



CEDAR LAKE PROTECTION AND REHABILITATION DISTRICT

NOTE FROM THE BOARD

In an effort to inform the lake residents of the activities of the board, we are publishing two newsletters annually. In the newsletter you will read about the priorities set by the board and many of the projects currently being undertaken.

The board's number one priority is water quality. This is evidenced by the effort and expense that has gone into the lake quality grant that was awarded to our lake district. The grant request, initially written by the late Jack Hayes in the year 2007, was awarded based on merit and titled "Cedar Lake Phosphorus Budget and Water Quality Study"

Other priorities the board has set are: maintain a budget without increasing the tax levy, research the improving of the north shore boat landing and dock, improving our website, and maintaining the good relationship in our partnerships that have been established over time.

As mentioned, the partnerships we have established have become an integral part of all our activities. These partnerships and the activities include: Star Prairie Fish and Game, building of fish cribs and placement and removal of buoys, maintenance of the McMurtrie Preserve and Cedar Bay Landing; Star Prairie Land Preservation Trust, development and planning of the Mc Murtrie Preserve and Cedar Bay Landing; Wisconsin DNR, Lake Study Grant and Fish Cribs; Beaver Creek Reserve, inspection for invasive species; Knowles-Nelson Stewardship Grant, Cedar Bay Landing and McMurtrie Preserve; Polk County Land Conservation Department, study of Horse Creek watershed as part of the Lake Quality Study. Without these Partnerships our agenda would not be possible.

In the newsletter you can read more about these activities, along with FEMA'S floodplain map, the future of our aeration system, 2012 Fish Crib initiative, and also an article from our partners at SPF& Game.

LAKE GRANT RESEARCH IN 2011 AND 2012

The Objectives of research conducted in 2011 on Cedar Lake, Wisconsin, were to determine the efficiency of the aeration system in reducing phosphorus inputs from sediment to algae. The aeration system was originally designed to continually mix water in the lake to maintain dissolved oxygen in the bottom waters throughout the summer. When not mixed, Cedar Lake develops anoxia (i.e., zero oxygen) in the bottom waters because bacteria consumes oxygen through respiration and it cannot be replenished due to temperature stratification. This pattern is typical of most lakes in the region. However, when the bottom waters become anoxic,

phosphorus bound to sediment compounds becomes dissolved and diffused upward into the water. This can be a big problem for lake that have a lot of phosphorus bound to sediment (such as Cedar Lake). When the lake mixes during fall turnover, this dissolved phosphorus disperses into the surface waters for use by algae. The nuisance algal blooms that typically develop during the fall in Cedar Lake are the direct result of this recycling process. The goal of aerating and continually mixing the water column in Cedar Lake was to prevent the development of nuisance algal blooms.

The results of the 2011 study indicated that chemical treatment of the bottom sediment to permanently bind the phosphorus is the best option. Additional research will be conducted in 2012 to determine the concentration of aluminum sulfate needed to achieve complete inactivation of the sediment phosphorus. Aluminum sulfate (alum) has been widely used in lakes to bind the phosphorus in the sediment and remove it from recycling. Alum is added to a lake by a boat equipped with injector nozzles. The alum reacts with the lake water to form aluminum hydroxides, milky white precipitate that rapidly settles to the lake bottom and binds the phosphorus that is active in the sediment. If properly dosed, alum can be effective in removing this phosphorus (CONTINUED) from recycling for decades. Many lakes have been successfully treated with alum with resulting major declines in algal blooms and increases in water clarity.

Soils in the watershed draining to Cedar Lake will also be examined in 2012 by personnel from the Polk County Land and Water Resources Division. Although the Cedar Lake watershed is not a major contributor of phosphorus to the lake, efforts to reduce sediment phosphorus recycling via alum will be greatly enhanced if watershed inputs can also be managed and even reduced further. The overall result will be a healthy lake with high water clarity and a low frequency of algal blooms. A final comprehensive analysis of all results will be completed by early 2013. This report will form the basis of efforts to procure funding to implement management of sediment phosphorus with alum.

LAKE AERATION HISTORY AND EFFECTIVENESS

The aerator was put in 1991 as means of reducing phosphorus released into the lake from the deep sediments contributing to the algae blooms that were occurring. Initially the aeration system was effective, but over time it's effectiveness decreased later studies have shown that this decreased effectiveness was related to the amount of iron in the water. Initially, there was accumulated iron in the sediment which controlled the release of phosphorus into (CONT.)

(CONT.) the lake when the aerator was in operation. As the aerator continued to function, this level of iron was depleted from the sediments. Iron forms an insoluble compound with phosphorus into the lake when the aerator was in operation. As the aerator continued to function, this level of iron was depleted from the sediments. Iron forms an insoluble compound with phosphorus in the presence of oxygen. We now know that the amount of iron that is added to the water column from the ground water and the watershed is only about 1/3rd as much as is needed to make the aerator work effectively. In 1994 another study showed that our phosphorus levels was coming from 3 main sources.: 1) the incoming water from the watershed 2) the bottom sediment and 3) the carp. In the fall and winter of 2000-2001 we had a virus that attacked the carp and reduced their numbers by almost 90%. In the following years it was noted that, even with the carp no longer a major contributor, the phosphorus levels kept increasing up to 5 times the levels measured in the early spring. In addition, field crews from the Engineer Research and Development Center - Eau Galle Aquatic Ecology Laboratory (a part of the U.S. Army Corps of Engineers) and the Wisconsin DNR found that the aeration system was not meeting the oxygen demand caused by the bacteria residing in the bottom waters by 2011. The result was 2-fold; 1) anoxia developed in the bottom waters allowing for the release of phosphorus from sediment and 2) phosphorus was continuously mixed to the surface for use by algae. In fact, so much phosphorus mixed into the surface waters during the summer of 2011 that algae could not use it completely. So, algal blooms were not severe as researchers might have expected, given the high phosphorus concentrations measured in the surface waters.

The latest study that has been going since 2009, and will issue the final report the year, has shown that, at best the aerator is not effective, and at worst is contributing to the algae blooms that we experienced last year. It has been decided that we will not continue to run the aerator any longer. This study has shown that our best chance to improve the water quality in Cedar Lake will be the application of an alum treatment.

In the 20 years that the aerator was used, science has advanced. While it may now appear that the aerator didn't accomplish what we had hoped for, it did give us much important data which we will now use to move forward.

FEMA FLOODPLAIN MAP

The Federal Emergency Management Agency (FEMA) issued a new floodplain map for Cedar Lake on September 16, 2011. Anyone owning property subject to a mortgage in the new floodplain area, which now includes both Polk and St. Croix County's portions of the lake district, will be receiving a notice from their mortgage lender requiring them to either purchase flood insurance or have it imposed on them by the lender pursuant to federal law. Persons so affected, can do a Letter of Map Amendment (LOMA) in order to attempt to remove their individual parcel from the floodplain and thus remove it from the flood insurance requirement. To do so, however, requires the services of professional surveyor to shoot the elevation of the land. No government funds are available for the purpose. The Cedar Lake Protection and Rehabilitation District Board researched this issue to determine whether a surveying or engineering firm could be hired collectively by all of the residents within the agreed area to help defray cost. We have been advised that it is not possible. This has to be done on an individual parcel basis. For more information, please go to the FEMA website by searching FEMA/LOMA. Also, the Polk and St. Croix County Zoning Administrators can be contacted for assistance.

PARTNERS IN CONSERVATION

Have you ever had that itchy spot in the middle of your back, that however much you stretch or contort your arms, your just cant get at it and taken care of? I have had this problem and would call on my spouse to scratch the itch. There is nothing like having a partner that can make the job easier or even possible.

The partnership between Star Prairie Fish & Game, The Cedar Lake Protection and Rehabilitation District, Wisconsin DNR - Fisheries, and the US Fish & Wildlife service have combined over 7 years to build and locate about 268 fish cribs on Cedar Lake. The cribs are located in clusters at 8 different sites on the lake with the first set of cribs constructed in 2004.

This year a planned build of about 40 more cribs, that are to be located on 3 new sites on the south end of the lake, is scheduled for Saturday, January 28. No cribs were built in 2011 due to poor ice and lake conditions.

Site planning and labor are provided by the DNR as well as over all guidance, USF&W generously saves brush from their cuttings on Water Foul Production Areas (WPA'S) and help us with transportation. An no, we are not paid by the local scuba divers to use special lure snagging brush. SPF&G and CLPRD members provide labor and split the costs of the project. A lunch prepared by SPF&G is served after the mornings work to all the volunteers.

This year the cribs will be constructed on near shore ice at Jackelen's boat launch on the south shore.

Drilling holes in the green oak logs used for the crib frames has been done by the Challenge Incarceration Program (CIP) in past years, as is the plan for this year. The cribs are constructed by cross stacking the logs into an open 8 foot square, secured on the 4 corners with re-rod through the pre-drilled holes, and then stuffed with brush. The last step is to secure cement blocks to 2 corners to ensure the cribs sink quickly at ice out.

Cribs are moved to their final clustered locations on custom built sleds, that winch the cribs a few inches off the ice for transport. ATV's are used for pulling the sleds to their desired locations. The clusters of cribs left on the ice are flagged off to be sure they are visible to winter users of the lake.

The days work is well orchestrated and goes quickly due to the strong four way partnership. I just hope I can get one of the partners to take care of that itchy spot on my back, that will no doubt strike just as I am about to do something useful.

WATERCRAFT INSPECTION GRANT

Beaver Creek Citizen Science Center received a grant for inspection of watercraft for incidence of aquatic invasive species in four Wisconsin Counties, at boat landings on 114 lakes including Cedar Lake. Bob Goodlad, from our board was contacted and initiated this project with the Science Center folks. We are pleased to report that only invasive species found in Cedar Lake was Curly Leaf Pondweed and it is not considered a danger.

PONTOON PARADE

Based on your request, the Cedar Lake Pontoon Parade will be held again this year on July 4th. Decorate your pontoon in the red, white and blue and assemble at the sand bar at 12:00 pm. As an added annual feature, the Cedar Lake Board of Commissioners will select a worthy Grand Marshall to lead the parade. It is our way of recognizing those who have given their talents and time to make Cedar Lake a better place to recreate and live.