

Shawano Area Waterways Management

2023 Aquatic Plant Monitoring Project Information Meeting

March 14, 2024

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Onterra LLC
Lake Management Planning

Shawano Area Waterways Management

Presentation Outline

- Introduction to Onterra
- Historic Management & Planning
- Point-Intercept Survey Results
- EWM Population Monitoring
- Discussion

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Onterra, LLC

- Founded in 2005, HQ in De Pere, WI
- Staff
 - Three aquatic ecologists
 - One paleoecologist
 - Four full-time field technicians
 - Five summer interns
- Services
 - Science and planning
- Philosophy
 - Promote realistic planning
 - Assist, not direct

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Select SAWM Studies & Plans

- 1991 Watershed Plan
- 2003 Watershed Tributary & In-lake WQ Monitoring
- 2008 Watershed Study
- 2009 Aquatic Plant Management Plan
- 2014 Aquatic Plant Management Plan
- 2016 Whole-Lake 2,4-D Treatment Project
- 2021 Comprehensive Management Plan (includes APM Plan)

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2016 Whole-Lake 2,4-D Treatment

- Slightly exceeded target levels
- Exposure time was much less than anticipated
- Expectation was 3-5 years of reduced EWM lake-wide
- EWM frequencies rebounded in about 3 years, but at low densities
- Some native plant declines observed, with some rebounding faster than others

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2021 Comprehensive Management Plan

- Periodically monitor the overall aquatic vegetation population
 - **Point-Intercept Surveys**
 - Periodic: every 3-5 years or when prompted
 - Last completed in 2019
- Periodically monitor EWM population
 - **Late-Season EWM Mapping Survey**
 - Periodic: every 2-3 years or when prompted
 - Last completed in 2020
 - If dense areas, plan for management outlined

2023 Project \$16.1K in Grants!

- PI Survey
- EWM Survey
- Report
- Results Mtg

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Types of Aquatic Plant Surveys

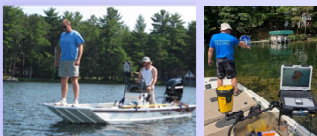
Quantitative

- Point-Intercept Survey
 - Numeric & systematic
 - Applied at various scales



Qualitative

- AIS Mapping Surveys
 - Fine-scale location accuracy
 - Subjective designations

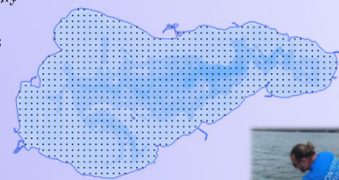


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Whole-Lake Point-Intercept Surveys

- Systematic approach to collecting aquatic plant information from a waterbody
- Using established protocol, WDNR dictates grid spacing
 - Snapshot of current plant community
 - Trend analysis
 - Allows comparisons between lakes

Shawano Lake
165-meter Resolution
925 Total Points
Compare: 2005*, 2013,
2015-2019, 2023

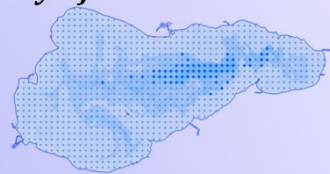


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Littoral Frequency of Occurrence

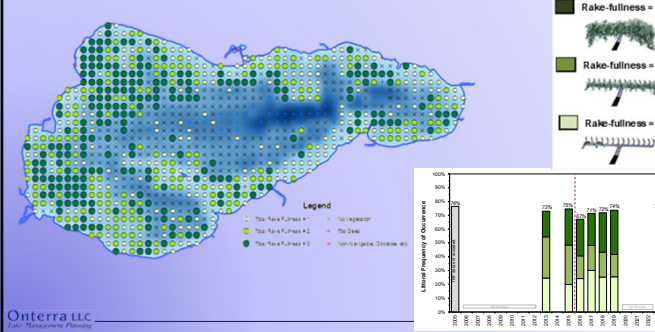
- How frequent a plant is found within the *plant-growing zone* of a lake
- ≤ Max Depth of Plants
- Overall Vegetation example:
865 Littoral Points in 2023

$$\frac{632}{865} = 73.1\%$$



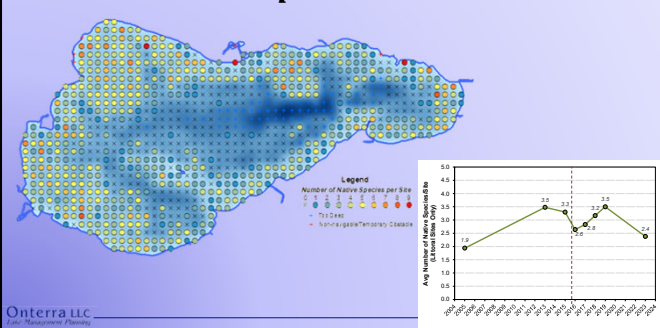
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Total Rake Fullness



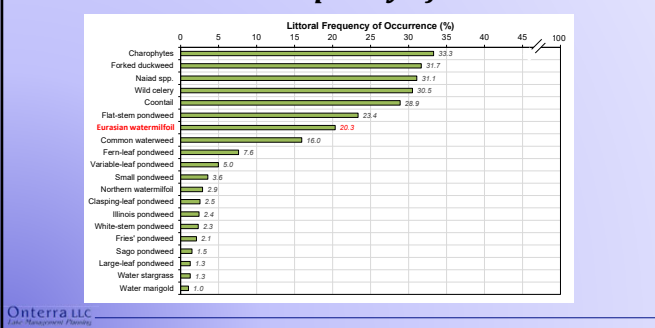
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Native Species Richness



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2023 Littoral Frequency of Occurrence



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Vegetation Trend Analysis

Figure 2.1-6. Littoral frequency of occurrence of muskgrasses. Open circle indicates a statistically valid change in occurrence from the previous survey (Chi-Square $\alpha = 0.05$).

Photograph 2.1-5. The aquatic macroalgae muskgrasses (Chara spp.). Photo credit Onterra.

Starry Stonewort
Non-native species NOT known from Shawano Lake

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Vegetation Trend Analysis

Figure 2.1-8. Littoral frequency of occurrence of forked duckweeds. Open circle indicates a statistically valid change in occurrence from the previous survey (Chi-Square $\alpha = 0.05$).

Photograph 2.1-8. Free-floating forked duckweed (Lemna troulxii). Photo credit Onterra.

Figure 2.1-7. Littoral frequency of occurrence of naiad species. Open circle indicates a statistically valid change in occurrence from the previous survey (Chi-Square $\alpha = 0.05$).

Photograph 2.1-7. Slender naiad (Najas flexilis). Photo credit Onterra.

Photograph 2.1-7. Southern naiad (N. guadalupensis). Photo credit Onterra.

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Vegetation Trend Analysis

Figure 2.1-4. Littoral frequency of occurrence of wild celery. Open circle indicates a statistically valid change in occurrence from the previous survey (Chi-Square $\alpha = 0.05$).

Photograph 2.1-4. Wild celery (Vallisneria spiralis). Photo credit Onterra.

Floating wild celery mats in and 2012 (left) and 2016 (right) on Shawano Lake

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Vegetation Trend Analysis

Figure 2.1-9. Littoral frequency of occurrence of naiad species.

Photograph 2.1-9. Coontail (Ceratophyllum demersum; left) and common waterweed (Elodea canadensis; right). Photo credit Onterra.

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Vegetation Trend Analysis

Flat-stem PW

Fern-leaf PW

Variable-leaf PW

Small PW

Clasping-leaf PW

Illinois PW

White-stem PW

Fries PW

Sago PW

Large-leaf PW

Photograph 2.1-7. Common Potamogetonaceae species in Shawano Lake. PW = Pondweed. Photo credit Onterra.

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Non-Native Aquatic Plants

Eurasian Watermilfoil

- First "officially" documented in 1994, but anecdotal from earlier
- EWM and HWM documented to be present, although unknown proportions

| | |
|-----------------------|-----------|
| Hybrid watermilfoil | ← 14-38 → |
| Eurasian watermilfoil | ← 24-38 → |
| Northern watermilfoil | ← 9-23 → |

Number of Leaflets per Leaf

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