

Beecher Lake Aquatic Plant Management Plan

Plan Amendment - April 2013



Marinette Co. LWCD
1926 Hall Avenue
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Eurasian watermilfoil Management Efforts

Since the discovery of Eurasian watermilfoil (*Myriophyllum spicatum*) in Beecher & Upper Lakes in 2007, the Beecher and Upper Lakes Protection & Rehabilitation District has been working to control the invasive plant in an effort to reduce its impact on the native plant community and recreational use of the lakes. In 2008 the District received an AIS Planning Grant to develop a comprehensive and sustainable aquatic plant management plan for Beecher & Upper Lakes. In 2010 the District received an aquatic Invasive Species Control Grant (ACEI-073-10.1) to implement the DNR approved Aquatic Plant Management Plan for Beecher Lake.

The management plan includes a multi-faceted strategy to prevent Eurasian water milfoil domination in Beecher & Upper Lakes and preserve the diverse aquatic plant community. The strategy calls for EWM management via winter drawdown, selective use of aquatic herbicides, manual harvesting where applicable, and monitoring for the native milfoil weevil (*Eubrychiopsis lecontei*).

The EWM management strategy includes follow up surveys to evaluate the effectiveness of management practices, routine aquatic plant monitoring to track changes in the spread and density of EWM in Beecher & Upper Lakes and regular review and modification of the EWM management plan to reflect changes in the aquatic plant community.

In 2012 the Marinette County Land & Water Conservation Division (LWCD) received a grant to build and operate a diver assisted hydraulic harvester to increase the efficiency of manual EWM removal from Marinette County Lakes (ACEI-112-12). The grant includes funding to operate the hydraulic harvester on Beecher & Upper Lakes for the removal of pioneer colonies and scattered plants.

Aquatic Plant Management Progress Update

Since 2010 the Beecher Lake District has made significant progress towards implementation of the following recommendations identified in the Aquatic Plant Management Plan for Beecher Lake, dated January 2010:

Selective use of early season 2,4-D treatments

The Beecher Lake District treated 13 acres of dense EWM in the spring of 2009 using Navigate 2,4-D. AIS grant funding was used to treat an additional 5.8 acres in 2010. As a result of these two herbicide applications EWM frequency declined from 38.6 percent of sample points to 7.6 percent. EWM was not treated in 2011. Since 2007 the District has used aquatic herbicides to control EWM infested areas four times. The highest levels of control have been achieved using Navigate (granular 2,4-D) at 150 lbs./ac., applied early in the season (early May) when EWM was just beginning to actively grow.

While post-treatment plant surveys showed steep declines in EWM frequency of occurrence, the average density remained essentially unchanged, indicating that where it remained, EWM continued to grow aggressively. Experience shows that, left unmanaged, EWM will continue to expand rapidly and crowd out native species in the lakes.

While it cannot be confirmed, the 2009 herbicide treatment may also have led to a noticeable decline in watershield (*Brasenia schreberi*) throughout the lake. In 2008 the areal coverage of floating leaf

plants was mapped. Together, watershield, white water lily (*Nymphaea odorata*), and Spatterdock lily (*Nuphar variegata*) covered 13.4 acres. Of this, watershield was the dominant species, covering 7.2 acres in dense vegetation. In 2010 it was noted that floating leaf vegetation was much less dense than in previous years and watershield in particular was hard to find. In 2011 floating leaf plants were again mapped and while the total aerial coverage was unchanged, the overall density of floating leaf plants was lower and white water lily was the dominant species. Watershield was the dominant floating leaf plant in only 0.5 acres. Newly sprouted watershed plants are reportedly very susceptible to 2,4-D. Since the decline in watershield was seen throughout the lake, it's thought that the 2009 treatment area was large enough that it may have led to an inadvertent "whole lake" treatment.

Lake drawdown for EWM control using siphons

Since there is no way to control the water level at the Beecher Lake Dam, it was decided to attempt a winter drawdown using siphons. In the summer of 2010 a single siphon tube was installed to demonstrate proof-of-concept. The test was successful and a drawdown of the lake using four siphon tubes was attempted in September 2010. Good progress was made until a late September rain event dropped nearly 4.5 inches of rain on the surrounding area, overwhelming the siphons capacity. The siphons were pulled on October 5, 2010 when it became obvious that the drawdown could not be complete in a timely manner.

A winter drawdown of the lake was again attempted during the winter of 2011 when four siphons were installed on August 27. The water level fell rapidly and the lake elevation in front of the dam was 4.4 feet below full pool by September 18. By mid-October the water level in front of the dam had reached the goal of 5.0 feet below full pool. While the maximum drawdown level was achieved near the dam (see figure 1), maintenance of the siphons became increasingly difficult as winter progressed and everything became encased in ice, snow, and frozen mud. The siphons were removed on December 28 when maintenance efforts became too great.

Although the siphons did reduce the water level near the dam, a build-up of sediment in the original creek bed between the dam and the lake prevented the main body of Beecher & Upper Lakes from draining completely. A survey of the dewatered lake bed showed that the water level in the main lake remained 2.5 feet higher than the water level in front of the dam.

EWM control was somewhat successful in the bay near the dam. However, throughout most of the lake, dewatering was insufficient. Success was also hampered by one of the warmest winters on record.



Figure 1. Exposed lake bed in front of the Beecher Lake dam.

Frost penetration was quite variable (0 to 4 inches) and much of the wet muck sediment that supports EWM did not freeze more than an inch or two deep. Test holes showed aquatic plant roots down to about 6 inches in much of the lake, much lower than the measured frost depth.

Post drawdown herbicide treatment

During the summer of 2012 EWM expanded rapidly throughout the lake. A detailed aquatic plant survey and EWM reconnaissance conducted in the fall of 2012 showed dense EWM covering nearly 12-acres and scattered EWM throughout the littoral area of both lakes. A whole-lake treatment using 2,4-D is planned for the spring of 2013.

Consider modifying the Beecher Lake dam

Experience shows that the siphons, while effective, are difficult to maintain, especially as winter progresses and everything becomes encased in ice and frozen mud. Since frost penetration below the rooting depth is essential for EWM control, it makes sense to maintain the drawdown as long as possible, increasing the likelihood of success. The experiences of 2010 and 2011 prove that installation of a drain is essential to successfully using winter drawdown as a EWM management tool. A drain can be designed with a higher capacity than the siphons and will require little or no maintenance, so the water level can be kept low through the entire winter.

Milfoil weevil survey and evaluation as a EWM management tool

Dense EWM beds were surveyed in 2010 and 2012 for the presence of milfoil weevils. To date, no weevils have been found.

Reduce nutrient loading to the lake from developed shoreline properties.

The District has been promoting the restoration of natural shorelines to increase infiltration and reduce runoff from developed lots. To date, at least 6 shoreline buffers have been installed on Beecher Lake and other homeowners have reduced the area of maintained lawn at the water's edge.

Hydraulic Harvester Grant – Conduct enhanced manual harvesting of scattered /pioneer EWM plants using the hydraulic conveyor system to reduce the rate of EWM expansion.

Hydraulic harvesting is a fairly labor intensive EWM management tool, best used for the control of low level EWM infestations. To date, the density of EWM on Beecher & Upper Lakes has not been reduced to a level where diver assisted hydraulic harvesting is a viable control method. In the future, hydraulic harvesting will be used as appropriate.

Monitoring and Evaluation Progress Update

A monitoring and evaluation program was included in the management plan to track changes in the aquatic plant community, evaluate management tools, and modify the management plan to address changing conditions and new opportunities.

Evaluation of management effectiveness

Point-intercept surveys of the Beecher & Upper Lakes were conducted in 2008 and 2010. In 2011 and 2012 detailed aquatic plant surveys were conducted at four representative areas throughout the

lakes. Data from these surveys has been used to document EWM management successes and failures during the last 5 years.

Aquatic plant surveys clearly show the decline in EWM abundance as a result of the 2009 and 2010 herbicide treatments. The surveys also show that, while EWM was not controlled by the winter drawdown in 2011, there was a significant impact on several native plant species (Figure 2). Dominant species including coontail (*Ceratophyllum demersum*), stonewort (*Nitella* sp.), flat-leaf bladderwort (*Utricularia intermedia*) and creeping bladderwort (*Utricularia gibba*) all saw significant declines in frequency of occurrence. Bushy pondweed (*Najas flexilis*), muskgrass (*Chara* sp.) and variable pondweed (*Potamogeton gramineus*) increased in frequency.

Beecher Lake aquatic plant committee

The Beecher Lake District has appointed an aquatic plant committee (the “weed committee”) to coordinate EWM management activities, evaluate aquatic plant management results, and make recommendations to the Board of Commissioners. The committee has been instrumental in implementing the management plan and assisting the Marinette County LWCD with water level and aquatic plant monitoring.

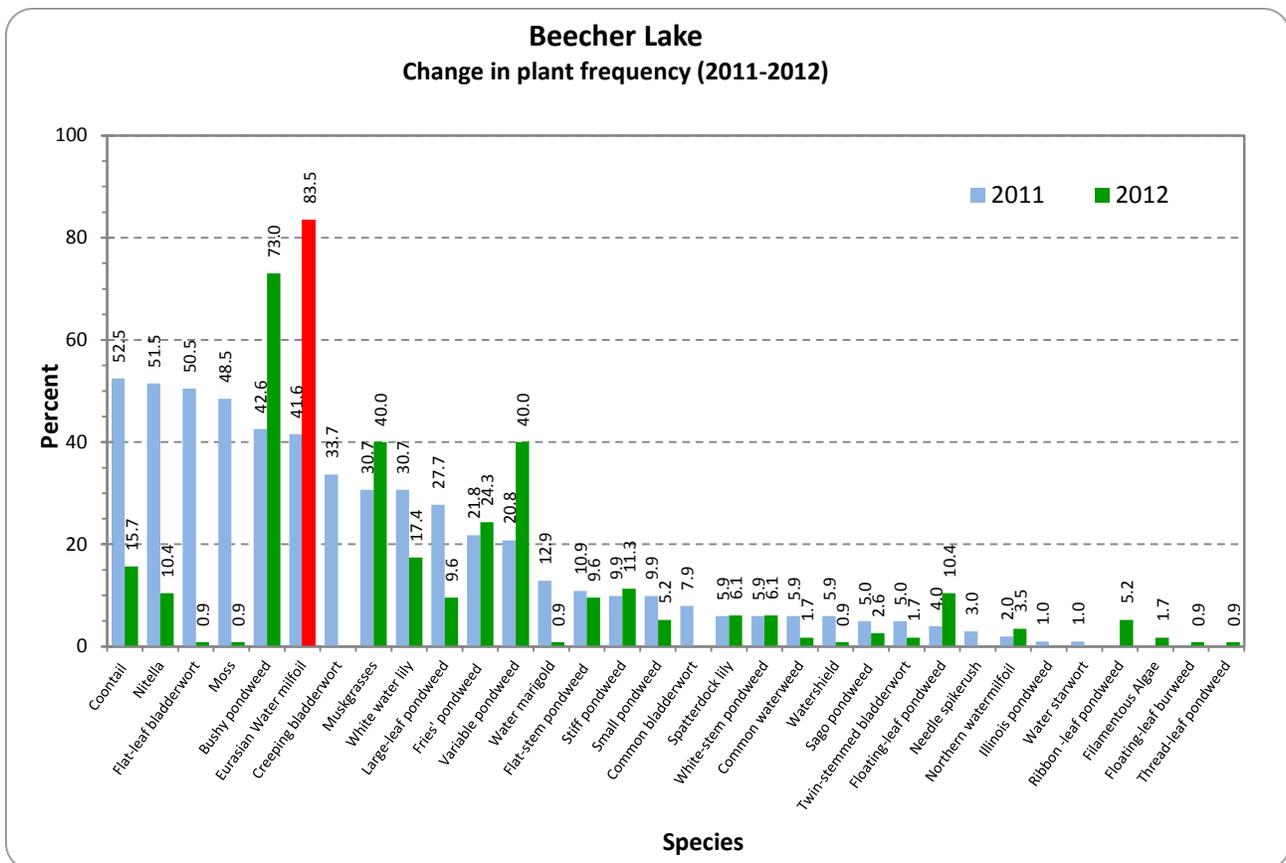


Figure 2. Change in aquatic plant frequency after the 2010/2011 winter drawdown.

Aquatic Plant Management Recommendations for Beecher & Upper Lakes

(Updated (March 2013))

The following recommendations are based on more than 5 years of EWM management efforts on Beecher and Upper Lakes. These recommendations are intended to modify those found in the Aquatic Plant Management Plan for Beecher Lake, dated January 2010

Recommendation #1 - Modify the Beecher Lake dam to simplify the drawdown process and allow for extended drawdown periods. After two attempts at conducting a winter drawdown it's clear that modification of the dam is necessary, both to simplify the process, and to eliminate maintenance issues. The most economical modification appears to be a low-level drain pipe and valve system installed through the existing spillway wall.

A Wisconsin DNR permit is required to conduct structural modifications to the dam and to modify the permitted water level requirement. The Beecher Lake District will have to work closely with the dam owner (Town of Beecher) and obtain the necessary permits.

Recommendation #2 - Dredge a channel from Beecher Lake to the dam. Currently, sedimentation in the original creek bed prevents the main body of Beecher, and therefore Upper Lake from draining. Dredging a channel to the dam would allow for an additional 2.5 feet of drawdown in the lakes.

A Wisconsin DNR permit is required for dredging in navigable waters. The Beecher Lake District will have to coordinate with the Town of Beecher and get the necessary permits from the DNR before any dredging can take place.

Logistically, it makes sense to draw the lake down using the siphons then install the low level drain prior to, or in conjunction with, the channel dredging. Both projects would be easier, and much less expensive if conducted during a drawdown.

Recommendation #3 - Apply for an AIS Control Grant to dredge and modify the dam. The District should apply for a Wisconsin Aquatic Invasive Species Control Grant to help defray the cost of dam modification and channel dredging. Channel dredging is not an eligible expense under current grant guidelines. However, the DNR can grant variances if the dredging is necessary for completing program objectives.

Recommendation #4 - Continue with early season 2,4-D treatments to control EWM as necessary. To date, early season herbicide treatment using 2,4-D is the only method that has worked to check the rapid expansion of EWM in Beecher and Upper Lakes. While winter drawdown holds promise, it will not be a viable management tool until the dam modifications and dredging are completed. Until that time, the District should continue to monitor the EWM population in the lakes and treat EWM as needed.

The application of Navigate 2,4-D at a rate of 150 lbs/ac has resulted in good control of EWM. Spot treatment should be considered when dense EWM beds covering ½ acre or more are identified. Recent studies suggest that when the EWM treatment area approaches 15 to 20 percent of the lake area the District should consider whole lake treatments. A whole lake treatment is currently scheduled for the spring of 2013.

Recommendation #5 – Survey the lake for milfoil weevils and establish control plots to test the use of biocontrol agents as a long-term EWM management tool. Continue to survey the lake for the presence of milfoil weevils. If found in significant numbers, or if grazing damage is noted on EWM, test plots should be established where other treatment measures are not used for a time to evaluate the potential for biocontrol of EWM.

Recommendation #6 – Reduce nutrient loading to the lake from developed shoreline properties. The District should continue to promote the restoration of natural shorelines. These “shoreline buffers” reduce pollutant loading primarily by increasing infiltration. Additional benefits include improved shoreline habitat and less time spent mowing! The Marinette County LWCD has cost-share funds available to defray the cost of shoreline restoration.

Monitoring and Evaluation Plan

(Updated April 2013)

In order to evaluate and make changes to the management program the District needs to track changes in the aquatic plant community. The management plan also needs to be evaluated on a regular basis and changed to meet shifting needs and address new challenges.

Recommendation #1 – Conduct aquatic plant surveys to evaluate management effectiveness and track changes to the lakes aquatic plant community. Surveys of the aquatic plant community should be completed with the application of any new management tool. For herbicide use, aquatic plant surveys should be completed before and after the treatment in and around areas to be treated. If possible, the same survey points and protocols used in the 2010 and 2011 plant surveys should be used so the results are directly comparable.

Periodically the entire lake should be surveyed to evaluate lake-wide changes to the plant community. These routine surveys should be completed approximately every 5 years. Sooner if sudden changes in the plant community are noticed. Whole-lake surveys should be completed using the same points and DNR point/intercept aquatic plant sampling protocol used in the 2008 plant survey. The floating leaf plant community should also be mapped using GPS and described.

Where grants are obtained to assist in aquatic plant management the cost of professional aquatic plant surveys can be included in the grant. Eventually however the District should develop this capability from within its own ranks. The DNR and Wisconsin Lakes Partnership have many aquatic plant ID resources and offer periodic aquatic plant identification training. The Marinette County Land & Water Conservation Division can also assist.

Recommendation #2 –Evaluate the aquatic plant management program annually. The Beecher Lake District aquatic plant committee (“weed committee”) should continue to coordinate aquatic plant management activities, evaluate the management program, and recommend changes to the District Board.

Information & Education Plan

(Updated April 2013)

A strong information & education effort is an important part of any AIS prevention program. It's also important to effectively communicate with district members when trying to implement a flexible aquatic plant management plan.

Recommendation #1 – Maintain signage at the boat landing and provide educational materials to visitors to Beecher Lake. Maintain educational signage at the boat landing to inform visitors to Beecher Lake about the danger of AIS and how they can help prevent the spread. Signage should be clear and uncluttered. Handouts should be provided through the “Clean Boats, Clean Waters” program during busy periods. Signage and educational materials can be obtained from the Peshtigo DNR office or on line at Wisconsin Lakes Partnership or UW Extension Lakes Program websites. This effort carries greater weight now that the town has greatly improved the public boat landing.

Recommendation #2 – Publish a regular newsletter, provide educational materials, and update lake residents about AIS management efforts. The District should continue to publish the Beech Chair News as a way of distributing educational materials and keeping members abreast of lake management issues. The District should also sign members up to receive the Lake Tides Newsletter, a free quarterly publication of the Wisconsin Lakes Partnership.

Recommendation #3 – Continue as a member of the Wisconsin Association of Lakes and take advantage of their resources. The Wisconsin Association of Lakes (WAL) is a statewide lake organization that promotes sound lake policy and provides training opportunities for lake groups throughout the state. The District should send a few members each year to the annual lakes convention, a three day event featuring numerous speakers, workshops and presentations concerning lake management, operating effective lake organizations, and other current issues affecting Wisconsin Lakes.

Aquatic Invasive Species Prevention, Monitoring and Rapid Response Plan

(Updated April 2013)

Unfortunately, Eurasian watermilfoil is not the only invasive aquatic species threatening our lakes. South of Marinette County curly-leaf pondweed (*Potamogeton crispus*) is an emerging problem. Other species including Hydrilla (*Hydrilla verticillata*), Brazilian waterweed (*Egeria densa*) and yellow floating heart (*Nymphoides peltata*) have been spreading north and may threaten our lakes in the future. Beyond the plant world we have Zebra mussels (*Dreissena polymorpha*), Rusty crayfish (*Orconectes rusticus*), exotic zooplankton, and fish diseases such as VHS to worry about. The best way to deal with these invaders is to be proactive and prevent their introduction. The following procedures should be used for the prevention, monitoring and response to new invasive species:

Prevention

An effective AIS prevention plan should focus on the most common routes of AIS invasion, boats, and water gardens. Boats traveling between lakes can carry plant fragments or zebra mussels attached to the boat or trailer. Water in the boat or bait buckets can carry plants, zebra mussels,

zooplankton, algae, and disease causing organisms. While the information and education program can provide valuable information regarding the spread of AIS a more effective case can be made when delivering the message face-to-face.

Recommendation #1 – The District should continue with the “Clean Boats, Clean Waters” watercraft inspection and information campaign. This is especially important since the Town of Beecher improved the public boat landing. Additional volunteers should be trained to conduct watercraft inspections and talk to boaters about the danger of spreading invasive species. The CBCW program is sponsored by the Wisconsin Lakes Partnership.

Recommendation #2 – Educate District members about the dangers of water gardening and the unintentional releases associated with the hobby. Mail order water garden plants are believed to be the likely source of hydrilla and yellow floating heart, two invasive exotic species that have been found growing in a private pond in northern Marinette County. A recent investigation of the water garden industry by the Minnesota DNR found that plants known to be invasive are available and routinely shipped around the country. Contamination of orders with other species, including invasive species, is also rampant.

Monitoring

Effective management of AIS is much easier when the invader is detected early. In some cases it may even be possible to eradicate an invasive species if it is discovered early enough.

Recommendation #1 – The District should join the Citizen Lake Monitoring Network and conduct annual AIS surveys of the lakes. While the information & education program should equip all District members with a basic knowledge of invasive species, several should be trained specifically for AIS monitoring. The Citizen Lake Monitoring Network holds training workshops to train volunteers in AIS monitoring protocol. They also provide a monitoring manual and laminated AIS identification sheets along with reconnaissance and reporting forms. The County LWCD can assist in AIS identification and monitoring.

Trained volunteers should conduct annual invasive species surveys. Findings should be reported to the District, the Marinette County Aquatic Invasive Species Coordinator and the Citizen Lake Monitoring Network.

Recommendation #2 – Report any suspected aquatic invasive species to local resource professionals. If any suspected exotic species are found report it immediately to the Peshtigo DNR office or the County LWCD. Collect a sample of any suspected exotic species and keep it wet and refrigerated in a zip-lock bag until it can be positively identified.

Rapid Response

When a new invasive species is positively identified the District needs to act quickly. Depending on the species found, length of time since invasion, and where the pioneer colony is found, there may be a possibility for eradication. The following steps should be followed:

Step #1 – Notify District board and local resource agencies and explore grant funding opportunities. The District Board should immediately notify the Wisconsin DNR, arrange a meeting to explore control measures, and determine if an AIS Rapid Response grant is advisable.

These grants were designed to deal with pioneer AIS infestations. The typical grant application process is bypassed so grant funds can be made available for quick action in hopes of eradication.

Step #2 – Notify membership of the discovery and what the Board plans to do about it.

Notify Lake District members of the discovery and measures they can take to prevent its further spread within the lake or to other waters. Let them know how the Board plans on dealing with the invasion.

Step #3 – Conduct a thorough survey of the lake to determine the extent of the AIS

infestation. Working with County or DNR staff, conduct a thorough survey of the lake. Map location of the invasive species and record its density as well as any other physical data that may be important such as water depth, sediment type etc.

Step #4 – Determine if eradication is a possibility, or if management is the only option.

Work with local resource agencies and outside experts where necessary to determine if eradication is possible. Where eradication is not feasible begin revising the lake management plan to deal with the new species.

Step #5 - Develop an action plan based on species and extent of invasion. Work closely with the experts to develop a customized plan aimed at eradication or control.

If outside consultants are needed for things like herbicide treatment or scuba diving bring them into the process early. Many consultants can also help with things like mapping and planning.