
2009 Balsam Lake Aquatic Plant Management Report

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Balsam Lake, Wisconsin (WBIC#2656200)

Balsam Lake is a 2,054 acre stratified seepage lake in Polk County, Wisconsin. It has a history of aquatic plant management and for many years aquatic plants have been managed along shorelines and navigational channels for recreational relief. Aquatic Engineering, Inc (AEI) has been implementing the aquatic plant management program since 2002. Early management used some harvesting activities (prior to 2002); however, management in most recent years has typically consisted of herbicide treatments for nuisance native plants and for the exotic plant curly-leaf pondweed (CLP, *Potamogeton crispus*).

The curly leaf pondweed (CLP) Pilot Project selective early season control project commenced again in 2009 for the two historic designated areas (Figure 1). CLP within these designated areas had been treated previously in 2004 and 2005. However, treatments were discouraged from 2006 through 2008 due to the Wisconsin Department of Natural Resources (WDNR) concern over an incomplete Aquatic Plant Management plan for Balsam Lake. The 2009 program achieved nearly 100% control of CLP within designated management zone. Third party quantitative pre and post treatment monitoring was conducted by Matt Berg.

Eurasian water milfoil prevention program has been monitoring boat launches (Figure 3) monthly (May-October) since 2002, and maybe earlier. Preventative treatments for EWM have occurred at boat launches two times each annually until 2007. Since 2007, boat launches have been qualitatively inspected by AEI. To date, there has not been an EWM infestation documented within Balsam Lake.

Navigational channel monitoring occurs annually but treatments have not occurred since 2006 because the DNR did not approve the permit for chemical management in the prioritized management areas. Navigational channel treatments were permitted in 2009 for the Mill Pond and Raskin Bay (Figure 2).

Management Strategy and Objectives

The objectives of this project were four fold:

1. Selective control CLP early within the growing so as to negatively impact the native plant community and its natural restorative processes;
2. Prevent pioneer colonization of Eurasian water-milfoil (*Myriophyllum spicatum*, EWM) at public launches;
3. Control nuisance vegetation within high-use recreational areas and navigational channels
4. Monitor plant community throughout the lake with particular emphasis on public launches.

Pre-Application Plant Survey Protocol

CLP management zones were surveyed pre and post application by Matt Berg. Boat launches were inspected monthly by AEI staff from May through November. Navigational Channels were surveyed monthly May through September by AEI staff and District representative(s). Prior to conducting all herbicide applications, AEI staff ecologists evaluate the plant community present within the proposed treatment zones. A treatment strategy is then formed onsite for the specific conditions encountered during each visit. Water volume, plant presence and abundance are considered when selecting herbicides and calculating application rates.

CLP Pilot Project Treatment

The management strategy addressed concerns with the exotic aquatic plant Curly-leaf pondweed (*Potamogeton crispus*, CLP). Two management zones were selected for monitoring in 2009. The areas were surveyed on for early CLP growth by Matt Berg. CLP was found abundantly at 1 of the 2 sites surveyed (Figure 1). A pre-treatment survey occurred by AEI staff on May 7, 2009. A total of 8 acres of the historic CLP bed were treated on May 14th, 2009, with water temperatures at 14.9°C or 58.82°F which were verified using a YSI 600R Sonde water sampling probe.

All CLP control activities on Balsam Lake were successful in the spring of 2009. CLP was controlled in the one management zone totaling 8 acres. Post application monitoring by AEI staff suggests 100% control and a healthy turion population in the seed bank within these areas of Balsam Lake. However, the untreated area and the shoreline proceeding westward from the untreated area contained abundant CLP later in May and should be treated in futures years. The long-term rehabilitation goal for Balsam Lake is the restoration of a healthy native aquatic plant community in areas currently affected by Curly-leaf pondweed. This goal will be attained

through a consistent series of selective low dose herbicide treatments over a 3-5 year period in areas of Balsam Lake known to contain monotypic stands of CLP coupled with monitoring activities to evaluate progress.

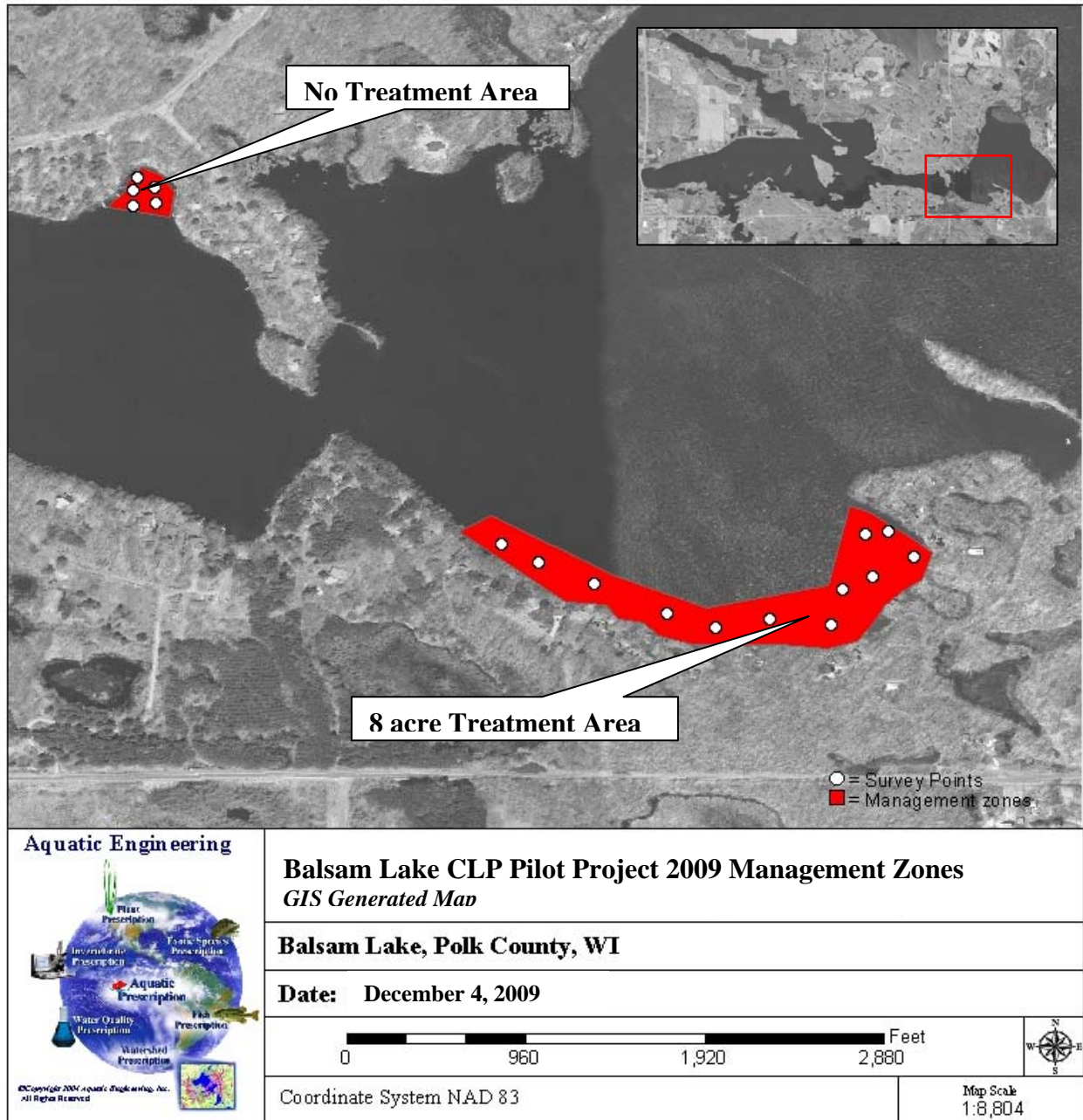


Figure 1. Balsam Lake, Polk County, WI CLP management zones and AEI survey points in 2009.

Navigation Channel Inspections and Treatments

Pre-treatment surveys occurred on May 7th, June 10th, July 23rd, August 5th, August 28th, September 4th and September 10th, 2009. During each survey an AEI representative was accompanied by a Balsam Lake District Aquatic Plant Committee member. Areas (Figure 2)

with history of creating nuisance levels of aquatic plants were targeted during this survey. All proposed treatment areas are recorded using a global positioning system (GPS).

The survey that occurred on July 23rd showed navigation concerns within Raskin Bay and the Mill Pond. This survey was performed in response to District concern's that native vegetation within the identified areas posed a level of nuisance that warranted chemical management.

Treatments within Raskin Bay and the Mill Pond were conducted on August 5th, 2009, for nuisance native vegetation in high use navigational channels. The proposed treatment channels were surveyed by the DNR, District, and AEI representatives. The DNR determined the selected management zones would warrant chemical management because conditions were severe enough. The Raskin Bay treatment occurred on 1.78 acres of submerged vegetation and 43 spots that were 30' in diameter totaling .31 acres of floating leaf vegetation treatments. The Mill Pond treatment occurred on 0.50 acres of submerged vegetation and 29 spots that were 30' in diameter totaling .21 acres of floating leaf vegetation treatments.

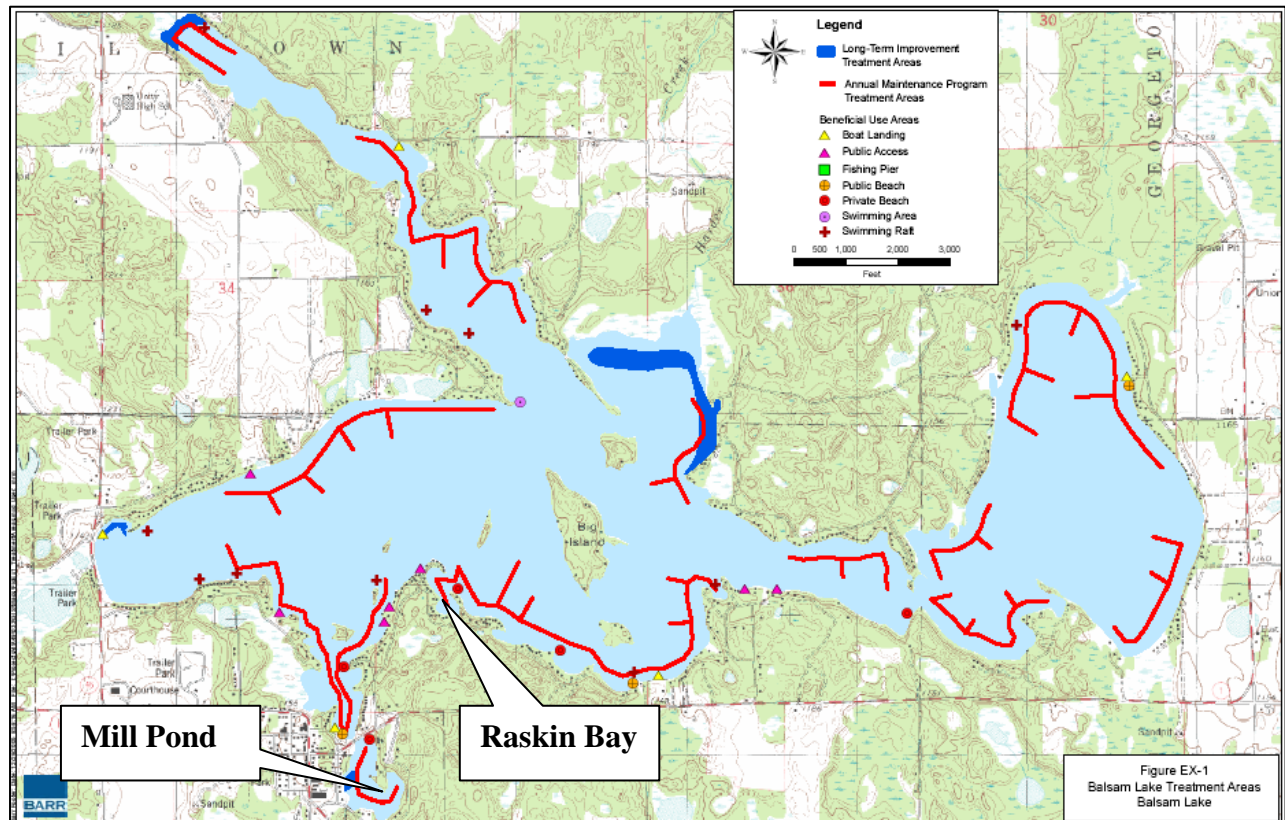


Figure 2. Historic navigational channels inspected in 2009, Balsam Lake (Polk County, WI).

Boat Launch Inspections

Each boat launch was qualitatively inspected monthly (Figure 3), and no treatments were performed. Inspections occurred on May 7th, June 10th, July 23rd, August 5th, August 28th

September 4th, October 9th and November 5th, 2009. Fifty feet of shoreline was inspected by 100 feet out into the water during each survey. EWM was not found during any survey. A mixture of native aquatic plants was found at each launch. Species found included: Clasp leaf pondweed, Coontail, Elodea, Flat stem pondweed, Large leaf pondweed, Northern milfoil, Robbins pondweed, Water buttercup, Wild celery, White lily, Star duckweed, Water meal, Planktonic algae and Filamentous algae.

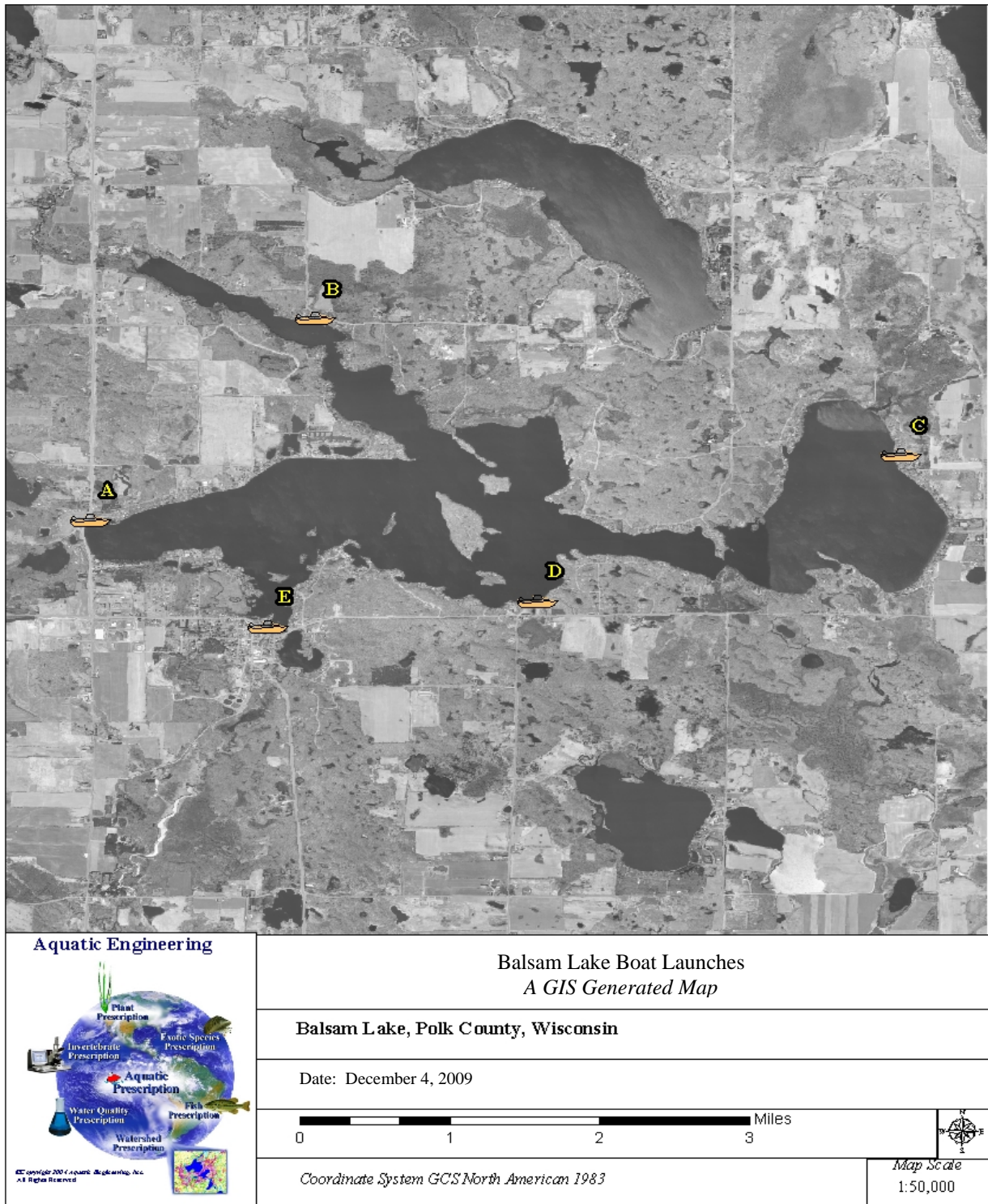


Figure 3. Boat launches inspected in 2009, Balsam Lake (Polk County, WI).

Summary and Benefits

Of the four listed program objectives, all objectives were accomplished in 2009, in some capacity. An early season pilot Curly leaf pondweed exotic species control project was approved by the WDNR in two selected areas. The objective of keeping Eurasian water milfoil from entering the lake has seemingly been accomplished to date. The objective of managing nuisance native vegetation within high-use recreational navigational channels was approved by the WDNR within Raskin Bay and the Mill Pond. And lastly, the aquatic plant community has been intensely monitored by the district and its contracted agents AEI and Matt Berg.

We all fear an exotic invader, and unfortunately in some cases they can be unavoidable and hard to manage without proper planning. Some exotic species live for sometime in an ecosystem before they show their problematic symptoms to the general lake user. As seen in 2003, 2004 and again now in 2009, populations of CLP have been identified and managed properly. The proactive actions of Balsam Lake's Management District must manage the problem with the right attitude and perseverance. The key to continued success must now be to address the problem with necessary management tools and address it as needed. At present, the health of Balsam Lake is in good, but a vulnerable condition. It remains imperative to update the Aquatic Plant Management Plan and subsequently resurvey the lakes aquatic plant communities to document invasive plant infestations as a whole in the near future.

Preventing an EWM infestation will help ensure native plants have the opportunity to maintain a natural, self-regulating aquatic plant community. Native aquatic plants provide optimal habitat for fish and wildlife and increase the recreational value of the lake. Inspections and treatments will continue to play a role in maintaining ecological and recreational balance.

Navigational channel maintenance provided significantly better recreational opportunities in Raskin Bay and the Mill Pond. It is clear that the District must be assertive when applying for nuisance native plant treatments. The District should apply for permits early in the spring and make sure the permits are approved or denied within the time allowed by law. Without public support and aggressive self-advocacy it is possible the aquatic plant management program will face challenges.

Management Suggestions

Short-Term

It is highly recommended that this monitoring, CLP management and EWM prevention effort be continued to control CLP and prevent future infestations of EWM. It is also recommended to work with the DNR and Native American Taskforce to ensure future management of nuisance native plants protects valuable plant communities and ecologically important areas while maintaining clear recreational channels. Lastly, purple loosestrife monitoring should be added to the annual inspection protocol.

Mid-Term

We recommend the District continues to be proactive in their lake management and planning activities. The District should have their Aquatic Plant Management Plan approved by the WDNR.

Long-Term

A revision of the comprehensive Lake Management Plan should be considered in the long-term planning of Balsam Lake. The Lake Management Plan should address all interrelated lake management issues such as the fishery, watershed, water quality, and aquatic plant management concerns. Guidelines established by the WDNR concerning monitoring in lakes with known invasive populations should include the following:

1. Sample more often.
 - Start sampling at ice out.
 - Continue sampling monthly throughout the summer.
2. Sample using the rake sampling method at:
 - Known sites of previous infestation
 - Sampling intensity will correspond to the area of infestation. Be sure to sample beyond the area of known infestation. Sample transects through the area of known infestation to a maximum distance of 50 meters from point to point.
 - Major inflows
 - Sample a wedged-shaped area (pointing upstream) using a minimum of 10 points, 10 meters apart.
 - Known boat launch sites

- Sample a wedged-shaped area (pointing at the boat landing) using a minimum of 20 points, 10 meters apart.
 - Identify all sites with rare, endangered, or sensitive aquatic plants, species of special concern, or areas with the Sensitive Area Designation.
3. Scale sampling to area. Be sure to sample beyond the margins.
 4. Note observed changes including major changes in the native plant community.

Issues that faced on Balsam Lake in 2009 will continue to shape future management for Balsam Lake. Regulatory officials will continue to adapt how legislation is interpreted and enforced. The District should be prepared to adapt its strategies as better information becomes available. The District will need to balance its self-advocacy efforts and professional relations to reach agreements that meet the District's needs and the needs of the lake resource.