR Fisheries modeling has shown that protecting the land and forest cover around the lake protects the lake's water quality. This map shows the land area that drains towards the lake (Hay Lakeshed). Areas that are green are the highest priority for increasing protection of the land. Landowners in these high priority areas can contact the SWCD for protection options such as Forest Stewardship Plans, the Sustainable Forest Incentive Act, and Conservation Easements.

