A

APPENDIX A

Public Participation Materials

Presentation Outline

- Onterra, LLC
- Why Create a Management Plan?
- Elements of a Lake Management Planning Project
  - Data & Information
  - Planning Process

Onterra, LLC

- Founded in 2005
- Staff
  - Three full-time ecologists
  - Two part-time ecologists
  - Two interns
- Services
  - Science and planning
- Philosophy
  - Promote realistic planning
  - Assist, not direct

Why create a lake management plan?

- To create a better understanding of lake's positive and negative attributes.
- To discover ways to minimize the negative attributes and maximize the positive attributes.
- To foster realistic expectations and dispel myths.
- To create a snapshot of the lake for future reference and planning.

Elements of an Effective Lake Management Planning Project

Data and Information Gathering

Environmental & Sociological

Planning Process

Brings it all together

Data and information gathering

- Study Components
  - Water Quality Analysis
  - Watershed Assessment
  - Aquatic Plant Surveys
  - Fisheries Data Integration
  - Stakeholder Survey

Water Quality Analysis

- General water chemistry
- Nutrient analysis
  - Lake trophic state (Eutrophication)
  - Limiting plant nutrient
- Supporting data for watershed modeling

Watershed Assessment

- Delineation of drainage basin
- Modeling
  - Land cover
  - Phosphorus loading
  - Scenario development

Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Curly-leaf pondweed survey
  - Point-intercept survey
  - Plant community mapping
  - Volunteer survey findings

Non-native Aquatic Plants

Curly-leaf Pondweed

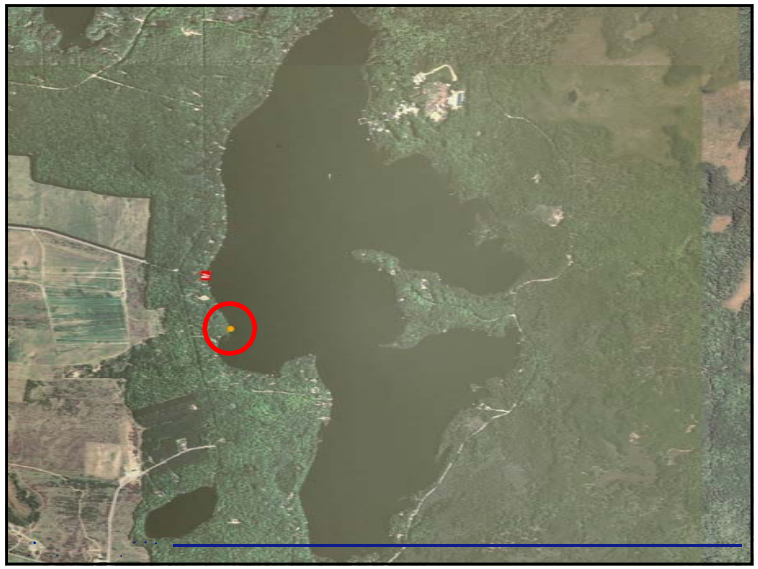
Non-native Aquatic Plants

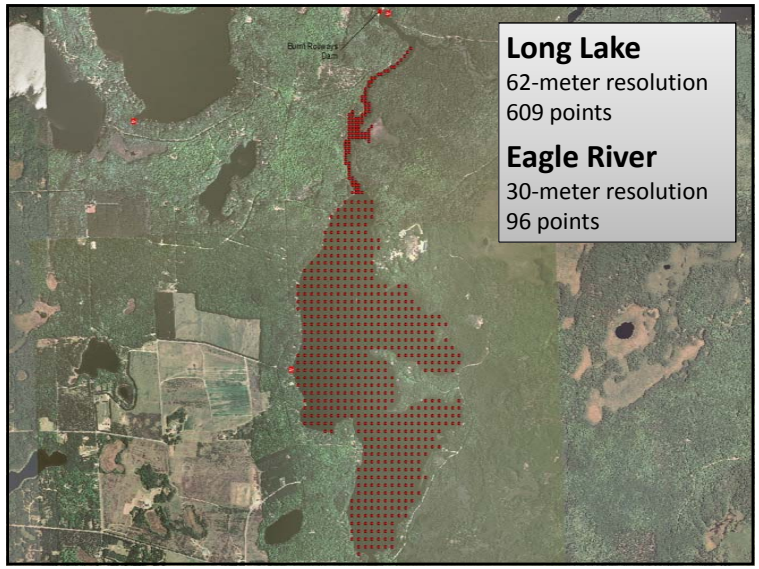
Eurasian Water Milfoil

2009 Treatment in Eagle River

Preliminary Results:

Excellent Treatment Response



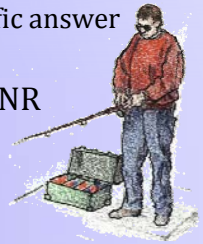


Fisheries Data Integration

- No fish sampling completed
- Assemble data from WDNR, USGS, USFWS, & GLIFWC
- Fish survey results summaries (if available)
- Use information in planning as applicable

Stakeholder Survey

- Standard survey used as base
  - Planning committee develops additional questions and options
  - Must not lead respondent to specific answer through a "loaded" question
- Survey must be approved by WDNR



Planning Process

Planning Committee Meetings

Study Results (including a stakeholder survey)
Conclusions & Initial Recommendations
Management Goals
Management Actions
Timeframe
Facilitator(s)

↓

Implementation Plan

Thank You

Many of the graphics used in this presentation were supplied by:

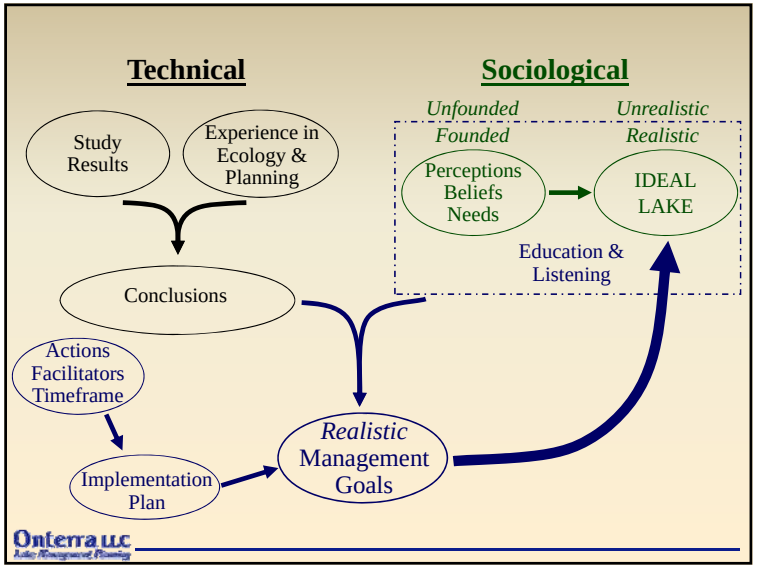
Wisconsin Lakes Partnership

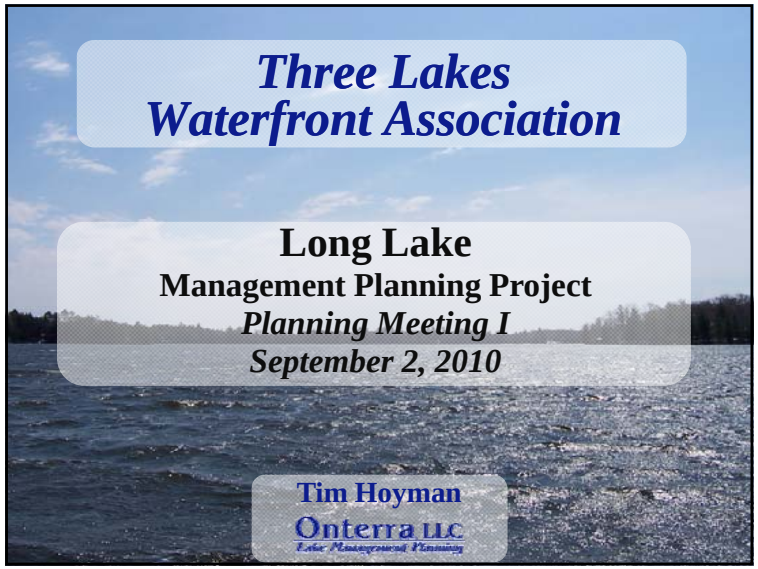
Extension

WISCONSIN DEPT. OF NATURAL RESOURCES

The Planning Process

…it's not as easy as you may think.



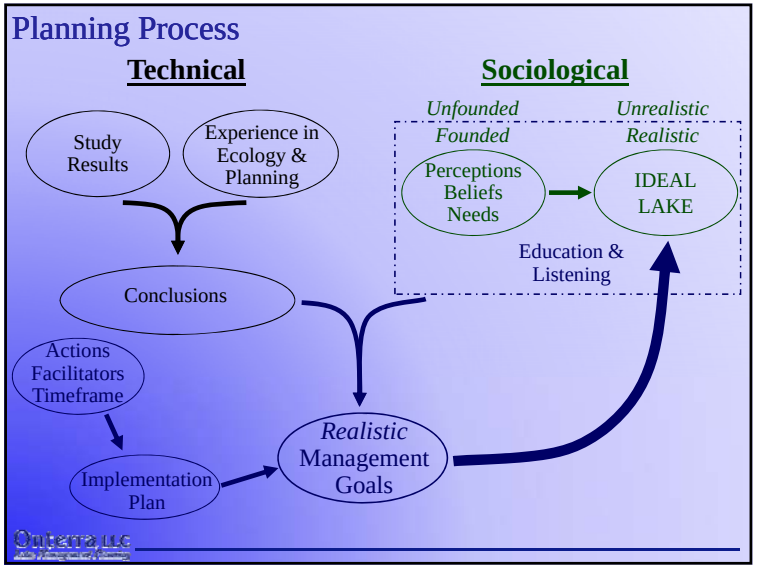


Presentation Outline

- Lake Management Planning Project Overview
- Study Results
  - Water Quality
  - Watershed
  - Aquatic Plants
- "Big Picture"
- Next Steps

Study and Plan Goals

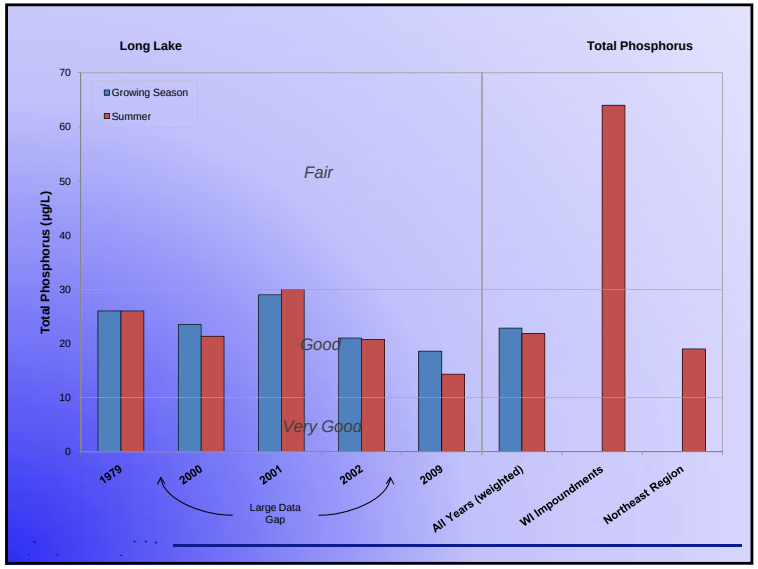
- Collect & Analyze Data
- Construct Long-Term & Useable Plan

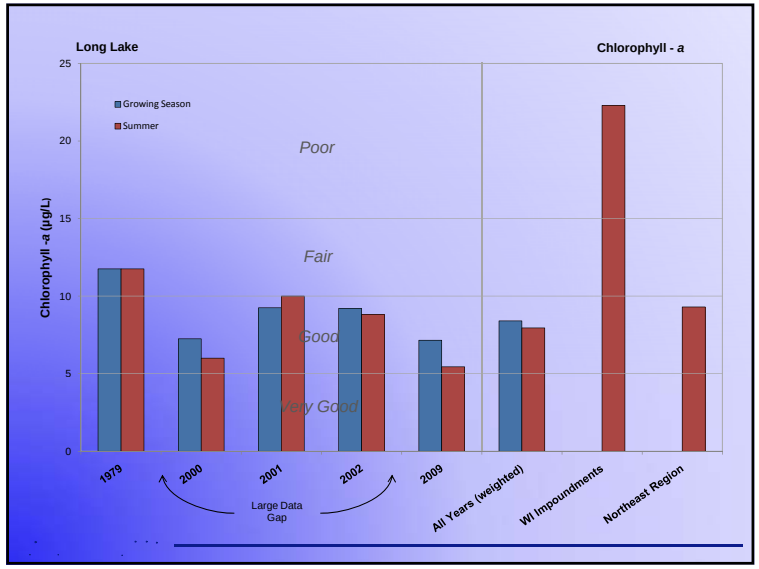


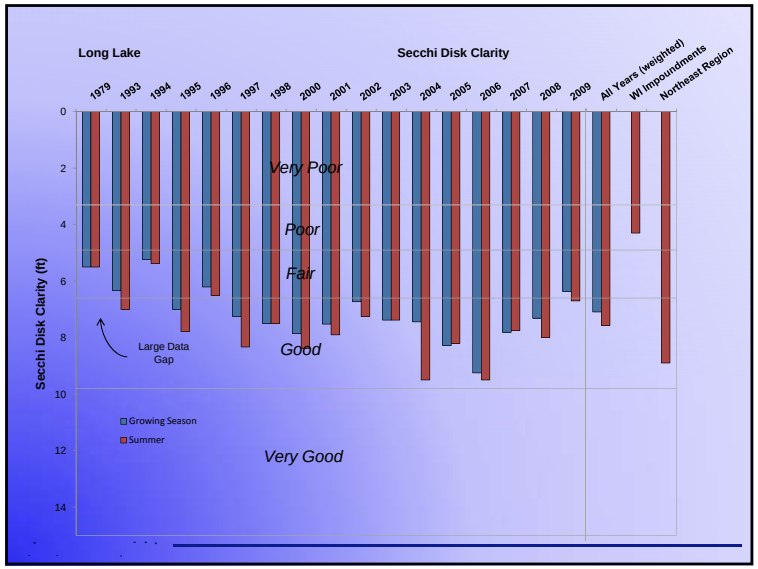
Water Quality

- ↑ Phosphorus (Limiting Plant Nutrient)
- ↑ Chlorophyll-*a* (Algal Abundance)
- ↓ Water Clarity (Secchi Disk)

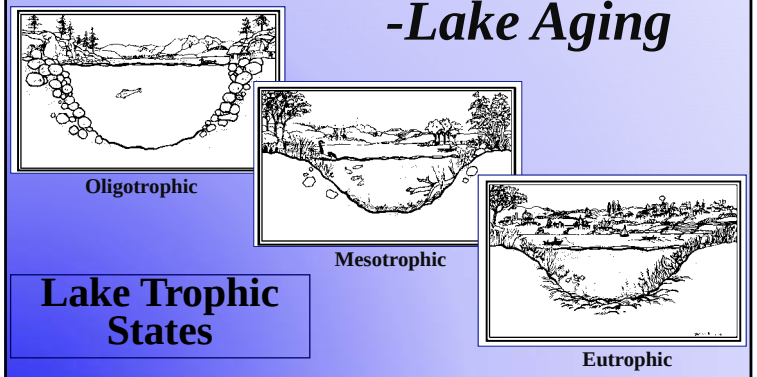
Lillie Mason Regions



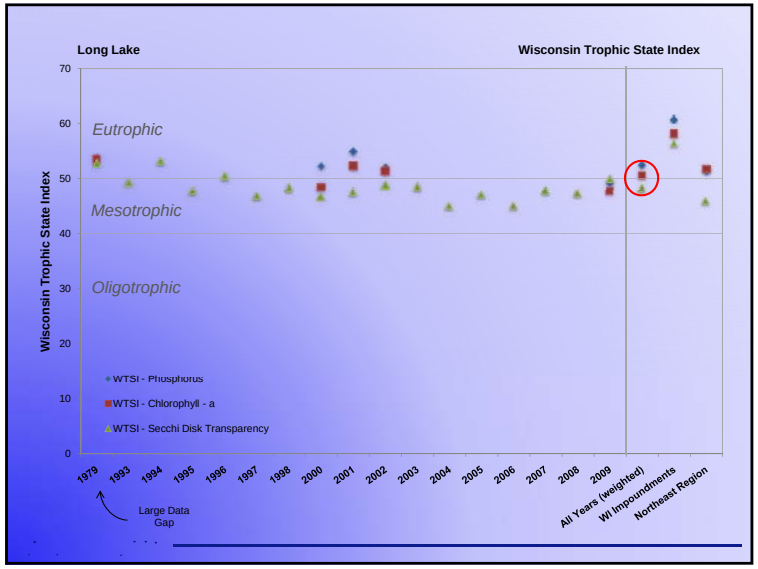




Eutrophication
-*Lake Aging*

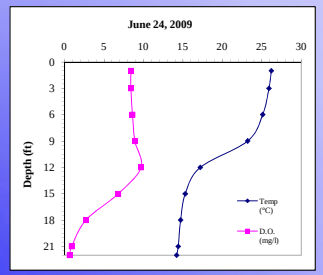


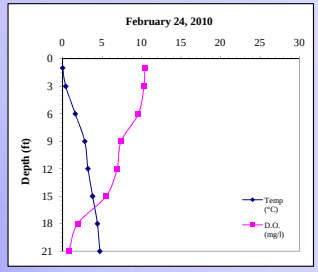
Lake Trophic States

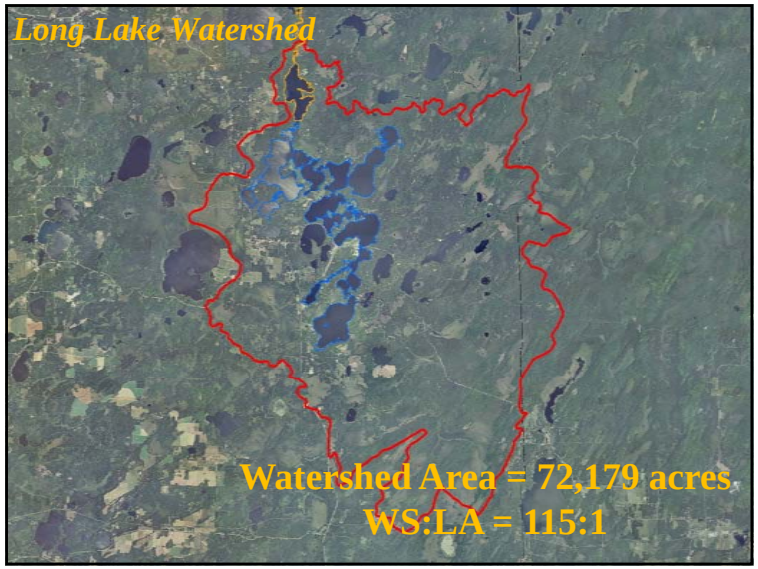


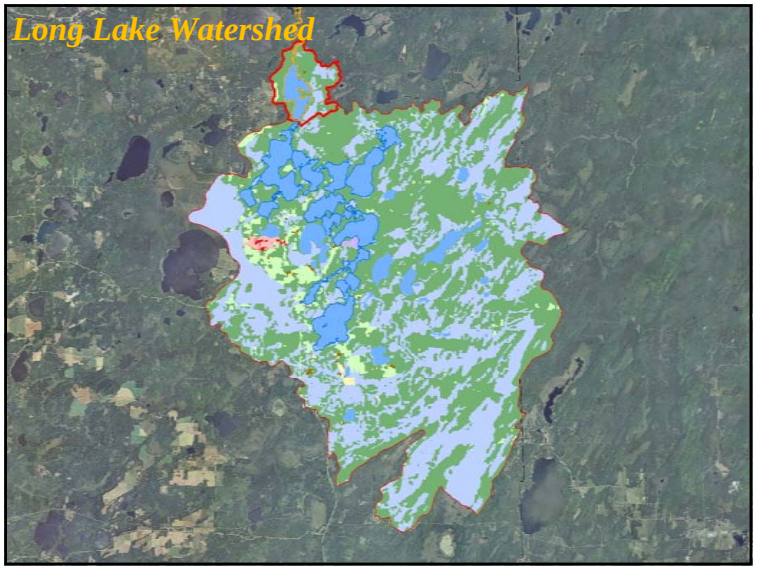
Additional Water Quality Results

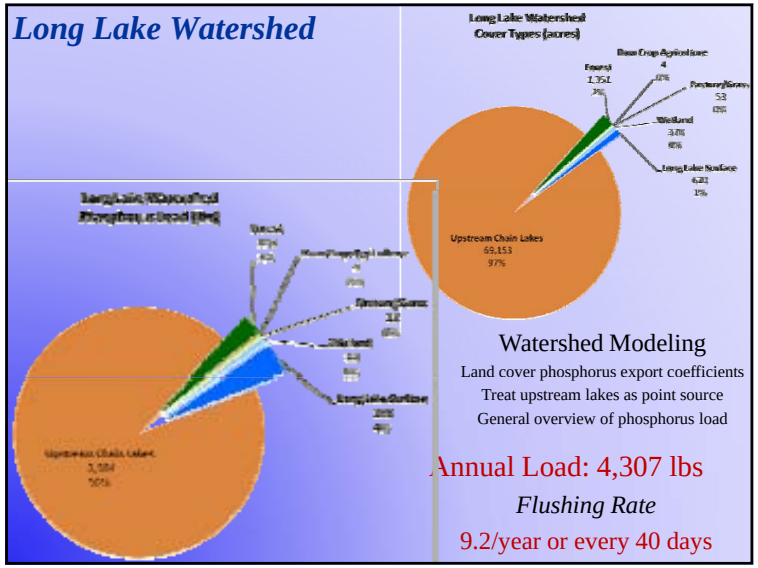
- Dissolved Oxygen and Temperature Profiles
  - Lake weakly stratified during summer & winter months
  - Very limited anoxia occurs near lake bottom during these times
    - Little concern for fishkill

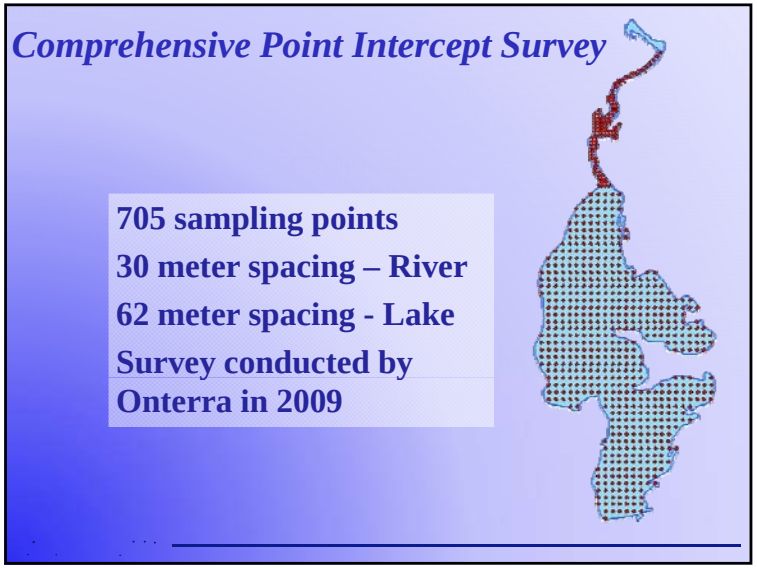


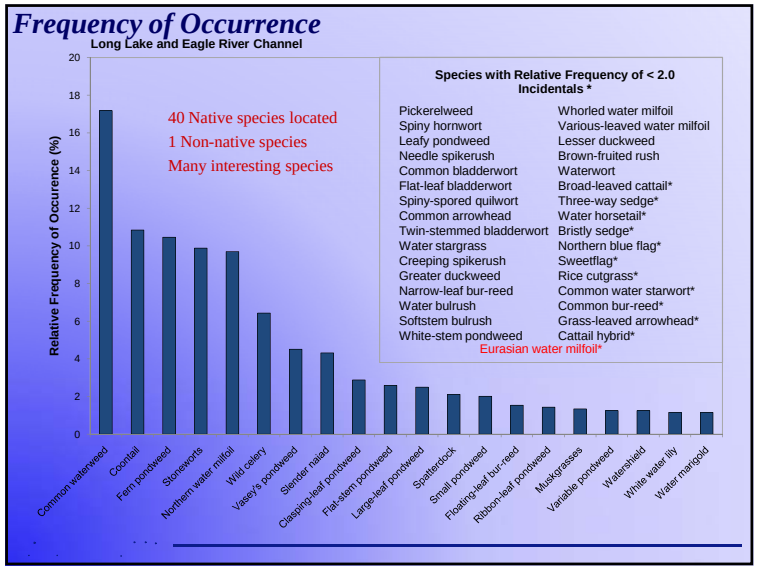



Long Lake Watershed
Watershed Area = 72,179 acres
WS:LA = 115:1

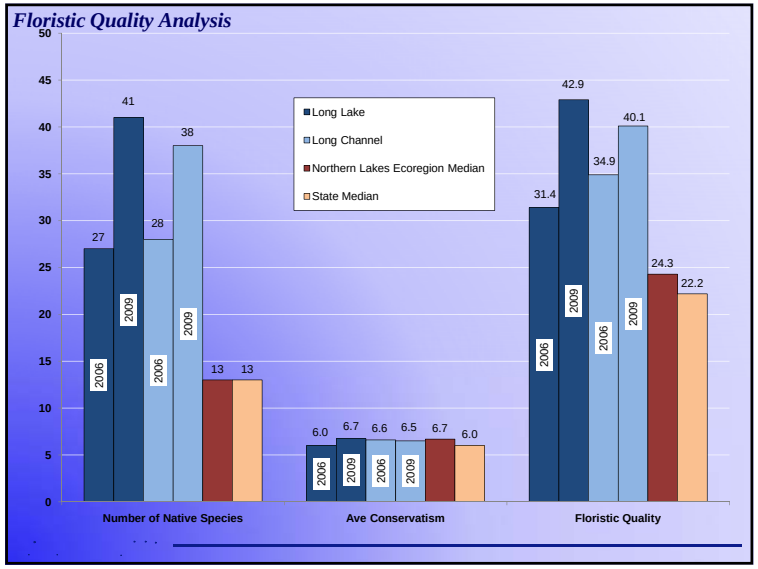

Long Lake Watershed

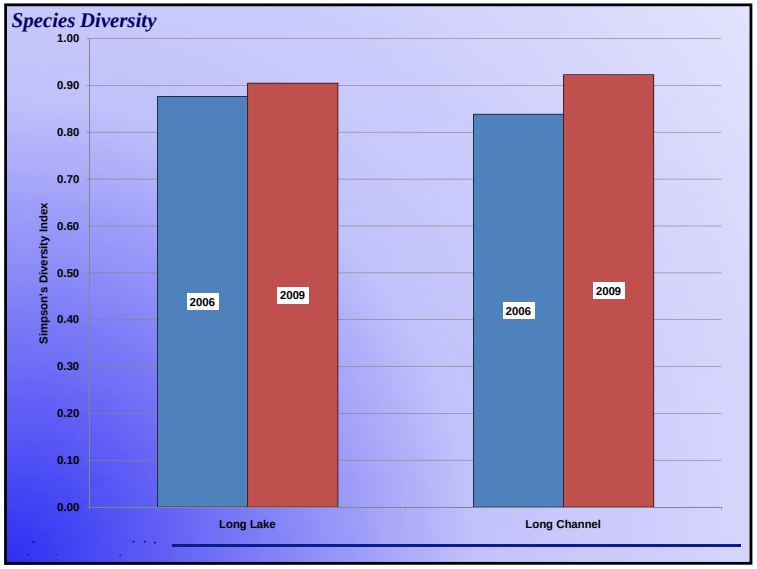

Long Lake Watershed
Long Lake Watershed
Cover Types (acres)
Upstream Chain Lakes
69,153
97%
Watershed Modeling
Land cover phosphorus export coefficients
Treat upstream lakes as point source
General overview of phosphorus load
Annual Load: 4,307 lbs
Flushing Rate
9.2/year or every 40 days


Comprehensive Point Intercept Survey
705 sampling points
30 meter spacing – River
62 meter spacing - Lake
Survey conducted by
Onterra in 2009


Frequency of Occurrence
Long Lake and Eagle River Channel
Relative Frequency of Occurence (%)
40 Native species located
1 Non-native species
Many interesting species
Species with Relative Frequency of < 2.0 Incidentals *
Pickerelweed
Spiny hornwort
Leafy pondweed
Needle spikerush
Common bladderwort
Flat-leaf bladderwort
Spiny-spored quilwort
Common arrowhead
Twin-stemmed bladderwort
Water stargrass
Creeping spikerush
Greater duckweed
Narrow-leaf bur-reed
Water bulrush
Softstem bulrush
White-stem pondweed
Whorled water milfoil
Various-leaved water milfoil
Lesser duckweed
Brown-fruited rush
Waterwort
Broad-leaved cattail*
Three-way sedge*
Water horsetail*
Bristly sedge*
Northern blue flag*
Sweetflag*
Rice cutgrass*
Common water starwort*
Common bur-reed*
Grass-leaved arrowhead*
Cattail hybrid*
Eurasian water milfoil*
Common waterweed
Coontail
Fern pondweed
Stoneworts
Northern water milfoil
Wild celery
Vasey's pondweed
Slender naiad
Clasping-leaf pondweed
Flat-stem pondweed
Large-leaf pondweed
Spatterdock
Small pondweed
Floating-leaf bur-reed
Ribbon-leaf pondweed
Muskgrasses
Variable pondweed
Watershield
White water lily
Water marigold

Aquatic Plants
Wisconsin Ecoregions
Northern Lakes and Forests
Long Lake
North Central Hardwood Forests
Driftless Area
Southeastern Wisconsin Till Plains


Floristic Quality Analysis
Long Lake
Long Channel
Northern Lakes Ecoregion Median
State Median
27
41
28
38
13
13
6.0
6.7
6.6
6.5
6.7
6.0
31.4
42.9
34.9
40.1
24.3
22.2
2006
2009
Number of Native Species
Ave Conservatism
Floristic Quality


Species Diversity
Simpson's Diversity Index
2006
2009
Long Lake
Long Channel

Eagle River Channel EWM

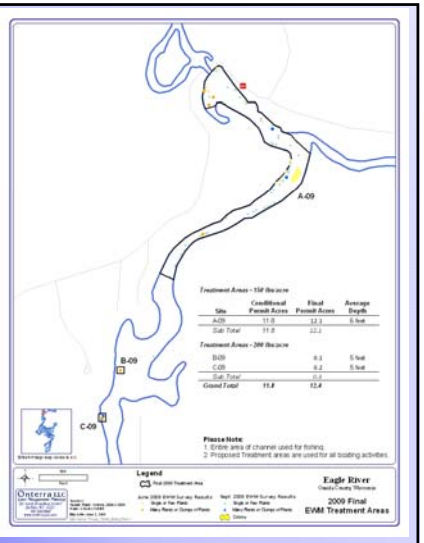
Last herbicide treatment – May 2009

Few EWM plants found during summer 2009 and spring 2010

Some plants found near dam and removed by association members during summer 2010

Onterra will check channel and lake during September 2010

If warranted, herbicide treatment will be completed during spring 2011



Conclusions

- Water quality is as expected for the final lake in a large chain with a large watershed.
  - Lake is moderately productive and healthy.
- Overall watershed is in good condition.
  - Land cover in chain watershed exports minimal phosphorus and upstream lakes act as sedimentation basins for Long Lake.
  - High flushing rate helps keep Long productivity down.
  - Largest, *controllable* contributor is likely shoreland properties.

Conclusions

- Aquatic plant community
  - Based upon standard analysis, native community is of moderate quality and indicative of a disturbed system.
  - Eurasian water milfoil has been found in small quantities in channel. Herbicide control efforts have been successful. Continued monitoring and control should be completed.

Management Plan Creation

- Next Steps
  - Complete stakeholder survey entry.
  - Analyze and distribute survey results.
  - Create *Implementation Plan*
  - Review plan among committee
  - Create *Draft Long Lake Management Plan*
  - Distribute to WDNR, committee, etc.
  - Integrate comments and suggestions

B

APPENDIX B

Stakeholder Survey Response Charts and Comments

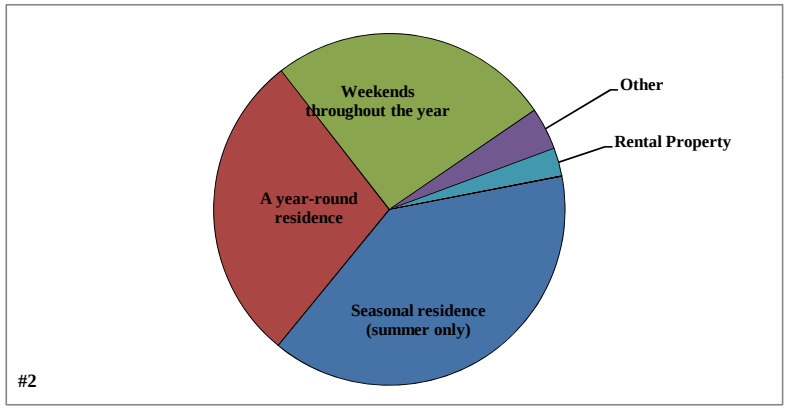
Returned Surveys	77
Sent Surveys	169
Response Rate (%)	45.6

#1 On which waterbody is your property located?

	Total	%
Long Lake	63	*87.5*
Eagle River Channel	9	*12.5*
	72	*100.0*

#2 What type of property do you own on Long Lake or the Eagle River Channel?

	Total	%
Seasonal residence (summer only)	30	*39.0*
A year-round residence	22	*28.6*
Weekends throughout the year	20	*26.0*
Other	3	*3.9*
I do not live on the lake	2	*2.6*
Resort	0	*0.0*
Rental property	0	*0.0*
Undeveloped	0	*0.0*
	77	*100.0*

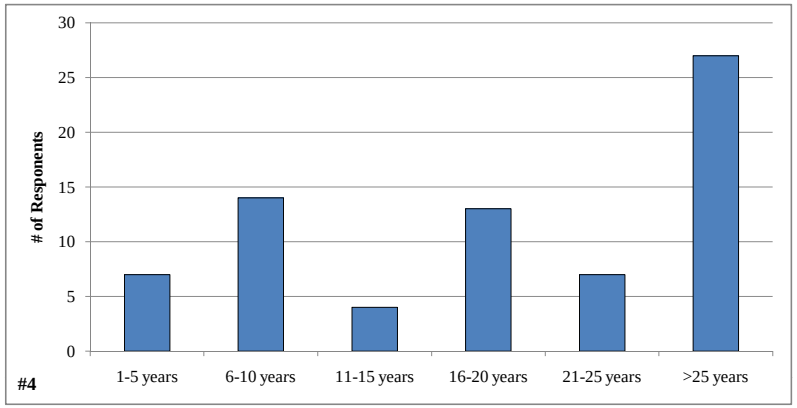


#3 If you are not a year-round resident, how many days each year is your property used by you or others?

Answered Question	45
Average	91.1
Standard deviation	65.3

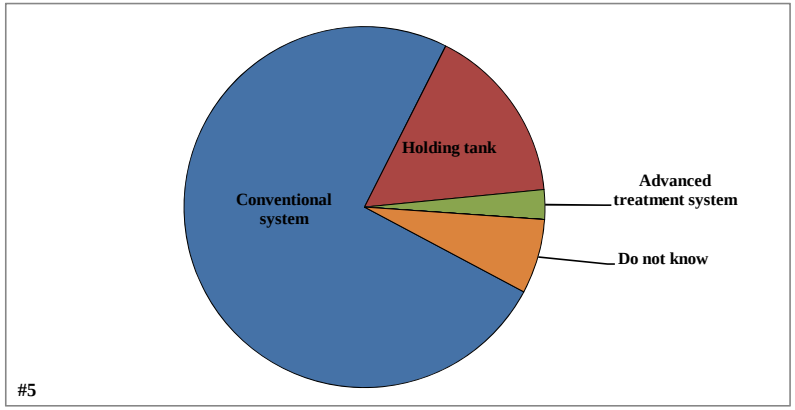
#4 How long have you owned your property on Long Lake or the Eagle River Channel?

	Total	%
1-5 years	7	*9.7*
6-10 years	14	*19.4*
11-15 years	4	*5.6*
16-20 years	13	*18.1*
21-25 years	7	*9.7*
>25 years	27	*37.5*
	72	*100.0*



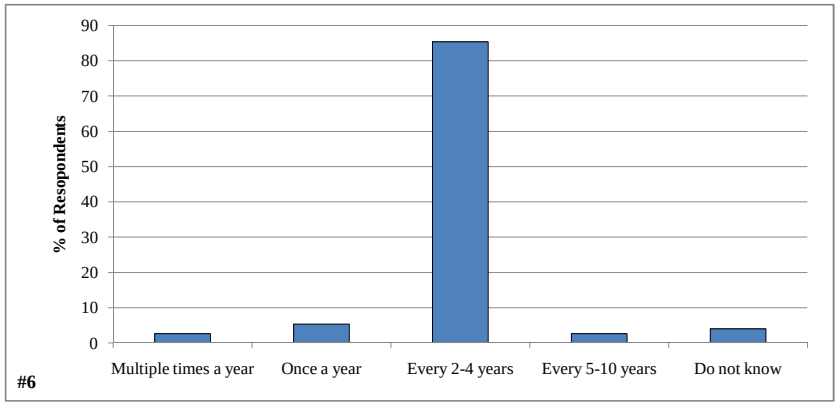
#5 What type of septic system does your property utilize?

	Total	%
Conventional system	56	*80.0*
Holding tank	12	*17.1*
Advanced treatment system	2	*2.9*
Mound	0	*0.0*
Municipal sewer	0	*0.0*
Do not know	5	*7.1*
	70	*100.0*



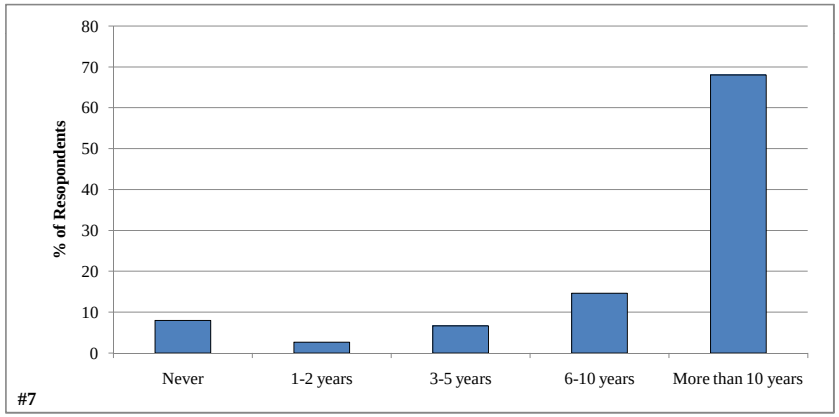
#6 How often is the septic tank on your property pumped?

	Total	%
Multiple times a year	2	*2.7*
Once a year	4	*5.3*
Every 2-4 years	64	*85.3*
Every 5-10 years	2	*2.7*
Do not know	3	*4.0*
	75	*100.0*



#7 For how many years have you fished on Long Lake and/or the Eagle River Channel?

	Total	%
Never	6	*8.0*
1-2 years	2	*2.7*
3-5 years	5	*6.7*
6-10 years	11	*14.7*
More than 10 years	51	*68.0*
	75	*100.0*



#8 Have you personally fished on Long Lake and/or the Eagle River Channel in the past 3 years?

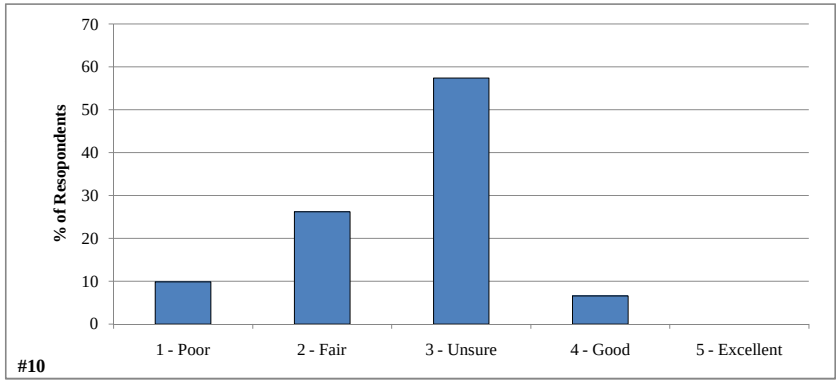
	Total	%
Yes	60	*85.7*
No	10	*14.3*
	70	*100.0*

#9 How would you describe the current quality of fishing on Long Lake?

	Total	%
1 - Poor	6	*9.1*
2 - Fair	21	*31.8*
3 - Unsure	16	*24.2*
4 - Good	21	*31.8*
5 - Excellent	2	*3.0*
	66	*100.0*

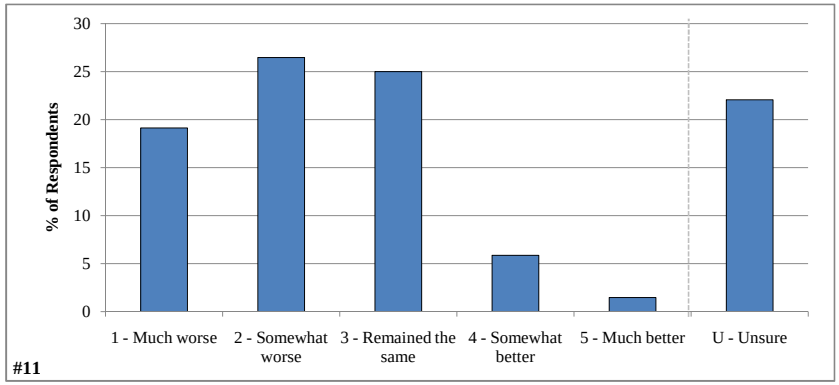
#10 How would you describe the current quality of fishing on the Eagle River Channel?

	Total	%
1 - Poor	6	*9.8*
2 - Fair	16	*26.2*
3 - Unsure	35	*57.4*
4 - Good	4	*6.6*
5 - Excellent	0	*0.0*
	61	*100.0*



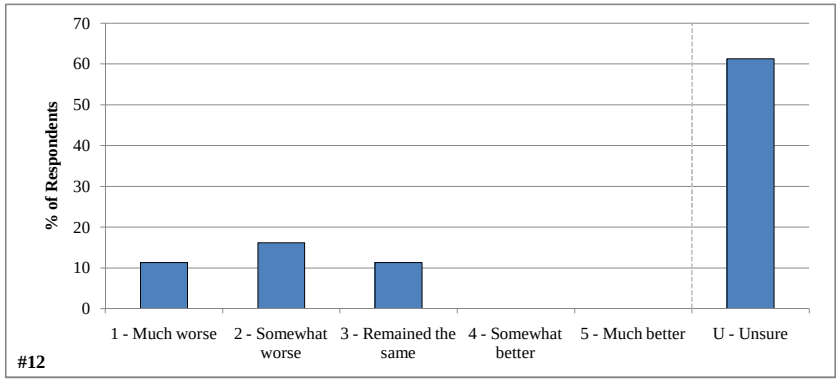
#11 How has the quality of fishing changed on Long Lake since you started fishing the lake?

	Total	%
1 - Much worse	13	*19.1*
2 - Somewhat worse	18	*26.5*
3 - Remained the same	17	*25.0*
4 - Somewhat better	4	*5.9*
5 - Much better	1	*1.5*
U - Unsure	15	*22.1*
	68	*100.0*



#12 How has the quality of fishing changed on the Eagle River Channel since you started fishing the channel?

	Total	%
1 - Much worse	7	*11.3*
2 - Somewhat worse	10	*16.1*
3 - Remained the same	7	*11.3*
4 - Somewhat better	0	*0.0*
5 - Much better	0	*0.0*
U - Unsure	38	*61.3*
	62	*100.0*



#13 Do you think that fish habitat should be improved on Long Lake?

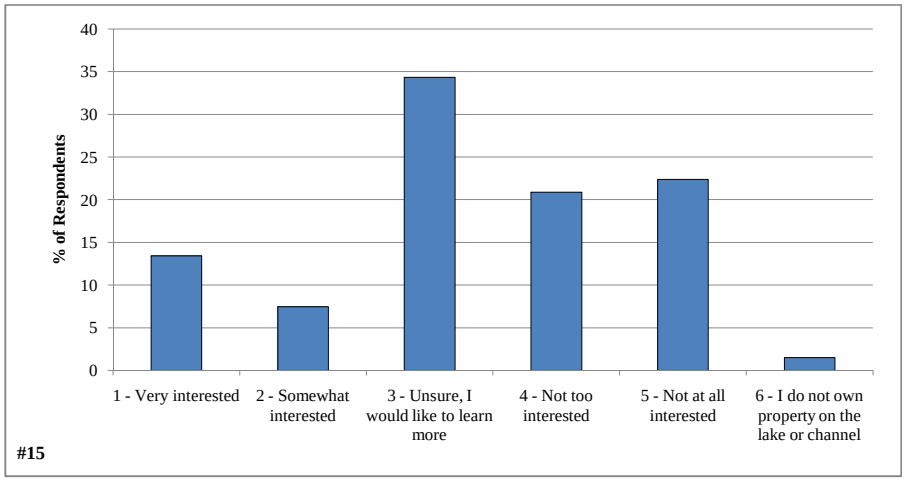
	Total	%
Yes	43	*62.3*
No	14	*20.3*
Unsure	12	*17.4*
	69	*100.0*

#14 Do you think that fish habitat should be improved on the Eagle River Channel?

	Total	%
Yes	26	*41.3*
No	11	*17.5*
Unsure	26	*41.3*
	63	*100.0*

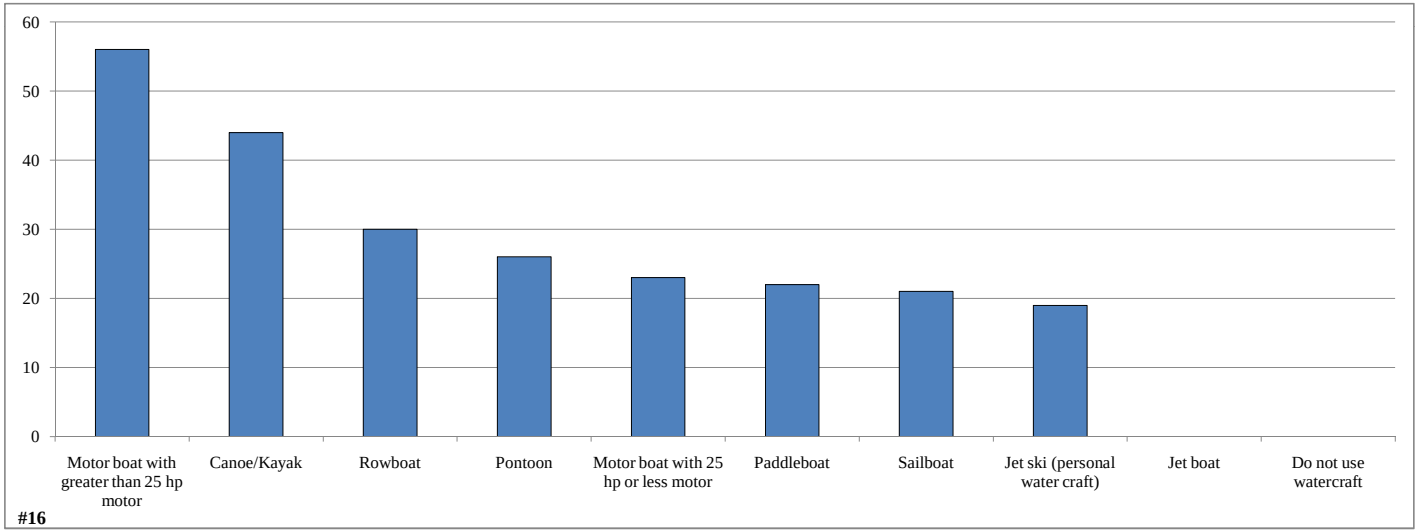
#15 How interested would you be in hosting a fish habitat improvement project on your shore?

	Total	%
1 - Very interested	9	*13.4*
2 - Somewhat interested	5	*7.5*
3 - Unsure, I would like to learn more	23	*34.3*
4 - Not too interested	14	*20.9*
5 - Not at all interested	15	*22.4*
6 - I do not own property on the lake or channel	1	*1.5*
	67	*100.0*



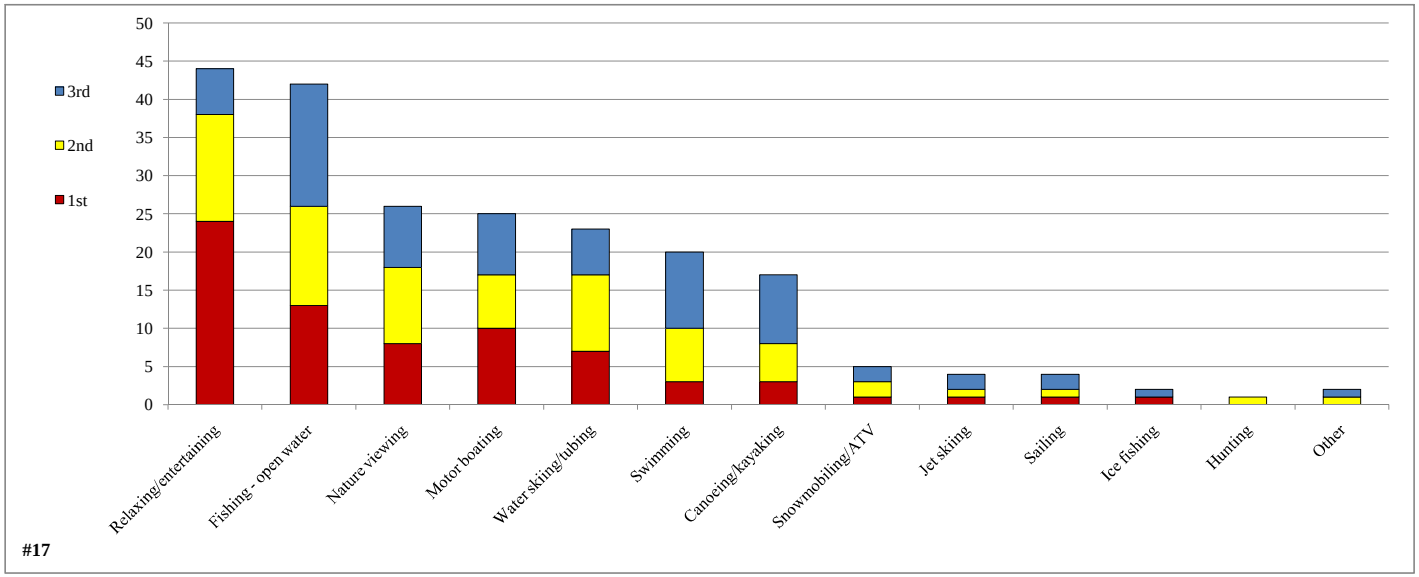
#16 What types of watercraft do you currently use on the lake or channel?

	Total
Motor boat with greater than 25 hp motor	56
Canoe/Kayak	44
Rowboat	30
Pontoon	26
Motor boat with 25 hp or less motor	23
Paddleboat	22
Sailboat	21
Jet ski (personal water craft)	19
Jet boat	0
Do not use watercraft	0
	241



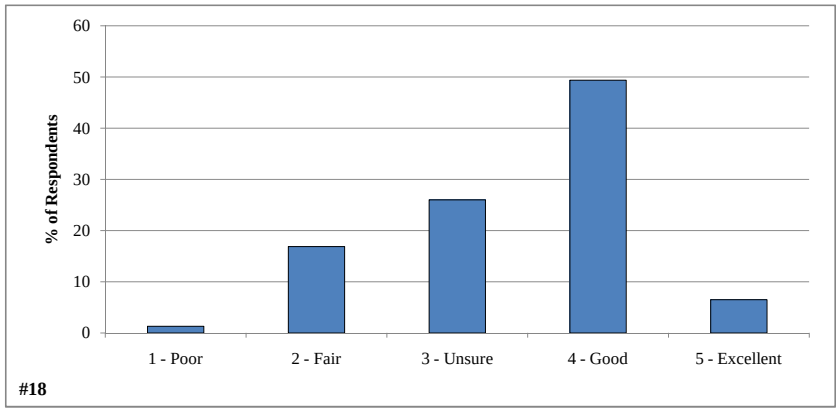
#17 Please rank up to three activities that are important reasons for owning your property on or near the lake or channel.

	1st	2nd	3rd	*% ranked*
Relaxing/entertaining	24	14	6	*20.5*
Fishing - open water	13	13	16	*19.5*
Nature viewing	8	10	8	*12.1*
Motor boating	10	7	8	*11.6*
Water skiing/tubing	7	10	6	*10.7*
Swimming	3	7	10	*9.3*
Canoeing/kayaking	3	5	9	*7.9*
Snowmobiling/ATV	1	2	2	*2.3*
Jet skiing	1	1	2	*1.9*
Sailing	1	1	2	*1.9*
Ice fishing	1	0	1	*0.9*
Hunting	0	1	0	*0.5*
Other	0	1	1	*0.9*
	72	72	71	*100.0*



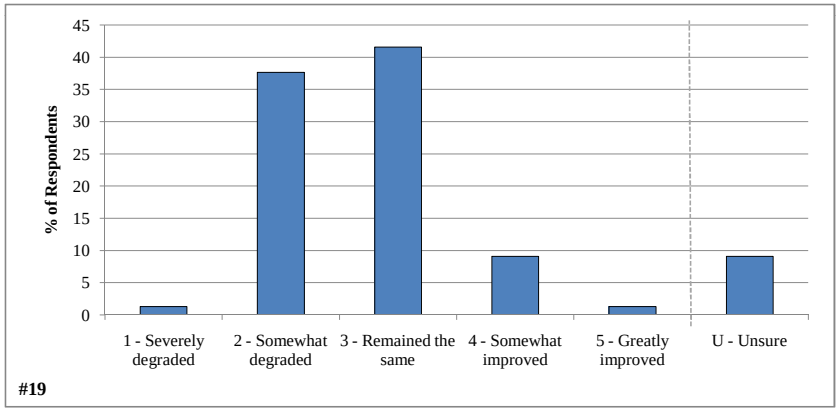
#18 How would you describe the current water quality of Long Lake and the Eagle River Channel?

	Total	%
1 - Poor	1	*1.3*
2 - Fair	13	*16.9*
3 - Unsure	20	*26.0*
4 - Good	38	*49.4*
5 - Excellent	5	*6.5*
	77	*100.0*



#19 How has the water quality changed in Long Lake and the Eagle River Channel since you obtained your property?

	Total	%
1 - Severely degraded	1	*1.3*
2 - Somewhat degraded	29	*37.7*
3 - Remained the same	32	*41.6*
4 - Somewhat improved	7	*9.1*
5 - Greatly improved	1	*1.3*
U - Unsure	7	*9.1*
	77	*100.0*



#20 Have you ever heard of aquatic invasive species?

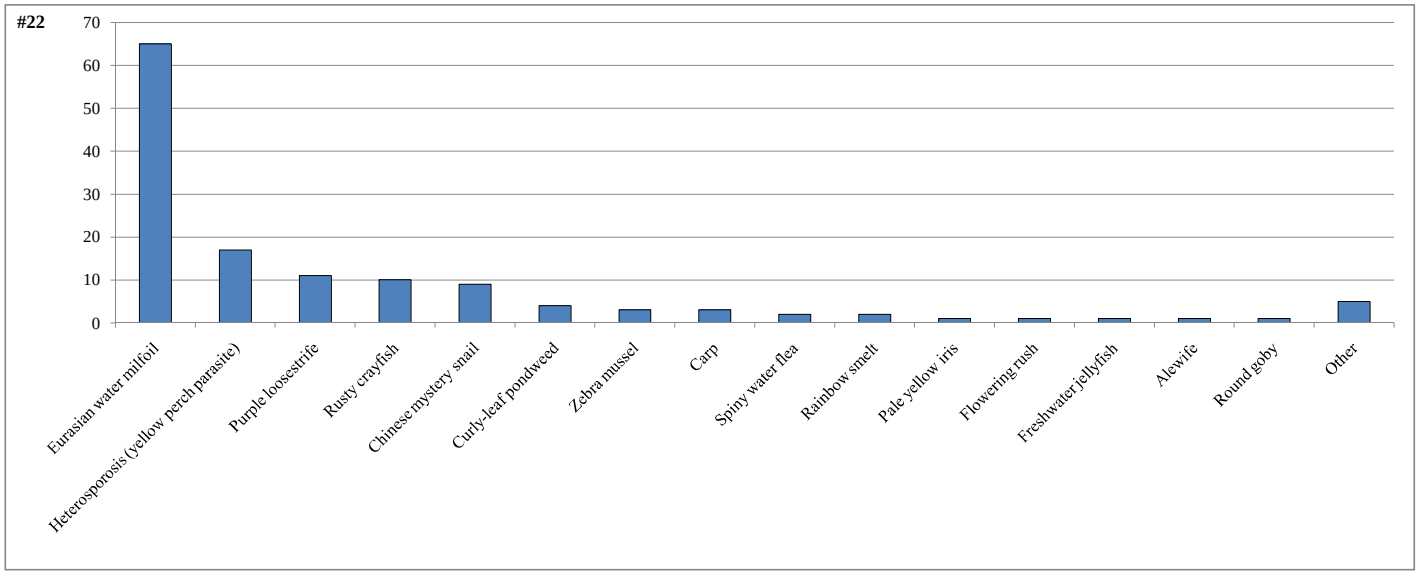
	Total	%
Yes	77	*100.0*
No	0	*0.0*
	77	*100.0*

#21 Are you aware of aquatic invasive species in Long Lake or the Eagle River Channel?

	Total	%
Yes	66	*85.7*
No	11	*14.3*
	77	*100.0*

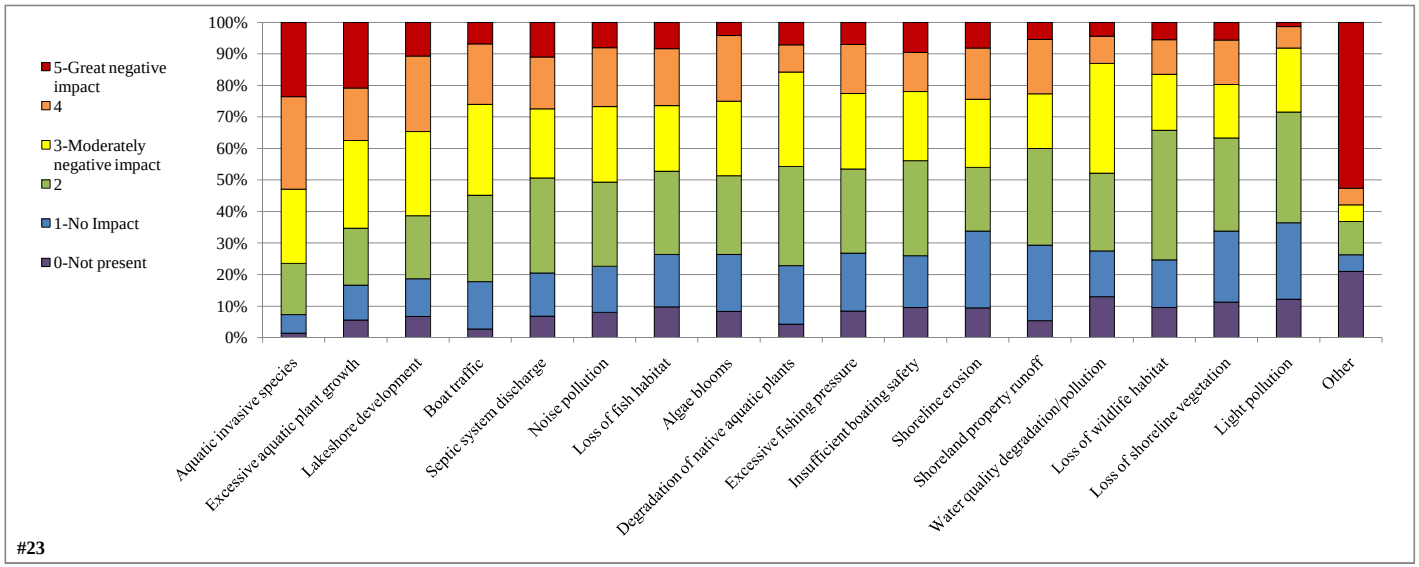
#22 Which aquatic invasive species are you aware of in the lake or channel?

	Total
Eurasian water milfoil	65
Heterosporosis (yellow perch parasite)	17
Purple loosestrife	11
Rusty crayfish	10
Chinese mystery snail	9
Curly-leaf pondweed	4
Zebra mussel	3
Carp	3
Spiny water flea	2
Rainbow smelt	2
Pale yellow iris	1
Flowering rush	1
Freshwater jellyfish	1
Alewife	1
Round goby	1
Other	5



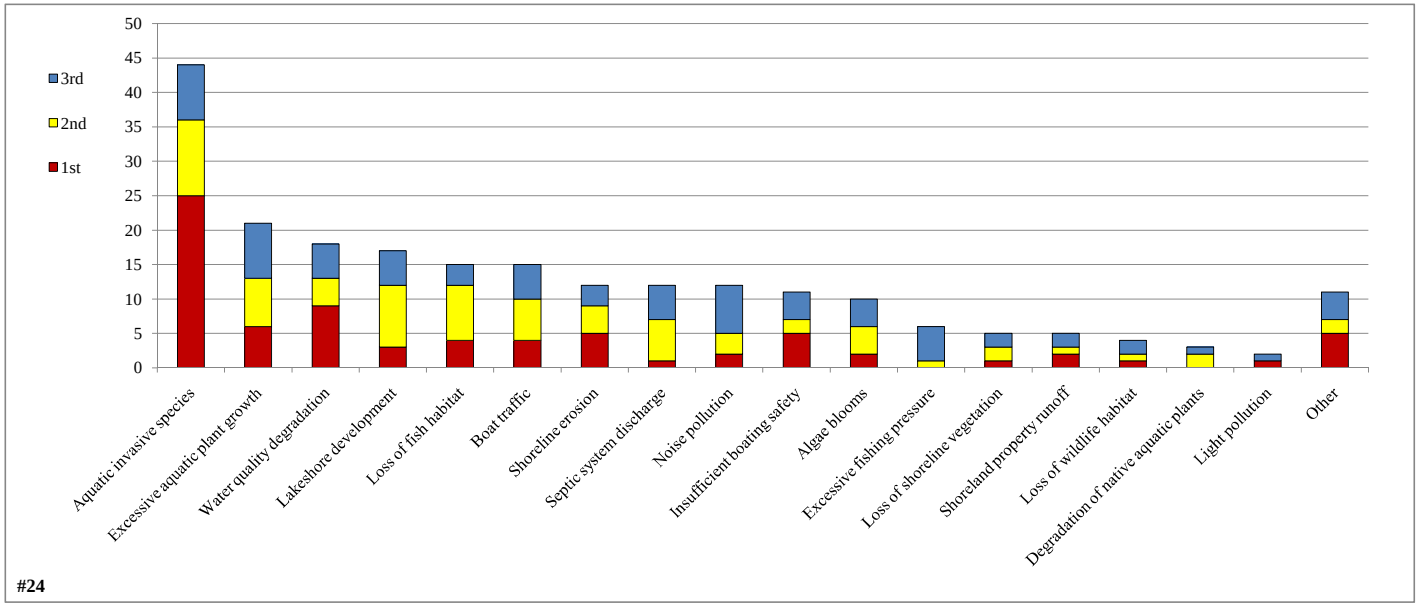
#23 To what level do you believe each of the following factors may be negatively impacting Long Lake and the Eagle River Channel?

	0-Not present	**1-No Impact**	**2**	**3-Moderately negative impact**	**4**	**5-Great negative impact**	*Total*	*Average*
Aquatic invasive species	1	4	11	16	20	16	*67*	*3.4*
Excessive aquatic plant growth	4	8	13	20	12	15	*68*	*3.0*
Lakeshore development	5	9	15	20	18	8	*70*	*2.8*
Boat traffic	2	11	20	21	14	5	*71*	*2.7*
Septic system discharge	5	10	22	16	12	8	*68*	*2.6*
Noise pollution	6	11	20	18	14	6	*69*	*2.5*
Loss of fish habitat	7	12	19	15	13	6	*65*	*2.5*
Algae blooms	6	13	18	17	15	3	*66*	*2.4*
Degradation of native aquatic plants	3	13	22	21	6	5	*67*	*2.4*
Excessive fishing pressure	6	13	19	17	11	5	*65*	*2.4*
Insufficient boating safety	7	12	22	16	9	7	*66*	*2.4*
Shoreline erosion	7	18	15	16	12	6	*67*	*2.4*
Shoreland property runoff	4	18	23	13	13	4	*71*	*2.3*
Water quality degradation/pollution	9	10	17	24	6	3	*60*	*2.2*
Loss of wildlife habitat	7	11	30	13	8	4	*66*	*2.2*
Loss of shoreline vegetation	8	16	21	12	10	4	*63*	*2.2*
Light pollution	9	18	26	15	5	1	*65*	*1.9*
Other	4	1	2	1	1	10	*15*	*3.3*



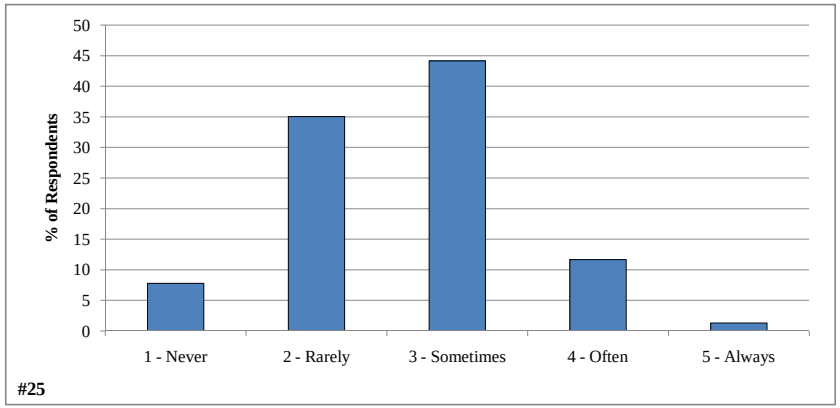
#24 From the list below, please rank your top three concerns regarding Long Lake and the Eagle River Channel.

	1st	2nd	3rd	*% Ranked*
Aquatic invasive species	25	11	8	*19.7*
Excessive aquatic plant growth	6	7	8	*9.4*
Water quality degradation	9	4	5	*8.1*
Lakeshore development	3	9	5	*7.6*
Loss of fish habitat	4	8	3	*6.7*
Boat traffic	4	6	5	*6.7*
Shoreline erosion	5	4	3	*5.4*
Septic system discharge	1	6	5	*5.4*
Noise pollution	2	3	7	*5.4*
Insufficient boating safety	5	2	4	*4.9*
Algae blooms	2	4	4	*4.5*
Excessive fishing pressure	0	1	5	*2.7*
Loss of shoreline vegetation	1	2	2	*2.2*
Shoreland property runoff	2	1	2	*2.2*
Loss of wildlife habitat	1	1	2	*1.8*
Degradation of native aquatic plants	0	2	1	*1.3*
Light pollution	1	0	1	*0.9*
Other	5	2	4	*4.9*
	76	73	74	*100.0*



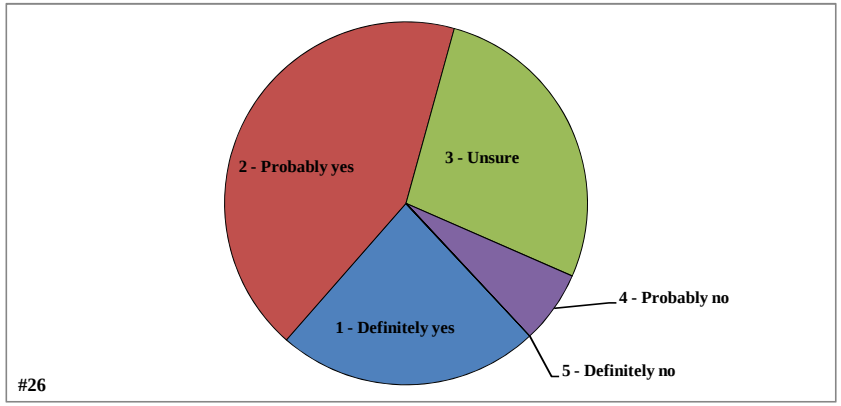
#25 During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of Long Lake and the Eagle River Channel?

	Total	%
1 - Never	6	*7.8*
2 - Rarely	27	*35.1*
3 - Sometimes	34	*44.2*
4 - Often	9	*11.7*
5 - Always	1	*1.3*
	77	*100.0*



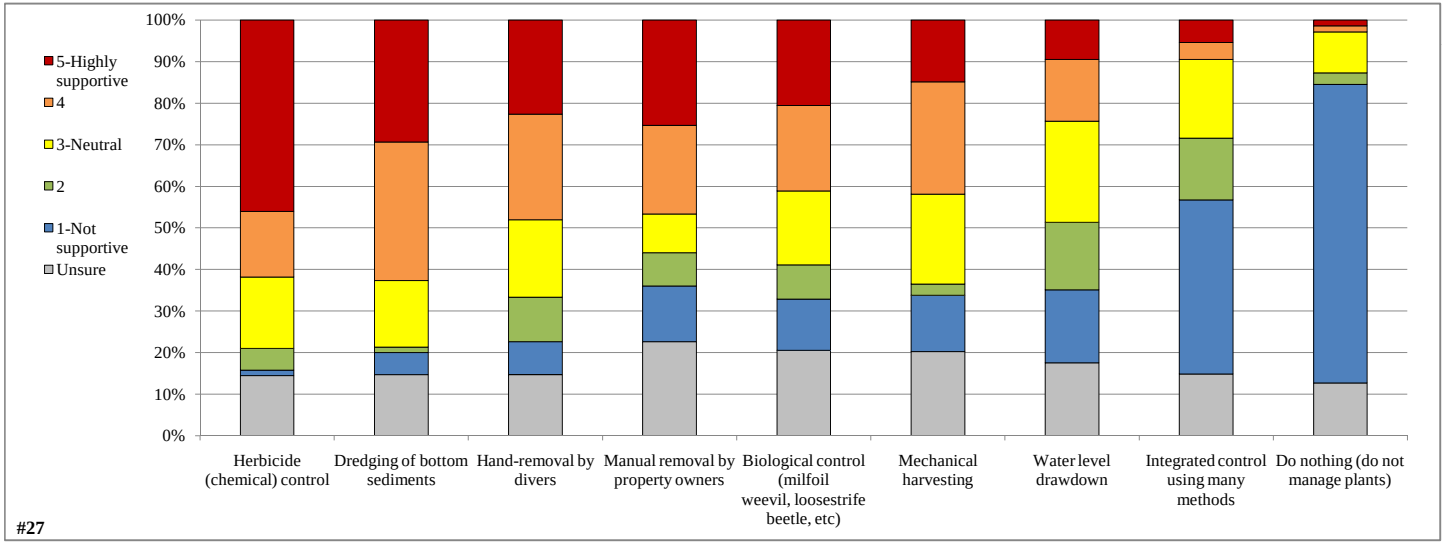
#26 Considering your answer to the question above, do you believe aquatic plant control is needed on Long Lake and the Eagle River Channel?

	Total	%
1 - Definitely yes	18	*23.4*
2 - Probably yes	33	*42.9*
3 - Unsure	21	*27.3*
4 - Probably no	5	*6.5*
5 - Definitely no	0	*0.0*
	77	*100.0*



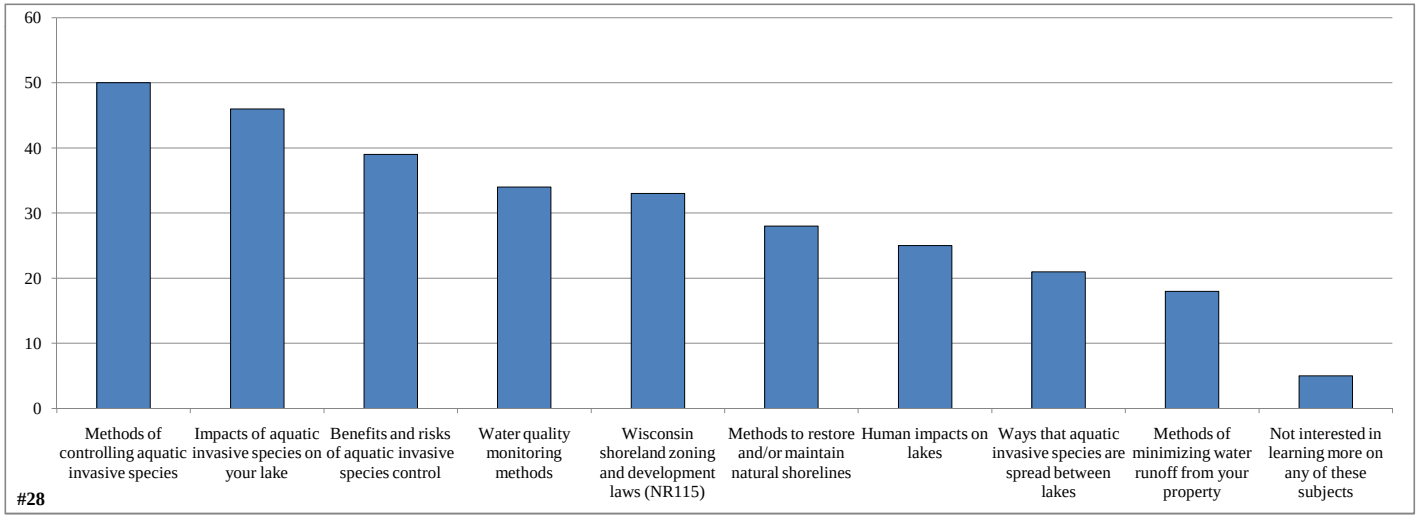
#27 What is your level of support for the responsible use of the following techniques on Long Lake and/or the Eagle River Channel?

	1-Not supportive	**2**	**3-Neutral**	**4**	**5-Highly supportive**	**Unsure, need more info**	*Total*	*Average*
Integrated control using many methods	1	4	13	12	35	11	*65*	*4.2*
Hand-removal by divers	4	1	12	25	22	11	*64*	*3.9*
Manual removal by property owners	6	8	14	19	17	11	*64*	*3.5*
Herbicide (chemical) control	10	6	7	16	19	17	*58*	*3.5*
Biological control (milfoil weevil, loosestrife beetle, etc)	9	6	13	15	15	15	*58*	*3.4*
Mechanical harvesting	10	2	16	20	11	15	*59*	*3.3*
Dredging of bottom sediments	13	12	18	11	7	13	*61*	*2.8*
Water level drawdown	31	11	14	3	4	11	*63*	*2.0*
Do nothing (do not manage plants)	51	2	7	1	1	9	*62*	*1.4*



#28 Which of these subjects would you like to learn more about?

	Total
Methods of controlling aquatic invasive species	50
Impacts of aquatic invasive species on your lake	46
Benefits and risks of aquatic invasive species control	39
Water quality monitoring methods	34
Wisconsin shoreland zoning and development laws (NR115)	33
Methods to restore and/or maintain natural shorelines	28
Human impacts on lakes	25
Ways that aquatic invasive species are spread between lakes	21
Methods of minimizing water runoff from your property	18
Not interested in learning more on any of these subjects	5



#29 Before receiving this mailing, have you ever heard of the Three Lakes Waterfront Association?

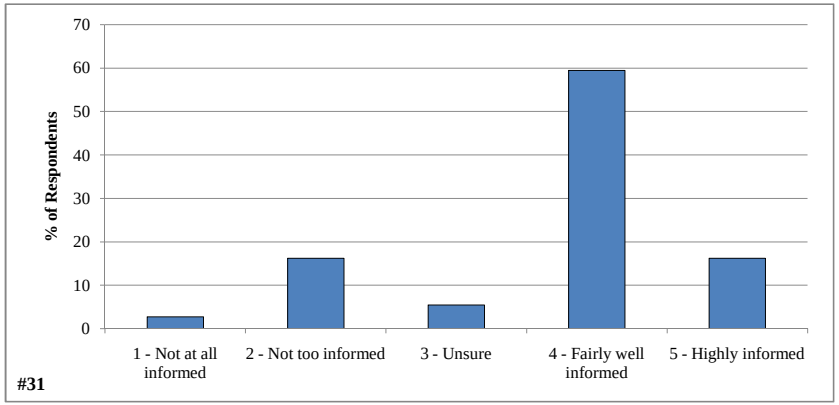
	Total	%
Yes	75	*97.4*
No	2	*2.6*
	77	*100.0*

#30 What is your membership status with the Three Lakes Waterfront Association?

	Total	%
Current member	57	*75.0*
Former member	7	*9.2*
Never been a member	12	*15.8*
	76	*100.0*

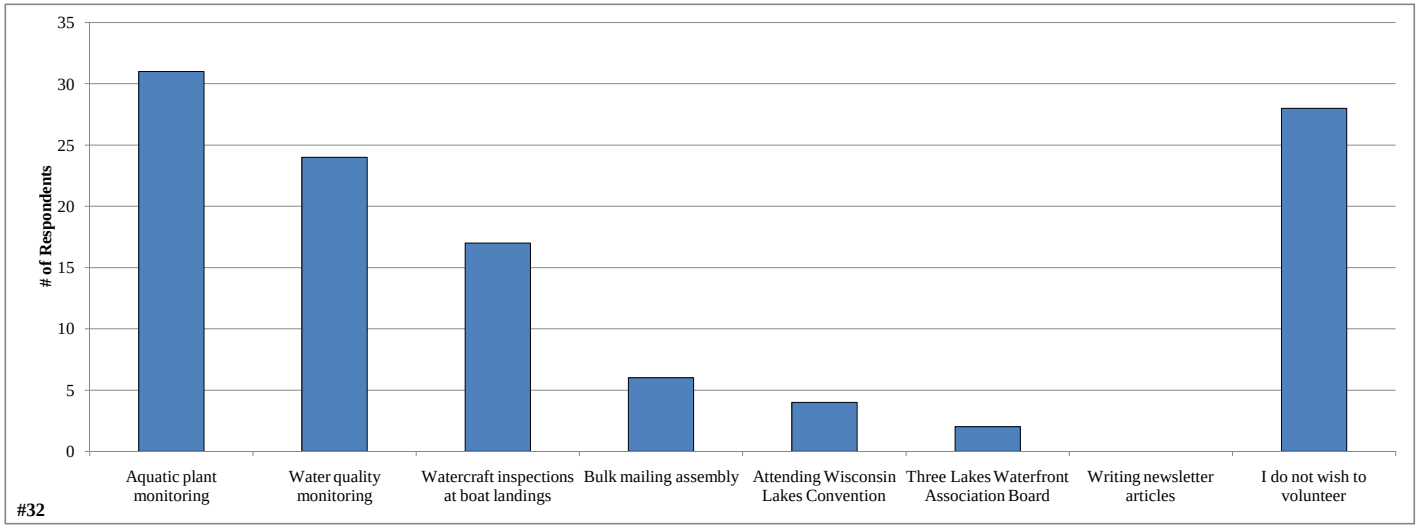
#31 How informed has the Three Lakes Waterfront Association kept you regarding issues with Long Lake and/or the Eagle River Channel and its management?

	Total	%
1 - Not at all informed	2	*2.7*
2 - Not too informed	12	*16.2*
3 - Unsure	4	*5.4*
4 - Fairly well informed	44	*59.5*
5 - Highly informed	12	*16.2*
	74	*100.0*



#32 Please circle the activities you would be willing to participate in if the Three Lakes Waterfront Association requires additional assistance.

	Total
Aquatic plant monitoring	31
Water quality monitoring	24
Watercraft inspections at boat landings	17
Bulk mailing assembly	6
Attending Wisconsin Lakes Convention	4
Three Lakes Waterfront Association Board	2
Writing newsletter articles	0
I do not wish to volunteer	28
	112



Survey Number	2g Comment	17m Comment	22p Comment	23r Comment	24r Comment	Other Comments (and Question 33)
1				Lack of awareness by all lake residents.		My grandfather originally bought our property on Long Lake in 1938. It has gone from a three room cabin with a pump and an outhouse to a newly built log cabin home in 2007. I am 60 years old and have spent most of my summers on Long Lake. Only because I am a volunteer at Burnt Rollways Dam am I aware of the milfoil. There have been residents from Long Lake who come to the dam with a weed sample while I am working and ask, "Is this the milfoil?" The weed population around my dock and in my bay has increased over the past three years. Would I know if it were milfoil? Probably not. I think the Waterfront Association should have big posters at prime locations showing what the milfoil looks like, and a drop off area that residents can bring a sample of their weeds to(how about Molly's gas station which is between Three Lakes and Long Lake - Molly grew up on Long Lake.) We should have a plastic bag that they can write their contact information on so the Waterfront Association will follow up with these concerned residents. We need to have more contact with our residents. Number 27 of your survey was hard to fill out. Show we need more community seminars to explain the varied methods of removing the milfoil.
2						Property has been in family since 1981. DON'T CLOSE THE BOAT LIFT
3		Silent sports: Cross country skiiing, hiking, biking		Large maintained lawns		I am not up for long, steady periods of time yet. Maybe in the future.
4						
5						One area that concerns me is the potential for milfoil in Musky Bay and the flats as you enter the thoroughfare to Planting Ground. I am not sure when I examine the plants in these areas whether or not it is native milfoil or EWM. I would like to be shown how to identify the two. Another concern is the extent of the winter draw down of the lake. The spring was a disaster for utilizing any of our watercraft until well after Memorial Day. The lack of winter snow and spring runoff for the last several years should be considered when the drawdown is done. The enjoyment of my property was negatively impacted because of the drawdown and lack of runoff.
6					Indian spearing	Keep what you do basic. Look at the larger picture. Instead of worrying about no wake and more buoys, why not fight at the Federal level to stop Indian spearing. This town is dying a slow death. Most lake front owners are absentee voters with no say, so we do not need a few making our decisions. More input from landowners.
7						
8						
9						The snails are an extreme nuisance. The black spots have been noted by me for around 5 years and I've seen them on perch and northerns. A white worm is also present in the meat of most bluegills.
10						
11						
12						
13					Jet skiing, pwc	
14						
15						

Survey Number	2g Comment	17m Comment	22p Comment	23r Comment	24r Comment	Other Comments (and Question 33)
16	Summer and deer season, occasional winter weekends		Red Horse			I do believe that more enforcement is needed for the boating laws, especially the no wake zones from the shoreline.
17						
18						
19				over spearing	spearing	My parents bought the property in 1961. Need to control amount of walleye spearing. Listen to owners' concerns. Do not restrict boating activities.
20				Indian spearfishing	The effect of Indian spearfishing of walleye has totally ruined fishing interest on this one-time class "A" walleye lake!	
21					Annual walleye spearing	I have been very interested in Long Lake and the E.R. channel since our property was purchased in 1961. In spite of increased shoreline development and increased boat traffic, water quality and clarity has remained fairly constant. The lake is especially clean after ice out. We on Long Lake and the channel are blest to have Honeyrock Camp as a primary owner of Lake and Channel property. Their ownership has kept development down. Especially over the past 20-25 years, I have seen an increase in algae blooms and weed growth (especially bad from 2004-2007), an inordinate amount of snails, and an overall decrease in the quality of fishing. Thank you for the opportunity to answer the survey. PS. There is more structure in the lake than in 1961. Five or six cribs were dropped in the lake in the 90's.
22						The chain of lakes is a precious resource that cannot be squandered We all must understand this.
23						Please continue your good work. Do everything you can to continue receiving state or federal funds for all the programs that you have undertaken.
24						
25			Not sure- but weed growth around me has gotten very bad. Last year we could not even get personal watercraft out.			By # 27 they added --Whatever it takes. By # 28 they added-Controlling weed growth.
26						I'm in my 80s if I were younger I would help. I think the younger people should be helping more! Which I think they do. I lost my spouse 5 years ago. I don't even drive. I have to depend on my son who lives with me. I hope this survey will help your people.

Survey Number	2g Comment	17m Comment	22p Comment	23r Comment	24r Comment	Other Comments (and Question 33)
27						Stop the migration of AIS in the Eagle River! Demand the County zoning office schedule septic system inspections on lake shore properties first! I was told by the zoning office it could take three to five years to schedule inspections. That is way too long! Have the town surcharge property $250.00 each year they pass before having their septic systems inspected. Failed systems are damaging our shorelines. By #32, they added Sorry I find it nearly impossible to schedule my time up there.
28				Unlimited spearing		There needs to be an honest and open discussion about the impact of unlimited spearing by native peoples. Methods, timing, harvest limits, and scope should be evaluated in light of the reality of todays facts, economy and the limits of the habitat. We can't pretend like it does not matter. Knowing the facts will help everybody. If it is determined the ultimate impact is minimal then it would exhonorate the native peoples who receive undue criticism. If fishing continues to deteriorate, especially walleye, people will stop coming. That means fewer customers for everyone...casinos too. Thank you TLWA for your work and stewardship.
29						
30						Since the dam was rebuilt and the water dropped down, the fishing has deteriorated. Many logs and stumps were removed during the draw down. The city needs to control septic runoff. House sizes and bedrooms are being added, without notice, and the septics need to be increased in size. How about a monthly newsletter on your website to keep us informed of what is happening? How about an annual meeting of all members? I am willing to help keep Long Lake clean and the fishing good as it was 35 years ago.
31						
32						
33				SPEARING	spearing, excessive fishing pressure-winter	
34						BY # 15 THE added- already have crib
35						
36						
37				excess Indian fishing		
38						
39						
40						
41						Although there are possitives to having Honey Rock Camp on Long Lake, the camp has some negative impacts on the north end of the lake namely shore line erosion and excess noise from their water skiing program. The west side of the lake is particularly impacted as most of the water skiing seems to happen close to this shore. Excessive noise level of boats and yelling occurs sometimes before 6 a.m. and up to 9 p.m. impeding the residents ability to enjoy the peace and quiet of the lake emvironment. In addition Honey Rock skiis into north end weed beds damaging them. Healthy weed beds help prevent EWM from establishing and if established in the north end Honey Rock is chopping them up and contributing to their disbursal.

Survey Number	2g Comment	17m Comment	22p Comment	23r Comment	24r Comment	Other Comments (and Question 33)
42	7-8 months a year					Beyond a limited number of very small lakes along the chain, a ban on high speed traffic within 100 feet of shore is not only reasonable but highly prudent and necessary. The future health of the lakes and channels require healthy shorelines, meaning we cannot conscienably subject them to excessive wake pounding. Additionally, excessive traffic close to shore poses a noise pollution problem and safety risk to any and all swimmers. We support the Association's objection to any plan to opt out of this requirement. We inherited this property from my parents 20 years ago. It has been in our family for 61 years.
43						
44						by # 32 g. they added - age 84 1/2 :)
45						Most boat traffic has respected the Slow No Wake but, there are still Jet Skis that come down the channel at speed. I have not seen the water patrol on Long Lake or the Channel this year. There are a lot more aquatic plants in the channel compared to years ago.
46						BY # 24q Insufficient boating safety, they added- jet skis
47						by # 32f they added- would like to be involved but not up during weekdays enough
48						Thank you for all you have done. However I worry about over regulation brought about by a asso. composed of elderly "do gooders". I watched this happen for 30 years on Lake Thunderbird in Illinois. Myself and family have owned property on Long Lake for over 100 years. I was born up here. I am 67 years old. I have been on both sides of the fence. Thanks for your concern
49						by # 6e- how often is septic system pumped? The added - never by # 32h they added- We are rarely at our cabin for more than 3 or 4 days at a time.
50				Fish spearing. Excessive fish removal!	Spearing and excessive fish removal	DNR allows too many fish removed by spearing, then limits hook & line fishermen with slot limit. Spearing is issue with populations of fish. Wisconsin needs to restrict gaming rights if spearing is not curtailed.
51						
52				JET SKI'S		General lack of consideration of boating regulations and between boating types: sail, canoe/kayak, fishing, motoring/towing (tubes/skiing), and especially personal watercraft (jet ski).
53						
54						
55						
56			tons of snails species unknown			We appreciate the time and effort that the Waterfront Assoc. has put into protecting Long Lake and the channel. Due to the fact we are not in Three Lakes on a regular basis we are unable to help at this time.
57			snails- type unknown			A great big thank you to the Waterfront Ass. for all the work that they do. It is not possible for me to volunteer at this time since my being here is quite eratic at this time. Maybe/possibly in the future. Thank you so much for your time and effort in putting this questionaire together. It certainly covers many areas and hopefully will be of great value.
58						For Question 1 - wrote in Planting Ground Lake for # 7-11 said- do not fish
59						

Survey Number	2g Comment	17m Comment	22p Comment	23r Comment	24r Comment	Other Comments (and Question 33)
60				visible cell tower blinking		for # 31--marked fairly well informed about AIS. And marked not at all informed about other important matters such as the new cell tower. **High speed boat traffic on Long Lake is excessive and there is no regard for shoreline distance in boat operation, including channel to Planting Ground. This is the SINGLE BIGGEST CONTRIBUTOR to shoreline erosion on Long Lake, which is severe. It is very unfortunate that the 3-Lake Town Board backed away from the new state ordinance this spring. It's just a matter of time before there is a serious accident in the channel to Planting Ground. **More unfortunate yet is that the Waterfront Association, which I hold in very high regard and has been extremely proactive on many matters such as AIS, has completely let down the membership by failing to notify members about the new cell tower (which blinks day and night in the face of everyone on the west shore of Long Lake) so that members and other residents could have taken action to seek an alternate place for the cell tower. In St Germain and Minocqua there were months of hearings and meeting with citizens about cell tower placement, but in 3 Lakes the tower just appeared overnight and no one was ever notified. The Waterfront Association completely failed its membership on thes issue. I would ask the the association address this issue further and approach the town board to see if ther is any possibility for remedial action.
61	Camp					by #1- they wrote both Long Lake and the Channel , by # 5 they wrote conventional system is most prevalent This survey was completed on behalf of Honey Rock. Some of the questions were difficult to answer with a single choice,. It is our impression that the single most significant change on Long Lake and the channel is lakeshore development. This of course has occurred over a long period of time and is nearly impossible to avoid. The overall water quality and general lake quality seem very good from our perspective. We wish to do our part to continue to enhance the overall quality of Long Lake and the Channel
62						In the time my family has used Long Lake, this year more boats were breaking rules of common courtesy and laws. In fact a law enforcement officer visiting was amazed at the number of violations he noticed in the short time he was there.
63						
64						
65						
66						By # 5 they wrote-Septic? For # 17 they wrote-all, for # 27 they circled all the techniques, but did not mark any of the numbers. Thank you for your interest. We live on Long Lake at the junction of the Channel. It is starting to erode on the shore and trees fall in from time to time helping the fish habitat. There are areas int he channel that are having more weeds--Many people SPEED through the Channel. It should be more CLEARLY MARKED. Some people don't know about the bouys and what they represent. Please put up a sign. (name and phone number were included)

Survey Number	2g Comment	17m Comment	22p Comment	23r Comment	24r Comment	Other Comments (and Question 33)
67			Are the snails invasive? Sure are millions of them.			for # 30 they think but are not sure they are members. Keep up great work. I really appreciate all the efforts to keep milfoil from the Lake. Now is time to win the battle. No wake in channel has made difference. About 10-20% of boats do not follow the law. Bouys on Channel have moved a lot this summer. Who keeps track of them and puts them back in place? Who call when they move?
68						Concerned about areas where there is sludge buildup and above water growth in Channels and bay areas: specifically the channel at the far south end of Long Lake. These areas have become so over-grown that it is difficult to navigate even with a canoe or kayak; areas are becoming marsh rather than lake. Increasing concern about the size and power of boats on the lake. Seem to be getting much bigger and high powered boat traffic. This is especially concerning to us in the channel near the south end of Long Lake where the bridge pilings are still standing. The shore areas are suffering erosion from the large wakes of fast moving water craft. This area would benefit if designated as NO Wake area. I would be glad to discuss these matters if you would contact me-(name and phone number were included)
69						
70						
71						
72						
73						
74						I feel the spear fishing has hurt the lake the most.
75						We have owned our land on Long Lake for 32 years. We have done nothing to change the natural shoreline. We have removed only trees that were dead or threatening our home or garage. We leave fallen trees in the water for fish habitat. We have avoided any asphalt or cement driveways by using crushed rock to maintain natural drainage. Having said the above, I also have to say that people on both sides of us have cut down too many trees, made lawns, changed the natural shoreline, etc. Several neighbors have extensive asphalt driveways and service areas There are several properties on Long Lake that remind me of the local lakes around Milwaukee with almost no trees & lawns. When i have spoken to several of these people, they say that it is what they want and it is their land. I hope it is not too late to save the Northwoods feel that I bought 32 years ago and have tried to maintain.
76						
77						

C

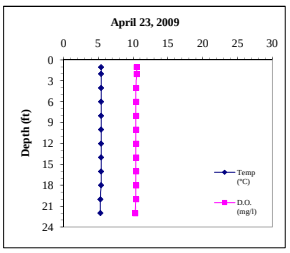
APPENDIX C

Water Quality Data

Long Lake

Date:	**04-23-09**	**Max Depth (ft):**	24.2
Time:	12:20	**LLS Depth (ft):**	3.0
Weather:	90% Clouds, 40°F, Very Windy	**LLB Depth (ft):**	21.0
Ent:	BTB **Verf:**	**Secchi Depth (ft):**	5.8

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	5.4	10.5	7.0	74
2.0	5.4	10.5	7.0	73
4.0	5.4	10.4	7.0	73
6.0	5.4	10.4	7.3	73
8.0	5.4	10.4	7.4	73
10.0	5.4	10.4	7.3	73
12.0	5.4	10.4	7.7	74
14.0	5.4	10.4	7.8	74
16.0	5.4	10.4	7.7	73
18.0	5.4	10.4	7.7	73
20.0	5.3	10.4	8.0	74
22.0	5.3	10.3	8.0	73



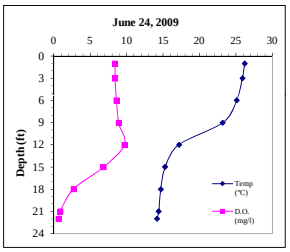
Parameter	LLS	LLB
Total P (µg/L)	25.000	29.000
Dissolved P (µg/L)	ND	ND
Chl a (µg/L)	7.76	NA
TKN (µg/L	550.00	560.00
NO3+NO2-N (µg/L)	47.000	48.000
NH3-N (µg/L)	ND	ND
Total N (µg/L)	597.00	608.00
Lab Cond. (µS/cm)	78	79
Lab pH	7.30	7.38
Alkal (mg/l CaCO3)	27	27
Total Susp Sol (mg/l)	2	2
Calcium (mg/l)	7.5	NA

Data collected by TAH and EJH (Onterra)

Long Lake

Date:	**06-24-09**	**Max Depth (ft):**	25.3
Time:	11:15	**LLS Depth (ft):**	3.0
Weather:	82°F, 100% sun, light breeze	**LLB Depth (ft):**	22.0
Ent:	BTB **Verf:**	**Secchi Depth (ft):**	8.9

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	26.2	8.4	7.9	74
3.0	25.9	8.4	8	73
6.0	25.1	8.6	8.1	74
9.0	23.2	8.9	8.1	73
12.0	17.2	9.7	8.1	72
15.0	15.3	6.8	7.5	73
18.0	14.7	2.7	6.8	74
21.0	14.4	0.9	6.7	79
22.0	14.2	0.6	6.7	79



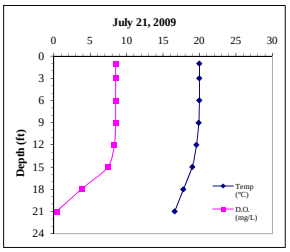
Parameter	LLS	LLB
Total P (µg/L)	19.000	41.000
Dissolved P (µg/L)	NA	NA
Chl a (µg/L)	3.18	NA
TKN (µg/L	NA	NA
NO3+NO2-N (µg/L)	NA	NA
NH3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkal (mg/l CaCO3)	NA	NA
Total Susp Sol (mg/l)	ND	7
Calcium (mg/l)	NA	NA

Data collected by BTB and TWH (Onterra)

Long Lake

Date:	**07-21-09**	**Max Depth (ft):**	24.8
Time:	1:30	**LLS Depth (ft):**	3.0
Weather:	80% Clouds, 74°F, breezy	**LLB Depth (ft):**	21.0
Ent:	BTB **Verf:**	**Secchi Depth (ft):**	5.6

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	20.0	8.5	7.7	74
3.0	20.0	8.5	7.7	74
6.0	20.0	8.5	7.7	74
9.0	19.9	8.5	7.7	74
12.0	19.6	8.3	7.6	74
15.0	19.0	7.4	7.3	74
18.0	17.8	3.8	6.9	76
21.0	16.6	0.4	6.7	88



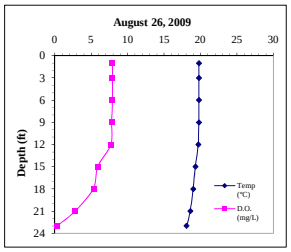
Parameter	LLS	LLB
Total P (µg/L)	23.000	45.000
Dissolved P (µg/L)	ND	20.000
Chl a (µg/L)	7.860	NA
TKN (µg/L	730.000	470.000
NO3+NO2-N (µg/L)	ND	ND
NH3-N (µg/L)	20.000	150.000
Total N (µg/L)	730.000	470.000
Lab Cond. (µS/cm)	76.000	95.000
Lab pH	7.780	6.870
Alkal (mg/l CaCO3)	26.000	38.500
Total Susp Sol (mg/l)	4.000	4.000
Calcium (mg/l)	NA	NA

Data collected by TAH and AAH (Onterra)

Long Lake

Date:	**08-26-09**	**Max Depth (ft):**	24.0
Time:	9:35	**LLS Depth (ft):**	3.0
Weather:	0% Clouds, 58 F	**LLB Depth (ft):**	21.0
Ent:	BTB **Verf:**	**Secchi Depth (ft):**	5.6

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	19.8	7.9	7.8	75
3.0	19.8	7.9	7.8	75
6.0	19.8	7.9	7.9	74
9.0	19.8	7.8	7.8	74
12.0	19.7	7.7	7.8	75
15.0	19.3	5.9	7.4	75
18.0	19.0	5.3	7.3	75
21.0	18.6	2.8	7.0	77
23.0	18.1	0.3	6.9	83



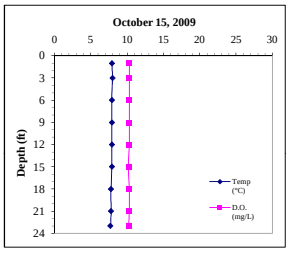
Parameter	LLS	LLB
Total P (µg/L)	21.000	41.000
Dissolved P (µg/L)	NA	NA
Chl a (µg/L)	5.300	NA
TKN (µg/L	NA	NA
NO3+NO2-N (µg/L)	NA	NA
NH3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkal (mg/l CaCO3)	NA	NA
Total Susp Sol (mg/l)	3.000	5.000
Calcium (mg/l)	NA	NA

Data collected by DAC and TWH (Onterra)

Long Lake

Date:	**10-15-09**	**Max Depth (ft):**	24.0
Time:	2:15	**LLS Depth (ft):**	3.0
Weather:	100 % Clouds, 40 °F, light breeze	**LLB Depth (ft):**	21.0
Ent:	BTB **Verf:**	**Secchi Depth (ft):**	5.9

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	7.9	10.3	8	74
3.0	8.0	10.3	8	74
6.0	7.9	10.3	8	74
9.0	7.9	10.3	8	74
12.0	7.9	10.3	8	74
15.0	7.9	10.2	8	74
18.0	7.8	10.3	8	74
21.0	7.8	10.3	8	74
23.0	7.7	10.2	8	74



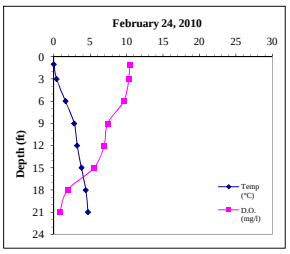
Parameter	LLS	LLB
Total P (µg/L)	25.000	26.000
Dissolved P (µg/L)	NA	NA
Chl a (µg/L)	11.700	NA
TKN (µg/L	NA	NA
NO3+NO2-N (µg/L)	NA	NA
NH3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkal (mg/l CaCO3)	NA	NA
Total Susp Sol (mg/l)	4.000	5.000
Calcium (mg/l)	NA	NA

Data collected by TAH (Onterra)

Long Lake

Date:	**02-24-10**	**Max Depth (ft):**	22.0
Time:	8:30	**LLS Depth (ft):**	3.0
Weather:	100% clouds, 15°F, windy	**LLB Depth (ft):**	20.0
Ent:	BTB **Verf:**	**Secchi Depth (ft):**	6.0

Depth (ft)	Temp (°C)	D.O. (mg/l)	pH	Sp. Cond (µS/cm)
1.0	0.0	10.4	6.6	83
3.0	0.4	10.3	6.7	82
6.0	1.6	9.6	6.7	78
9.0	2.8	7.4	6.6	79
12.0	3.2	6.9	6.6	80
15.0	3.8	5.5	6.5	82
18.0	4.4	1.9	6.5	88
21.0	4.7	0.8	6.5	97



Parameter	LLS	LLB
Total P (µg/L)		
Dissolved P (µg/L)		
Chl a (µg/L)		
TKN (µg/L		
NO3+NO2-N (µg/L)		
NH3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkal (mg/l CaCO3)		
Total Susp Sol (mg/l)		
Calcium (mg/l)		

Data collected by: BTB and DAC (Onterra)
Ice: 1.6 ft

Water Quality Data

2009/2010	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	6	6.3	NA	NA
Total P (µg/L)	5	22.6	5	36.4
Dissolved P (µg/L)	2	ND	1	20.0
Chl a (µg/L)	5	7.2	NA	NA
TKN (µg/L	2	640.0	2	515.0
NO3+NO2-N (µg/L)	2	47.0	2	48.0
NH3-N (µg/L)	2	20.0	2	150.0
Total N (µg/L)	2	663.5	2	539.0
Lab Cond. (µS/cm)	2	77.0	2	87.0
Lab pH	2	7.5	2	7.1
Alkal (mg/l CaCO3)	2	26.4	2	32.6
Total Susp Sol (mg/l)	5	3.3	5	4.6
Calcium (µg/L)	1	7.5	NA	NA

Wisconsin Trophic State Index (WTSI)

Year	TP	Chla	SD
1979	53.50	53.25	52.55
1993			49.07
1994			52.87
1995			47.55
1996			50.14
1997			46.57
1998			48.08
2000	51.95	48.20	46.48
2001	54.61	52.03	47.33
2002	51.74	51.09	48.57
2003			48.31
2004			44.67
2005			46.77
2006			44.67
2007			47.61
2008			47.15
2009	48.86	47.48	49.71
All Years (weighted)	52.14	50.32	47.95
WI Natural Lakes	53.19	54.23	47.33
Northeast Region	51.0535	51.4879	45.611

Morphological / Geographical Data

Parameter	
Acreage	620
Volume (acre-feet)	7,831
Perimeter (miles)	7.45
Shoreland Development	
Maximum Depth (feet)	31
County	Oneida County
WBIC	1609000
Lillie Mason Region(1983)	Northeast
Nichols Ecoregion(1999)	NLFL

Watershed Data

WiLMS Class	Acreage	kg/yr	lbs/yr
Forest	1351.0	490	108.0
Open Water	620.0	75	165.0
Pasture/Grass	53.0	6	13.0
Row Crops	4.0	2	4.0
Wetland	378.0	15	33.0
Upstream Chain Lakes	69153.0	1,811	3984.0

Watershed to Lake Area	115:1

	Secchi (feet)				Chlorophyll a (µg/L)				Phosphorus (µg/L)				Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season				Spring Turnover		Fall Turnover	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1979	1	5.5	1	5.5	1	11.76	1	11.76	1	26	1	26				
1993	3	6.33	2	7												
1994	10	5.23	4	5.38												
1995	18	7	9	7.78												
1996	14	6.21	11	6.5												
1997	18	7.25	9	8.33												
1998	5	7.5	5	7.5												
2000	6	7.86	5	8.38	4	7.25	3	6.00	4	23.5	3	21.33				
2001	5	7.52	4	7.9	4	9.25	3	10.00	4	29	3	30				
2002	3	6.73	2	7.25	5	9.21	4	8.82	5	21	4	20.75				
2003	4	7.38	4	7.38												
2004	4	7.44	1	9.5												
2005	9	8.28	7	8.21												
2006	4	9.25	2	9.5												
2007	8	7.81	6	7.75												
2008	8	7.31	6	8												
2009	5	6.36	3	6.70	5	7.16	3	5.45	5	18.6	3	14.33				
All Years (weighted)		7.1		7.6		8.4		8.0		22.8		21.9				
WI Natural Lakes				7.9				13.4				25				
Northeast Region				8.9				9.3				19				

D

APPENDIX D

Watershed Analysis WiLMS Results

Date: 9/1/2010 Scenario: LongO with Planting Ground Lake Input

Lake Id: Long Lake, Oneida County
Watershed Id: LongO

Hydrologic and Morphometric Data

Tributary Drainage Area: 1786.0 acre
Total Unit Runoff: 12.20 in.
Annual Runoff Volume: 1815.8 acre-ft
Lake Surface Area <As>: 620.0 acre
Lake Volume <V>: 7832.0 acre-ft
Lake Mean Depth <z>: 12.6 ft
Precipitation - Evaporation: 5.8 in.
Hydraulic Loading: 71836.8 acre-ft/year
Areal Water Load <qs>: 115.9 ft/year
Lake Flushing Rate <p>: 9.17 1/year
Water Residence Time: 0.11 year
Observed spring overturn total phosphorus (SPO): 25.0 mg/m^3
Observed growing season mean phosphorus (GSM): 22.8 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre (ac)	Low	Most Likely	High	Loading %	Low	Most Likely	High
		|---- Loading (kg/ha-year) ----|				|----- Loading (kg/year) ----|		
Row Crop AG	4.0	0.50	1.00	3.00	0.1	1	2	5
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	53.0	0.10	0.30	0.50	0.3	2	6	11
HD Urban (1/8 Ac)	0.0	1.00	1.50	2.00	0.0	0	0	0
MD Urban (1/4 Ac)	0.0	0.30	0.50	0.80	0.0	0	0	0
Rural Res (>1 Ac)	0.0	0.05	0.10	0.25	0.0	0	0	0
Wetlands	378.0	0.10	0.10	0.10	0.8	15	15	15
Forest	1351.0	0.05	0.09	0.18	2.5	27	49	98
Lake Surface	620.0	0.10	0.30	1.00	3.8	25	75	251

POINT SOURCE DATA

Point Sources	Water Load (m^3/year)	Low (kg/year)	Most Likely (kg/year)	High (kg/year)	Loading %
Planting Ground Lake	8.6E+007	1811.0	1811.0	1811.0	92.5

SEPTIC TANK DATA

Description	Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)	0.30	0.50	0.80	
# capita-years	0.0			
% Phosphorus Retained by Soil	98.0	90.0	80.0	
Septic Tank Loading (kg/year)	0.00	0.00	0.00	0.0

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	4148.4	4318.4	4830.7	100.0
Total Loading (kg)	1881.7	1958.8	2191.2	100.0
Areal Loading (lb/ac-year)	6.69	6.97	7.79	
Areal Loading (mg/m^2-year)	749.96	780.71	873.32	
Total PS Loading (lb)	3992.5	3992.5	3992.5	92.5
Total PS Loading (kg)	1811.0	1811.0	1811.0	92.5
Total NPS Loading (lb)	100.5	160.0	285.0	7.5
Total NPS Loading (kg)	45.6	72.6	129.3	7.5

Phosphorus Prediction and Uncertainty Analysis Module

Date: 9/1/2010 Scenario: **LongO with Planting Ground Lake Input**

Observed spring overturn total phosphorus (SPO): 25.0 mg/m^3
Observed growing season mean phosphorus (GSM): 22.8 mg/m^3
Back calculation for SPO total phosphorus: 0.0 mg/m^3
Back calculation GSM phosphorus: 0.0 mg/m^3
% Confidence Range: 70%
Nurenberg Model Input - Est. Gross Int. Loading: 0 kg

Lake Phosphorus Model	Low Total P (mg/m^3)	Most Likely Total P (mg/m^3)	High Total P (mg/m^3)	Predicted -Observed (mg/m^3)	% Dif.
Walker, 1987 Reservoir	17	18	20	-5	-22
Canfield-Bachmann, 1981 Natural Lake	18	18	20	-5	-22
Canfield-Bachmann, 1981 Artificial Lake	17	17	19	-6	-26
Rechow, 1979 General	14	14	16	-9	-39
Rechow, 1977 Anoxic	18	19	22	-4	-18
Rechow, 1977 water load<50m/year	12	13	14	-10	-44
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	16	17	19	-8	-32
Vollenweider, 1982 Combined OECD	15	16	17	-8	-33
Dillon-Rigler-Kirchner	13	13	15	-12	-48
Vollenweider, 1982 Shallow Lake/Res.	12	12	13	-12	-50
Larsen-Mercier, 1976	16	17	19	-8	-32
Nurnberg, 1984 Oxic	15	16	18	-7	-31

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	13	25	Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	6	52	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	5	49	FIT	1	GSM
Rechow, 1979 General	10	20	FIT	0	GSM
Rechow, 1977 Anoxic	14	26	Pin	0	GSM
Rechow, 1977 water load<50m/year	9	18	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	27	FIT	0	SPO
Vollenweider, 1982 Combined OECD	9	27	FIT	0	ANN
Dillon-Rigler-Kirchner	10	18	FIT	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	7	20	FIT	0	ANN
Larsen-Mercier, 1976	13	22	P Pin	0	SPO
Nurnberg, 1984 Oxic	10	24	FIT	0	ANN

E

APPENDIX E

Aquatic Plant Survey Data

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
1	45.8743347	45.8743347	7	S	P	No vegetation																																	
2	45.8737767	45.8737767	6	M	P								1							1											1							1	
3	45.8732188	45.8732188	7	M	P								1						1												1	1							
4	45.8726608	45.8726608	4	S	P	No vegetation																																	
5	45.8693129	45.8693129	8	M	P			1					1																										
6	45.868755	45.868755	11		R	No vegetation																																	
7	45.868197	45.868197				Too deep																																	
8	45.867639	45.867639	11		R																1																		
9	45.8670811	45.8670811	6	M	P														1		1																	1	
10	45.8754447	45.8754447	7	S	P								2						1	1												1						1	
11	45.8748867	45.8748867	14		R	No vegetation																																	
12	45.8743288	45.8743288				Too deep																																	
13	45.8737708	45.8737708				Too deep																																	
14	45.8732128	45.8732128				Too deep																																	
15	45.8726548	45.8726548				Too deep																																	
16	45.8720969	45.8720969	14		R	No vegetation																																	
17	45.8715389	45.8715389	12		R	No vegetation																																	
18	45.8709809	45.8709809	10		R	No vegetation																																	
19	45.870423	45.870423	10		R																											1							
20	45.869865	45.869865	7		P								1																		2		1						
21	45.869307	45.869307				Too deep																																	
22	45.868749	45.868749				Too deep																																	
23	45.8681911	45.8681911				Too deep																																	
24	45.8676331	45.8676331				Too deep																																	
25	45.8670751	45.8670751	11		R	No vegetation																																	
26	45.8665171	45.8665171	7	M	P			1																							1		1						
27	45.8659592	45.8659592	6	M	P								1						1	1											1	1							
28	45.8654012	45.8654012	3	R	P															1																			
29	45.8648432	45.8648432	7	S	P			1					1							1	1																		
30	45.8642853	45.8642853	10	S	P														1	1																			
31	45.8759967	45.8759967	9	S	P	No vegetation																																	
32	45.8754388	45.8754388				Too deep																																	
33	45.8748808	45.8748808				Too deep																																	
34	45.8743228	45.8743228																																					
35	45.8737649	45.8737649																																					
36	45.8732069	45.8732069																																					
37	45.8726489	45.8726489																																					
38	45.8720909	45.8720909				Too deep																																	
39	45.871533	45.871533				Too deep																																	
40	45.870975	45.870975				Too deep																																	
41	45.870417	45.870417				Too deep																																	
42	45.869859	45.869859				Too deep																																	
43	45.8693011	45.8693011				Too deep																																	
44	45.8687431	45.8687431																																					
45	45.8681851	45.8681851																																					
46	45.8676272	45.8676272																																					
47	45.8670692	45.8670692				Too deep																																	
48	45.8665112	45.8665112	12		R	No vegetation																																	
49	45.8659532	45.8659532	15		R	No vegetation																																	
50	45.8653953	45.8653953	9	S	P																1																		
51	45.8648373	45.8648373	15		R	No vegetation																																	
52	45.8642793	45.8642793	14		R			1																															
53	45.8765488	45.8765488	6	R	P								1																		1								
54	45.8759908	45.8759908				Too deep																																	
55	45.8754328	45.8754328				Too deep																																	

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
56	45.8748749	45.8748749				Too deep																																		
57	45.8743169	45.8743169				Too deep																																		
58	45.8737589	45.8737589				Too deep																																		
59	45.8732009	45.8732009				Too deep																																		
60	45.872643	45.872643				Too deep																																		
61	45.872085	45.872085				Too deep																																		
62	45.871527	45.871527				Too deep																																		
63	45.870969	45.870969				Too deep																																		
64	45.8704111	45.8704111				Too deep																																		
65	45.8698531	45.8698531				Too deep																																		
66	45.8692951	45.8692951				Too deep																																		
67	45.8687372	45.8687372				Too deep																																		
68	45.8681792	45.8681792				Too deep																																		
69	45.8676212	45.8676212				Too deep																																		
70	45.8670632	45.8670632				Too deep																																		
71	45.8665053	45.8665053				Too deep																																		
72	45.8659473	45.8659473				Too deep																																		
73	45.8653893	45.8653893	15		R	No vegetation																																		
74	45.8648313	45.8648313				Too deep																																		
75	45.8642734	45.8642734	15		R	No vegetation																																		
76	45.8782167	45.8782167	6	R	P															1											1							1		
77	45.8776588	45.8776588	8	R	P								1								1																			
78	45.8771008	45.8771008	15		R																																			
79	45.8765428	45.8765428				Too deep																																		
80	45.8759848	45.8759848				Too deep																																		
81	45.8754269	45.8754269				Too deep																																		
82	45.8748689	45.8748689				Too deep																																		
83	45.8743109	45.8743109				Too deep																																		
84	45.873753	45.873753				Too deep																																		
85	45.873195	45.873195				Too deep																																		
86	45.872637	45.872637				Too deep																																		
87	45.872079	45.872079				Too deep																																		
88	45.8715211	45.8715211				Too deep																																		
89	45.8709631	45.8709631				Too deep																																		
90	45.8704051	45.8704051				Too deep																																		
91	45.8698472	45.8698472				Too deep																																		
92	45.8692892	45.8692892				Too deep																																		
93	45.8687312	45.8687312				Too deep																																		
94	45.8681732	45.8681732				Too deep																																		
95	45.8676153	45.8676153				Too deep																																		
96	45.8670573	45.8670573				Too deep																																		
97	45.8664993	45.8664993				Too deep																																		
98	45.8659413	45.8659413				Too deep																																		
99	45.8653834	45.8653834				Too deep																																		
100	45.8648254	45.8648254				Too deep																																		
101	45.8642674	45.8642674				Too deep																																		
102	45.8637095	45.8637095	7	S	P														1																				1	
103	45.8793267	45.8793267	5	S	P	No vegetation																																		
104	45.8787687	45.8787687	9	S	P	No vegetation																																		
105	45.8782108	45.8782108	12		R	No vegetation																																		
106	45.8776528	45.8776528	12		R																1																			
107	45.8770948	45.8770948	15		R																																			
108	45.8765369	45.8765369				Too deep																																		
109	45.8759789	45.8759789				Too deep																																		
110	45.8754209	45.8754209				Too deep																																		

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
111	45.8748629	45.8748629				Too deep																																		
112	45.874305	45.874305				Too deep																																		
113	45.873747	45.873747				Too deep																																		
114	45.873189	45.873189				Too deep																																		
115	45.8726311	45.8726311				Too deep																																		
116	45.8720731	45.8720731				Too deep																																		
117	45.8715151	45.8715151				Too deep																																		
118	45.8709571	45.8709571				Too deep																																		
119	45.8703992	45.8703992				Too deep																																		
120	45.8698412	45.8698412				Too deep																																		
121	45.8692832	45.8692832				Too deep																																		
122	45.8687253	45.8687253				Too deep																																		
123	45.8681673	45.8681673				Too deep																																		
124	45.8676093	45.8676093				Too deep																																		
125	45.8670513	45.8670513				Too deep																																		
126	45.8664934	45.8664934				Too deep																																		
127	45.8659354	45.8659354				Too deep																																		
128	45.8653774	45.8653774				Too deep																																		
129	45.8648194	45.8648194				Too deep																																		
130	45.8642615	45.8642615	8		P				1												1											1								
131	45.8637035	45.8637035	3	S	P															1					1															
132	45.8798787	45.8798787	5	S	P																										1									
133	45.8793208	45.8793208	9	M	P																						2					1	1							
134	45.8787628	45.8787628	8	M	P								1								1											1								
135	45.8782048	45.8782048	7	S	P								1								1										1	1								
136	45.8776468	45.8776468	9	M	P								1																		1								1	
137	45.8770889	45.8770889	14		R	No vegetation																																		
138	45.8765309	45.8765309				Too deep																																		
139	45.8759729	45.8759729				Too deep																																		
140	45.875415	45.875415				Too deep																																		
141	45.874857	45.874857				Too deep																																		
142	45.874299	45.874299				Too deep																																		
143	45.873741	45.873741				Too deep																																		
144	45.8731831	45.8731831				Too deep																																		
145	45.8726251	45.8726251				Too deep																																		
146	45.8720671	45.8720671				Too deep																																		
147	45.8715092	45.8715092				Too deep																																		
148	45.8709512	45.8709512				Too deep																																		
149	45.8703932	45.8703932				Too deep																																		
150	45.8698352	45.8698352				Too deep																																		
151	45.8692773	45.8692773				Too deep																																		
152	45.8687193	45.8687193				Too deep																																		
153	45.8681613	45.8681613				Too deep																																		
154	45.8676033	45.8676033				Too deep																																		
155	45.8670454	45.8670454				Too deep																																		
156	45.8664874	45.8664874				Too deep																																		
157	45.8659294	45.8659294				Too deep																																		
158	45.8653715	45.8653715	15		R																																			
159	45.8648135	45.8648135	7	M	P			1													1						1				1									
160	45.8804307	45.8804307	3	S	P	No vegetation																																		
161	45.8798728	45.8798728	5	S	P								1																		1									
162	45.8793148	45.8793148	9	M	P																1											1								
163	45.8787568	45.8787568	11		R								1								1											2								
164	45.8781988	45.8781988	8	S	P								1								1										1	1								
165	45.8776409	45.8776409	6	R	P																										1									

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
166	45.8770829	45.8770829				Too deep																																	
167	45.8765249	45.8765249				Too deep																																	
168	45.875967	45.875967				Too deep																																	
169	45.875409	45.875409				Too deep																																	
170	45.874851	45.874851				Too deep																																	
171	45.874293	45.874293				Too deep																																	
172	45.8737351	45.8737351																																					
173	45.8731771	45.8731771																																					
174	45.8726191	45.8726191																																					
175	45.8720612	45.8720612																																					
176	45.8715032	45.8715032																																					
177	45.8709452	45.8709452																																					
178	45.8703872	45.8703872																																					
179	45.8698293	45.8698293																																					
180	45.8692713	45.8692713																																					
181	45.8687133	45.8687133																																					
182	45.8681554	45.8681554																																					
183	45.8675974	45.8675974																																					
184	45.8670394	45.8670394																																					
185	45.8664814	45.8664814																																					
186	45.8659235	45.8659235				Too deep																																	
187	45.8653655	45.8653655	13		R																1											1								
188	45.8648075	45.8648075	6	S	P																										1								
189	45.8804248	45.8804248	7	S	P																										1								
190	45.8798668	45.8798668	10	M	P			1																															
191	45.8793088	45.8793088	8	M	P																										1		1						
192	45.8787508	45.8787508	9	M	P														1		1											1	1						
193	45.8781929	45.8781929	9	M	P								1								1											1						1	
194	45.8776349	45.8776349	12		R	No vegetation																																	
195	45.8770769	45.8770769	11		R	No vegetation																																	
196	45.876519	45.876519	12		R																1																		
197	45.875961	45.875961	12		R	No vegetation																																	
198	45.875403	45.875403				Too deep																																	
199	45.874845	45.874845	13		R	No vegetation																																	
200	45.8742871	45.8742871				Too deep																																	
201	45.8737291	45.8737291				Too deep																																	
202	45.8731711	45.8731711				Too deep																																	
203	45.8726132	45.8726132				Too deep																																	
204	45.8720552	45.8720552				Too deep																																	
205	45.8714972	45.8714972				Too deep																																	
206	45.8709392	45.8709392				Too deep																																	
207	45.8703813	45.8703813				Too deep																																	
208	45.8698233	45.8698233				Too deep																																	
209	45.8692653	45.8692653				Too deep																																	
210	45.8687074	45.8687074				Too deep																																	
211	45.8681494	45.8681494				Too deep																																	
212	45.8675914	45.8675914				Too deep																																	
213	45.8670334	45.8670334				Too deep																																	
214	45.8664755	45.8664755				Too deep																																	
215	45.8659175	45.8659175				Too deep																																	
216	45.8653595	45.8653595	7	R	P	No vegetation																																	
217	45.8648016	45.8648016	6	S	P																1										1		1					1	
218	45.8586638	45.8586638	8	S	P	No vegetation																																	
219	45.8581059	45.8581059	8	M	P								1																										
220	45.8575479	45.8575479	7	M	P			1																						1	1								

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
221	45.8569899	45.8569899	8	M	P			1																															
222	45.856432	45.856432	9	S	P			1																															
223	45.855874	45.855874	7	S	P	No vegetation																																	
224	45.8804188	45.8804188	4	S	P	No vegetation																																	
225	45.8798608	45.8798608	7	S	P																						1												
226	45.8793028	45.8793028	6	M	P																				1		1												
227	45.8787449	45.8787449	9	M	P								1				1		1		1										1	1							
228	45.8781869	45.8781869	8	M	P																1											1							
229	45.8776289	45.8776289	14		R	No vegetation																																	
230	45.877071	45.877071	8	M	P																2											1							
231	45.876513	45.876513	12		R	No vegetation																																	
232	45.875955	45.875955	13		R	No vegetation																																	
233	45.875397	45.875397	13		R	No vegetation																																	
234	45.8748391	45.8748391	12		R	No vegetation																																	
235	45.8742811	45.8742811	18		R	No vegetation																																	
236	45.8737231	45.8737231				Too deep																																	
237	45.8731652	45.8731652				Too deep																																	
238	45.8726072	45.8726072				Too deep																																	
239	45.8720492	45.8720492				Too deep																																	
240	45.8714912	45.8714912				Too deep																																	
241	45.8709333	45.8709333				Too deep																																	
242	45.8703753	45.8703753				Too deep																																	
243	45.8698173	45.8698173				Too deep																																	
244	45.8692594	45.8692594				Too deep																																	
245	45.8687014	45.8687014				Too deep																																	
246	45.8681434	45.8681434				Too deep																																	
247	45.8675854	45.8675854				Too deep																																	
248	45.8670275	45.8670275				Too deep																																	
249	45.8664695	45.8664695				Too deep																																	
250	45.8659115	45.8659115				Too deep																																	
251	45.8653535	45.8653535				Too deep																																	
252	45.8647956	45.8647956	6	R	P	No vegetation																																	
253	45.8642376	45.8642376	11		R																																		
254	45.8636796	45.8636796	11		R																																		
255	45.8608898	45.8608898	6	S	P				1										1						1						1							1	
256	45.8603318	45.8603318	8	S	P																												1					1	
257	45.8597738	45.8597738	9	M	P								1																										
258	45.8592158	45.8592158	8	M	P														1											2									
259	45.8586579	45.8586579	7	M	P			1					2						1		1																		
260	45.8580999	45.8580999	6	M	P								1						1		2																		
261	45.8575419	45.8575419	7	M	P			1																						1									
262	45.856984	45.856984	8	M	P			1																						1									
263	45.856426	45.856426	9	M	P			1					1								1																		
264	45.855868	45.855868	8	M	P								1								1																	1	
265	45.85531	45.85531	9	S	P								1								1																		
266	45.8547521	45.8547521				Too deep																																	
267	45.8804128	45.8804128	4	S	P	Too deep		1												1							1												
268	45.8798548	45.8798548	8	M	P								1								1											1							
269	45.8792969	45.8792969	9	M	P			2					1																										
270	45.8787389	45.8787389	6	M	P	No vegetation																																	
271	45.8781809	45.8781809	6	M	P								1						1		1						1				1	1							
272	45.8776229	45.8776229	8	S	P					1			1						1	1	1																	1	
273	45.877065	45.877065	7	S	P								1								1											1							
274	45.876507	45.876507	8	S	P																1																		
275	45.875949	45.875949	9	S	P								1																		1								

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
276	45.8753911	45.8753911	6	S	P								1														1												
277	45.8748331	45.8748331	10		R																1																		
278	45.8742751	45.8742751	12		R	No vegetation																																	
279	45.8737171	45.8737171				Too deep																																	
280	45.8731592	45.8731592	14		R	No vegetation																																	
281	45.8726012	45.8726012	15		R	No vegetation																																	
282	45.8720432	45.8720432				Too deep																																	
283	45.8714853	45.8714853				Too deep																																	
284	45.8709273	45.8709273				Too deep																																	
285	45.8703693	45.8703693				Too deep																																	
286	45.8698113	45.8698113				BOATERS																																	
287	45.8692534	45.8692534	5	S	P															1	1										1							1	
288	45.8686954	45.8686954				Too deep																																	
289	45.8681374	45.8681374				Too deep																																	
290	45.8675795	45.8675795				Too deep																																	
291	45.8670215	45.8670215				Too deep																																	
292	45.8664635	45.8664635				Too deep																																	
293	45.8659055	45.8659055				Too deep																																	
294	45.8653476	45.8653476				Too deep																																	
295	45.8647896	45.8647896	7	R	P								1								1																		
296	45.8642316	45.8642316	12		R	No vegetation																																	
297	45.8636736	45.8636736	11		R																											1							
298	45.8631157	45.8631157	11	M	P															1																			
299	45.8625577	45.8625577	11	M	P	No vegetation																																	
300	45.8619997	45.8619997	11	M	P	No vegetation																																	
301	45.8614418	45.8614418	11	M	P	No vegetation																																	
302	45.8608838	45.8608838	9	M	P								1																										
303	45.8603258	45.8603258	9	M	P								1																1										
304	45.8597678	45.8597678	8	M	P																										2								
305	45.8592099	45.8592099	6	M	P			1											1																				
306	45.8586519	45.8586519	6	M	P			3	1																					1									
307	45.8580939	45.8580939	6	M	P			1											1																				
308	45.8575359	45.8575359	7	M	P			1																						1			1						
309	45.856978	45.856978	10	M	P			1					1						1		1																		
310	45.85642	45.85642	9	M	P								1								1																		
311	45.855862	45.855862				Too deep																																	
312	45.8553041	45.8553041	7	S	P														1		1									2									
313	45.8804068	45.8804068	4	M	P	No vegetation																																	
314	45.8798488	45.8798488	5	S	P																										1	1							
315	45.8792909	45.8792909	4	R	P																										1								
316	45.8776169	45.8776169	5	M	P																										1								
317	45.877059	45.877059	5	R	P																										2								
318	45.876501	45.876501	3	S	P							1			1																								
319	45.875943	45.875943				SWIM AREA																									1								
320	45.8753851	45.8753851	6	S	P																				1						1								
321	45.8748271	45.8748271	9	S	P								1																										
322	45.8742691	45.8742691	6	M	P														1		1																		
323	45.8737112	45.8737112	8	S	P								1				1														1	1						1	
324	45.8731532	45.8731532	7		P															1	1																		
325	45.8725952	45.8725952	10		R																1																		
326	45.8720372	45.8720372				Too deep																																	
327	45.8714793	45.8714793				Too deep																																	
328	45.8709213	45.8709213				Too deep																																	
329	45.8703633	45.8703633				Too deep																																	
330	45.8698054	45.8698054	8	S	P			1					1				1									1					2							1	

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
331	45.8686894	45.8686894				Too deep																																		
332	45.8681314	45.8681314				Too deep																																		
333	45.8675735	45.8675735				Too deep																																		
334	45.8670155	45.8670155				Too deep																																		
335	45.8664575	45.8664575				Too deep																																		
336	45.8658995	45.8658995				Too deep																																		
337	45.8653416	45.8653416				Too deep																																		
338	45.8647836	45.8647836	12		R	No vegetation																																		
339	45.8642256	45.8642256	13		R																																			
340	45.8636677	45.8636677	13		R	No vegetation																																		
341	45.8631097	45.8631097	13		R			1																																
342	45.8625517	45.8625517	12	M	P																																			
343	45.8619937	45.8619937	11	M	P																								1											
344	45.8614358	45.8614358	11	M	P																								1											
345	45.8608778	45.8608778	11	M	P																								1											
346	45.8603198	45.8603198	8	M	P								1						1										2											
347	45.8597619	45.8597619	8	M	P			1					1						1																					
348	45.8592039	45.8592039	7	M	P			1					1																				1							
349	45.8586459	45.8586459	6	M	P			1											1												1									
350	45.8580879	45.8580879	9	M	P																				1															
351	45.85753	45.85753	8	M	P			1											1																					
352	45.856972	45.856972	9	M	P			1											1																					
353	45.856414	45.856414	7	M	P								1								1																		1	
354	45.855856	45.855856	14		R								1						1																					
355	45.8552981	45.8552981	7	S	P								1								1																			
356	45.877611	45.877611	3	M	P			3					1						1			1		1						1	1	1					1	1	
357	45.877053	45.877053	3	M	P			1					1						1				1							1							1		
358	45.8742631	45.8742631	4	M	P					1			1			1			1																				1	
359	45.8737052	45.8737052	8	S	P														1						1		1													
360	45.8731472	45.8731472	8	S	P																						1				1		1							
361	45.8725892	45.8725892	9	M	P																						1													
362	45.8720312	45.8720312				Too deep																																		
363	45.8714733	45.8714733				Too deep																																		
364	45.8709153	45.8709153				Too deep																																		
365	45.8703573	45.8703573				Too deep																																		
366	45.8697994	45.8697994	11			No vegetation																																		
367	45.8686834	45.8686834	8	S	P																2																		1	
368	45.8681254	45.8681254				Too deep																																		
369	45.8675675	45.8675675				Too deep																																		
370	45.8670095	45.8670095				Too deep																																		
371	45.8664515	45.8664515				Too deep																																		
372	45.8658936	45.8658936				Too deep																																		
373	45.8653356	45.8653356	12	R	P			1													1																			
374	45.8647776	45.8647776	12		R																											1								
375	45.8642196	45.8642196	14		R																																			
376	45.8636617	45.8636617	14		R																																			
377	45.8631037	45.8631037	13		R																																			
378	45.8625457	45.8625457	12	M	P	No vegetation																																		
379	45.8619878	45.8619878	12	M	P																																			
380	45.8614298	45.8614298	11	M	P	No vegetation																																		
381	45.8608718	45.8608718	11	M	P			1																					1											
382	45.8603138	45.8603138	9	M	P			1																					1	3										
383	45.8597559	45.8597559	8	M	P			1											1																					
384	45.8591979	45.8591979	8	M	P			2					1																	1										
385	45.8586399	45.8586399	6	M	P			1					1						1											1										

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
386	45.8580819	45.8580819	11	M	P			1					1																											
387	45.857524	45.857524	10	M	P			2					1																	2										
388	45.856966	45.856966	9	S	P								1						1		1				1	1				1	1									
389	45.856408	45.856408	4	S	P								1							1	1				1															
390	45.8558501	45.8558501	6	M	P			1													1									2										
391	45.8552921	45.8552921	7	M	P								1								1																			
392	45.8742571	45.8742571	4	M	P		1						1			1			1												1		1					1		
393	45.8736992	45.8736992	5	R	P	No vegetation																																		
394	45.8731412	45.8731412	12		R																																			
395	45.8725832	45.8725832				Too deep																																		
396	45.8720252	45.8720252				Too deep																																		
397	45.8714673	45.8714673	13		R																																			
398	45.8709093	45.8709093				Too deep																																		
399	45.8703513	45.8703513				Too deep																																		
400	45.8697934	45.8697934	13																																					
401	45.8686774	45.8686774	5	S	P																										1									
402	45.8681194	45.8681194	7	S	P																										3									
403	45.8675615	45.8675615				Too deep																																		
404	45.8670035	45.8670035	15		R	No vegetation																																		
405	45.8664455	45.8664455				Too deep																																		
406	45.8658876	45.8658876				Too deep																																		
407	45.8653296	45.8653296																																						
408	45.8647716	45.8647716	12		R																											1								
409	45.8642136	45.8642136	12		R	No vegetation																																		
410	45.8636557	45.8636557	14		R																																			
411	45.8630977	45.8630977	14		R	No vegetation																																		
412	45.8625397	45.8625397	14		R																																			
413	45.8619818	45.8619818	12	M	P	No vegetation																																		
414	45.8614238	45.8614238	12		R																								1											
415	45.8608658	45.8608658	10	M	P								1																1											
416	45.8603078	45.8603078	10	M	P			1					1													1			2									1		
417	45.8597499	45.8597499	8	M	P			1																																
418	45.8591919	45.8591919	10	M	P			3																				1												
419	45.8586339	45.8586339	8	M	P			3																																
420	45.8580759	45.8580759	11	M	P			1	1										1												1									
421	45.857518	45.857518	10	M	P			1											3												1									
422	45.85696	45.85696	8	M	P			2																							1									
423	45.856402	45.856402	9	M	P			1					1								1																			
424	45.8558441	45.8558441	9	M	P			1													2																			
425	45.8552861	45.8552861	5	M	P														1	1	1																			
426	45.8736931	45.8736931	5	M	P															1												1							1	
427	45.8731352	45.8731352	15		R	No vegetation																																		
428	45.8725772	45.8725772				Too deep																													1					
429	45.8720192	45.8720192				Too deep																																		
430	45.8714613	45.8714613	11		R																																			
431	45.8709033	45.8709033				Too deep																																		
432	45.8703453	45.8703453				Too deep																																		
433	45.8697874	45.8697874				Too deep																																		
434	45.8675555	45.8675555	7	S	P								1	1					1	1	1																			
435	45.8669975	45.8669975	7	S	P																1										1								1	
436	45.8664395	45.8664395	14		R	No vegetation																																		
437	45.8658816	45.8658816	14		R																																			
438	45.8647656	45.8647656	7	M	P																										1									
439	45.8642076	45.8642076	13	M	P	No vegetation																																		
440	45.8636497	45.8636497	12		R			1																																

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
441	45.8630917	45.8630917	13	M	P	No vegetation																																		
442	45.8625337	45.8625337	13		R																																			
443	45.8619757	45.8619757	12	M	P	No vegetation																																		
444	45.8614178	45.8614178	10	M	P	No vegetation																																		
445	45.8608598	45.8608598	11	M	P																																			
446	45.8603018	45.8603018	8	M	P			2																					1											
447	45.8597439	45.8597439	9	M	P			2																																
448	45.8591859	45.8591859	10	M	P			3																																
449	45.8586279	45.8586279	6	M	P			3																																
450	45.8580699	45.8580699	7	M	P			1					1						1		1																			
451	45.857512	45.857512	10	M	P								1								1																			
452	45.856954	45.856954	10	M	P			1					1							1	1																			
453	45.856396	45.856396	6	M	P				1	1			1								1																			
454	45.8558381	45.8558381	9	M	P			1					1						1							1					2		1							
455	45.8552801	45.8552801	6	S	P					1										1																				
456	45.8742451	45.8742451	3	S	P								1																		1									
457	45.8736871	45.8736871	14		R	No vegetation																																		
458	45.8731292	45.8731292	15		R	No vegetation																																		
459	45.8725712	45.8725712	15		R																																			
460	45.8720132	45.8720132				Too deep																																		
461	45.8714553	45.8714553	15		R	No vegetation																																		
462	45.8708973	45.8708973	15		R	No vegetation																																		
463	45.8703393	45.8703393				Too deep																																		
464	45.8697813	45.8697813				Too deep																																		
465	45.8692234	45.8692234	6	S	P									1					1	1												1								
466	45.8647596	45.8647596	6	M	P																										3								1	
467	45.8642016	45.8642016	10	R	P	No vegetation																																		
468	45.8636437	45.8636437	14		R																																			
469	45.8630857	45.8630857	13	M	P	No vegetation																																		
470	45.8625277	45.8625277	14		R																																			
471	45.8619697	45.8619697	10	S	P			1													1										1									
472	45.8614118	45.8614118	10	M	P	No vegetation																																		
473	45.8608538	45.8608538	10	M	P								1							1																				
474	45.8602958	45.8602958	8	M	P			1					1																1											
475	45.8597379	45.8597379	8	M	P			2					1						1																					
476	45.8591799	45.8591799	8	M	P			1					1						1																					
477	45.8586219	45.8586219	9	M	P								1								1																			
478	45.8580639	45.8580639	8	M	P			1											1		2																			
479	45.857506	45.857506	1	R	P						1				1																									
480	45.8742391	45.8742391	3	S	P															1																				
481	45.8736811	45.8736811	8	M	P								1						1																				1	
482	45.8731232	45.8731232	11		R	No vegetation																																		
483	45.8725652	45.8725652	15		R																																			
484	45.8720072	45.8720072	14		R	No vegetation																																		
485	45.8714492	45.8714492				Too deep																																		
486	45.8708913	45.8708913	15		R																																			
487	45.8703333	45.8703333	15			No vegetation																																		
488	45.8697753	45.8697753	15			No vegetation																																		
489	45.8692174	45.8692174	13		R	No vegetation																																		
490	45.8647536	45.8647536	10	M	P															1	1																			
491	45.8641956	45.8641956	11	M	P																											1								
492	45.8636376	45.8636376	12		R																																			
493	45.8630797	45.8630797	12	M	P																																			
494	45.8625217	45.8625217	12	M	P			1					1																											
495	45.8619637	45.8619637	11	M	P			1																																

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496	45.8614058	45.8614058	10	M	P								1							1																				
497	45.8608478	45.8608478	9	M	P			1					1																											
498	45.8602898	45.8602898	9	M	P			1					1						1																					
499	45.8597318	45.8597318	9	M	P			1					1																											
500	45.8591739	45.8591739	10	M	P			1																						3										
501	45.8586159	45.8586159	9	M	P			1					1						1		1																			
502	45.8580579	45.8580579	7	S	P								1						1	1																				
503	45.8574999	45.8574999	2	M	P			1					1									1									1							1		
504	45.8731171	45.8731171	8	S	P																1																			
505	45.8725592	45.8725592	10		R																																			
506	45.8720012	45.8720012	8		R								1						1	1																				
507	45.8714432	45.8714432	11		R	No vegetation																																		
508	45.8708852	45.8708852	15		R	No vegetation																																		
509	45.8703273	45.8703273	15			No vegetation																																		
510	45.8697693	45.8697693				Too deep																																		
511	45.8692113	45.8692113	10		R	No vegetation																																		
512	45.8653055	45.8653055	9	M	P								1								1								1			1								
513	45.8647476	45.8647476	7	M	P			1													1								1			1								
514	45.8641896	45.8641896	10	M	P								1																			1								
515	45.8636316	45.8636316	11	M	P								1							1																				
516	45.8630736	45.8630736	12	M	P			1																																
517	45.8625157	45.8625157	10	M	P								1							1																				
518	45.8619577	45.8619577	10	M	P			1					1																											
519	45.8613997	45.8613997	10	M	P			1					1								1								1											
520	45.8608418	45.8608418	10	M	P															1									1											
521	45.8602838	45.8602838	10	M	P																3																			
522	45.8597258	45.8597258	9	M	P																1											1								
523	45.8591678	45.8591678	9	M	P								1								1									1										
524	45.8586099	45.8586099	5	S	P					1									1	1	1				1															
525	45.8725531	45.8725531	7	S	P														1																					
526	45.8719952	45.8719952	7	S	P														1	1																				
527	45.8714372	45.8714372	14		R	No vegetation																																		
528	45.8708792	45.8708792	14		R	No vegetation																																		
529	45.8703212	45.8703212	15			No vegetation																																		
530	45.8697633	45.8697633	9	S															1																					
531	45.8692053	45.8692053	13		R	No vegetation																																		
532	45.8686473	45.8686473	7	M	P																										1								1	
533	45.8652995	45.8652995	9	M	P				1				1							1									1	2										
534	45.8647415	45.8647415	9	M	P			1																						1										
535	45.8641836	45.8641836	10	M	P			1					1																		1	1								
536	45.8636256	45.8636256	11	M	P			1					1																			1								
537	45.8630676	45.8630676	10	M	P								1																	3										
538	45.8625097	45.8625097	10	M	P								1							1																				
539	45.8619517	45.8619517	10	M	P			1					1																											
540	45.8613937	45.8613937	10	M	P			1					1																1											
541	45.8608357	45.8608357	9	S	P			1					1						1		1																			
542	45.8602778	45.8602778	6	S	P														1						1		1				1		1							
543	45.8591618	45.8591618	5	S	P																										1								1	
544	45.8719891	45.8719891	6	M	P	No vegetation																																		
545	45.8714312	45.8714312	12		R	No vegetation																																		
546	45.8708732	45.8708732	13		R																1																			
547	45.8703152	45.8703152	5	S									1								1																			
548	45.8697572	45.8697572	12																																					
549	45.8691993	45.8691993	12		R	No vegetation																																		
550	45.8686413	45.8686413	10		R								1								1																			

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Ceratophyllum echinatum	Chara sp.	Eleocharis acicularis	Eleocharis palustris	Elodea canadensis	Heteranthera dubia	Isoetes lacustris	Juncus pelocarpus	Megalodonta beckii	Myriophyllum heterophyllum	Myriophyllum sibiricum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Schoenoplectus tabernaemontani	Sparganium angustifolium	Sparganium fluctuans	Vallisneria americana	Aquatic moss
551	45.8680833	45.8680833	6	M	P								3																				1					1	
552	45.8658514	45.8658514	5	M	P					1			1								1																		
553	45.8652935	45.8652935	9	M	P			1					1																	1		1							
554	45.8647355	45.8647355	9	M	P								1																1	1		1							
555	45.8641775	45.8641775	10	M	P								1								1											1							
556	45.8636196	45.8636196	11	M	P						1		1							1	1																		
557	45.8630616	45.8630616	10	M	P								1								1																		
558	45.8625036	45.8625036	10	M	P								1								1				1						1							1	
559	45.8619456	45.8619456	7	S	P								1						1		1										1		1						
560	45.8602717	45.8602717				UNREACHABLE																																	
561	45.8719831	45.8719831	4	S	P														1												1						1		
562	45.8714251	45.8714251	4	S	P																				2														
563	45.8708671	45.8708671	6	S															1						1						1								
564	45.8703092	45.8703092	5	S																																		1	
565	45.8697512	45.8697512	4	R												1											1												
566	45.8691932	45.8691932	12		R																																		
567	45.8686353	45.8686353	12		R																																		
568	45.8680773	45.8680773	9	S	P	No vegetation																																	
569	45.8658454	45.8658454	8	M	P								2								1									1								1	
570	45.8652874	45.8652874	9	M	P			1	1				1																										
571	45.8647295	45.8647295	8	M	P								1																										
572	45.8641715	45.8641715	9	M	P																3								1										
573	45.8636135	45.8636135	7	R	P								1						1											1	1								
574	45.8630556	45.8630556	7	M	P			1					1						1		1										1							1	
575	45.8624976	45.8624976	8	S	P			1											2												1							1	
576	45.871977	45.871977	3		P																	1														1			
577	45.8714191	45.8714191				UNREACHABLE																																	
578	45.8697452	45.8697452	4	M													1		1	1																			
579	45.8691872	45.8691872	8	M	P															1	1																		
580	45.8686292	45.8686292	10		R																1																		
581	45.8680712	45.8680712	11	M	P								1																										
582	45.8658394	45.8658394	6	M	P																										2		1						
583	45.8652814	45.8652814	9	M	P			1					1								1									1									
584	45.8647234	45.8647234	10	M	P			1					1								1																		
585	45.8641655	45.8641655	10	M	P																1											1							
586	45.8636075	45.8636075	5	M	P								1						1	1	1						1				1							1	
587	45.8624915	45.8624915	4	S	P			1																							1								
588	45.871413	45.871413				UNREACHABLE																																	
589	45.8702971	45.8702971	3	S									1							1		1												1			1		
590	45.8697391	45.8697391	4	M															1			1									1								
591	45.8691811	45.8691811	8	M	P			2					1						1												1		1						
592	45.8686232	45.8686232	8	M	P																1																		
593	45.8680652	45.8680652	10	M	P																																		
594	45.8652753	45.8652753	8	M	P			1					1																									1	
595	45.8647174	45.8647174	8	M	P			1																							1								
596	45.8641594	45.8641594	8	M	P			1					1						2		1																		
597	45.8697331	45.8697331	3	S								1			1					1		1												1					
598	45.8691751	45.8691751	4	M	P			1					1						3													1	1						
599	45.8686171	45.8686171	8	M	P			3											3											1									
600	45.8680591	45.8680591				People																																	
601	45.8652693	45.8652693	4	M	P													1																					
602	45.8647113	45.8647113	8	M	P																										1							1	
603	45.8641533	45.8641533	6	M	P			1					1						3																			1	
604	45.869169	45.869169	4	M	P								1												1						1							1	
605	45.8686111	45.8686111	4	S	P															1																			

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606	45.8658212	45.8658212	3	S	P			1					1				1					1																		1
607	45.8652632	45.8652632	4	M	P					1			1																											
608	45.8647053	45.8647053	5	M	P								1				1														1		1						1	
609	45.8641473	45.8641473	8	S	P																								1											

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Brasenia schreberi	Ceratophyllum demersum	Chara sp.	Elatine minima	Elodea canadensis	Isoetes lacustris	Juncus pelocarpus	Lemna minor	Megalodonta beckii	Myriophyllum sibiricum	Myriophyllum verticillatum	Najas flexilis	Nitella sp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton epihydrus	Potamogeton foliosus	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton vaseyi	Potamogeton zosteriformis	Sagittaria latifolia	Sparganium fluctuans	Spirodela polyrhiza	Utricularia geminiscapa	Utricularia intermedia	Utricularia vulgaris	Vallisneria americana
1	45.88491330	-89.14579423	5	S	P						1				1		1							1				1									
2	45.88464331	-89.14579837	6	S	P						1																	1									
3	45.88437332	-89.14580251	7	S	P	No vegetation																															
4	45.88410334	-89.14580664	6	S	P	No vegetation																															
5	45.88383335	-89.14581078	6	S	P						1																										
6	45.88356337	-89.14581492	6	S	P	No vegetation																															
7	45.88329338	-89.14581906	6	S	P	No vegetation																															
8	45.88680030	-89.14537866	3	M	P		1	1						1						1		1											1				
9	45.88653032	-89.14538280	3	M	P		1				1									1								1									
10	45.88626033	-89.14538694	4	M	P		1				1					1					1							1									
11	45.88599035	-89.14539108	4	M	P											1												1				1					
12	45.88572036	-89.14539522	5	S	P			1			1					1			1									1									
13	45.88545038	-89.14539936	6	S	P			1			1				1									1				2									1
14	45.88518039	-89.14540350	6	R	P	No vegetation																															
15	45.88491040	-89.14540764	3	S	P						1					1																					1
16	45.88464042	-89.14541178	6	M	P						1					1												1									1
17	45.88437043	-89.14541592	4	M	P						1					1			1						1												1
18	45.88410045	-89.14542006	5	M	P			1			1					1												1									1
19	45.88329049	-89.14543248	6	S	P						1																										
20	45.88302050	-89.14543662	4	S	P	No vegetation																															
21	45.88275052	-89.14544076	5	R	P	No vegetation																															
22	45.88248053	-89.14544490	5	R	P	No vegetation																															
23	45.88221055	-89.14544904	5	S	P			1			1																										
24	45.88706740	-89.14498791	3	M	P			2																				1									
25	45.88679741	-89.14499205	3	M	P			1			2					1												1									
26	45.88652743	-89.14499619	5	M	P			1												1	1							1				1					
27	45.88625744	-89.14500034	5	M	P			1			2					1				1				1				2									1
28	45.88598746	-89.14500448	5	M	P						1					1								1			1	1									
29	45.88571747	-89.14500862	6	S	P				1																												
30	45.88544748	-89.14501276	5	S	P																																1
31	45.88517750	-89.14501691	5	M	P						1					1				1	1		1					2									
32	45.88220766	-89.14506246	5	S	P			1															1					1									1
33	45.88193767	-89.14506661	5	S	P						1																										1
34	45.88166768	-89.14507075	5	M	P																																1
35	45.88112771	-89.14507903	2	S	P													1																			
36	45.88652453	-89.14460959	6	M	P			3			1					1			1	1	1																1
37	45.88625455	-89.14461374	6	M	P				1		1					1							1														
38	45.88598456	-89.14461788	5	S	P						1								1						1												
39	45.88571458	-89.14462202	5	M	P						1				1	1													1								1
40	45.88544459	-89.14462617	4	M	P		1													1	1							2				1					1
41	45.88517461	-89.14463031	4	M	P		1	2											1	1		1						1									
42	45.88193478	-89.14468004	4	S	P								1																								
43	45.88166479	-89.14468418	5	S	P			1			1							1																			1
44	45.88139480	-89.14468832	5	S	P											1																					1
45	45.88112482	-89.14469246	3	S	P						1					1							1							1							1
46	45.88652164	-89.14422299	5	M	P						1												1					3									
47	45.88625165	-89.14422714	4	S	P			1	1		1																	1	1								
48	45.88598167	-89.14423128	4	M	P											1							1														1
49	45.88571168	-89.14423543	3	S	P		1			1		1	1							1	1								1								

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50	45.88544170	-89.14423957	3	M	P		1	3													1	1							1			1			1		
51	45.88517171	-89.14424372	3	M	P		1									1			1			1						1			1						
52	45.88166190	-89.14429761	5	S	P								1																								1
53	45.88139191	-89.14430175	5	S	P														1				1														1
54	45.88112192	-89.14430590	4	S	P				1															1													1
55	45.88813866	-89.14381150	6	S	P						1					1												2									1
56	45.88786867	-89.14381565	6	M	P						1					1							1							1							1
57	45.88678873	-89.14383224	5	M	P						1					1				1										1		1					
58	45.88651874	-89.14383639	6	S	P						1																										
59	45.88624876	-89.14384054	4	S	P						1														1			2									
60	45.88543880	-89.14385298	3	M	P		1												1	1	1	1										1					
61	45.88516881	-89.14385713	2	M	P		1	1			1							1		1	1	1						1				1			1		
62	45.88111903	-89.14391933	6	M	P																		1					3									
63	45.88867573	-89.14341659	6	R	P	No vegetation																															
64	45.88840574	-89.14342074	5	S	P						1					1																					
65	45.88813576	-89.14342489	3	S	P		V				1					1												1									1
66	45.88786577	-89.14342904	5	S	P						1					1								1				1									
67	45.88759579	-89.14343319	4	S	P			1			1												1					2									1
68	45.88732580	-89.14343734	4	S	P				1		1					1													1								1
69	45.88705582	-89.14344149	4	S	P						1														1				1								1
70	45.88678583	-89.14344564	7	M	P						3					1			1									1	1								
71	45.88543590	-89.14346638	2	M	P		1	1								1		1		1	1	1					1					1		1	1	1	
72	45.88516592	-89.14347053	2	M	P		1	1								1		1		1	1	1				1	1	1				1		1	1	1	
73	45.88921280	-89.14302166	6	S	P				1																												
74	45.88894282	-89.14302582	6	S	P				1		1																	1									
75	45.88759289	-89.14304658	7	S	P			1			1					1			1						1			1									1
76	45.88732290	-89.14305073	4	S	P						3					1				1										1							1
77	45.88705292	-89.14305488	4	S	P						1					1								1			3			1							
78	45.88570299	-89.14307564																																			
79	45.88543300	-89.14307979																																			
80	45.88516302	-89.14308394																																			
81	45.88489303	-89.14308809																																			
82	45.88947989	-89.14263089	6	R	P						2				1	1												1									
83	45.88920990	-89.14263504	5	M	P						3					1												2									
84	45.88597008	-89.14268489																																			
85	45.88947698	-89.14224427	6	S	P						1																			1							
86	45.88974407	-89.14185349	6	R	P						1																										
87	45.88974116	-89.14146686	6	M	P						3												1					1									
88	45.89000824	-89.14107607	6	S	P														1					1													
89	45.89000533	-89.14068945	6	M	P			1			1				1													1		1						1	1
90	45.89027241	-89.14029866	6	S	P						1												1					1									1
91	45.89026950	-89.13991203	10	M	P						1																										
92	45.89053658	-89.13952123	6	R	P	No vegetation																															
93	45.89080365	-89.13913043	6	S	P						1								1					1						1							
94	45.89107072	-89.13873963	7	M	P						3																	1									
95	45.89133779	-89.13834882	6	S	P						2													1				1									
96	45.89160486	-89.13795801	6	S	P						1													1				1								1	