CEDAR LAKE MANAGEMENT PLAN
July 2013

The process to develop the Cedar Lake Management Plan began with a thorough three-year study of the lake and its watershed. We discovered that about 90% of the phosphorus that causes algae growth in summer comes from the lake sediments. This source must be controlled to have a visible impact on lake quality.

A survey of lake residents was an important part of the planning process. With a 53% response rate, the survey provided great guidance to an advisory committee who helped develop the plan. The advisory committee included lake residents, community leaders, and lake experts. Members are listed on the back cover.

This summary document presents an overview of lake concerns, plan actions, and expected results. If the plan is supported and implemented, our future vision for the year 2030 follows.

Vision for Cedar Lake in the Year 2030

Cedar Lake is a healthy lake that provides clear water, excellent aquatic and nearshore fish and wildlife habitat, and quality recreation.

NOT SCUMMY GREEN WATER

If we do nothing, scummy green water is what we will continue to get. Lake water quality on Cedar Lake has been degraded for years. DNR files include reports of “pea soup” conditions way back in 1938. Cedar Lake family memories include retreating from the lake in the 1950s because of foul odors from lake algae.

A sediment core study revealed that clearing the land for agriculture impacted the lake as early as the late 1880s. And tilling land and using commercial fertilizer for crops led to a build-up of nutrients in lake sediments over the years. The good news is that farmers in the Horse Creek Watershed (which flows to Cedar Lake) now use best management practices such as minimum tillage that keep Horse Creek much cleaner than in the past!

WE WANT CLEAN WATER for FUTURE GENERATIONS

Clear water with substantially less algae growth is a major goal of the lake management plan. Clear water will make Cedar Lake a better place to share with friends and family. Cedar Lake property owners surveyed reported that algae growth is by far the top negative impact to Cedar Lake.

<u>Clear Water Benefits:</u>

Lower Risk from Algae Toxins

Increased Property Values

Increased Aquatic Plant Growth for

- *Better fish and wildlife habitat*
- *Stabilized lake sediments*
- *Reduced shoreline erosion*
- *Better lake health*

Fresh Air – Reduced Lake Odor

Better Recreational Opportunities

Relaxing Lake Experiences

Better Swimming

ACHIEVING CEDAR LAKE MANAGEMENT PLAN GOALS

Achieve and maintain clear water throughout the summer.

Phosphorus is the main nutrient that leads to algae growth in Cedar Lake. Significant improvements in water clarity will result only if the release of phosphorus from the lake sediments is controlled. An alum treatment is recommended to reduce phosphorus release from lake sediments by 90%. Clear water is not possible if sediment phosphorus is not controlled. Reducing phosphorus that flows to the lake from the watershed even further is also necessary to ensure a successful, long-term result.

Phosphorus is released from lake sediments when the oxygen levels decrease at the bottom of the lake. In many lakes, the phosphorus circulates to the lake surface to cause algae growth in the fall. Cedar Lake occasionally mixes during the summer bringing phosphorus to the surface and dramatically increasing algae growth. An alum application leaves a thin layer at the lake sediment surface to bind the phosphorus and prevent release to the water.

Alum applications are safe as long as the pH is kept in a close to neutral range. Cedar Lake has some buffering ability to maintain pH. As a further measure of safety, alum will be applied in two doses in subsequent years.

The science of alum application rates has advanced greatly in recent years. After careful study, an application rate was recommended with higher concentrations applied in areas where water is over 25 feet deep and lower concentrations applied in areas where water depth is between 20 and 25 feet.

Long-term successful alum treatments include four lakes in the Minneapolis Chain of Lakes. DNR reports success on most lakes as long as the external (or watershed) phosphorus load is controlled.

Planned Actions

- Conduct an alum treatment.

Clear Water Expectations

In-lake total phosphorus objective:
Achieve and maintain a summer total phosphorus mean of less than 40 ug/L.
(In 2010, the total phosphorus mean was 68 ug/L/)

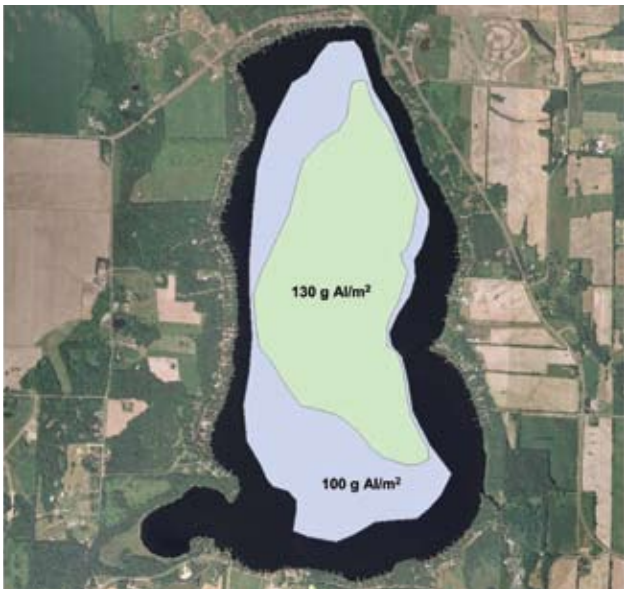
This objective is achievable with the alum treatment alone. Watershed reductions will ensure that the alum treatment is successful in the long-term.

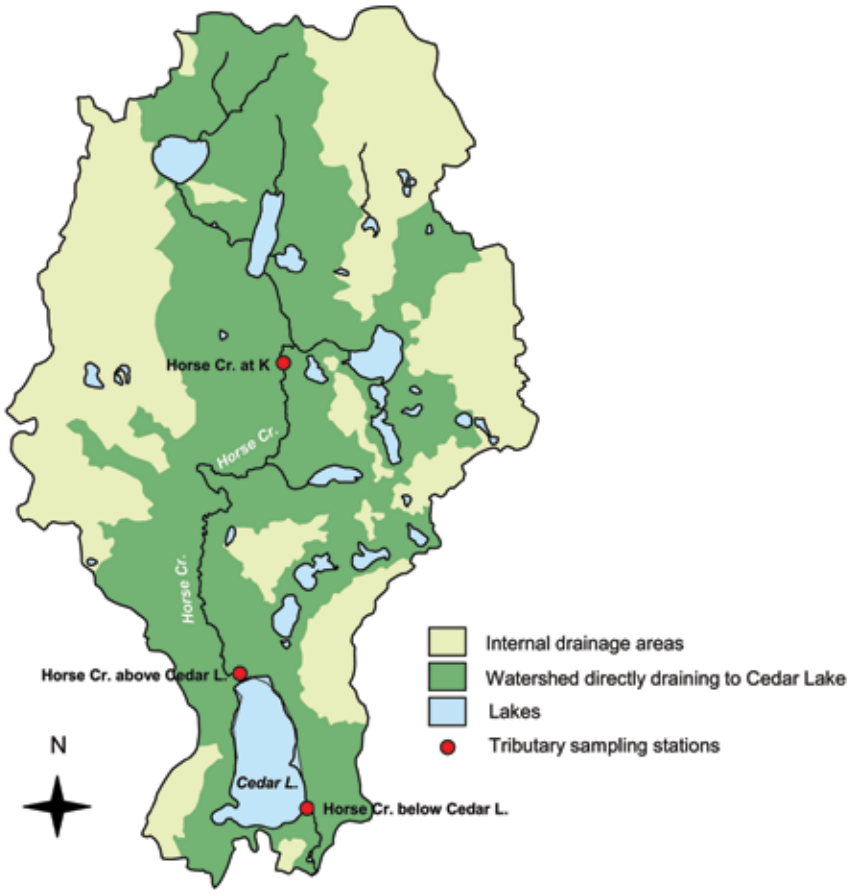
Lake quality varies greatly from year-to-year with changing rainfall, wind, temperature and other factors. On average we predict* significant changes following an alum treatment:

- Summer water clarity will increase from an average secchi depth of 5 feet in 2010 to 10 feet.
- The frequency of nuisance summer algae blooms will decrease from 55% to less than 5 percent of the time.
- The threat of blue-green algae toxin production will be minimized.

*predictions are based upon mathematical water quality models

Alum Application at Half Moon Lake in Eau Claire, WI





Cedar Lake's watershed includes agricultural and residential areas.

Horse Creek Farmer-Led Council

The Horse Creek Watershed is home to one of only four farmer-led watershed management pilot projects across the state. Farmers in the watershed are using information from an inventory conducted by the Polk County Land and Water Resources Department to develop incentives for on-farm measures for water quality improvements. The inventory found that phosphorus levels leaving farm fields and draining directly to Horse Creek average only about 1/6 of the allowed state standard.

The primary goal of the pilot project is to allow members of the agricultural community an opportunity to become actively involved in the process of developing a strategy to improve water quality, adopting that strategy, and ensuring its success.

Planned Actions

- Support farmer-led watershed efforts and encourage installation of best management practices.
- Encourage residential best management practices.
- Monitor the lake to assess the effectiveness of alum treatment and watershed projects.

Conservation tillage leaves crop residue to prevent soil erosion.

Rain gardens capture water briefly to prevent runoff to the lake.

ACHIEVING CEDAR LAKE MANAGEMENT PLAN GOALS

Prevent the introduction of aquatic invasive species and effectively manage those introduced into the lake.

Eurasian water milfoil, an aquatic invasive species

When non-native plants, animals, or pathogens rapidly take over a new location and alter the ecosystem, they are considered invasive species. Invasive species can take over and spread rapidly and widely causing major harm to the native ecosystem or humans.

Prevention of invasive species introduction is a high priority for lake residents.

Planned Actions

- Carry out educational activities to reach residents and visitors to the lake.
- Continue a Clean Boats, Clean Waters Program at the North Boat Landing.
- Monitor the lake for aquatic invasive species in areas of high public use.
- Develop a Rapid Response Protocol for newly introduced invasive species.
- Control invasive species in the shoreland zone.

Activities are currently carried out with interns hired by Beaver Creek Reserve and with staff hired directly by the lake district. Services are supported by DNR grants and include resident and visitor education, checks of boats and trailers at the landing, and monitoring for potentially introduced species in the lake. The Rapid Response Protocol will outline procedures and contacts should a new invasive species be introduced into the lake.

Maintain a high quality sport fishery in Cedar Lake.

Planned Actions

(these are DNR-led activities supported by the Lake District and other partners)

- Use effective regulations to improve game and pan fish populations/size structure.
- Complete fish habitat improvement projects.
- Stock musky in alternate years
- Conduct in-lake and creel surveys to assess fish populations and effectiveness of management efforts.

Management objectives vary by fish species. Walleye, musky, and pan fish are especially prized fish for Cedar Lake anglers.

Carp have frustrated lake residents and commercial fisherman for years after being implicated for water quality problems. In 2002 a viral disease brought carp populations down to a low level where they remain today. A barrier at the dam keeps carp from re-entering the lake at the Cedar Creek outflow. Carp are also present in upstream lakes including Horse and Lotus. Efforts are underway to control carp in these lakes.

Photo by Marty Engel

ACHIEVING CEDAR LAKE MANAGEMENT PLAN GOALS

Protect and improve near shore habitat both in the water and on the land.

Planned Actions

- Encourage restoration of near shore (shoreline) habitat.
- Provide education about the importance of maintaining vegetation on the land and in the water.
- Encourage preservation of existing high quality habitat.

Balance recreational uses so that residents and lake users can enjoy the natural benefits Cedar Lake provides.

Planned Actions

- Inform lake users about ways to use the lake without conflicts with other users and damage to the lake environment.

Carry out the Cedar Lake Management Plan effectively and efficiently with a cooperative spirit.

Planned Actions

- Provide information to lake residents to increase understanding about lake management plan actions.






INVESTING IN LAKE MANAGEMENT

Costs for plan implementation over the next ten years are expected to be $2.2 million. Virtually all of the cost is for an alum treatment. Grants will be sought to pay for the alum treatment and other program costs. However, grants from the Wisconsin Department of Natural Resources (our most likely funding source) are available on a reimbursement basis. This means that we need to have the money available for the alum treatment up front.

After careful investigation, a municipal loan was determined to be the most cost effective option for the following reasons:

- Favorable interest rate climate
- Ten-year amortization
- No pre-payment penalties
- Audited financial statements not required
- Semi-annual assessment based on property equalized value.

SPECIAL THANKS TO THE CEDAR LAKE MANAGEMENT PLAN ADVISORY COMMITTEE

Larry Gee ..... WITC, Dean General Education
Robert Goodlad ..... Lake Resident
Nate Warner ..... Warner's Dock
Brad Johnson ..... Town of Alden, Chair
Scott Counter ..... Town of Star Prairie, Chair
Mike Kelly ..... Star Prairie Land Preservation Trust , Star Prairie Fish and Game
Helen Johnson ..... Town of Alden, Church Pine, Round and Big Lake P&R District Board
Dennis Early ..... Cedar Lake P&R District Board
Dan Early ..... Cedar Lake P&R District Board
Stuart Nelson ..... Cedar Lake P&R District Board, Star Prairie Fish and Game
Jim Drill ..... Lake Resident
Kent Rebeck ..... Lake Resident
Jennifer Blazek ..... UWEX Agriculture Agent
Peter Kling ..... UWEX Community, Natural Resource and Economic Development Agent

ADVISORS

Buzz Sorge ..... Department of Natural Resources
William James ..... UW Stout/Army Corps of Engineers
Eric Wjochik ..... Polk County Land and Water Resources Department

PLANNING CONSULTANT

Cheryl Clemens ..... Harmony Environmental

TO LEARN MORE ABOUT THE CEDAR LAKE MANAGEMENT PLAN:

Go to cedarlake-wi.org or townofstarprairie.com

Attend the **Cedar Lake Protection and Rehabilitation District Annual Meeting**
August 3, 9 a.m. at the Star Prairie Town Hall, 2118 Cook Drive, Somerset, WI

PLEASE SEND WRITTEN COMMENTS TO:

Harmony Environmental, 516 Keller Ave. S, Amery, WI 54001
or harmonyenv@amerytel.net by August 3rd