AMENDMENT

Aquatic Plant Management Plan for Jenni and Kyle Preserve Ponds, Tenney Park Lagoon, Vilas Park Lagoon, Warner Park Lagoon, Lower Rock River Basin; and Verona Quarry, Grant-Platte-Sugar-Pecatonica Basin, Dane County Wisconsin

Approved by the Dane County Lakes and Watershed Commission on April 10, 2014 and by the Wisconsin Department of Natural Resources on March 27, 2014

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Plant surveys conducted by Jim Leverance, Marcia Hartwig and Sue Jones of the Dane County Office of Lakes and Watersheds (2011).

Introduction

This is an update to the Aquatic Plant Management Plan for Jenni and Kyle Preserve Ponds, Tenney Park Lagoon, Vilas Park Lagoon, Warner Park Lagoon, Lower Rock River Basin; and Verona Quarry, Grant-Platte-Sugar-Pecatonica Basin, Dane County Wisconsin, published in November 2007 by the Dane County Office of Lakes and Watersheds. The Wisconsin Department of Natural Resources approved the 2007 plan on November 20, 2007 and the Dane County Lakes and Watershed Commission approved the plan on November 8, 2007. Aquatic Plant Management Plans are required under NR 109.04(d), Wisconsin Administrative Code, to guide mechanical harvesting activities and the effective management of aquatic plants in water bodies.

Some of the water bodies addressed in this plan (e.g. Vilas Lagoon, Warner Lagoon, and Tenney Lagoon) are hydraulically connected to larger water bodies (e.g. Lake Wingra and Lake Mendota) which are the focus of their own separate plans. Jenni and Kyle Preserve Ponds, Tenney Park Lagoon, Vilas Park Lagoon, Warner Park Lagoon, and Verona Quarry are grouped together in this plan because they are shallow, highly disturbed systems with limited plant diversity, similar management needs, and, with the exception of Vilas Lagoon, infrequently harvested.

This plan is prepared in support of Dane County's permit for its mechanical aquatic plant harvesting program, operated in accordance with NR 109 Wisconsin Administrative Code. Individuals and groups that propose herbicide treatments of aquatic plants in Dane County waters would need to go through a separate planning and permitting process with the Wisconsin Department of Natural Resources.

Recent Plant Survey Methods and Results

Dane County conducted the aquatic plant surveys for this plan update on July 20, 2011 (Jenni and Kyle Preserve Ponds, Tenney Park Lagoon), July 29, 2011 (Vilas Park Lagoon), August 4, 2011 (Warner Park Lagoon), and August 16, 2011 (Verona Quarry).

Dane County staff followed state protocols and used the point intercept method. The 2007 plant surveys were conducted by visual observation. The sampling grids for sampling completed in 2011 are found in Figures 1 through 5.

Figure 1: Points sampled for Jenni and Kyle Preserve Ponds

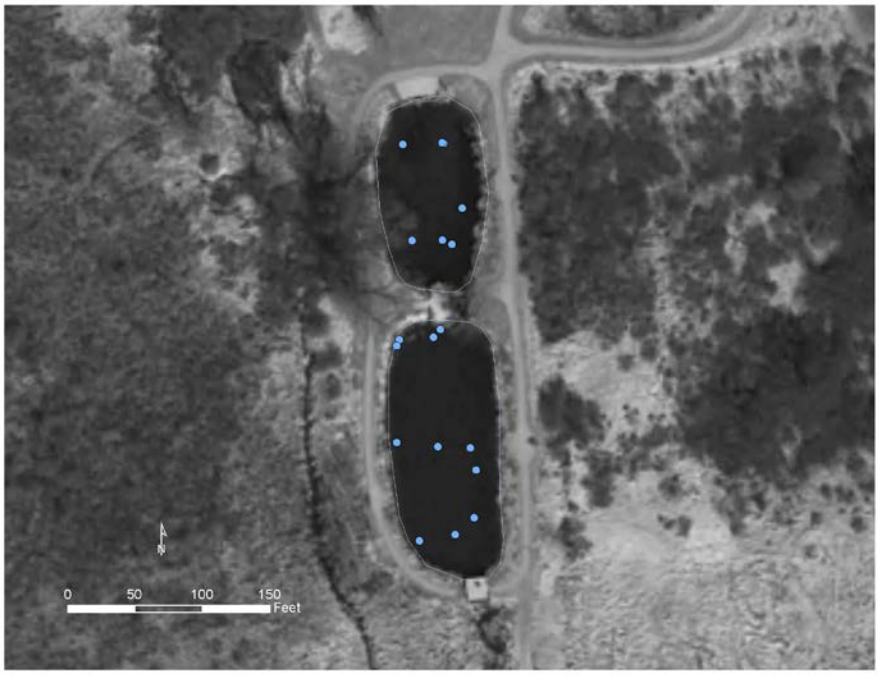


Figure 2: Point intercept sampling grid for Tenney Park Lagoon

Figure 3: Point intercept sampling grid for Vilas Park Lagoon

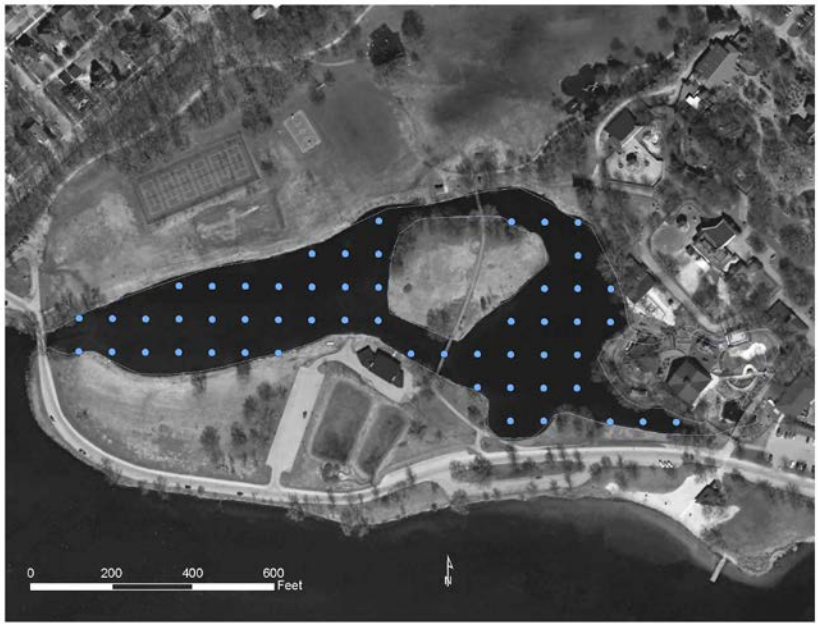


Figure 4: Point intercept sampling grid for Warner Park Lagoon

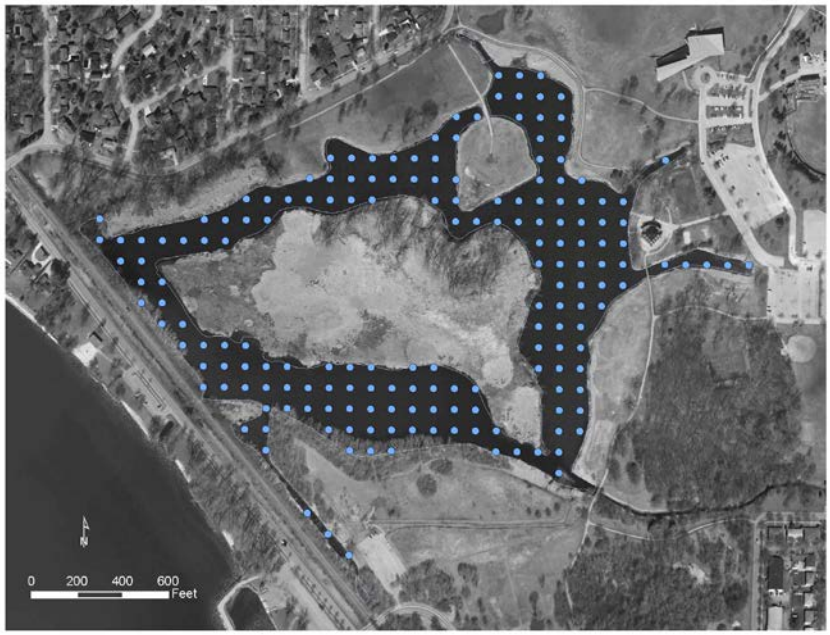
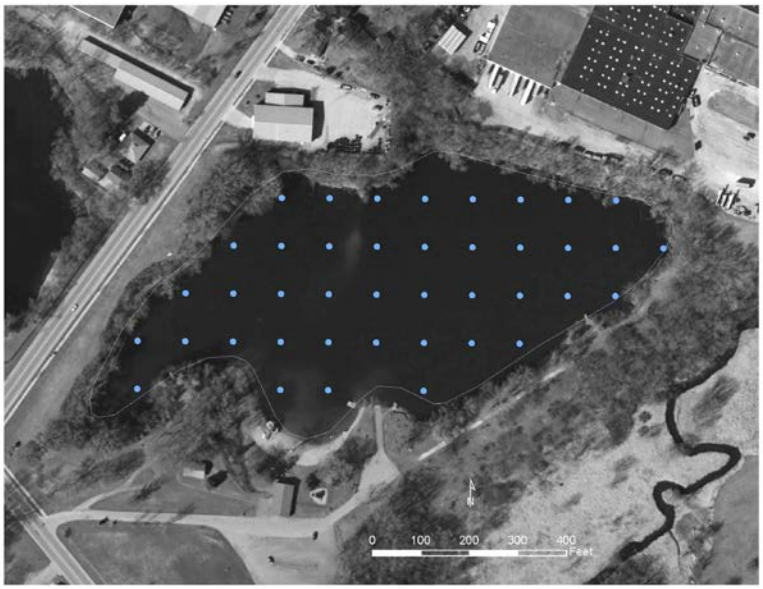


Figure 5: Point intercept sampling grid for Verona Quarry



Tables 1 through 5 below indicate species present in the five ponds sampled in 2011 surveys. Native species richness is also indicated for each waterbody, which is a count of the total number of different native plant species found in a waterbody. Generally, the better the water quality the higher the native species richness count.

Table 1: Species present during 2011 aquatic plant survey – Jenni and Kyle Preserve Ponds

Species	Common Name	Category
Ceratophyllum demersum	Coontail	Submersed
Chara	Muskgrass	Submersed
Elodea canadensis	Common waterweed	Submersed
Najas flexilis	Slender naiad	Submersed
Potamogeton crispus	Curly leaf pondweed	Submersed (invasive)
Ranunculus sp.	Buttercup	Submersed
Stuckenia pectinata	Sago pondweed Unknown pondweed	Submersed Submersed

Native species richness was 6. Coontail and buttercup maps are not included in Appendix E because a corrupted data file made mapping impossible

Table 2: Species present during 2011 aquatic plant survey – Tenney Park Lagoon

Species	Common Name	Category
Ceratophyllum demersum	Coontail	Submersed
Myriophyllum spicatum	Eurasian watermilfoil	Submersed (invasive)
Nymphaea odorata	White water lily	Submersed
Potamogeton crispus	Curly leaf pondweed	Submersed (invasive)
Stuckenia pectinata	Sago pondweed	Submersed

Native species richness was 3.

Table 3: Species present during 2011 aquatic plant survey – Verona Quarry

Species	Common Name	Category
Ceratophyllum demersum	Coontail	Submersed
Chara	Muskgrass	Submersed
Elodea canadensis	Common waterweed	Submersed
Myriophyllum spicatum	Eurasian watermilfoil	Submersed (invasive)
Najas flexilis	Slender naiad	Submersed
Potamogeton crispus	Curly leaf pondweed	Submersed (invasive)
Potamogeton foliosus	Leafy pondweed	Submersed
Stuckenia pectinata	Sago pondweed	Submersed

Native species richness was 6.

Table 4: Species present during 2011 aquatic plant survey – Vilas Park Lagoon

Species	Common Name	Category
Ceratophyllum demersum	Coontail	Submersed
Elodea canadensis	Common waterweed	Submersed
Myriophyllum spicatum	Eurasian watermilfoil	Submersed (invasive)
Nymphaea odorata	White water lily	Submersed
Stuckenia pectinata	Sago pondweed	Submersed

Native species richness was 4.

Table 5: Species present during 2011 aquatic plant survey – Warner Park Lagoon

Species	Common Name	Category
Ceratophyllum demersum	Coontail	Submersed
Nymphaea odorata	White water lily	Submersed

Native species richness was 2.

Appendix F includes maps of aquatic plant distributions for all ponds sampled in 2011. As noted after Table 1, Jenni and Kyle Preserve Pond maps do not include coontail and buttercup.

Discussion of historical plant community changes

Jenni and Kyle Preserve Ponds

The 2011 point intercept survey confirmed a greater diversity of native plants than the 2007 visual survey. Eight total species are present, and the invasive Eurasian watermilfoil (EWM) is still not present.

Tenney Park Lagoon

At the time of the visual plant survey conducted in late June 2007, Tenney Lagoon was choked with EWM and filamentous algae in deeper water. The 2011 point intercept survey documented plant growth dramatically less than the 2007 visual survey, especially EWM. Coontail dominates this system.

Verona Quarry

EWM and the total plant community has declined since the 2007 visual survey.

Vilas Park Lagoon

In the 2007 visual survey, the Vilas Lagoons were dominated by EWM. In the 2011 point intercept survey, five species were documented, and EWM was not as dense as in 2007. Coontail dominated the lagoon in 2011, and white water lilies were still present.

Warner Park Lagoon

Only two plant species were present in the 2011 point intercept survey. White water lilies were present both in 2007 and 2011 and should be protected. There is no EWM in Warner Lagoon, as the water may be too shallow for growth of this plant.

Recent Chemical and Harvesting Aquatic Plant Management Records

None of these ponds has been treated with herbicides to control aquatic plants. Since 2007, when the initial aquatic plant management plan was completed, Dane County has conducted mechanical harvesting in Tenney Park Lagoon, Verona Quarry, Vilas Park Lagoon, and Jenni and Kyle Preserve Ponds. Warner Park Lagoon has never been harvested.

Figures 6 through 9 summarize Dane County's mechanical harvesting operations in the ponds from 2007 through 2012.

Please note that, starting in 2006, Dane County changed the way it records total harvested plant weight. In the 2007 plan, one truck load of harvested plants was equated with one ton. Beginning in 2006, Dane County uses a formula to more precisely estimate the wet weight of one truck load, expressed in U.S. tons. What may seem to be a dramatic increase in harvested plant amounts, compared to 2005 and earlier, is likely mostly due to this change in estimating harvested weights.

Figure 6: Summary of Jenni and Kyle Preserve Ponds Aquatic Plant Harvesting Records, 2007-2012

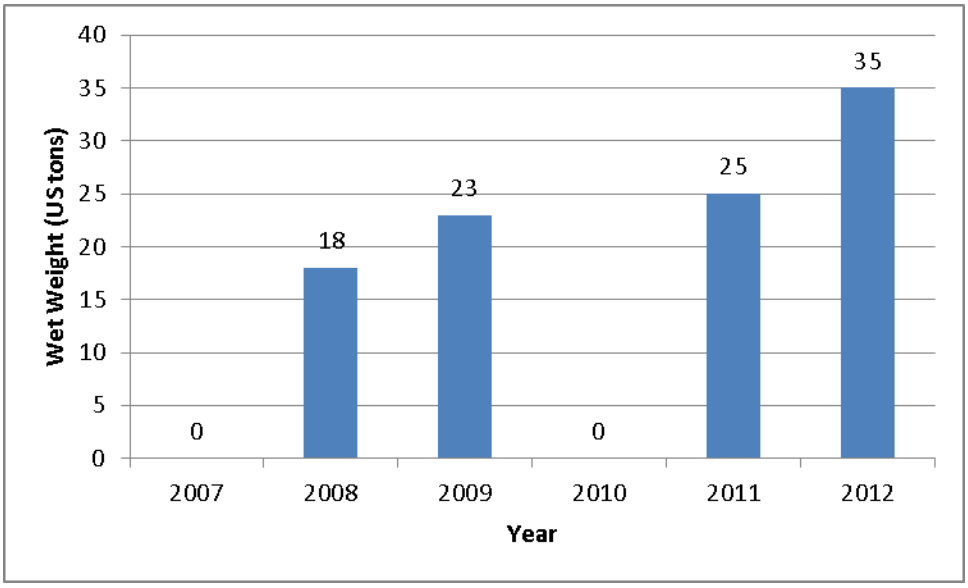
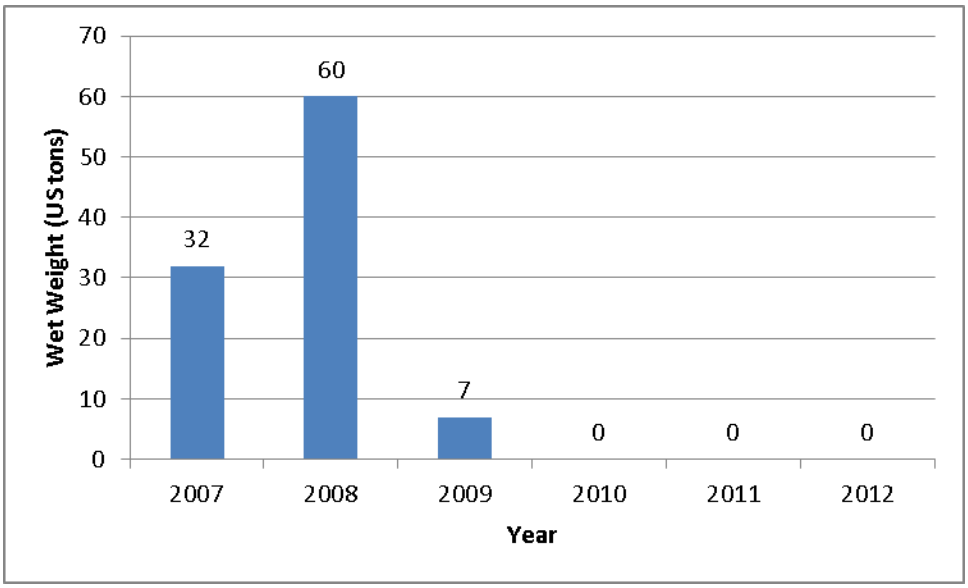


Figure 7: Summary of Tenney Park Lagoon Aquatic Plant Harvesting Records, 2007-2012



Note: Tenney Park Lagoon is a popular ice skating destination in winter. City of Madison staff have the ability to manipulate water levels here to control plant growth, and mechanical harvesting has not been needed to facilitate good ice for skating. City Parks staff have requested harvesting to improve the aesthetic experience for anglers and other park users.

Figure 8: Summary of Verona Quarry Aquatic Plant Harvesting Records, 2007-2012

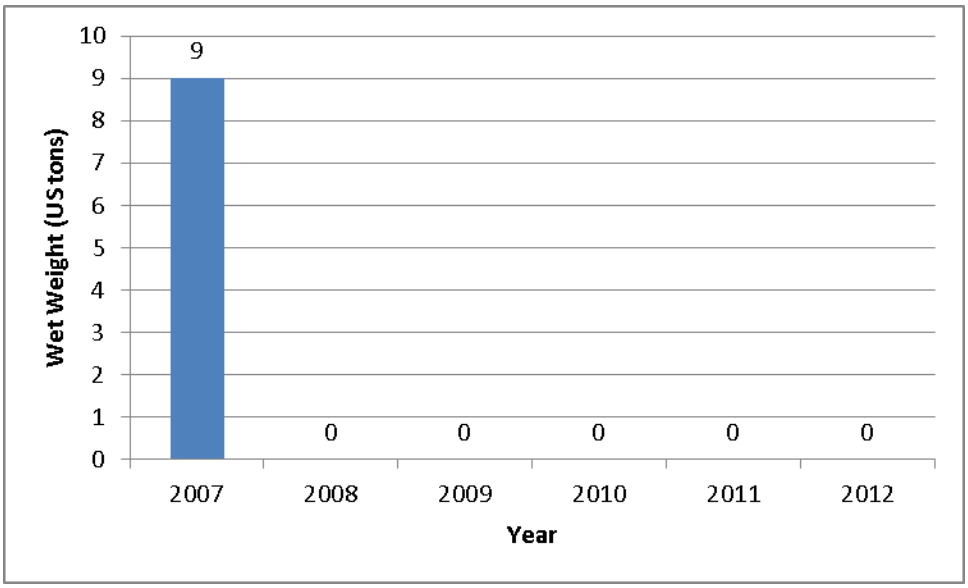
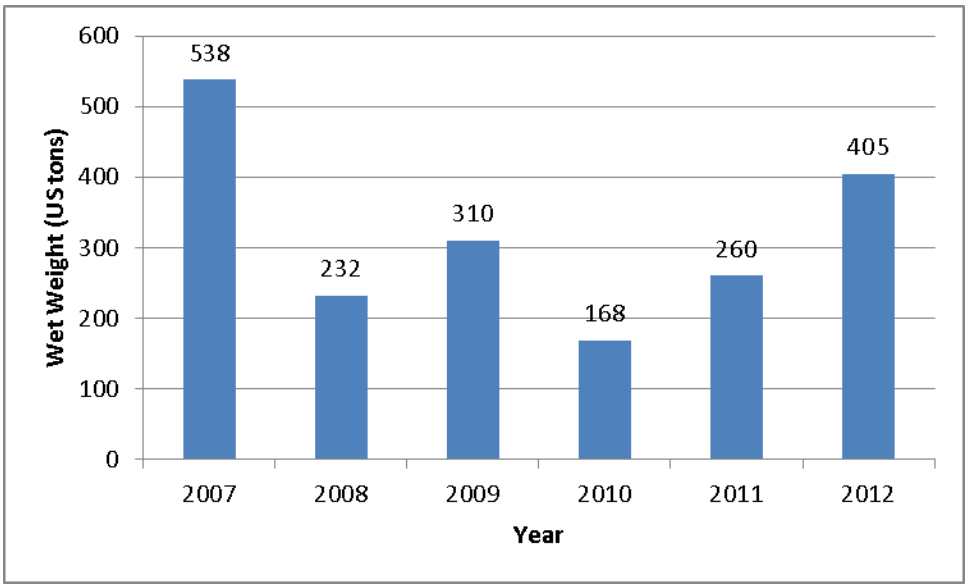


Figure 9: Summary of Vilas Park Lagoon Aquatic Plant Harvesting Records, 2007-2012



Public input opportunities

Dane County Land and Water Resources Department staff held a public information and input meeting on March 20, 2013, at the Middleton City Hall, with approximately five area residents present. The focus of the meeting was lakes Mendota and Monona; Fish, Indian and Crystal Lakes; Tenney, Warner and Vilas Lagoons. Attendees represented the Yahara Lakes Association and Lake Mendota and Monona residents who enjoy these lakes for recreation and aesthetics.

Dane County Land and Water Resources Department staff held a public information and input meeting on April 16, 2013 at the Village of McFarland Municipal Center -- Training Room, with 18 area residents present. The focus of the meeting was lakes Waubesa and Kegonsa, Yahara River, Upper and Lower Mud Lake, Jenni and Kyle Ponds, and Verona Quarry. Attendees represented Friends of Lake Kegonsa Society, Lake Waubesa Conservation Association, Waubesa Beach Neighborhood Association, and others who enjoy Lake Kegonsa and Lake Waubesa for recreation and aesthetics.

At each meeting, Dane County and DNR staff presented current plant data, following an overview of the ecological importance of aquatic plants and the current harvesting operation. Dane County staff invited comments on suggested revisions to the plan goals, recommendations, and harvesting operations. There were no attendees at either meeting interested in reviewing the plant data from the ponds, and no specific suggestions were made about updating the 2007 plan's goals and recommendations.

A draft plan amendment was posted on www.danewaters.com in fall 2013, and a final draft in spring 2014, and comments requested via email and other direct outreach to parties interested in these ponds.

The Friends of Lake Wingra provided comments at several venues in 2013 and 2014, focused on the need for protection of white water lily in Vilas Lagoon, and on concern that harvesters churned up bottom sediments while cutting plants in Vilas Lagoon at the request of the City of Madison in preparation for ice skating. This final plan amendment and the Dane County Lake Management Operations Manual includes extensive edits based on that input.

Aquatic Plant Management in Dane County

The overall goal of Dane County's mechanical harvesting program is to cut and harvest Eurasian watermilfoil and other invasives to help provide for reasonable use of the lakes for boating, fishing and swimming, while preserving the health and balance of the lake ecosystem. During periods of high water, harvesting of plants in the Yahara River between lakes Waubesa and Kegonsa becomes the highest priority.

Aquatic plant growth varies from lake to lake and year to year. Dane County employs a Plant Scout to evaluate plant growth conditions and recommend appropriate harvesting in response, within the limits of the plan harvesting priority areas and DNR permit. In times of heavy plant growth, local residents often advocate for additional harvesting in their areas, harvesting longer into the season (into the fall), or dedicating a harvester for a particular waterbody. County managers need to balance staff and harvesting equipment resources and priorities with needs and ecological conditions countywide. Local

groups or individuals always have the option of contracting with the county for additional harvesting and special event harvesting, within the boundaries of the permit. Additional information about contract harvesting is available here: www.countyofdane.com/lwrd/parks/aquatic_plant_harvesting2.aspx#garden.

Dane County, Wisconsin Department of Natural Resources, and the U.S. Army Corps of Engineers completed a research project in 2013 that evaluated the response of selective early-season herbicide application and cutting of aquatic plants on Turville Bay, the southwest area of Lake Monona, on Eurasian watermilfoil (EWM, an invasive aquatic exotic plant) and on native plant communities. The complete project report and a summary fact sheet are available at www.danewaters.com.

Eurasian watermilfoil begins growing early in the year, and creates a dense growth canopy which shades out native plant species. Cooperating scientists and managers wondered if controlling EWM early in the season would give an advantage to native plants. The research project found that both herbicide and harvested early-season treatment resulted in significant decreases in EWM. Mechanical harvesting produced more variable results, but better protected native coontail plants. The herbicide treatment resulted in longer control of EWM than mechanical harvesting.

One outcome of this research is that Dane County staff may identify small areas in larger lake systems for early-season mechanical harvesting to provide nuisance control of EWM, as resources and priorities permit.

Dane County holds annual training sessions for new and returning harvester operators before the harvesting season begins. In that training, permanent and seasonal staff receive instruction on many topics including aquatic invasive species prevention protocols, plant identification, and communications. The Lakes Management Supervisor directs the day-to-day operations of the staff, guided by the Parks Director who is informed of plant conditions and harvesting needs by the Plant Scout. Particular concerns with a water body; deep versus shallow harvesting; collection of plant fragments from harvesters, plant senesces, and boat propellers etc. are all addressed in the supervision.

Working closely with the Wisconsin Department of Natural Resources, the Dane County Land and Water Resources Department has developed harvesting priority maps that are included in many of the aquatic plant management plans and referred to in DNR harvesting permits issued to Dane County. Not every area that is identified for potential harvesting on the map will be harvested in any given harvesting season if there is little to no plant growth, because attention to higher priority areas does not permit it, or due to budget constraints. Harvester operators are instructed not to cut and remove plants outside of harvesting priority areas identified on these maps, unless authorized by their Supervisor in consultation with the Wisconsin Department of Natural Resources.

Harvesting machines are designed to collect and remove plant fragments. Dane County also helps clean up plant materials at beaches and other public access points, even when the plant material is not associated with harvesting operations.

Limits of the equipment, staff, and budget mean that plant harvesting for aesthetics, collection of wind-blown plant fragments due to boat propeller action, and the removal of plants that release from the

sediment and float free in the fall cannot generally be accomplished. However, program managers do their best to accommodate requests for collection of naturally-occurring windblown and boat motor chopped plant fragments near shorelines, as time and budget permit. The Dane County Lake Management Operations Manual provides instructions to harvesting machine operators about plant fragment collection.

There is a common misperception that excessive external nutrients carried into lakes in runoff from the watershed causes macrophyte (large aquatic plant) problems. In fact, external nutrient loading usually produces algal blooms that shade and reduce macrophyte biomass. Attempts to control biomass by controlling nutrients in the water column are unproductive, according to G. Dennis Cooke and others in the third edition of Restoration and Management of Lakes and Reservoirs (2005). This is because rooted macrophytes, such as the nuisance Eurasian watermilfoil, usually get their phosphorus and nitrogen directly from sediments. In the short-term, reduced phosphorus in the water column resulting from watershed controls may actually result in more macrophyte growth, because clearer water permits more light penetration that fosters plant growth.

It could take many years to reduce the historical nutrient additions to lake sediments especially in agricultural areas. Much important work is underway in the Yahara River watershed to reduce watershed phosphorus loadings. Long-term, scientists and managers hope that community efforts can reduce sediment phosphorus, thereby more directly affecting plant growth.

Recommended Management for Ponds

Dane County staff have reviewed the plant survey data and public input, and recommend the updated management elements found in this section.

Ponds Recommendations

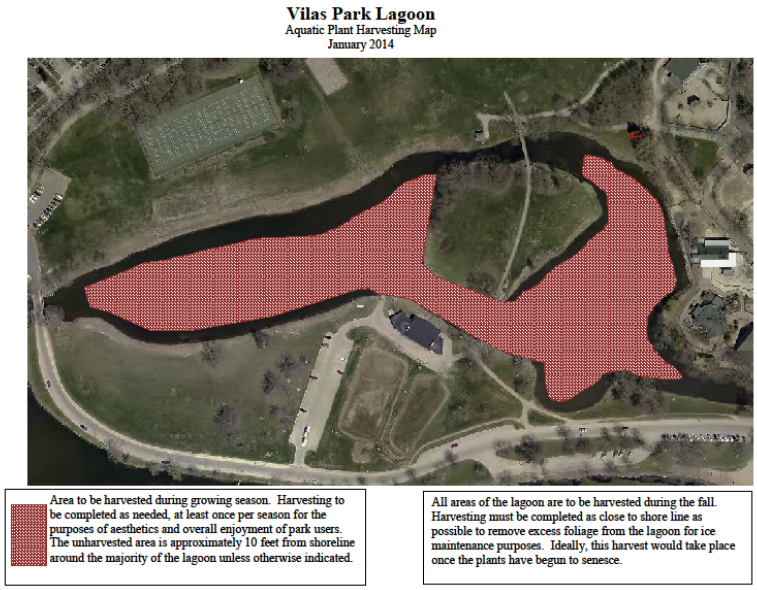
1. The Dane County Plant Scout should document occurrences of high value native plants in regular scouting reports, including shoreline reference and GPS location. Dane County staff should make an annual summary report of these occurrences available to the public.
2. Harvesting is recommended at Jenni and Kyle Preserve Ponds to provide pond angling opportunities and aesthetically pleasing conditions for visitors. After pre-season visual observation, early harvesting should be conducted to control EWM, if it becomes established here, with subsequent harvesting only as necessary to provide fishing access. Maintaining favorable turtle habitat is also recommended by sustaining floating logs, and adding turtle resting spots on the shoreline in areas that would not interfere with shore fishing access. It is especially important to ensure that harvesting equipment has been decontaminated before entry, so that aquatic invasives such as EWM are not introduced.
3. Mechanical harvesting is recommended as needed for controlling high densities of EWM and filamentous algae in Tenney Park Lagoon. White water lily habitat should be surveyed pre-season and protected during the harvesting season.
4. Mechanical harvesting is recommended only as needed, based on pre-season survey, for controlling EWM in Verona Quarry to improve boating access, angling opportunities,

swimming, and fish habitat. Coarse woody debris should be protected for fish and turtle habitat.

5. After consultation with City of Madison Parks staff and Friends of Lake Wingra, Dane County has established the operational goals specific to Vilas Lagoon, as resources permit: a) on a trial basis, harvest deeper-water locations of this shallow lagoon and adjacent to the park shelter, one to two times per summer for the aesthetic enjoyment of Vilas Park users, b) provide harvesting services in September or October to cut and remove plants close to the water's surface, all the way up to the shoreline of the lagoon, in order to facilitate good, solid ice for winter recreation while minimizing environmental disturbance. In the fall, the City of Madison requests that harvesting be done in shallow water up to the land's edge because lack of solid ice at edges threatens integrity of the entire ice sheet and the enjoyment of skaters.

   To define the specific areas of trial summer harvesting in the lagoon, the City of Madison Parks staff has prepared a map of requested harvesting areas (see Figure 10: City of Madison "Vilas Park Lagoon Aquatic Plant Harvesting Map"), leaving a buffer of near-shore aquatic vegetation except for near the park shelter. This map will be used as a guide for harvester operators, and will be evaluated and adjusted as necessary after use for a year or two.

Figure 10. Vilas Park Lagoon Aquatic Plant Harvesting Map



6. Water clouding phytoplankton in Warner Lagoon inhibited submersed plant growth except for the sparsely occurring plants close to shore. Mechanical harvesting has not been recommended for several years, but conditions may change and warrant harvesting in the future. White water lily habitat should be protected. If mechanical harvesting is used in the future, areas with white water lilies should be avoided.
7. The Dane County Plant Scout should document occurrences of high value native plants in regular scouting reports, including shoreline reference and GPS location. Dane County staff should make an annual summary report of these occurrences available to the public.

Additional Discussion of Vilas Lagoon

This plan amendment for several ponds and lagoons, consistent with the 2007 aquatic plant management plans for Lake Wingra and Vilas Lagoon, recommends protection of white water lily and other native plants and their habitat. Dane County staff balance native species protection with historic recreational uses of the lagoon. For 40 years, for example, harvesting staff have cut and removed plants in Vilas Lagoon to provide for good ice for winter skating. These plants are typically cut in September or October, when they are already dying back. The white water lily beds have expanded in recent years, seemingly not negatively affected by harvesting.

Colleagues from the Wisconsin DNR do not believe that there have been negative environmental impacts from plant harvesting in Vilas Lagoon dating back more than 40 years. DNR staff have confirmed that Vilas Lagoon is a shallow water body that is a former wetland adjacent to Lake Wingra, and those wetlands have been filled and the area dramatically altered by humans over time. There is only limited hydraulic connection between the lagoon and the lake, and the lagoon has accumulated quite a bit of sediment over the years. The lagoon has limited plant diversity and is dominated by Eurasian watermilfoil, and the native white water lilies present (observed by plant survey consultants in

both 2007 and 2011) are hearty and bounce back after harvesting disturbance. Common carp, an invasive species, are the primary inhabitants of the lagoon and DNR fisheries managers are therefore not concerned about negative impacts on lagoon fisheries from plant harvesting. Despite these limitations, Vilas Lagoon is valued by area residents for a variety of uses including aesthetics, and could potentially see ecological improvement.

Proposed Critical Habitat Areas

Wisconsin DNR's website describes the importance of the DNR's designation of Critical Habitat Areas as follows: "Every waterbody has critical habitat - those areas that are most important to the overall health of the aquatic plants and animals. Remarkably, eighty percent of the plants and animals on the state's endangered and threatened species list spend all or part of their life cycle within the near shore zone. As many as ninety percent of the living things in lakes and rivers are found along the shallow margins and shores. Wisconsin law mandates special protections for these critical habitats. Critical Habitat Designation is a program that recognizes those areas and maps them so that everyone knows which areas are most vulnerable to impacts from human activity. A critical habitat designation assists waterfront owners by identifying these areas up front, so they can design their waterfront projects to protect habitat and ensure the long-term health of the lake they where they live.

In error, the 2007 Lake Wingra plan's proposed sensitive area (now called "critical habitat") map showed Vilas Lagoon as a proposed sensitive area. DNR did not designate any critical habitat areas in response to that plan. The proposed 2013 Lake Wingra plan update no longer shows Vilas Lagoon as a critical habitat area, acknowledging the fact that late season harvesting to facilitate ice skating, at the request of City of Madison Parks, has occurred for many years and this historic recreational use of the lagoon has been balanced with the need for native species protection.

No Critical Habitat Areas for Jenni and Kyle Preserve Ponds, Tenney Park Lagoon, Vilas Park Lagoon, Warner Park Lagoon, and Verona Quarry are recommended for Department of Natural Resources designation under Wisconsin Administrative Codes at this time.

Harvesting Operations

Dane County holds annual training sessions for new and returning harvester operators before the harvesting season begins. In that training, permanent and seasonal staff receive instruction on many topics including aquatic invasive species prevention protocols, plant identification, and communications. The Lakes Management Supervisor directs the day-to-day operations of the staff, guided by the Parks Director who is informed of plant conditions and needs by the Plant Scout. Particular concerns with a water body, deep v. shallow harvesting, collection of plant fragments from harvesters, plant senesces, boat propellers etc. are all addressed in the supervision.