Appendix B – Lake Eau Galle 2024-28 Aquatic Plant Management Plan Discussion and Goals

Aquatic plants are probably the most important part of a lake ecosystem. A lake's rooted plants are the basis of the aquatic ecosystem. They capture the sun's energy and turn it into usable food, "clean" the water of excess nutrients, stabilize shorelines and lake beds, and provide habitat for other organisms like the lake's fish populations. Because of this, preserving them is critical to maintaining a lake's overall health.

WHEN IS AQUATIC PLANT MANAGEMENT NECESSARY?

In Wisconsin, there are generally two main reasons why aquatic plant management is considered: 1) Are there demonstrated ecological changes as a result of one or more specific aquatic plants (target plants)? 2) Is lake use restricted or obstructed by one or more specific aquatic plants?

To determine if the first reason applies questions like Has the target plant spread, and/or gotten denser; and has that spread and increase in density negatively impacted other, more desirable aquatic plants (non-target plants)? If the answer to these questions is generally "no", then aquatic plant management is likely not necessary.

To determine if the second reason applies, exactly where, when, and what species is causing restricted or obstructed lake use has to be determined.

IS AQUATIC PLANT MANAGEMENT NECESSARY IN LAKE EAU GALLE?

REASON 1 – DEMONSTRATED ECOLOGICAL CHANGES

Non-native, aquatic invasive species like curly-leaf pondweed and Eurasian watermilfoil can be problematic, but only when they take over habitat previously filled with other, likely more desirable native aquatic plants, creating a more monotypic plant community. Diversity is key. Generally the more diverse, i.e. a greater number of different aquatic plants in a lake, the healthier the lake is. Lake Eau Galle has a limited plant community with only a handful of different native species making the addition of any new aquatic plant, even non-natives like CLP and EWM, beneficial to the lake provided the non-natives do not take over the aquatic plant community.

This is the case in Lake Eau Galle. With CLP and EWM included, there are around 11 different aquatic plant species in the lake, well below average for lakes in the region. Where they grow is dictated by water clarity, sediment type, and available nutrients. In Lake Eau Galle, this means the bulk of the aquatic plant growth is in the 1-7ft with 4ft of water being the depth with the most abundant vegetation (Figure 1). The area of the lake that presents the best conditions for aquatic plant growth is where the delta created by the Eau Galle River begins to taper off and before the lake water gets too deep to provide the necessary sunlight (Figure 2). The map of total rake fullness for all points sampled during the 2022 survey confirms this (Figure 2). The rest of the lake has few if any aquatic plant issues.

Aquatic plant management in Lake Eau Galle should not be done for this reason.

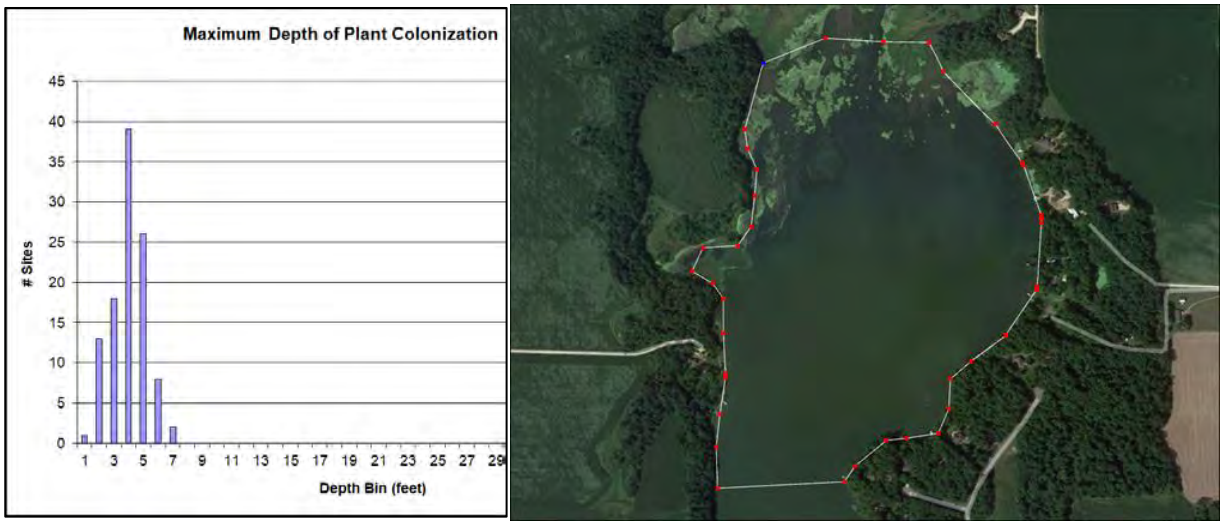
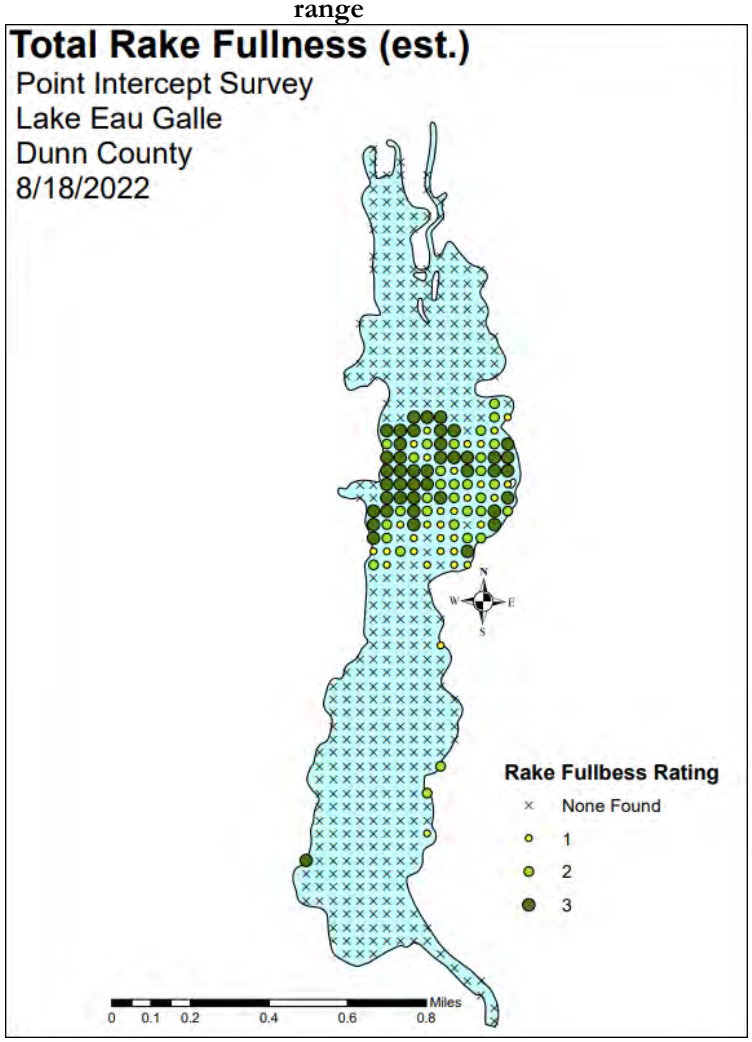


Figure 1: Depth of aquatic plant growth (Smith, 2022), and area of Lake Eau Galle in that depth range



1)

Figure 2: 2022 survey rake fullness results (Smith, 2022)

REASON 2 – RESTRICTED OR OBSTRUCTED LAKE USE

Unfortunately, the area discussed in the last section does cause restricted or obstructed access to the lake for at least a few property owners, particularly those along the northeast shore. This is confirmed based on lake use and public input survey results from early 2023 where property owners on the north half of the lake indicated that dense aquatic plant growth prevented them from doing several lake activities, more than twice as often as property owners living on the southern half of the lake.

In this area, aquatic plant management would benefit the property owners, and if limited in nature, have little negative impact on the aquatic plant community that is so vital for the health of the lake.

AQUATIC PLANT MANAGEMENT

In the public use and input survey, respondents were asked what aquatic plant management alternatives they would support. The most supported management alternative (over 84% of respondents) was the one that would help address both aquatic plant issues and sediment issues – dredging. Unfortunately, this is likely the most complicated management alternative to implement. Other management alternatives were physical removal (79%), mechanical harvesting (65% support), drawdown (48%), and application of herbicides (32%). Implementing no management was opposed by 78% of respondents.

The aquatic plant management actions recommended in this APMP takes a two-step approach. The first step is providing needed relief for those property owners who are struggling with gaining access to open water due to dense aquatic plant growth along the northeast shore of the lake. To that end, establishing a navigation/access channel along that shore to open water is recommended. The channel, as presented in Figure 3 is approximately 2,100ft long and would be made to be at least 20-ft wide. In total, just shy of an acre of surface water is included in the channel. There are multiple ways the channel could be constructed.

A private company offering mechanical harvesting could be contracted to clear the channel. Mechanical harvesting is usually limited to 3ft of water or more to reduce disturbances of the bottom and to protect the harvesting equipment. The channel in Figure 3 has been placed where mapping has indicated lake depth is 3 or more feet. One-time, contracted harvesting may not provide season-long benefit, simply because plants cut by the harvester will likely grow back over time. For this reason, it may be beneficial for LEGA to consider the purchase of their own mechanical harvester, something along the lines of the WaterGator presented in a previous section. Owning their equipment would allow harvest of the channel multiple times during the season without substantial additional cost. There are grant dollars available to help purchase a mechanical harvester through the WDNR Recreational Boating Facilities program, perhaps covering as much as 50% of the cost. Mechanical harvesting requires a WDNR permit and a designated disposal site.

The channel could also be cleared using an aquatic herbicide. In this case, a contact herbicide like endothall or diquat, expected to kill all of the plant material it comes in contact with would be the most appropriate. Use of an aquatic herbicide would not create a clearly distinct navigation lane like mechanical harvesting would due to the fact that the herbicide would likely drift off the designated channel, possibly negatively impacting nearby vegetation. In addition, it would take longer for the channel to be clear of vegetation due to the fact that it takes time for the herbicide to kill the plant and to have it drop out of the water column. The benefit is likely cost and longevity. Applying an aquatic herbicide to approximately 3-acft of water would be quick and relatively inexpensive. If an aquatic herbicide is used, one application a year would likely suffice. Herbicide application requires a WDNR permit.

Finally, limited dredging could be used to "excavate" an access channel. Dredging would both remove the aquatic plants and make the channel deeper for extended use. There are companies that could provide dredging services, though this is likely to be the most expensive way to establish the channel. It would also require consultation with the WDNR and other stakeholders. A WDNR permit is necessary to complete a

dredging project in most cases (see previous section), and a place to dispose of the sediment removed is necessary.

Figure 3: Navigation/access channel along the northeast shore of Lake Eau Galle

The second step is to consider a broader approach that includes not just aquatic plant control, but also addresses the issues that cause the aquatic plant issues in the first place, namely sedimentation in the lake. This step is an important one, because aquatic plants, even the two non-native, invasive species CLP and EWM are not the problem in Lake Eau Galle. They are a symptom of a larger problem caused by sediment carried into the lake from the Eau Galle River. And, unless the larger problem of sedimentation is addressed, the aquatic plant management actions in the first step will have to be continued indefinitely.

Determining an appropriate plan to address issues with sedimentation is beyond the scope of this APMP. It is recommended that LEGA work with lake residents, area landowners, Township and County elected officials, Dunn County Land and Water Resources staff, RWE power company representatives, sportsmen's groups, and others to generate interest and secure commitments to help address the sediment problem in the lake. It can't be denied that in-filling is occurring and will continue to occur.

Sediment issues may best be addressed on a watershed level. In fact, in previous years sediment loading to the lake has been studied and lake-specific modeling to determine likely outcomes of implementing Best

Management Practices (BMPs) has been completed (The Eau Galle Aquatic Ecology Laboratory, 2003) (St. Paul District-Hydraulics/Hydrology, 2006).

CLP AND EWM

No management action other than physical removal is specifically recommended for control of CLP and EWM.

OTHER AIS MONITORING AND MANAGEMENT

Lake Eau Galle volunteers should be trained to monitor the lake and shoreline for other AIS like purple loosestrife, yellow iris, and zebra mussels. Training can be provided by State and County resource personnel through the CLMN AIS Monitoring Program. If individual purple loosestrife plants or yellow iris are found, they should be removed if possible. Any new AIS should be reported to the WDNR with samples collected to serve as vouchers.

COARSE WOODY HABITAT

Coarse woody habitat has never been quantified in Lake Eau Galle. At some point during the implementation of this 5-year plan, the amount of CWH should be quantified and willing property owners sought for the installation of one or more CWH/Fishsticks projects. Increasing the level of CWH in the lake would likely improve the overall fishery in the lake.

SHORELAND IMPROVEMENT

Making improvements to the nearshore area around the lake and upstream of the lake could benefit the lake. Information on small-scale, grant eligible projects for interested property owners can be found at https://healthylakeswi.com/

WATER QUALITY

Water quality data is very limited for Lake Eau Galle. It is recommended that Lake Eau Galle volunteers collect basic water quality data through the Citizen Lake Monitoring Network (CLMN). This program begins with the collection of water clarity data, but can be expanded to include temperature and oxygen profiling, and collection of water samples to be analyzed for total phosphorus and chlorophyll-a.

2024-2028 AQUATIC PLANT MANAGEMENT GOALS, OBJECTIVES, AND ACTIONS

Based on the information shared in this document the following aquatic plant management goals, objectives, and actions are recommended. The Goals, Objectives, and Actions are also available in Appendix A.

Goal 1 – Minimize access to open water and lake use issues caused by dense aquatic plant growth.

1) Objective 1 – Open and maintain an access channel for properties along the NE shoreline to open water.
    a) Action – Removal of aquatic plants via mechanical harvesting of a channel approximately 2,100 ft long and 20-ft
        i) Requires a WDNR Mechanical Harvesting Permit
        ii) The same channel could be opened and maintained via dredging with DNR consultation and appropriate permitting.
2) Objective 2 – Physical removal (hand-pulling and/or raking) of CLP and EWM in areas adjacent to docks, beaches, or public boat launches

a) Action – Unlimited hand-pulling and raking by property owners and/or maintenance crews to remove CLP and EWM in shallow areas considered important for public use and adjacent to developed properties.
    i) No permits are necessary
3) Objective 3 – Physical removal (hand-pulling and/or raking) of native aquatic plants in areas adjacent to docks, beaches, or public boat launches
    a) Action – Hand-pulling, raking, and/or manual cutting with removal of native aquatic plants in shallow areas considered important for public use and adjacent to developed properties.
        i) No permit is necessary
        ii) Subject to restrictions/conditions in NR 106.06(2)

Goal 2 – Reduce the threat that existing AIS will leave the lake; that new aquatic invasive species will be introduced into the lake; and that new AIS introduced to the lake will go undetected in the lake.

1) Objective 1 – Implement a Clean Boats, Clean Waters (watercraft inspection) program.
    a) Action – Complete 200 hours annually if grant funding is used.
    b) Action – Complete an unspecified number of hours if grant funding is not used.
        i) Number of hours would be determined by expected lake use.
2) Objective 2 – Monitor for the presence of AIS in the lake.
    a) Action – Participate in CLMN AIS monitoring
3) Objective 3 – Increase AIS awareness and knowledge level of the LEGA constituency and lake users.
    a) Action – Distribute AIS education and identification materials
    b) Action – Plan and implement AIS identification and physical removal workshops

Goal 3 – Promote and support nearshore and riparian best management practices that will improve fish and wildlife habitat, reduce runoff, and minimize nutrient loading into Lake Eau Galle.

1) Objective 1 – Evaluate the state of the shoreland and nearshore around Lake Eau Galle.
    a) Action – Complete a Shoreland Habitat Assessment on Lake Eau Galle.
    b) Action - Promote Healthy Lakes projects based on the results of the Shoreland Habitat Assessment.
    c) Action – Apply for Healthy Lake grant funding to support projects that improve shoreland habitat and reduce runoff into the lake.

Goal 4 – Complete appropriate and on-going monitoring and management assessment to determine changes in the health of the lake ecosystem.

1) Objective 1 – Monitor long-term trends in water quality.
    a) Action - Become a part of the CLMN Level 1 Water Quality Monitoring Program (water clarity).
    b) Action – Become a part of the CLMN Expanded Level Water Quality Monitoring Program (adding total phosphorus and chlorophyll-a monitoring).
    c) Action – In future grants, add water quality sampling for total phosphorus and chlorophyll-a (if not already being done as a part of CLMN) and total suspended sediment.
2) Objective 2 – Complete Annual Project Activity and Assessment Reports.
    a) Action – LEGA and their Consultant will prepare end-of-year reports summarizes the management actions taken and how they impacted the lake.
    b) Action – Review end of year summary reports with the LEGA constituency, other stakeholders, and WDNR to determine following year management actions.

Goal 5 – Implement the 2024-28 Lake Eau Galle Aquatic Plant Management Plan effectively and efficiently with a focus on community and constituent education, information, and involvement.

1) Objective 1 - Build and support partnerships.
    a) Action – Work with WDNR, Dunn County, local Towns, Renewable World Energies, local businesses, contractors, and other resources to support management actions.
2) Objective 2 – Keep lake residents are informed about planned activities
    a) Action – Continue reaching out to the lake constituency to inform and seek input for management actions.
3) Objective 3 - Select cost effective implementation actions
    a) Action – Work within the budget constraints to establish the best management actions to implement annually.
    b) Action – Continue to investigate the use of dredging to make improvements to the lake and aquatic plant community.
    c) Action – Apply for State of Wisconsin grant funding to support education, planning, and management implementation.