A

APPENDIX A

Public Participation Materials

- **State of Lakes Project Informational Meeting** – April 4, 2024
- **APM Planning Meeting I** – May 14, 2024

Presentation Outline

- Introduction to Onterra
- Lake Management Planning
- Stakeholder Survey
- Shoreland Surveys
- Aquatic Plant Surveys
- Discussion/Next Steps

Onterra, LLC

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

What is a Lake Management Plan?

A *Lake Management Plan* is the sponsor's plan for managing their aquatic resource

Specifically, the goals and actions outlined are based upon:

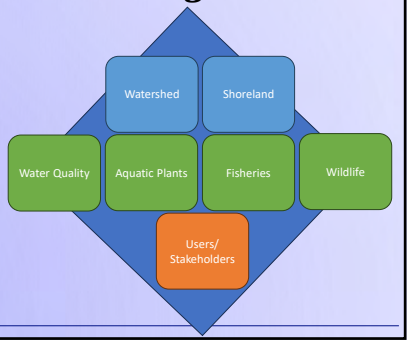
- The sponsor's concerns and priorities
- The sponsor's capacity

With attention to:

- Being complimentary to other *Plans*
- Acknowledging the Public Trust Doctrine

Components of Lake Management Plan

- Aquatic Plant Management Plan, as a module/phase of Comp Mgmt Plan
  - Shoreland Condition
  - Aquatic Plants
  - Stakeholder Perceptions



Management Plan and Grants

- WDNR recommends ***Comprehensive Management Plans*** have a 10-year lifespan
  - Aquatic Plant Management (APM) Plan is one component of a Comprehensive Plan, along with water quality, watershed, shoreland, fisheries, etc.
  - Particularly for grants/permits related to water quality/watershed improvements, plan must have completion date within the last 10 years
  - Management action in grant or permit needs to be supported by Plan
- WDNR recommends lakes conducting active plant management update aspects of the plan every 5 years (***APM Plan***)
  - Particularly for grants/permits related to aquatic plant management (AIS control grants, NR107, NR109)
  - Whole-lake point-intercept survey needs to have been completed within last 5 years
  - Management action in grant or permit needs to be supported by Plan

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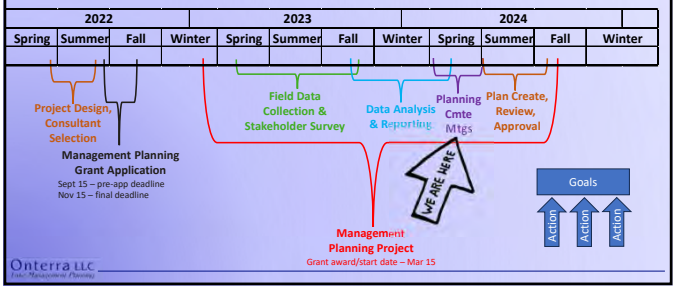
Management Planning Timeline



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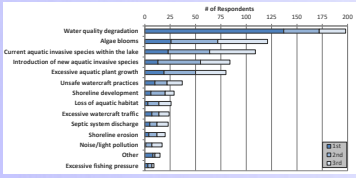
Defined Population Stakeholder Survey

- GLA & GLSD Members
- Web-based, advertised through mailings
- Hardcopies available by request
- Final survey approved by WDNR social scientist prior to distribution
- 925 surveys sent, 30% response rate

From the list below, please rank your top three concerns regarding Green Lake, with the 1st being your top concern.



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Shoreland Condition Assessment

Shoreland area is important for buffering runoff and provides valuable habitat for aquatic and terrestrial wildlife.

- Assessments in this project
  - Shorelands & Shallows
    - WDNR Protocol – 1,111 parcels
  - Human-Modified Shoreland Practices
  - Buffer Zone Boathouses & Structures

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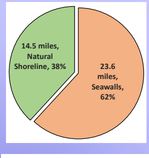
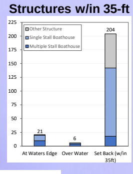
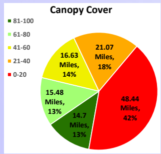
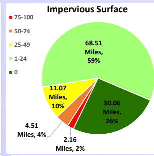
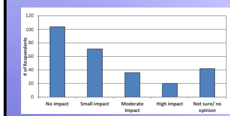
Shoreland Condition Assessment



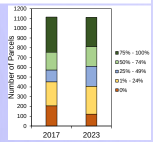


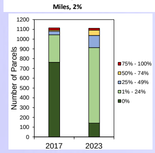






How much of a negative impact, if any, do you feel boathouses have on Green Lake's water quality?





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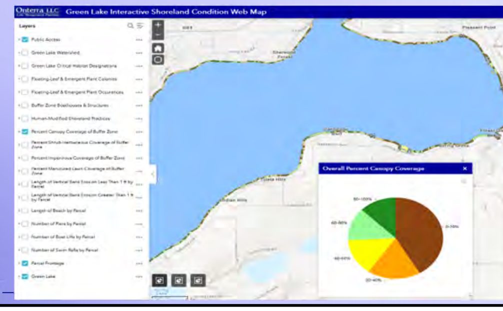
Shoreland Condition Assessment

ArcGIS Online Web Application



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Aquatic Plants

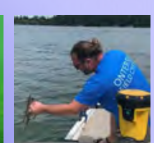
Types of Aquatic Plant Surveys

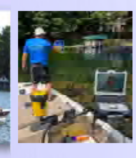
Quantitative

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

Qualitative

- 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

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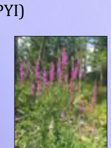
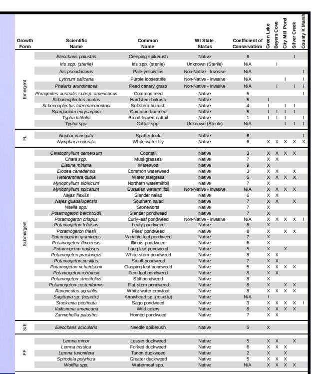
Species List

- **47 Species in 2023**
  - **Non-Native Species**
    - Eurasian watermilfoil (EWM/HWM)
    - Curly-leaf Pondweed
    - Purple loosestrife (PL)
    - Pale-yellow iris (PYI)





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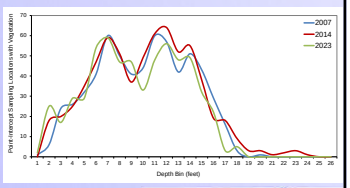
Littoral Frequency of Occurrence

- How frequent a plant is found within the *plant-growing* zone of a lake
- ≤ Max Depth of Plants

- Overall Vegetation example: 803 Littoral Points in 2023

$$\frac{605}{803} = 75.3\%$$



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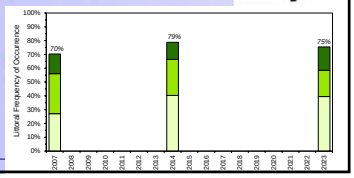
Total Rake Fullness



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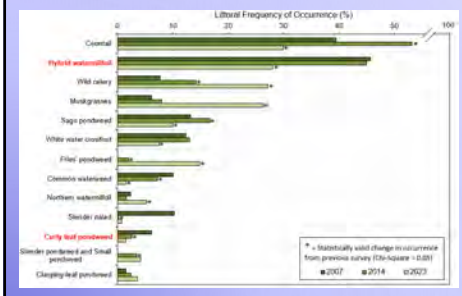

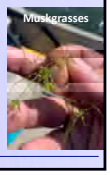

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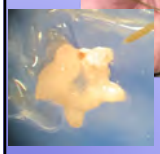
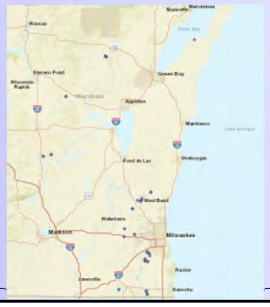
Starry Stonewort

Non-native species NOT known from Green Lake





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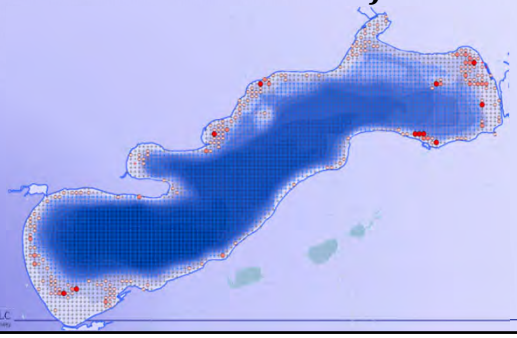
Eurasian Watermilfoil



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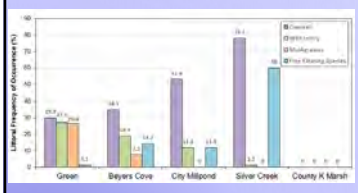

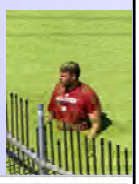

How many days in total over the last year, if at all, has duckweed caused a significant navigational or recreation impairment to you?

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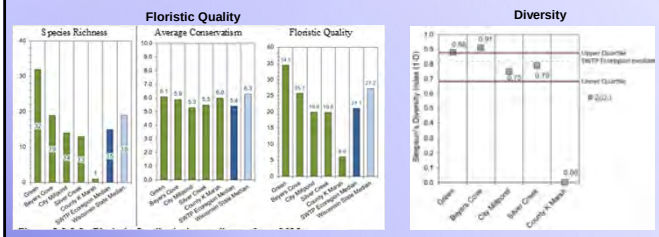
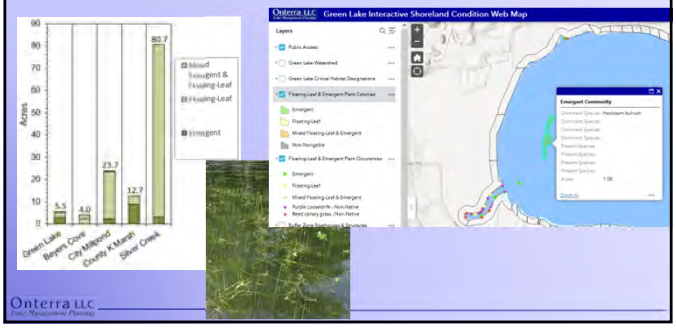
Plant Health Metrics



Community Mapping Survey



Community Mapping Survey

Aquatic Plant Management

- Mechanical Harvesting
- Nuisance Herbicide Treatments
- Species-specific plans?
  - AIS or Duckweed?

Discussion

- Shoreland assessments indicate declining quality since 2017
- Native plant population of Green Lake is healthy
  - Investigations of estuaries/basins ongoing
- Trend analysis indicated some plants are stable, some fluctuate
- 2023 PI frequency of EWM is less than 2007 and 2014
- No new AIS were identified from the investigations
- The next step is to develop realistic and implementable protection and restoration goals

Thank You

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Lake Management Planning

1

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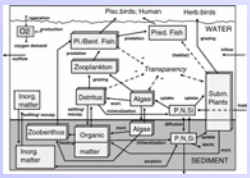
3

Lake Management Planning

4

Complexity of Lake Ecosystems

- Aquatic ecology is a quest to understand as many of the variables as possible and their magnitude of influence
- Lake management is figuring out how to best support ecosystem function in the face of human presence and use
  - Not always an engineering problem to solve
  - Not playing "God"
  - Support the best version of the lake
- This project is analogous to a physician's "check-up"
  - Follow-up studies are often needed



The process of taking a core group of decision-makers through a planning project is arguably more valuable than the resulting document itself

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5

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7

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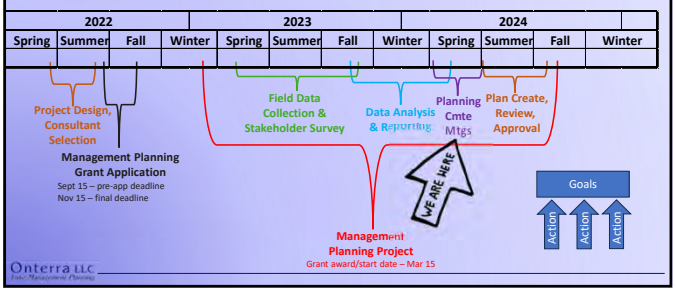
8

Management Planning Timeline



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9

Defined Population Stakeholder Survey

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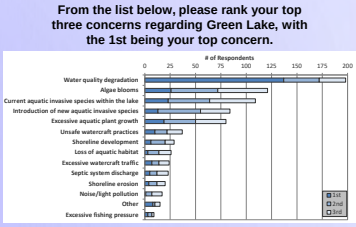

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10

11

Shoreland Condition Assessment

Shoreland area is important for buffering runoff and provides valuable habitat for aquatic and terrestrial wildlife.

- Assessments in this project
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  - Human-Modified Shoreland Practices
  - Buffer Zone Boathouses & Structures

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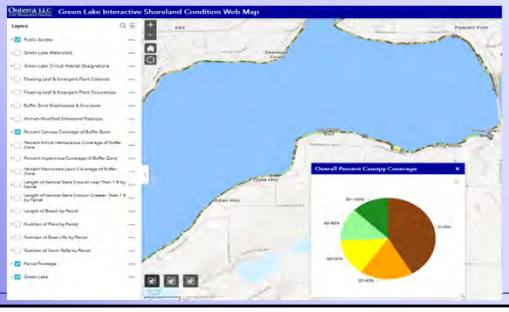
12

Shoreland Condition Assessment

ArcGIS Online Web Application



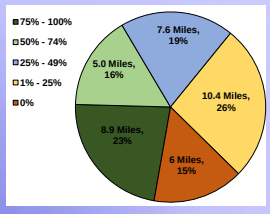
13

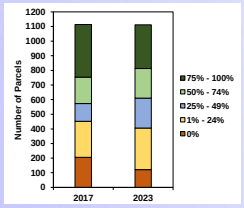
Shorelands & Shallows

	Number
Piers	1,197
Boat Lifts	1,937
Swim Rafts	58
Boat Houses	5

14

S&S: Canopy Coverage





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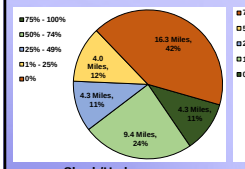
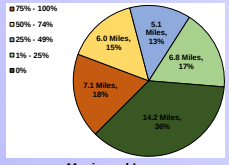
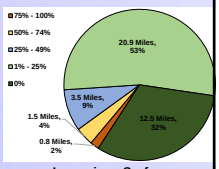
S&S: Ground Layer Coverage



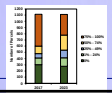
Shrub/Herbaceous

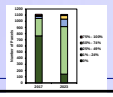


Manicured Lawn



Impervious Surface





16

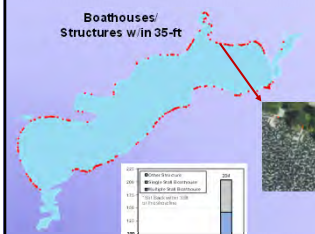
Human-Modified Shoreland Practices

Shoreline Condition	Miles	%	Miles	%
Natural	14.5	38.1%	14.5	38.2%
Human Modified: RipRap/Rock	21.7	57.1%		
Masonary Seawall	1.2	3.1%		
Other	0.3	0.8%	23.6	61.8%
Wood Seawall	0.2	0.5%		
Metal Seawall	0.2	0.4%		
Total	38.1		38.1	

17

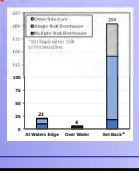
Buffer Zone Boathouses & Structures

Boathouses/ Structures w/in 35-ft



How much of a negative impact, if any, do you feel boathouses have on Green Lake's

- Water quality
- Natural Beauty/Aesthetics



How much would you support or oppose stricter ordinances for Green Lake County to restrict the placement and size of boathouses

18

19

Types of Aquatic Plant Surveys

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  - Numeric & systematic
  - Applied at various scales

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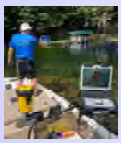

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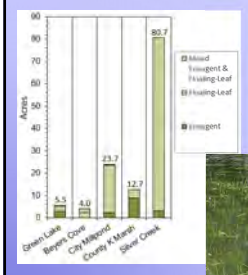
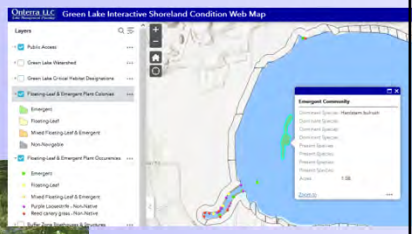
20

Community Mapping Survey





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21

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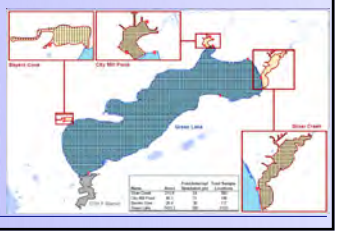

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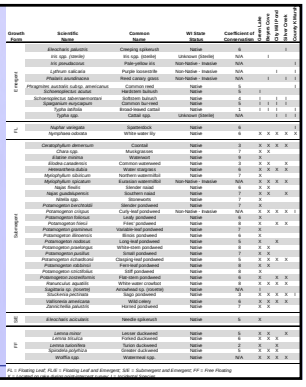
22

Species List

- **47 Species in 2023**
  - **Non-Native Species**
    - Eurasian watermilfoil (EWM/HWM)
    - Curly-leaf Pondweed
    - Purple loosestrife (PL)
    - Pale-yellow iris (PYI)





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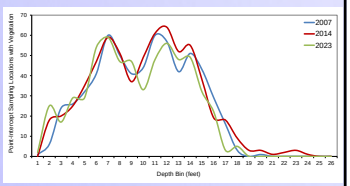
Littoral Frequency of Occurrence

- How frequent a plant is found within the *plant-growing* zone of a lake
- ≤ Max Depth of Plants



- Overall Vegetation example:
  803 Littoral Points in 2023

$$\frac{605}{803} = 75.3\%$$

In basins, denominator is number of reachable sample locations

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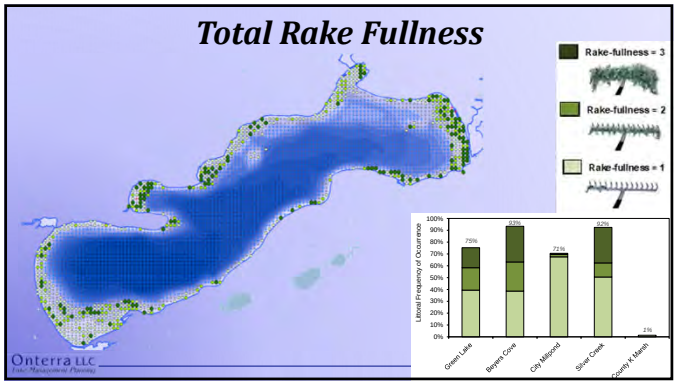
24



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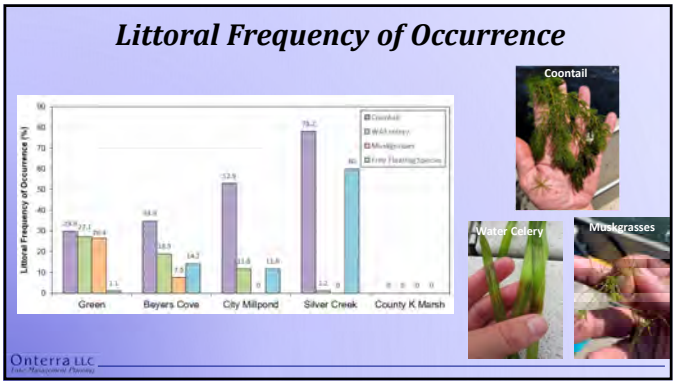

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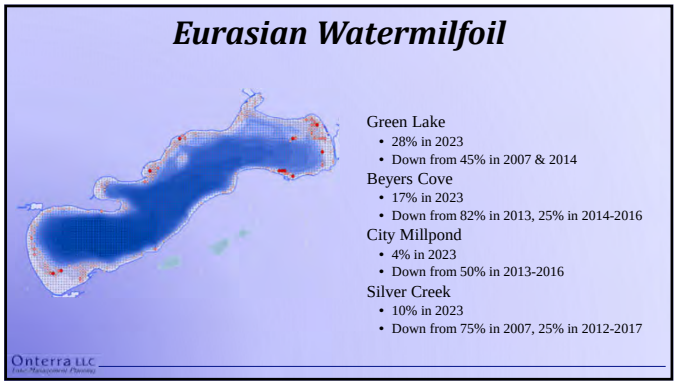

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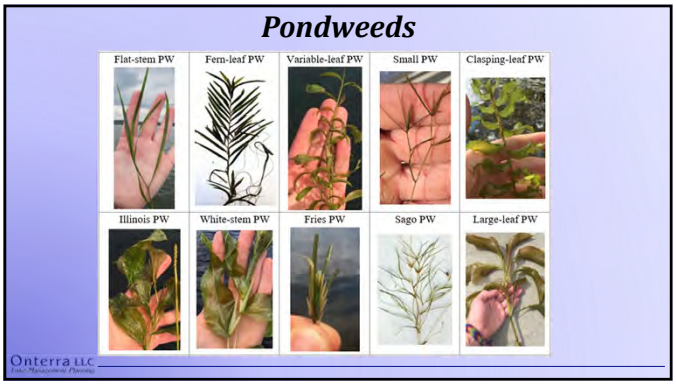

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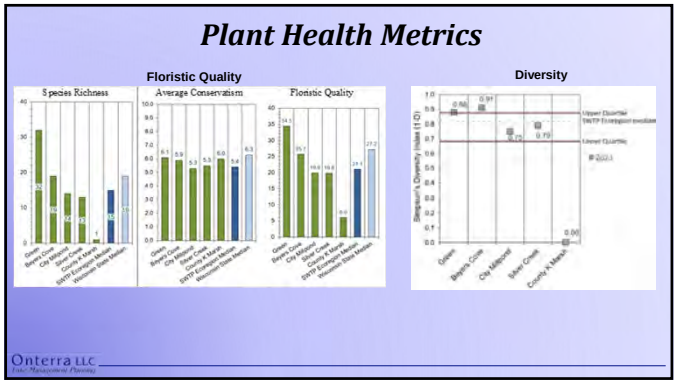

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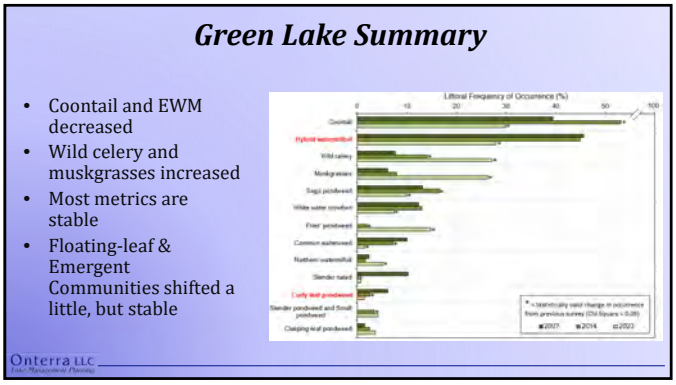
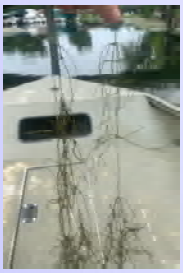


30

Starry Stonewort

Non-native charaphyte NOT known from Green Lake



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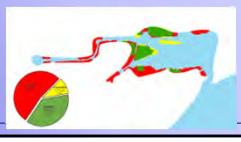
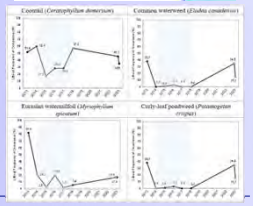
31

Beyers Cove Summary

- CLP is still prevalent in June (35%)
- Large native plant recovery observed since 2014-2018 treatments
- Most metrics indicate large improvements
- Floating-leaf & Emergent Communities decreased





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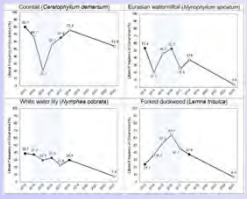
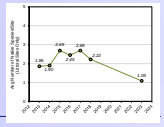
32

City Millpond Summary

- Most species declined, coontail dominates
- Most metrics indicate increased impairment
- Floating-leaf & Emergent Communities shifted a little, losses concerning





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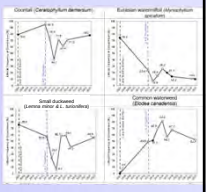
33

Silver Creek Summary

- Species composition continues to be variable, maybe signs of stabilization
- Duckweed concerns for residents/users as well as nutrient loading to Green Lake
- Floating-leaf & Emergent Communities shifted greatly



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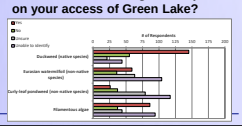
34

Free-Floating Plants

- *Lemna minor*
- *Lemna turionifera*
- *Lemna trisulca*
- *Spirodela polyrhiza*
- *Wolffia* spp.

Have any of the plant populations listed below had a negative impact on your access of Green Lake?



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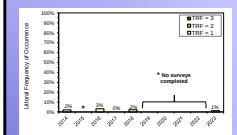
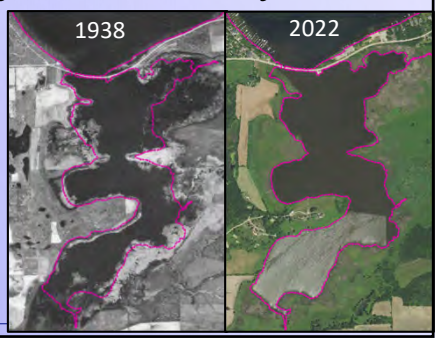
35

County K Marsh Summary

- Continues in turbid-state with essentially no submersed macrophytes
- Lake-wetland interface currently more defined





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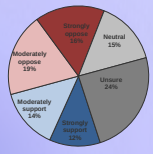
36

37

Stakeholder Survey

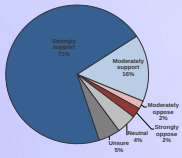
- What is your level of support for the use of the following management techniques in Green Lake?

Herbicide



Support	26%
Not Support	35%
Unsure/Neutral	39%

Mechanical Harvest



Support	87%
Not Support	4%
Unsure/Neutral	9%

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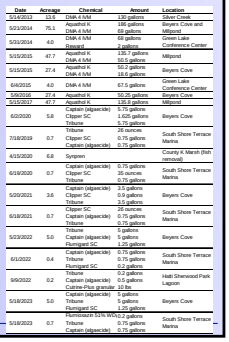
38

Aquatic Plant Management

- Nuisance Herbicide Treatments
  - 2019-current
  - Small footprint, contact herbicides
    - Copper
    - Diquat
    - Flumioxazin

- *Can an Implementation Trigger or other guidance be created?*



Date	Acreage	Chemical	Amount	Location
5/14/2013	13.6	DMA 4 IVM	130 gallons	Silver Creek
5/21/2014	75.1	Aquathol K DMA 4 IVM	166 gallons 69 gallons	Beyers Cove and Millpond
5/31/2014	4.0	DMA 4 IVM Aquazol	68 gallons 2 gallons	Green Lake Conference Center
5/15/2015	47.7	Aquathol K DMA 4 IVM	128.7 gallons 50.3 gallons	Millpond
5/15/2015	27.4	Aquathol K DMA 4 IVM	69.2 gallons 18.6 gallons	Beyers Cove
6/4/2015	4.0	DMA 4 IVM	67.5 gallons	Green Lake Conference Center
5/6/2016	27.4	Aquathol K	60.25 gallons	Beyers Cove
5/15/2017	47.7	Aquathol K	128.8 gallons	Millpond
6/2/2020	5.8	Captain (algaecide) Clipper SC Tribune	5.75 gallons 1.625 gallons 0.75 gallons	Beyers Cove
7/18/2019	0.7	Tribune Clipper SC Captain (algaecide)	26 ounces 0.75 gallons 0.75 gallons	South Shore Terrace Marina
6/15/2020	6.8	Symprex		County K Marsh (fish removal)
6/19/2020	0.7	Captain (algaecide) Clipper SC Tribune	0.75 gallons 26 ounces 0.75 gallons	South Shore Terrace Marina
5/20/2021	3.6	Captain (algaecide) Clipper SC Tribune	3.5 gallons 0.9 gallons 3.5 gallons	Beyers Cove
6/18/2021	0.7	Clipper SC Captain (algaecide) Tribune	26 ounces 0.75 gallons 0.75 gallons	South Shore Terrace Marina
5/23/2022	5.0	Tribune Captain (algaecide) Flumigard SC	5 gallons 5 gallons 1.25 gallons	Beyers Cove
6/1/2022	0.4	Captain (algaecide) Tribune Flumigard SC	0.75 gallons 0.75 gallons 0.2 gallons	South Shore Terrace Marina
5/9/2022	0.2	Tribune Captain (algaecide) Cutrine-Plus granular	0.2 gallons 0.5 gallons 10 lbs	Haiti Sherwood Park Lagoon
5/18/2023	5.0	Captain (algaecide) Tribune Flumigard SC	5 gallons 5 gallons 1.25 gallons	Beyers Cove
5/18/2023	0.7	Flumioxazin 51% WDG Tribune Captain (algaecide)	0.2 gallons 0.75 gallons 0.75 gallons	South Shore Terrace Marina

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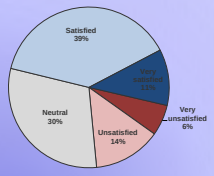
39

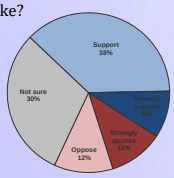
Stakeholder Survey

- How satisfied are you with the past mechanical harvesting program?



Satisfied	50%
Unsatisfied	20%
Neutral	30%

- Would you support or oppose increasing the tax levy in order to accomplish mechanical harvesting goals for Green Lake?



Support	47%
Oppose	23%
Not Sure	30%

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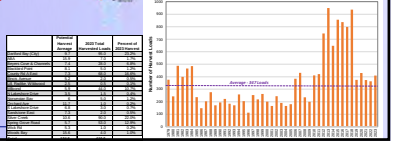
40

Aquatic Plant Management

- Mechanical Harvesting
  - 30-ft lane
  - ~135 potential acres
  - 10-15% of area is annually cut

- *Efficiency strategy?*
- *Wider lane in Silver Creek?*
- *GPS guidance/tracking?*
- *Plant ID training?*
- *Tracking?*



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41

Discussion

- Shoreland assessments indicate declining quality since 2017
  - This project established solid benchmark for future surveys
- Native plant population of Green Lake is healthy
  - Beyers Cove increasing, City millpond decreasing, Silver Creek stabilizing, Cnty K Marsh…
- Trend analysis indicated some plants are stable, some fluctuate
- 2023 PI frequency of EWM is less than 2007 and 2014
- No new AIS were identified from the investigations

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42

B

APPENDIX B

Riparian Stakeholder Survey Response Charts & Comments

Green Lake - Anonymous Stakeholder Survey

Surveys Distributed: 925
Surveys Returned: 278
Response Rate: 30%

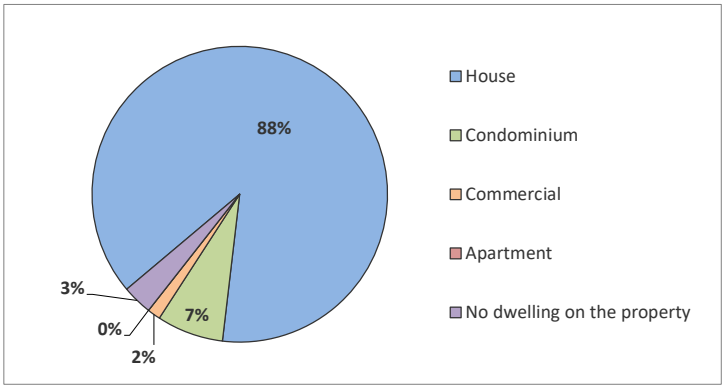
Green Lake Property

1. Is your property on the lake or off the lake?

Answer Options	Response Percent	Response Count
Green Lake proper – between Beyers Cove and Lone Tree Point	16.9%	46
Green Lake proper – between City Millpond and Silver Creek	13.2%	36
Green Lake proper – between Horner's Landing and County K Marsh	25.4%	69
County Highway K Marsh	2.9%	8
Beyers Cove	0.7%	2
City Mill Pond	6.3%	17
Green Lake proper – between Lone Tree Point and City Mill Pond	8.5%	23
Green Lake proper – between Silver Creek and Horner's Landing	9.9%	27
Green Lake proper – between County K Marsh and Beyers Cove	14.7%	40
Silver Creek Estuary	0.7%	2
Off the lake	0.7%	2
answered question		272
skipped question		6

2. What type of dwelling, if any, do you have on your property on or near Green Lake?

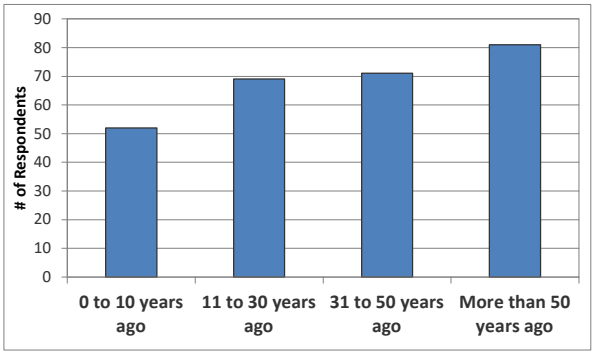
Answer Options	Response Percent	Response Count
House	88.0%	242
Condominium	7.3%	20
Commercial	1.5%	4
Apartment	0.0%	0
No dwelling on the property	3.3%	9
answered question		275
skipped question		3



3. How many years ago did you first visit Green Lake?

Answer Options	Response Count
	273
answered question	273
skipped question	5

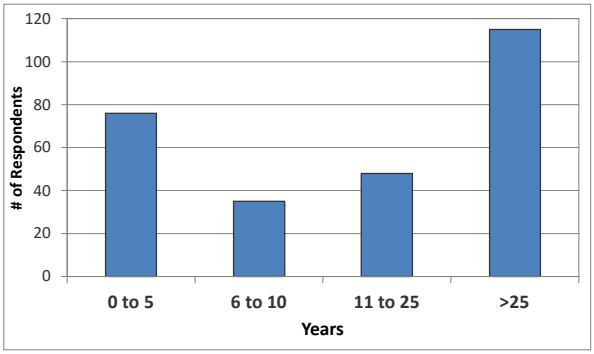
Category (# of years)	Responses	% Response
0 to 10 years ago	52	19%
11 to 30 years ago	69	25%
31 to 50 years ago	71	26%
More than 50 years ago	81	30%



4. How many years have you owned or rented your property on or near Green Lake?

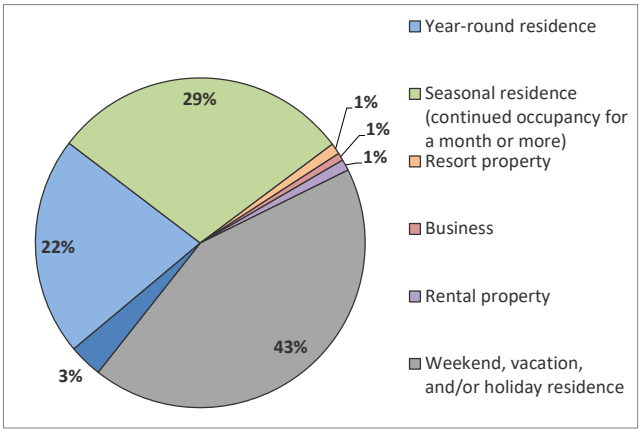
Answer Options	Response Count
	274
answered question	274
skipped question	4

Category (# of years)	Responses	% Response
0 to 5	76	28%
6 to 10	35	13%
11 to 25	48	18%
>25	115	42%



5. How is your property on or near Green Lake used?

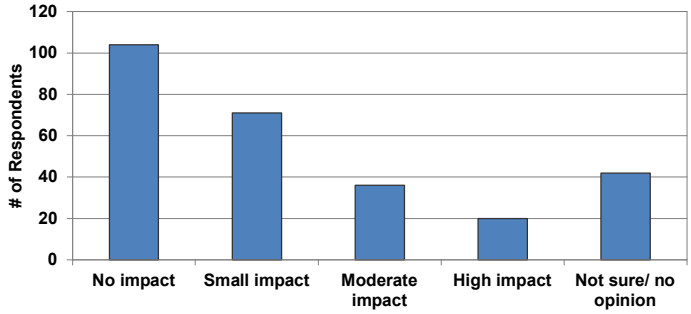
Answer Options	Response Percent	Response Count
Year-round residence	21.5%	59
Seasonal residence (continued occupancy for a month or more)	29.5%	81
Resort property	1.1%	3
Business	0.7%	2
Rental property	1.1%	3
Weekend, vacation, and/or holiday residence	42.9%	118
Other	3.3%	9
answered question		275
skipped question		3



Number	"Other" responses
1	We live at our property year-round and we also rent little cottages on the property seasonally.
2	Seasonal residence but not continued occupancy for a month or more at a time. We use it regularly but don't spend the night often
3	Year-round secondary home (40% of our time)
4	I own a vacant lake lot with no home on it at this time
5	Pier
6	At lake about every other weekend as well as vacation, holiday, etc
7	vacant lot
8	Education
9	currently there is no residence on our property, however our intension is to build a year-round residence there in the next few years.

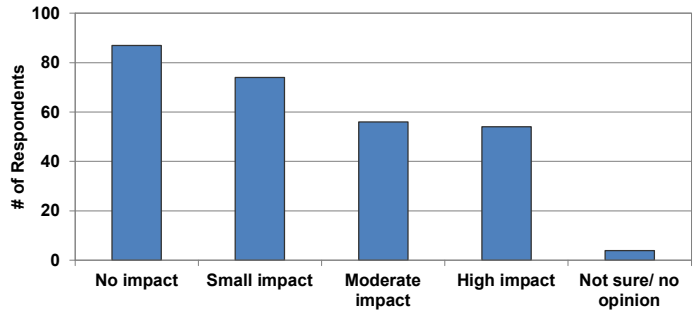
6. How much of a negative impact, if any, do you feel boathouses have on Green Lake's water quality?

Answer Options	No impact	Small impact	Moderate impact	High impact	Not sure/ no opinion	Response Count
	104	71	36	20	42	273
answered question						273
skipped question						5



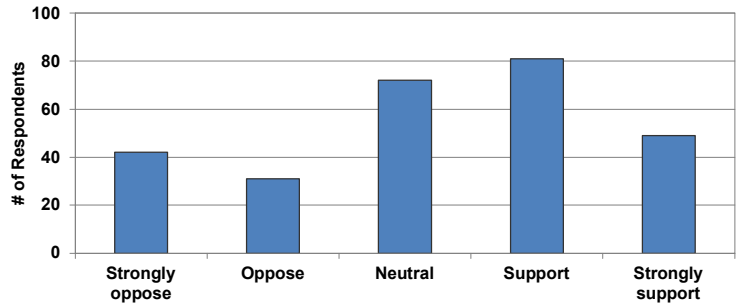
7. How much of a negative impact, if any, do you feel boathouses have on Green Lake's natural beauty and aesthetics?

Answer Options	No impact	Small impact	Moderate impact	High impact	Not sure/ no opinion	Response Count
	87	74	56	54	4	275
					answered question	275
					skipped question	3



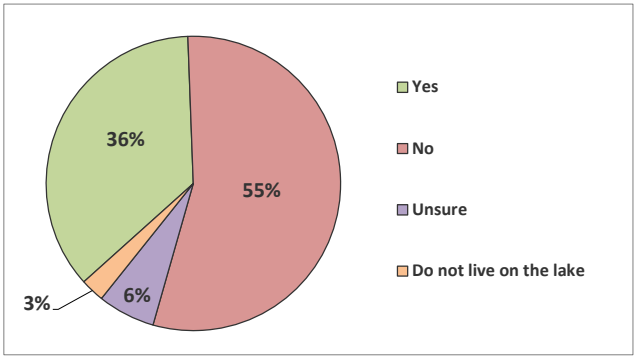
8. How much would you support or oppose stricter ordinances for Green Lake County to restrict the placement and size of boathouses?

Answer Options	Strongly oppose	Oppose	Neutral	Support	Strongly support	Response Count
	42	31	72	81	49	275
					answered question	275
					skipped question	3



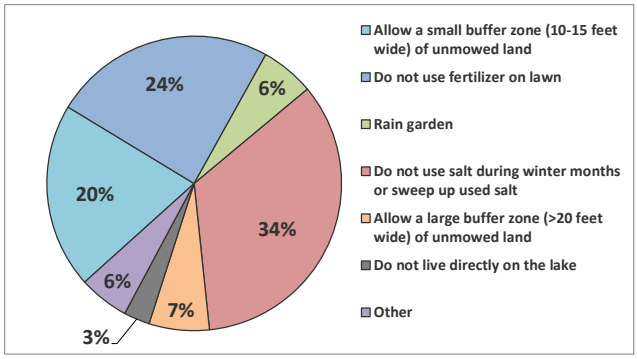
9. Have you observed erosion along your property shoreline?

Answer Options	Response Percent	Response Count
Yes	36.1%	97
No	55.0%	148
Unsure	6.3%	17
Do not live on the lake	2.6%	7
answered question		269
skipped question		9



10. Which of the following healthy lake conservation practices do you participate in?

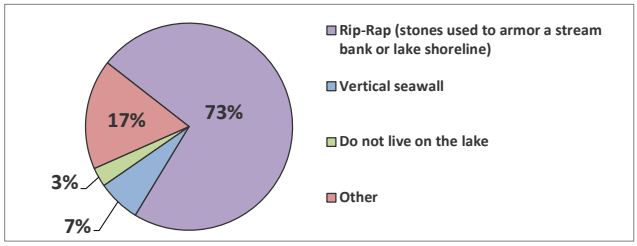
Answer Options	Response Percent	Response Count
Allow a small buffer zone (10-15 feet wide) of unmowed strip of land to grow naturally along the lake	43.4%	114
Do not use fertilizer on lawn	52.1%	137
Rain garden	12.6%	33
Do not use salt during winter months or sweep up used salt	73.4%	193
Allow a large buffer zone (>20 feet wide) of unmowed strip of land to grow naturally along the lake	14.1%	37
Do not live directly on the lake	6.1%	16
Other	11.8%	31
answered question		**263**
skipped question		**15**



Number	"Other" responses
1	minimize the number of leaves that blow into the lake
2	Rocks along our shoreline property
3	Association practices many of these
4	Sand beach buffer zone
5	Rip Rap Shoreline
6	Clean up leaves, plant for drainage using native plants
7	installed large boulders to prevent erosion along shoreline
8	Installed riprap to protect shoreline
9	Riprap
10	Our house is across the street from the lake but we own vacant property across the street on the lake for our pier
11	Naturally strip and Boulders along shore line
12	My property has a six foot wall at the lake. It feels like nothing, except for leaves, enters the lake from our property.
13	install plantings and maintain rocks along shoreline to beautify and slow/prevent erosion
14	i have substantial gardens around my house to soak up water. Also, for the past 40 years, I have gone in the lake to throw the rocks that have been moved from the ice, back up onto the shoreline, to reinforce the shoreline and reduce erosion
15	None of above
16	The house is set up on a high bluff. The hill is full of trees and undergrowth.
17	Rain water mitigation for property
18	Condo operates
19	Do not throw any yard waste into lake
20	Use only natural fertilizer-fish guts
21	I use a riverbed of rocks in various drainage areas on my property also I various drainage collection area with drains to prevent runoff into the lake
22	All house downspouts are buried in engineered infiltration beds
23	na
24	Dont know since it is condo
25	keep leaves and other bio waste cleaned up
26	Rake, mulch, and remove leaves from property.
27	5 years ago replanted the bank with native plants and the support of GLSD. It's a work in progress trying to check the bank erosion.
28	We do not put leaves or lawn waste in the water.
29	Attentive leaf collection in the fall, no riprap (natural shoreline only), no detergents, cleaners or soap in the lake, proper disposal of waste products, no spilling of gas/oil into the water
30	collect fall leaves and dispose of properly
31	Rock shoreline constructed

11. What type of seawall do you have on your property?

Answer Options	Response Percent	Response Count
Rip-Rap (stones used to armor a stream bank or lake shoreline)	73.1%	196
Vertical seawall	6.7%	18
Do not live on the lake	3.0%	8
Other	17.2%	46
answered question		268
skipped question		10



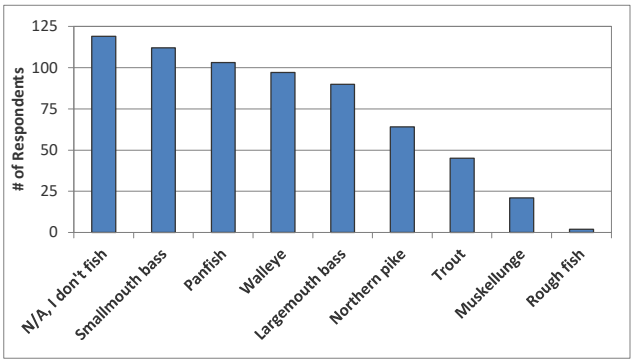
Number	"Other" responses
1	Rocks
2	sand
3	natural landscape
4	untouched undisturbed natural shoreline of rocks
5	n/a
6	Natural
7	Rocks
8	beautiful sand beach on the terrace
9	Rip-Rap & Vertical Seawall, Natural growth between the Rip-Rap and yard at about 10 & 27; above the waterline.
10	none - sand beach
11	Rip rap and natural
12	sand beach
13	see above
14	80% no shore line protection
15	none
16	Dont have a seawall.
17	Some larger rocks, but nothing other than that
18	no seawall at this time as property is undeveloped
19	Vegetation
20	We utilize both Rip-Rap and a vertical seawall
21	natural plants
22	Natural sand shoreline
23	Natural
24	There are some natural stones along the lake shore
25	Vegetation on slope leading to lake
26	None of above
27	Beach
28	Natural
29	None
30	Part cement, part rock
31	mostly natural
32	Broken down rip-rap.
33	Undisturbed 25ft high natural slope
34	stone/rock
35	Rip-rsp and concrete wall
36	Natural Rocks
37	natural cliffs
38	Natural cliffside
39	I do not have a seawall
40	Nothing//natural shoreline
41	None
42	natural rock as located on Sliding Rock, Emerald Shores
43	None, natural shoreline only
44	Sloping natural shore, ice push creating a lip
45	Naturally rocky at shoreline.
46	Natural

12. Do you believe natural shorelines (defined as undisturbed shoreline) are important for fish/wildlife?

Answer Options	Response Percent	Response Count
Yes	56.0%	153
No	12.8%	35
Unsure	31.1%	85
answered question		273
skipped question		5

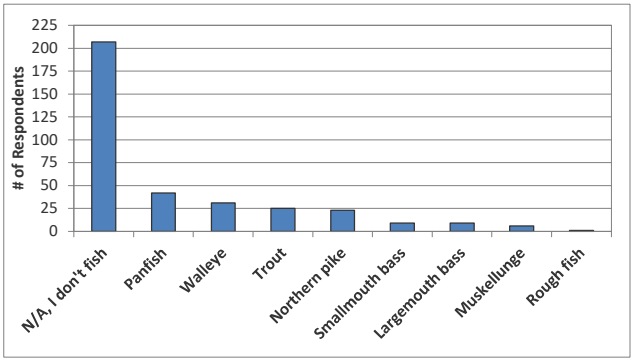
13. What species do you typically target during open water season on Green Lake?

Answer Options	Response Percent	Response Count
N/A, I don't fish	44.2%	119
Smallmouth bass	41.6%	112
Panfish	38.3%	103
Walleye	36.1%	97
Largemouth bass	33.5%	90
Northern pike	23.8%	64
Trout	16.7%	45
Muskellunge	7.8%	21
Rough fish (i.e. Carp)	0.7%	2
answered question		269
skipped question		9



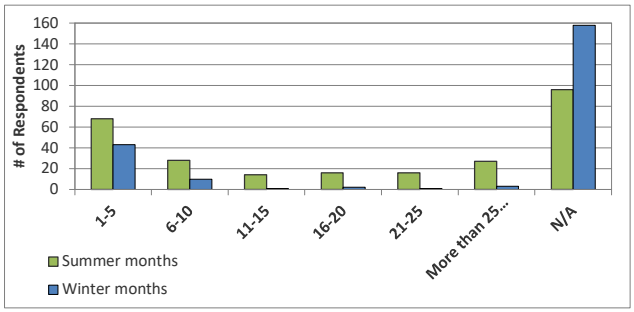
14. What species do you typically target during ice fishing season on Green Lake?

Answer Options	Response Percent	Response Count
N/A, I don't fish	77.5%	207
Panfish	15.7%	42
Walleye	11.6%	31
Trout	9.4%	25
Northern pike	8.6%	23
Smallmouth bass	3.4%	9
Largemouth bass	3.4%	9
Muskellunge	2.3%	6
Rough fish (i.e. Carp)	0.4%	1
answered question		267
skipped question		11



15. Approximately how many times do you fish on Green Lake in summer open water months and during winter ice fishing months?

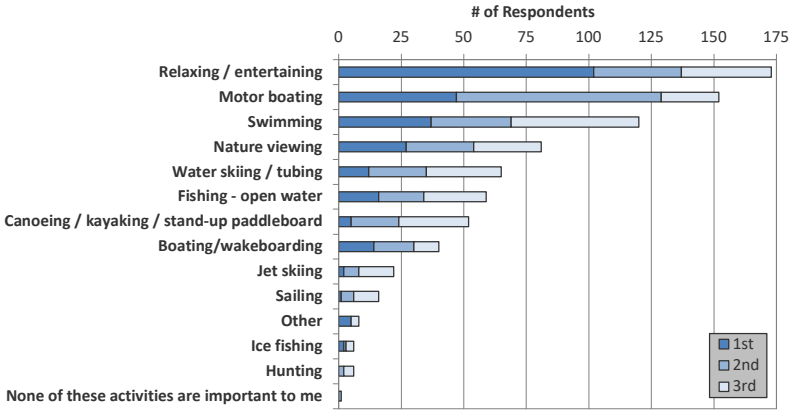
Answer Options	Summer months	Winter months	Response Count
1-5	68	43	99
6-10	28	10	35
11-15	14	1	14
16-20	16	2	18
21-25	16	1	16
More than 25 days	27	3	27
N/A	96	158	163
	answered question		266
	skipped question		12



16. Please rank up to three activities that are important reasons for owning your property on or near Green Lake. Please select the options below in order of importance with the 1st being most important.

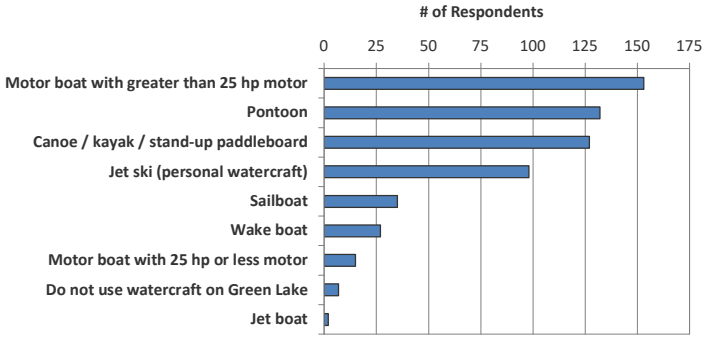
Answer Options	1st	2nd	3rd	Rating Average	Response Count
Relaxing / entertaining	102	35	36	1.62	173
Motor boating	47	82	23	1.84	152
Swimming	37	32	51	2.12	120
Nature viewing	27	27	27	2	81
Water skiing / tubing	12	23	30	2.28	65
Fishing - open water	16	18	25	2.15	59
Canoeing / kayaking / stand-up paddleboard	5	19	28	2.44	52
Boating/wakeboarding	14	16	10	1.9	40
Jet skiing	2	6	14	2.55	22
Sailing	1	5	10	2.56	16
Other	5	0	3	1.75	8
Ice fishing	2	1	3	2.17	6
Hunting	0	2	4	2.67	6
None of these activities are important to me	0	1	0	2	1
			answered question		270
			skipped question		8

Number	"Other" responses
1	Farming
2	Water skiing,/stand up paddleboard, swimming/kayaking, relaxing/entertaining, nature viewing
3	viewing and relaxing are important
4	Sailing is a close third!
5	Winter activities - ice skating, sledding, etc.
6	Nature viewing as 4
7	(Pontoon Boating)
8	wake surfing
9	surfing (its different than wakeboarding) and its awesome!
10	Wake-Surfing
11	the natural beaty of the lake and shorelines are the biggest thing
12	I fly a small float plane off the lake
13	Cycling
14	Biking around the lake



17. What types of watercraft do you currently use on Green Lake?

Answer Options	Response Percent	Response Count
Motor boat with greater than 25 hp motor	56.7%	153
Pontoon	48.9%	132
Canoe / kayak / stand-up paddleboard	47.0%	127
Jet ski (personal watercraft)	36.3%	98
Sailboat	13.0%	35
Wake boat	10.0%	27
Motor boat with 25 hp or less motor	5.6%	15
Do not use watercraft on Green Lake	2.6%	7
Jet boat	0.7%	2
	answered question	270
	skipped question	8



18. Do you use your watercraft on waters other than Green Lake?

Answer Options	Response Percent	Response Count
Yes	10.8%	29
No	89.2%	239
	answered question	268
	skipped question	10

19. What is your typical cleaning routine after using your watercraft on waters other than Green Lake?

Answer Options	Response Percent	Response Count
Remove aquatic hitch-hikers (ex. - plant material, clams, mussels)	51.6%	16
Drain bilge	48.4%	15
Rinse boat	38.7%	12
Power wash boat	3.2%	1
Apply bleach	0.0%	0
Air dry boat for 5 or more days	35.5%	11
Do not clean boat	6.5%	2
Other	29.0%	9
answered question		**31**
skipped question		**247**

Number	"Other" responses
1	Only use on Green Lake
2	Only on GL
3	Different boats that do not see Green Lake
4	Make sure not to use other lakes with boat/trailer
5	Sewering the whole lake
6	wipe down boat with cleaner on the boat lift once per week
7	wipe down
8	Ocean vessel thoroughly soap and rinse washed
9	Boat always resides on Green Lake. No washing required

20. If you boat elsewhere, would you be willing to wash your boat before entering Green Lake to help protect it from aquatic invasive species?

Answer Options	Response Percent	Response Count
Yes	90.3%	28
No	3.2%	1
Unsure	6.5%	2
answered question		**31**
skipped question		**247**

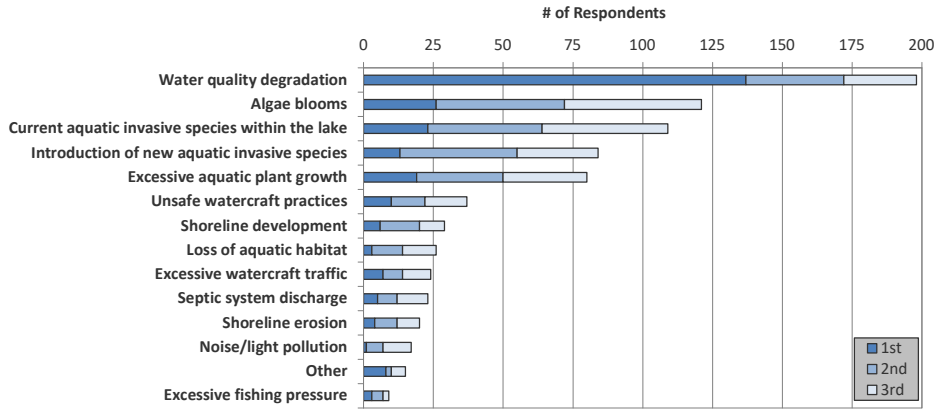
21. Do you believe washing your boat before entering Green Lake should be required at boat launches?

Answer Options	Response Percent	Response Count
Yes	73.7%	199
No	8.5%	23
Unsure	17.8%	48
answered question		**270**
skipped question		**8**

Green Lake Current and Historic Condition, Health and Management

22. From the list below, please rank your top three concerns regarding Green Lake, with the 1st being your top concern.

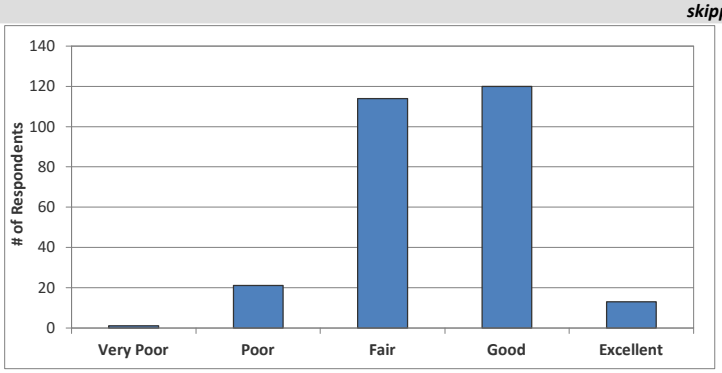
Answer Options	1st	2nd	3rd	Response Count
Water quality degradation	137	35	26	198
Algae blooms	26	46	49	121
Current aquatic invasive species within the lake	23	41	45	109
Introduction of new aquatic invasive species	13	42	29	84
Excessive aquatic plant growth	19	31	30	80
Unsafe watercraft practices	10	12	15	37
Shoreline development	6	14	9	29
Loss of aquatic habitat	3	11	12	26
Excessive watercraft traffic	7	7	10	24
Septic system discharge	5	7	11	23
Shoreline erosion	4	8	8	20
Noise/light pollution	1	6	10	17
Other	8	2	5	15
Excessive fishing pressure	3	4	2	9
		answered question		**266**
		skipped question		**12**



Number	"Other" responses
1	Runoff from agriculture fields
2	to clarify Noise Pollution - every day we hear obnoxiously loud stereos from boats.
3	Run off from agriculture fields
4	Current invasive species, excessive watercraft traffic at times
5	Excessive Fishing Tournaments with 100s of boats a weekend!
6	Wakeboats
7	Weed Cutter loss of cuttings.
8	I also am concerned abou future invasive species. I think people should have their septoic systems inspected every three years. I have not seen algae blooms but that is concerning. The boaters on the lake are nice and curtious.
9	GLSD test septic/sewer systems to ensure proper function - force replacement of cesspools. If proper function no requirement for sewer use.
10	I believe a number of those other issues should be included. shoreline development, current aquatic species, excessive fishing pressure aka bass tournaments, light pollution, and unsafe watercraft traffic, specifically the new wake boats WITH their noise pollution
11	All of the above!!
12	Runoff from agricultural fields
13	MANY of the above apply, and overlap.
14	Duckweed and the degradation of the Silver Creek Estuary so it is no longer useable for recreation and is an eyesore
15	Night time carp fishing should be prohibited
16	Duck Weed
17	Runoff from agriculture fields
18	fish kill this summer
19	run off from farmland
20	Water Levels Higher than Natural level.
21	Shoreline erosion and dangerous wave height and ridiculous sound systems all due to wake boats
22	Basically phosphorus entering lake from any/all sources
23	Low Lake Level
24	Specific to Excessive watercraft traffic, wakeboarding boats churn up weeds & debris, and also generate excessive waves and noise. How can we restrict that activity to something like 1000 yards from shore and between 10:00am - 5:00pm?
25	alot of these are high concerns, we need to take care of our lake
26	Extremely Low Water Levels
27	Hypoxic (low oxygen) zones..or water quality degradation if that is same thing for survey purposes
28	the water color has even changed
29	Dock area seaweed control is a big concern
30	Lack of police presence to monitor unsafe watercraft traffic.
31	Farm land runoff into the lake
32	Arrogant and ignorant rich people who think they know what is best for the lake
33	Wave Boats create noise pollution and affect shoreline erosion from large wakes.
34	Many more than 3 categories are very important to us, unable to prioritize and narrow it down to 3
35	Manure spreading & runoff
36	Water depth and muck buildup on Mill Pond.
37	Wake boats are destroying Big Green Lake
38	Too many McMansions

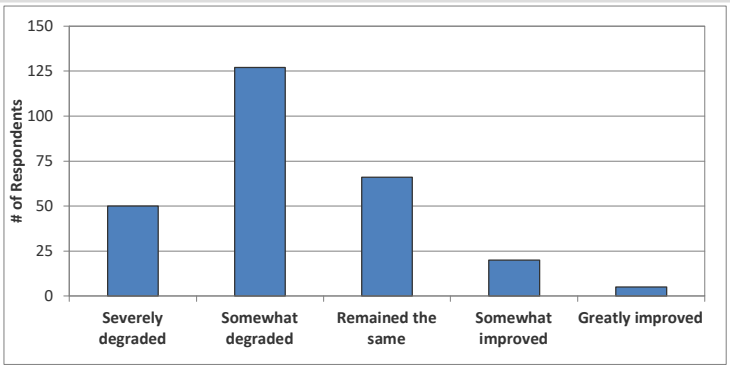
23. How would you describe the overall current water quality of Green Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Response Count
	1	21	114	120	13	269
					answered question	269
					skipped question	9



24. How has the overall water quality changed in Green Lake since you first visited the lake?

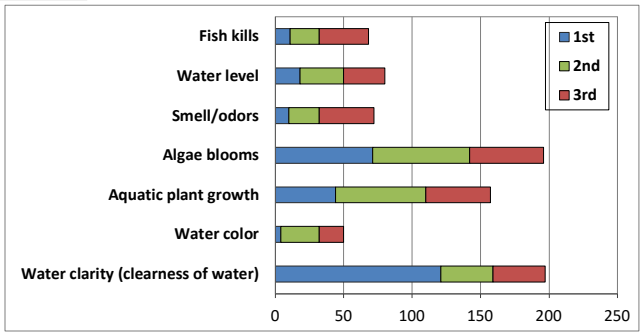
Answer Options	Severely degraded	Somewhat degraded	Remained the same	Somewhat improved	Greatly improved	Response Count
	50	127	66	20	5	268
					answered question	268
					skipped question	10



25. Which of the following would you say is the single most important aspect when considering water quality?

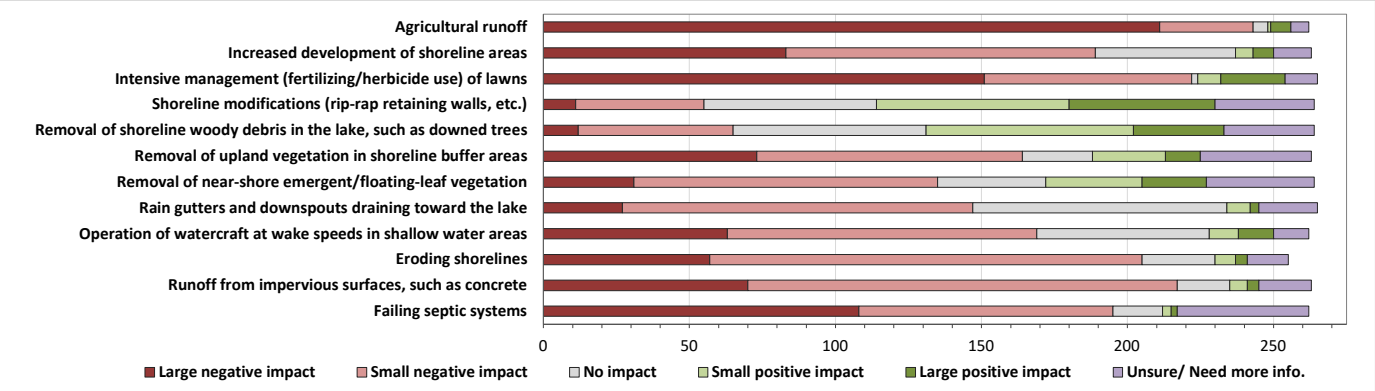
Answer Options	1st	2nd	3rd	Response Count
Water clarity (clearness of water)	121	38	38	197
Water color	4	28	18	50
Aquatic plant growth	44	66	47	157
Algae blooms	71	71	54	196
Smell/odors	10	22	40	72
Water level	18	32	30	80
Fish kills	11	21	36	68
Other				6
			answered question	268
			skipped question	10

Number	"Other" responses
1	Run off from agriculture fields, poor farm practices
2	All of the above!
3	GLSD test septic/sewer systems to ensure proper function - force replacement of cesspools. If proper function no requirement for sewer use.
4	again these are all concerns
5	Parasites like swimmers itch and bacteria like E. coli
6	also water levels have greatly decreased this year



26. Using the following scale, what impact, if any, do you believe each of the following practices have on the water quality of Green Lake?

Answer Options	Large negative impact	Small negative impact	No impact	Small positive impact	Large positive impact	Unsure/ Need more info.	Response Count
Failing septic systems	108	87	17	3	2	45	262
Runoff from impervious surfaces, such as concrete	70	147	18	6	4	18	263
Eroding shorelines	57	148	25	7	4	14	255
Operation of watercraft at wake speeds in shallow water areas	63	106	59	10	12	12	262
Rain gutters and downspouts draining toward the lake	27	120	87	8	3	20	265
Removal of near-shore emergent/floating-leaf vegetation, such as bulrushes, lily pads, cattails, etc.	31	104	37	33	22	37	264
Removal of upland vegetation in shoreline buffer areas	73	91	24	25	12	38	263
Removal of shoreline woody debris in the lake, such as downed trees	12	53	66	71	31	31	264
Shoreline modifications (rip-rap retaining walls, etc.)	11	44	59	66	50	34	264
Intensive management (fertilizing/herbicide use) of lawns	151	71	2	8	22	11	265
Increased development of shoreline areas such as increasing home sizes, growing boathouse construction, etc.	83	106	48	6	7	13	263
Agricultural runoff	211	32	5	1	7	6	262
						answered question	266
						skipped question	12

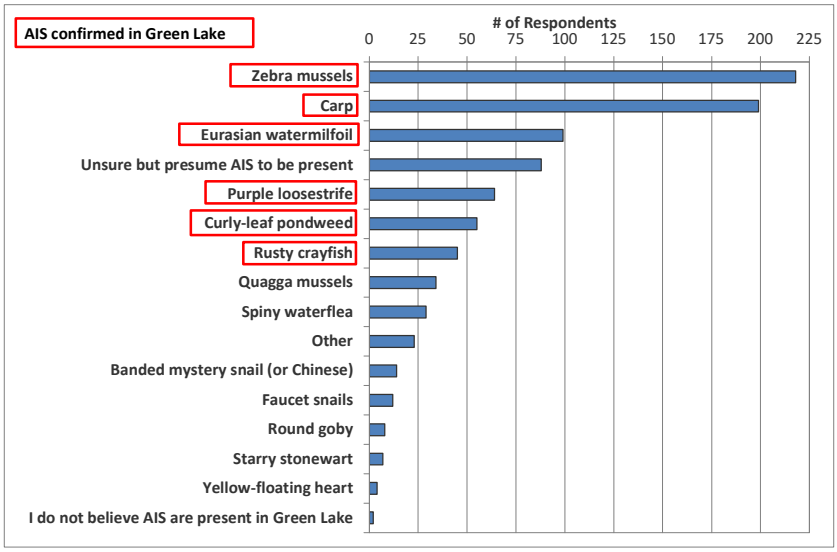


27. What changes do you hope to see for the Green Lake shoreline?

Answer Options	Response Percent	Response Count
More development	2%	5
More public access	2%	5
More natural shoreline	56%	148
Just right as it is	41%	108
answered question		266
skipped question		12

28. Which aquatic invasive species do you believe are present in or immediately around Green Lake?

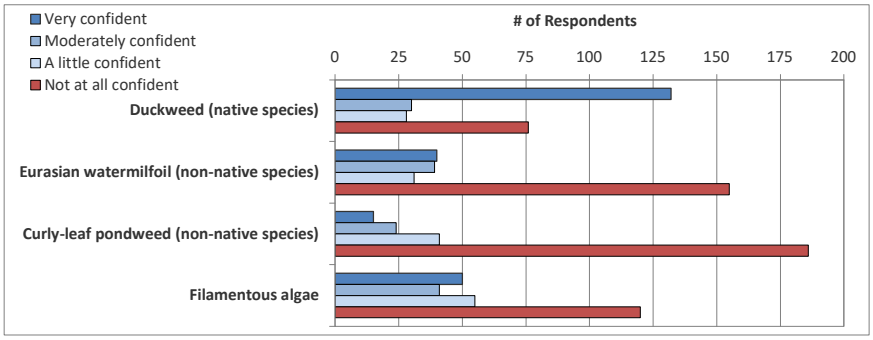
Answer Options	Response Percent	Response Count
Zebra mussels	82.0%	218
Carp	74.8%	199
Eurasian watermilfoil	37.2%	99
Unsure but presume AIS to be present	33.1%	88
Purple loosestrife	24.1%	64
Curly-leaf pondweed	20.7%	55
Rusty crayfish	16.9%	45
Quagga mussels	12.8%	34
Spiny waterflea	10.9%	29
Other	8.7%	23
Banded mystery snail (or Chinese)	5.3%	14
Faucet snails	4.5%	12
Round goby	3.0%	8
Starry stonewart	2.6%	7
Yellow-floating heart	1.5%	4
I do not believe AIS are present in Green Lake	0.8%	2
answered question		266
skipped question		12



Number	"Other" responses
1	I believe there are probably more here to check off--unsure of them.
2	No boat
3	We have not seen the goby...yet
4	Tourists
5	Not sure
6	Humans, Buckthorn, Phragmites
7	so many weeds on our waterfront property, harvester can not get close enough to cut them. It is getting difficult to enjoy the water for swimming, or wading, the weeds get caught in our props too. It seems such a shame to see this beautiful lake going downhill.
8	Blue Alge
9	Sorry I don't know the other species to comment on them
10	I don't know all of them but I have seen zebra mussels
11	I am not knowledgeable about this subject.
12	Duckweed is the worst problem..take on the DNR
13	Most people aren't aquatic species experts….should have included pictures.
14	I am sure there are others but need to be more informed.
15	Duckweed is an AIS in excessive quantities as present in Silver Creek Estuary
16	Restricting public access would have the most positive impact on water quality
17	Non-native weeds and that green floating mass stuff
18	Very uneducated regarding this topic but I know many exist
19	Put a focus on preventing Phragmites Australis from reaching the Silver Creek and Hwy K marshes. Its all around us and just a matter of time before it chokes out the cattail marshes.
20	I am not sure what to call weeds that have grown up from the bottom to end up floating at the surface
21	more invasive species than ever before
22	would like to see some type of regulation on Bass Tournaments and how to protect our lake from plants and species being admitted
23	dont know many of the species

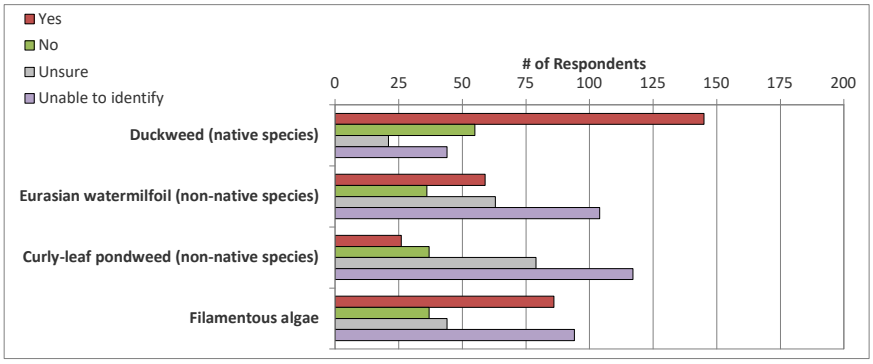
29. How confident are you that you could accurately identify the following aquatic plants?

Answer Options	Very confident	Moderately confident	A little confident	Not at all confident	Response Count
Duckweed (native species)	132	30	28	76	266
Eurasian watermilfoil (non-native species)	40	39	31	155	265
Curly-leaf pondweed (non-native species)	15	24	41	186	266
Filamentous algae	50	41	55	120	266
				answered question	267
				skipped question	11



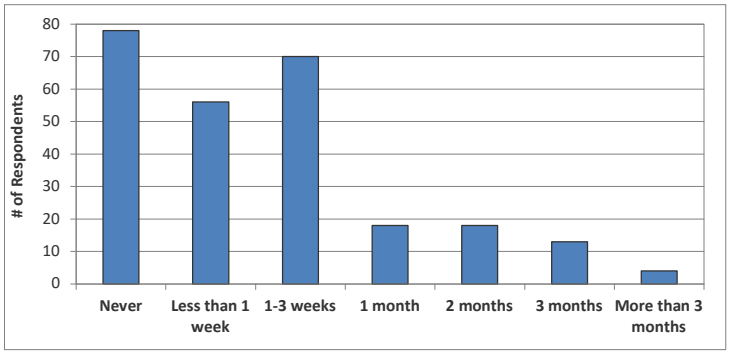
30. Have any of the plant populations listed below had a negative impact on your access of Green Lake?

Answer Options	Yes	Unsure	No	Unable to identify	Response Count
Duckweed (native species)	145	21	55	44	265
Eurasian watermilfoil (non-native species)	59	63	36	104	262
Curly-leaf pondweed (non-native species)	26	79	37	117	259
Filamentous algae	86	44	37	94	261
				answered question	266
				skipped question	12



31. How many days in total over the last year, if at all, has duckweed caused a significant navigational or recreational impairment for you?

Answer Options	Response Percent	Response Count
Never	31%	78
Less than 1 week	22%	56
1-3 weeks	27%	70
1 month	7%	18
2 months	7%	18
3 months	5%	13
More than 3 months	2%	4
answered question		255
skipped question		23

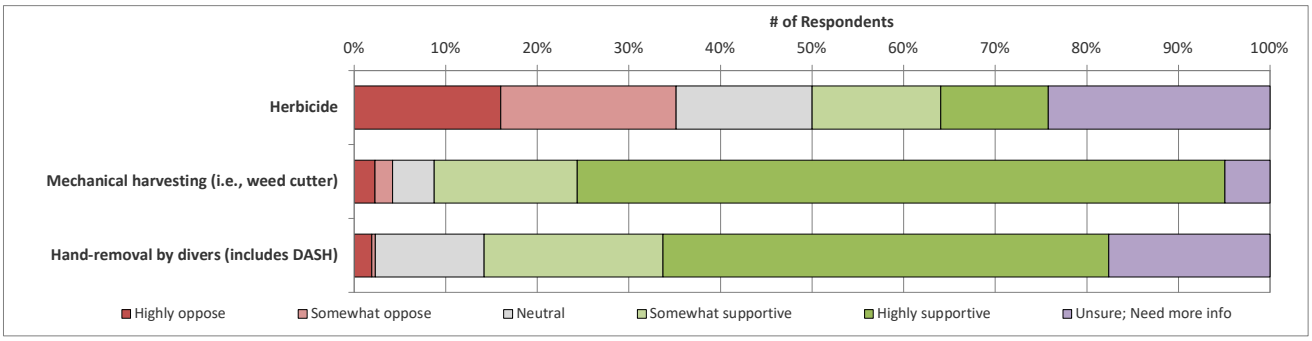


32. Do you believe active management (herbicide treatment and/or mechanical harvesting, etc.) should be utilized on aquatic plants in Green Lake?

Answer Options	Response Percent	Response Count
Yes	69.2%	182
No	3.8%	10
Unsure	27.0%	71
answered question		263
skipped question		15

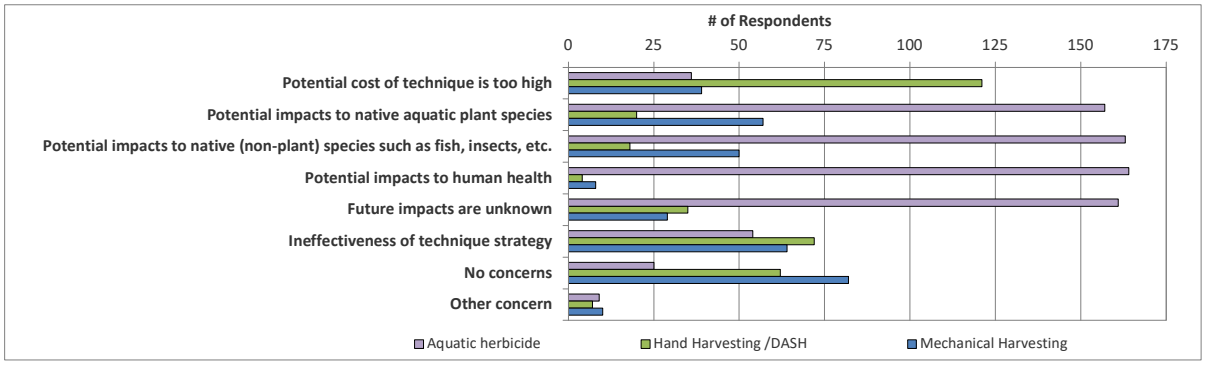
33. Aquatic plants can be controlled using many techniques. What is your level of support for the use of the following management techniques in Green Lake?

Answer Options	Highly oppose	Somewhat oppose	Neutral	Somewhat supportive	Highly supportive	Unsure; Need more info	Response Count
Herbicide	41	49	38	36	30	62	256
Mechanical harvesting (i.e., weed cutter)	6	5	12	41	186	13	263
Hand-removal by divers (includes DASH - Diver Assisted Suction Harvesting)	5	1	31	51	127	46	261
answered question							263
skipped question							15



34. What concerns, if any, do you have for the future use of aquatic herbicides, hand harvesting/DASH, and/or mechanical harvesting to target Eurasian watermilfoil and curly-leaf pondweed in Green Lake?

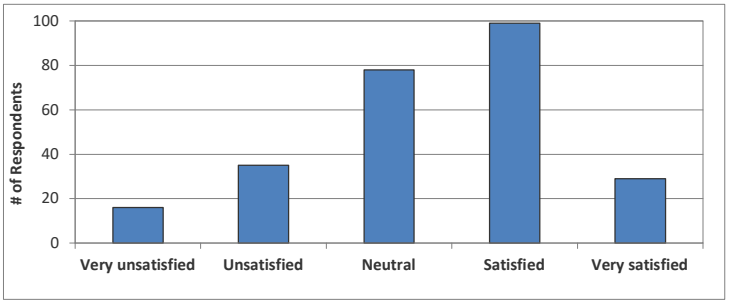
Answer Options	Aquatic herbicide	Hand Harvesting /DASH	Mechanical Harvesting	Response Count
Potential cost of technique is too high	36	121	39	139
Potential impacts to native aquatic plant species	157	20	57	172
Potential impacts to native (non-plant) species such as fish, insects, etc.	163	18	50	174
Potential impacts to human health	164	4	8	170
Future impacts are unknown	161	35	29	167
Ineffectiveness of technique strategy	54	72	64	127
No concerns	25	62	82	94
Other concern	9	7	10	14
answered question				235
skipped question				43



Number	"Other" responses for Question 34
1	I do not have enough info on the Aquatic Herbicide or the Hand Harvest option...
2	I have no knowledge about the impacts of these techniques except to say that mechanical harvesting makes swimming off our pier more pleasant.
3	Need more information, but if risks are minimal seems like a good solution.
4	i do not have enough knowledge to make these choices.
5	Need more info on these items and current state of usage
6	Weed cutting sending excessive weeds to western shoreline
7	Until agricultural runoff and Ripon Sewer system discharge are eliminated from Silver Creek all methods are a waste of time and money
8	Weed cutter leaves just as many weeds floating behind as it picks up. Paddle wheel is the cause.
9	Cut material accumulates on shoreline and rots
10	unsure of this category
11	I need to learn more about each of these
12	I am unsure of many of the above concerns, however, with my family owning property on this lake since 1977, I am certain that something absolutely needs to be done, and it
13	Get rid of the Duckweed! by any means
14	Traditional tactics may be too limited
15	I do not have knowledge on impact or cost of aquatic herbicide
16	I would have to have more facts before making a judgment
17	I do not know many of the facts to make this call
18	insufficient information to respond
19	I do not know
20	need more information
21	raise the lake water level. Shallow water increases growth
22	I feel very uneducated on the science behind some of these questions so my answers do not contribute meaningfully
23	I do not know enough about this to answer the question.

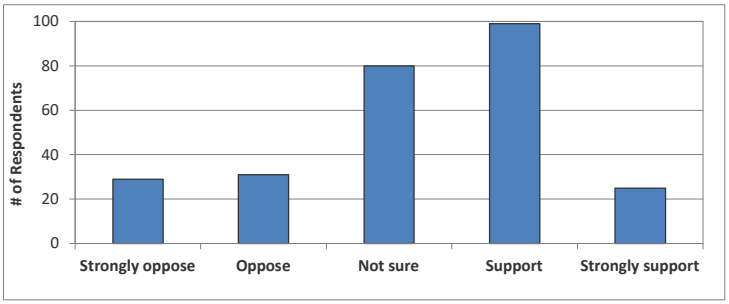
35. Mechanical Harvesting operations are aimed at providing nuisance plant relief to allow for more unrestricted recreation such as boating and swimming. However, this process can impact native plants and fish through unselective harvesting. In the past on Green Lake, mechanical harvesting has been utilized for nuisance aquatic plant control. How satisfied are you with the past mechanical harvesting program?

Answer Options	Response Percent	Response Count
Very unsatisfied	6%	16
Unsatisfied	14%	35
Neutral	30%	78
Satisfied	39%	99
Very satisfied	11%	29
answered question		257
skipped question		21



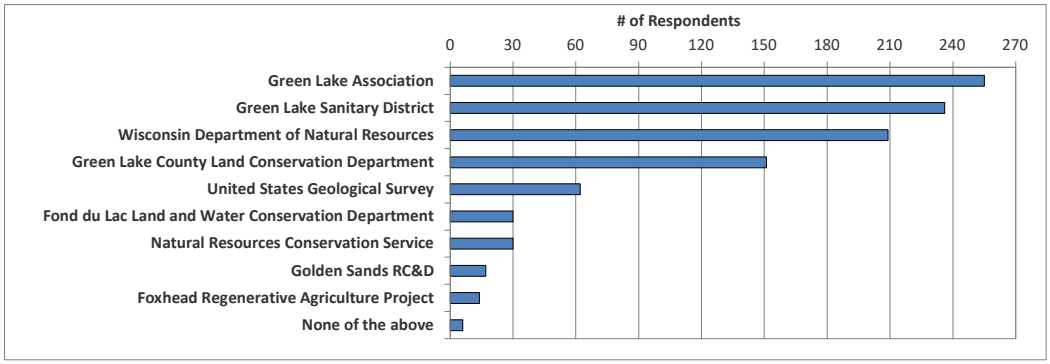
36. If additional funds are needed, would you support or oppose increasing the tax levy in order to accomplish mechanical harvesting goals for Green Lake?

Answer Options	Response Percent	Response Count
Strongly oppose	11%	29
Oppose	12%	31
Not sure	30%	80
Support	38%	99
Strongly support	9%	25
answered question		264
skipped question		14



37. Which of the following organizations that are dedicated to protecting Green Lake's water quality are you aware of?

Answer Options	Response Percent	Response Count
Green Lake Association	97%	255
Green Lake Sanitary District	89%	236
Wisconsin Department of Natural Resources	79%	209
Green Lake County Land Conservation Department	57%	151
United States Geological Survey	23%	62
Fond du Lac Land and Water Conservation Department	11%	30
Natural Resources Conservation Service	11%	30
Golden Sands RC&D	6%	17
Foxhead Regenerative Agriculture Project	5%	14
None of the above	2%	6
answered question		264
skipped question		14



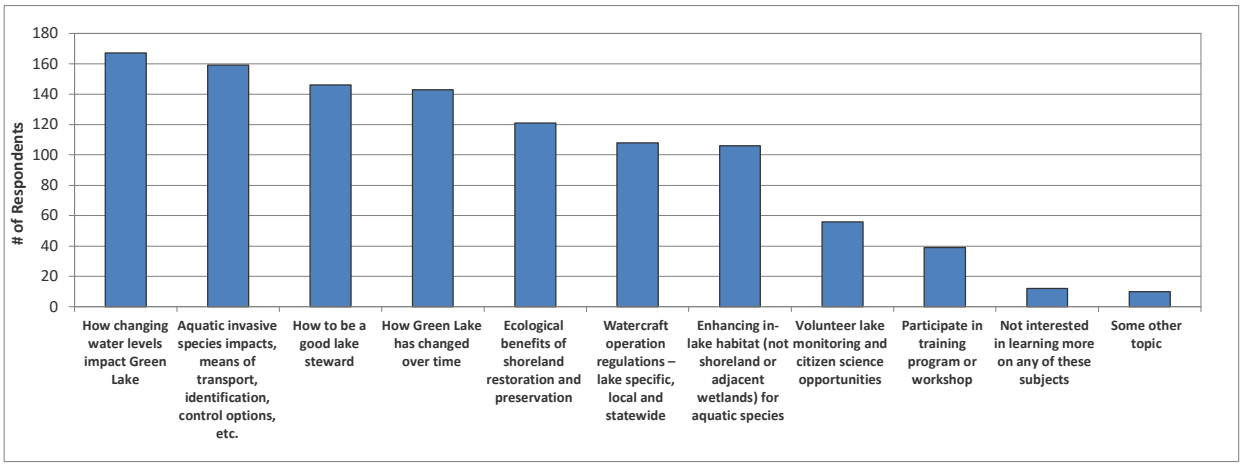
38. Do you feel Green Lake County and local towns value improving Green Lake's water quality?

Answer Options	Response Percent	Response Count
Yes	70.1%	183
No	10.0%	26
Unsure	19.9%	52
answered question		261
skipped question		17

39. Stakeholder education is an important component of every lake management planning effort. Which of these subjects would you like to learn more about?

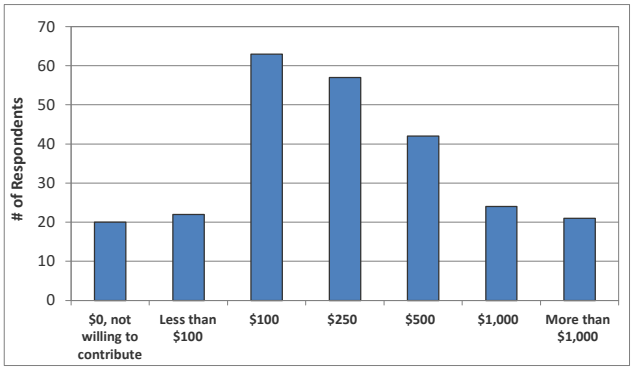
Answer Options	Response Percent	Response Count
How changing water levels impact Green Lake	65.5%	167
Aquatic invasive species impacts, means of transport, identification, control options, etc.	62.4%	159
How to be a good lake steward	57.3%	146
How Green Lake has changed over time	56.1%	143
Ecological benefits of shoreland restoration and preservation	47.5%	121
Watercraft operation regulations – lake specific, local and statewide	42.4%	108
Enhancing in-lake habitat (not shoreland or adjacent wetlands) for aquatic species	41.6%	106
Volunteer lake monitoring and citizen science opportunities	22.0%	56
Participate in training program or workshop	15.3%	39
Not interested in learning more on any of these subjects	4.7%	12
Some other topic	3.9%	10
answered question		255
skipped question		23

Number	"Some other topic" responses for Question 39
1	Agriculture practices
2	de sedimentation of the mill pond
3	How to achieve MEASURABLE improvement to Green Lake water
4	Restoration of Silver Creek Estuary
5	Opportunities/strategies to minimize fertilizer runoff into feeder streams
6	why water level dropped so significantly and nothing was done to close the dam
7	Property taxes are too high for the benefits/investments received. Costs must be cut, like to many townships, small schools and local redundancy. Why are taxes so high and driving middle America away from GL?.
8	I think and believe having an orchestrated approach from lake people; as we are called and the town that resides all year round and government and private bodies would be benefical to this fight. Facts are important science is important and we need agree to what we as a whole want to accomplish for next generations.
9	i dont believe you. You are about cocktail parties and money
10	Intercepting P



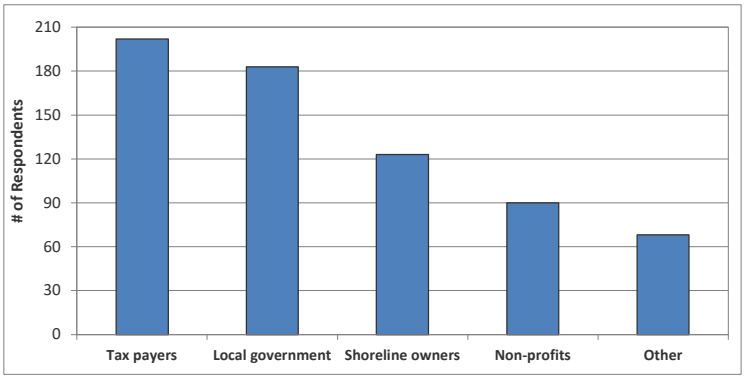
40. Green Lake requires a 57% phosphorus reduction to remove the lake from the WDNR's impaired waters list. Approximately what would you be willing to contribute annually to support management efforts to reduce phosphorus in Green Lake? Note: This is to gauge potential investment from the community and is not a formal commitment to pay.

Answer Options	Response Percent	Response Count
$0, not willing to contribute	8.0%	20
Less than $100	8.8%	22
$100	25.3%	63
$250	22.9%	57
$500	16.9%	42
$1,000	9.6%	24
More than $1,000	8.4%	21
answered question		249
skipped question		29



41. Who should pay to improve Green Lake's water quality?

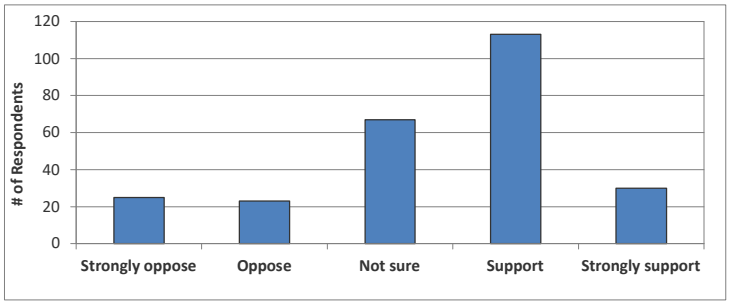
Answer Options	Response Percent	Response Count
Tax payers	78.6%	202
Local government	71.2%	183
Shoreline owners	47.9%	123
Non-profits	35.0%	90
Other	26.5%	68
answered question		257
skipped question		21



Number	"Some other topic" responses for Question 41
1	All surrounding area people benefit from GL's beauty as a recreational destination. If one lives within an hour/within the watershed, you are responsible for it's care.
2	Farmers
3	visiting fisherman, boaters, swimmers, renters, etc. who do not pay lake property taxes
4	Farm land owners
5	all boaters that put a boat in the water and make use of the lake.
6	Non Profits who use the lake and benefit from it.
7	Farmers
8	Tourists
9	Associations & Government Entities tied to Green Lake
10	known polluters, mainly farmers and up stream discharge polluters
11	DNR-They screwed up Green Lake in 1st place
12	Boat launch users
13	Non resident boaters and residential visitors (Air B&B surcharge)
14	Agriculture fines when there is a major runoff into the lake
15	Not sure
16	I believe that the surrounding communities do benefit from the economic impact of having the lake and all should be vested in preserving the quality.
17	I'm
18	people who use the boat launch
19	Local businesses
20	GL has a great tax base and we need to use it for this
21	Everyone that benefits from the lake should contribute
22	Outside in boaters, fisherman and recreational lake users.
23	Local Business owners
24	fines for irresponsible lawn fertilization & non-performing septic systems
25	All users of the lake
26	The County and all surrounding counties and municipalities that generate flowage into Green Lake
27	unsure
28	With as high as the taxes on the lake are? We are now!
29	Boaters
30	Cities around Green Lake
31	All in the Green Lake watershed area.
32	All lake users
33	Federal government
34	everyone
35	Grants
36	If you gouge me for $100K for a sewer I dont need, not me.
37	More funding for Watershed Management. Solve the issue well before it hits the lake.
38	users of public boat launches. shoreline owners already pay large property taxes while those who drop in & pay little to no fees directly to GL
39	All owners who benefit from GL.
40	All of the above
41	Would need state and possibly federal funds to remediate. Shoreline owners are included in tax payer category.
42	All property owners and lake visitors since they use the lake as well as shoreline owners
43	Watershed Ag operations
44	Everybody in the GL area benefits from the lake
45	DNR
46	State Tax Payers, not local property tax payers. The lake is part of the public trust, and used by more than locals.
47	Boat launch users
48	Everyone benefits from the lake in one way or another even the surrounding towns
49	Anyone launching a boat on the lake. Anyone keeping a boat on the lake.
50	others that use the lake
51	Farmers
52	farmers using fertilizers that drain into the lake
53	Agricultural sources of phosphorus
54	this should be priority for anyone who has business or recreational interests near the lake
55	boat launch users
56	all who use the lake. funds should be collected from non-owners who launch boats. there should be a tax on fishing tournaments
57	Green Lake Association
58	I believe farm run off especially the trucked in dairy waste is the main culpret. Those organization should pay to restore water quality. They have and do benefit from our already high taxes.
59	Additional boat launch fees.
60	use the current taxes, the lake residents pay alot and use very little of the local services-- education, etc... where does all that money go?
61	You have abused the responsibility. The lake suffers. It is all about collecting money and not helping the lake
62	Monies derived via DNR, Hunting, Fishing Boat Registrations, etc
63	Agricultural landowners
64	Corporations/Manufaturers
65	anyone who is using the lake. Also, surrounding communities benefit greatly from the commerce that the lake attracts, so everyone has a stake, not just property owners
66	Those with septic systems in the watershed should have a special assessment added to their tax bills.
67	Federal and State Governments
68	anyone who uses lake

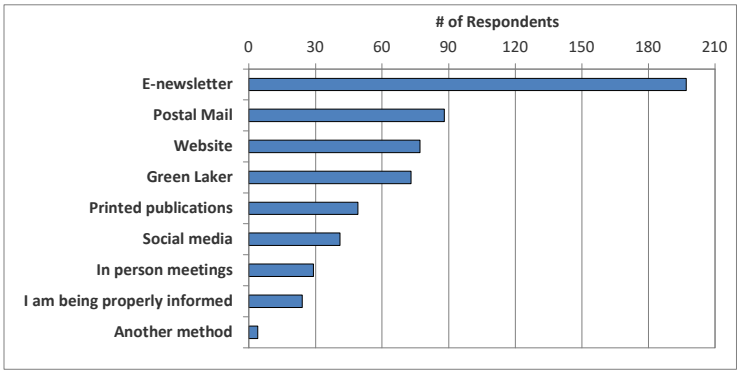
42. If additional funds are needed, would you support or oppose increasing the tax levy in order to fund conservation projects that aim to improve Green Lake's water quality?

Answer Options	Response Percent	Response Count
Strongly oppose	10%	25
Oppose	9%	23
Not sure	26%	67
Support	44%	113
Strongly support	12%	30
answered question		**258**
skipped question		**20**



43. What is your preferred method of communication to receive information related to Green Lake?

Answer Options	Response Percent	Response Count
E-newsletter	75%	197
Postal Mail	34%	88
Website	29%	77
Green Laker	28%	73
Printed publications	19%	49
Social media	16%	41
In person meetings	11%	29
I am being properly informed	9%	24
Another method	2%	4
answered question		**262**
skipped question		**16**



Number	"Some other topic" responses
1	Text
2	Please no postal or printed publications.
3	The media sites feeds is enough info. SAVE printing cost. You print and mail too much.
4	GLA is important source of news

44. Please feel free to provide comments concerning Green Lake, its current and/or historic condition, and its management.

Answer Options	Response Count
	99
answered question	**99**
skipped question	**179**

Number	Response Text
1	Thank you for informing the masses regarding keeping GL clear and healthy. We clear our shallow area of weeds/debris and would love to see a back healthy plan; to keep doing it everywhere.
2	Too many bass tournaments.mechanical harvesters do not come near our pier
3	66 years on the lake, first 50 no boat issues. Last 16 Walker defunds DNR boathouse and clear cutting of lots?
4	We have had issues for my 30 years here. When are we going to get the proper equipment and knowledge to save our lake. I know its talked about but no positive action has ever been taken!!!
5	Weed management is terrible in shallow shoreline areas
6	Keep working on improvements to have a healthy lake. The lake became severely compromised in the flood of 2008
7	The saving grace of the lake is its depth, a nutrient sink. Agricultural runoff is single biggest contributor of phosphorus to unwanted plant growth. Lakefront property owners pay way too high taxes with no representation (i.e. out of state owners) and most all of the taxes go to the County budget and not for the lake itself (when was the last time real soft sand was put on the county park beach?) A lake district has always been apposed because then ALL lake front property owners would have a say in how their taxes are spent. The County Govt does not want owners telling them how to spend their budget. The lake is big enough to let all water lovers use the lake without having further restrictions placed on lake users. There is room for everyone, i.e. fisherman complain about and blame others when they can not catch a fish - maybe they are just lousy fishermen. People who never set foot in the water complain about others enjoying the lake. Again, the lake is big enough for all to share and use and no need to complain about someone else using and enjoying the lake. NO LAKE USE RESTRICTIONS NEEDED!
8	The current degraded condition of the lake took years or decades to occur. It may take this long or longer to reverse the damage. The cost of this effort should come from the tax payers as well as those organizations that are working toward this goal. Anyone who will benefit from a healthy Green Lake should be invested in preserving its beauty for future generations and share in the effort and cost.
9	ARE THERE ANY DREDGING OPTIONS (MILL POND/COUNTY K/SILVER CREEK)WHICH WOULD HELP WITH BOTH PHOSPHORUS AND INVASIVE SPECIES? i MAY BE WILLING TO GIVE MORE IF YOU PROVIDED COST AND EXPECTED RESULTS OF EACH ALTERNATIVE (HERBICIDE VS DIVERS VS. MECHANICAL)

10	Thank you for all of your efforts ! We feel one of the biggest problems / changes in the lake over the years is the incredibly loud and inconsiderate use of stereos on boats. If the noise ordinance that exists could be enforced that might help.
11	Chemical fertilizer and animal manure (85%) run off into streams and creeks are the primary sources of phosphorous in Green Lake. One example: Manure spread on top of fields so much that one could not even see the downed corn stalks. In the spring (as often is the case) of 2019, the manure washed into Mitchell Glen & White Creek. IT WAS TERRIBLE! Corn stalks littered White Creek Mitchell Glen. The manure spreading practice has been going on for decades at the farm located at 4807 Prairie Rd Ripon, WI. Enforcement of proper farming practices by the DNR is so necessary.
12	I feel that this water is everyones responsibility on and off the water. Every boater that uses this lake is also financially responsible for it.
13	GL is a special lake in its history, uniqueness, and beauty. It needs quality preserving not rampant over-development by the real estate market.
14	Although the Harvesting program is currently operating every year, it does make kind of a mess of weed debris on the north shoreline of the lake.
15	1/2: Regarding the current mechanical weed cutters. They have clearly been on the west side but they miss a lot of weeds (still in swim areas off piers) and they just cut the weeds without removing them. Anyone fishing will tell you that the cut weeds are a huge hassle. All of us on the shore have to clean up the mess! 2/2: We have water skied for decades on Green Lake and Im sure we have caused some shoreline damage but the new wake boats, with their 4 foot wakes present a whole new challenge. The operators most likely do not have any idea what kind of danger their wake presents to other boats, kayaks and paddleboards. Wake boats should be limited to operating 1 mile away from shore.
16	Enforce current zoning/laws before incorporating new fixes like mandating sewer; eliminate Air B&Bs (noise, overuse of designed systems); remove wakeboats (shoreline destruction & safety); reduce total club and pro fishing tournaments; stop cutting weeds unless properly removed from lake as opposed to East shoreline.
17	Wake boats are ruining lake bottom and destroying weeds. Example is the Big bar near Green Lake Conference Center
18	The actual extent that septic systems (especially well functioning ones) are impacting lake is unclear compaired to farm run off and Ripon sewer run off into Silver Creek.
19	The water quality is generally very much improved over the 70's and 80"s, despite a lot more shoreline development and water craft users. Sewering the lake shore homes is very important to continue. Instead of spending money on mitigation of lake "weeds" the GLA and sanitary district should work with the GLC to purchase the most offending farms in the watershed and take them out of production. That is a project that I would contribute $$
20	Weedcutters loose lots of cutting, Can't really troll after June 30th. Between wake boards, Big wave boats & Jet Skis, way too much shore erosion, & prevents trolling for trout. Too dangerous! That's why State MI has no wake zone 1500 from shore!!!!
21	Disappointed at the decline in quality of fishing (numbers/size caught) from even 20 years ago. Though I do practice catch and release.
22	Stopping duckweed from entering at silver creek and figuring out how to collect the weeds that the paddle wheels cut
23	Water quality improved on the lake after near lake septic systems abandoned. Quality of the mill pond has gone down hill. I used to water ski there now you can not get through with a boat.
24	I do feel that the dairy in Ripon has had a significant negative impact on our lake - I noticed a change in the quality of water color and quantities of weeds with the mega-dairy.
25	We have been impressed by the concerted efforts to rid Green Lake of the carp that was tough but seems to be helping.
26	Why was the eye sore of the dock piling crane allowed to sit on Sunset Boat launch all summer?
27	We greatly appreciate the efforts to improve and protect Green Lake for present and future generations.
28	I have watched people fill their boats with gas off of their piers and gas is spilt into the lake. You can see the gas floating on top of the water I do not want to swim in gasoline nor do I want my grandchildren swimming in it.
29	Get all Green Lake properties on sewers!!
30	Green Lake is amazing. I strongly support making it better. I own a property on the lake, but I use my boat very infrequently, I do not fish, I use city sewer and I respect and safeguard the lake. In other words, I believe I have very low impact on the lake. I support an increae in taxes to help the lake, perhaps a higher rate for homes on gthe lake but, it looks to me that more boating/fishing is done by people who do not live on the lake so the surrounding areas should be taxed also, albeit, at a lower rate. Thanks for your excellent work!
31	The GLA communicates well, is supported by the GL community and has completed several studies, off lake projects etc. What I haven't seen is a measurable impact on the lake. It is hard to invest in a feel good story that does not provide measurable results.
32	The faster existing farmland around Green Lake is returned back to nature the faster we will have a less problematic lake. The single biggest issue to solve is farmland chemical runoff. Next is regulating/limiting outside in boat volume on Green Lake.
33	Green Lake should implement a property transfer tax on the sale of commercial and residential property that is specifically dedicated to Green Lake Water Quality.
34	thank you.
35	Requirement/forced sewer usage not appropriate when no benefit is shown. Require periodic testing and remediation upon failure and force removal of cesspools. Fully functioning septics regardless of age have proven no negative impact on lake quality. Properties large enough to support multiple septic fields should be permanently immune from sewering.
36	I have been a property owner on Green Lake since 1995, my family since 1977 I have lived here fulltime since 2003, and I have been visiting Green Lake my entire life, 60 years. I have borne witness to the deterioration of the lake since I can remember. I love the lake and the area and am proud to call it my home. While i do believe the development on the lake has contributed to the water quality deterioration, just because of the sheer size of the homes being built, i truly believe it is very obvious where the majority of the problem originates, and that is Silver Creek, and the inlet waters. i remember canoeing in there when lily pads, frogs, turtles, wildlife and natural foliage was abundant, and how over time the lily pads have disappeared and been replaced by duckweed and that filament algae, and how the existing wildlife and fish in there have been impacted. the inlet was originally a marsh whose purpose was to filter the water entering the lake, it has now turned into a mucky swamp that breeds unwanted foliage, in my opinion due to the off-water farming practices and fertilizers that come from upstream, enter the inlet and spread out in the shallow slow-moving waters. I truly hope this area, and other crucial areas like this, can be returned to their original purposes.
37	GLA did a good job with the Quarry opposition.GLA need to stop playing nice with the DNR on Duckweed and start the lobbing effort! Get tough. Monitoring is not cutting it.
38	When we first bought, our drinking water was pumped from the lake!
39	We notice the most dramatic effects after heavy rainfalls, especially in the spring. Dan Simonson had the most dramatic photos of the silt plume entering from Silver Creek after an 8" rainfall one spring in the late 80s. Slowing the farm runoff seemed to have a significant effect on weed and algae growth.
40	We completely support your efforts to improve the water quality of Green Lake.
41	I am concerned by what appears to me to be a total lack of enforcement re. impermeable surfaces, i.e., new driveways, aprons, shoulders (e.g., north apron between the road and the lake on Spring Grove Road at marina near Hill Creek. This was recently PAVED but previously was gravel). Erosion management on new construction sites can be seen from the lake side to be inadequate….leaving plumes of mud after rains.
42	Boat launches are in bad shape in spite of pay to launch. The Dodge park landing is only usable for larger boats on one of the slips. We have damaged our boat both loading and unloading. Piers are removed at the launches very early in the fall and dont take into account the late season fisherman. Summer boat traffic on the lake is unsafe with boats making large wakes well within the 100 foot mark of our pier. We really cant swim or fish safely on weekends. Fishing tournaments launch hours before the boat wash stations are open on the weekends. The construction barge at the County A landing is very unsightly and now appears to be a permanent structure. New construction is held to a high standard for run off water, yet existing structures are not audited for any sort of compliance or improvement.

43	I appreciate and support the efforts made to improve the water quality by all parties involved.
44	Thanks for putting out the survey, and attempting to improve our Green Lake. Its a gem, we need to invest in it, and preserve our water quality and natural surroundings.
45	Failure to properly manage Silver Creek estuary and intensive manure spreading from CAFO's are the major problems that should be addressed
46	Need reliable quantitative analysis of the various initiatives/strategies to improve water quality such that the funds expended are impactful.
47	It is important to concentrate on sewers in and around the lake and the moveout from there into the watershed to remove runoff into lake which causes degration of the lake
48	Largest concern I have is with wake boats and their excessive wakes…some are conscientious but far too many run close to the shore and play crazy loud music. I also feel that non-lake owners should pay more to launch boats…kind of like a toll road. Raising funding from only lake property owners isn't the total answer.
49	Look, generally speaking we are well-informed on whats going on and the ag runoff mitigation has helped Woods Bay. But this move on sewer will make us sell if it goes through. It is an unnecessary overreach and a total reversal of policy from when we built our home. Infuriating.
50	In regards to septic systems and the sewering proposal, there are several factors for us that make this proposal untenable. 1) The cost is extraordinary especially when you include a 430ft lateral. 2) An even bigger concern is that we bought our lot before any discussion of this study was proposed with the intention to build a home. Now we are in an indefinite holding pattern where we likely wouldnt be able to build for 2 to 3 years or more until the sewering was complete. This proposal requires even brand new septic systems to be removed within a year of sewering completion and we couldnt afford to put in a septic system to then rip it out a year or two later. What about more tenable solutions like ensuring systems are set back far enough from bodies of water. As an example, in our case, we would be building new so our septic could be set back much further than required to mitigate phosphorus risk. Plus, our system would be new which is a lower risk of significant leaching. For existing systems, what about possibly testing to see which systems are indeed contributing at a significant level and mitigate those systems.
51	1.Lake water levels are too high based on historic levels. 2.Create a Conservancy Trust Fund to buy polluting properties vs increasing the taxes. Voluntary contributions could be collected by the GL Sanitary District.
52	As a permanent resident on Green Lake, I have an opportunity to watch the Aquweed mechanical weed removal being performed. It is ineffective due to the fact that the operators do not lower the cutter very far. They get the weeds at the surface and very little goes up their conveyor belt. Upon examination of the area after they are done, the weeds are still there just below the surface. The program is a waste of fuel and labor under the current operating strategy.
53	How concerned is GLA about the filling in of Mill Pond? Its covered by lily pads and becoming shallower each year.
54	I appreciate everything that the GLA is doing to improve the quality of the lake, but feel that government with more funds is needed to make the necessary changes. Hate to suggest it, but Green Lake would benefit from some in the upcoming federal budget process.
55	water level dropped significantly and my understanding is green lake dam could of been closed down. significantly impacted boat lifts on west shore line. shoreline is also a mess
56	We purchased our property in 2020 intending to tear down the house that was there and build a new one. We did tear down the existing home. However, our plans have been put on the back burner for a few reasons....including the cost of building supplies and labor as well as concerns about the health of the lake.
57	Mechanical harvesting - spent May 20-September 6 at shoreline house and only saw the weed eater one time. Is that normal?
58	I'm not sure if GL's Phosphorus issue can be solved independently of the statewide problem. And not optimistic that state or federal leaders have the motivation to act.
59	It seems to me that this last summer the lake water has been extremely clear at least along our shore. It is hard to understand how much improvement is believed to be necessary in terms of some sort of numerical value or comparison benchmark.
60	Save on the expensive breakfast meetings and print materials, unnecessary IMO. Thanks for all you do.
61	We do not understand why we continue to open the dam all summer long. The West end of the lake was ridiculously low this year and could have been controlled.
62	I believe the impact of the shoreline owners have much less impact on the lake as the surrounding farms in the watershed and the thousands of people who trailer their boat to use the lake. The majority of the lake owners keep their boats on the lake all season. The invasive species and phosphorous levels are being brought into the lake people not paying large amounts to live on the lake. It shouldn't be the responsibility of the lake owners to pay all the money to fix the problem. We should also not be restricted further than state law on what can be built for a boat house. If the boat house under current regulation is built correctly, it should not negatively affect the lake quality at all.
63	Please consider enacting start and end times for waterskiers and wakeboarders. Both get too close to shore and fisherman. I cant remember the last time I saw a sheriff boat or DNR warden pull over a ski boat for getting too close to a fisherman, but it happens every time I'm out. Also, the waves (loud music), noise, floating weeds and turbidity generated by wakeboarders is an increasing problem. Lastly, how can we limit the tournaments on the lake? I dead bass all over the lake following most every tournament.
64	I think, to the extent possible, more "buy In" needs to be made by the farmers, surrounding communities that benefit from the lake and visitors.
65	The duck grass has been an issue the mechanical removal near our shores seems to stir up more muck than remove grass. There are also starting to be too many speed boats/wake boats. We don't want to see Green Lake become the mess that Lake Geneva is-- we want a healthy, relaxing environment.
66	Still see a ton of Carp swimming around, duck weed was better this year. Low water level seemed to cause issues towards the end of summer. Hope we can keep working to better the lake for all.
67	Boaters are not following Wisconsin Boating Regulations. We need to enforce these regulations.
68	why arent there limits on fertilizers that run into the lake, can their be tax penalties for this, can their be subsidies to transition away from phosphorus?
69	GLA is true asset for our lake and our community
70	Every effort must be made now before it is too late to get our lake 100% back...NOW!!!!!!!!!!!!!!!
71	GLA is doing a great job protecting GL. Thank you.
72	I have lived on and off for over 58 years on the lake and at times I feel nothing has changed except the lake is worse off of course and the town has little to offer vactioners. I spend all my money in Princeton and Ripon because of the lack of recreation and food in Green Lake. But the biggest issue for me is how divided the people are who "run" the town and government and how not connected they are to all of who they serve. I come up often and the officials that are elected and making decisions represent me as well as a year round resident. Yet that is not the case. The splintered thinking was around when I was 10 and it is now. Your local government should be informed by committess that represent all people that resisde in any way within your community, they do not. Regarding the lake, in tthe quest not to become Lake Geneva you have thrown the baby out with the bathwater. I have 7 grandchildren and there is no mini golf there is no splash pad or craft place for rainy days, no family restaurants, no ice cream place or pizza place, nothing stays open during high season at regular intervals...trust me I have tried to figure it out. There is no cross country skiing or sledding efforts or skating efforts or anyting to make town a fun place to go to and spend some money and spend time with family. But I think your biggest hurdle is the discrimination towards lake people in general. Also the whole darn lake has part time residents you offer one day for pick up refuse of large items!! One day and I was told if I cant be there that one day I ihad to wait until next year. Really? Why not have private haulers available to us and or I dont know when the season is over and time to get rid of blow ups that pop or other items have a pick up or recycle event. Where is the education and service I dont see it.
73	The primary source of phosphorus is farm run off. Not enough is being done to address this problem. Legislation in Madison is needed to stop this problem.
74	I feel that progress is being made to improve GL water quality. The coalition of various agencies and non profits is th way to proceed. Communications out to anyone who lives or visits the lake is key. People need to understand all aspects of what affects the quality of the water. TY

75	Recreational boaters/jet skiers seem to be more uneducated than ever with regard to staying a safe distance from other boats and piers/shorelines. I'd suggest publishing rules of the road, regularly in the Green Laker and/or other pubs. I'd like to see an end to the fishing tournaments (except the AYA-which is local). as it seems to be putting extra pressure on the lake. In my opinion boat houses offer a uniqueness to the lake and it's nice to see the variety. The new regulations are boring and don't allow for much style. Certainly would be mindful of neighbors but I think each boat house should be reviewed for style and size independently as some shorelines are wide open. As I understand it, there is debate about sewering more parts of the lake. It sounds like that is an extremely expensive program that would address a very small part of the problem. Thanks for this survey. I think very smart!
76	The management of removing the boards in the dam to drop the lake level by 8” should be better communicated.
77	Concentrate on the limitation of Phosphorous that enters the lake from inlets, Invasive aquatic plants and keep water levels higher.
78	We have owned a home on Green Lake since the early 1950's. The increased use, farm run off, Ripon creek contributions, and to a lesser degree, more residences have had influence in dramatically decreasing water quality. When I see farm runoff as being nearly 70% of the problem, it makes sense. Slow build up to a problem like lake and well quality that may be irreversible.
79	We bought when the lake was clear and clean. I know GL Assoc. is working hard to get it back to being good. I would love to leave my grandchildren a clean lake.
80	I am worried about the gopy and the asian (jumping) crap making into Green Lake.
81	We are forcing alot of people to go onto the sewer system at a significant cost to the taxpayer, with very little benefit to the lake. Why are we not putting those efforts to reduce the agricultural runoff, which is the largest contributing factor to deteriorating conditions for Green Lake, per you own report.
82	I am sadly disappointed in the condition of the lake. Rich out of state people control Green Lake. The water quality of the lake has severely deteriated over the last 20 years and you are worried about people being able to build boat houses and donate cash. You should all be ashamed that the lake is so poor. Can't even go swimming along the shore anywhere. Fish are suffering too. Welcome to Lake Geneva
83	Sewering lake properties benefits everyone in general and not the property owner in specific. Costs should be borne by everyone in the District. Well maintained private sewers should continue to be permitted.
84	we have had a home on the lake since 1959. We had native aquatic plants and clear water. there were problems then regarding agricultural and septic run off. Now we have corrected much of this. I feel the biggest detriment to the lake is coming from the invasive species that are brought to GL via fisherman. Bass Tournaments are held each weekend, with multiple tournament going at the same time. These have contributed to many of our problems, especially noted are the Zebra mussels. these were never here until about 20-25 years ago. I recognize that the lake is for all to enjoy but this highly mobile sport has brought many of our problems to our Lake. Septics have been handled by offering low pressure sewer and many farms have gone by the wayside or they have built retension ponds. Still there are run offs that add to our complex problems due to High Nitrates. This is a large complex problem that is ever changing. Hope these comments help and together we can work to cull the issues that present themselves
85	We have been on the lake since 1975, was told by a local realtor at that time that the water in the lake was "drinkable". I don't know whether that was really true, but there is no doubt that the quality of the lake has deteriorated a great deal over the years. The duckweed is intolerable at times, the odor of dead fish (particularly carp) floating around is gag-worthy, the increase in weeds is very annoying to us as swimmers. We are all about the lake and also want to see the community thrive. It is imperative that we all do what is necessary to preserve/improve the quality of our lake. Tourism on GL is the economic driver of this area. People ALL need to pitch in to help improve the quality of the water. On the other hand, we pay very healthy taxes to be on the shoreline, where are those taxes being spent? I have an issue with a new neighbor (who knows/cares nothing about nature) who elevated the level of his lot approx. 4 feet above mine, also filled in the ditch at the road and created a slope. All rainwater will now flow down onto my old garage and onto my property. I did have Matt Kirkman and Derek Kavanaugh visit our property. A letter was written to the Land Conservation people as well. Essentially, they agreed that this is a problem, but also stated that they have no teeth to enforce any stormwater run-off regulations. What is the point of regulations if there is no enforcement? Where have my real estate taxes gone for 48 years? The same is true about chopping down trees. We see many lots get clearcut unnecessarily, strictly to clear the owners view. When we complained to the zoning board, again there is no enforcement and they only act when there is a complaint. Once a mature tree is removed, the damage is done. This kind of ineffective government does not benefit us in any way. We heartily support any efforts to restore the health of Green Lake and appreciate everyone's efforts in doing so. Thank you for the opportunity to give my input.
86	Agricultural runoff is the most important source of polution and we have little buy in from our farmers. *Name Removed* large cattle operation on the south west side of the lake needs to be addressed as they spread manure along half of the south shore. Short term rentals also need to be addressed. They disrupt the neighborhood feel of the lake and cause increased noise, pollution and garbage.
87	Thank you for asking. I think we need to be more concerned with fertilizer and agriculture. Can we stop manure spreading so close to the lake? Can we help farmers invest in better equipment to better “bury” the manure? Keep up the good work with teaching farmers and all about land management practices. Aquatic weed harvesting helps, but doesn’t get to the root of the problem. I don’t imagine we can impact water level much. Im unsure about herbicide, but wonder if we could replace with native species. I manually select and pick weeds at both my pier locations on the East end and it has made a difference each year. This year, the aquatic growth and duckweed seemed slightly more under control due to lack of rain, hence less runoff and less push and flow from the Silver Creek.
88	1) When I was growing up in the 1950s, one could regularly see the lake bottom in 30ft of water. 2) I see a lot of on-lake construction with exposed soil and improperly installed (as in completely ineffective) silt fences. Who is responsible for approving silt fence installations and for monitoring their function?
89	Why is there not a regulation that bands the application of nitrogen fertilizer within a certain distance from the lake waters edge [shoreline]? (i.e., 50’ or 100’). When you see deep green lawns right next to the water’s edge, common sense tells you during a moderate or heavy rain that soluble nitrogen quickly moves down in the soil and into the lake. Having a “no nitrogen fertilizing zone from the shoreline is an easy and no-cost option to help minimize nutrients from getting into Green Lake contributing to the excess growth of duckweed, algae and plants.
90	We need more enforcement of boating regulations and wake boat restrictions.
91	I have found the videos and publication from the Green Lake Association to be very educational
92	My biggest concern is the Mill Pond. Muck build up, cat tails, lily pads, EMF, etc., continue to invade the pond, causing depth/navigation issues, water quality issues, decrease in fish levels, and it just gets worse and worse every year. The ENTIRE Mill Pond could be not only a gateway to attract boaters to come under the bridge and park downtown, as well as allow paddle boards, canoes, kayaks, fishing boats, etc to use the ENTIRE Mill Pond. It could be amazing, but its treated as a 2nd thought to the big lake in my opinion.
93	Keep up the good work! If we all work together, we can make a difference in the water quality of Big Green.
94	There needs to be restrictions set and enforced for wake boat traffic. These boats are destroying natural plant life that supports our fishery, and accelerating shoreline erosion..
95	Can somebody explain why these masses of weeds (not duck weed) are floating around Green Lake recently. Is this because of Wake Boats? If so, how about more regulation of Wake Boats.
96	Consideration to raising Lawson St bridge as well as a study on size of outlet (only one for the lake) to determine if lake can be “cycled “ more expeditiously. I heard it takes approximately 20 years to cycle the lake versus others that occur more frequently. What is the impact for GL?
97	DNR should quit worrying about Green Lake. Lake Mendota is 10,000 times worse. Fix that first DNR
98	I believe farming is responsible for the largest deposition of phosphorus in Green Lake, and the farmland in Green Lake County is not taxed at a level comparable to its value.
99	3rd gen prop owner. water quality way down, too many boats,many large wakes causing shore erosion. too many trees cut down just for wrong reasons. duckweed inch thick. just a big shitshow on weekends. dont fish on weekends or holidays for past 20 years.

C

APPENDIX C

Aquatic Plant Survey Data

- Select Native Plant Distribution Maps
- Littoral Frequency of Occurrence Data Matrices

Coontail (*Ceratophyllum demersum*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3082

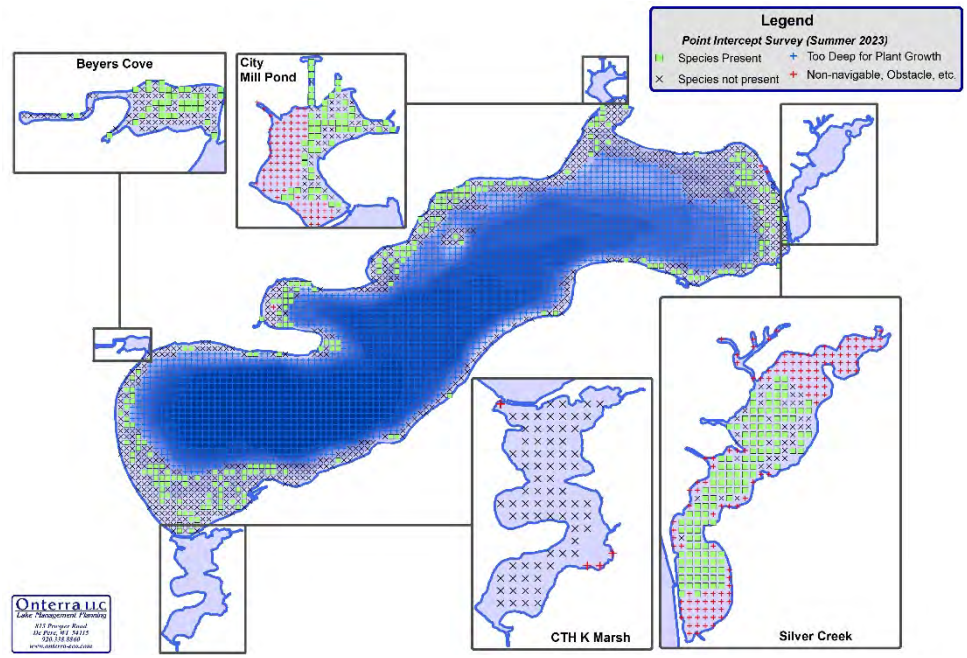


Photo Credit: Onterra

- Coontail has whorls of leaves which fork into two to three segments, providing surface area for invertebrate habitat.
- Does not produce true roots and is often found growing entangled amongst other aquatic plants or matted at the surface.
- Coontail has a high tolerance for low-light conditions which allows this plant to become more abundant in eutrophic waterbodies with higher nutrients and low water clarity.

Common waterweed (*Elodea canadensis*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3499

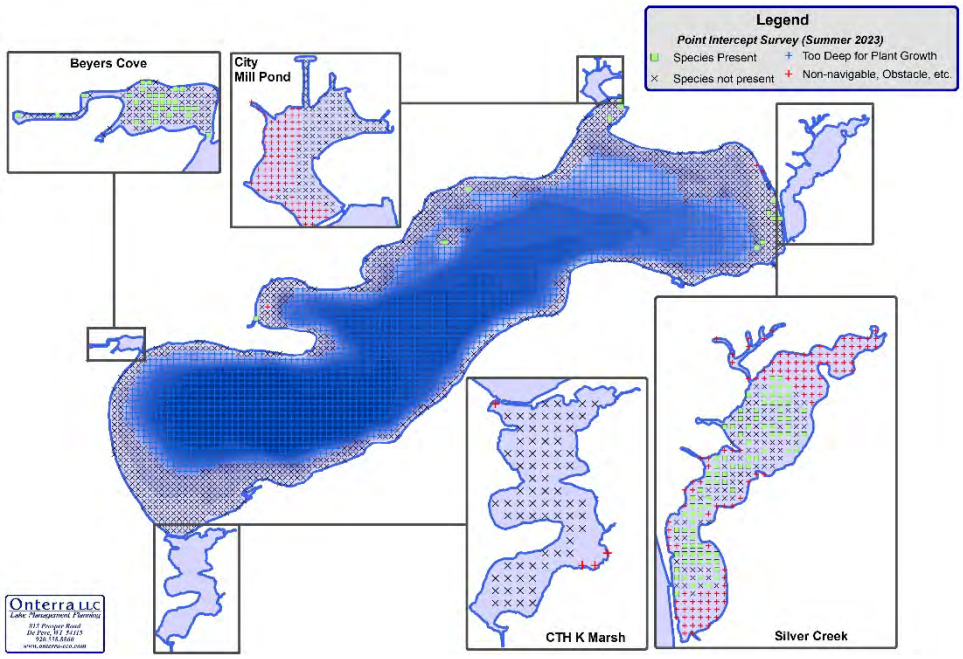


Photo Credit: Onterra

- Although it sometimes produces root-like structures that bury themselves into the sediment, it is largely an unrooted plant that can obtain nutrients directly from the water.
- As a result, this plant's location in a lake can be dependent upon water movement.

Wild Celery (*Vallisneria americana*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=21276

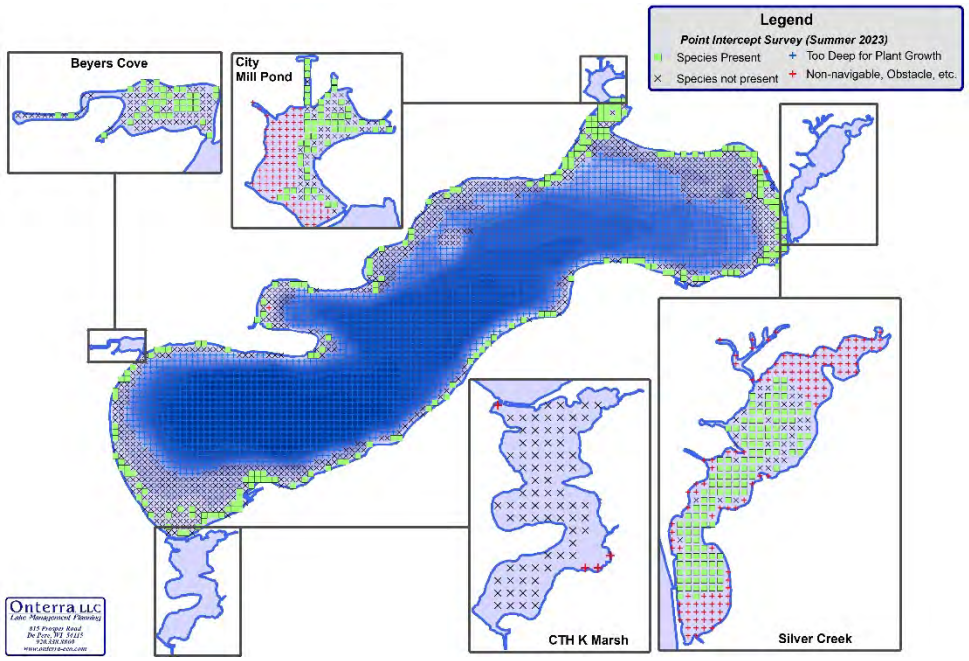


Photo Credit: Onterra

- Wild Celery has long ribbon-like leaves that tend to sway with the current and projects a singular small white flower to the surface from a spiraling stalk.
- Prefers to grow over harder substrates and is tolerant of low-light conditions.

Muskgrasses & Stoneworts (*Chara & Nitella*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3499

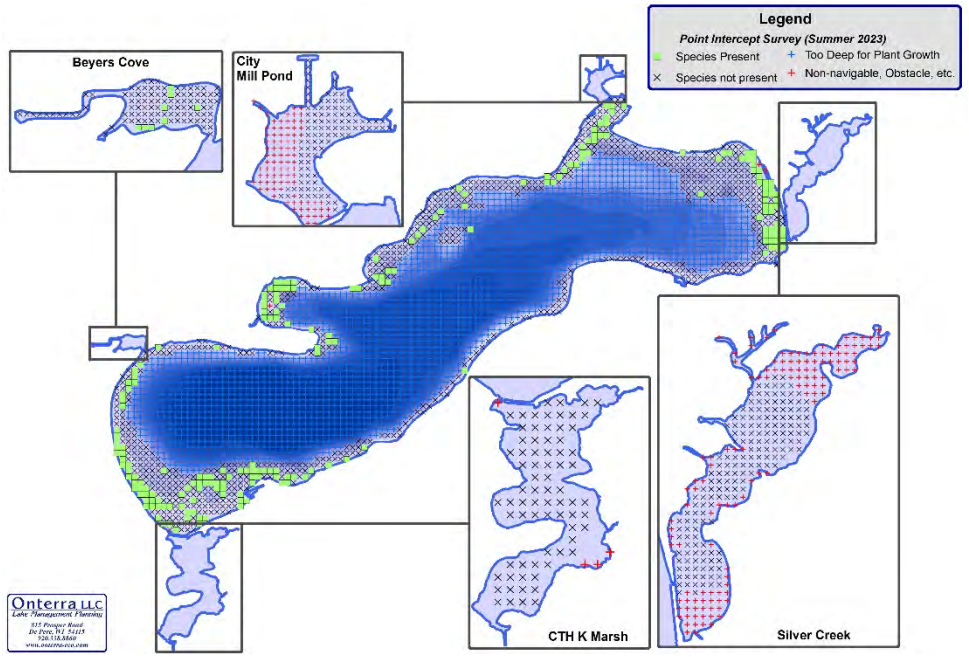


Photo Credits: Onterra

- These groups of plants grow unrooted and generally and low along the bottom of the water column and can provide dense coverage. Their large beds help stabilize bottom sediments.
- Muskgrasses require lakes with good water clarity, and are often some of the deepest growing plants in the lake.
- Although these two groups of plants are similar in appearance, they can generally be distinguished by stonewort's having forked ends and muskgrasses do not. Muskgrasses commonly have a skunk like smell while stonewort's do not.

Sago pondweed (*Stuckenia pectinata*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=21276

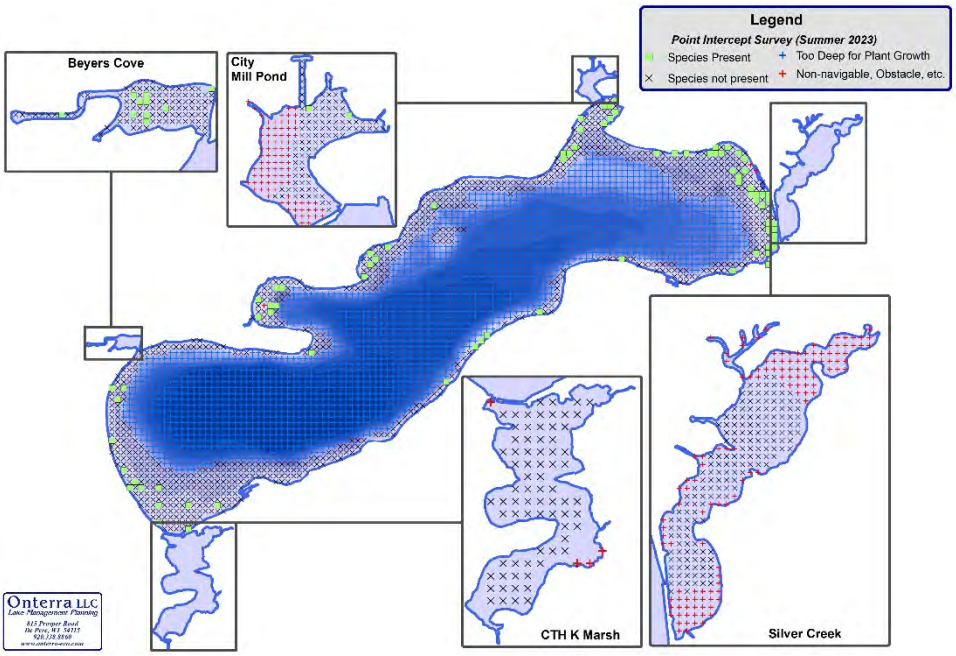


Photo Credit: Onterra

- Tolerant of disturbance and is often found in greater abundance in degraded lakes that have higher nutrient concentrations and low water clarity.
- Waterfowl have been observed to use sago pondweed as a major food source.

Fries' pondweed (*Potamogeton friesii*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3499

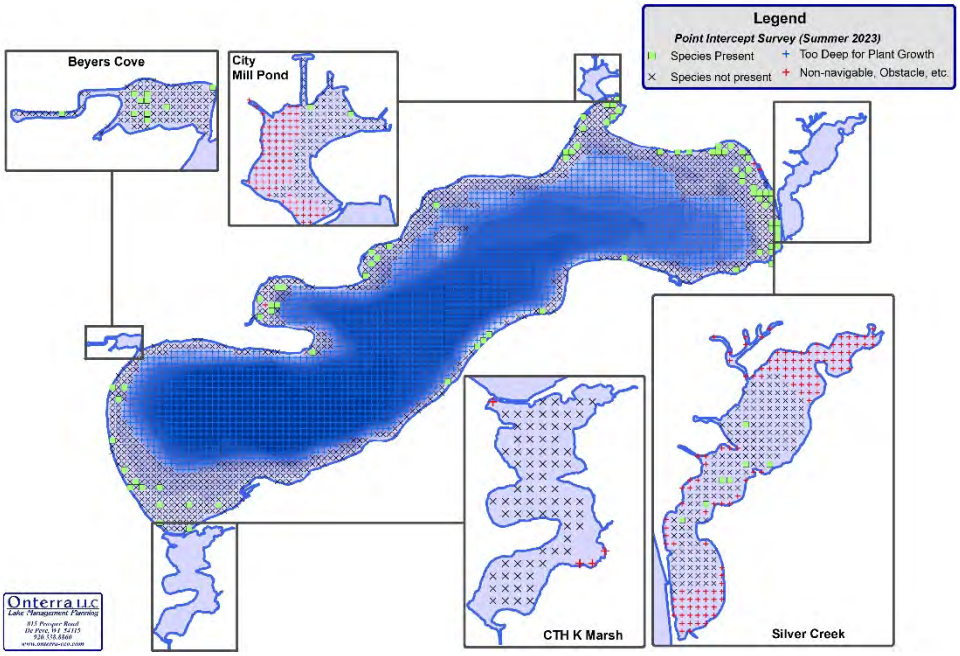


Photo Credit: Onterra

- Fries' pondweed is a small pondweed that may be difficult to identify down to species but can be distinguished from other small pondweeds by its unique winter bud which is on a cross-sectional plane from the rest of the plant (see photo). It also generally has five vanes which can be observed though a magnifying glass.
- Delicate submersed plant that is rooted to the sediment and creates a "winter bud" which acts similar to a seed without entering a dormant state like a seed would.

Northern watermilfoil (Myriophyllum sibiricum) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3082

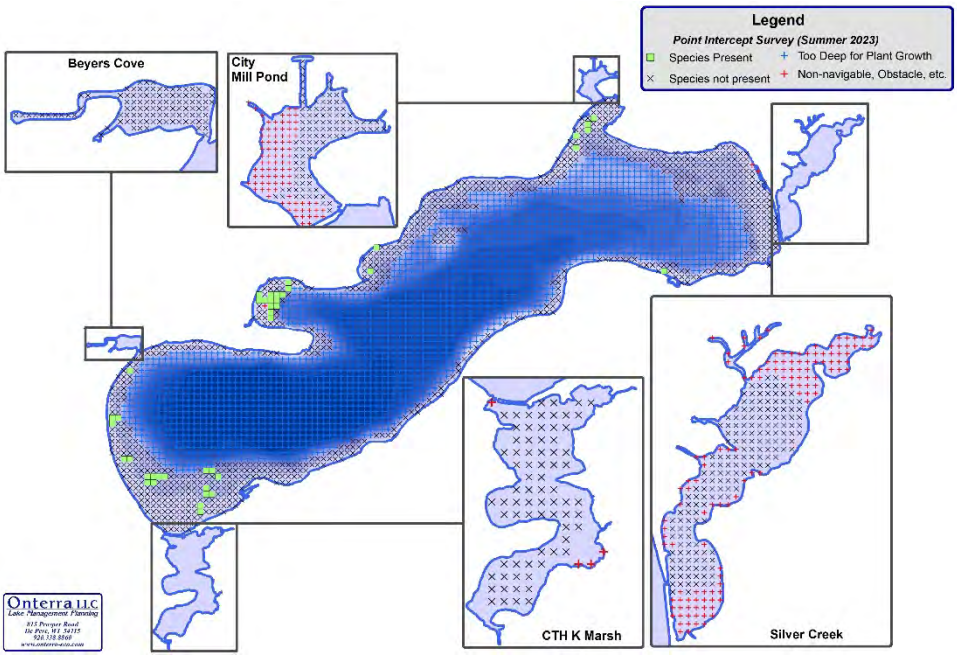


Photo Credit: Onterra

- Northern watermilfoil is arguably the most similar native species to the invasive Eurasian watermilfoil. These two plants can hybridize with one another.
- Northern watermilfoil also has less leaflets on its leaves (5-10 pairs) than Eurasian watermilfoil (12-16 pairs).
- Northern watermilfoil can be distinguished from the invasive Eurasian watermilfoil in that northern watermilfoil has more whorls of leaves per length of stem which appears as a bushier plant than Eurasian watermilfoil.

White water crowfoot (*Ranunculus aquatilis*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3499

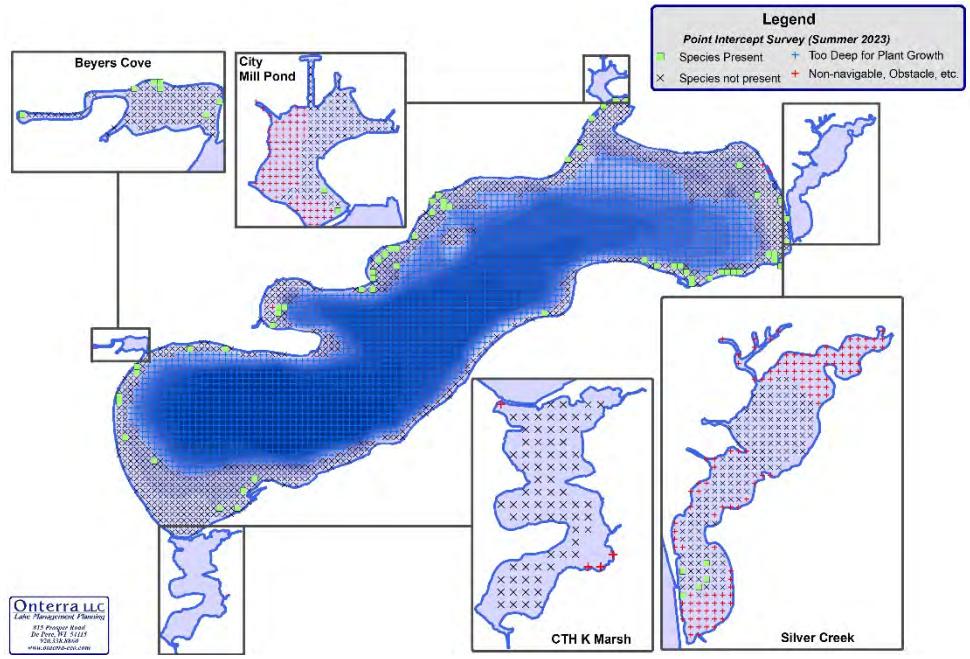


Photo Credit: Robert W. Freckmann

- This plant grows in shallow water with mucky sediment in shallow water.
- The leaves of white water crowfoot alternate off the stem and appear more curly than some of its look alikes. The leaves branch in a “Y” manner multiple times.

Water stargrass (*Heteranthera dubia*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3082

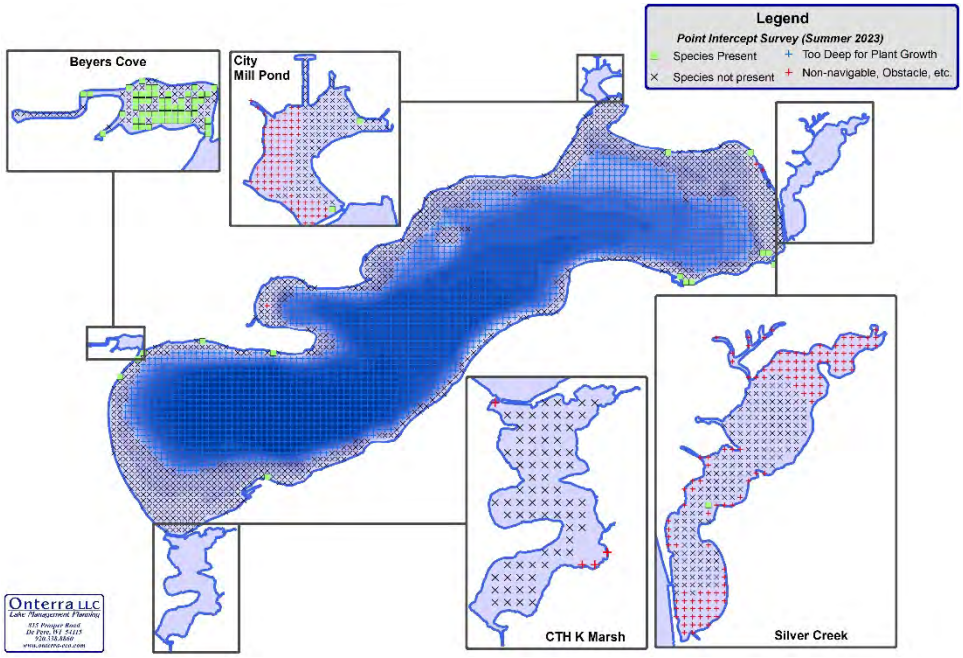


Photo Credit: Onterra

- Water stargrass has a similar morphology to some of the pondweed species with a rooted base, stem, and leaves that project off of the stem. A notable difference is that water stargrass does not have a midvein on its leaves like all pondweeds do.
- Does not produce true roots and is often found growing entangled amongst other aquatic plants or mated at the surface in very shallow water.

Clasping-leaf pondweed (*Potamogeton richardsonii*) Native

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=3499

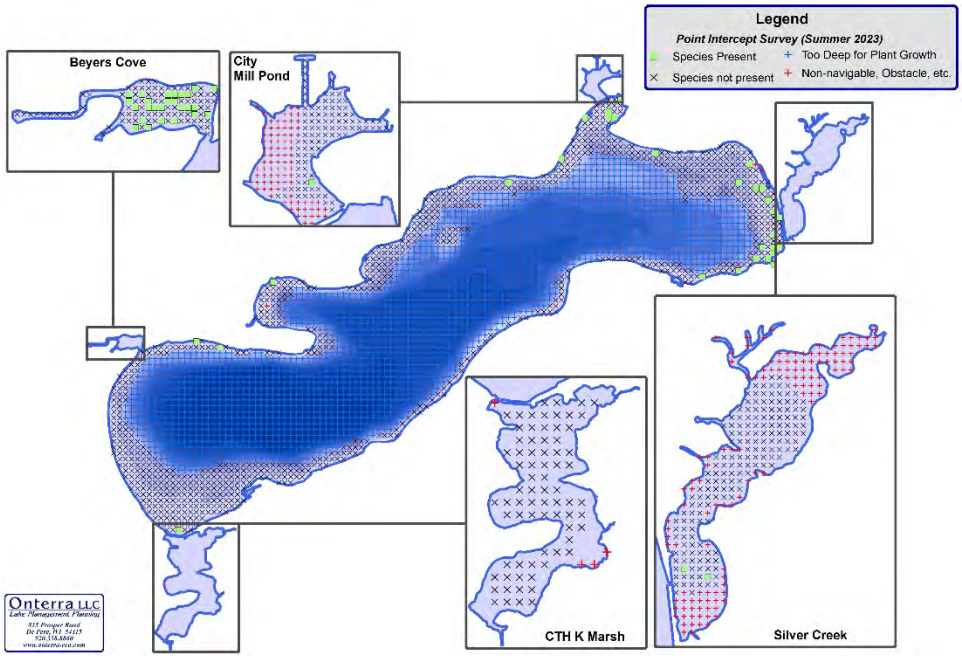


Photo Credit: Onterra

- Identifiable characteristics are the absence of a petiole on its leaves. The leaves wrap partially around the stem at the leaf base. The stems are often more white than other pondweeds and have a zigzag shape towards the top of the plant.
- This plant is one of the larger pondweeds which are good for fish habitat due to the cover they provide, and greater surface area for invertebrates (important food source for many fishes) to inhabit.

Eurasian watermilfoil (*Myriophyllum spicatum*) Exotic

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=4313

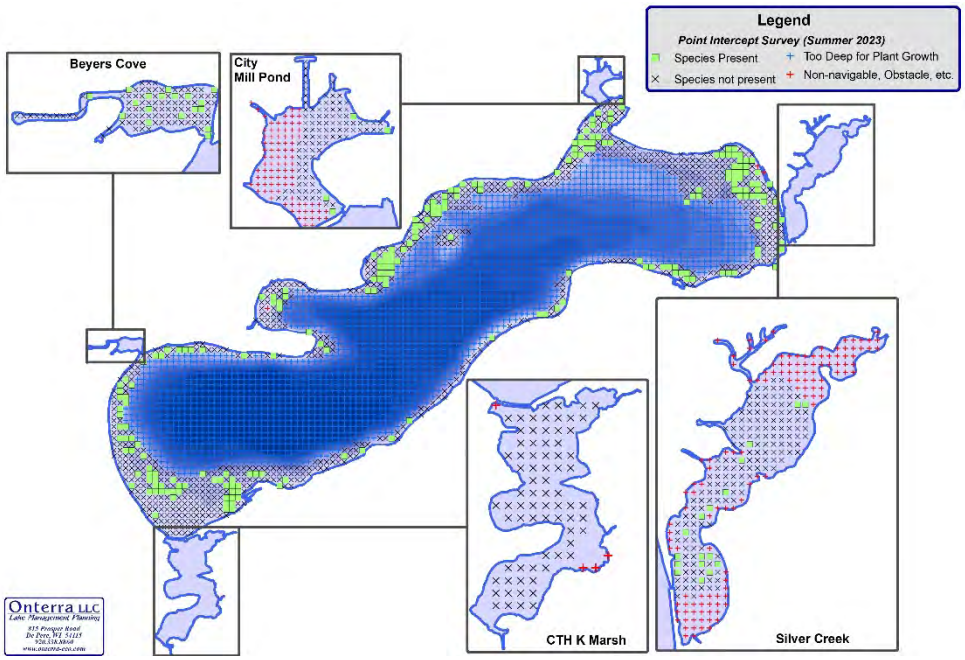


Photo Credit: Onterra

- A common and problematic invasive species in Wisconsin. Most developed lakes in Wisconsin have been exposed to this plant and some have even experienced change in its aquatic environment due to this plant.
- It can be identified by its slender shape when held out of water, the leaves are in whorls of around four, and each leaf has 24 or more leaflets (12 on each side of a leaf). There are some native milfoil plants in Wisconsin, but they are more likely to hold their bushy shape when pulled out of the water and have less leaflets on each of their leaves.

Curly-leaf pondweed (*Potamogeton crispus*) Exotic

FLORA of WISCONSIN: https://wisflora.herbarium.wisc.edu/taxa/index.php?taxon=4618

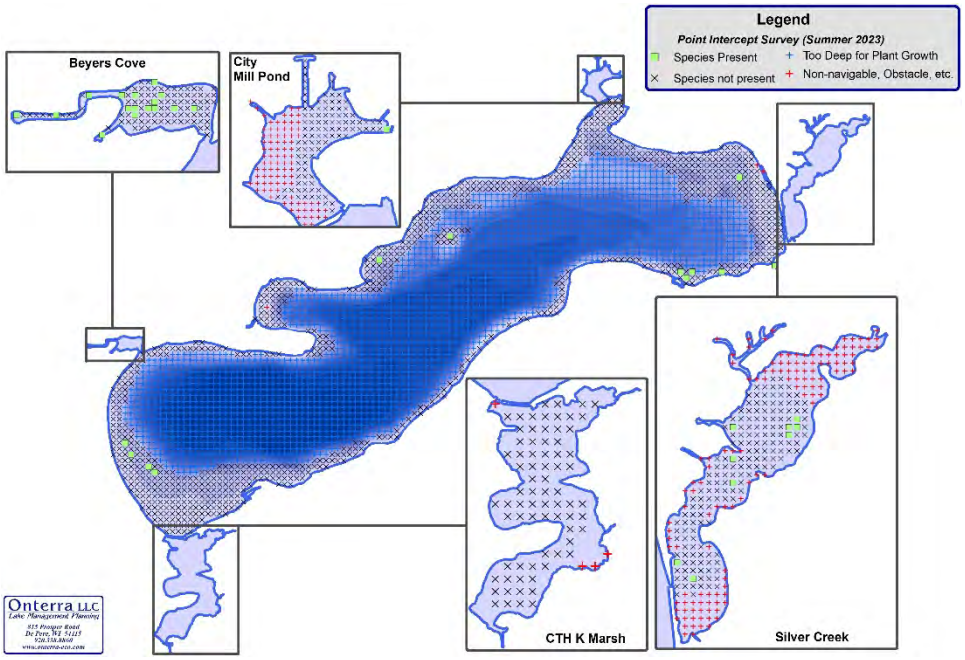


Photo Credit: Onterra

- A common and problematic invasive species in Wisconsin. It is more likely to be seen in the beginning half of the growing season, as it generally finishes its life cycle and starts to decay earlier than the native plants in Wisconsin.
- It's easily identifiable by its curly and serrated leaf edges which none of the native pondweeds of Wisconsin have.

Green Lake

Summer Point-Intercept Aquatic Plant Data Matrix

Scientific Name	Common Name	LFOO (%)		
		2007	2014	2023
Ceratophyllum demersum	Coontail	39.5	53.2	29.9
Myriophyllum sibiricum X spicatum	Hybrid watermilfoil	45.6	45.0	28.0
Vallisneria americana	Wild celery	7.7	14.2	27.1
Chara spp.	Muskgrasses	6.2	8.0	26.4
Stuckenia pectinata	Sago pondweed	13.2	16.7	10.0
Ranunculus aquatilis	White water crowfoot	12.3	13.0	7.5
Potamogeton friesii	Fries' pondweed	0.0	2.0	14.8
Elodea canadensis	Common waterweed	10.1	7.3	1.5
Myriophyllum sibiricum	Northern watermilfoil	2.4	1.6	5.2
Najas flexilis	Slender naiad	10.3	0.2	0.7
Potamogeton crispus	Curly-leaf pondweed	6.2	2.6	1.5
Potamogeton berchtoldii & Potamogeton pusillus	Slender pondweed and Small pondweed	0.0	3.4	4.2
Potamogeton richardsonii	Clasping-leaf pondweed	1.6	2.5	3.6
Ruppia cirrhosa	Spiral ditch-grass	9.9	0.5	0.0
Heteranthera dubia	Water stargrass	4.0	2.2	1.7
Potamogeton pusillus	Small pondweed	0.0	4.9	1.2
Potamogeton berchtoldii	Slender pondweed	0.0	0.1	3.6
Potamogeton zosteriformis	Flat-stem pondweed	2.0	1.2	1.2
Zannichellia palustris	Horned pondweed	3.4	1.1	0.4
Fissidens spp. & Fontinalis spp.	Aquatic Moss	3.5	0.1	0.0
Potamogeton foliosus	Leafy pondweed	1.9	0.6	0.2
Potamogeton nodosus	Long-leaf pondweed	0.2	0.6	0.6
Potamogeton illinoensis	Illinois pondweed	0.2	0.8	0.2
Potamogeton strictifolius	Stiff pondweed	0.0	0.5	0.5
Potamogeton praelongus	White-stem pondweed	0.3	0.2	0.4
Wolffia spp.	Watermeal spp.	0.0	0.0	0.4
Nymphaea odorata	White water lily	0.0	0.2	0.2
Lemna minor	Lesser duckweed	0.0	0.0	0.4
Nitella spp.	Stoneworts	0.2	0.1	0.1
Eleocharis acicularis	Needle spikerush	0.0	0.2	0.1
Potamogeton gramineus	Variable-leaf pondweed	0.1	0.0	0.1
Spirodela polyrhiza	Greater duckweed	0.0	0.0	0.1
Schoenoplectus acutus	Hardstem bulrush	0.1	0.1	0.0
Potamogeton amplifolius	Large-leaf pondweed	0.2	0.0	0.0
Lemna turionifera	Turion duckweed	0.0	0.0	0.1
Lemna trisulca	Forked duckweed	0.0	0.0	0.1
Elatine minima	Waterwort	0.0	0.0	0.1
Najas marina	Spiny naiad	0.1	0.0	0.0

Beyers Cove

Summer Point-Intercept Aquatic Plant Data Matrix

Scientific Name	Common Name	LFOO (%)						
		2013	2014	2015	2016	2017	2018	2023
Ceratophyllum demersum	Coontail	51.4	59.6	17.3	28.3	28.4	57.0	34.9
Elodea canadensis	Common waterweed	21.0	12.8	0.0	9.4	25.7	95.3	28.3
Myriophyllum spicatum	Eurasian watermilfoil	81.9	20.2	2.9	19.8	1.8	5.6	17.0
Heteranthera dubia	Water stargrass	0.0	0.0	0.0	0.9	0.0	0.0	51.9
Potamogeton crispus	Curly-leaf pondweed	38.1	0.0	1.0	2.8	0.0	0.0	15.1
Nymphaea odorata	White water lily	1.9	6.4	8.7	8.5	3.7	4.7	12.3
Potamogeton richardsonii	Clasping-leaf pondweed	8.6	0.0	0.0	0.0	0.0	2.8	24.5
Vallisneria americana	Wild celery	0.0	0.0	0.0	0.9	0.9	13.1	18.9
Najas guadalupensis	Southern naiad	0.0	0.0	1.0	0.0	2.8	9.3	28.3
Ranunculus aquatilis	White water crowfoot	1.0	0.0	1.0	0.0	0.0	0.0	6.6
Stuckenia pectinata	Sago pondweed	2.9	0.0	2.9	2.8	2.8	0.0	9.4
Lemna minor	Lesser duckweed	0.0	0.0	0.0	0.0	0.9	0.0	12.3
Lemna turionifera	Turion duckweed	10.5	0.0	0.0	0.0	0.0	0.0	0.0
Chara spp.	Muskgrasses	0.0	0.0	0.0	0.0	0.0	0.9	7.5
Wolffia spp.	Watermeal spp.	0.0	0.0	0.0	0.0	0.0	0.0	9.4
Potamogeton berchtoldii	Slender pondweed	0.0	0.0	0.0	0.0	0.0	0.0	9.4
Najas flexilis	Slender naiad	0.0	0.0	0.0	0.9	0.0	0.0	2.8
Zannichellia palustris	Horned pondweed	0.0	0.0	0.0	0.0	0.0	0.0	3.8
Myriophyllum sibiricum	Northern watermilfoil	0.0	0.9	2.9	0.0	0.0	0.0	0.0
Potamogeton praelongus	White-stem pondweed	1.9	0.0	0.0	0.0	0.0	0.0	0.9
Fissidens spp. & Fontinalis spp.	Aquatic Moss	0.0	0.9	1.0	0.0	0.0	0.0	0.0
Spirodela polyrhiza	Greater duckweed	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Potamogeton robbinsii	Fern-leaf pondweed	0.0	0.0	0.0	0.0	0.0	0.0	1.9
Potamogeton pusillus	Small pondweed	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Nuphar variegata	Spatterdock	1.0	0.0	0.0	0.0	0.9	0.0	0.0
Potamogeton friesii	Fries' pondweed	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Lemna trisulca	Forked duckweed	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Eleocharis acicularis	Needle spikerush	0.0	0.0	0.0	0.0	0.0	0.0	0.0

City Millpond

Summer Point-Intercept Aquatic Plant Data Matrix

Scientific Name	Common Name	LFOO (%)						
		2013	2014	2015	2016	2017	2018	2023
Ceratophyllum demersum	Coontail	80.1	66.7	20.1	55.7	65.4	75.8	53.9
Lemna trisulca	Forked duckweed	24.1	36.8	52.8	63.9	45.1	37.6	6.9
Myriophyllum spicatum	Eurasian watermilfoil	53.4	20.1	45.8	52.5	25.3	37.6	3.9
Nymphaea odorata	White water lily	38.7	37.4	29.9	32.9	22.8	29.9	7.8
Wolffia spp.	Watermeal spp.	1.0	7.5	22.2	12.0	61.1	0.0	5.9
Lemna minor	Lesser duckweed	0.0	0.0	28.5	13.9	49.4	8.3	0.0
Ranunculus aquatilis	White water crowfoot	3.7	6.9	22.9	12.0	1.9	15.3	2.0
Potamogeton crispus	Curly-leaf pondweed	26.2	3.4	4.2	6.3	3.7	12.7	1.0
Potamogeton friesii	Fries' pondweed	7.9	1.1	0.0	9.5	6.2	23.6	2.9
Elodea canadensis	Common waterweed	7.9	2.3	17.4	15.2	3.7	4.5	0.0
Heteranthera dubia	Water stargrass	7.3	6.3	17.4	9.5	1.9	0.6	2.0
Vallisneria americana	Wild celery	0.5	4.0	6.9	6.3	1.2	10.2	11.8
Spirodela polyrhiza	Greater duckweed	1.6	6.3	23.6	1.3	0.0	0.0	4.9
Chara spp.	Muskgrasses	1.6	1.7	16.0	5.1	0.0	0.6	0.0
Stuckenia pectinata	Sago pondweed	1.6	2.3	3.5	5.7	1.9	5.7	2.0
Lemna turionifera	Turion duckweed	2.1	8.0	0.0	0.0	0.0	0.0	6.9
Potamogeton richardsonii	Clasping-leaf pondweed	0.5	0.6	1.4	0.6	1.9	5.7	1.0
Potamogeton zosteriformis	Flat-stem pondweed	0.5	0.6	0.0	0.6	1.9	3.2	1.0
Zannichellia palustris	Horned pondweed	3.1	0.0	0.0	0.0	0.0	0.0	0.0
Potamogeton strictifolius	Stiff pondweed	1.6	0.0	1.4	0.0	0.0	0.6	0.0
Potamogeton nodosus	Long-leaf pondweed	1.0	0.0	0.0	0.0	0.0	0.0	1.0
Sparganium eurycarpum	Common bur-reed	0.0	0.0	0.7	0.0	1.2	0.0	0.0
Najas guadalupensis	Southern naiad	1.0	0.0	0.7	0.0	0.0	0.0	0.0
Myriophyllum sibiricum	Northern watermilfoil	0.0	1.1	0.7	0.0	0.0	0.0	0.0
Nuphar variegata	Spatterdock	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Eleocharis acicularis	Needle spikerush	0.0	0.0	0.0	0.0	0.0	0.6	0.0

Silver Creek

Summer Point-Intercept Aquatic Plant Data Matrix

Scientific Name	Common Name	LFOO (%)							
		2007	2013	2014	2015	2016	2017	2018	2023
Ceratophyllum demersum	Coontail	79.5	94.9	74.9	40.7	71.5	61.4	71.2	78.2
Elodea canadensis	Common waterweed	0.0	49.5	51.2	69.9	82.0	56.7	67.7	52.4
Lemna minor & L. turionifera	Lesser and turion duckweed	75.9	57.5	23.2	6.2	58.7	59.0	41.2	55.9
Wolffia spp.	Watermeal spp.	46.7	37.8	23.2	0.9	53.5	54.3	23.0	47.1
Lemna minor	Lesser duckweed	75.9	0.0	0.0	0.0	58.7	59.0	41.2	55.9
Myriophyllum spicatum	Eurasian watermilfoil	74.4	23.6	6.9	15.0	26.2	20.0	14.2	10.0
Potamogeton crispus	Curly-leaf pondweed	6.7	21.5	20.2	15.9	19.2	42.9	17.3	5.3
Nymphaea odorata	White water lily	56.9	17.5	4.9	10.6	4.7	5.2	7.5	0.6
Lemna turionifera	Turion duckweed	0.0	57.5	23.2	6.2	0.0	0.0	0.0	0.0
Ranunculus aquatilis	White water crowfoot	0.0	2.9	4.4	20.4	25.0	3.3	7.1	2.9
Spirodela polyrhiza	Greater duckweed	0.0	38.9	0.0	0.0	0.0	0.0	0.0	0.0
Stuckenia pectinata	Sago pondweed	1.0	6.2	5.9	8.8	5.2	6.7	9.3	4.1
Potamogeton zosteriformis	Flat-stem pondweed	0.0	4.0	4.4	5.3	11.0	4.8	12.4	2.9
Potamogeton richardsonii	Clasping-leaf pondweed	0.0	0.0	0.5	0.9	0.0	0.0	0.9	1.2
Vallisneria americana	Wild celery	0.0	0.0	0.0	0.9	0.6	0.0	0.4	1.2
Potamogeton strictifolius	Stiff pondweed	0.0	0.0	0.0	0.0	0.0	1.4	1.3	0.0
Heteranthera dubia	Water stargrass	0.0	0.0	0.0	0.0	1.2	0.0	0.9	0.6
Najas guadalupensis	Southern naiad	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.6
Potamogeton friesii	Fries' pondweed	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.6
Eleocharis acicularis	Needle spikerush	0.0	0.0	1.0	0.0	0.6	0.0	0.0	0.0
Potamogeton nodosus	Long-leaf pondweed	0.0	0.0	0.0	0.0	0.6	0.5	0.0	0.0
Potamogeton foliosus	Leafy pondweed	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Myriophyllum sibiricum	Northern watermilfoil	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Lemna trisulca	Forked duckweed	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Acorus americanus	Sweetflag	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0

County K Marsh

Summer Point-Intercept Aquatic Plant Data Matrix

Scientific Name	Common Name	LFOO (%)				
		2014	2016	2017	2018	2023
Nymphaea odorata	White water lily	2.2	2.2	0.0	0.0	1.4
Stuckenia pectinata	Sago pondweed	0.0	1.1	0.0	1.2	0.0
Ceratophyllum demersum	Coontail	1.1	1.1	0.0	0.0	0.0
Potamogeton crispus	Curly-leaf pondweed	0.0	0.0	0.0	1.2	0.0

D

APPENDIX D

Comment Response Document for the Official First Draft *(To Be Included in Final Version)*