

# Appendix A – Horseshoe Lake, Barron/Polk Counties 2023-27 Aquatic Plant Management Plan Goals, Objectives, and Actions

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## Goal 1 – Protect and enhance the native aquatic plant community.

This goal was also in the last APM Plan with the objective of maintaining or improving measures of the health of the aquatic plant community. From the Table below, only Frequency of Occurrence, Average native species per site, and Mean C were below the goal set in the 2015-19 APM Plan and this was likely due to the more normal water levels experienced in 2020. Once again the goal for the next five years is to see no decline in measures of a healthy, diverse, and sustainable aquatic plant community that can be tied directly to the use of aquatic herbicides, as measured by a repeat whole-lake, point-intercept survey.

### Objective 1

Over the course of the next five years (2023-27) the following measures of a healthy native aquatic plant community (Table 1) will be maintained or exceeded:

**Table 1: Past and target aquatic plant community health values**

Parameter	2008	2013	2019 (Goal)	2020 Results	2026 (Goal)
Rake Species Identified	47	52	≥49	54	≥51
Visual Survey Species	51	54	≥53	60	≥55
Frequency of Occurrence	79.43	88.44	≥83.94	82.83	≥83.57
Simpsons Diversity Index	0.93	0.94	≥0.93	0.93	≥0.93
Ave. Native Spec/site (shallower than max depth)	2.61	2.47	≥2.54	1.87	≥2.31
Mean C	6.7	6.7	≥6.7	6.6	≥6.7
FQI	44.2	46.2	≥45.2	45.9	≥45.4

**Action Item:** Implement aquatic plant management actions that will do the most for protecting and enhancing the native plant population while controlling the target species.

**Action Item:** Determine appropriate management actions annually based on management and survey results from the previous year.

### Objective 2

Prepare summary reports for annual aquatic plant surveys and management actions that can be used to help guide successive year management.

**Action Item:** Complete aquatic plant survey results reports annually.

**Action Item:** Complete End-of Year Summary Reports annually.

### Objective 3

Measure the five year impact of AIS management actions completed on Horseshoe Lake.

**Action Item:** Repeat a whole lake, point-intercept, aquatic plant survey in 2025.

**Action Item:** Review and revise the existing APM Plan for implementation in 2026.

## **Goal 2 – Manage existing AIS in the lake and along its shoreline in a way that minimizes its impact on the native aquatic plant community, lake use, and accessibility.**

An integrated approach to management including physical removal, diver removal, and the use of herbicides will be implemented between 2023 and 2027 in an effort to keep the amount of E-HWM growth below 2.0 acres of the littoral zone in any given year. Any amount of E-HWM can be managed at any time provided chemical application is not used. If any individual bed or combined beds of E-HWM reaches 1.0 acres, management using aquatic herbicides will be considered along with other management actions. If aquatic herbicides are used, treated areas must be at least 1.0 acres in size to use ProcettaCOR, the recommended herbicide for use in Horseshoe Lake. If a 2,4D or triclopyr –based herbicide is used, the minimum treatment area shall be 5.0 acres. The same treatment area will not be chemically treated in two or more consecutive years with the same herbicide. All herbicide applications will take place in the early season generally expected to be before June 15 annually.

There are two additional non-native aquatic plant species present in Horseshoe Lake. Curly-leaf pondweed is limited and monitoring and physical removal will be completed by District volunteers. Purple loosestrife has been identified in several locations along the shoreline of Horseshoe Lake. Monitoring for purple loosestrife will be completed by District volunteers every year and physical removal implemented.

### **Objective 1**

Determine how much E-HWM is present in the lake each year.

**Action Item:** E-HWM bedmapping will be completed annually in the late summer by a hired contractor or trained District volunteer to identify potential areas for management consideration.

### **Objective 2**

Implement E-HWM management actions to keep E-HWM below 2.0 acres each year.

**Action Item:** If the amount of E-HWM in any given bed is <1.0 acre, implement an integrated approach to management that includes physical removal by property owners, rake removal, snorkel, scuba diver, and potentially DASH (if resources are available).

**Action Item:** If the amount of E-HWM in any given bed or combined beds is  $\geq 1.0$  acres, implement an integrated approach to management that includes physical removal by property owners, rake removal, snorkel, scuba diver, and potentially DASH (if resources are available), and/or the application of aquatic herbicides (if the resources are available).

### **Objective 3**

Measure the effectiveness and impacts of herbicide treatments on target and non-target plants within the treated areas on an annual basis.

**Action Item:** If aquatic plant herbicides are used for management, consider implementing a pre-treatment sub-PI survey within a proposed treatment area in the year prior to treatment, and a post-treatment sub-PI survey either in the year of treatment or the year following treatment. This action must be done if the expected treatment area(s) reaches or exceeds 10 acres of the lake.

**Action Item:** Complete a pre-chemical treatment readiness survey in the year of proposed management to assess the readiness of the proposed treatment area and make modification to the proposed treatment area if necessary.

**Action Item:** If aquatic plant herbicides are used for management, consider implementing an herbicide concentration testing program in the year of management. This action must be done if the expected treatment area(s) reaches or exceeds 10 acres of the lake.

#### **Objective 4**

Monitor and remove CLP in Horseshoe Lake annually.

**Action Item:** Complete on-the-water monitoring of CLP via the CLMN AIS Monitoring Program.

**Action Item:** Physically remove CLP by rake, snorkel, diver, or potentially DASH when found.

#### **Objective 5**

Track the distribution and density of purple loosestrife along the shores of Horseshoe Lake and implement management actions annually.

**Action Item:** Complete a visual inspection of the entire shoreland in late July or early August and record the location of any purple loosestrife found on a map. Remove any purple loosestrife or at a minimum remove its flowering heads if possible.

## **Goal 3 – Reduce the threat that a new aquatic invasive species will be introduced and go undetected in Horseshoe Lake, that existing AIS will be carried to other lakes, and improve the level of knowledge property owners and lake users have related to aquatic invasive species.**

Horseshoe Lake is already a source lake for E-HWM being carried out attached to boats and/or trailers and taken to other lakes. The District will continue to implement a watercraft inspection program according to WDNR/UW-Extension Lakes protocol. This program will either be paid for by the District or through a small-scale CBCW grant. Watercraft inspection data will be entered into the WDNR SWIMS database annually.

Appropriate AIS signage will be maintained at the public access on Horseshoe Lake to improve the AIS awareness of many lake users.

AIS monitoring to track the AIS already present in Horseshoe Lake and to monitor for possible new AIS will be completed following WDNR/UW-Extension Lakes protocol through the Citizen Lake Monitoring Network (CLMN) AIS Monitoring Program. Zebra mussels, spiny waterflea, hydrilla, banded mystery snails, and other species will be watched for and survey data entered into the WDNR SWIMS database annually.

The District will continue efforts to educate and inform property owners and lake users about AIS already in Horseshoe Lake and AIS not already in Horseshoe Lake. Efforts will include annual education events; distribution of AIS publications, placement of E-HWM maps at the public access, and discussion forums of various types related to management actions and alternatives.

### **Objective 1**

Implement a Clean Boats Clean Waters (CBCW) water craft inspection program annually.

**Action Item:** Attempt to get 200 hours of paid watercraft inspection at the public access.

**Action Item:** Apply for small-scale CBCW grants annually to support watercraft inspection efforts.

### **Objective 2**

Maintain current and complete AIS Signage at the public access on Horseshoe Lake annually.

**Action Item:** Inspect the public access for appropriate AIS signage annually.

**Action Item:** Repair, replace, and/or install current WDNR AIS signs at the public access.

### **Objective 3**

Reduce the likelihood that new AIS goes undetected in Horseshoe Lake and track existing AIS for additional spread.

**Action Item:** Participate in CLMN AIS Monitoring at least monthly between May and October each year.

### **Objective 4**

Plan, coordinate, and implement an annual AIS education event(s) alone or in cooperation with other Stakeholders.

**Action Item:** Seek out other stakeholders including but not limited to the Echo Lake Association, Polk County Association of Lakes and Rivers, Town, and County entities to explore cooperative education and information events.

**Objective 5**

Distribute information and education materials to property owners and lake users.

**Action Item:** Research AIS and lake stewardship materials with little or no cost to attain and make available at events including but not limited to Annual Meetings, Lake Fairs, Summer Picnic, etc.

**Objective 6**

Solicit public input and review of annual AIS management planning efforts.

**Action Item:** Complete preliminary AIS management planning by January 31 each year and post on the District webpage for public comment.

**Action Item:** Provide a summary of coming year AIS management plans in a spring newsletter to be published and distributed prior to April 30 each year.

**Action Item:** Present current year AIS management actions at the Annual Meeting held in August each year.

## **Goal 4 - Improve the level of knowledge property owners and lake users have related to how their actions impact the aquatic plant community, lake community, and water quality.**

An important part of controlling undesirable aquatic plant growth and the production of algae is reducing the amount of nutrients (mainly phosphorus) that enters the lake. The District will attempt to get 13-15 properties to install new native plantings along the shoreline by 2026 by promoting and encouraging the implementation of simple and generally inexpensive best management practices included in the WDNR Healthy Lakes and Rivers Program. The total number of native plantings completed will be monitored by the District and reported at the end of this five year plan.

The District will continue to collect water quality data through the CLMN Expanded Water Quality Monitoring program.

### **Objective 1**

Increase the amount of shoreland with a natural buffer in place by 20% (13 to 15 parcels) through native plantings and other best management practices.

**Action Item:** Distribute shoreland improvement education and information materials to lake property owners through the newsletter, webpage, and general mailings.

**Action Item:** Host and/or sponsor annual lake community events that encourage land owner participation in best management practices.

**Action Item:** Support property owners who wish to complete shoreland restoration or habitat improvement projects through District sponsorship of at least one Healthy Lakes grant application by 2026.

**Action Item:** Recognize property owners who participate in and/or complete shoreland restoration and habitat improvement projects in the newsletter, on the webpage, in local news publications, and/or at the site of the project.

### **Objective 2**

Continue to collect long-term trend water quality data in Horseshoe Lake.

**Action Item:** Collect CLMN water quality data (water clarity, total phosphorus, chlorophyll a, and dissolved oxygen and temperature) in the Deep Hole.

### **Objective 3**

Determine why Horseshoe Lake experiences significant algae blooms in the late summer and fall and take steps to mediate the situation.

**Action Item:** Work with the WDNR, USGS, UW-System, and other water quality experts to develop a plan to collect data that will help explain why the lake experiences significant algae blooms in the late summer and fall.

**Action Item:** Implement that plan with the help of WDNR surface water grant funding and Resource Professionals.

**Action Item:** Work toward the development of a water quality focused comprehensive lake management plan based on data collected in the previous action item.