

2021-25 Aquatic Plant/Lake Management Goals, Objectives, and Actions for the Clam Lakes

Overall Management Goal

The overall management goal for the Clam Lakes is to maintain and enhance the positive gains in native aquatic plant growth, water quality, fisheries management, and control of aquatic invasive species that have been experienced since 2010 when the negative impacts of an over-abundant carp population were first recognized and addressed. The last Aquatic Plant Management Plan for the Clam Lakes was completed in 2014, but was really only intended to be an interim guide to management that would support efforts being made by the Clam Lake Protection and Rehabilitation District (CLPRD), St. Croix Tribal Environmental Services (SCTES), the Wisconsin Department of Natural Resources (WDNR), and other entities to restore the health of the lakes.

The efforts made have brought the lakes back from thoroughly impaired state to a much more desirable state that is reflected in better water clarity/quality, a more diverse and healthy native aquatic plant community, and a healthier fishery. It has also opened the door for greater distribution and density of curly-leaf pondweed (CLP) and nuisance level growth of native aquatic plants in some places. This plan attempts to keep the more desirable changes happening, while at the same time limiting the less desirable changes.

Goal: Protect, preserve, and enhance native aquatic plant communities in the Clam Lakes including wild rice.

From 2010 to 2017 the aquatic plant community in the Clam Lakes was decimated by over-abundant carp. Since 2017, after at least 5-yrs of large-scale carp removal, the health of the aquatic plant community in the Clam Lakes has improved considerably from what it was during the carp removal projects and even from what it was in 2009, the last whole-lake PI survey to be completed before the severity of the carp issues was recognized.

The Clam Lakes historically have been one of the best wild rice producing bodies of water in Wisconsin. Recent changes in the lakes nearly wiped out these historic beds. St. Croix Tribal Environmental Services, in cooperation with the WDNR, and the Clam Lakes Protection and Rehabilitation District have and will continue to implement management actions to protect, enhance, and restore this valuable resource.

1. Objective: Maintain or increase three measurements of the quality of the native aquatic plant community: FQI, mean C, and # of native aquatic plant species w/visual and boat survey, based on values from the 2019 Whole-lake, Summer Point-intercept, Aquatic Plant Survey (Table 1).

Table 1: Survey values from 2019 point-intercept survey

Upper Clam Lake	Lower Clam Lake
FQI – 35	FQI – 31.2
Mean C – 5.8	Mean C – 5.8
# of aquatic plant species - 45	# of aquatic plant species - 40

- a. Action: Complete management planning annually with the intent to minimize negative impacts of management implementation on native aquatic vegetation.
- b. Action: Continue education efforts aimed at changing attitudes of lake property owners and lake users as it relates to the importance of aquatic vegetation in the Clam Lakes for water quality, invasive species control, and improved fish and wildlife habitat.
2. Objective: Maintain the distribution and density of wild rice in both lakes at 2019 levels or better
 - a. Action: Support SCTES efforts to protect, enhance, and restore historic wild rice beds
 - b. Action: Continue property owner and Lake User education efforts aimed at establishing the importance of wild rice as a resource in the Clam Lakes
 - c. Action: Establish “no wake zones” during the floating-leaf stage of wild rice development to help minimize dislodging events caused by watercraft generated waves

- i. Identify and evaluate areas of the lake near existing wild rice beds where establishing “no wake zones” would provide protection benefits
- ii. Example: Northeast corner/shoreline of Lower Clam Lake

Measurement: In 2024 a whole-lake, summer PI survey of all aquatic plants will be redone and the three measurements referred to in this objective will be compared to the 2019 data.

Goal: Prevent CLP in Upper Clam Lake from expanding to levels where it might cause navigation issues or hinder native aquatic plant growth.

In 2009, CLP was limited to only 33 of 668 points sampled covering only 4.9% of the lakes surface area, primarily in the northern third of the lake. Of this only 2% was considered moderate or dense in growth. 2019 survey work identified only 7 points with CLP, the densest points were in the southern portion of the lake. Bedmapping identified the largest bed (4.4 acres) in the center of what is known as Lonestar Bay. Lonestar Bay is where a significant portion of the wild rice in the lake is located. The 2019 CLP bed is located outside of the current distribution of wild rice and doesn't cause navigation issues. Like in 2009, CLP was present in other parts of the lake including the northern third of the lake, but was very sparse and scattered among beds of native plants. The main objective for CLP in Upper Clam Lake is to monitor its distribution and density annually to document when and if it reaches a level of concern that warrants management. Management would involve limited harvesting.

3. Objective: Maintain the distribution of CLP at no more than 5% (67 acres) of the total lake surface, and maintain a density where moderate or dense growth CLP (rakehead density of 2 or 3) covers no more than 2% (27 acres) of the total lake surface.
 - a. Action: Complete annual bedmapping of CLP
 - i. June 1 – June 15 annually
 1. Completed by a plant specialist or trained CLPRD volunteers
 - b. Action: Implement physical/manual removal
 - i. Local property owners will be trained to identify and properly remove CLP from their nearshore area
 - ii. An organized physical removal plan should be implemented that includes lay persons and experienced people. This effort could include multiple boats, divers, and other volunteers who identify, locate, and remove offending vegetation
 - iii. If a problem area is determined to be too large for organized physical/manual removal to be an effective management action, move to action
 - c. Action: Harvest CLP beds when:
 - i. The total area with CLP exceeds 40 acres, and
 - ii. Any single bed exceeds 10 acres with a rakehead density of 2 or 3
 1. Harvesting would not occur until the year after the criteria for active management was reached.
 - d. Action: Prepare a WDNR aquatic plant harvesting permit annually, and once approved, implement large-scale harvesting under the following guidelines:
 - i. Harvesting must take place before the onset of turion production

- ii. Harvesters must stay in at least three feet of water and operate cutters at a maximum depth of 5-ft or two-thirds of the water column, whichever is less.
- iii. When harvesting close to shore, harvesters must operate parallel to shore and remain in at least 3-ft of water.
- iv. At off-loading sites, efforts to return game fish, turtles, and other wildlife back to the water will be made by the harvester operator
- v. Harvester operators will identify and record the species and quantity (estimated % of total plant biomass removed) of aquatic plants removed by the harvesters

Measurement: Annual bedmapping results and harvesting records will be used to document the total area of CLP and that portion of the area harvested.

Goal: Prevent CLP in Lower Clam Lake from taking over the littoral zone.

The third goal of this project is to prevent CLP from dominating the littoral zone of Lower Clam Lake like it was doing through 2009. In 2009, 231 of 350 points surveyed (66%) in the spring on Lower Clam Lake had CLP present. Of those, 204 had a rakehead density rating of 2 or 3 indicating that 58% of the lake had a significant CLP problem where navigation and lake use were difficult and the native aquatic plant community was being negatively impacted. According to the 2009 surveyor, the only places on the lake not dominated by CLP were the deepest areas that were beyond the littoral zone, the lake's sandy shorelines and the far eastern bay. At the time of the 2009 survey, the far eastern bay was the only place on the lake that had any native vegetation growing. In 2019, 38% of the lake had CLP with 22% of that having a density of 2 or 3. This amount of CLP still interfered with lake use and likely has had negative consequences on the growth of native aquatic vegetation later in the season. Though not quantified, anecdotally CLP in 2020 was just as bad or worse than it was in 2019. The following objectives will prevent CLP from once again dominating the shallow areas of Lower Clam Lake

4. Objective: Maintain the distribution of CLP at no more than 34% (115 acres) of the total lake surface, and maintain a density where moderate or dense growth CLP (rakehead density of 2 or 3) covers no more than 20% (67 acres) of the total lake surface.
 - a. Action: Complete annual bedmapping of CLP
 - i. June 1 – June 15 annually
 - ii. Completed by a plant specialist or trained CLPRD volunteers
 - b. Action: See Action 3b
 - c. Action: Harvest all CLP that expands past 500-ft from shore
 - i. May 1 – June 15 annually
 1. Cut to maximum depth of harvester
 2. CLP will be removed regardless of density
 - ii. Keeps the maximum CLP acreage to 145 acres (43%) if all surface area within 500-ft of shore previously documented with CLP once again had CLP present.
 - d. Action: Create fish passage/navigation lanes through CLP beds
 - i. May 1- June 30 annually
 1. 1st lane between 100-ft and 200-ft from shore
 2. 2nd lane between 300-ft and 400-ft from shore
 3. Cut to a maximum of 2/3 of the water column
 4. CLP will be removed regardless of density
 - ii. Harvested lanes would remove approximately 40% of CLP beds within 500-ft of shore.
 - e. Action: See Action 3d

Measurement: Annual harvesting records and bedmapping results will be used to document the total area of CLP and that portion of the area harvested.

Goal: Improve access to open water through dense growth native aquatic vegetation for property owners along the Clam Lakes.

Both lakes are very shallow with maximum depths of <10-ft. Nearly the entire surface area of Upper Clam Lake is considered littoral zone. All except the southwestern third of Lower Clam Lake is considered littoral zone. Since 2017, water clarity in both lakes has improved dramatically, even late in the summer season. As a result, the distribution and density of native aquatic vegetation is also increasing causing significant navigation impairments when accessing open water from docks and when traveling through certain areas of the lakes.

Wild rice is extremely dense in the southern half of Upper Clam Lake and in the northeastern bay of Lower Clam Lake. Generating access to these areas will be kept at a minimum. One narrow access lane that connects the inlet of the Clam River to Upper Clam Lake through wild rice is proposed to allow access up river.

In any given year, the distribution and density of native aquatic vegetation changes with some areas bad some years, and other areas not bad. The following year the bad and good areas could be reversed. Because of this, navigation lanes parallel to the shore are proposed all the way around both lakes where development exists. Access lanes perpendicular to the shore through the densest areas of vegetation are also proposed.

5. Objective: Improve access to open water for property owners and Lake Users on both lakes.
 - a. Action: Open up a combined 9.5 miles of navigation lanes in both lakes
 - i. June 15 – Sept 15
 1. Parallel to shore
 2. 75-ft wide channels
 - a. The inland edge begins at the ends of docks with the channel expanding out toward the center of the lakes
 - b. Action: Open up a combined 3.2 miles of “open water access lanes” on both lakes
 - i. June 15 – Sept 15
 1. 23 access lanes on Upper Clam totaling 2.63 miles
 2. 16 access lanes on Lower Clam totaling 0.54 miles
 3. Perpendicular to shore
 4. 50-ft wide
 - a. Approximately 19.2 acres
 - c. Action: Open up an access lane from the inlet of the Clam River to Upper Clam Lake
 - i. May 15 – Sept 15
 1. Direct line from inlet to open water
 2. 20-ft wide
 - d. Action: See Action 3c

Measurement: Harvesting records will be kept each year. A survey could be sent out at the end of each season seeking property owner satisfaction and input into the actions completed.

Goal: Prevent purple loosestrife from taking over any of the shoreline or wetlands around the Clam Lakes.

The 2019 survey found Purple Loosestrife was noticeably more common than in 2016, when last a whole lake plant survey was completed. Inspection of plants showed no evidence of the loosestrife beetles (*Galerucella* spp.) released on Lower Clam Lake in June/July 2015 by Grantsburg High School students and the Burnett County Land and Water Conservation office. If beetles don't recover in the near future, it may be time to raise another batch for release on the lake. In the meantime, all residents and the Lake District are encouraged to watch for and remove any PL plants in August and September when the bright fuchsia candle-shaped flower spikes are easily seen. Plants should be bagged and disposed of well away from any wetland. Also, because the plants have an extensive root system, care should be taken to remove the entire plant if possible, as even small root fragments can survive and produce new plants the following year.

6. Objective: Allow no new purple loosestrife plants to remain along the greater shoreline of the lakes
 - a. Action: Survey the shoreline of both lakes at least once a year between July 20 and Aug 20
 - b. Action: Physically remove pioneering plants that are easily accessible and attempt to pull or dig-up the entire plant, root and all
 - c. Action: Cut off flower heads and bulk of the stem from any plants identified during the survey
 - i. Single plants or small groups of plants discovered in new locations around the lakes that cannot be easily removed
 - d. Action: Apply herbicide to cut stems or leaves of purple loosestrife where possible and where a permit is not required
 - i. Stem dabbing method
 - ii. Plant wicking method
 1. Glyphosate w/surfactant and dye (RoundUp® (dry ground) or Rodeo® (in water))
7. Objective: Establish a viable population of *Galerucella* beetles in areas where purple loosestrife plants are too numerous to physically or chemically remove.
 - a. Action: Implement a biological control rearing program with Lake District volunteers and aided by the Burnett County AIS Coordinator and the Siren School District.
 - i. Attempt to reach a goal of at least one volunteer rearing station (12 rearing pots) with release in each season
 1. One rearing station can produce as many as 10,000 beetles annually

Measurement: Annual surveying continually shows a reduced or at least non-expanding, population of purple loosestrife. Existing purple loosestrife plants begin to show evidence of a self-propagating population of beetles.

Goal: Minimize negative impacts to the existing bluegill fishery caused by aquatic plant management actions in the Clam Lakes.

Management of aquatic plants goes beyond just impacting the target species. Water quality and the health and viability of the fishery and habitat for wildlife can be impacted. Specifically for this goal, the bluegill population in the lakes is still in recovery in Upper and Lower Clam Lake and restoring a healthy population is important for the overall fishery and health of the system. Craig Roberts, the WDNR fisheries manager covering the Clam Lakes, is supportive of trying to remove CLP as it is an invasive species, but is concerned about removing too much vegetation at once from Clam Lake following bluegill spawning. The vegetation is likely serving as juvenile bluegill habitat. Overall, he is supportive of trying to tackle large beds of CLP if native vegetation can re-establish or be maintained, and removal can be done in a way that doesn't impact bluegill.

By promoting aquatic plant management methods that limit removal of aquatic plants and by working closely with SCTES and WDNR fisheries staff, and other stakeholders during planning phases, the impacts of concern can be minimized.

Trees and other vegetation that naturally fall into a lake or that is intentionally placed in the lake by permit, is known as coarse woody structure. Coarse woody structure provides many benefits to fish and wildlife. On a highly developed system like the Clam Lakes coarse woody structure is limited, as property owners remove this debris from their shoreline considering it an eyesore or impediment to their lake use. Like aquatic vegetation, coarse woody structure is essential to the overall health of a lake and should be protected and enhanced, not eliminated. Knowing where coarse woody structure is present or where the addition of coarse woody structure might be beneficial and supported by lake users is beneficial for long term management planning.

8. Objective: See no decline in the current bluegill population in the Clam Lakes
 - a. Action: Promote physical removal of nuisance aquatic plants close to the shore (<3-ft)
 - i. Physical removal is limited by the ability of a property owner to complete it and considered the least impactful management actions
 - b. Action: Discuss with and seek input from the WDNR, SCTES, and other fisheries personnel before, during, and after aquatic plant management planning and implementation
9. Objective: Support SCTES and WDNR efforts to monitor and manage the carp population in the Clam Lakes
 - a. Action: Continue to be a part of the dialogue surrounding carp management and planning implementation

- b. Action: Perpetuate financial, logistical, and resource support for carp management efforts by keeping the CLPRD constituency informed and involved.
10. Objective: Improve in-lake habitat for fish and wildlife by installing coarse woody habitat (Fishsticks) projects.
- a. Action: Map the shoreline of Clam Lakes and document the location of all coarse woody structure.
 - i. Follow WDNR Shoreland Habitat Assessment survey protocols
 - b. Action: Provide educational materials to lake property owners and users that state the benefits of coarse woody habitat in a lake
 - i. Encourage property owner to leave coarse woody structure in the lake
 - c. Action: Promote and support the installation of Fishsticks projects through the Healthy Lakes and Rivers grant program.
 - i. 3-5 projects in the next five years

Measurement: Fisheries surveys by the WDNR and SCTES; approval by the WDNR and SCTES for management actions; results from the SHA; installation of fishsticks projects.

Goal: Minimize opportunities for new AIS to enter and become established in the Clam Lakes.

The Clam Lakes already have several established AIS. However there are many more that could be introduced to the lake. EWM and zebra mussels are just two of many possible threats. EWM is located in several waterbodies in Barron, Burnett, Douglas, Polk, and Washburn Counties. Zebra mussels are present in Douglas (Lake Superior), Polk (Deer Lake), St. Croix (Bass Lake), and Washburn (Big and Middle McKenzie lakes) Counties. Having an educated and informed lake constituency is the best way to keep non-native aquatic invasive species at bay in the Clam Lakes. Implementation of a watercraft inspection program can reduce the risk that new AIS get introduced but it cannot prevent it entirely. Additional monitoring efforts within the lakes and along the shoreline will help identify new invaders before they become a problem.

11. Objective: Improve the level of knowledge lake property owners and lake users have related to AIS and how they are and could impact the lakes.
 - a. Action: Host and/or sponsor annual lake community events including AIS identification and management workshops.
 - b. Action: Distribute education and information materials to lake property owners and lake users through the newsletter, webpage, social media, and general mailings.
 - c. Action: Create a library of AIS materials accessible to property owners and lake users.
 - i. Update annually
12. Objective: Implement a watercraft inspection and AIS signage program at all public and private access sites.
 - a. Action: Incorporate a CLMN/UW-Extension Lakes Clean Boats, Clean Waters program at the Hwy 70 Boat Landing on Lower Clam Lake
 - b. Action: Evaluate and update signage at all public access points on the lakes
 - c. Action: Work with resorts on the lake with private accesses to post signage and encourage watercraft inspection
13. Objective: Implement an in-lake and shoreland AIS monitoring program in the lakes
 - a. Action: Participate in the CLMN/UW-Extension Lakes AIS Monitoring Program to support in-lake monitoring efforts

Measurement:

Goal: Reduce pollutant loading into the Clam Lakes.

Shoreland improvement planning is used on many lakes to reduce erosion, increase and improve native habitat, and improve water quality. Restoration not only improves the lake aesthetic enjoyed by so many, it filters runoff and can keep invasive species at bay. There are many improvement projects that could be implemented. Property owners can create shoreline buffer strips, establish no-mow areas, install rain gardens, plant native species, divert surface runoff away from the lakes, reduce impervious surfaces, or complete a full shoreland restoration project which may include all of these things and more.

Bottom sediments contain phosphorus that can be reintroduced into the lakes when disturbed. Disturbances are caused by many different things, both natural and man-made. Carp root around in the sediment of a lake to forage food and while spawning. Waves, both natural and those caused by boat use, stir up sediments in shallow water, particularly in places where aquatic vegetation is limited. Prop wash from boat motors used in shallow areas of the lakes stir up sediment. Reducing these disturbances will reduce the amount of phosphorus readily available to grow algae.

Assuming most septic systems are in good working order and appropriately maintained, they generally contribute a very small percentage of the nutrient loading occurring in a body of water. While the contribution may be limited, making sure all systems on the lake are up-to-date and functioning properly is an easy thing to promote and do.

Land use practices in the watershed surrounding the lakes can contribute significant sediment and nutrient loading to a body of water. Changing poor land use practices can reduce what is contributed. Cover crops, no till, manure storage, field buffers, and nutrient management planning are just a few examples of agricultural best management practices that are and should be implemented throughout the watershed. The logging industry also has accepted best management practices that are and should be implemented throughout the watershed. Actions designed to reduce the amount of sediment blown from the land adjacent to the lakes, like road watering to reduce dust from unimproved roads should be implemented. Reducing the amount of ice melting agents and other pollutants on roadways and driveways will also benefit the lakes.

14. Objective: Promote shoreland improvement projects in the nearshore area that will reduce surface runoff and pollutants entering the lakes.
 - a. Action: Promote property owner participation in the Burnett County Shoreland Incentive Program <https://www.burnettcounty.com/index.aspx?NID=1123>
 - i. Work with the Burnett County Land and Water Conservation Department to actively pursue increased participation

- b. Action: Promote property owner participation in projects supported by the Healthy Lakes and Rivers grant program
 - i. Native plantings, rain gardens, diversions, and infiltration trenches
 - ii. Work with a local contractor other qualified person to help property owners plan shoreland improvement projects
 - iii. 5-10 projects over a 5 year period
 - c. Action: Recognize property owners who participate in and/or complete runoff and pollutant reduction practices
 - i. Examples: post signs at the site, articles in the newsletter or on the webpage, social media outlets, and in local news publications
15. Objective: Reduce disturbances to bottom sediments in the Clam Lakes
- a. Action: Provide education and informational materials to lake property owners and users related to the disturbances caused by boat prop wash in shallow areas of the lake
 - i. Examples: post signs at the landing, articles in the newsletter or on the webpage, social media outlets, and in local news publications
 - b. Action: Promote voluntary extended “no wake” zones in shallow water near the shore
 - c. Action: Continue to support carp removal efforts by SCTES and the WDNR
16. Objective: Encourage septic system inspection, maintenance, and repair
- a. Action: Send out reminders to property owners to have their septic system inspected to see if they are functioning properly
 - b. Action: Encourage property owners to replace or repair septic systems not functioning properly
17. Objective: Encourage the use of agricultural, logging, and other industry best management practices to reduce sediment and nutrient loading from the watershed
- a. Action: Work with the Burnett County Land and Water Conservation Department and other entities to identify problem sites in the watershed and to develop plans to address them
 - b. Action: Consider offering financial assistance to the County or other entities to implement first time and additional best management practices throughout the watershed
 - c. Action: Encourage business and private property owners around the lake to implement best management practices that will reduce sediment and pollutant loading from the watershed

Measurement:

Goal: Provide property owner and lake user education and awareness of issues impacting the Clam Lakes.

Public involvement and input is essential if management actions on a given body of water are to be successful. The lake community must be aware of the issues facing the lakes and how those issues impact the lakes. They need to know that what they do on a daily basis matters. Encouraging participation and providing ample opportunities to do so is important. Workshops, lake fairs, annual organization events, on-lake monitoring and data collection projects, distribution of educational and informational materials, and sharing of lake data are just a few examples of how to keep the lake community involved.

18. Objective: Continue public outreach and education programs on issues facing the Clam lakes.

- a. Action: Facilitate AIS, aquatic plants, and water quality, and wildlife public education opportunities annually
 - i. Examples: Lake Fair, Workshops, Public Speakers
 - ii. Maintain a Lake District webpage, Facebook page, and or newsletter
- b. Action: Promote sustainable and multi-use recreational opportunities on the lakes
 - i. Hold open forums to discuss lake use issues with interested parties
 - ii. Monitor patterns of recreational use in the lake to identify potential conflicts and guide management activities
 - iii. Determine the need for a lake-use plan and what that plan should include

Measurement:

Goal: Collect lake related data to enhance and support current and future lake management planning and implementation in the Clam Lakes.

There can never be too much data when it comes to determining the best way to manage a lake so that it meets all of its intended uses. Compiling existing data and collecting additional data to document current and future conditions of the lake is important.

19. Objective: For management planning and assessing general lake health, collect lake data that will provide a better understanding of the issues impacting the lakes.

- a. Action: Reinstitute a CLPRD volunteer driven water quality testing program through the CLMN expanded water quality monitoring program
 - i. Secchi disk (water clarity), total phosphorus, chlorophyll-a, temperature, and dissolved oxygen
- b. Action: Solicit water quality data collected by the SCTES annually
- c. Action: Begin precipitation and lake level monitoring
 - i. Participate in the Community Collaborative Rain, Hail, and Snow (CoCoRaHS) monitoring program
 - ii. Work Burnett County to establish lake level monitoring stations on both lakes

Measurement:

Goal: Implement this plan following Integrated Pest Management guidelines from the WDNR.

This document is not intended to be a static, once and for all plan, but rather one that makes room for management changes that still fall under the guise of the stated goals, but that may make attaining those goals easier and more efficient. Integrated Pest Management (IPM) is an ecosystem-based management strategy that focuses on long-term prevention and/or control of species of concern or their damage. IPM considers all the available control practices such as: prevention, biological control, biomanipulation, nutrient management, habitat manipulation, substantial modification of cultural practices, pesticide application, water level manipulation, mechanical removal and population monitoring (Figure 60). Integrated pest management projects should be informed by current, comprehensive information on pest life cycles and the interactions among pests and the environment.

20. Objective: Follow an adaptive management strategy that measures and analyzes the effectiveness of management activities and modify the management plan as necessary to meet goals and objectives.

- a. Action: The CLPRD will continue active participation in all discussions related to management of the Clam Lakes
- b. Action: Annual reports will be completed summarizing actions and results and presenting revisions for future management actions.
 - i. Reports will be completed by the CLPRD or its retainers and shared with its constituency, SCTES, WDNR, County, and other local resources
- c. Action: Evaluate results and revise management actions in this plan as needed to help meet the needs of the lakes.

Measurement: