



2024 AQUATIC PLANT MANAGEMENT PLAN PRESENTATION TO ANNUAL MEETING, MAY 25, 2024

Why Do We Need An Aquatic Plant Management Plan?

- Aquatic plants are vital to the health of a freshwater lake.
- The diversity of the aquatic plant community is a reflection of the quality of a lake's ecosystem.
- Aquatic plants sometimes grow to nuisance levels that hamper recreational activities or the health of a lake.
- In addition, the introduction of invasive plant species that out-compete native vegetation can "take-over" and occupy large portions of a lake.
- An Aquatic Plant Management Plan consists of a comprehensive survey of the aquatic plant life in the lake, provides a snapshot of the health and diversity of a lake, and assesses changes over time and direct management results.
- An Aquatic Plant Management Plan also identifies invasive species in the lake, describes their historical and potential impacts on a lake, and provides alternative strategies for managing invasive species to reduce their impact on the lake and spread into or out of Silver Lake.
- The WDNR recommends that Aquatic Plant Management Plans be updated every five years to provide a time-series record of the health of the lake's ecosystem, as well as the effectiveness of the management actions to contain invasive species.

What is the History of the 2024 Aquatic Plant Management Plan (APMP)?

- The prior APMP for Silver Lake was completed in 2013, and an updated APMP was overdue.
- The preparation of an updated Aquatic Plant Management Plan for Silver Lake was approved at the 2022 Annual Meeting for a cost not-to-exceed \$13,585.
- The WDNR provided a \$7,945 grant to help fund the preparation of the updated APMP.
- The Silver Lake Protection Association also provided a \$1,500 donation to be used toward the preparation of the APMP.

- Wisconsin Lake & Pond Resource (WLPR) was engaged to prepare the APMP. WLPR staff have been working on Silver Lake since 2014.
- WLPR conducted a comprehensive “point-intercept” survey of aquatic plants in August 2023, by sampling the presence and density of aquatic plant species at 490 pre-determined locations in the lake.
- WLPR also conducted a Lake User Survey in late summer/ early fall to determine concerns about lake issues and attitudes toward various lake management strategies.
- WLPR drafted the updated APMP in fall 2023.
- The APMP was presented to the District Board in December 2023 and was subsequently published for public review in January.
- The WDNR reviewed and approved the APMP in February 2024.
- The District Board adopted the 2024 APMP in March 2024.
- An audio presentation of the APMP, the full 2024 APMP report, and a pdf copy of this presentation to the 2024 Silver Lake Management District Annual Meeting can be found on the District’s website <https://silverlakemgmt.org/aquatic-plant-management-plan>

Results of the Aquatic Plant Survey: Silver Lake Has a Healthy, High-Quality Plant Community

- Silver Lake is home to 28 different aquatic plant species, three of which are invasive species.
- Silver Lake has a high-quality plant community whose diversity and quality metrics generally rank Silver Lake as one of the best in Southeast Wisconsin and in the top 25% of all other Wisconsin lakes.

Table 5: FQI and Average Coefficient of Silver Lake Compared to Wisconsin and Southeastern Till Plain lakes.

Quartile*	Avg. Coefficient of Conservatism			Floristic Quality			Number of Species		
	Lower	Mean	Upper	Lower	Mean	Upper	Lower	Mean	Upper
Wisconsin Lakes	5.5	6	6.9	16.9	22.2	27.5	8	13	20
Southeastern Till Plain Lakes	5.2	5.6	5.8	17	20.9	24.4	10	14	19
2023	6.42			31.44			28		
2020	6.07			32.13			31		
2019	6.28			31.4			28		
2017	6.24			31.2			28		
2016	6.41			30.06			25		
2015	6.00			23.24			15		
2014	6.24			28.59			23		
2013	6.14			28.78			26		
2012	5.33			26.13			28		
2006	6.35			30.44			29		

* - Values indicate highest value of the lowest quartile, mean, and lowest value of the upper quartile

- Overall, the native aquatic plant community of Silver Lake was in excellent condition during the 2023 survey.
- The strong population of native pondweeds especially are vital for the health of the lake and create an excellent fisheries habitat.

The Five Most Common Species in Silver Lake

Chara or Muskgrass



Wild Celery



Native Pondweeds

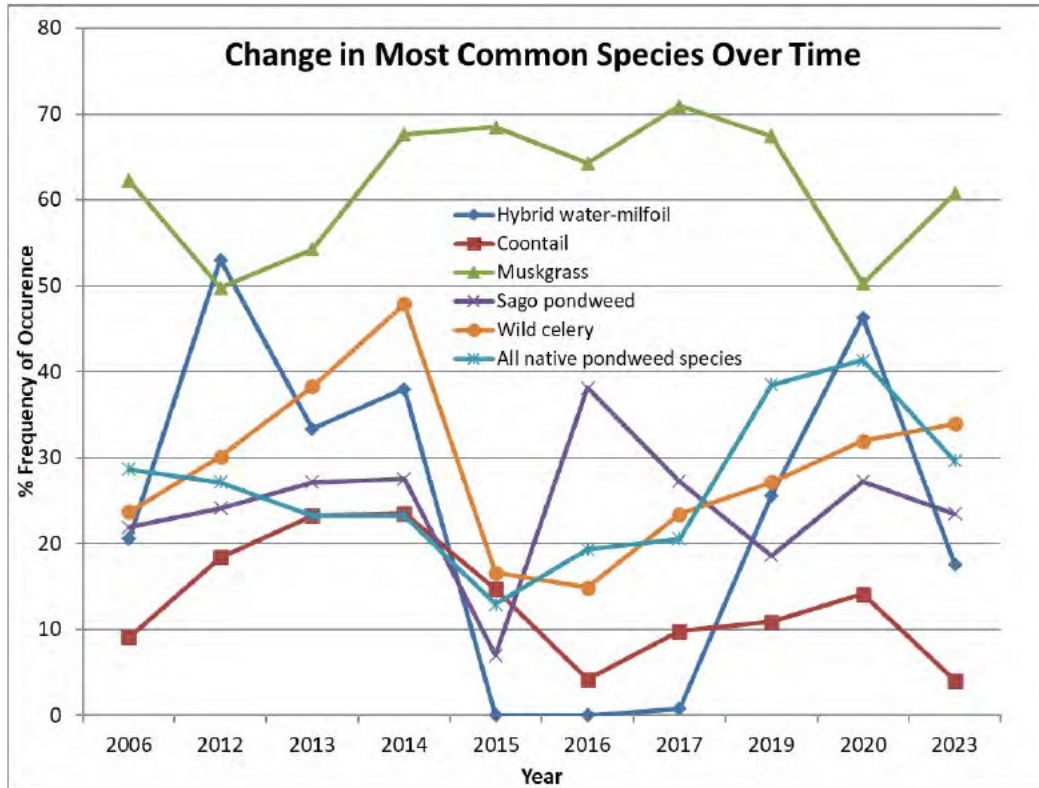


Sago Pondweed



Hybrid Water Milfoil (HWM)





- The overall species composition of the aquatic plant community in Silver Lake changes over time.
- Dominant species can vary year to year, depending on many factors including weather patterns, community composition in years prior, water levels, and more. Some conditions may favor certain species one year, but not the next. Variance is normal and is indicative of a healthy lake.
- Most noteworthy is the fact that there have been no long-term effects on the aquatic plant community from the treatment of HWM. Native species rebounded from even the “whole lake” HWM treatment in 2015.

The Primary Invasive Species in Silver Lake – HWM -- Requires Active Management

- HWM (pictured on prior page) is the most prevalent invasive species in Silver Lake.
- HWM also has been the most damaging invasive species for the past dozen years.
- HWM “took over” Silver Lake in 2012-2014, severely inhibiting recreational boating during those years when masses of HWM came to the surface by mid-summer, clogging most of the lake having a depth of less than 10’.
- The Silver Lake Protection Association sponsored the “whole lake” treatment of HWM in 2015 which eliminated the HWM nuisance until its resurgence in 2019-2020.

- Annual HWM treatments of the densest areas since then have, however, kept the expansion of HWM in check.
- Current HWM populations are scattered throughout the lake and are low density.

A Second Invasive Plant Species in Silver Lake – Curly-Leaf Pondweed -- Has Been Benign

- Curly-Leaf Pondweed (below left) is the second most prevalent aquatic invasive plant species in Silver Lake.
- Curly-Leaf Pondweed has been present in Silver Lake since the 1970's, but has consistently remained at low, background levels not requiring active management.
- The 2023 survey continued to find Curly-Leaf Pondweed at low levels where it was often mixed in with native species.

Curly-Leaf Pondweed



Starry Stonewort



A New Invasive Species in Silver Lake – Starry Stonewort -- Is A Potential Threat

- Starry Stonewort (above right) is a large, plant-like macroalgae, and a newly identified invasive species in Wisconsin, first found in 2015.
- Starry Stonewort was found in one location in Silver Lake in the 2023 survey.
- Starry Stonewort is now found in 37 Wisconsin lakes, including nearby Camp Lake and Lake Geneva.
- Starry Stonewort can outcompete native vegetation and create dense stands that reduce the lake ecosystem quality, negatively impact fish habitat, and even inhibit navigation.
- Continued close monitoring of the lake for Starry Stonewort is warranted.

- In some lakes, Starry Stonewort is present but remains benign like curly-leaf pondweed has done in Silver Lake.
- Other lakes that are experiencing problems with Starry Stonewort are experimenting with management measures, but no management techniques are providing consistent results.
- WDNR recommends a hands-off management approach with a focus on monitoring and boat landing inspections.

Aquatic Plant Maintenance Alternatives

- A combination of management alternatives may be used on a lake with a healthy native aquatic plant community with invasive species present.
- Annual monitoring and as-needed management of invasive species should be continued, with lake-wide comprehensive aquatic plant surveys undertaken at least every five years.
- Prevention of the introduction of new invasive species and the spread of existing invasive species from the lake is a top priority. Participation in a boat launch inspection program such as the Clean Boats, Clean Waters program is recommended.
- Silver Lake is somewhat unusual for southeastern Wisconsin lakes in that it has almost one-third of its shoreline in undeveloped private / public ownership, primarily along its northwest and northern shores.
- However, additional protection of the native aquatic plant community can be provided by restoration of natural shorelines in other parts of the lake. Some measures are reasonably simple to accomplish (e.g., stop mowing and/or planting natural buffers at the shore edge).
- Other measures to further protect the native aquatic plant community are more difficult to accomplish, but center around determining cost-effective, best practice methods of reducing nutrient and chemical inputs into the lake (e.g., use of reduced-phosphorous lawn fertilizers, reduce road salt use, identifying effective methods to reduce/ filter street and agricultural run-off, etc.).
- Kenosha County offers a grant program for Soil & Water Management conservation practices, including shoreline protection and riparian buffers.
- Silver Lake volunteers need to continue to participate in the WDNR's Citizen Lake Monitoring Network, providing water quality readings for clarity, chlorophyll-a, and phosphorus levels in the lake. That effort could be enhanced with additional baseline sampling of the lake's chemistry.

Nuisance Plant Management

- Native plants may be at nuisance levels in certain areas of the lake, particularly along the Cogswell Drive shoreline.

- Private property owners do not need a WDNR permit to manually remove nuisance aquatic plants in a 30'-wide recreational zone adjacent to piers and beaches up to 100-ft from shore.
- Nuisance plant removal over an area wider than 30' or removal of nuisance plants using mechanical or chemical methods does require a WDNR permit.

Management of Invasive Species

- The primary goal is to annually monitor and then take appropriate management measures to contain the spread of HWM in the lake.
- Private property owners could use manual pulling and DASH (Diver Assisted Suction Harvesting) methods for small HWM areas near the shore.
- In deeper waters, the lake district should continue as-needed chemical lake treatments in areas of high HWM densities to contain the spread of HWM.
- Mechanical harvesting of HWM in Silver Lake is not recommended at this time. The extent of HWM is currently contained, and mechanical harvesting would not be cost effective due to its very high investment and operational costs.
- If HWM does get out of control as it did in the early-2010's, whole-lake management efforts will again be required.
- The near-term action plan regarding Starry Stonewort is to carefully monitor its presence in the lake and, if needed, identify best practice methods to address the problem.

Lake User Survey Results

- Of the 99 Lake User Survey responses received, 76 were from lakefront property owners.
- 64% have used the lake for over 10 years. The median lake use was 15 years.
- Respondents use the lake in typical fashion for a lake in southeastern Wisconsin – pleasure boating, fishing, swimming, and more active recreational pursuits such as tubing, wakeboarding, and water skiing.
- The respondents' primary issues/concerns were:
 - Invasive Species Management
 - Boating Safety and Enforcement
 - Lake Levels/Outlet Dam
 - Water Quality
- The overwhelming majority of respondents understood that HWM was present in Silver Lake and supported the continued annual monitoring and as-needed targeted chemical treatment of HWM going forward.