A

APPENDIX A

Public Participation Materials

Town of Winchester

Town of Winchester
Lake Management Planning Project
Phase II: Birch, Tamarack, & Rainbow Lakes
Kick-off Meeting
July 25, 2016

Brenton Butterfield
Onterra LLC
Lake Management Planning

Presentation Outline

- Onterra, LLC
- Why Create a Management Plan?
- Elements of this Lake Management Planning Project
  - Data & Information
  - AIS Education & Volunteer Involvement
  - Planning Process
- Project Phasing
- Project Deliverables

Onterra LLC Lake Management Planning

Onterra, LLC

- Founded in 2005
- Staff
  - Four full-time ecologists
  - One part-time ecologist
  - Two field technicians
  - Four summer interns
- Services
  - Science and planning
- Philosophy
  - Promote realistic planning
  - Assist, not direct

Onterra LLC Lake Management Planning

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.

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Elements of an Effective Lake Management Planning Project

Data and Information Gathering

Environmental & Sociological

Planning Process

Brings it all together

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Data and information gathering

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

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Water Quality Analysis

- General water chemistry (current & historic)
  - Citizens Lake Monitoring Network & Professional
- Nutrient analysis
  - Lake trophic state (Eutrophication)
  - Limiting plant nutrient
- Supporting data for watershed modeling

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Watershed Assessment

- Delineation of drainage basins
- Modeling
  - Land cover
  - Phosphorus loading
  - Lakes are modeled in series
  - Scenario development

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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early Season AIS Survey

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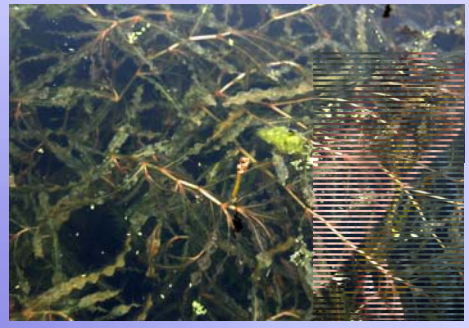
Non-native Aquatic Plants

Curly-leaf Pondweed



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Non-native Aquatic Plants

Eurasian Water Milfoil

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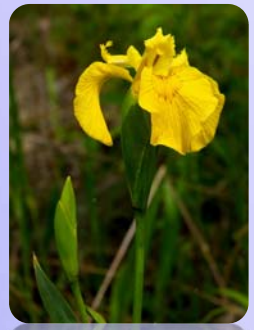
Non-native Aquatic Plants

Purple Loosestrife & Pale-yellow Iris



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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early Season AIS survey
  - Point-intercept survey

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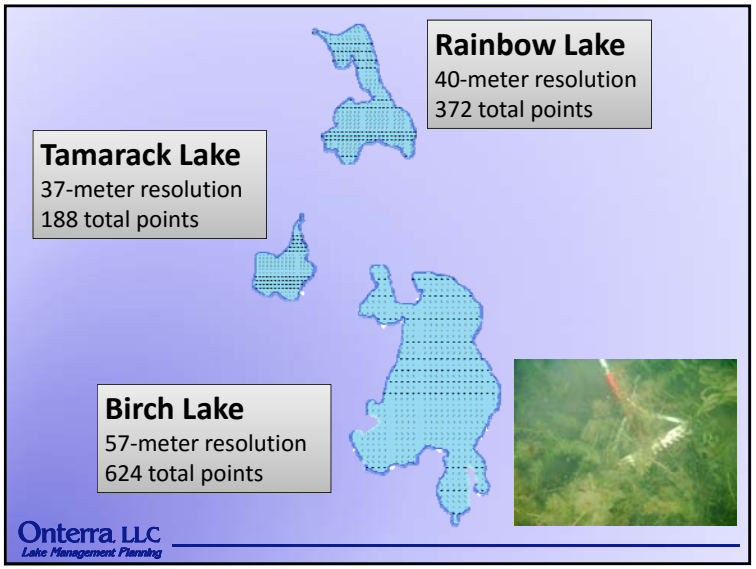

Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early Season AIS survey
  - Point-intercept survey
  - Aquatic plant community mapping

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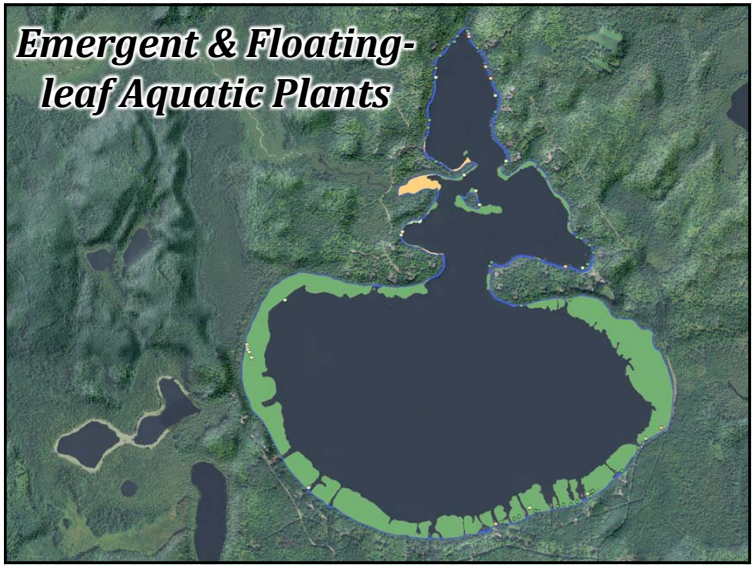

Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early Season AIS survey
  - Point-intercept survey
  - Aquatic plant community mapping

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Shoreland Assessment

- Shoreland area is important for buffering runoff and provides valuable habitat for aquatic and terrestrial wildlife.
- It does not look at lake shoreline on a property-by-property basis.
- Assessment ranks shoreland area from shoreline back 35 feet

Urbanized — Range — **Natural**

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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

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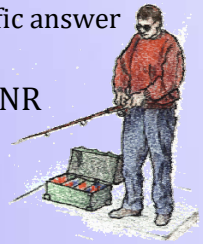
Stakeholder Survey

- 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



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Planning Process

Planning Committee Meetings

Study Results (including a stakeholder survey)

Conclusions & Initial Recommendations

Management Goals

Management Actions

Timeframe

Facilitator(s)

↓

Implementation Plan

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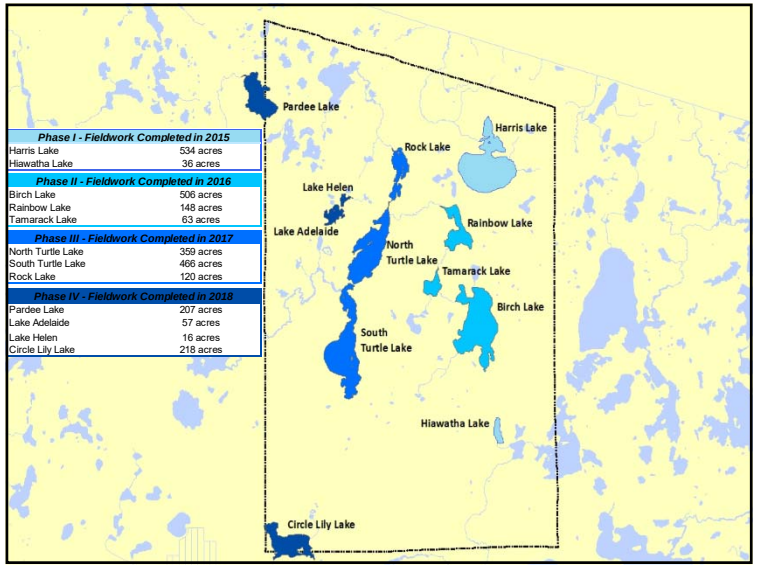

Phase I - Fieldwork Completed in 2015	
Harris Lake	534 acres
Hiawatha Lake	36 acres
Phase II - Fieldwork Completed in 2016	
Birch Lake	506 acres
Rainbow Lake	148 acres
Tamarack Lake	63 acres
Phase III - Fieldwork Completed in 2017	
North Turtle Lake	359 acres
South Turtle Lake	466 acres
Rock Lake	120 acres
Phase IV - Fieldwork Completed in 2018	
Pardee Lake	207 acres
Lake Adelaide	57 acres
Lake Helen	16 acres
Circle Lily Lake	218 acres

Town of Winchester
Lake Management Plan Documents

- Multiple document types
  - Town of Winchester Lake Management Plan
  - Lake-Specific Results and Conclusions
  - Lake-Specific Implementation Plan
  - Appendices (raw data, etc.)
- Town-wide Compilation
  - All documents
- Individual Lake Document
  - Town-wide management plan
  - Lake-specific documents

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Thank You

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

Wisconsin Lakes Partnership

UW Extension

Wisconsin Dept. of Natural Resources

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Lake Management Planning

Presentation Outline

- Lake Management Planning Project Overview
- Study Results
  - Water Quality
  - Watershed
  - Shoreland Condition
  - Aquatic Plants
  - Fishery

  Stakeholder Survey
- "Big Picture"
- Implementation Plan Development

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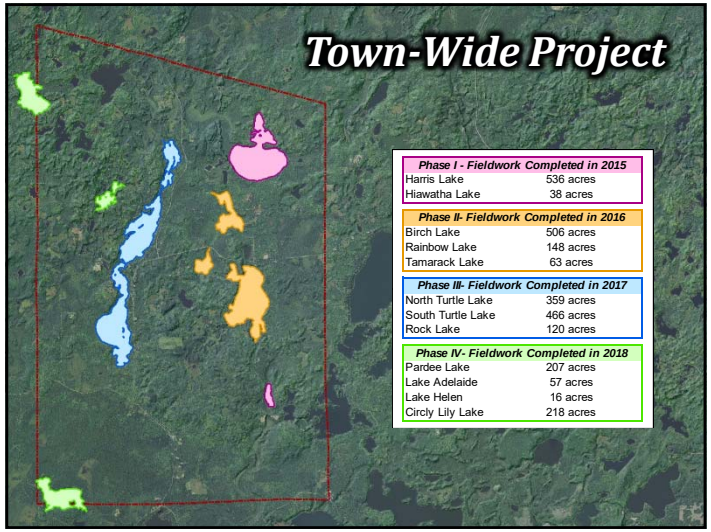

Management Planning Project Overview

- Collect & analyze data – completed
  - Technical & sociological
- Construct long-term & useable plan

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Summary of Project Results

Water Quality
- Good to excellent for deep lowland drainage lakes

Watershed & Immediate Shoreline
- Watersheds in excellent shape – primarily forests & wetlands
- Majority of shoreland areas contain little to no development

Aquatic Plant Community
- High-quality native species present
- No non-native species located

Fisheries
- Not too much information available

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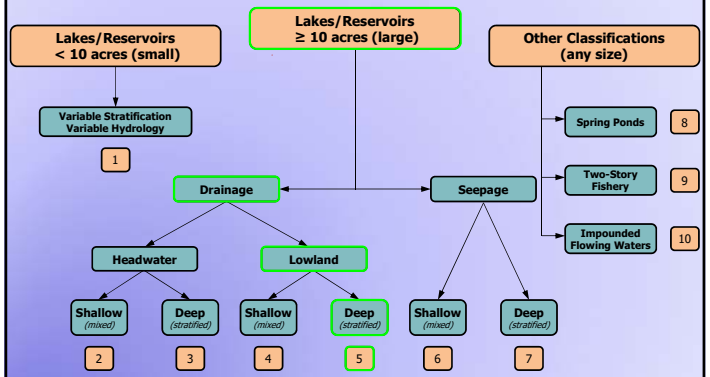
Wisconsin Lakes Natural Community Types



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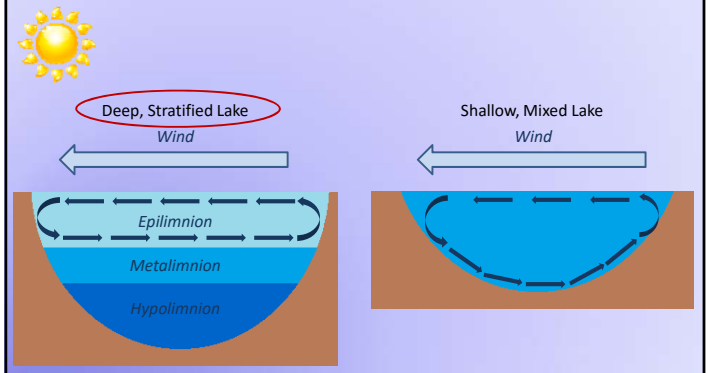
Wisconsin Lakes Classification



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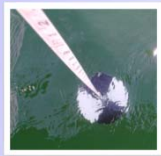
Introduction to Lake Water Quality

Phosphorus
Naturally occurring & essential for all life
Regulates phytoplankton biomass in most WI lakes
Most often 'limiting plant nutrient' (shortest supply)
Human development often increases P delivery to lakes

Chlorophyll-*a*
Pigment used in photosynthesis
Used as surrogate for phytoplankton biomass

Secchi Disk Transparency
Measure of water clarity
Measured using a Secchi disk



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Water Quality

Wisconsin Ecoregions

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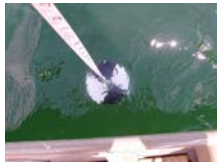
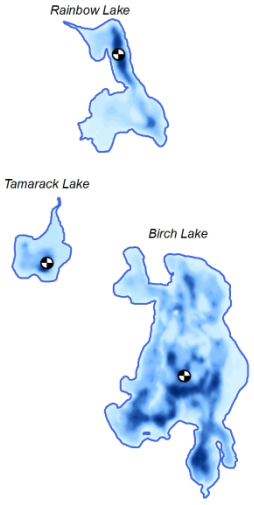
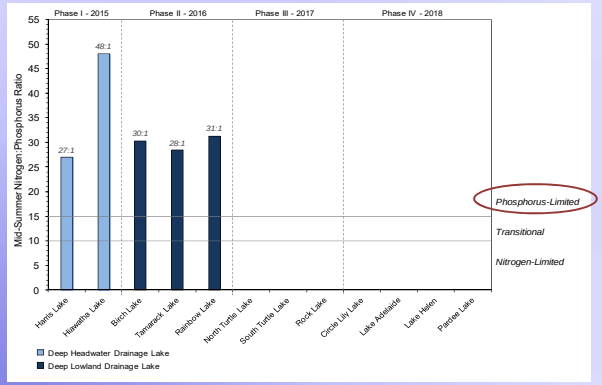
Water Quality Sampling Locations





Town of Winchester – Phase I & II Lakes Mid-Summer Nitrogen:Phosphorus Ratio



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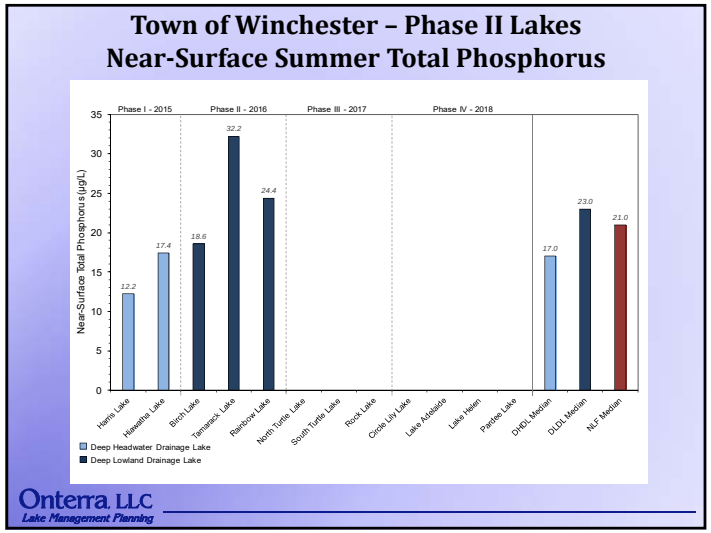
Town of Winchester – Phase II Lakes
Near-Surface Summer Total Phosphorus
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
Near-Surface Total Phosphorus (µg/L)
12.2
17.4
18.6
32.2
24.4
17.0
23.0
21.0
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
DHDL Median
DLDL Median
NLF Median
Deep Headwater Drainage Lake
Deep Lowland Drainage Lake
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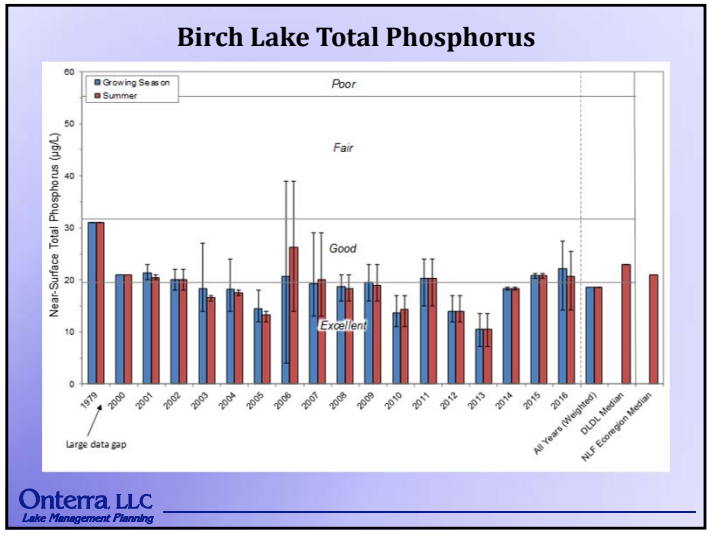
Birch Lake Total Phosphorus
Growing Season
Summer
Poor
Fair
Good
Excellent
Near-Surface Total Phosphorus (µg/L)
Large data gap
All Years (Weighted)
DLDL Median
NLF Ecoregion Median
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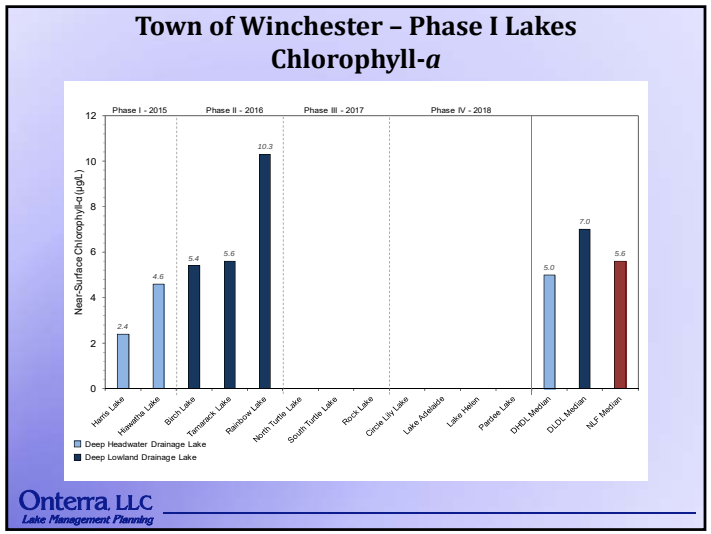
Town of Winchester – Phase I Lakes
Chlorophyll-a
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
Near-Surface Chlorophyll-a (µg/L)
2.4
4.6
5.4
5.6
10.3
5.0
7.0
5.6
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
DHDL Median
DLDL Median
NLF Median
Deep Headwater Drainage Lake
Deep Lowland Drainage Lake
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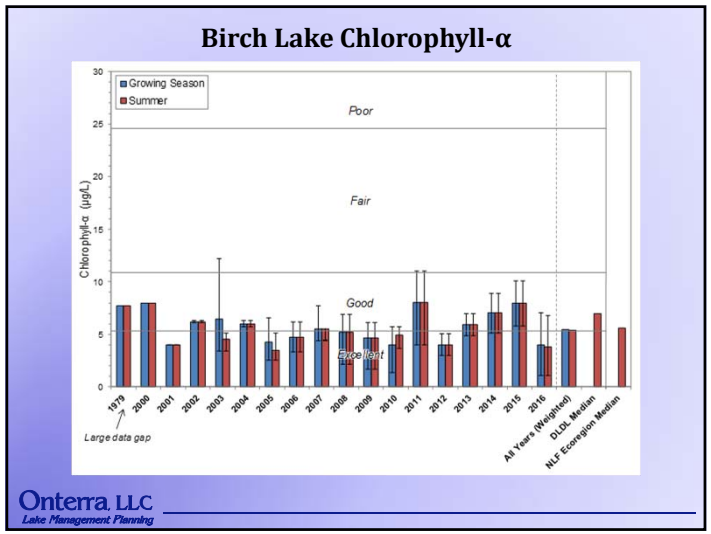
Birch Lake Chlorophyll-α
Growing Season
Summer
Poor
Fair
Good
Excellent
Chlorophyll-a (µg/L)
Large data gap
All Years (Weighted)
DLDL Median
NLF Ecoregion Median
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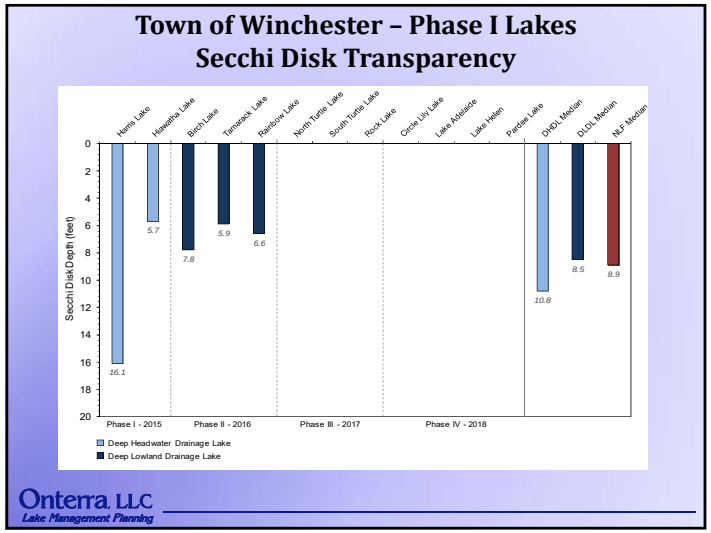
Town of Winchester – Phase I Lakes
Secchi Disk Transparency
Secchi Disk Depth (feet)
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
DNDL Median
DLDL Median
NLF Median
16.1
5.7
7.8
5.9
6.6
10.8
8.5
8.9
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
Deep Headwater Drainage Lake
Deep Lowland Drainage Lake
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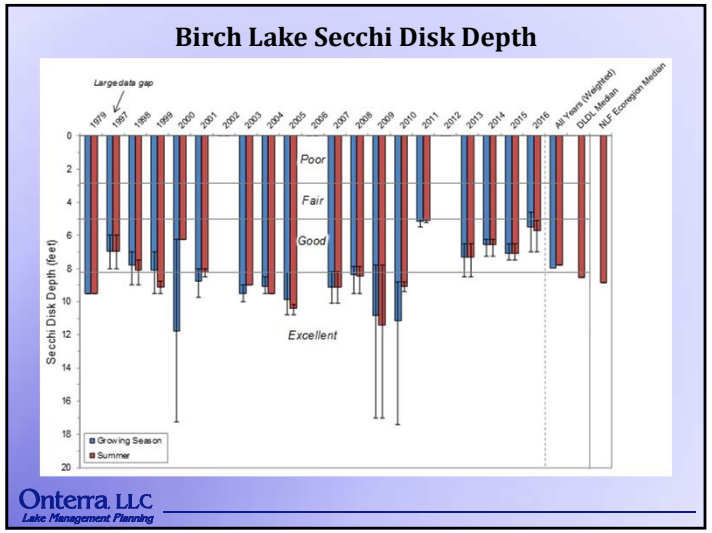
Birch Lake Secchi Disk Depth
Large data gap
Secchi Disk Depth (feet)
Poor
Fair
Good
Excellent
Growing Season
Summer
All Years (Weighted)
DLDL Median
NLF Ecoregion Median
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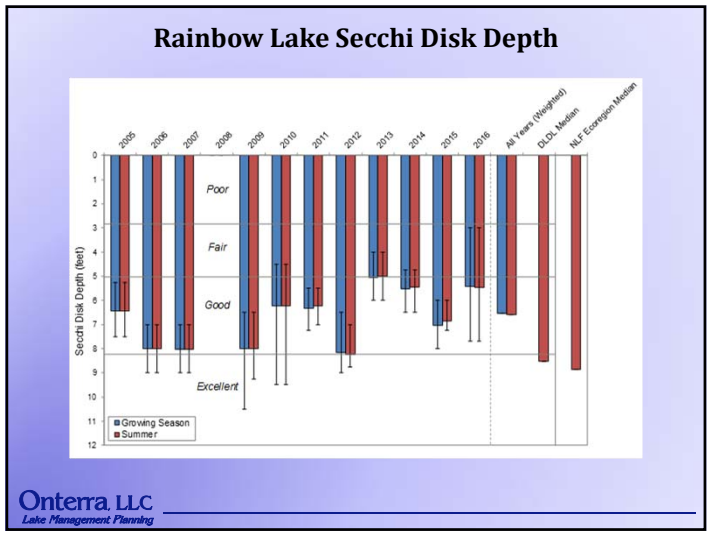
Rainbow Lake Secchi Disk Depth
Secchi Disk Depth (feet)
Poor
Fair
Good
Excellent
Growing Season
Summer
All Years (Weighted)
DLDL Median
NLF Ecoregion Median
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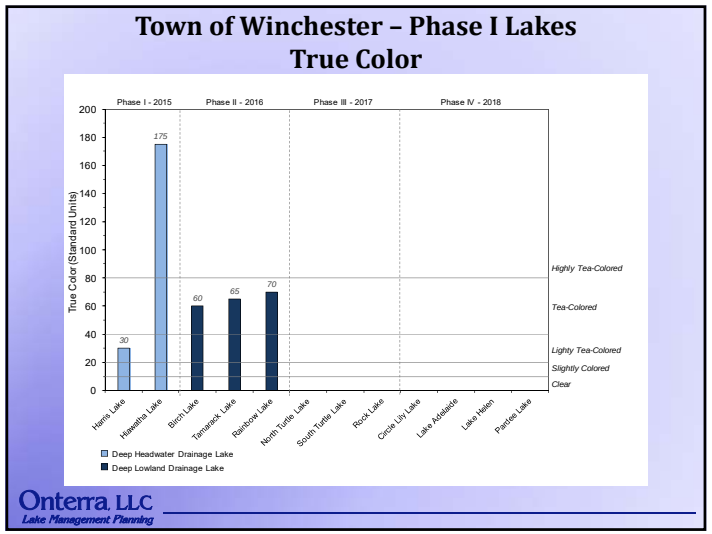
Town of Winchester – Phase I Lakes
True Color
True Color (Standard Units)
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
30
175
60
65
70
Highly Tea-Colored
Tea-Colored
Lighty Tea-Colored
Slightly Colored
Clear
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
Deep Headwater Drainage Lake
Deep Lowland Drainage Lake
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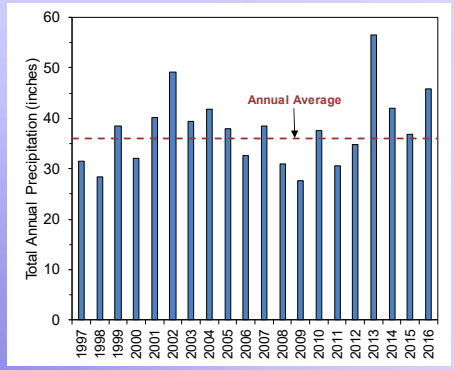
Annual Precipitation Data – Hurley, WI



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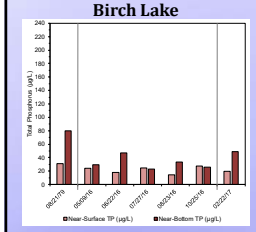
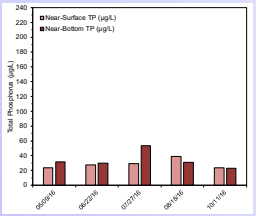
Internal Phosphorus Loading

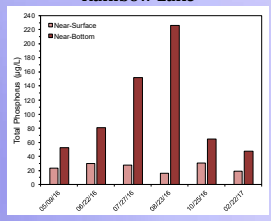
Birch Lake



Tamarack Lake



Rainbow Lake



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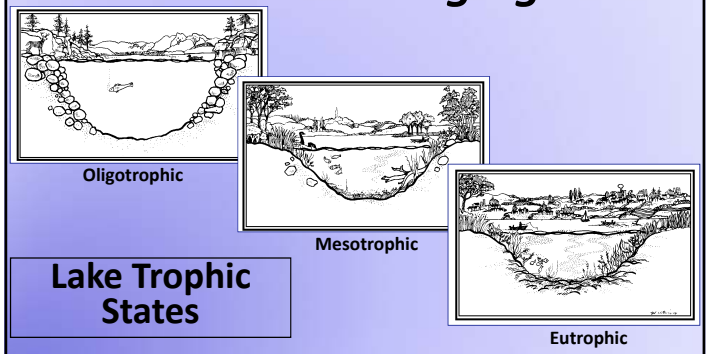
Eutrophication -Lake Aging



Lake Trophic States

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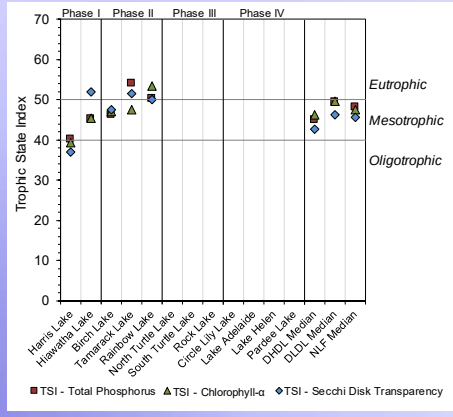
Winchester Lakes Trophic State Index



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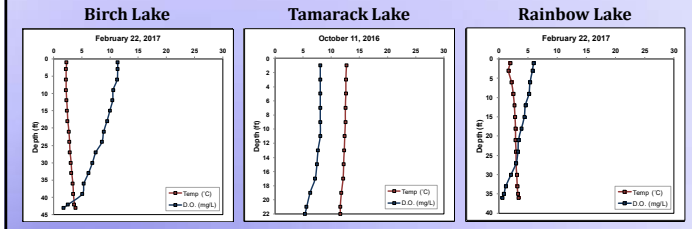
Temperature & Dissolved Oxygen



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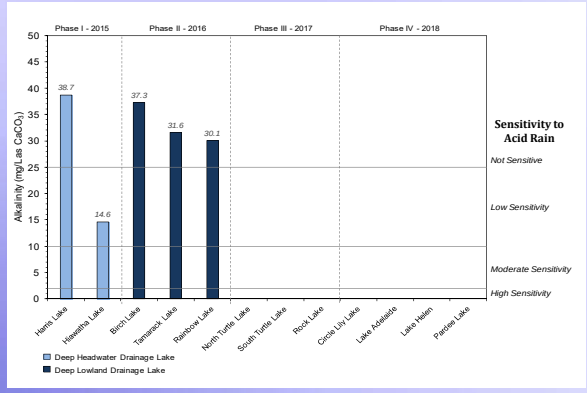
Additional Water Quality Parameters
Alkalinity



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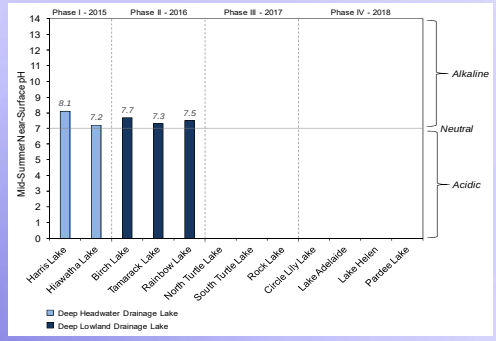
Additional Water Quality Parameters
pH



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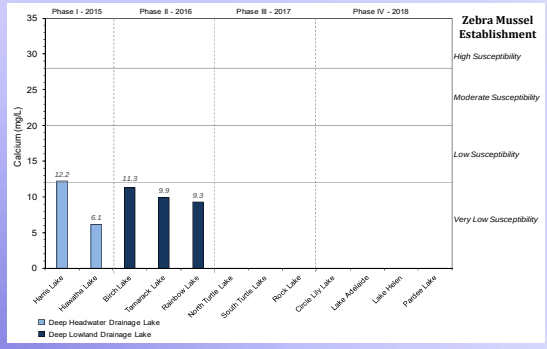
Additional Water Quality Parameters
Calcium



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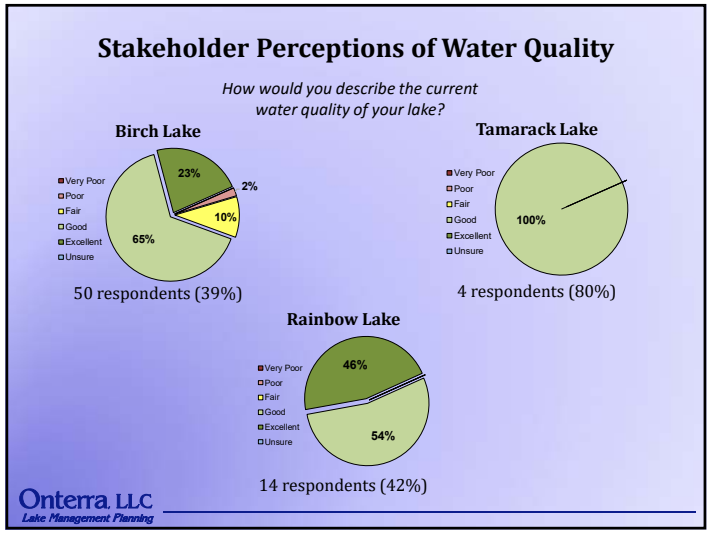
Stakeholder Perceptions of Water Quality
How would you describe the current water quality of your lake?
Birch Lake
Very Poor
Poor
Fair
Good
Excellent
Unsure
23%
2%
10%
65%
50 respondents (39%)
Tamarack Lake
100%
4 respondents (80%)
Rainbow Lake
46%
54%
14 respondents (42%)
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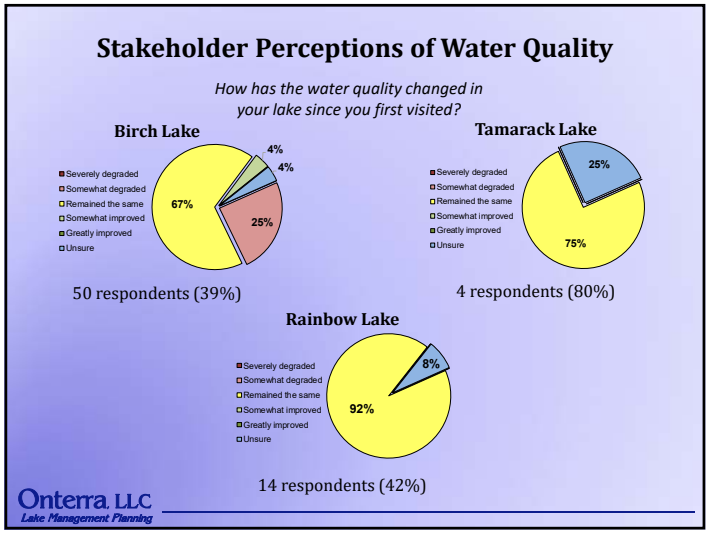
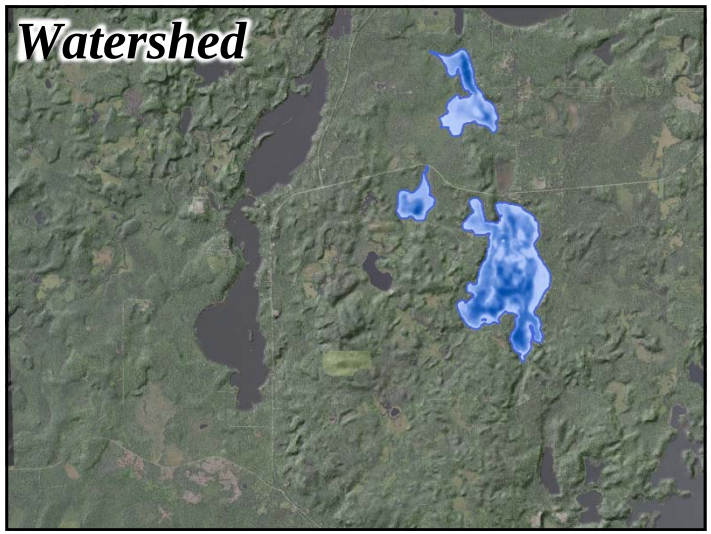
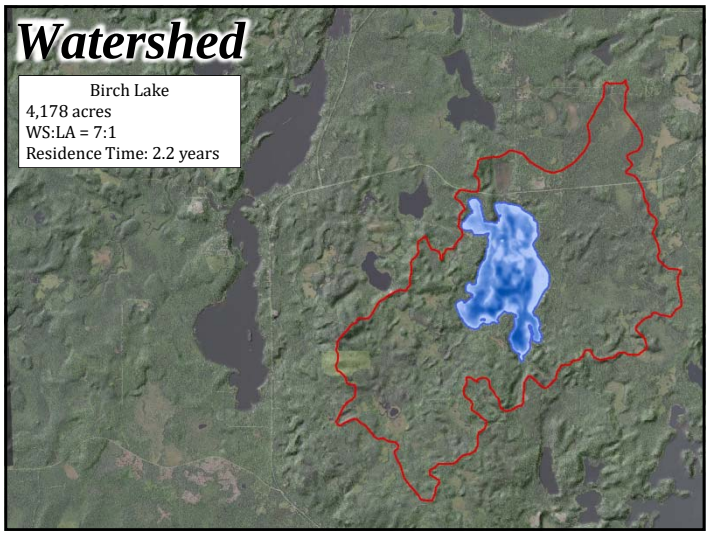
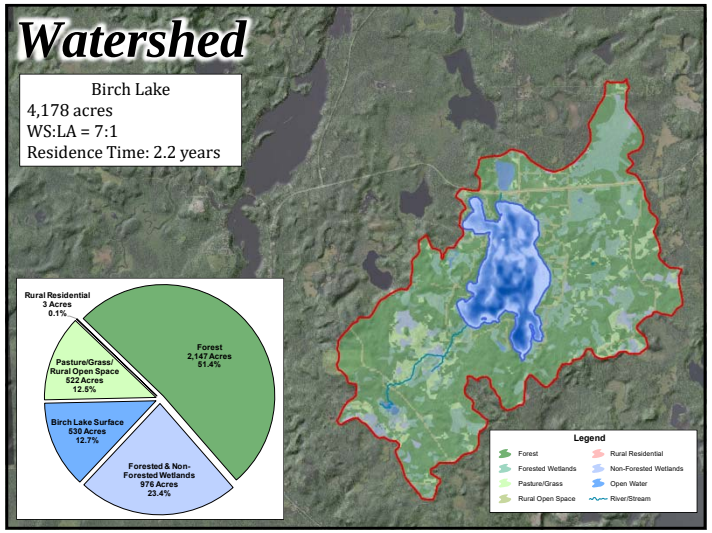
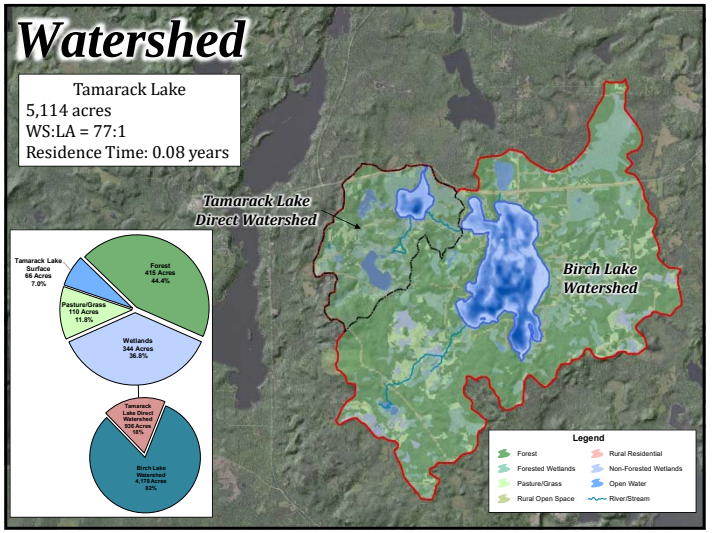
Lake Management Planning

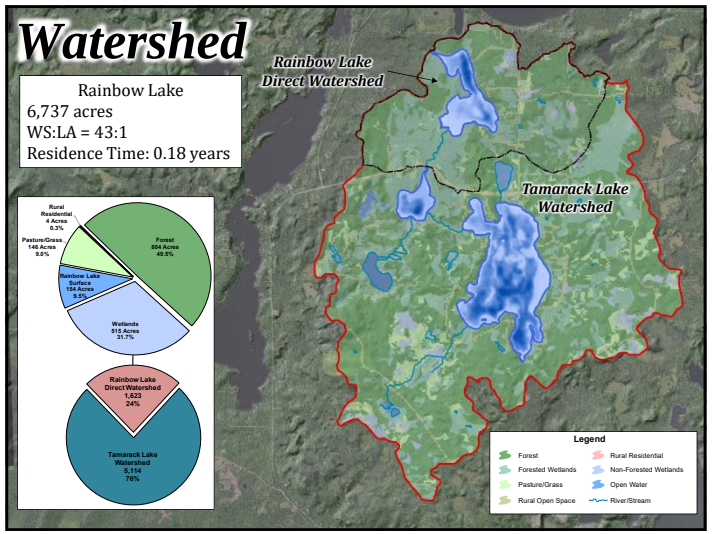

Stakeholder Perceptions of Water Quality
How has the water quality changed in your lake since you first visited?
Birch Lake
Severely degraded
Somewhat degraded
Remained the same
Somewhat improved
Greatly improved
Unsure
4%
4%
67%
25%
50 respondents (39%)
Tamarack Lake
25%
75%
4 respondents (80%)
Rainbow Lake
8%
92%
14 respondents (42%)
Onterra LLC
Lake Management Planning

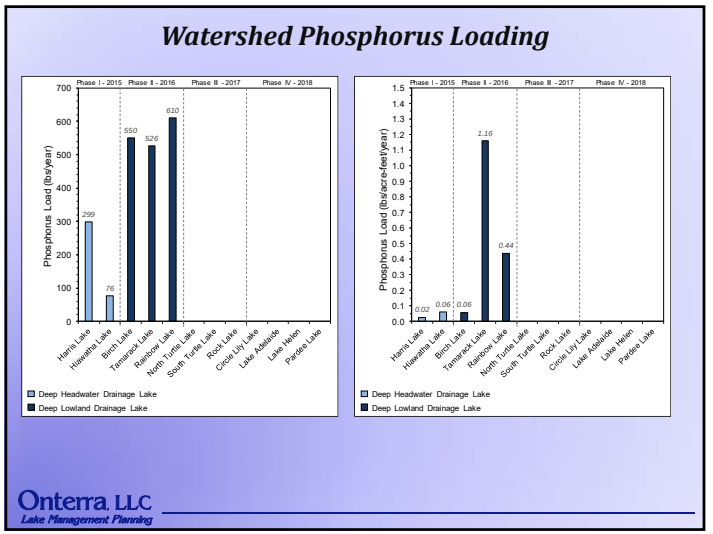

Watershed

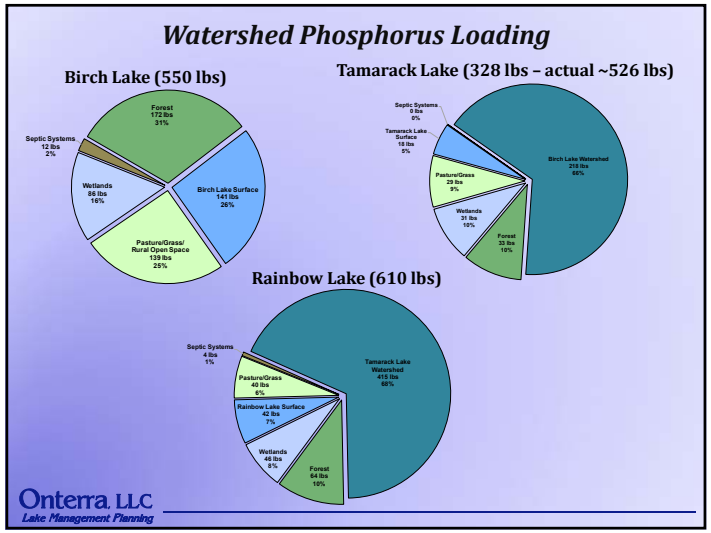

Watershed
Birch Lake
4,178 acres
WS:LA = 7:1
Residence Time: 2.2 years

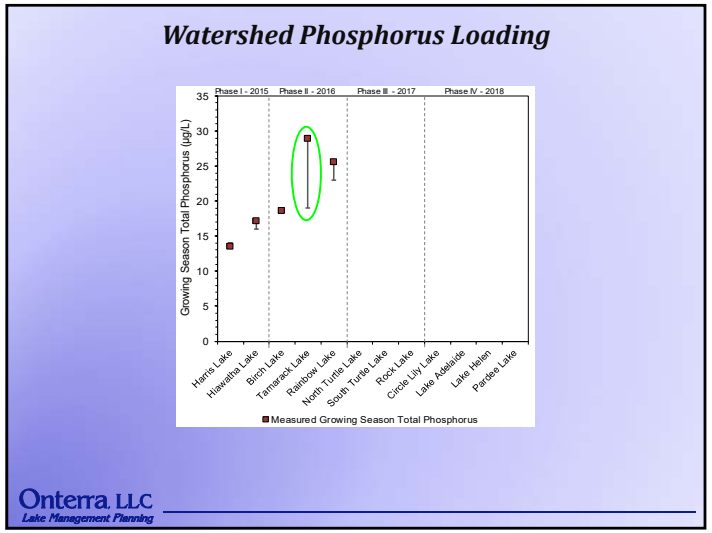

Watershed
Birch Lake
4,178 acres
WS:LA = 7:1
Residence Time: 2.2 years
Rural Residential 3 Acres 0.1%
Forest 2,147 Acres 51.4%
Pasture/Grass/ Rural Open Space 522 Acres 12.5%
Birch Lake Surface 530 Acres 12.7%
Forested & Non-Forested Wetlands 976 Acres 23.4%
Legend
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Rural Residential
Non-Forested Wetlands
Open Water
River/Stream


Watershed
Tamarack Lake
5,114 acres
WS:LA = 77:1
Residence Time: 0.08 years
Tamarack Lake Direct Watershed
Birch Lake Watershed
Tamarack Lake Surface 66 Acres 7.0%
Forest 415 Acres 44.4%
Pasture/Grass 110 Acres 11.8%
Wetlands 344 Acres 36.8%
Tamarack Lake Direct Watershed 836 Acres 16%
Birch Lake Watershed 4,178 Acres 82%
Legend
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Rural Residential
Non-Forested Wetlands
Open Water
River/Stream


Watershed
Rainbow Lake
6,737 acres
WS:LA = 43:1
Residence Time: 0.18 years
Rainbow Lake Direct Watershed
Tamarack Lake Watershed
Rural Residential 4 Acres 0.3%
Forest 804 Acres 49.8%
Pasture/Grass 146 Acres 9.0%
Rainbow Lake Surface 154 Acres 9.5%
Wetlands 515 Acres 31.7%
Rainbow Lake Direct Watershed 1,623 24%
Tamarack Lake Watershed 5,114 76%
Legend
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Rural Residential
Non-Forested Wetlands
Open Water
River/Stream


Watershed Phosphorus Loading
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
Phosphorus Load (lbs/year)
299
76
550
526
610
Phosphorus Load (lbs/acre-feet/year)
0.02
0.05
0.06
1.16
0.44
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Perdew Lake
Deep Headwater Drainage Lake
Deep Lowland Drainage Lake
Onterra, LLC
Lake Management Planning


Watershed Phosphorus Loading
Birch Lake (550 lbs)
Forest 172 lbs 31%
Septic Systems 12 lbs 2%
Wetlands 86 lbs 16%
Birch Lake Surface 141 lbs 26%
Pasture/Grass/ Rural Open Space 139 lbs 25%
Tamarack Lake (328 lbs – actual ~526 lbs)
Septic Systems 0 lbs 0%
Tamarack Lake Surface 18 lbs 5%
Pasture/Grass 29 lbs 9%
Wetlands 31 lbs 10%
Forest 33 lbs 10%
Birch Lake Watershed 218 lbs 66%
Rainbow Lake (610 lbs)
Septic Systems 4 lbs 1%
Pasture/Grass 40 lbs 6%
Rainbow Lake Surface 42 lbs 7%
Wetlands 46 lbs 8%
Forest 64 lbs 10%
Tamarack Lake Watershed 415 lbs 68%
Onterra LLC
Lake Management Planning


Watershed Phosphorus Loading
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
Growing Season Total Phosphorus (µg/L)
35
30
25
20
15
10
5
0
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
Measured Growing Season Total Phosphorus
Onterra LLC
Lake Management Planning


Shoreland Condition


Shoreland Assessment
Shoreland area is important for buffering runoff and provides valuable habitat for aquatic and terrestrial wildlife.
EPA National Lakes Assessment results indicate shoreland development has greatest negative impact to health of our nation's lakes.
It does not look at lake shoreline on a property-by-property basis.
Assessment ranks shoreland area from shoreline back 35 feet
Urbanized
Natural
Range
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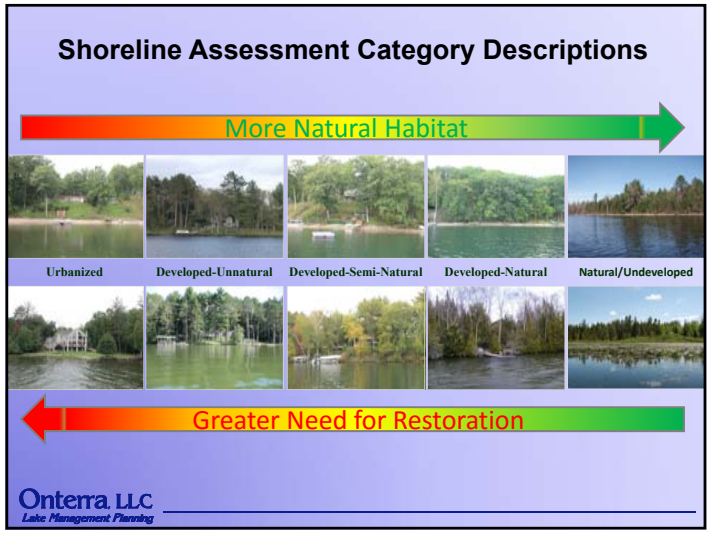
Lake Management Planning


Shoreline Assessment Category Descriptions
More Natural Habitat
Urbanized
Developed-Unnatural
Developed-Semi-Natural
Developed-Natural
Natural/Undeveloped
Greater Need for Restoration
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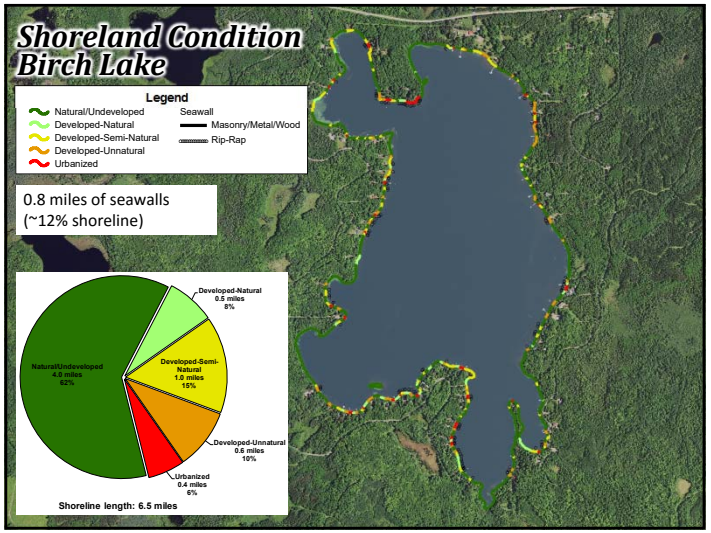
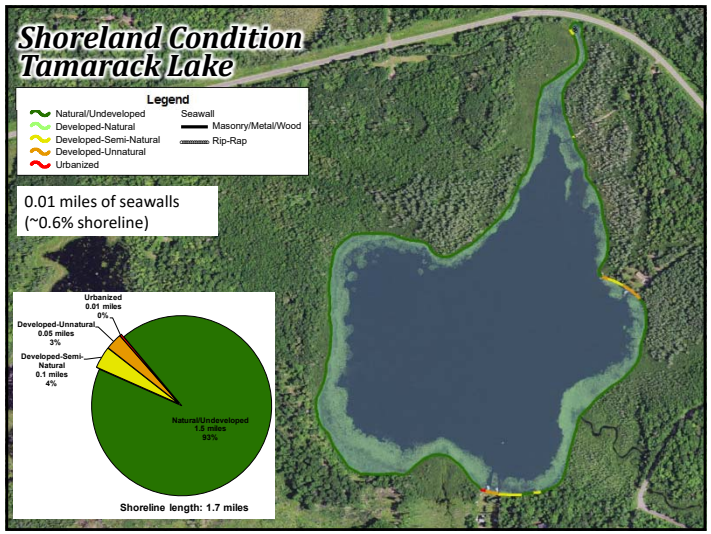
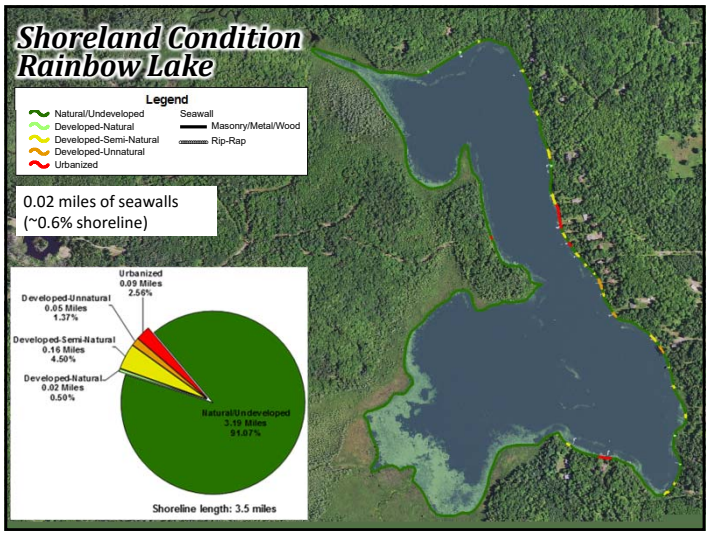
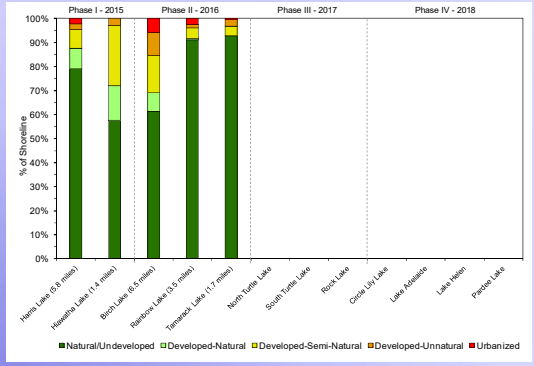

Shoreland Condition
Birch Lake
Legend
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized
Seawall
Masonry/Metal/Wood
Rip-Rap
0.8 miles of seawalls
(~12% shoreline)
Developed-Natural
0.5 miles
8%
Developed-Semi-Natural
1.0 miles
15%
Developed-Unnatural
0.6 miles
10%
Urbanized
0.4 miles
6%
Natural/Undeveloped
4.0 miles
62%
Shoreline length: 6.5 miles


Shoreland Condition
Tamarack Lake
Legend
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized
Seawall
Masonry/Metal/Wood
Rip-Rap
0.01 miles of seawalls
(~0.6% shoreline)
Urbanized
0.01 miles
0%
Developed-Unnatural
0.05 miles
3%
Developed-Semi-Natural
0.1 miles
4%
Natural/Undeveloped
1.5 miles
93%
Shoreline length: 1.7 miles


Shoreland Condition
Rainbow Lake
Legend
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized
Seawall
Masonry/Metal/Wood
Rip-Rap
0.02 miles of seawalls
(~0.6% shoreline)
Urbanized
0.09 Miles
2.56%
Developed-Unnatural
0.05 Miles
1.37%
Developed-Semi-Natural
0.16 Miles
4.50%
Developed-Natural
0.02 Miles
0.50%
Natural/Undeveloped
3.19 Miles
91.07%
Shoreline length: 3.5 miles

Town of Winchester Lakes
Shoreland Condition



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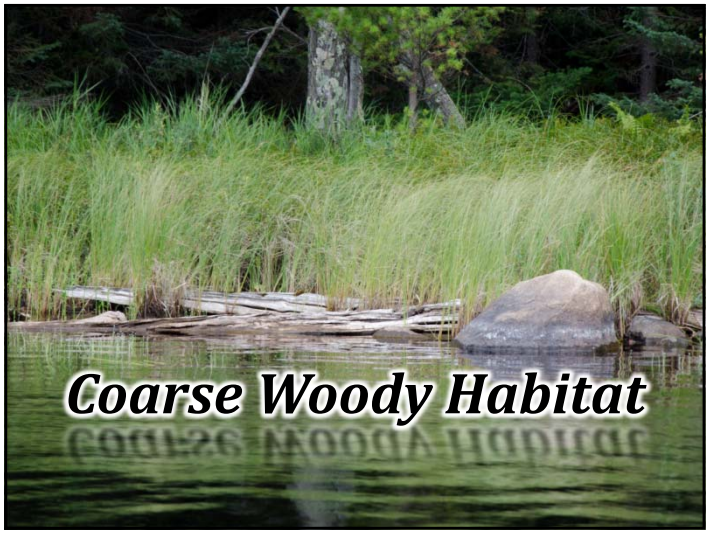

Coarse Woody Habitat

- Provides shoreland erosion control and prevents suspension of sediments.
- Preferred habitat for a variety of aquatic life.
  - Periphyton growth fed upon by insects.
  - Refuge, foraging and spawning habitat for fish.
  - Complexity of CWH important.
- Changing of logging and shoreland development practices = reduced CWH in Wisconsin lakes.
- Survey aimed at quantifying CWH in Town of Winchester Lakes

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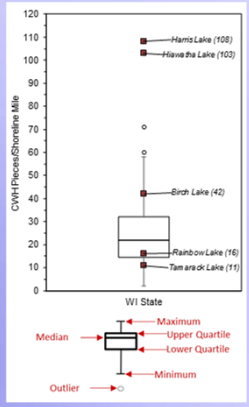
Town of Winchester Lakes
Coarse Woody Habitat



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Aquatic Plant Surveys

- Assess both non-native & native species
- Four surveys completed in 2016
  - Early-Season AIS Survey
  - Whole-Lake Point-Intercept Survey
  - Acoustic Survey
    - Water depth (bathymetry)
    - Substrate hardness
    - Aquatic plant bio-volume
  - Emergent/Floating-Leaf Community Mapping Survey

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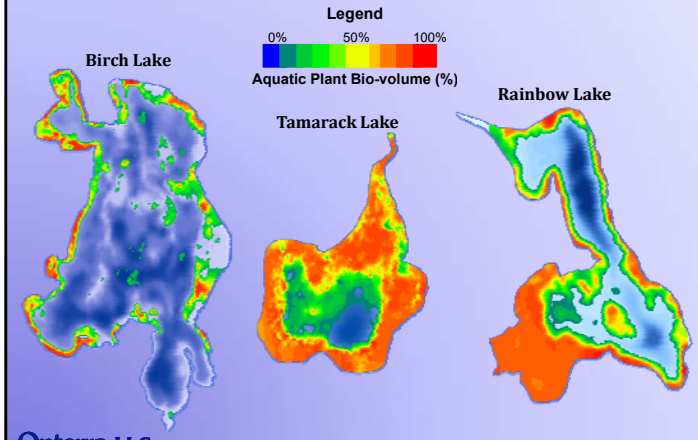
Aquatic Plant Bio-Volume



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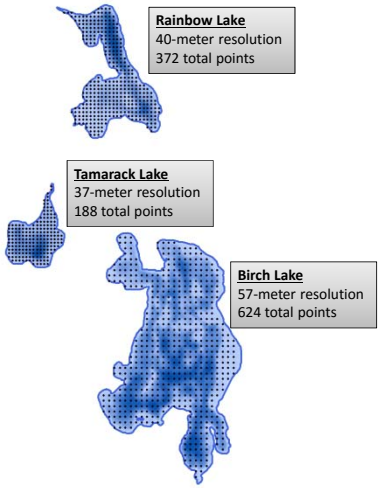
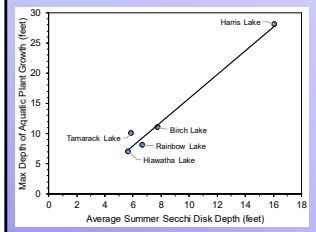
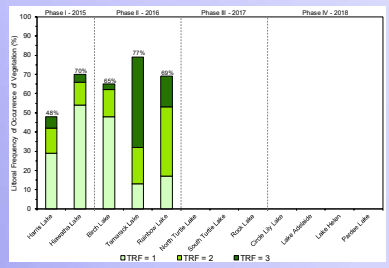
Whole-Lake Point-Intercept Survey



Frequency of Aquatic Plants





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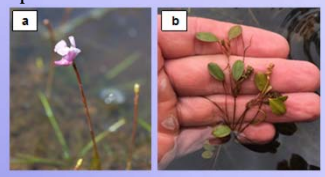
Plant Data Overview – Phase I & II

- 83 native plant species located to date
  - 2 listed as special concern: Northeastern bladderwort & Vasey's pondweed



- 1 non-native plant species
  - Curly-leaf pondweed (Harris Lake)

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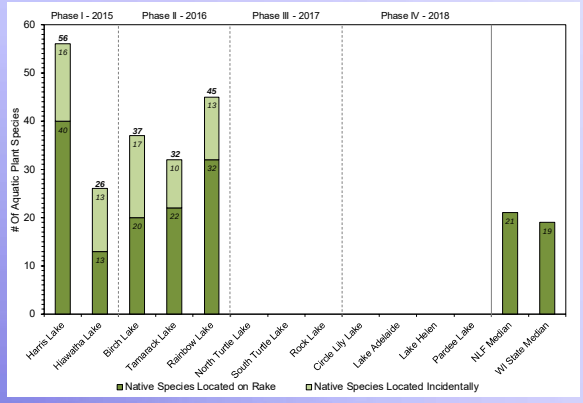
Native Species Richness



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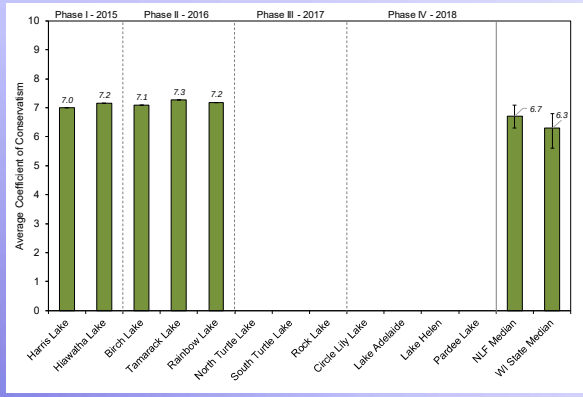
Average Conservatism



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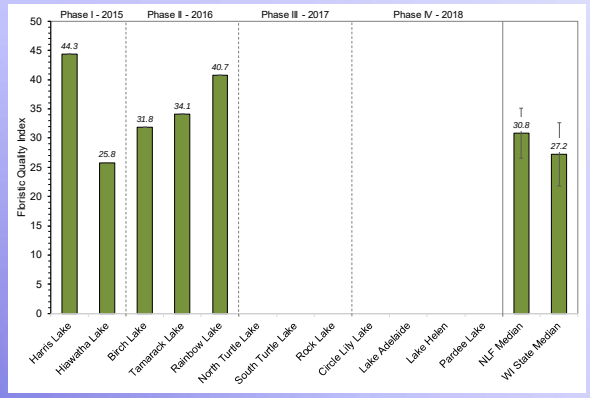
Floristic Quality



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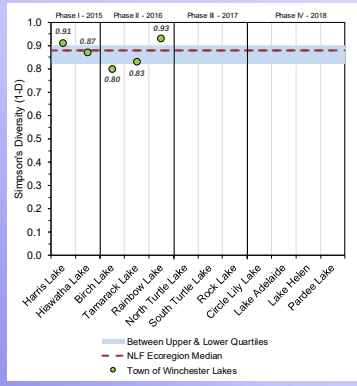
Simpson's Diversity Index



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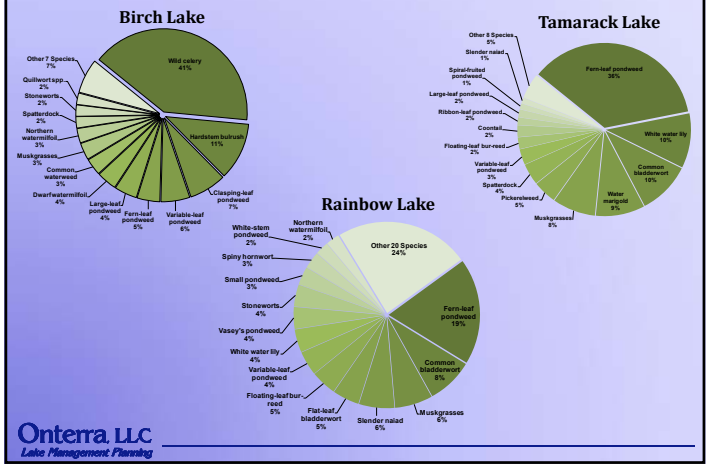
Relative Occurrence



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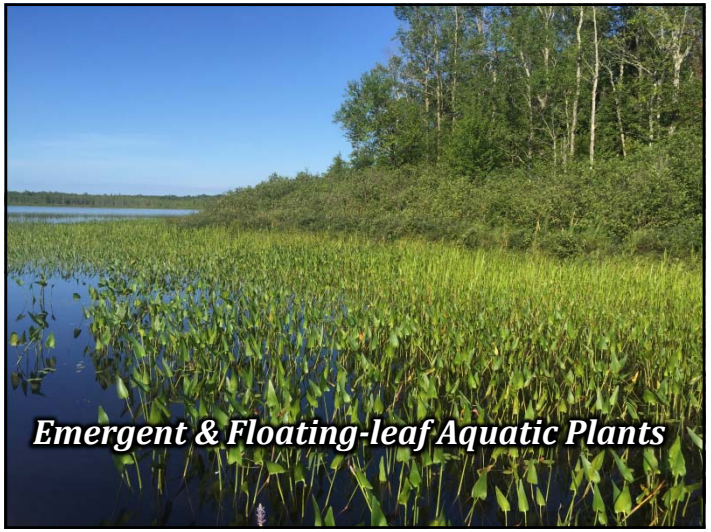

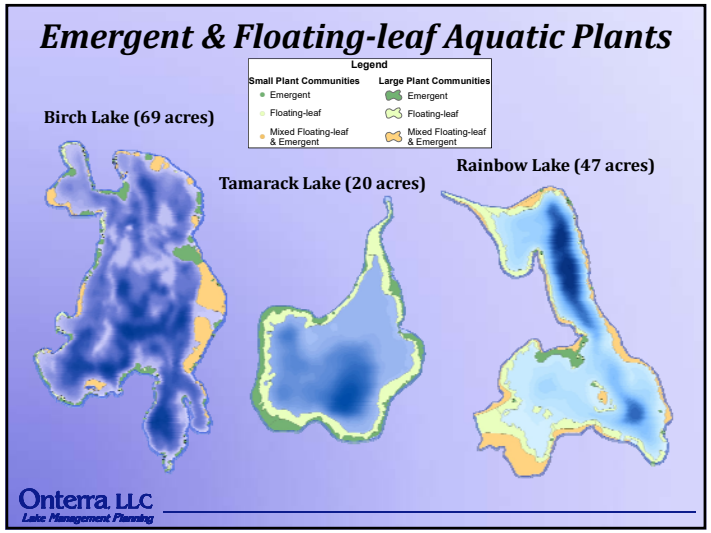
Emergent & Floating-leaf Aquatic Plants
Legend
Small Plant Communities
Emergent
Floating-leaf
Mixed Floating-leaf & Emergent
Large Plant Communities
Emergent
Floating-leaf
Mixed Floating-leaf & Emergent
Birch Lake (69 acres)
Tamarack Lake (20 acres)
Rainbow Lake (47 acres)
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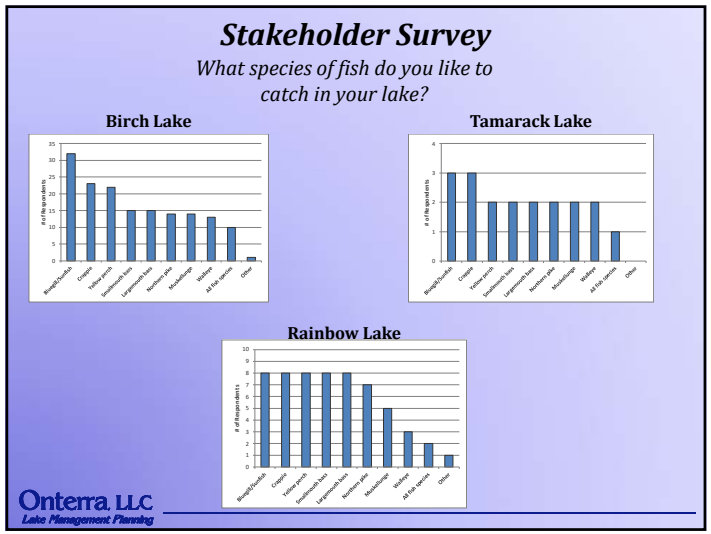
Fisheries


Stakeholder Survey
What species of fish do you like to catch in your lake?
Birch Lake
Tamarack Lake
Rainbow Lake
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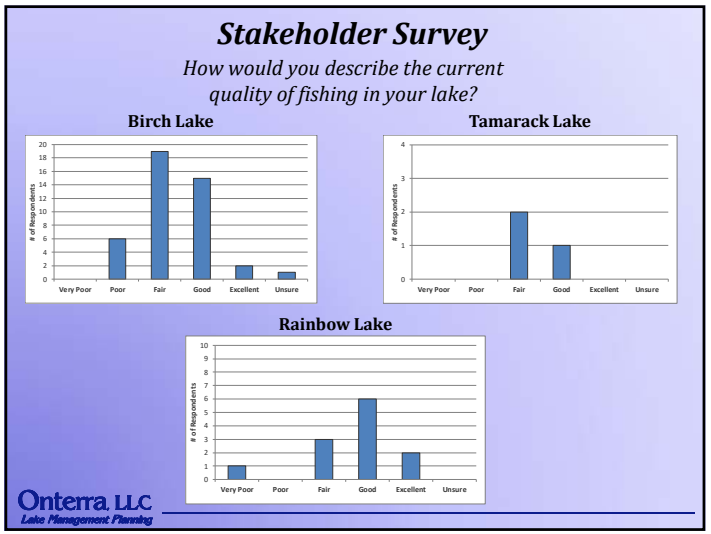
Stakeholder Survey
How would you describe the current quality of fishing in your lake?
Birch Lake
Tamarack Lake
Rainbow Lake
Very Poor
Poor
Fair
Good
Excellent
Unsure
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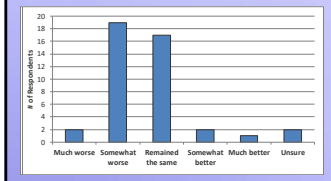
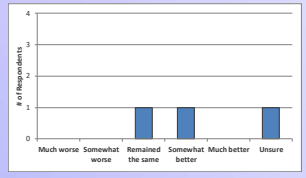
Stakeholder Survey

How has the quality of fishing changed since you first started fishing the lake?

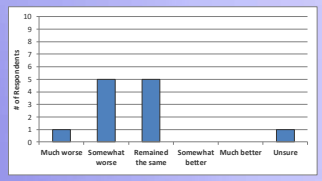
Birch Lake



Tamarack Lake



Rainbow Lake



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Native American Spear Harvest

- Town is within Treaty of 1842
- Tribal and State authorities establish *total allowable catch* based on population estimates (typically 35% for walleye & 27% for muskellunge)
- The total allowable catch number may be reduced based on confidence in population estimates: *safe harvest level*
- Tribal community claims percentage of safe harvest level, or *declaration*
- Bag limits for hook and line anglers set to accommodate declaration
- Can only harvest two walleye over 20 inches per night – one between 20 and 24" and one any size over 20"

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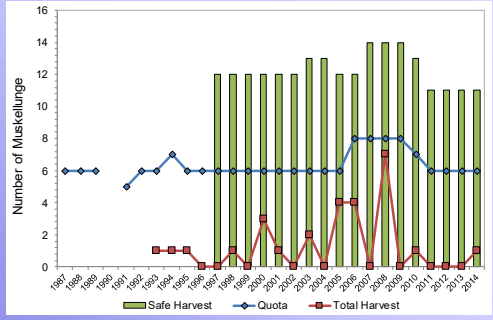
Birch Lake Spear Harvest



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Conclusions

Water Quality

- Overall very good for deep lowland drainage lakes
- Recent increase in precipitation likely cause of recent decline in clarity
- Water clarity largely influenced by dissolved tannins

Watershed & Immediate Shoreland

- Watershed mainly comprised of natural land cover
- Model-predicted phosphorus aligns with measured phosphorus in Birch Lake
- Slightly higher phosphorus in Tamarack and Rainbow due to underestimates from model
- Minimal development within shoreland areas
- High occurrence of CWH in Birch Lake; lower occurrence in Tamarack and Rainbow lakes

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Conclusions

Aquatic Plant Community

- High native species richness
- Quality of species present very high and indicative of high-quality environment
- No non-native plants located

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

Wisconsin Lakes Partnership

UW Extension

Wisconsin Dept. of Natural Resources

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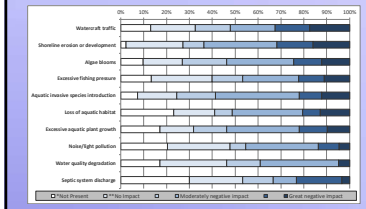
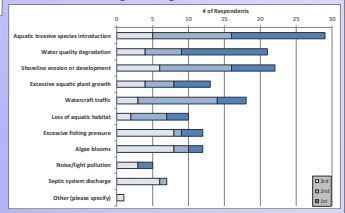
Birch Lake

To what level do you believe the following factors may be negatively impacting the lake?



Please rank your top three concerns regarding the lake.



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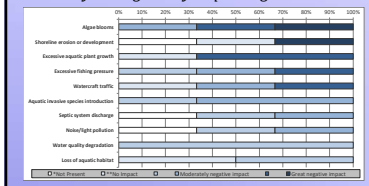
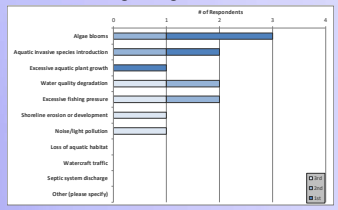
Tamarack Lake

To what level do you believe the following factors may be negatively impacting the lake?



Please rank your top three concerns regarding the lake.



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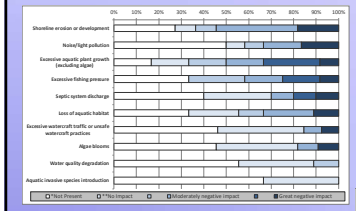
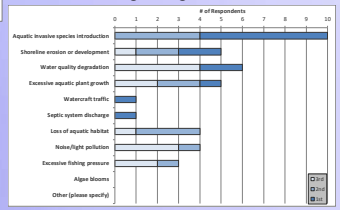
Rainbow Lake

To what level do you believe the following factors may be negatively impacting the lake?



Please rank your top three concerns regarding the lake.



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Bryozoans

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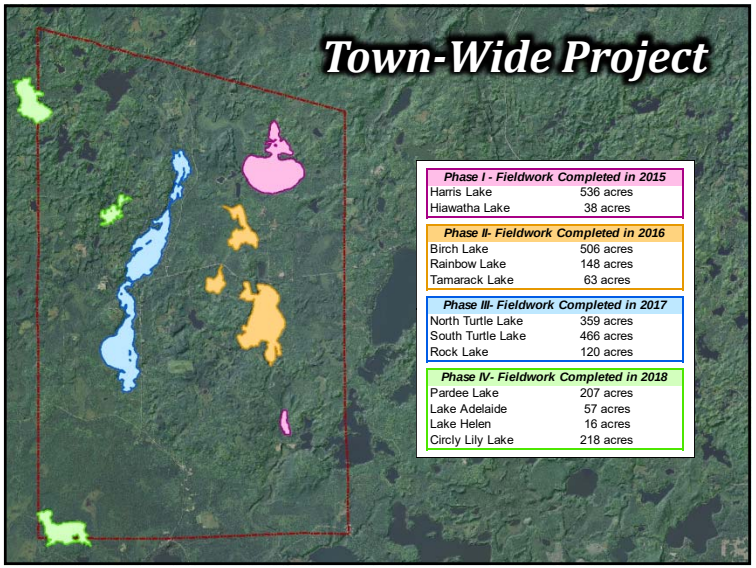
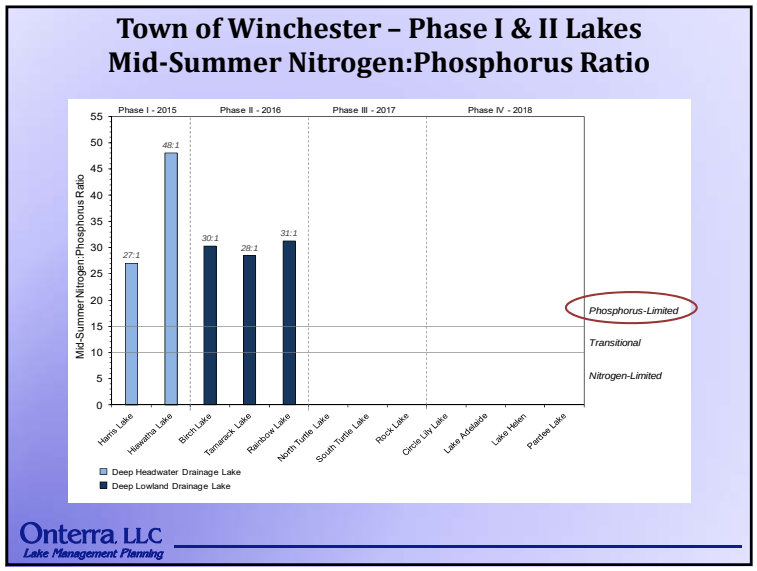
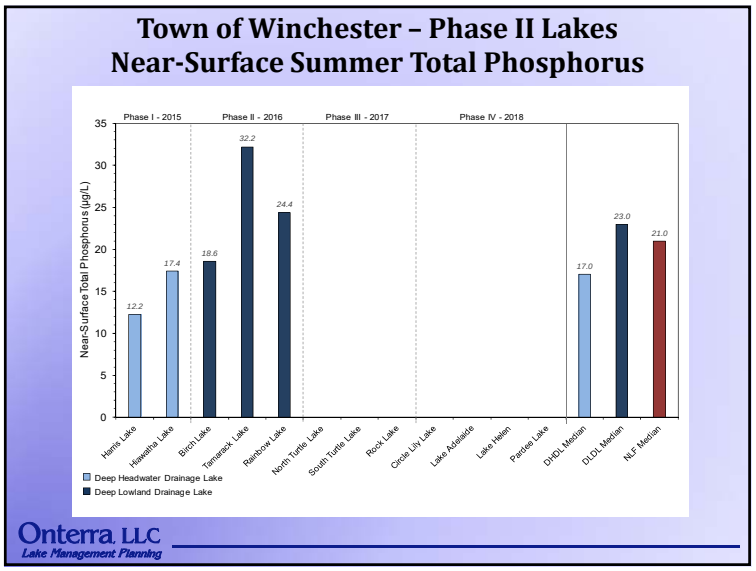
North Lakeland Discovery Center
Town of Winchester
Phase II
Birch, Tamarack, & Rainbow Lakes
Management Planning Project
Planning Meeting II
June 23, 2017
Brenton Butterfield
Onterra LLC
Lake Management Planning


Town-Wide Project
Phase I - Fieldwork Completed in 2015
Harris Lake 536 acres
Hiawatha Lake 38 acres
Phase II- Fieldwork Completed in 2016
Birch Lake 506 acres
Rainbow Lake 148 acres
Tamarack Lake 63 acres
Phase III- Fieldwork Completed in 2017
North Turtle Lake 359 acres
South Turtle Lake 466 acres
Rock Lake 120 acres
Phase IV- Fieldwork Completed in 2018
Pardee Lake 207 acres
Lake Adelaide 57 acres
Lake Helen 16 acres
Circly Lily Lake 218 acres


Town of Winchester – Phase I & II Lakes
Mid-Summer Nitrogen:Phosphorus Ratio
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
Mid-Summer Nitrogen:Phosphorus Ratio
27:1
48:1
30:1
28:1
31:1
Phosphorus-Limited
Transitional
Nitrogen-Limited
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
Deep Headwater Drainage Lake
Deep Lowland Drainage Lake
Onterra LLC
Lake Management Planning


Town of Winchester – Phase II Lakes
Near-Surface Summer Total Phosphorus
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
Near-Surface Total Phosphorus (µg/L)
12.2
17.4
18.6
32.2
24.4
17.0
23.0
21.0
Harris Lake
Hiawatha Lake
Birch Lake
Tamarack Lake
Rainbow Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
DHDL Median
DLDL Median
NLF Median
Deep Headwater Drainage Lake
Deep Lowland Drainage Lake
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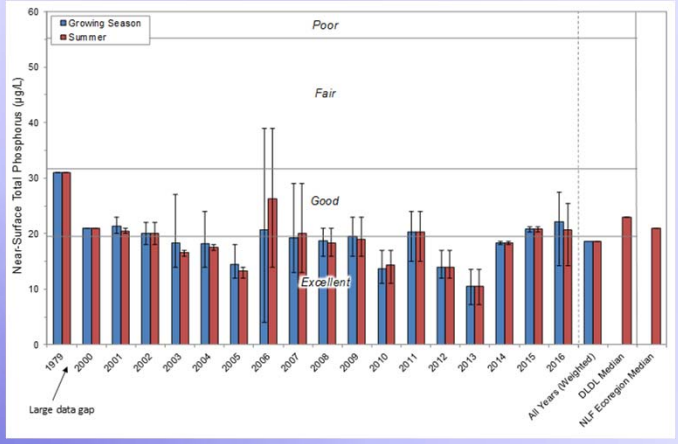
Birch Lake Total Phosphorus



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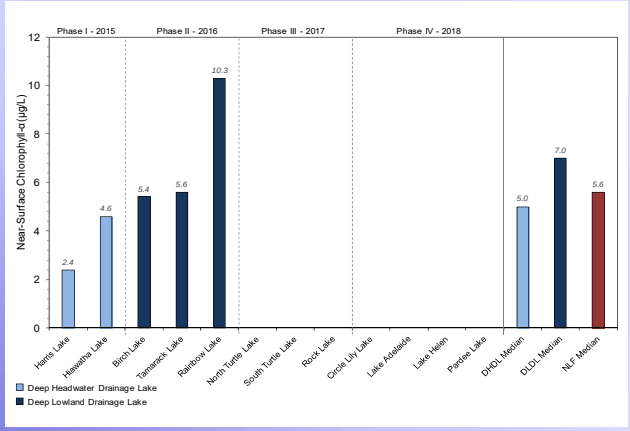
Town of Winchester – Phase I Lakes Chlorophyll-*a*



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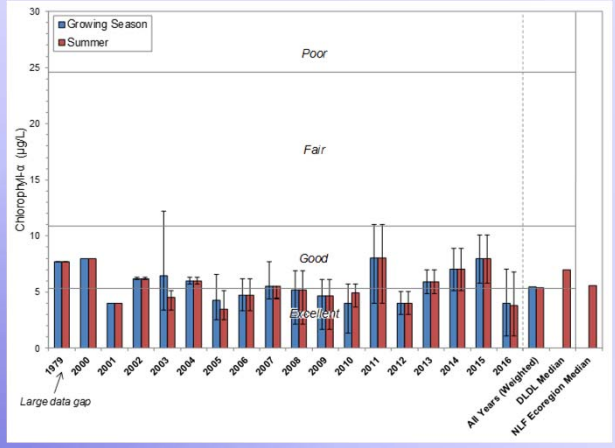
Birch Lake Chlorophyll-α



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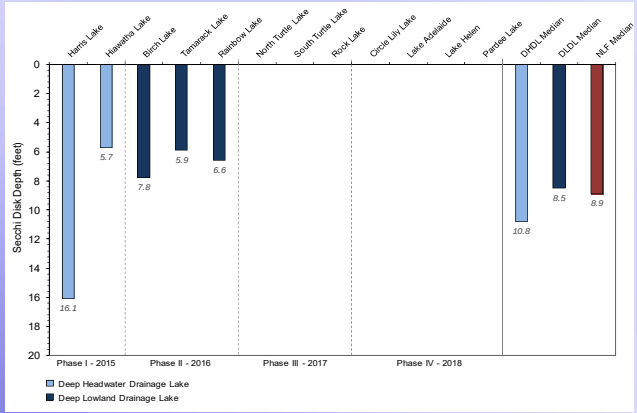
Town of Winchester – Phase I Lakes Secchi Disk Transparency



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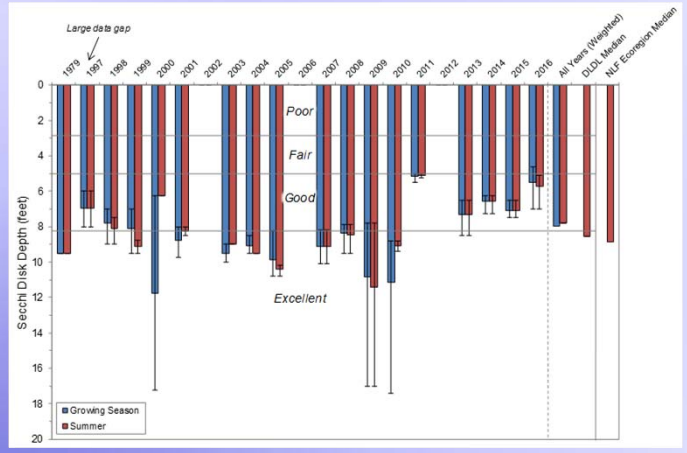
Birch Lake Secchi Disk Depth



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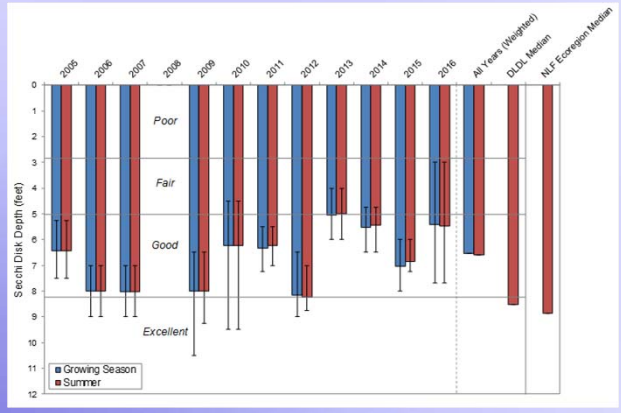
Rainbow Lake Secchi Disk Depth



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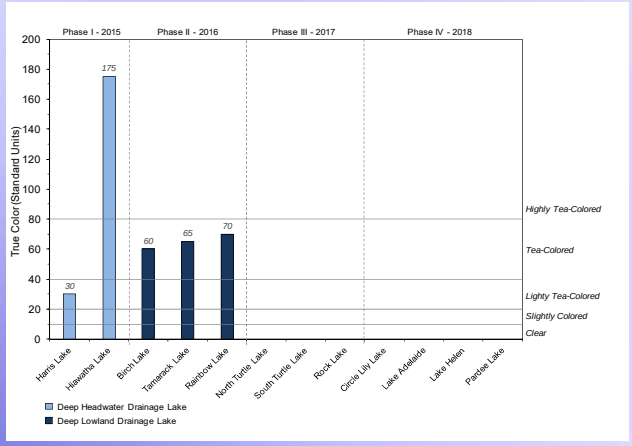
Town of Winchester – Phase I Lakes True Color



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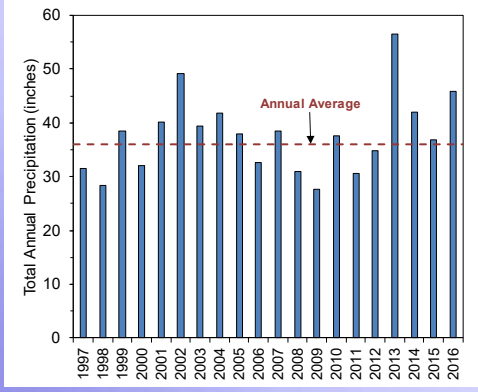
Annual Precipitation Data – Hurley, WI



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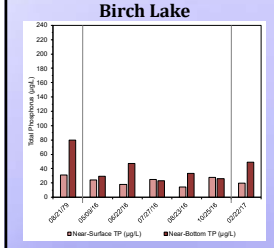
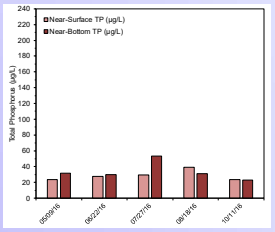
Internal Phosphorus Loading

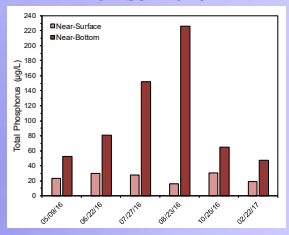
Birch Lake



Tamarack Lake



Rainbow Lake



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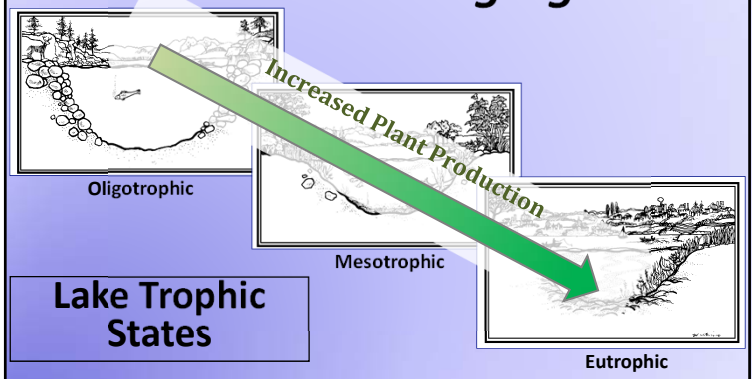
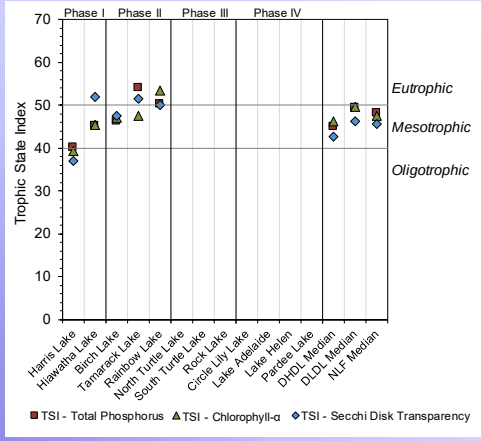
Eutrophication -Lake Aging



Lake Trophic States

Onterra LLC
Lake Management Planning

Winchester Lakes Trophic State Index



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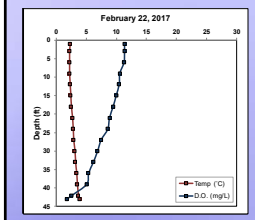
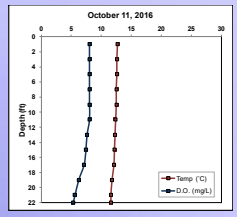
Temperature & Dissolved Oxygen

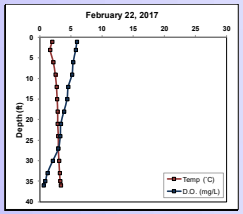
Birch Lake



Tamarack Lake

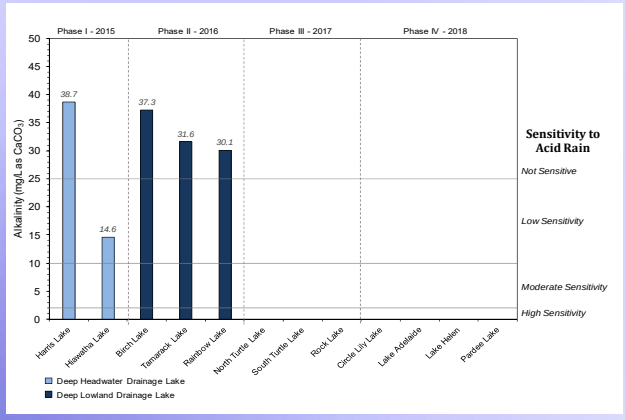


Rainbow Lake



Onterra LLC
Lake Management Planning

Additional Water Quality Parameters
Alkalinity



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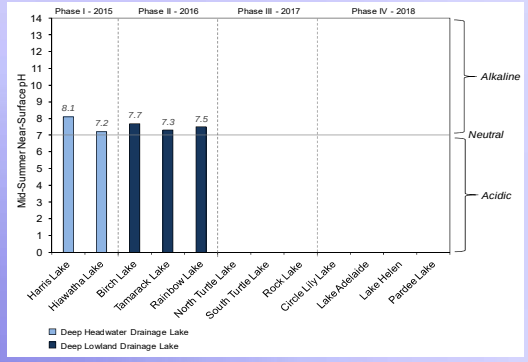
Lake Management Planning

Additional Water Quality Parameters
pH



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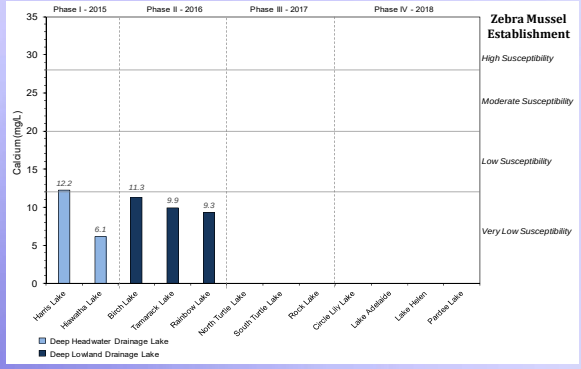
Additional Water Quality Parameters
Calcium



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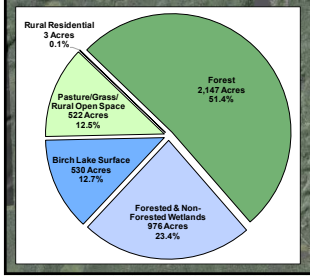
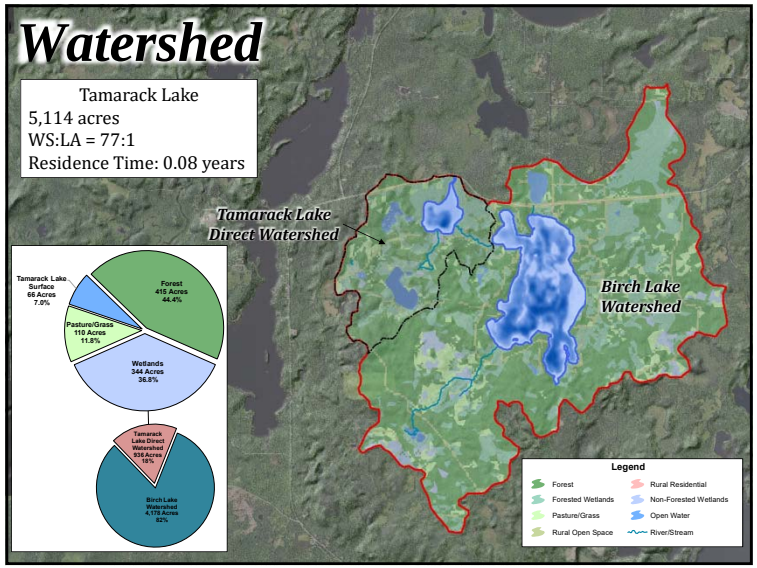
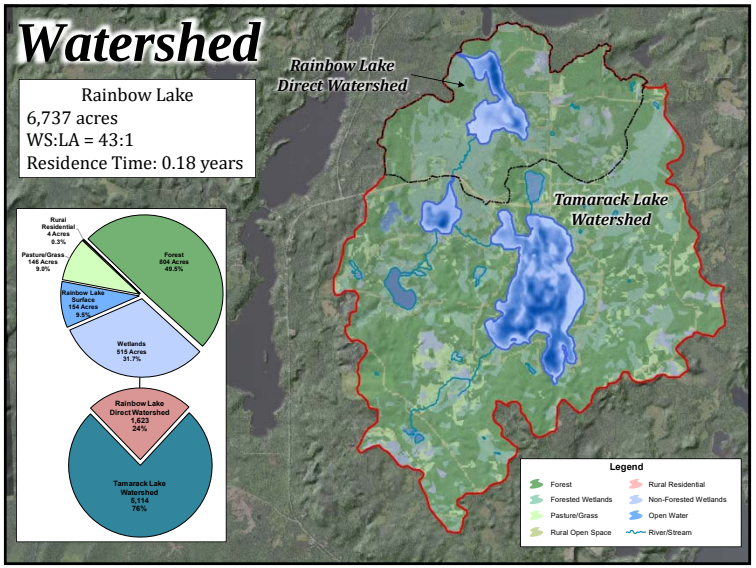
Lake Management Planning

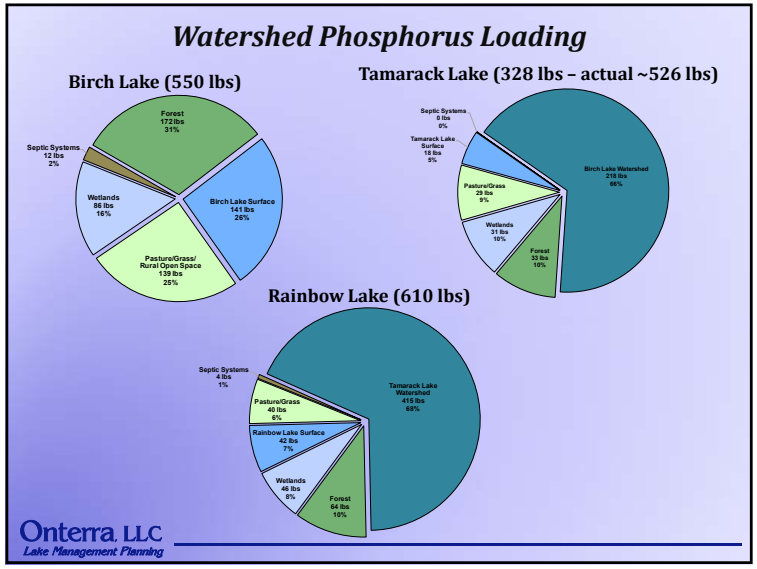
Watershed

Birch Lake
4,178 acres
WS:LA = 7:1
Residence Time: 2.2 years




Watershed
Tamarack Lake
5,114 acres
WS:LA = 77:1
Residence Time: 0.08 years
Tamarack Lake Direct Watershed
Birch Lake Watershed
Tamarack Lake Surface 66 Acres 7.9%
Forest 415 Acres 44.4%
Pasture/Grass 110 Acres 11.8%
Wetlands 344 Acres 36.8%
Tamarack Lake Direct Watershed 858 Acres 18%
Birch Lake Watershed 4,179 Acres 82%
Legend
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Rural Residential
Non-Forested Wetlands
Open Water
River/Stream


Watershed
Rainbow Lake
6,737 acres
WS:LA = 43:1
Residence Time: 0.18 years
Rainbow Lake Direct Watershed
Tamarack Lake Watershed
Rural Residential 4 Acres 0.3%
Forest 804 Acres 49.5%
Pasture/Grass 146 Acres 9.0%
Rainbow Lake Surface 154 Acres 9.5%
Wetlands 515 Acres 31.7%
Rainbow Lake Direct Watershed 1,623 24%
Tamarack Lake Watershed 5,114 76%
Legend
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Rural Residential
Non-Forested Wetlands
Open Water
River/Stream


Watershed Phosphorus Loading
Birch Lake (550 lbs)
Forest 172 lbs 31%
Septic Systems 12 lbs 2%
Wetlands 86 lbs 16%
Birch Lake Surface 141 lbs 26%
Pasture/Grass/ Rural Open Space 139 lbs 25%
Tamarack Lake (328 lbs – actual ~526 lbs)
Septic Systems 0 lbs 0%
Tamarack Lake Surface 18 lbs 5%
Birch Lake Watershed 218 lbs 66%
Pasture/Grass 29 lbs 9%
Wetlands 31 lbs 10%
Forest 33 lbs 10%
Rainbow Lake (610 lbs)
Septic Systems 4 lbs 1%
Tamarack Lake Watershed 415 lbs 68%
Pasture/Grass 40 lbs 6%
Rainbow Lake Surface 42 lbs 7%
Wetlands 46 lbs 8%
Forest 64 lbs 10%
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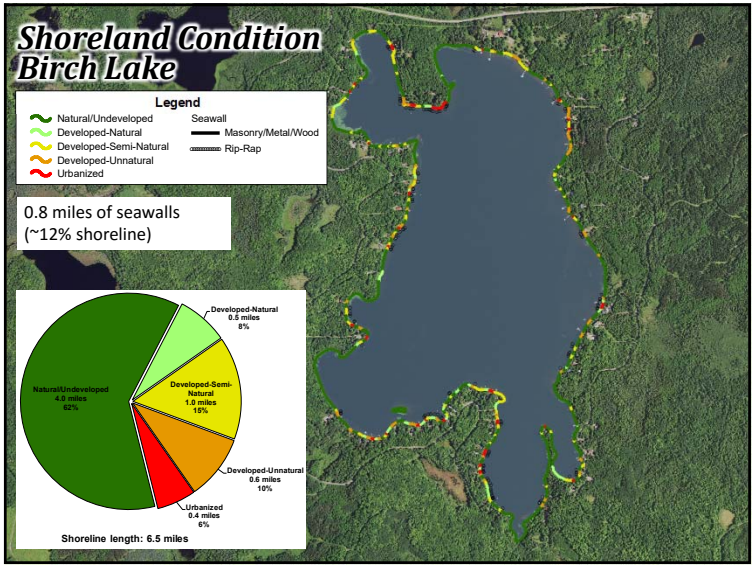
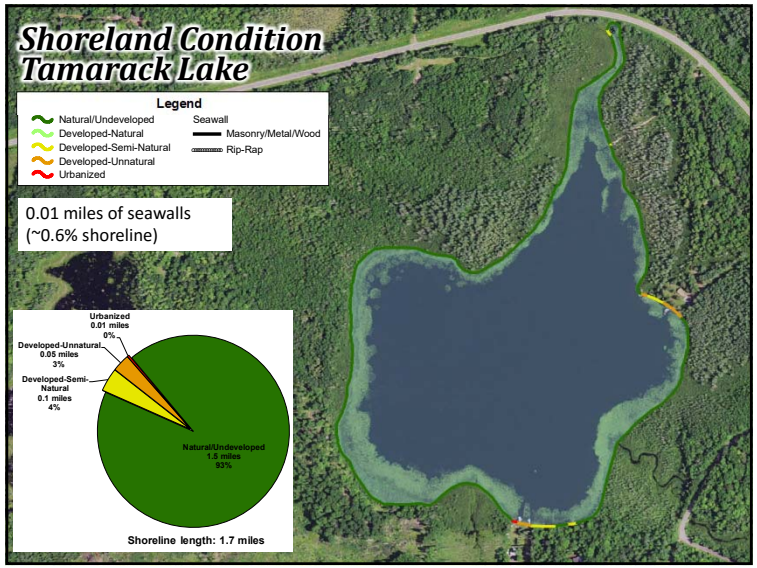
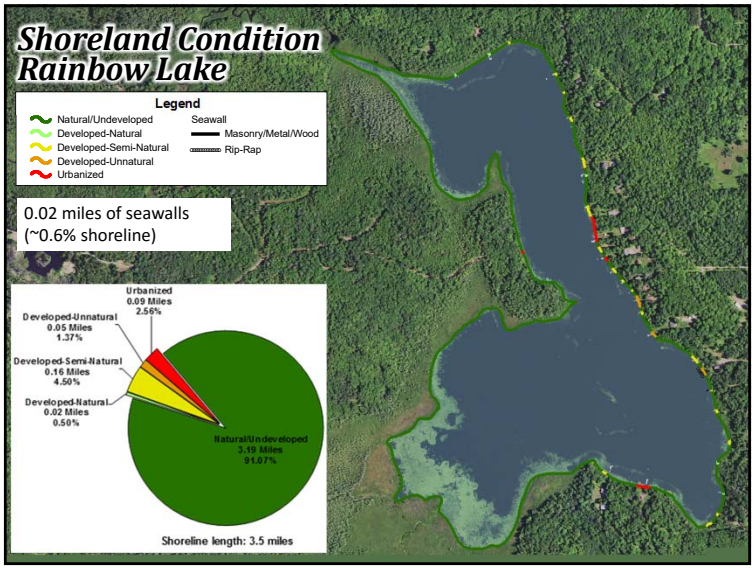
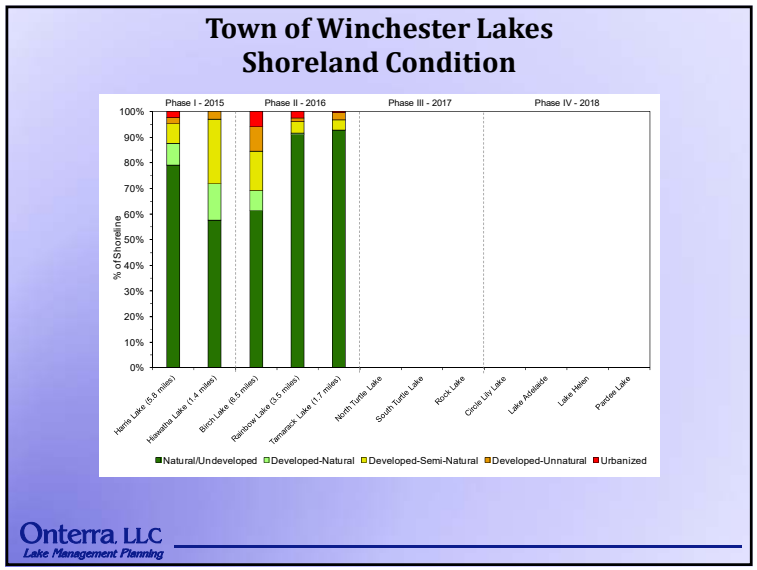
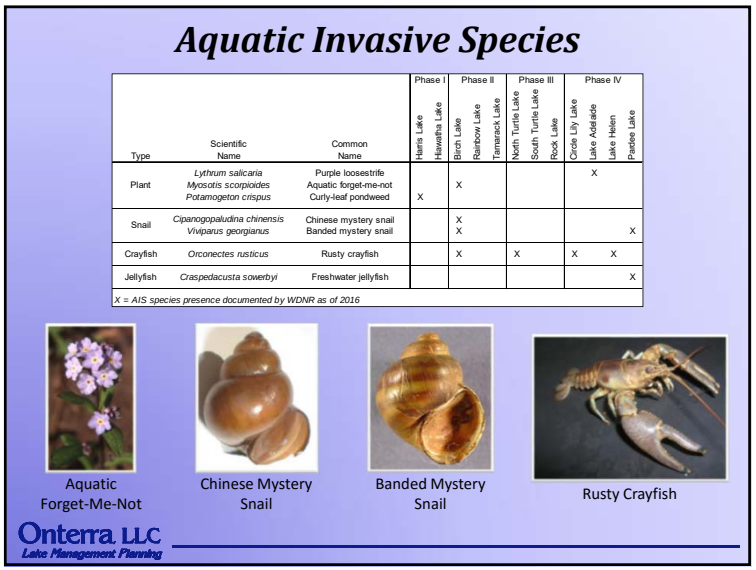

Shoreland Condition
Birch Lake
Legend
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized
Seawall
Masonry/Metal/Wood
Rip-Rap
0.8 miles of seawalls
(~12% shoreline)
Developed-Natural 0.5 miles 8%
Developed-Semi-Natural 1.0 miles 15%
Developed-Unnatural 0.6 miles 10%
Urbanized 0.4 miles 6%
Natural/Undeveloped 4.0 miles 62%
Shoreline length: 6.5 miles


Shoreland Condition
Tamarack Lake
Legend
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized
Seawall
Masonry/Metal/Wood
Rip-Rap
0.01 miles of seawalls
(~0.6% shoreline)
Urbanized
0.01 miles
0%
Developed-Unnatural
0.05 miles
3%
Developed-Semi-Natural
0.1 miles
4%
Natural/Undeveloped
1.5 miles
93%
Shoreline length: 1.7 miles


Shoreland Condition
Rainbow Lake
Legend
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized
Seawall
Masonry/Metal/Wood
Rip-Rap
0.02 miles of seawalls
(~0.6% shoreline)
Urbanized
0.09 Miles
2.56%
Developed-Unnatural
0.05 Miles
1.37%
Developed-Semi-Natural
0.16 Miles
4.50%
Developed-Natural
0.02 Miles
0.50%
Natural/Undeveloped
3.19 Miles
91.07%
Shoreline length: 3.5 miles


Town of Winchester Lakes
Shoreland Condition
Phase I - 2015
Phase II - 2016
Phase III - 2017
Phase IV - 2018
% of Shoreline
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Harris Lake (6.8 miles)
Hiawatha Lake (1.4 miles)
Birch Lake (6.5 miles)
Rainbow Lake (3.5 miles)
Tamarack Lake (1.7 miles)
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized
Onterra LLC
Lake Management Planning


Aquatic Invasive Species
Phase I
Phase II
Phase III
Phase IV
Type
Scientific Name
Common Name
Harris Lake
Hiawatha Lake
Birch Lake
Rainbow Lake
Tamarack Lake
North Turtle Lake
South Turtle Lake
Rock Lake
Circle Lily Lake
Lake Adelaide
Lake Helen
Pardee Lake
Plant
Lythrum salicaria
Myosotis scorpioides
Potamogeton crispus
Purple loosestrife
Aquatic forget-me-not
Curly-leaf pondweed
X
X
X
Snail
Cipanogopaludina chinensis
Viviparus georgianus
Chinese mystery snail
Banded mystery snail
X
X
X
Crayfish
Orconectes rusticus
Rusty crayfish
X
X
X
X
Jellyfish
Craspedacusta sowerbyi
Freshwater jellyfish
X
X = AIS species presence documented by WDNR as of 2016
Aquatic Forget-Me-Not
Chinese Mystery Snail
Banded Mystery Snail
Rusty Crayfish
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Lake Management Planning

Conclusions

Water Quality

- Overall very good for deep lowland drainage lakes
- Recent increase in precipitation likely cause of recent decline in clarity
- Water clarity largely influenced by dissolved tannins

Watershed & Immediate Shoreland

- Watershed mainly comprised of natural land cover
- Model-predicted phosphorus aligns with measured phosphorus in Birch Lake
- Slightly higher phosphorus in Tamarack and Rainbow due to underestimates from model
- Minimal development within shoreland areas
- High occurrence of CWH in Birch Lake; lower occurrence in Tamarack and Rainbow lakes

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Conclusions

Aquatic Plant Community

- High native species richness
- Quality of species present very high and indicative of high-quality environment
- No non-native plants located

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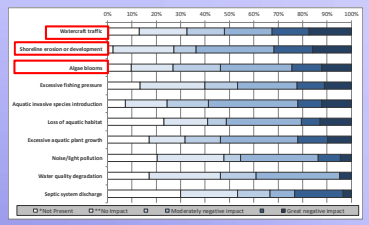
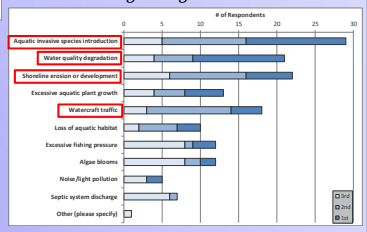
Birch Lake

To what level do you believe the following factors may be negatively impacting the lake?



Please rank your top three concerns regarding the lake.



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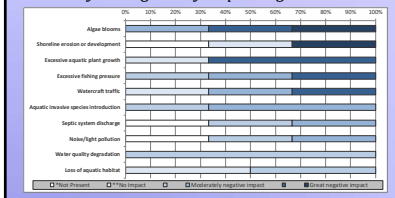
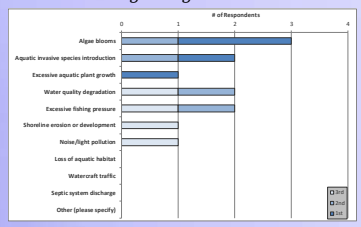
Tamarack Lake

To what level do you believe the following factors may be negatively impacting the lake?



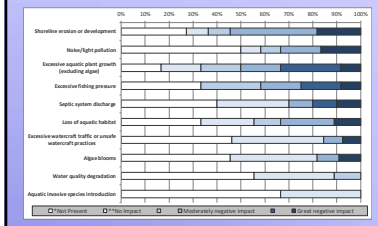
Please rank your top three concerns regarding the lake.



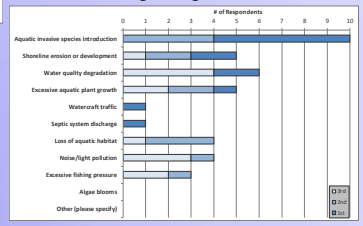
Onterra, LLC
Lake Management Planning

Rainbow Lake

To what level do you believe the following factors may be negatively impacting the lake?



Please rank your top three concerns regarding the lake.



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Lake Management Planning

Bryozoans

Onterra LLC
Lake Management Planning

B

APPENDIX B

Stakeholder Survey Response Charts and Comments

Birch Lake - Anonymous Stakeholder Survey

Surveys Distributed: 129
Surveys Returned: 50
Response Rate: 39%

Birch Lake Property

1. Do you rent or own your property on or near Birch Lake? Please select one choice.

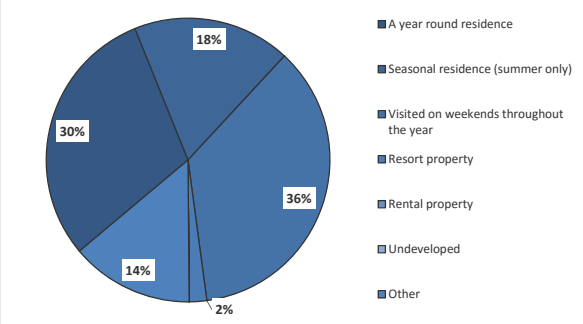
Answer Options	Response Percent	Response Count
Own	100.0%	50
Rent	0.0%	0
answered question		50
skipped question		0

2. Is your property from Question 1 on the lake or off the lake? Please select one choice.

Answer Options	Response Percent	Response Count
On the lake	96.0%	48
Off the lake	4.0%	2
answered question		50
skipped question		0

3. How is your property on or near Birch Lake utilized?

Answer Options	Response Percent	Response Count
A year round residence	30.0%	15
Seasonal residence (summer only)	18.0%	9
Visited on weekends throughout the year	36.0%	18
Resort property	2.0%	1
Rental property	0.0%	0
Undeveloped	0.0%	0
Other (please specify)	14.0%	7
answered question		50
skipped question		0

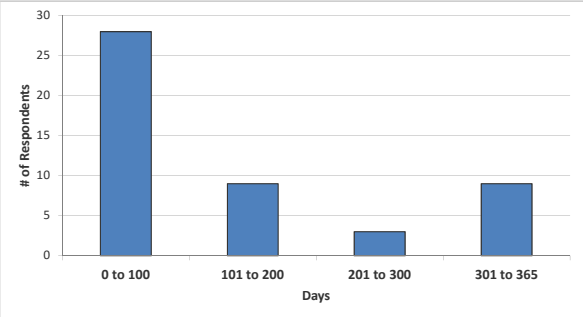


Number	Other (please specify)
1	Seasonal residence mostly spring-fall occasional winter weekend Spring-fall weekends and many weekdays as well
2	Summer, plus 3-4 weeks throughout the rest of the year
3	2nd home seasonally summer, fall & winter
4	Visit a week or more per month all year
5	Used extensively throughout the year
6	visits during summer and other seasons
7	visit weeks and weekends throughout the entire year

4. How many days each year is your property used by you or others?

Answer Options	Response Count
	49
answered question	49
skipped question	1

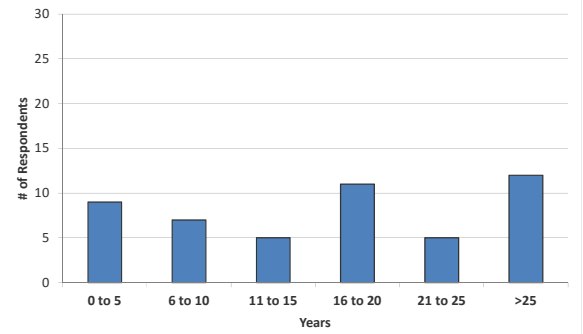
Category (# of days)	Responses	
0 to 100	28	57%
101 to 200	9	18%
201 to 300	3	6%
301 to 365	9	18%



5. How long have you owned or rented your property on or near Birch Lake?

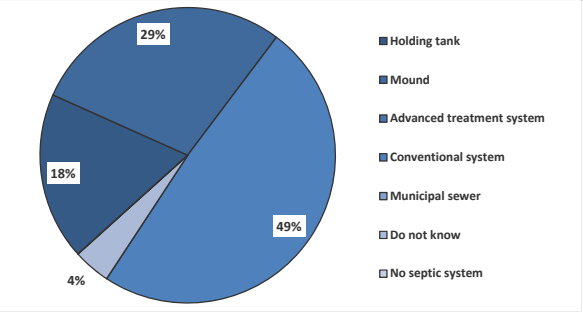
Answer Options	Response Count
	49
answered question	49
skipped question	1

Category (# of years)	Responses	% Response
0 to 5	9	18%
6 to 10	7	14%
11 to 15	5	10%
16 to 20	11	22%
21 to 25	5	10%
>25	12	24%



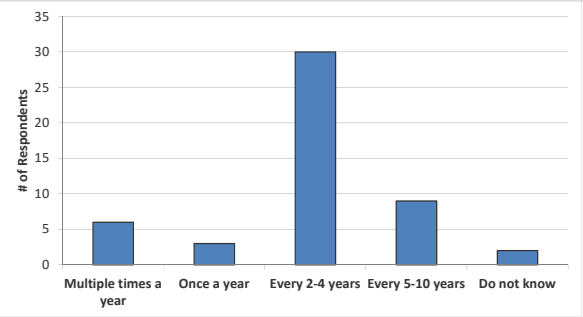
6. What type of septic system does your property utilize?

Answer Options	Response Percent	Response Count
Holding tank	18.4%	9
Mound	28.6%	14
Advanced treatment system	0.0%	0
Conventional system	49.0%	24
Municipal sewer	0.0%	0
Do not know	4.1%	2
No septic system	0.0%	0
answered question		49
skipped question		1



7. How often is the septic system on your property pumped?

Answer Options	Response Percent	Response Count
Multiple times a year	12.0%	6
Once a year	6.0%	3
Every 2-4 years	60.0%	30
Every 5-10 years	18.0%	9
Do not know	4.0%	2
answered question		50
skipped question		0

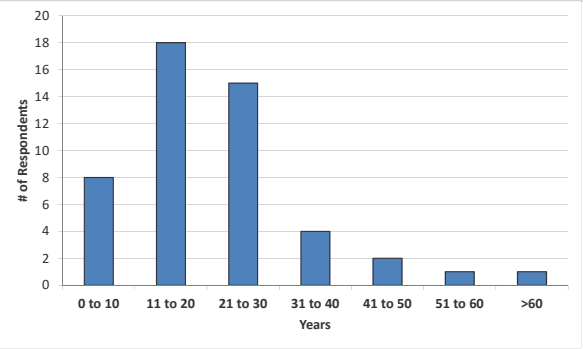


Recreational Activity on Birch Lake

8. How many years ago did you first visit Birch Lake?

Answer Options	Response Count
	49
answered question	49
skipped question	1

Category (# of days)	Responses	% Response
0 to 10	8	16%
11 to 20	18	37%
21 to 30	15	31%
31 to 40	4	8%
41 to 50	2	4%
51 to 60	1	2%
>60	1	2%



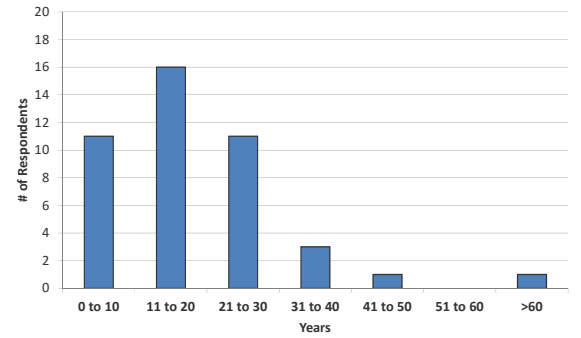
9. Have you personally fished on Birch Lake in the past three years?

Answer Options	Response Percent	Response Count
Yes	87.8%	43
No	12.2%	6
answered question		49
skipped question		1

10. For how many years have you fished Birch Lake?

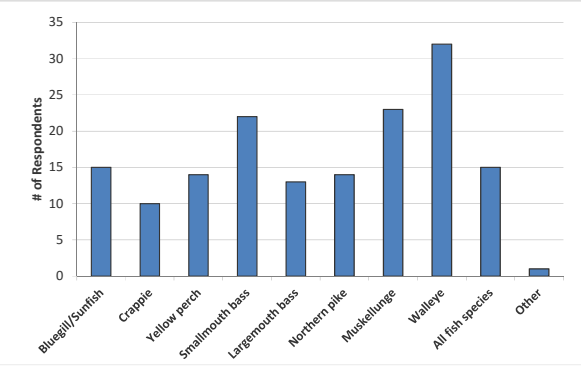
Answer Options	Response Count
	43
answered question	43
skipped question	7

Category (# of years)	Responses	% Response
0 to 10	11	26%
11 to 20	16	37%
21 to 30	11	26%
31 to 40	3	7%
41 to 50	1	2%
51 to 60	0	0%
>60	1	2%



11. What species of fish do you like to catch on Birch Lake?

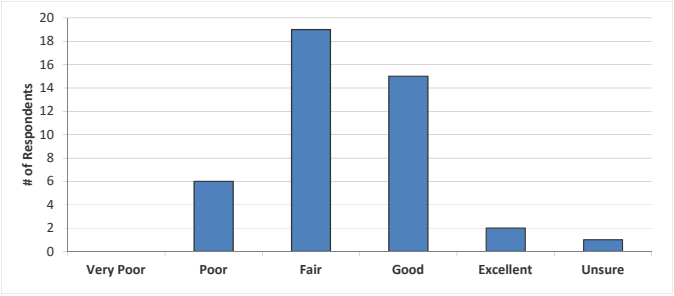
Answer Options	Response Percent	Response Count
Bluegill/Sunfish	34.9%	15
Crappie	23.3%	10
Yellow perch	32.6%	14
Smallmouth bass	51.2%	22
Largemouth bass	30.2%	13
Northern pike	32.6%	14
Muskellunge	53.5%	23
Walleye	74.4%	32
All fish species	34.9%	15
Other (please specify)	2.3%	1
answered question		43
skipped question		7



Number	Other (please specify)
1	Rock Bass

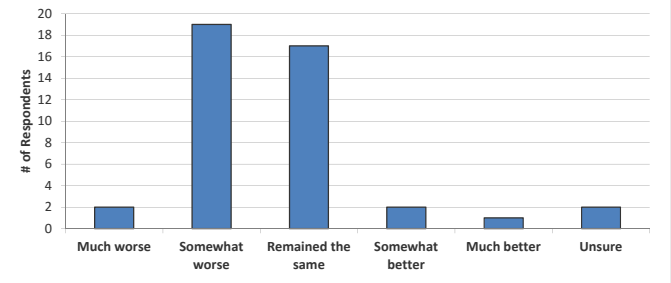
12. How would you describe the current quality of fishing on Birch Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Unsure	Response Count
	0	6	19	15	2	1	43
answered question							43
skipped question							7



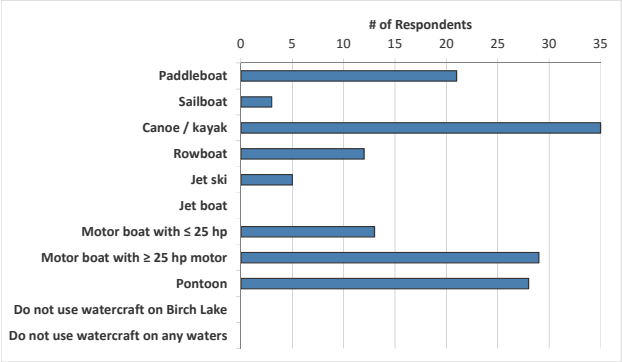
13. How has the quality of fishing changed on Birch Lake since you have started fishing the lake?

Answer Options	Much worse	Somewhat worse	Remained the same	Somewhat better	Much better	Unsure	Response Count
	2	19	17	2	1	2	43
						answered question	**43**
						skipped question	**7**



14. What types of watercraft do you currently use on Birch Lake?

Answer Options	Response Percent	Response Count
Paddleboat	43.8%	21
Sailboat	6.3%	3
Canoe / kayak	72.9%	35
Rowboat	25.0%	12
Jet ski (personal water craft)	10.4%	5
Jet boat	0.0%	0
Motor boat with 25 hp or less motor	27.1%	13
Motor boat with greater than 25 hp motor	60.4%	29
Pontoon	58.3%	28
Do not use watercraft on Birch Lake	0.0%	0
Do not use watercraft on any waters	0.0%	0
	answered question	**48**
	skipped question	**2**



15. Do you use your watercraft on waters other than Birch Lake?

Answer Options	Response Percent	Response Count
Yes	46.9%	23
No	53.1%	26
	answered question	**49**
	skipped question	**1**

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

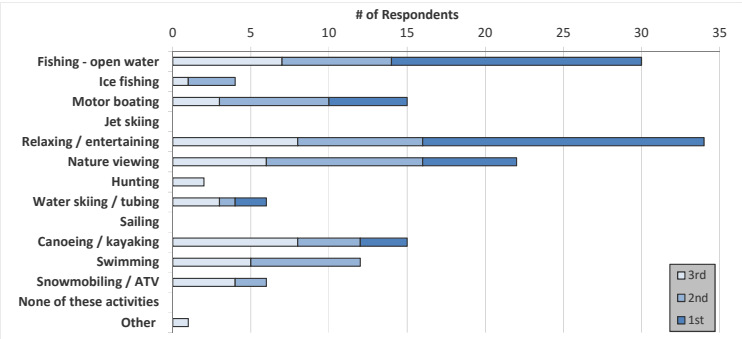
Answer Options	Response Percent	Response Count
Remove aquatic hitch-hikers (ex. - plant material, clams, mussels)	95.7%	22
Drain bilge	82.6%	19
Rinse boat	39.1%	9
Power wash boat	4.3%	1
Apply bleach	4.3%	1
Do not clean boat	0.0%	0
Other (please specify)	13.0%	3
	answered question	**23**
	skipped question	**27**

Number	Other (please specify)
1	Usually drain livewell and baitwell
2	Wipe down with towel
3	Allow boat to dry for long periods prior to use on other waters

17. For the list below, rank your top three activities that are important reasons for owning or renting your property on or near Birch Lake, with 1 being the most important activity.

Answer Options	1st	2nd	3rd	Rating Average	Response Count
Fishing - open water	16	7	7	1.70	30
Ice fishing	0	3	1	2.25	4
Motor boating	5	7	3	1.87	15
Jet skiing	0	0	0	0.00	0
Relaxing / entertaining	18	8	8	1.71	34
Nature viewing	6	10	6	2.00	22
Hunting	0	0	2	3.00	2
Water skiing / tubing	2	1	3	2.17	6
Sailing	0	0	0	0.00	0
Canoeing / kayaking	3	4	8	2.33	15
Swimming	0	7	5	2.42	12
Snowmobiling / ATV	0	2	4	2.67	6
None of these activities are important to me	0	0	0	0.00	0
Other (please specify below)	0	0	1	3.00	1
				answered question	**50**
				skipped question	**0**

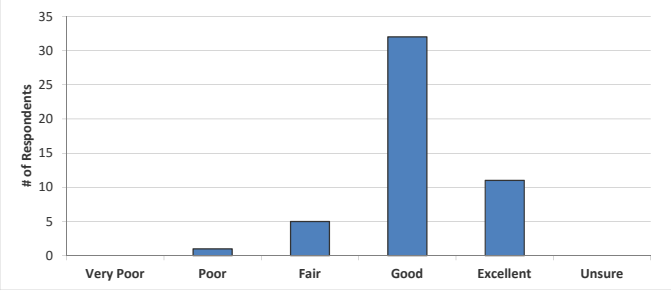
Number	"Other" responses
1	Having friends up to visit.



Birch Lake Current and Historic Condition, Health and Management

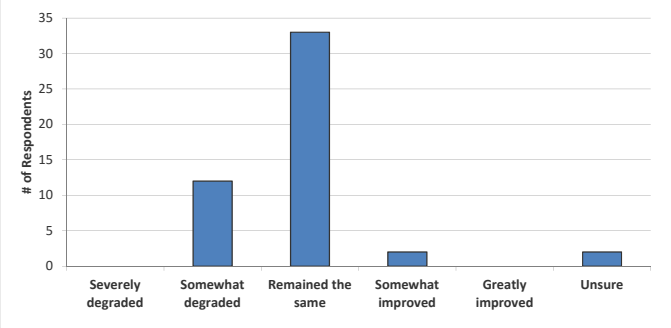
18. How would you describe the current water quality of Birch Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Unsure	Response Count
	0	1	5	32	11	0	49
						answered question	**49**
						skipped question	**1**



19. How has the water quality changed in Birch Lake since you first visited the lake?

Answer Options	Severely degraded	Somewhat degraded	Remained the same	Somewhat improved	Greatly improved	Unsure	Response Count
	0	12	33	2	0	2	49
					answered question		49
					skipped question		1



20. Before reading the statement above, had you ever heard of aquatic invasive species?

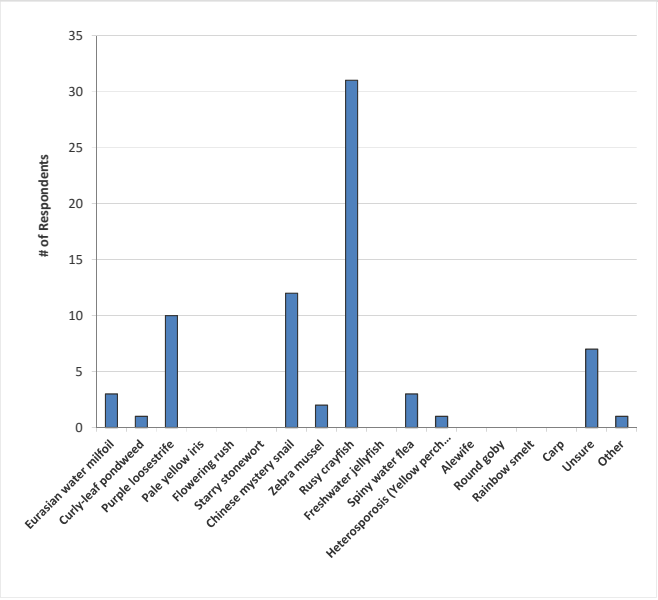
Answer Options	Response Percent	Response Count
Yes	98.0%	49
No	2.0%	1
	answered question	50
	skipped question	0

21. Do you believe aquatic invasive species are present within Birch Lake?

Answer Options	Response Percent	Response Count
Yes	56.3%	27
I think so but am not certain	25.0%	12
No	18.8%	9
	answered question	48
	skipped question	2

22. Which aquatic invasive species do you believe are in Birch Lake?

Answer Options	Response Percent	Response Count
Eurasian water milfoil	7.7%	3
Curly-leaf pondweed	2.6%	1
Purple loosestrife	25.6%	10
Pale yellow iris	0.0%	0
Flowering rush	0.0%	0
Starry stonewort	0.0%	0
Chinese mystery snail	30.8%	12
Zebra mussel	5.1%	2
Rusy crayfish	79.5%	31
Freshwater jellyfish	0.0%	0
Spiny water flea	7.7%	3
Heterosporosis (Yellow perch parasite)	2.6%	1
Alewife	0.0%	0
Round goby	0.0%	0
Rainbow smelt	0.0%	0
Carp	0.0%	0
Unsure, but I believe AIS are present	17.9%	7
Other (please specify)	2.6%	1
	answered question	39
	skipped question	11

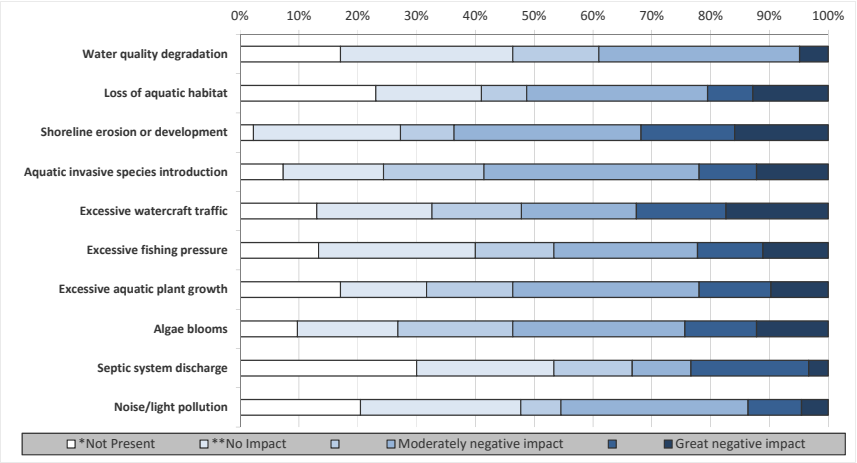


Number	"Other" responses
1	I assume the worms in perch are the parasite.

23. To what level do you believe each of the following factors may currently be negatively impacting Birch Lake?
*** Not present means that you believe the issue does not exist on Birch Lake.**
**** No impact means that the issue may exist on Birch Lake but it is not negatively impacting the lake.**

Answer Options	*Not Present	**No Impact		Moderately negative impact		Great negative impact	Unsure: Need more information	Rating Average	Response Count
Water quality degradation	7	12	6	14	0	2	7	1.58	48
Loss of aquatic habitat	9	7	3	12	3	5	7	1.87	46
Shoreline erosion or development	1	11	4	14	7	7	4	2.58	48
Aquatic invasive species introduction	3	7	7	15	4	5	7	2.23	48
Watercraft traffic	6	9	7	9	7	8	3	2.41	49
Excessive fishing pressure	6	12	6	11	5	5	3	2.13	48
Excessive aquatic plant growth	7	6	6	13	5	4	8	1.98	49
Algae blooms	4	7	8	12	5	5	7	2.17	48
Septic system discharge	9	7	4	3	6	1	18	1.10	48
Noise/light pollution	9	12	3	14	4	2	5	1.76	49
Other (please specify)									4
								answered question	**49**
								skipped question	**1**

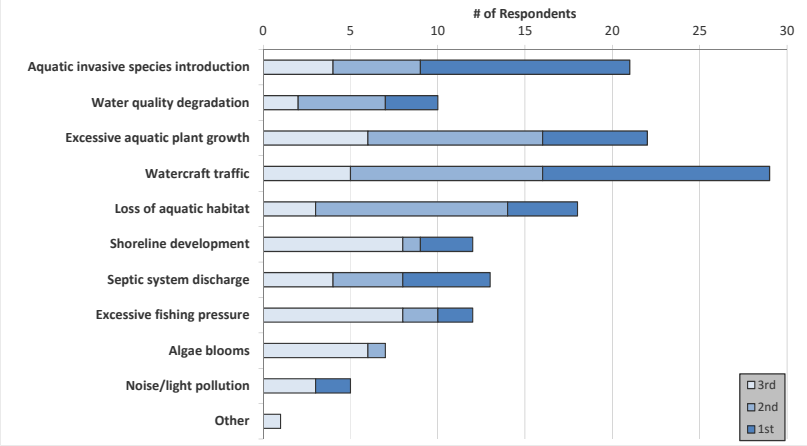
Number	Other (please specify)
1	Barking dogs and at times noisy neighbors at inappropriate times spoils the peace and experience desired by this property owner Just elaborating on the noise issue
2	Water level was kept excessively high this summer creating increased erosion, poor water quality, expanded weed bed growth.
3	High water level
4	Wake boats are ruining birch lakes shoreline. We need a 400' setback on wake/bladder type boats or totally eliminate them.



24. From the list below, please rank your top three concerns regarding Birch Lake, with 1 being your greatest concern.

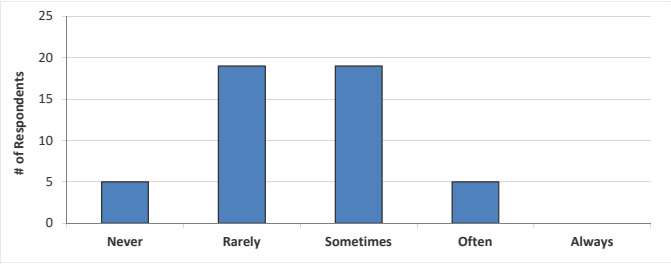
Answer Options	1st	2nd	3rd	Response Count
Water quality degradation	12	5	4	21
Loss of aquatic habitat	3	5	2	10
Shoreline erosion or development	6	10	6	22
Aquatic invasive species introduction	13	11	5	29
Watercraft traffic	4	11	3	18
Excessive fishing pressure	3	1	8	12
Excessive aquatic plant growth	5	4	4	13
Algae blooms	2	2	8	12
Septic system discharge	0	1	6	7
Noise/light pollution	2	0	3	5
Other (please specify)	0	0	1	1
			answered question	**50**
			skipped question	**0**

Number	Other (please specify)
1	High water level
2	General lack of concern for degredation of shoreline & wetlands
3	The shoreline is also being ruined by the high water raising the culvert has caused when West Birch Lake rd was redone.



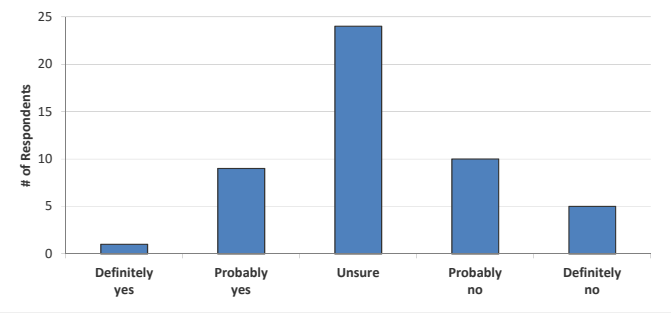
25. During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of Birch Lake?

Answer Options	Never	Rarely	Sometimes	Often	Always	Response Count
	5	19	19	5	0	48
				answered question		**48**
				skipped question		**2**



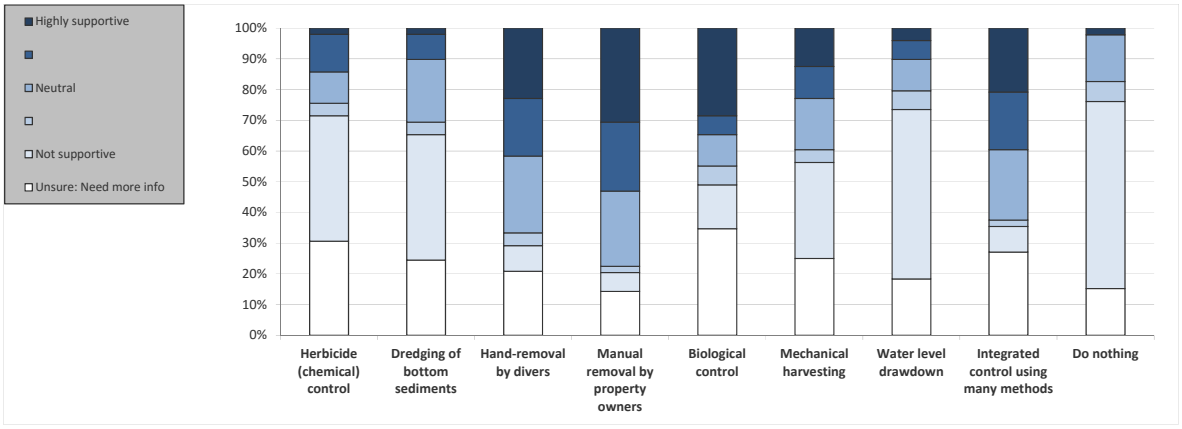
26. Considering your answer to the question above, do you believe aquatic plant control is needed on Birch Lake?

Answer Options	Definitely yes	Probably yes	Unsure	Probably no	Definitely no	Response Count
	1	9	24	10	5	49
				answered question		49
				skipped question		1



27. Aquatic plants can be managed using many techniques. Please tell us if you oppose or support the responsible use of the following techniques on Birch Lake.

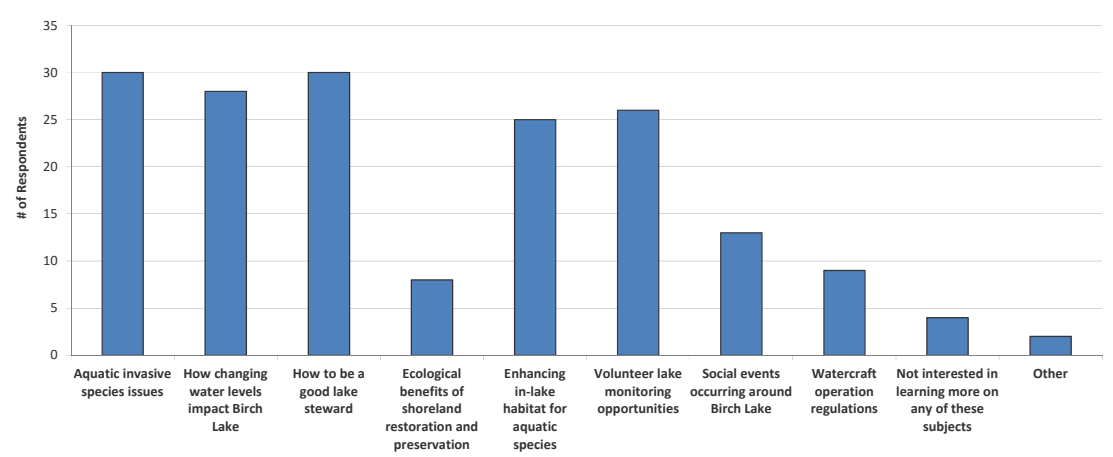
Answer Options	Not supportive		Neutral		Highly supportive	Unsure: Need more info	Rating Average	Response Count
Herbicide (chemical) control	20	2	5	6	1	15	1.39	49
Dredging of bottom sediments	20	2	10	4	1	12	1.53	49
Hand-removal by divers	4	2	12	9	11	10	2.81	48
Manual removal by property owners	3	1	12	11	15	7	3.27	49
Biological control	7	3	5	3	14	17	2.24	49
Mechanical harvesting	15	2	8	5	6	12	1.94	48
Water level drawdown	27	3	5	3	2	9	1.43	49
Integrated control using many methods	4	1	11	9	10	13	2.60	48
Do nothing (do not manage plants)	28	3	7	0	1	7	1.30	46
						answered question		50
						skipped question		0



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

Answer Options	Response Percent	Response Count
Aquatic invasive species issues	61.2%	30
How to be a good lake steward	57.1%	28
How changing water levels impact Birch Lake	61.2%	30
Social events occurring around Birch Lake	16.3%	8
Enhancing in-lake habitat for aquatic species	51.0%	25
Ecological benefits of shoreland restoration and preservation	53.1%	26
Watercraft operation regulations	26.5%	13
Volunteer lake monitoring opportunities	18.4%	9
Not interested in learning more on any of these subjects	8.2%	4
Other (please specify)	4.1%	2
answered question		**49**
skipped question		**1**

Number	Other (please specify)
1	Effective shoreland erosion practices, protection of nature, understanding of the laws regarding distance from shore to be maintained when going full speed.
2	Sheet Ice: pushing of shoreline to create banks, what can be done?



Birch Lake Association (BLA)

29. Before receiving this mailing, had you ever heard of the BLA?

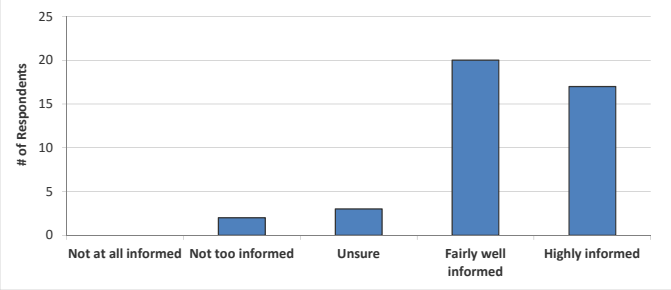
Answer Options	Response Percent	Response Count
Yes	91.8%	45
No	8.2%	4
answered question		**49**
skipped question		**1**

30. What is your membership status with the BLA?

Answer Options	Response Percent	Response Count
Current member	91.1%	41
Former member	2.2%	1
Never been a member	6.7%	3
answered question		**45**
skipped question		**5**

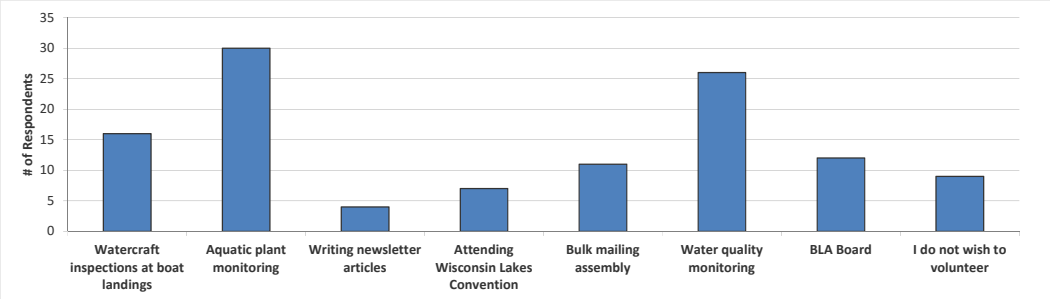
31. How informed has (or had) the BLA kept you regarding issues with Birch Lake and its management?

Answer Options	Not at all informed	Not too informed	Unsure	Fairly well informed	Highly informed	Response Count
	0	2	3	20	17	42
					answered question	**42**
					skipped question	**8**



32. The effective management of your lake will require the cooperative efforts of numerous volunteers. Please circle the activities you would be willing to participate in if the BLA requires additional assistance.

Answer Options	Response Percent	Response Count
Watercraft inspections at boat landings	33.3%	16
Aquatic plant monitoring	62.5%	30
Writing newsletter articles	8.3%	4
Attending Wisconsin Lakes Convention	14.6%	7
Bulk mailing assembly	22.9%	11
Water quality monitoring	54.2%	26
BLA Board	25.0%	12
I do not wish to volunteer	18.8%	9
answered question		**48**
skipped question		**2**



33. Please feel free to provide written comments concerning the Birch Lake, its current and/or historic condition and its management.

Answer Options	Response Count
	15
answered question	**15**
skipped question	**35**

Number	Response Text
1	Birch Lake seems to be holding its own.
2	I feel we do a good job of watching changes in our lake. Glenn Widenberg does a great job keeping us up to date on lake issues. Love the area and lake and will do our part in water condition issues. Support this project very much, took classes and have inspected at boat landing.
3	Birch Lk is a nice body of water Unfortunately fishing pressure increased pwc and power boats/ski boats traffic and noise pollution barking dogs/noisy neighbors (at times) has reduced the desirability of the lake from my perspective I love before school gets out and after Labor Day as noise/lake traffic is greatly reduced Overall the lake has become too busy in my opinion I drive 300 miles one way to get away from noise/fishing pressure /busy lake traffic If I wanted that I would stay in SE Wi and fish pewaukee Lk I know some of that is inevitable but seems to have gotten worse over the years on birch Lk
4	Thank you for putting together this survey and helping property owners keep our lake healthy. I look forward to hearing the results.
5	As stated previous, concerned about water level management on Birch Lake. Past couple of years, in particular this year, the high water level that was maintained significantly contributed to poor water quality- decreased clarity, erosion, explosion of weed growth!
6	Our shoreline (part of a small bay) is negatively impacted by motorized vehicles, especially personal watercraft, who do not remain the required feet out from shore when traveling at high speeds. The large waves damage the shore.
7	We have been on Birch Lake for 20 years. It has an active and enjoyable lake association. The association members have participated in fish cubes, water quality and clarity monitoring, socializing, and educating themselves on maintaining water quality. It is good to have a lake quality basis for future generations.
8	Need better access to Tamarack from Birch Lake
9	Birch is a beautiful lake. We want to keep it that way. We are on the board and steering committee and volunteer at the boat landing & pull weeds.
10	Question #28 asked about how aquatic plants can be managed - don't know enough about the many methods/options listed. All options would need to be explored (i.e. cost, implementation, etc.) if plant management was needed on our lake.
11	The biggest obstacle to preservation of Birch Lake and its habitat is stakeholder apathy. If people don't get involved the Lakes management Plan will not succeed. Amen!!
12	Thanks for all the support understand and protecting our lake!
13	Birch is a fantastic lake, thanks for taking action to keep it that way.
14	Thank you very much for this survey, we will be very interested in reading results and any actions to be taken over time.
15	The West Birch culvert needs to be put back where it was before the road was redone. It is a joke that it is 18" higher than it was before. Now we can't get to a reasonable low level and even canoes can hardly get into Tamarak like we could before.

Rainbow Lake - Anonymous Stakeholder Survey

Surveys Distributed: 33
Surveys Returned: 14
Response Rate: 42%

Rainbow Lake Property

1. Do you rent or own your property on or near Rainbow Lake? Please select one choice.

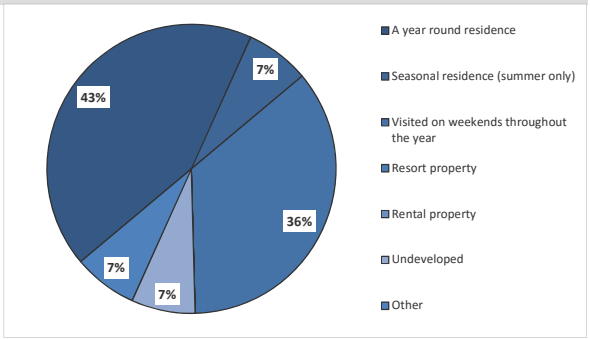
Answer Options	Response Percent	Response Count
Own	100.0%	14
Rent	0.0%	0
answered question		14
skipped question		0

2. Is your property from Question 1 on the lake or off the lake? Please select one choice.

Answer Options	Response Percent	Response Count
On the lake	100.0%	14
Off the lake	0.0%	0
answered question		14
skipped question		0

3. How is your property on or near Rainbow Lake utilized?

Answer Options	Response Percent	Response Count
A year round residence	42.9%	6
Seasonal residence (summer only)	7.1%	1
Visited on weekends throughout the year	35.7%	5
Resort property	0.0%	0
Rental property	0.0%	0
Undeveloped	7.1%	1
Other (please specify)	7.1%	1
answered question		14
skipped question		0

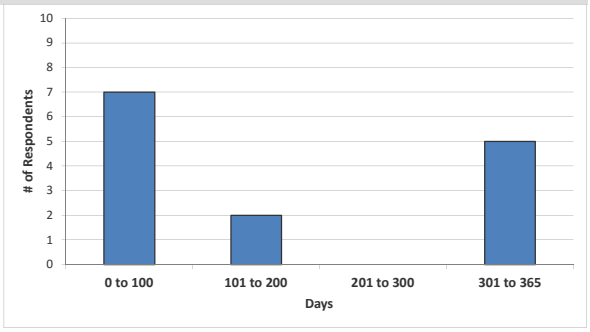


Number	Other (please specify)
1	retirement home we get up there several xs per mon

4. How many days each year is your property used by you or others?

Answer Options	Response Count
	14
answered question	14
skipped question	0

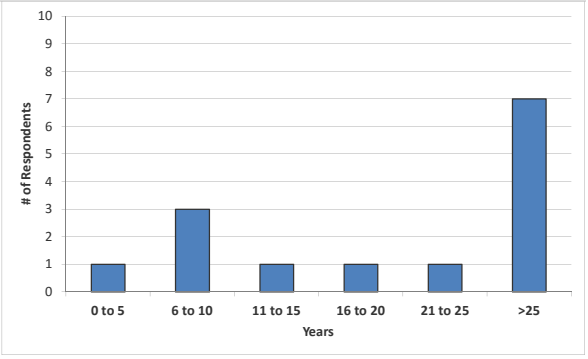
Category (# of days)	Responses	
0 to 100	7	50%
101 to 200	2	14%
201 to 300	0	0%
301 to 365	5	36%



5. How long have you owned or rented your property on or near Rainbow Lake?

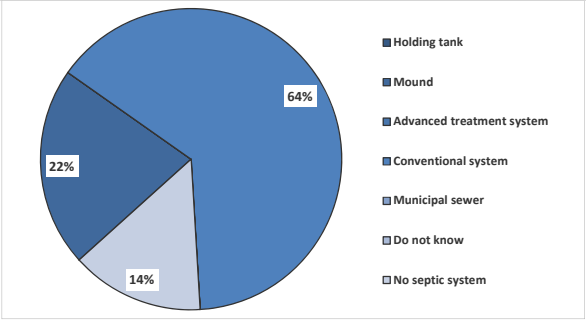
Answer Options	Response Count
	14
answered question	14
skipped question	0

Category (# of years)	Responses	% Response
0 to 5	1	7%
6 to 10	3	21%
11 to 15	1	7%
16 to 20	1	7%
21 to 25	1	7%
>25	7	50%



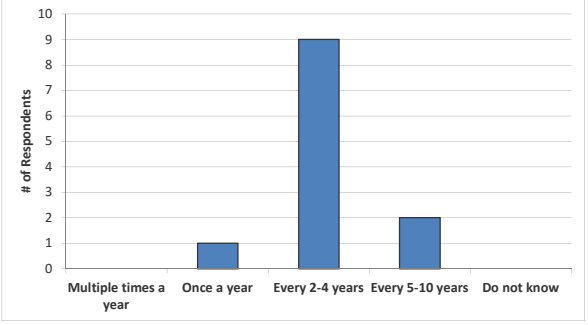
6. What type of septic system does your property utilize?

Answer Options	Response Percent	Response Count
Holding tank	0.0%	0
Mound	21.4%	3
Advanced treatment system	0.0%	0
Conventional system	64.3%	9
Municipal sewer	0.0%	0
Do not know	0.0%	0
No septic system	14.3%	2
answered question		14
skipped question		0



7. How often is the septic system on your property pumped?

Answer Options	Response Percent	Response Count
Multiple times a year	0.0%	0
Once a year	8.3%	1
Every 2-4 years	75.0%	9
Every 5-10 years	16.7%	2
Do not know	0.0%	0
answered question		12
skipped question		2

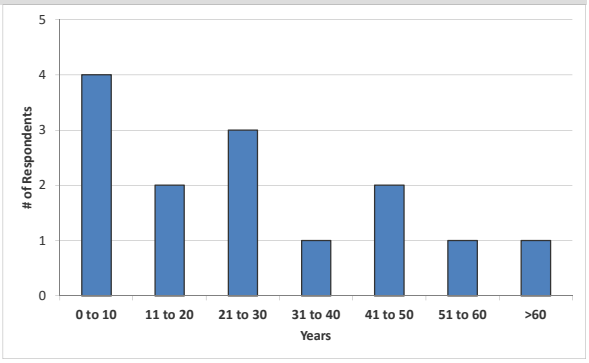


Recreational Activity on Rainbow Lake

8. How many years ago did you first visit Rainbow Lake?

Answer Options	Response Count
	14
answered question	14
skipped question	0

Category (# of days)	Responses	% Response
0 to 10	4	29%
11 to 20	2	14%
21 to 30	3	21%
31 to 40	1	7%
41 to 50	2	14%
51 to 60	1	7%
>60	1	7%



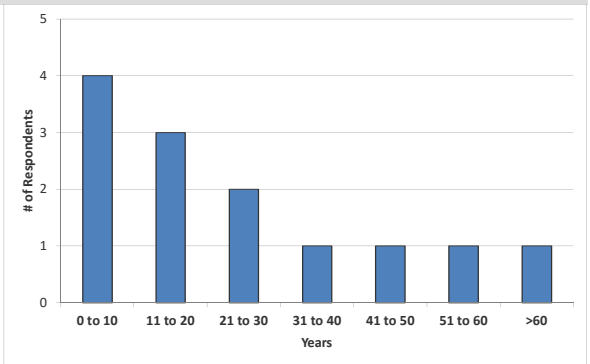
9. Have you personally fished on Rainbow Lake in the past three years?

Answer Options	Response Percent	Response Count
Yes	92.9%	13
No	7.1%	1
answered question		**14**
skipped question		**0**

10. For how many years have you fished Rainbow Lake?

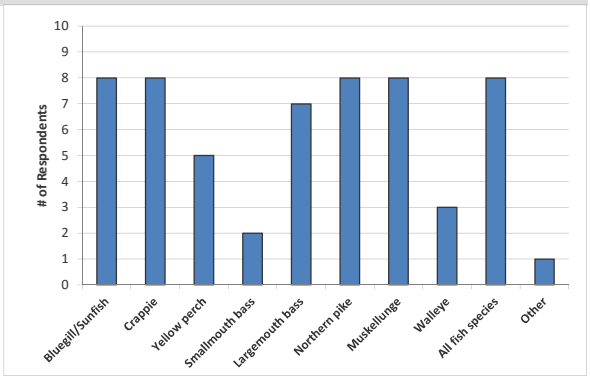
Answer Options	Response Count
	13
answered question	**13**
skipped question	**1**

Category (# of years)	Responses	% Response
0 to 10	**4**	**31%**
11 to 20	**3**	**23%**
21 to 30	**2**	**15%**
31 to 40	**1**	**8%**
41 to 50	**1**	**8%**
51 to 60	**1**	**8%**
>60	**1**	**8%**



11. What species of fish do you like to catch on Rainbow Lake?

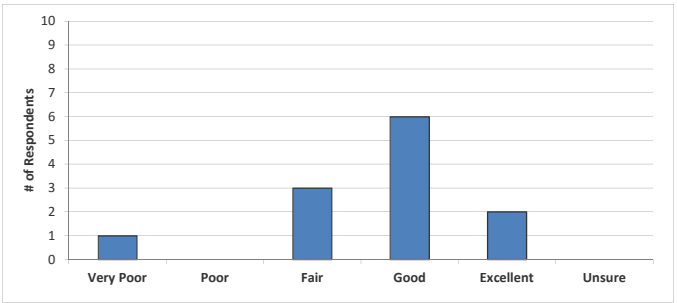
Answer Options	Response Percent	Response Count
Bluegill/Sunfish	66.7%	8
Crappie	66.7%	8
Yellow perch	41.7%	5
Smallmouth bass	16.7%	2
Largemouth bass	58.3%	7
Northern pike	66.7%	8
Muskellunge	66.7%	8
Walleye	25.0%	3
All fish species	66.7%	8
Other (please specify)	8.3%	1
answered question		**12**
skipped question		**2**



Number	Other (please specify)
1	very few walleye

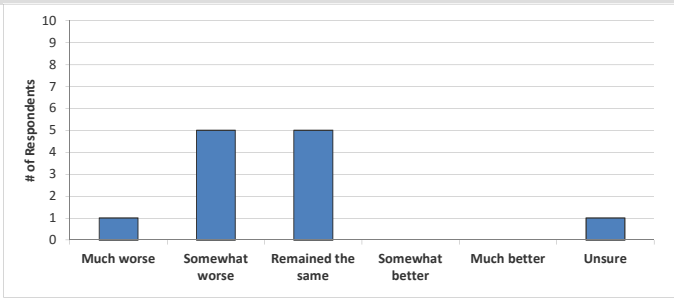
12. How would you describe the current quality of fishing on Rainbow Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Unsure	Response Count
	1	0	3	6	2	0	12
answered question							**12**
skipped question							**2**



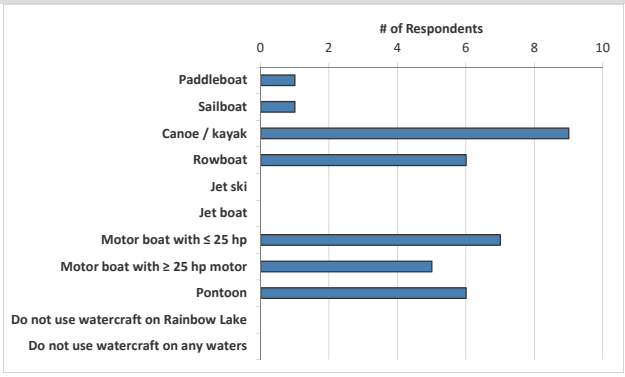
13. How has the quality of fishing changed on Rainbow Lake since you have started fishing the lake?

Answer Options	Much worse	Somewhat worse	Remained the same	Somewhat better	Much better	Unsure	Response Count
	1	5	5	0	0	1	12
						answered question	12
						skipped question	2



14. What types of watercraft do you currently use on Rainbow Lake?

Answer Options	Response Percent	Response Count
Paddleboat	7.7%	1
Sailboat	7.7%	1
Canoe / kayak	69.2%	9
Rowboat	46.2%	6
Jet ski (personal water craft)	0.0%	0
Jet boat	0.0%	0
Motor boat with 25 hp or less motor	53.8%	7
Motor boat with greater than 25 hp motor	38.5%	5
Pontoon	46.2%	6
Do not use watercraft on Rainbow Lake	0.0%	0
Do not use watercraft on any waters	0.0%	0
answered question		13
skipped question		1



15. Do you use your watercraft on waters other than Rainbow Lake?

Answer Options	Response Percent	Response Count
Yes	38.5%	5
No	61.5%	8
answered question		13
skipped question		1

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

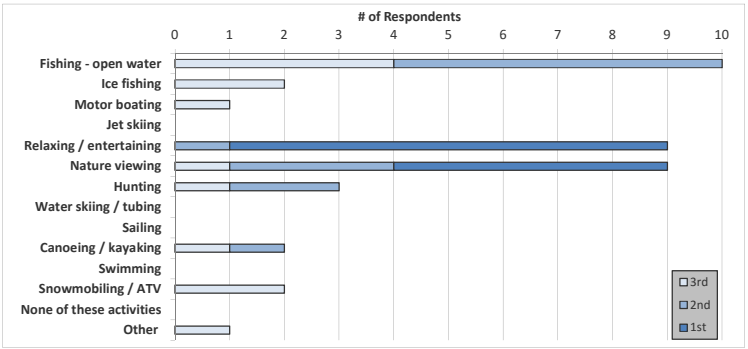
Answer Options	Response Percent	Response Count
Remove aquatic hitch-hikers (ex. - plant material, clams, mussels)	80.0%	4
Drain bilge	80.0%	4
Rinse boat	80.0%	4
Power wash boat	20.0%	1
Apply bleach	20.0%	1
Do not clean boat	20.0%	1
Other (please specify)	20.0%	1
answered question		5
skipped question		9

Number	Other (please specify)
1	I have a separate boat that I use on other lakes

17. For the list below, rank your top three activities that are important reasons for owning or renting your property on or near Rainbow Lake, with 1 being the most important activity.

Answer Options	1st	2nd	3rd	Rating Average	Response Count
Fishing - open water	0	6	4	2.40	10
Ice fishing	0	0	2	3.00	2
Motor boating	0	0	1	0.00	1
Jet skiing	0	0	0	0.00	0
Relaxing / entertaining	8	1	0	1.11	9
Nature viewing	5	3	1	1.63	9
Hunting	0	2	1	2.50	3
Water skiing / tubing	0	0	0	0.00	0
Sailing	0	0	0	0.00	0
Canoeing / kayaking	0	1	1	2.50	2
Swimming	0	0	0	0.00	0
Snowmobiling / ATV	0	0	2	3.00	2
None of these activities are important to me	0	0	0	0.00	0
Other (please specify below)	0	0	1	3.00	1
				answered question	**13**
				skipped question	**1**

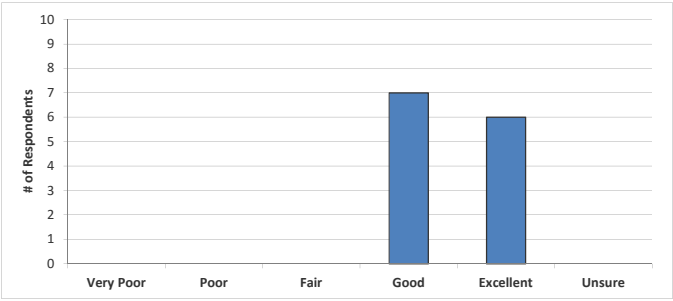
Number	"Other" responses
1	Just where we live



Rainbow Lake Current and Historic Condition, Health and Management

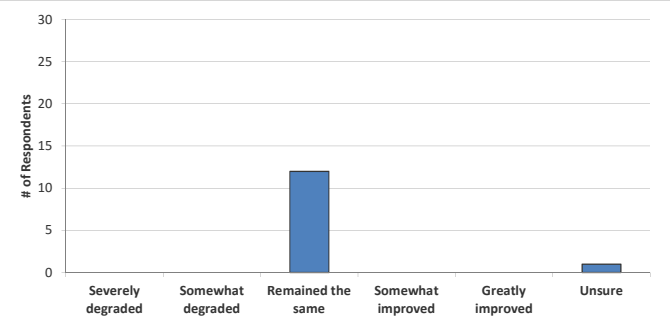
18. How would you describe the current water quality of Rainbow Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Unsure	Response Count
	0	0	0	7	6	0	13
						answered question	**13**
						skipped question	**1**



19. How has the water quality changed in Rainbow Lake since you first visited the lake?

Answer Options	Severely degraded	Somewhat degraded	Remained the same	Somewhat improved	Greatly improved	Unsure	Response Count
	0	0	12	0	0	1	13
						answered question	13
						skipped question	1



20. Before reading the statement above, had you ever heard of aquatic invasive species?

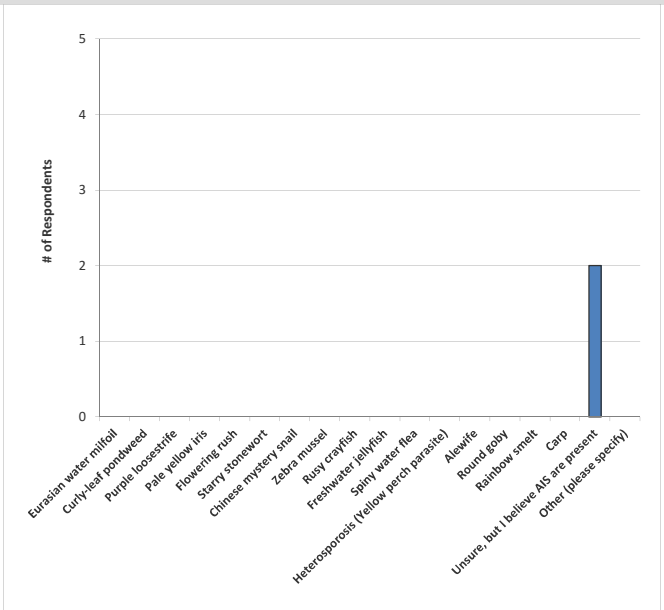
Answer Options	Response Percent	Response Count
Yes	100.0%	13
I think so but am not certain	0.0%	0
No	0.0%	0
answered question		13
skipped question		1

21. Do you believe aquatic invasive species are present within Rainbow Lake?

Answer Options	Response Percent	Response Count
Yes	7.7%	1
I think so but am not certain	7.7%	1
No	84.6%	11
answered question		13
skipped question		1

22. Which aquatic invasive species do you believe are in Rainbow Lake?

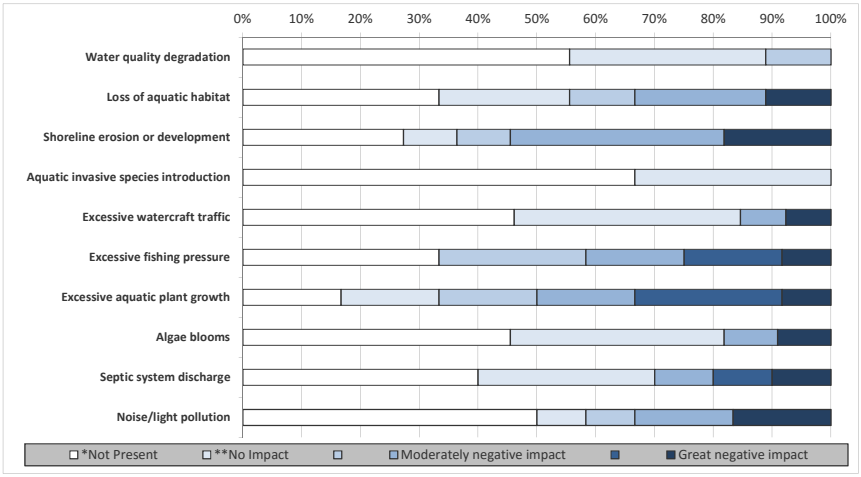
Answer Options	Response Percent	Response Count
Eurasian water milfoil	0.0%	0
Curly-leaf pondweed	0.0%	0
Purple loosestrife	0.0%	0
Pale yellow iris	0.0%	0
Flowering rush	0.0%	0
Starry stonewort	0.0%	0
Chinese mystery snail	0.0%	0
Zebra mussel	0.0%	0
Rusy crayfish	0.0%	0
Freshwater jellyfish	0.0%	0
Spiny water flea	0.0%	0
Heterosporosis (Yellow perch parasite)	0.0%	0
Alewife	0.0%	0
Round goby	0.0%	0
Rainbow smelt	0.0%	0
Carp	0.0%	0
Unsure, but I believe AIS are present	100.0%	2
Other (please specify)	0.0%	0
answered question		2
skipped question		12



23. To what level do you believe each of the following factors may currently be negatively impacting Rainbow Lake?
*** Not present means that you believe the issue does not exist on Rainbow Lake.**
**** No impact means that the issue may exist on Rainbow Lake but it is not negatively impacting the lake.**

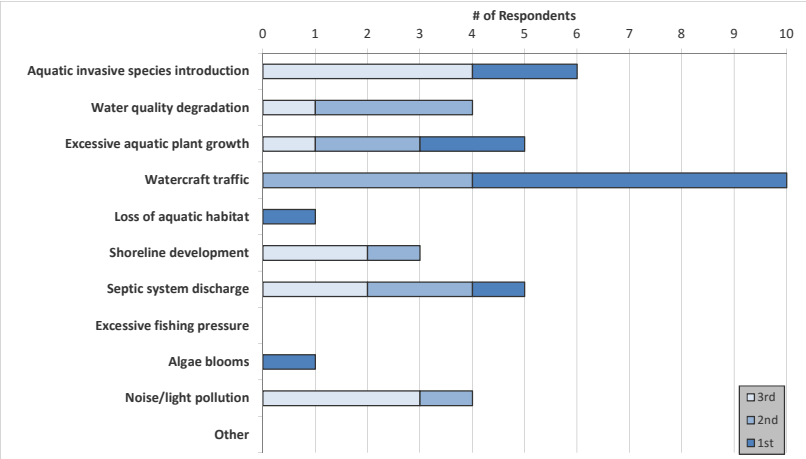
Answer Options	*Not Present	**No Impact		Moderately negative impact		Great negative impact	Unsure: Need more information	Rating Average	Response Count
Water quality degradation	5	3	1	0	0	0	3	0.42	12
Loss of aquatic habitat	3	2	1	2	0	1	3	1.25	12
Shoreline erosion or development	3	1	1	4	0	2	2	1.67	13
Aquatic invasive species introduction	6	3	0	0	0	0	3	0.25	12
Excessive watercraft traffic or unsafe watercra	6	5	0	1	0	1	0	0.67	13
Excessive fishing pressure	4	0	3	2	2	1	1	1.67	13
Excessive aquatic plant growth (excluding alga	2	2	2	2	3	1	0	2.42	12
Algae blooms	5	4	0	1	0	1	1	1.00	12
Septic system discharge	4	3	0	1	1	1	3	0.83	13
Noise/light pollution	6	1	1	2	0	2	0	1.27	12
Other (please specify)									1
								answered question	**13**
								skipped question	**1**

Number	Other (please specify)
1	Over the past 50+ years the quality of fishing has decreased and the vegatation has increased



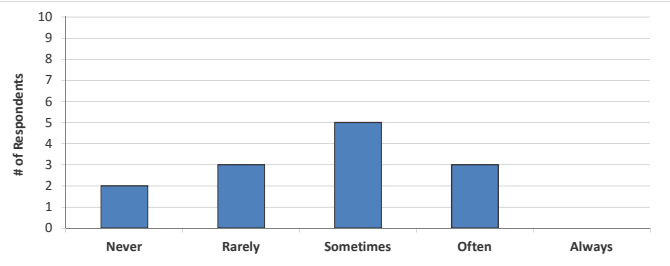
24. From the list below, please rank your top three concerns regarding Rainbow Lake, with 1 being your greatest concern.

Answer Options	1st	2nd	3rd	Response Count
Water quality degradation	2	0	4	6
Loss of aquatic habitat	0	3	1	4
Shoreline erosion or development	2	2	1	5
Aquatic invasive species introduction	6	4	0	10
Watercraft traffic	1	0	0	1
Excessive fishing pressure	0	1	2	3
Excessive aquatic plant growth	1	2	2	5
Algae blooms	0	0	0	0
Septic system discharge	1	0	0	1
Noise/light pollution	0	1	3	4
Other (please specify)	0	0	0	0
			answered question	13
			skipped question	1



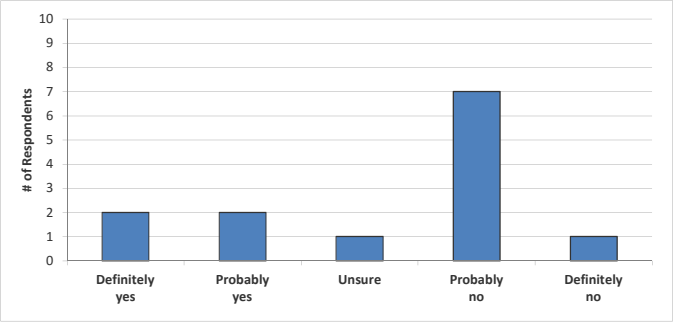
25. During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of Rainbow Lake?

Answer Options	Never	Rarely	Sometimes	Often	Always	Response Count
	2	3	5	3	0	13
				answered question		13
				skipped question		1



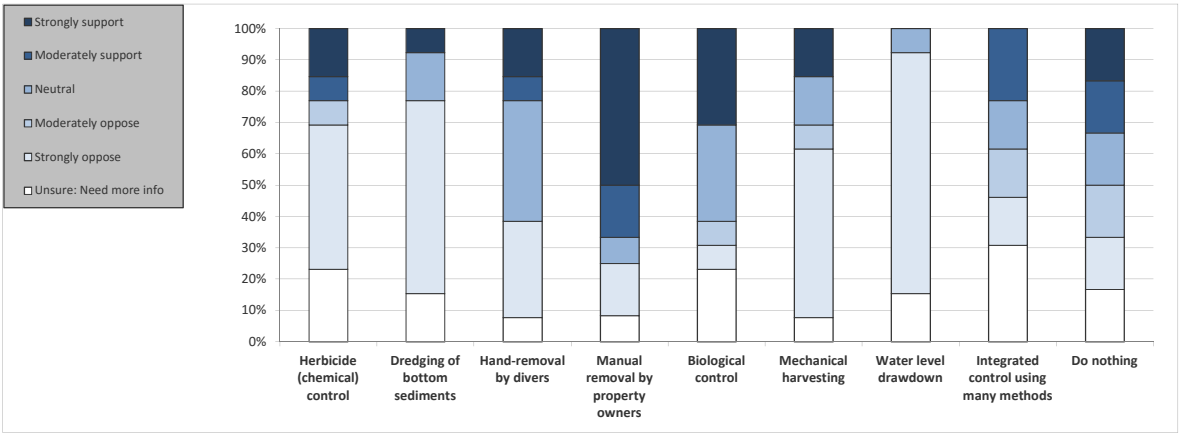
26. Considering your answer to the question above, do you believe aquatic plant control is needed on Rainbow Lake?

Answer Options	Definitely yes	Probably yes	Unsure	Probably no	Definitely no	Response Count
	2	2	1	7	1	13
					answered question	13
					skipped question	1



27. Aquatic plants can be managed using many techniques. Please tell us if you oppose or support the responsible use of the following techniques on Rainbow Lake.

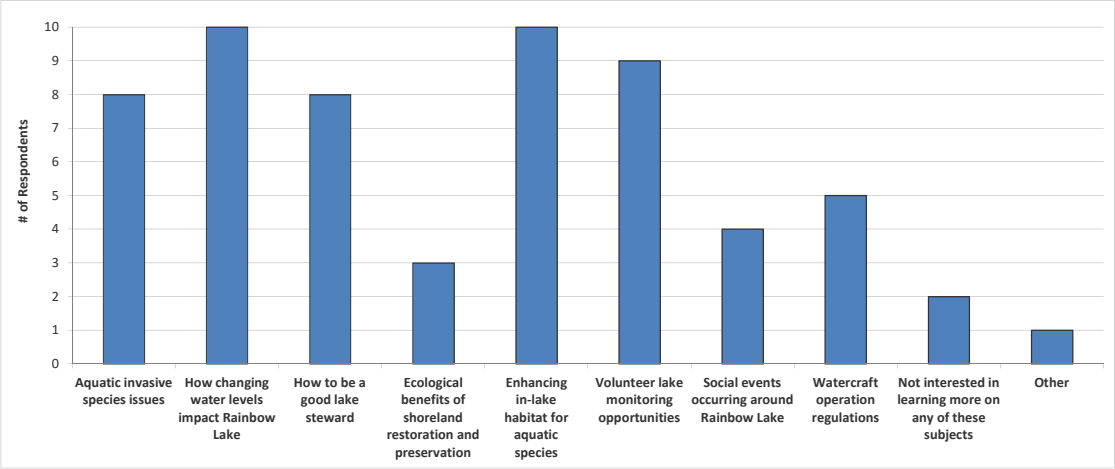
Answer Options	Strongly oppose	Moderately oppose	Neutral	Moderately support	Strongly support	Unsure: Need more info	Rating Average	Response Count
Herbicide (chemical) control	6	1	0	1	2	3	1.83	13
Dredging of bottom sediments	8	0	2	0	1	2	1.58	13
Hand-removal by divers	4	0	5	1	2	1	2.75	13
Manual removal by property owners	2	0	1	2	6	1	3.91	12
Biological control	1	1	4	0	4	3	2.92	13
Mechanical harvesting	7	1	2	0	2	1	2.08	13
Water level drawdown	10	0	1	0	0	2	1.08	13
Integrated control using many methods	2	2	2	3	0	4	2.00	13
Do nothing (do not manage plants)	2	2	2	2	2	2	2.73	12
						answered question		13
						skipped question		1



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

Answer Options	Response Percent	Response Count
Aquatic invasive species issues	61.5%	8
How to be a good lake steward	76.9%	10
How changing water levels impact Rainbow Lake	61.5%	8
Social events occurring around Rainbow Lake	23.1%	3
Enhancing in-lake habitat for aquatic species	76.9%	10
Ecological benefits of shoreland restoration and preservation	69.2%	9
Watercraft operation regulations	30.8%	4
Volunteer lake monitoring opportunities	38.5%	5
Not interested in learning more on any of these subjects	15.4%	2
Other (please specify)	7.7%	1
answered question		**13**
skipped question		**1**

Number	Other (please specify)
1	stocking walleye



Rainbow Lake Association (RLA)

29. Before receiving this mailing, had you ever heard of the RLA?

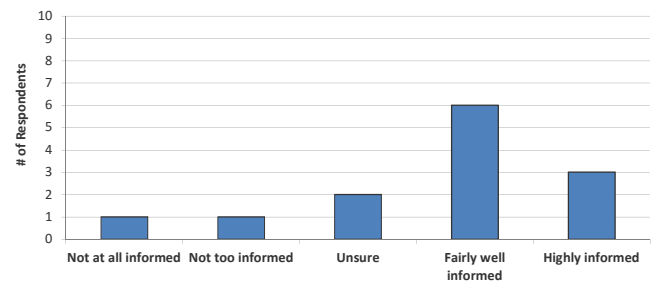
Answer Options	Response Percent	Response Count
Yes	100.0%	13
No	0.0%	0
answered question		**13**
skipped question		**1**

30. What is your membership status with the RLA?

Answer Options	Response Percent	Response Count
Current member	84.6%	11
Former member	15.4%	2
Never been a member	0.0%	0
answered question		**13**
skipped question		**1**

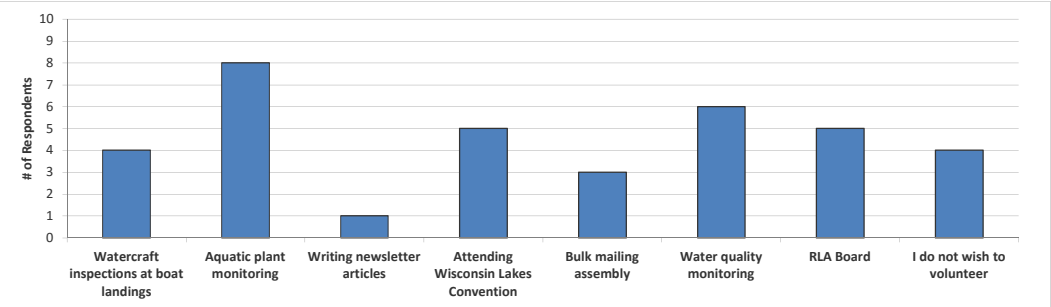
31. How informed has (or had) the RLA kept you regarding issues with Rainbow Lake and its management?

Answer Options	Not at all informed	Not too informed	Unsure	Fairly well informed	Highly informed	Response Count
	1	1	2	6	3	13
					answered question	13
					skipped question	1



32. The effective management of your lake will require the cooperative efforts of numerous volunteers. Please circle the activities you would be willing to participate in if the RLA requires additional assistance.

Answer Options	Response Percent	Response Count
Watercraft inspections at boat landings	30.8%	4
Aquatic plant monitoring	61.5%	8
Writing newsletter articles	7.7%	1
Attending Wisconsin Lakes Convention	38.5%	5
Bulk mailing assembly	23.1%	3
Water quality monitoring	46.2%	6
RLA Board	38.5%	5
I do not wish to volunteer	30.8%	4
answered question		13
skipped question		1



33. Please feel free to provide written comments concerning the Rainbow Lake, its current and/or historic condition and its management.

Answer Options	Response Count
	4
answered question	4
skipped question	9

Number	Response Text
1	Thanks Ken, Your work is appreciated
2	I would like to keep the lake in good condition without any AIS. I would also like to improve the fishing. I believe we can all enjoy the lake.
3	Like I stated, I'm one of the longest residents of Rainbow Lake, and over the years I"ve experienced more plant growth and less fish being caught. I would like to see some fish stocking program introduced.
4	Rainbow Lake's best feature is its ability to be a sanctuary for wildlife and waterfowl. A large influence is the large tracts of uninhabited and undeveloped shoreline and the relatively light motor boat traffic. I hope these characteristics can be preserved. I believe the aquatic weed environment is not a pressing issue and favorably contributes to the high level of wildlife, waterfowl & fish populations, as well as, the peaceful enjoyment of nature on the lake
5	DNR needs to be disbanded and reformed. Personnel [unsure] needs to be replaced - No.1 thing DNR personnel worry about is their own personal welfare. How to create [unsure] a problem and pretend to know how to fix the problem the DNR invented - lake problems will never be solved because the DNR would be out of work. State wide 8 hours training before boat/craft could be registered in this state - no exception for out of state water craft. Education before Wisc registration test knowledge before and renewal - every two or three years. The boat owner would be responsible for all violations. Guides in our area and fishing tournaments [unsure] creates problems, current area lake problems: A) uneducated population on water statewide, B) few people maintain whatever septic system they have C) seasonal residents do not care about lake problems, as they move on, D) Current laws, rules & regulation are not enforced in Vilas or Oneida counties. County politics need to change state does not enforce laws we already have. Shake up the whole system within our state. Banish feel good projects - residents know what problems are - Political power needs to again control and enforce in Wisconsin we have had fifty years of erosion of rural problems because of an increase of population, more land and lake development, the dollar controls how policy is developed & controlled, and who will be at best advantage. Follow the $ (money) and the problem will be found. Define the problem. Define the solution. Work the plan of action to solve the problem(s).

Tamarack Lake - Anonymous Stakeholder Survey

Surveys Distributed: 5
Surveys Returned: 4
Response Rate: 80%

Tamarack Lake Property

1. Do you rent or own your property on or near Tamarack Lake? Please select one choice.

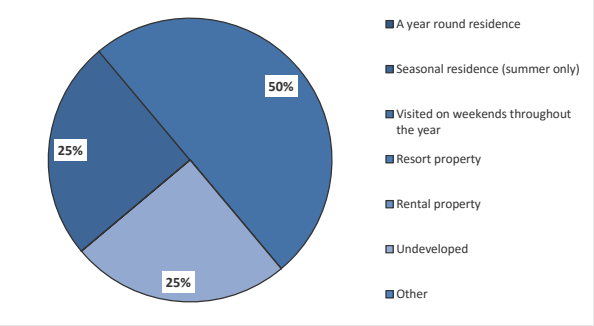
Answer Options	Response Percent	Response Count
Own	100.0%	4
Rent	0.0%	0
answered question		4
skipped question		0

2. Is your property from Question 1 on the lake or off the lake? Please select one choice.

Answer Options	Response Percent	Response Count
On the lake	100.0%	4
Off the lake	0.0%	0
answered question		4
skipped question		0

3. How is your property on or near Tamarack Lake utilized?

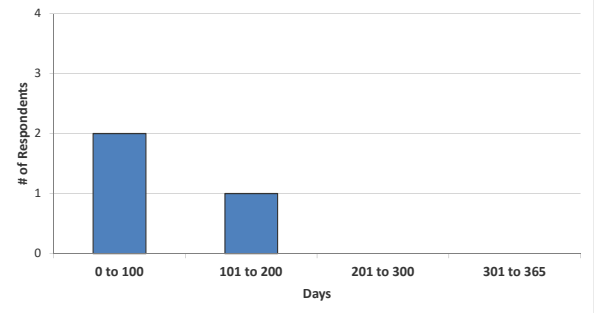
Answer Options	Response Percent	Response Count
A year round residence	0.0%	0
Seasonal residence (summer only)	25.0%	1
Visited on weekends throughout the year	50.0%	2
Resort property	0.0%	0
Rental property	0.0%	0
Undeveloped	25.0%	1
Other (please specify)	0.0%	0
answered question		4
skipped question		0



4. How many days each year is your property used by you or others?

Answer Options	Response Count
	3
answered question	3
skipped question	1

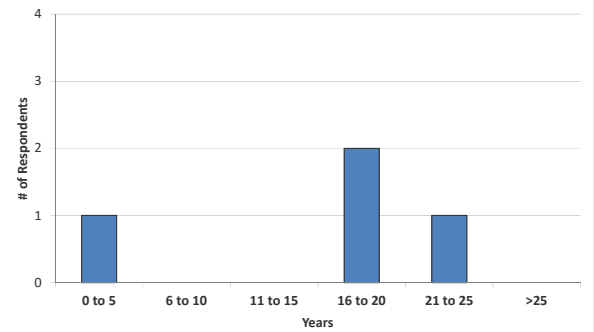
Category (# of days)	Responses	
0 to 100	**2**	**67%**
101 to 200	**1**	**33%**
201 to 300	**0**	**0%**
301 to 365	**0**	**0%**



5. How long have you owned or rented your property on or near Tamarack Lake?

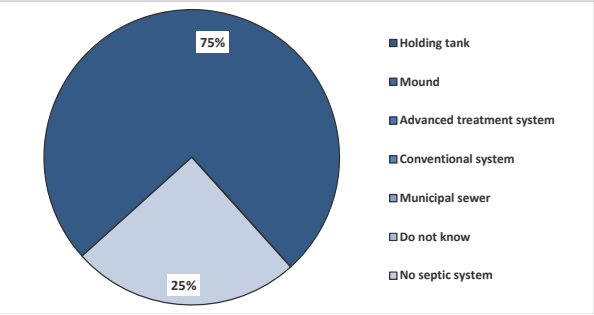
Answer Options	Response Count
	4
answered question	4
skipped question	0

Category (# of years)	Responses	% Response
0 to 5	1	25%
6 to 10	0	0%
11 to 15	0	0%
16 to 20	2	50%
21 to 25	1	25%
>25	0	0%



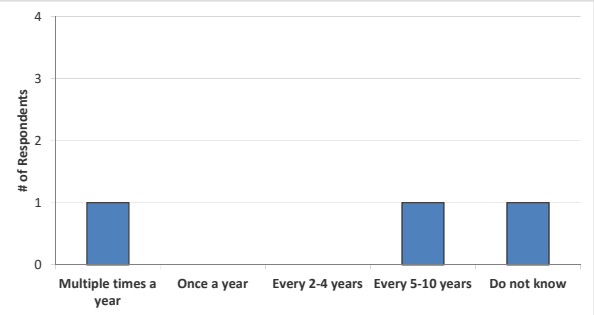
6. What type of septic system does your property utilize?

Answer Options	Response Percent	Response Count
Holding tank	75.0%	3
Mound	0.0%	0
Advanced treatment system	0.0%	0
Conventional system	0.0%	0
Municipal sewer	0.0%	0
Do not know	0.0%	0
No septic system	25.0%	1
answered question		4
skipped question		0



7. How often is the septic system on your property pumped?

Answer Options	Response Percent	Response Count
Multiple times a year	33.3%	1
Once a year	0.0%	0
Every 2-4 years	0.0%	0
Every 5-10 years	33.3%	1
Do not know	33.3%	1
answered question		3
skipped question		1

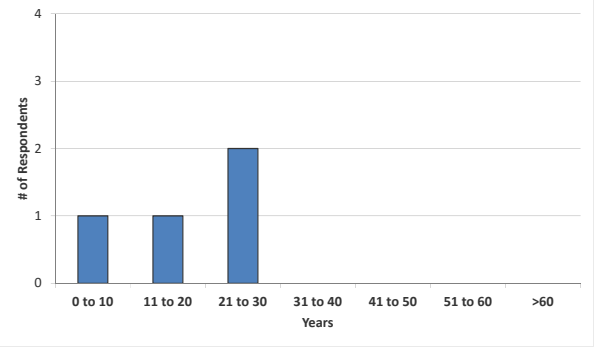


Recreational Activity on Tamarack Lake

8. How many years ago did you first visit Tamarack Lake?

Answer Options	Response Count
	4
answered question	4
skipped question	0

Category (# of days)	Responses	% Response
0 to 10	1	25%
11 to 20	1	25%
21 to 30	2	50%
31 to 40	0	0%
41 to 50	0	0%
51 to 60	0	0%
>60	0	0%



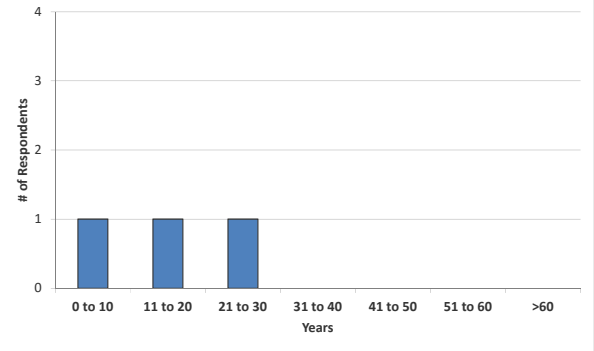
9. Have you personally fished on Tamarack Lake in the past three years?

Answer Options	Response Percent	Response Count
Yes	75.0%	3
No	25.0%	1
answered question		4
skipped question		0

10. For how many years have you fished Tamarack Lake?

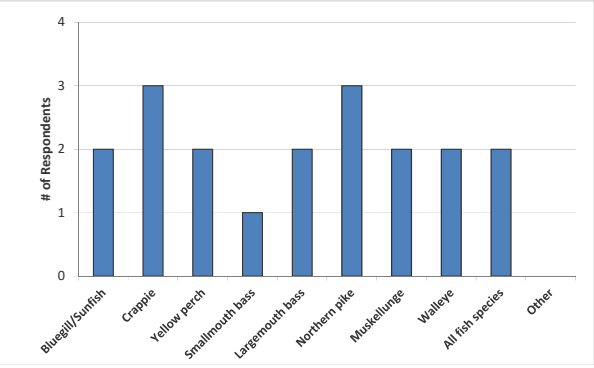
Answer Options	Response Count
	3
answered question	3
skipped question	1

Category (# of years)	Responses	% Response
0 to 10	1	33%
11 to 20	1	33%
21 to 30	1	33%
31 to 40	0	0%
41 to 50	0	0%
51 to 60	0	0%
>60	0	0%



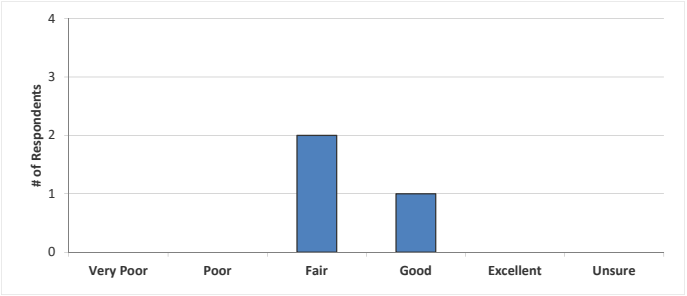
11. What species of fish do you like to catch on Tamarack Lake?

Answer Options	Response Percent	Response Count
Bluegill/Sunfish	66.7%	2
Crappie	100.0%	3
Yellow perch	66.7%	2
Smallmouth bass	33.3%	1
Largemouth bass	66.7%	2
Northern pike	100.0%	3
Muskellunge	66.7%	2
Walleye	66.7%	2
All fish species	66.7%	2
Other (please specify)	0.0%	0
answered question		3
skipped question		1



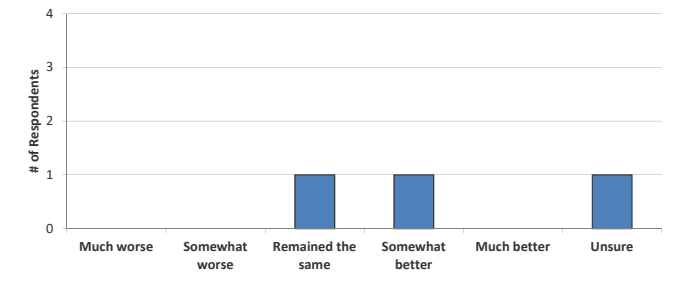
12. How would you describe the current quality of fishing on Tamarack Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Unsure	Response Count
	0	0	2	1	0	0	3
answered question							3
skipped question							1



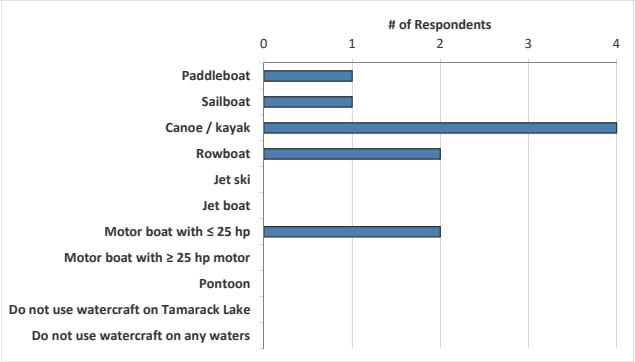
13. How has the quality of fishing changed on Tamarack Lake since you have started fishing the lake?

Answer Options	Much worse	Somewhat worse	Remained the same	Somewhat better	Much better	Unsure	Response Count
	0	0	1	1	0	1	3
						answered question	**3**
						skipped question	**1**



14. What types of watercraft do you currently use on Tamarack Lake?

Answer Options	Response Percent	Response Count
Paddleboat	25.0%	1
Sailboat	25.0%	1
Canoe / kayak	100.0%	4
Rowboat	50.0%	2
Jet ski (personal water craft)	0.0%	0
Jet boat	0.0%	0
Motor boat with 25 hp or less motor	50.0%	2
Motor boat with greater than 25 hp motor	0.0%	0
Pontoon	0.0%	0
Do not use watercraft on Tamarack Lake	0.0%	0
Do not use watercraft on any waters	0.0%	0
answered question		**4**
skipped question		**0**



15. Do you use your watercraft on waters other than Tamarack Lake?

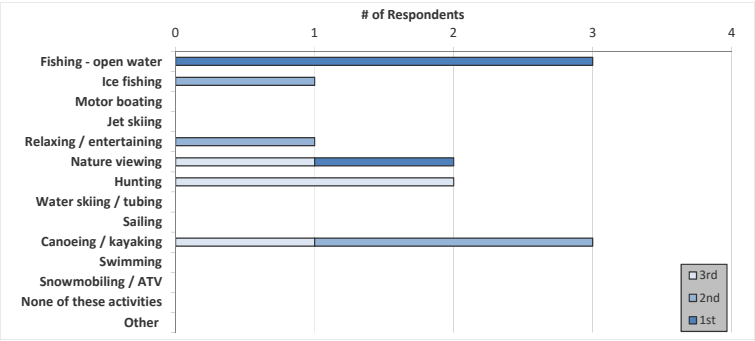
Answer Options	Response Percent	Response Count
Yes	100.0%	4
No	0.0%	0
answered question		**4**
skipped question		**0**

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

Answer Options	Response Percent	Response Count
Remove aquatic hitch-hikers (ex. - plant material, clams, mussels)	75.0%	3
Drain bilge	50.0%	2
Rinse boat	25.0%	1
Power wash boat	0.0%	0
Apply bleach	0.0%	0
Do not clean boat	25.0%	1
Other (please specify)	0.0%	0
answered question		**4**
skipped question		**0**

17. For the list below, rank your top three activities that are important reasons for owning or renting your property on or near Tamarack Lake, with 1 being the most important activity.

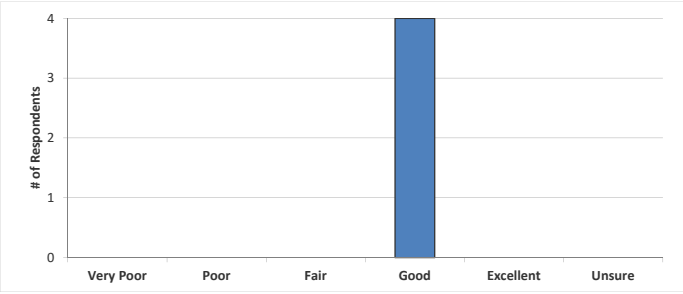
Answer Options	1st	2nd	3rd	Rating Average	Response Count
Fishing - open water	3	0	0	1.00	3
Ice fishing	0	1	0	2.00	1
Motor boating	0	0	0	0.00	0
Jet skiing	0	0	0	0.00	0
Relaxing / entertaining	0	1	0	2.00	1
Nature viewing	1	0	1	2.00	2
Hunting	0	0	2	3.00	2
Water skiing / tubing	0	0	0	0.00	0
Sailing	0	0	0	0.00	0
Canoeing / kayaking	0	2	1	2.33	3
Swimming	0	0	0	0.00	0
Snowmobiling / ATV	0	0	0	0.00	0
None of these activities are important to me	0	0	0	0.00	0
Other (please specify below)	0	0	0	0.00	0
				answered question	**4**
				skipped question	**0**



Tamarack Lake Current and Historic Condition, Health and Management

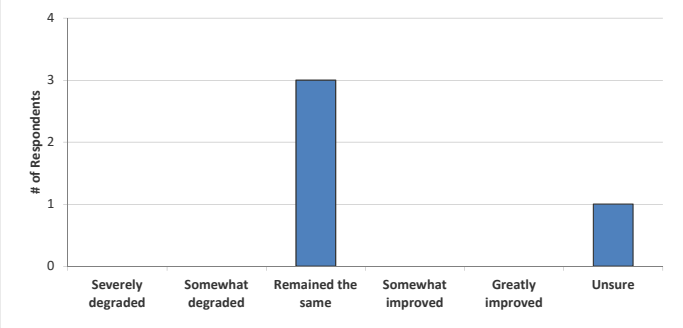
18. How would you describe the current water quality of Tamarack Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Unsure	Response Count
	0	0	0	4	0	0	4
						answered question	**4**
						skipped question	**0**



19. How has the water quality changed in Tamarack Lake since you first visited the lake?

Answer Options	Severely degraded	Somewhat degraded	Remained the same	Somewhat improved	Greatly improved	Unsure	Response Count
	0	0	3	0	0	1	4
						answered question	4
						skipped question	0



20. Before reading the statement above, had you ever heard of aquatic invasive species?

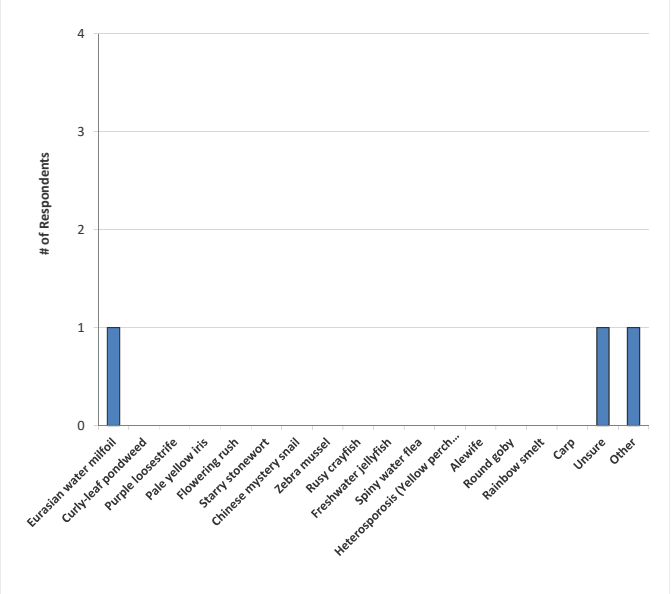
Answer Options	Response Percent	Response Count
Yes	100.0%	4
No	0.0%	0
answered question		4
skipped question		0

21. Do you believe aquatic invasive species are present within Tamarack Lake?

Answer Options	Response Percent	Response Count
Yes	0.0%	0
I think so but am not certain	50.0%	2
No	50.0%	2
answered question		4
skipped question		0

22. Which aquatic invasive species do you believe are in Tamarack Lake?

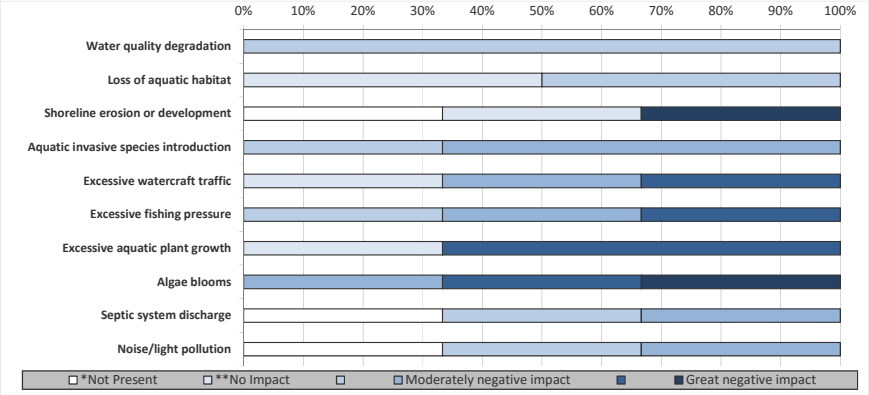
Answer Options	Response Percent	Response Count
Eurasian water milfoil	50.0%	1
Curly-leaf pondweed	0.0%	0
Purple loosestrife	0.0%	0
Pale yellow iris	0.0%	0
Flowering rush	0.0%	0
Starry stonewort	0.0%	0
Chinese mystery snail	0.0%	0
Zebra mussel	0.0%	0
Rusy crayfish	0.0%	0
Freshwater jellyfish	0.0%	0
Spiny water flea	0.0%	0
Heterosporosis (Yellow perch parasite)	0.0%	0
Alewife	0.0%	0
Round goby	0.0%	0
Rainbow smelt	0.0%	0
Carp	0.0%	0
Unsure, but I believe AIS are present	50.0%	1
Other (please specify)	50.0%	1
answered question		2
skipped question		2



Number	"Other" responses
1	Bryozoan showed up in one place last summer on Tamarack Lake

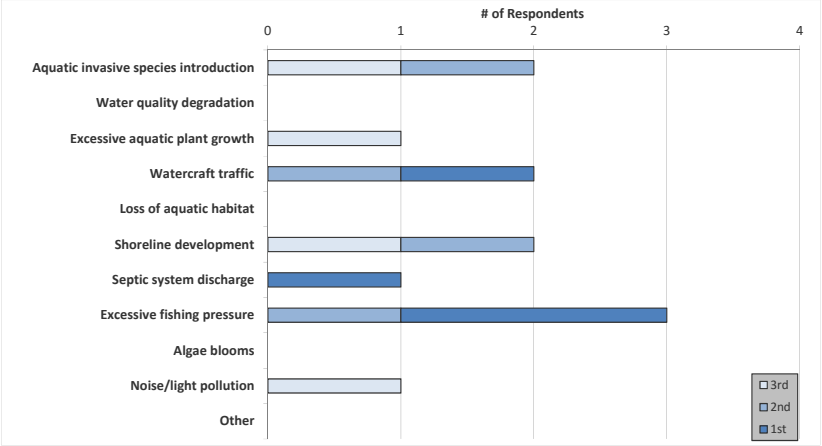
23. To what level do you believe each of the following factors may currently be negatively impacting Tamarack Lake?
*** Not present means that you believe the issue does not exist on Tamarack Lake.**
**** No impact means that the issue may exist on Tamarack Lake but it is not negatively impacting the lake.**

Answer Options	*Not Present	**No Impact		Moderately negative impact		Great negative impact	Unsure: Need more information	Rating Average	Response Count
Water quality degradation	0	0	2	0	0	0	1	1.33	3
Loss of aquatic habitat	0	1	1	0	0	0	1	1.00	3
Shoreline erosion or development	1	1	0	0	0	1	0	2.00	3
Aquatic invasive species introduction	0	0	1	2	0	0	0	2.67	3
Watercraft traffic	0	1	0	1	1	0	0	2.67	3
Excessive fishing pressure	0	0	1	1	1	0	0	3.00	3
Excessive aquatic plant growth	0	1	0	0	2	0	0	3.00	3
Algae blooms	0	0	0	1	1	1	0	4.00	3
Septic system discharge	1	0	1	1	0	0	0	1.67	3
Noise/light pollution	1	0	1	1	0	0	0	1.67	3
Other (please specify)									0
								answered question	**3**
								skipped question	**1**



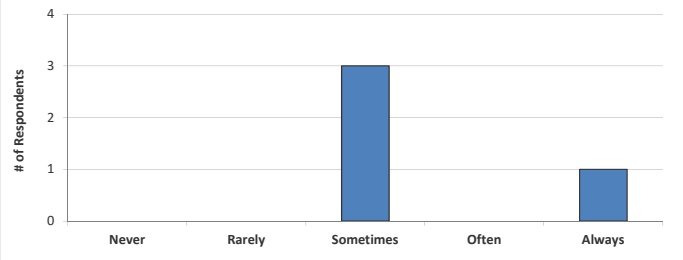
24. From the list below, please rank your top three concerns regarding Tamarack Lake, with 1 being your greatest concern.

Answer Options	1st	2nd	3rd	Response Count
Water quality degradation	0	1	1	2
Loss of aquatic habitat	0	0	0	0
Shoreline erosion or development	0	0	1	1
Aquatic invasive species introduction	1	1	0	2
Watercraft traffic	0	0	0	0
Excessive fishing pressure	0	1	1	2
Excessive aquatic plant growth	1	0	0	1
Algae blooms	2	1	0	3
Septic system discharge	0	0	0	0
Noise/light pollution	0	0	1	1
Other (please specify)	0	0	0	0
			answered question	**4**
			skipped question	**0**



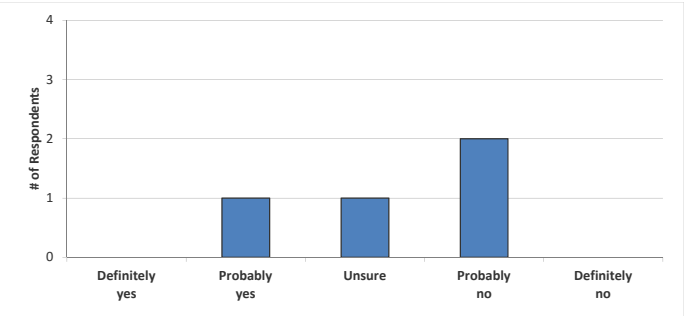
25. During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of Tamarack Lake?

Answer Options	Never	Rarely	Sometimes	Often	Always	Response Count
	0	0	3	0	1	4
					answered question	**4**
					skipped question	**0**



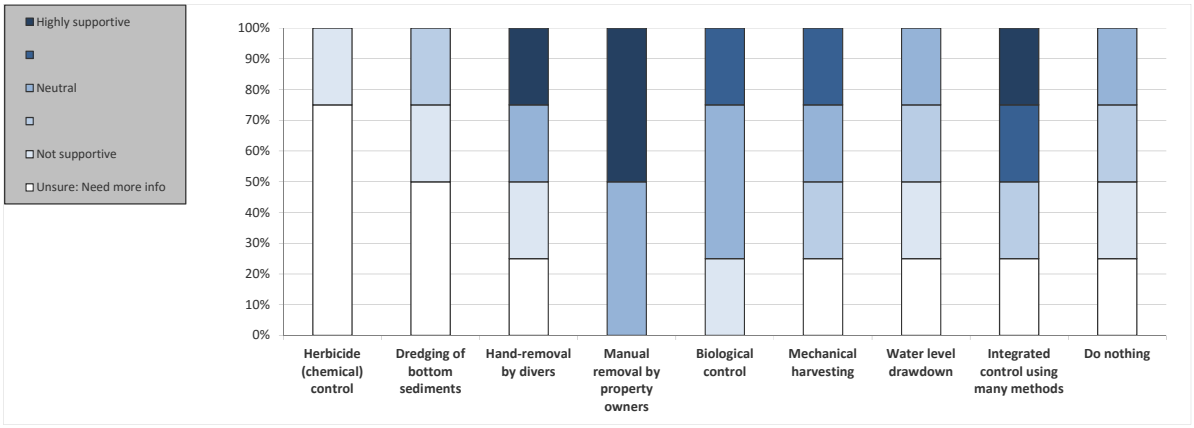
26. Considering your answer to the question above, do you believe aquatic plant control is needed on Tamarack Lake?

Answer Options	Definitely yes	Probably yes	Unsure	Probably no	Definitely no	Response Count
	0	1	1	2	0	4
					answered question	**4**
					skipped question	**0**



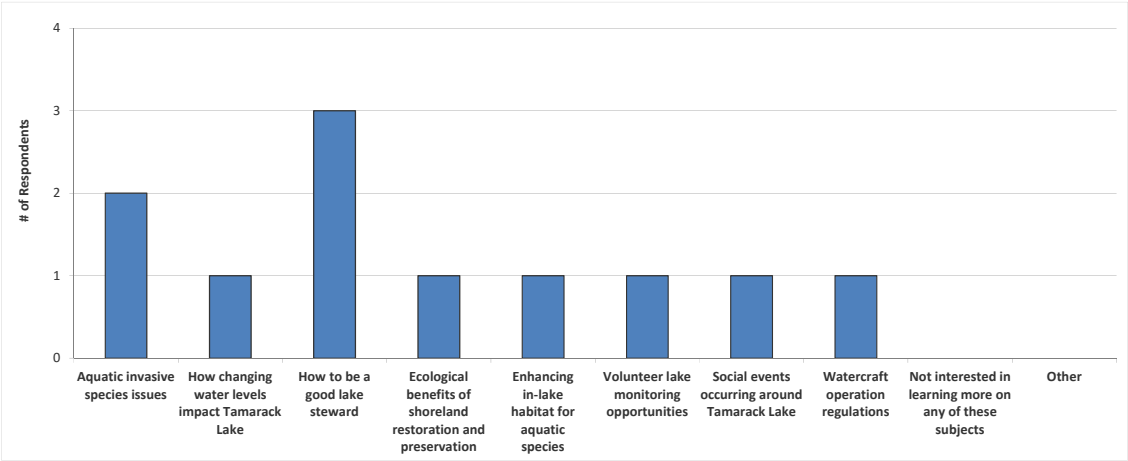
27. Aquatic plants can be managed using many techniques. Please tell us if you oppose or support the responsible use of the following techniques on Tamarack Lake.

Answer Options	Not supportive		Neutral		Highly supportive	Unsure: Need more info	Rating Average	Response Count
Herbicide (chemical) control	1	0	0	0	0	3	0.25	4
Dredging of bottom sediments	1	1	0	0	0	2	0.75	4
Hand-removal by divers	1	0	1	0	1	1	2.25	4
Manual removal by property owners	0	0	2	0	2	0	4.00	4
Biological control	1	0	2	1	0	0	2.75	4
Mechanical harvesting	0	1	1	1	0	1	2.25	4
Water level drawdown	1	1	1	0	0	1	1.50	4
Integrated control using many methods	0	1	0	1	1	1	2.75	4
Do nothing (do not manage plants)	1	1	1	0	0	1	1.50	4
							answered question	4
							skipped question	0



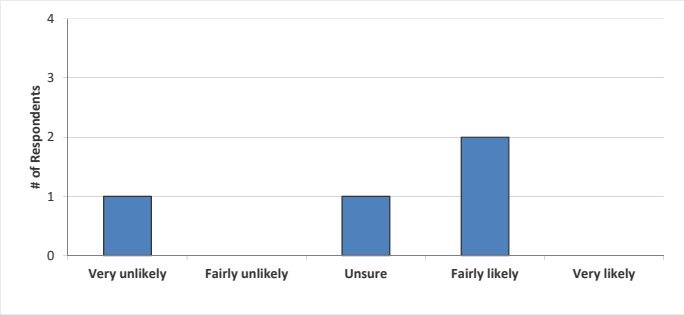
28. Stakeholder education is an important component of every lake management planning effort. Which of these subjects would you like to learn more about?

Answer Options	Response Percent	Response Count
Aquatic invasive species issues	66.7%	2
How to be a good lake steward	33.3%	1
How changing water levels impact Tamarack Lake	100.0%	3
Social events occurring around Tamarack Lake	33.3%	1
Enhancing in-lake habitat for aquatic species	33.3%	1
Ecological benefits of shoreland restoration and preservation	33.3%	1
Watercraft operation regulations	33.3%	1
Volunteer lake monitoring opportunities	33.3%	1
Not interested in learning more on any of these subjects	0.0%	0
Other (please specify)	0.0%	0
	answered question	3
	skipped question	1



34. If Tamarack Lake were to establish a lake association, what would be your interest level injoining the association?

Answer Options	Very unlikely	Fairly unlikely	Unsure	Fairly likely	Very likely	Response Count
	1	0	1	2	0	4
					answered question	**4**
					skipped question	**0**



33. Please feel free to provide written comments concerning the Tamarack Lake, its current and/or historic condition and its management.

Answer Options	Response Count
	2
answered question	**2**
skipped question	**2**

Number	Response Text
1	We did not have any white water lilies when we first moved to our lake. Only had the yellow ones and now the last few years the shore line has way more white lilies comparing to the yellow ones. The white ones look a lot nicer.
2	There are only 5 families on the lake, I suggest still belonging to Birch Lake Association since Tamarack and Birch are connected to each other by a creek. This summer we noticed a massive blob in the creek leading to Rainbow Lake just south of Hwy W. It was inside a patch of lily pads. I believe it's called Bryozoans. It is a jelly like blob. These bryozoans can be attached to the legs of docks. Seen this also in Birch Lake. They are not a water pollution and in fact help filter water. These are called moss animals. Very slim, firm, clear, and gelatinous to the touch. It looks like a colony of animals each with a whorl of swirling tentacles.

C

APPENDIX C

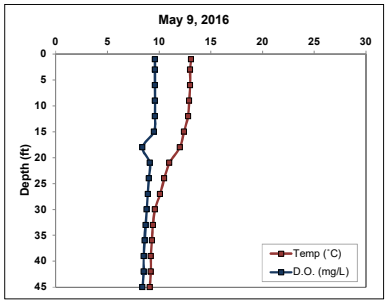
Water Quality Data

Birch Lake

Date: 5/9/2016
Time: 15:00
Weather: 80% sun, 68F, slightly breezy
Entry: EEH

Max Depth: 45.1
LS Depth (ft): 3.0
LB Depth (ft): 42.0
Secchi Depth (ft): 4.6

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	13.1	9.6		
3	13.0	9.6		
6	13.0	9.6		
9	12.9	9.6		
12	12.8	9.6		
15	12.4	9.5		
18	12.0	8.4		
21	11.0	9.1		
24	10.5	9.0		
27	10.1	8.9		
30	9.6	8.8		
33	9.4	8.7		
36	9.3	8.6		
39	9.2	8.5		
42	9.2	8.5		
45	9.1	8.4		



Parameter	BILS	BILB
Total P (µg/L)	24.00	29.50
Dissolved P (µg/L)	2.70	5.70
Chl-a (µg/L)	1.89	NA
TKN (µg/L)	478.00	483.00
$NO_3 + NO_2$-N (µg/L)	103.00	112.00
NH_3-N (µg/L)	ND	24.10
Total N (µg/L)	581.00	595.00
Lab Cond. (µS/cm)	86.50	87.30
Lab pH	7.57	7.32
Alkalinity (mg/L $CaCC_3$)	37.30	37.50
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	11.30	NA
Magnesium (mg/L)	3.00	NA
Hardness (mg/L)	40.70	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

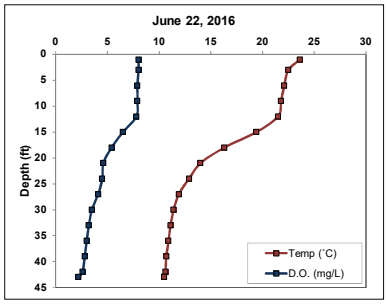
Data collected by TWH and TAH (Onterra)

Birch Lake

Date: 6/22/2016
Time: 12:25
Weather: 25% clouds, calm, 75F
Entry: JLW

Max Depth: 44.0
LS Depth (ft): 3.0
LB Depth (ft): 42.0
Secchi Depth (ft): 5.1

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	23.6	8.0		
3	22.5	8.0		
6	22.1	7.9		
9	21.8	7.9		
12	21.5	7.8		
15	19.4	6.5		
18	16.3	5.4		
21	14.0	4.6		
24	12.9	4.5		
27	11.9	4.1		
30	11.4	3.5		
33	11.1	3.2		
36	10.9	3.0		
39	10.7	2.8		
42	10.6	2.6		
43	10.5	2.2		



Parameter	LS	LB
Total P (µg/L)	18.10	46.90
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	1.12	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCC_3$)	NA	NA
Total Susp. Solids (mg/L	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

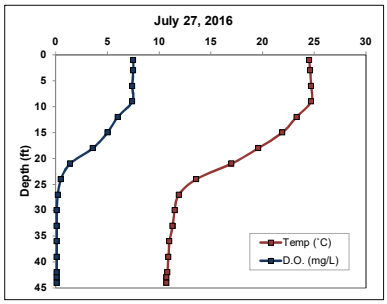
Data collected by TAH (Onterra)

Birch Lake

Date: 7/27/2016
Time: 11:00
Weather: 65F, overcast, no winc
Entry: JMB

Max Depth: 45.4
LS Depth (ft): 3.0
LB Depth (ft): 43.0
Secchi Depth (ft): 5.7

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	24.5	7.5		
3	24.6	7.5		
6	24.7	7.4		
9	24.7	7.4		
12	23.3	6.0		
15	21.9	5.0		
18	19.6	3.6		
21	17.0	1.4		
24	13.6	0.5		
27	11.9	0.2		
30	11.5	0.1		
33	11.3	0.1		
36	11.0	0.1		
39	10.9	0.1		
42	10.8	0.1		
43	10.7	0.1		
44	10.7	0.1		



Parameter	LS	LB
Total P (µg/L)	24.90	22.80
Dissolved P (µg/L)	ND	6.70
Chl-a (µg/L)	3.98	NA
TKN (µg/L)	755.00	499.00
$NO_3 + NO_2$-N (µg/L)	ND	151.00
NH_3-N (µg/L)	ND	54.10
Total N (µg/L)	755.00	650.00
Lab Cond. (µS/cm)	82.50	94.50
Lab pH	7.69	7.30
Alkalinity (mg/L $CaCC_3$)	36.20	42.80
Total Susp. Solids (mg/L)	2.20	ND
Calcium (mg/L)	11.50	NA
Magnesium (mg/L)	3.24	NA
Hardness (mg/L)	42.10	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

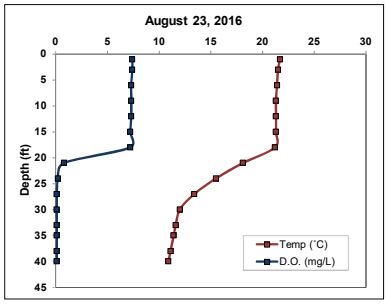
Data collected by TAH (Onterra).

Birch Lake

Date: 8/23/2016
Time:
Weather: Clear, 65F, Breezy
Entry: JMB

Max Depth: 41.2
LS Depth (ft): 3.0
LB Depth (ft): 38.0
Secchi Depth (ft): 5.2

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	21.7	7.4		
3	21.5	7.4		
6	21.4	7.3		
9	21.3	7.3		
12	21.3	7.3		
15	21.3	7.2		
18	21.2	7.2		
21	18.1	0.8		
24	15.5	0.2		
27	13.4	0.1		
30	12.0	0.1		
33	11.6	0.1		
35	11.4	0.1		
38	11.1	0.1		
40	10.9	0.1		



Parameter	LS	LB
Total P (µg/L)	14.20	33.60
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	2.01	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCC_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

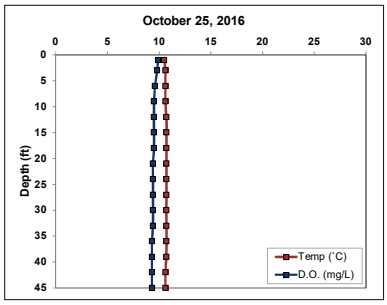
Data collected by TAH (Onterra).

Birch Lake

Date: 10/25/2016
Time: 12:30
Weather: 20% clouds, 7C
Entry: JMB

Max Depth: 45.4
LS Depth (ft): 3.0
LB Depth (ft): 42.0
Secchi Depth (ft): 5.1

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	10.5	9.9		
3	10.6	9.8		
6	10.6	9.6		
9	10.6	9.5		
12	10.7	9.5		
15	10.7	9.5		
18	10.7	9.5		
21	10.7	9.4		
24	10.7	9.4		
27	10.7	9.4		
30	10.7	9.4		
33	10.7	9.4		
36	10.7	9.3		
39	10.7	9.3		
42	10.6	9.3		
45	10.6	9.3		



Parameter	LS	LB
Total P (µg/L)	27.40	25.70
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	7.02	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCC_3$)	NA	NA
Total Susp. Solids (mg/L)	2.40	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

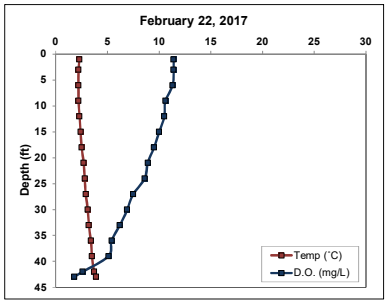
Data collected by TWH & JMB (Onterra).

Birch Lake

Date: 2/22/2017
Time: 9:30
Weather: 100% clouds, 40F, 0mph winc
Entry: JMB

Max Depth: 44.8
LS Depth (ft): 3.0
LB Depth (ft): 42.0
Secchi Depth (ft): 9.1

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	2.3	11.4		
3	2.2	11.4		
6	2.2	11.3		
9	2.2	10.6		
12	2.3	10.5		
15	2.4	10.0		
18	2.5	9.5		
21	2.7	8.9		
24	2.8	8.6		
27	2.9	7.5		
30	3.1	6.9		
33	3.2	6.2		
36	3.4	5.4		
39	3.5	5.1		
42	3.7	2.6		
43	3.9	1.8		



Parameter	LS	LB
Total P (µg/L)	19.80	49.00
Dissolved P (µg/L)	5.00	23.30
Chl-a (µg/L)	NA	NA
TKN (µg/L)	404.00	492.00
$NO_3 + NO_2$-N (µg/L)	77.10	106.00
NH_3-N (µg/L)	16.00	91.70
Total N (µg/L)	481.10	598.00
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCC_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH & JMB (Onterra). Ice depth: 1.3.

Water Quality Data

2016-2017	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	6	5.8	NA	NA
Total P (µg/L)	6	21.4	6	34.6
Dissolved P (µg/L)	3	3.9	3	11.9
Chl a (µg/L)	5	3.2	0	NA
TKN (µg/L	3	545.7	3	491.3
NO_3+NO_2-N (µg/L)	3	90.1	3	123.0
NH_3-N (µg/L)	3	16.0	3	56.6
Total N (µg/L)	3	605.7	3	614.3
Lab Cond. (µS/cm)	2	84.5	2	90.9
Alkal (mg/l $CaCO_3$)	2	36.8	2	40.2
Total Susp. Solids (mg/l)	3	2.3	3	ND
Calcium (mg/L)	2	11.4	0	NA
Magnesium (mg/L)	2	3.1	0	NA
Hardness (mg/L)	2	41.4	0	NA
Color (SU)	2	60.0	0	NA
Turbidity (NTU)	0	NA	0	NA

Trophic State Index (TSI

Year	TP	Chl-a	Secchi
1979			44.7
1997			49.2
1998			47.0
1999			45.3
2000	48.1	51.0	50.7
2001	47.7	44.2	46.7
2002	47.3	48.5	
2003	44.7	45.4	45.5
2004	45.4	48.2	44.7
2005	41.5	42.8	43.4
2006	51.3	45.8	
2007	47.3	47.3	45.3
2008	46.1	46.8	46.3
2009	46.6	45.6	42.0
2010	42.5	46.2	45.4
2011	47.5	51.0	53.6
2012	42.2	44.2	
2013	38.1	48.0	48.5
2014	46.1	49.7	50.0
2015	48.0	51.0	48.9
2016	47.9	43.7	52.0
All Years (Weighted)	46.3	47.1	47.5
DLDL Median	49.4	49.7	46.2
NLF Ecoregion Median	48.1	47.5	45.7

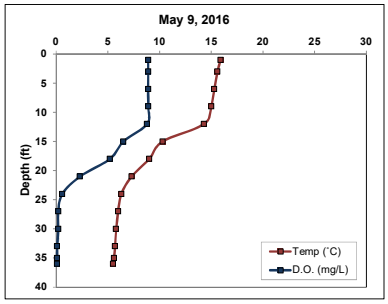
	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1979	1	9.5	1	9.5	1	7.7	1	7.7	1	31.0	1.0	31.0
1997	9	7.0	6	7.0								
1998	7	7.8	5	8.1								
1999	4	8.1	2	9.1								
2000	2	11.8	1	6.3	1	8.0	1	8.0	1	21.0	1.0	21.0
2001	3	8.8	2	8.3	2	4.0	2	4.0	3	21.3	2.0	20.5
2002	0		0		2	6.2	2	6.2	2	20.0	2.0	20.0
2003	2	9.5	1	9.0	4	6.4	3	4.5	6	18.3	3.0	16.7
2004	3	9.1	1	9.5	3	6.0	2	6.0	4	18.3	2.0	17.5
2005	4	9.9	3	10.4	4	4.3	3	3.5	4	14.5	3.0	13.3
2006	0		0		3	4.7	3	4.7	4	20.8	3.0	26.3
2007	3	9.1	3	9.1	3	5.5	3	5.5	4	19.3	3.0	20.0
2008	4	8.3	3	8.5	3	5.2	3	5.2	4	18.8	3.0	18.3
2009	4	10.9	3	11.4	3	4.6	3	4.6	4	19.5	3.0	19.0
2010	4	11.2	3	9.1	4	4.0	3	4.9	4	13.8	3.0	14.3
2011	6	5.2	4	5.1	3	8.0	3	8.0	4	20.3	4.0	20.3
2012	0		0		3	4.0	3	4.0	3	14.0	3.0	14.0
2013	4	7.3	4	7.3	3	5.9	3	5.9	3	10.6	3.0	10.6
2014	3	6.6	3	6.6	2	7.0	2	7.0	3	18.3	3.0	18.3
2015	3	7.1	3	7.1	3	8.0	3	8.0	3	20.9	3.0	20.9
2016	8	5.5	6	5.7	7	4.0	5	3.8	7	22.1	5.0	20.7
All Years (Weighted)		8.0		7.8		5.4		5.4		18.6		18.6
DLDL Median				8.5				7.0				23.0
NLF Ecoregion Median				8.9				5.6				21.0

Rainbow Lake

Date: 5/9/2016
Time: 12:45
Weather: 90% sun, light wind
Entry: EEH

Max Depth: 37.2
LS Depth (ft): 3.0
LB Depth (ft): 35.0
Secchi Depth (ft): 5.1

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	15.9	8.9		
3	15.6	8.9		
6	15.3	8.9		
9	15.0	8.9		
12	14.3	8.8		
15	10.3	6.5		
18	9.0	5.2		
21	7.3	2.3		
24	6.3	0.6		
27	6.0	0.2		
30	5.8	0.2		
33	5.7	0.1		
35	5.6	0.1		
36	5.5	0.1		



Parameter	RLS	RLB
Total P (µg/L)	23.40	52.30
Dissolved P (µg/L)	2.80	3.00
Chl-a (µg/L)	5.69	NA
TKN (µg/L)	796.00	772.00
$NO_3 + NO_2$-N (µg/L)	ND	ND
NH_3-N (µg/L)	ND	158.00
Total N (µg/L)	796.00	772.00
Lab Cond. (µS/cm)	68.10	95.90
Lab pH	7.42	6.77
Alkalinity (mg/L $CaCO_3$)	29.20	42.80
Total Susp. Solids (mg/L)	2.20	16.00
Calcium (mg/L)	9.29	NA
Magnesium (mg/L)	2.40	NA
Hardness (mg/L)	33.10	NA
Color (SU)	70.00	NA
Turbidity (NTU)	NA	NA

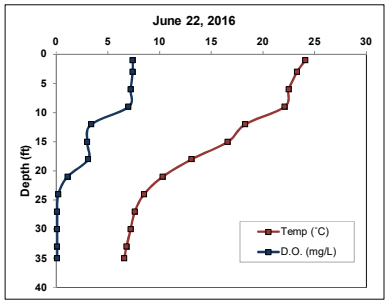
Data collected by TWH and TAH (Onterra)

Rainbow Lake

Date: 6/22/2016
Time: 11:15
Weather: clear, 75F
Entry: JLW

Max Depth: 35.7
LS Depth (ft): 3.0
LB Depth (ft): 33.0
Secchi Depth (ft): 4.4

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	24.1	7.4		
3	23.3	7.4		
6	22.5	7.2		
9	22.1	7.0		
12	18.3	3.4		
15	16.6	3.0		
18	13.1	3.1		
21	10.3	1.1		
24	8.5	0.2		
27	7.6	0.1		
30	7.2	0.1		
33	6.8	0.1		
35	6.6	0.1		



Parameter	RLS	RLB
Total P (µg/L)	29.70	80.70
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	11.70	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

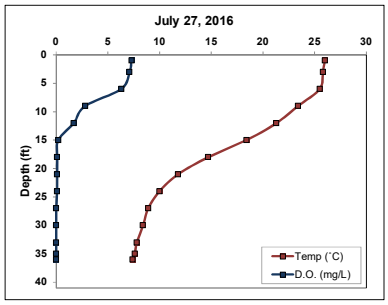
Data collected by TAH (Onterra).

Rainbow Lake

Date: 7/27/2016
Time: 13:00
Weather: 72F, overcast, no wind, light rai
Entry: JMB

Max Depth: 37.0
LS Depth (ft): 3.0
LB Depth (ft): 35.0
Secchi Depth (ft): 3.8

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	26.0	7.3		
3	25.8	7.1		
6	25.5	6.3		
9	23.4	2.8		
12	21.3	1.7		
15	18.4	0.2		
18	14.7	0.1		
21	11.8	0.1		
24	10.0	0.1		
27	8.9	0.0		
30	8.4	0.0		
33	7.8	0.0		
35	7.6	0.0		
36	7.4	0.0		



Parameter	RLS	RLB
Total P (µg/L)	27.50	152.00
Dissolved P (µg/L)	2.40	109.00
Chl-a (µg/L)	19.20	NA
TKN (µg/L)	862.00	1100.00
$NO_3 + NO_2$-N (µg/L)	ND	ND
NH_3-N (µg/L)	16.90	479.00
Total N (µg/L)	862.00	1100.00
Lab Cond. (µS/cm)	68.90	95.50
Lab pH	7.48	6.89
Alkalinity (mg/L $CaCO_3$)	30.90	45.40
Total Susp. Solids (mg/L)	ND	6.50
Calcium (mg/L)	9.89	NA
Magnesium (mg/L)	2.79	NA
Hardness (mg/L)	36.20	NA
Color (SU)	70.00	NA
Turbidity (NTU)	NA	NA

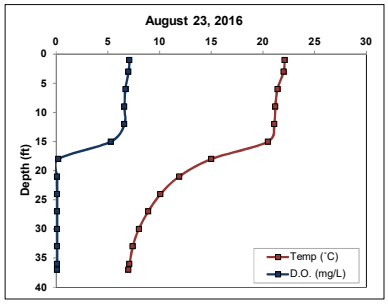
Data collected by TAH (Onterra).

Rainbow Lake

Date: 8/23/2016
Time: 12:15AM
Weather: Clear, 72F, Breezy
Entry: JMB

Max Depth: 37.9
LS Depth (ft): 3.0
LB Depth (ft): 36.0
Secchi Depth (ft): 7.7

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	22.1	7.1		
3	22.0	7.0		
6	21.4	6.7		
9	21.2	6.6		
12	21.1	6.6		
15	20.5	5.3		
18	15.0	0.2		
21	11.9	0.1		
24	10.1	0.1		
27	8.9	0.1		
30	8.0	0.1		
33	7.4	0.1		
36	7.1	0.1		
37	7.0	0.1		



Parameter	RLS	RLB
Total P (µg/L)	15.90	226.00
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	4.43	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

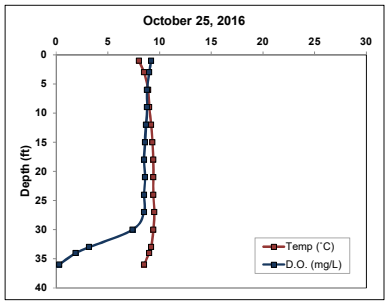
Data collected by TAH (Onterra).

Rainbow Lake

Date: 10/25/2016
Time: 9:40
Weather: 5% clouds, 35F
Entry: JMB

Max Depth: 36.9
LS Depth (ft): 3.0
LB Depth (ft): 34.0
Secchi Depth (ft): 3.5

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	8.0	9.2		
3	8.5	9.0		
6	8.9	8.8		
9	9.0	8.8		
12	9.2	8.7		
15	9.3	8.6		
18	9.4	8.5		
21	9.4	8.6		
24	9.4	8.5		
27	9.5	8.5		
30	9.4	7.4		
33	9.2	3.2		
34	9.0	1.9		
36	8.5	0.3		



Parameter	RLS	RLB
Total P (µg/L)	30.80	64.70
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	0.92	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	ND	4.00
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

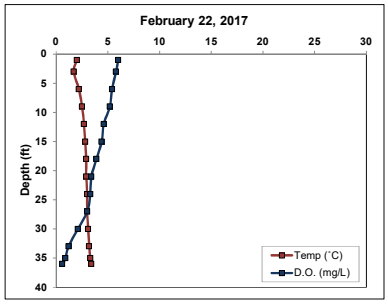
Data collected by JMB (Onterra).

Rainbow Lake

Date: 2/22/2017
Time: 10:45
Weather: 100% clouds, 0mph wind, 45F
Entry: JMB

Max Depth: 37.5
LS Depth (ft): 3.0
LB Depth (ft): 35.0
Secchi Depth (ft): 3.9

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	2.0	6.0		
3	1.7	5.8		
6	2.2	5.4		
9	2.5	5.2		
12	2.7	4.6		
15	2.8	4.4		
18	2.9	3.9		
21	2.9	3.4		
24	3.0	3.3		
27	3.0	3.0		
30	3.1	2.1		
33	3.2	1.2		
35	3.3	0.9		
36	3.4	0.6		



Parameter	RLS	RLB
Total P (µg/L)	19.00	47.00
Dissolved P (µg/L)	4.50	10.50
Chl-a (µg/L)	NA	NA
TKN (µg/L)	505.00	778.00
$NO_3 + NO_2$-N (µg/L)	73.10	83.50
NH_3-N (µg/L)	28.10	207.00
Total N (µg/L)	578.10	861.50
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L)	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH & JMB (Onterra). Ice depth: 1.0ft.

Water Quality Data

2016-2017	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	6	4.7	NA	NA
Total P (µg/L)	6	24.4	6	103.8
Dissolved P (µg/L)	3	3.2	3	40.8
Chl a (µg/L)	5	8.4	0	NA
TKN (µg/L	3	721.0	3	883.3
NO_3+NO_2-N (µg/L)	3	73.1	3	83.5
NH_3-N (µg/L)	3	22.5	3	281.3
Total N (µg/L)	3	745.4	3	911.2
Lab Cond. (µS/cm)	2	68.5	2	95.7
Alkal (mg/l $CaCO_3$)	2	30.1	2	44.1
Total Susp. Solids (mg/l)	3	2.2	3	8.8
Calcium (mg/L)	2	9.6	0	NA
Magnesium (mg/L)	2	2.6	0	NA
Hardness (mg/L)	2	34.7	0	NA
Color (SU)	2	70.0	0	NA
Turbidity (NTU)	0	NA	0	NA

Trophic State Index (TSI)

Year	TP	Chl-a	Secchi
1984		48.2	
2005			50.3
2006			47.2
2007			47.1
2008			
2009			47.2
2010			50.8
2011			50.8
2012			46.7
2013			53.9
2014			52.7
2015			49.4
2016	50.2	54.8	52.6
All Years (Weighted)	50.2	53.5	50.0
DLDL Median	49.4	49.7	46.2
NLF Ecoregion Median	48.1	47.5	45.7

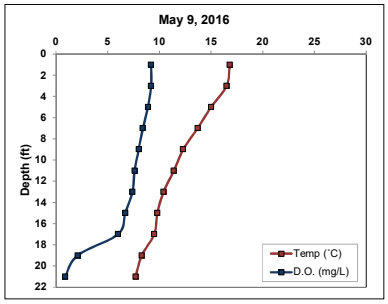
	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1984					1	6.0	1	6.0				
2005	14	6.4	14	6.4								
2006	9	8.0	9	8.0								
2007	6	8.0	6	8.0								
2008	0		0									
2009	9	8.0	9	8.0								
2010	11	6.2	11	6.2								
2011	14	6.3	12	6.2								
2012	14	8.2	12	8.2								
2013	14	5.1	12	5.0								
2014	14	5.5	12	5.5								
2015	16	7.0	13	6.9								
2016	22	5.4	13	5.5	5	8.4	3	11.8	5	25.5	3.0	24.4
All Years (Weighted)		6.5		6.6		8.0		10.3		25.5		24.4
DLDL Median				8.5				7.0				23.0
NLF Ecoregion Median				8.9				5.6				21.0

Tamarack Lake

Date: 5/9/2016
Time: 13:45
Weather: 80% sun
Entry: EEH

Max Depth: 21.9
LS Depth (ft): 3.0
LB Depth (ft): 19.0
Secchi Depth (ft): 4.4

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	16.8	9.2		
3	16.5	9.2		
5	15.0	8.9		
7	13.7	8.4		
9	12.3	8.0		
11	11.4	7.6		
13	10.4	7.4		
15	9.8	6.7		
17	9.5	6.0		
19	8.3	2.1		
21	7.7	0.9		



Parameter	TAMLS	TAMLB
Total P (µg/L)	23.70	31.80
Dissolved P (µg/L)	2.60	3.20
Chl-a (µg/L)	4.85	NA
TKN (µg/L)	805.00	683.00
$NO_3 + NO_2$-N (µg/L)	ND	21.00
NH_3-N (µg/L)	ND	73.30
Total N (µg/L)	805.00	704.00
Lab Cond. (µS/cm)	73.40	79.90
Lab pH	7.58	6.86
Alkalinity (mg/L $CaCO_3$)	31.60	34.70
Total Susp. Solids (mg/L	ND	2.20
Calcium (mg/L)	9.94	NA
Magnesium (mg/L	2.66	NA
Hardness (mg/L)	35.70	NA
Color (SU)	60.00	NA
Turbidity (NTU)	NA	NA

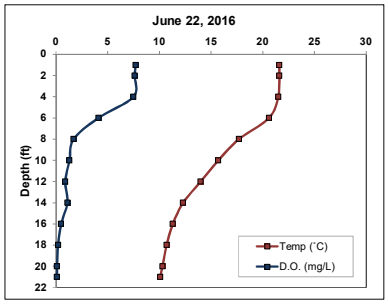
Data collected by TWH and TAH (Onterra)

Tamarack Lake

Date: 6/22/2016
Time: 9:30
Weather: 20% clouds, light breeze, 65f
Entry: JLW

Max Depth: 21.7
LS Depth (ft): 3.0
LB Depth (ft): 19.0
Secchi Depth (ft): 4.7

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	21.6	7.7		
2	21.6	7.6		
4	21.5	7.5		
6	20.6	4.1		
8	17.7	1.7		
10	15.7	1.3		
12	14.0	0.9		
14	12.3	1.1		
16	11.3	0.5		
18	10.7	0.2		
20	10.3	0.1		
21	10.1	0.1		



Parameter	TAMLS	TAMLB
Total P (µg/L)	27.90	29.90
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	11.00	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

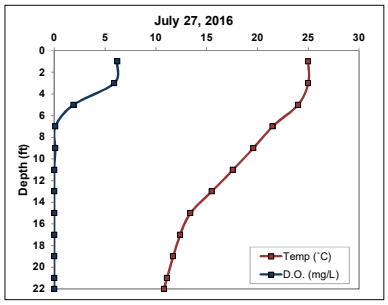
Data collected by TAH (Onterra)

Tamarack Lake

Date: 7/27/2016
Time: 11:50
Weather: 72F, calm
Entry: JMB

Max Depth: 22.7
LS Depth (ft): 3.0
LB Depth (ft): 21.0
Secchi Depth (ft): 5.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	25.0	6.2		
3	25.0	5.9		
5	24.0	1.9		
7	21.5	0.1		
9	19.6	0.1		
11	17.6	0.0		
13	15.5	0.0		
15	13.4	0.0		
17	12.4	0.0		
19	11.7	0.0		
21	11.1	0.0		
22	10.8	0.0		



Parameter	TAMLS	TAMLB
Total P (µg/L)	29.50	53.20
Dissolved P (µg/L)	ND	19.10
Chl-a (µg/L)	4.18	NA
TKN (µg/L)	839.00	856.00
$NO_3 + NO_2$-N (µg/L)	ND	ND
NH_3-N (µg/L)	20.30	189.00
Total N (µg/L)	839.00	856.00
Lab Cond. (µS/cm)	72.40	85.30
Lab pH	7.34	6.86
Alkalinity (mg/L $CaCO_3$)	32.50	39.80
Total Susp. Solids (mg/L	ND	4.29
Calcium (mg/L	10.70	NA
Magnesium (mg/L	3.05	NA
Hardness (mg/L	39.20	NA
Color (SU)	70.00	NA
Turbidity (NTU)	NA	NA

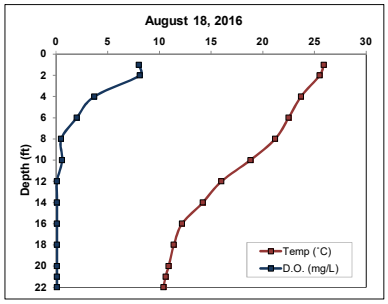
Data collected by TAH (Onterra).

Tamarack Lake

Date: 8/18/2016
Time: 12:25
Weather: 30% clouds, light breeze, 78f
Entry: JMB

Max Depth: 22.8
LS Depth (ft): 2.0
LB Depth (ft): 21.0
Secchi Depth (ft): 5.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	25.9	8.0		
2	25.5	8.1		
4	23.7	3.7		
6	22.5	2.0		
8	21.2	0.5		
10	18.8	0.6		
12	16.0	0.1		
14	14.2	0.1		
16	12.2	0.1		
18	11.4	0.1		
20	10.9	0.1		
21	10.6	0.1		
22	10.4	0.1		



Parameter	TAMLS	TAMLB
Total P (µg/L)	39.20	31.00
Dissolved P (µg/L	NA	NA
Chl-a (µg/L)	1.57	NA
TKN (µg/L)	NA	NA
$NO_3 + NO_2$-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L	NA	NA
Calcium (mg/L	NA	NA
Magnesium (mg/L	NA	NA
Hardness (mg/L	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

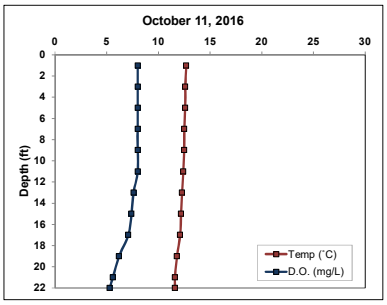
Data collected by TAH and AAH (Onterra).

Tamarack Lake

Date: 10/11/2016
Time: 12:15 PM
Weather: 100% clouds, 57F
Entry: JMB

Max Depth: 24.2
LS Depth (ft): 3.0
LB Depth (ft): 22.0
Secchi Depth (ft): 5.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	12.7	8.0		
3	12.6	8.0		
5	12.6	8.0		
7	12.5	8.0		
9	12.5	8.0		
11	12.4	8.0		
13	12.3	7.6		
15	12.2	7.4		
17	12.1	7.1		
19	11.8	6.2		
21	11.6	5.6		
22	11.6	5.3		
23	11.5	5.1		



Parameter	TAMLS	TAMLB
Total P (µg/L)	23.80	23.30
Dissolved P (µg/L)	5.50	4.90
Chl-a (µg/L)	4.64	NA
TKN (µg/L)	NA	NA
NO_3 + NO_2-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L	ND	ND
Calcium (mg/L)	NA	NA
Magnesium (mg/L	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Data collected by TWH (Onterra).

Tamarack Lake

Date:
Time:
Weather:
Entry:

Max Depth:
LS Depth (ft):
LB Depth (ft):
Secchi Depth (ft):

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)

Parameter	TAMLS	TAMLB
Total P (µg/L)	NA	NA
Dissolved P (µg/L)	NA	NA
Chl-a (µg/L)	NA	NA
TKN (µg/L)	NA	NA
NO_3 + NO_2-N (µg/L)	NA	NA
NH_3-N (µg/L)	NA	NA
Total N (µg/L)	NA	NA
Lab Cond. (µS/cm)	NA	NA
Lab pH	NA	NA
Alkalinity (mg/L $CaCO_3$)	NA	NA
Total Susp. Solids (mg/L	NA	NA
Calcium (mg/L)	NA	NA
Magnesium (mg/L	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

Unable to sample winter water quality due to ice conditions

Water Quality Data

2016-2017	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	5	4.8	NA	NA
Total P (µg/L)	5	28.8	5	33.8
Dissolved P (µg/L)	3	4.1	3	9.1
Chl a (µg/L)	5	5.2	0	NA
TKN (µg/L	2	822.0	2	769.5
NO_3+NO_2-N (µg/L)	2	ND	2	21.0
NH_3-N (µg/L)	2	20.3	2	131.2
Total N (µg/L)	2	822.0	2	780.0
Lab Cond. (µS/cm)	2	72.9	2	82.6
Alkal (mg/l $CaCO_3$)	2	32.1	2	37.3
Total Susp. Solids (mg/l)	3	ND	3	3.2
Calcium (mg/L)	2	10.3	0	NA
Magnesium (mg/L)	2	2.9	0	NA
Hardness (mg/L)	2	37.5	0	NA
Color (SU)	2	65.0	0	NA
Turbidity (NTU)	0	NA	0	NA

Trophic State Index (TSI

Year	TP	Chl-a	Secchi
2016	54.2	47.5	51.5
All Years (Weighted)	54.2	47.5	51.5
DLDL Median	49.4	49.7	46.2
NLF EcoregionMedian	48.1	47.5	45.7

	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
2016	5	5.4	3	5.9	5	5.2	3	5.6	5	28.8	3.0	32.2
All Years (Weighted)		5.4		5.9		5.2		5.6		28.8		32.2
DLDL Median				8.5				7.0				23.0
Median				8.9				5.6				21.0

D

APPENDIX D

Watershed Analysis WiLMS Results

Date: 2/3/2017 Scenario: Birch Lake Watershed Current

Lake Id: Birch Lake
Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 3648.0 acre
Total Unit Runoff: 14 in.
Annual Runoff Volume: 4256.0 acre-ft
Lake Surface Area <As>: 530 acre
Lake Volume <V>: 9786 acre-ft
Lake Mean Depth <z>: 18.5 ft
Precipitation - Evaporation: 5.5 in.
Hydraulic Loading: 4498.9 acre-ft/year
Areal Water Load <qs>: 8.5 ft/year
Lake Flushing Rate <p>: 0.46 1/year
Water Residence Time: 2.18 year
Observed spring overturn total phosphorus (SPO): 16.8 mg/m^3
Observed growing season mean phosphorus (GSM): 18.6 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	0.0	0.50	1.00	3.00	0.0	0	0	0
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	522	0.10	0.30	0.50	25.2	21	63	106
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)	3	0.05	0.10	0.25	0.0	0	0	0
Wetlands	976	0.10	0.10	0.10	15.7	39	39	39
Forest	2147	0.05	0.09	0.18	31.1	43	78	156
Lake Surface	530.0	0.10	0.30	1.00	25.6	21	64	214

POINT SOURCE DATA

Point Sources	Water Load	Low	Most Likely	High	Loading %
	(m^3/year)	(kg/year)	(kg/year)	(kg/year)	

SEPTIC TANK DATA

Description		Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)		0.3	0.5	0.8	
# capita-years	112				
% Phosphorus Retained by Soil		98	90	80	
Septic Tank Loading (kg/year)		0.67	5.60	17.92	2.2

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	278.3	553.7	1177.8	100.0
Total Loading (kg)	126.3	251.1	534.2	100.0
Areal Loading (lb/ac-year)	0.53	1.04	2.22	0.0
Areal Loading (mg/m^2-year)	58.86	117.09	249.08	0.0
Total PS Loading (lb)	0.0	0.0	0.0	0.0
Total PS Loading (kg)	0.0	0.0	0.0	0.0
Total NPS Loading (lb)	229.6	399.5	665.4	97.8
Total NPS Loading (kg)	104.1	181.2	301.8	97.8

Phosphorus Prediction and Uncertainty Analysis Module

Date: 2/3/2017 Scenario: 55
Observed spring overturn total phosphorus (SPO): 16.8 mg/m^3
Observed growing season mean phosphorus (GSM): 18.6 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	10	20	43	1	5
Canfield-Bachmann, 1981 Natural Lake	11	19	32	0	0
Canfield-Bachmann, 1981 Artificial Lake	11	18	29	-1	-5
Rechow, 1979 General	4	8	17	-11	-59
Rechow, 1977 Anoxic	15	30	64	11	59
Rechow, 1977 water load<50m/year	6	13	27	-6	-32
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	21	44	4	24
Vollenweider, 1982 Combined OECD	10	17	31	-1	-6
Dillon-Rigler-Kirchner	6	12	25	-5	-30
Vollenweider, 1982 Shallow Lake/Res.	7	13	26	-5	-28
Larsen-Mercier, 1976	9	18	39	1	6
Nurnberg, 1984 Oxic	6	12	26	-7	-38

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	12	36	Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	6	55	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	6	52	FIT	1	GSM
Rechow, 1979 General	5	14	FIT	0	GSM
Rechow, 1977 Anoxic	18	53	FIT	0	GSM
Rechow, 1977 water load<50m/year	7	23	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	40	FIT	0	SPO
Vollenweider, 1982 Combined OECD	8	31	FIT	0	ANN
Dillon-Rigler-Kirchner	7	21	FIT	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	6	25	FIT	0	ANN
Larsen-Mercier, 1976	11	32	P Pin	0	SPO
Nurnberg, 1984 Oxic	6	23	FIT	0	ANN

Water and Nutrient Outflow Module

Date: 2/3/2017 Scenario: 28
Average Annual Surface Total Phosphorus: 18.6mg/m^3
Annual Discharge: 4.50E+003 AF => 5.55E+006 m^3
Annual Outflow Loading: 217.6 LB => 98.7 kg

Date: 3/13/2017 Scenario: Tamarack Lake Watershed Current

Lake Id: Tamarack_WS_Current

Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 869.0 acre
Total Unit Runoff: 14.00 in.
Annual Runoff Volume: 1013.8 acre-ft
Lake Surface Area <As>: 66.0 acre
Lake Volume <V>: 454.0 acre-ft
Lake Mean Depth <z>: 6.9 ft
Precipitation - Evaporation: 5.5 in.
Hydraulic Loading: 5543.5 acre-ft/year
Areal Water Load <qs>: 84.0 ft/year
Lake Flushing Rate <p>: 12.21 1/year
Water Residence Time: 0.08 year
Observed spring overturn total phosphorus (SPO): 23.7 mg/m^3
Observed growing season mean phosphorus (GSM): 28.8 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	0.0	0.50	1.00	3.00	0.0	0	0	0
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	110.0	0.10	0.30	0.50	8.9	4	13	22
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	344.0	0.10	0.10	0.10	9.3	14	14	14
Forest	415.0	0.05	0.09	0.18	10.1	8	15	30
Lake Surface	66.0	0.10	0.30	1.00	5.4	3	8	27

POINT SOURCE DATA

Point Sources	Water Load (m^3/year)	Low (kg/year)	Most Likely (kg/year)	High (kg/year)	Loading %
Birch Lake Subwatershed	5550000.0	0.0	99.0	0.0	66.3

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)	64.9	329.4	205.3	100.0
Total Loading (kg)	29.4	149.4	93.1	100.0
Areal Loading (lb/ac-year)	0.98	4.99	3.11	
Areal Loading (mg/m^2-year)	110.23	559.38	348.65	
Total PS Loading (lb)	0.0	218.3	0.0	66.3
Total PS Loading (kg)	0.0	99.0	0.0	66.3
Total NPS Loading (lb)	59.0	93.5	146.4	33.7
Total NPS Loading (kg)	26.8	42.4	66.4	33.7

Phosphorus Prediction and Uncertainty Analysis Module

Date: 3/13/2017 Scenario: Tamarack Lake Watershed Current
Observed spring overturn total phosphorus (SPO): 23.7 mg/m^3
Observed growing season mean phosphorus (GSM): 28.8 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	4	19	12	-10	-35
Canfield-Bachmann, 1981 Natural Lake	4	19	12	-10	-35
Canfield-Bachmann, 1981 Artificial Lake	4	17	11	-12	-42
Rechow, 1979 General	3	13	8	-16	-56
Rechow, 1977 Anoxic	4	19	12	-10	-35
Rechow, 1977 water load<50m/year	3	14	9	-15	-52
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	3	17	11	-7	-30
Vollenweider, 1982 Combined OECD	4	16	11	-10	-38
Dillon-Rigler-Kirchner	2	12	7	-12	-51
Vollenweider, 1982 Shallow Lake/Res.	3	12	8	-14	-53
Larsen-Mercier, 1976	3	17	11	-7	-30
Nurnberg, 1984 Oxic	3	14	9	-15	-52

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	8	27	Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	6	55	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	5	49	FIT	1	GSM
Rechow, 1979 General	6	19	FIT	0	GSM
Rechow, 1977 Anoxic	9	27	Pin	0	GSM
Rechow, 1977 water load<50m/year	6	20	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	6	28	FIT	0	SPO
Vollenweider, 1982 Combined OECD	6	27	FIT	0	ANN
Dillon-Rigler-Kirchner	5	17	FIT	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	5	20	FIT	0	ANN
Larsen-Mercier, 1976	8	23	P Pin	0	SPO
Nurnberg, 1984 Oxic	6	22	FIT	0	ANN

Water and Nutrient Outflow Module

Date: 3/13/2017 Scenario: 20
Average Annual Surface Total Phosphorus: 28.8mg/m^3
Annual Discharge: 5.54E+003 AF => 6.84E+006 m^3
Annual Outflow Loading: 415.1 LB => 188.3 kg

Date: 3/13/2017 Scenario: Rainbow Lake Watershed Current

Lake Id: Rainbow_WS_Current

Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 1469.0 acre
Total Unit Runoff: 14.00 in.
Annual Runoff Volume: 1713.8 acre-ft
Lake Surface Area <As>: 154.0 acre
Lake Volume <V>: 1713.8 acre-ft
Lake Mean Depth <z>: 11.1 ft
Precipitation - Evaporation: 5.5 in.
Hydraulic Loading: 7329.7 acre-ft/year
Areal Water Load <qs>: 47.6 ft/year
Lake Flushing Rate <p>: 4.28 1/year
Water Residence Time: 0.23 year
Observed spring overturn total phosphorus (SPO): 23.4 mg/m^3
Observed growing season mean phosphorus (GSM): 25.5 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	0.0	0.50	1.00	3.00	0.0	0	0	0
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	146.0	0.10	0.30	0.50	6.4	6	18	30
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)	4.0	0.05	0.10	0.25	0.1	0	0	0
Wetlands	515.0	0.10	0.10	0.10	7.5	21	21	21
Forest	804.0	0.05	0.09	0.18	10.6	16	29	59
Lake Surface	154.0	0.10	0.30	1.00	6.8	6	19	62

POINT SOURCE DATA

Point Sources	Water Load (m^3/year)	Low (kg/year)	Most Likely (kg/year)	High (kg/year)	Loading %
Tamarack Lake SW	6840000.0	0.0	188.3	0.0	68.1

SEPTIC TANK DATA

Description		Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)		0.30	0.50	0.80	
# capita-years	32.0				
% Phosphorus Retained by Soil		98.0	90.0	80.0	
Septic Tank Loading (kg/year)		0.19	1.60	5.12	0.6

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	109.2	609.8	389.8	100.0
Total Loading (kg)	49.5	276.6	176.8	100.0
Areal Loading (lb/ac-year)	0.71	3.96	2.53	
Areal Loading (mg/m^2-year)	79.47	443.84	283.69	
Total PS Loading (lb)	0.0	415.1	0.0	68.1
Total PS Loading (kg)	0.0	188.3	0.0	68.1
Total NPS Loading (lb)	95.0	149.9	241.1	31.3
Total NPS Loading (kg)	43.1	68.0	109.4	31.3

Phosphorus Prediction and Uncertainty Analysis Module

Date: 3/13/2017 Scenario: Rainbow Lake Watershed Current
Observed spring overturn total phosphorus (SPO): 23.4 mg/m^3
Observed growing season mean phosphorus (GSM): 25.5 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	4	21	14	-5	-20
Canfield-Bachmann, 1981 Natural Lake	5	23	15	-3	-12
Canfield-Bachmann, 1981 Artificial Lake	5	21	14	-5	-20
Rechow, 1979 General	3	15	10	-11	-43
Rechow, 1977 Anoxic	5	26	17	1	4
Rechow, 1977 water load<50m/year	4	20	13	-6	-24
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	4	21	14	-2	-9
Vollenweider, 1982 Combined OECD	5	19	13	-5	-20
Dillon-Rigler-Kirchner	3	15	10	-8	-34
Vollenweider, 1982 Shallow Lake/Res.	3	15	10	-9	-37
Larsen-Mercier, 1976	4	21	13	-2	-9
Nurnberg, 1984 Oxic	3	16	11	-10	-39

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	9	30	FIT	0	GSM
Canfield-Bachmann, 1981 Natural Lake	7	66	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	7	60	FIT	1	GSM
Rechow, 1979 General	6	22	FIT	0	GSM
Rechow, 1977 Anoxic	12	36	FIT	0	GSM
Rechow, 1977 water load<50m/year	9	29	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	8	34	FIT	0	SPO
Vollenweider, 1982 Combined OECD	7	32	FIT	0	ANN
Dillon-Rigler-Kirchner	7	21	FIT	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	5	25	FIT	0	ANN
Larsen-Mercier, 1976	10	29	P Pin	0	SPO
Nurnberg, 1984 Oxic	6	25	FIT	0	ANN

Water and Nutrient Outflow Module

Date: 3/13/2017 Scenario: 21
Average Annual Surface Total Phosphorus: 25.5mg/m^3
Annual Discharge: 7.33E+003 AF => 9.04E+006 m^3
Annual Outflow Loading: 485.9 LB => 220.4 kg

E

APPENDIX E

Aquatic Plant Survey Data

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
1	46.213388	-89.848096	68	Birch Lake	Vilas	7/20/2016	EEH & LJS	1	5	Muck	Pole	SAMPLED			0																					
2	46.212875	-89.848097	67	Birch Lake	Vilas	7/20/2016	EEH & LJS	2	6	Muck	Pole	SAMPLED			0																					
3	46.212362	-89.848098	62	Birch Lake	Vilas	7/20/2016	EEH & LJS	3	8	Muck	Pole	SAMPLED			2																				2		
4	46.211849	-89.848100	61	Birch Lake	Vilas	7/20/2016	EEH & LJS	4	2	Sand	Pole	SAMPLED			1																1				1		
5	46.224673	-89.847325	243	Birch Lake	Vilas	7/20/2016	EEH & LJS	5	0			NONNAVIGABLE (PLANTS)																									
6	46.224160	-89.847327	246	Birch Lake	Vilas	7/20/2016	EEH & LJS	6	0			NONNAVIGABLE (PLANTS)																									
7	46.213387	-89.847357	69	Birch Lake	Vilas	7/20/2016	EEH & LJS	7	7	Muck	Pole	SAMPLED			1																				1		
8	46.212874	-89.847358	66	Birch Lake	Vilas	7/20/2016	EEH & LJS	8	9	Muck	Pole	SAMPLED			0																					
9	46.212361	-89.847359	63	Birch Lake	Vilas	7/20/2016	EEH & LJS	9	10	Sand	Pole	SAMPLED			0																					
10	46.211848	-89.847361	60	Birch Lake	Vilas	7/20/2016	EEH & LJS	10	16			DEEP																									
11	46.211335	-89.847362	57	Birch Lake	Vilas	7/20/2016	EEH & LJS	11	4	Rock	Pole	SAMPLED			1								1									1			1		
12	46.225698	-89.846583	245	Birch Lake	Vilas	7/20/2016	EEH & LJS	12	3	Sand	Pole	SAMPLED			1												1									2
13	46.225185	-89.846585	244	Birch Lake	Vilas	7/20/2016	EEH & LJS	13	8	Muck	Pole	SAMPLED			3		1																	3		
14	46.224672	-89.846586	242	Birch Lake	Vilas	7/20/2016	EEH & LJS	14	7	Muck	Pole	SAMPLED			1																				1		
15	46.224159	-89.846588	241	Birch Lake	Vilas	7/20/2016	EEH & LJS	15	4	Muck	Pole	SAMPLED			2										1	1					1				1		
16	46.215951	-89.846610	82	Birch Lake	Vilas	7/20/2016	EEH & LJS	16	3	Muck	Pole	SAMPLED			1																				1		
17	46.215438	-89.846612	81	Birch Lake	Vilas	7/20/2016	EEH & LJS	17	2	Muck	Pole	SAMPLED			2											2											1
18	46.213386	-89.846618	70	Birch Lake	Vilas	7/20/2016	EEH & LJS	18	15	Muck	Pole	SAMPLED			0																					
19	46.212873	-89.846619	65	Birch Lake	Vilas	7/20/2016	EEH & LJS	19	18			DEEP																									
20	46.212360	-89.846620	64	Birch Lake	Vilas	7/20/2016	EEH & LJS	20	17			DEEP																									
21	46.211847	-89.846622	59	Birch Lake	Vilas	7/20/2016	EEH & LJS	21	18			DEEP																									
22	46.211334	-89.846623	58	Birch Lake	Vilas	7/20/2016	EEH & LJS	22	18			DEEP																									
23	46.210821	-89.846625	55	Birch Lake	Vilas	7/20/2016	EEH & LJS	23	11	Sand	Pole	SAMPLED			0																					
24	46.210308	-89.846626	56	Birch Lake	Vilas	7/20/2016	EEH & LJS	24	0			TERRESTRIAL																									
25	46.228262	-89.845837	216	Birch Lake	Vilas	7/20/2016	EEH & LJS	25	4	Muck	Pole	SAMPLED			3											1					1			1	1		
26	46.227749	-89.845838	217	Birch Lake	Vilas	7/20/2016	EEH & LJS	26	4	Muck	Pole	SAMPLED			2										1						1				2		
27	46.226210	-89.845843	236	Birch Lake	Vilas	7/20/2016	EEH & LJS	27	0			NONNAVIGABLE (PLANTS)																									
28	46.225697	-89.845844	237	Birch Lake	Vilas	7/20/2016	EEH & LJS	28	14	Muck	Pole	SAMPLED			0																					
29	46.225184	-89.845846	238	Birch Lake	Vilas	7/20/2016	EEH & LJS	29	16			DEEP																									
30	46.224671	-89.845847	239	Birch Lake	Vilas	7/20/2016	EEH & LJS	30	10	Muck	Pole	SAMPLED			2																				2		
31	46.224158	-89.845849	240	Birch Lake	Vilas	7/20/2016	EEH & LJS	31	4	Muck	Pole	SAMPLED			1																1						
32	46.215950	-89.845871	83	Birch Lake	Vilas	7/20/2016	EEH & LJS	32	8	Muck	Pole	SAMPLED			2																				2		
33	46.215437	-89.845873	80	Birch Lake	Vilas	7/20/2016	EEH & LJS	33	7	Rock	Pole	SAMPLED			1																				1		
34	46.213898	-89.845877	72	Birch Lake	Vilas	7/20/2016	EEH & LJS	34	6	Muck	Pole	SAMPLED			2																				2		
35	46.213385	-89.845879	71	Birch Lake	Vilas	7/20/2016	EEH & LJS	35	19			DEEP																									
36	46.212872	-89.845880	0	Birch Lake	Vilas	7/20/2016		36	0			DEEP																									
37	46.212359	-89.845882	0	Birch Lake	Vilas	7/20/2016		37	0			DEEP																									
38	46.211846	-89.845883	0	Birch Lake	Vilas	7/20/2016		38	0			DEEP																									
39	46.211333	-89.845884	0	Birch Lake	Vilas	7/20/2016		39	0			DEEP																									
40	46.210820	-89.845886	54	Birch Lake	Vilas	7/20/2016	EEH & LJS	40	16			DEEP																									
41	46.210307	-89.845887	53	Birch Lake	Vilas	7/20/2016	EEH & LJS	41	3	Sand	Pole	SAMPLED			1																				1		
42	46.228261	-89.845098	215	Birch Lake	Vilas	7/20/2016	EEH & LJS	42	6	Muck	Pole	SAMPLED			1																1						
43	46.227748	-89.845099	218	Birch Lake	Vilas	7/20/2016	EEH & LJS	43	7	Muck	Pole	SAMPLED			3																1				3		
44	46.227235	-89.845101	221	Birch Lake	Vilas	7/20/2016	EEH & LJS	44	7	Muck	Pole	SAMPLED			0																					
45	46.226722	-89.845102	222	Birch Lake	Vilas	7/20/2016	EEH & LJS	45	0			NONNAVIGABLE (PLANTS)																									
46	46.226209	-89.845104	235	Birch Lake	Vilas	7/20/2016	EEH & LJS	46	4	Sand	Pole	SAMPLED			1										1							1					
47	46.225696	-89.845105	234	Birch Lake	Vilas	7/20/2016	EEH & LJS	47	16			DEEP																									
48	46.225183	-89.845107	233	Birch Lake	Vilas	7/20/2016	EEH & LJS	48	18			DEEP																									
49	46.224670	-89.845108	232	Birch Lake	Vilas	7/20/2016	EEH & LJS	49	12	Muck	Pole	SAMPLED			0																					
50	46.224157	-89.845109	231	Birch Lake	Vilas	7/20/2016	EEH & LJS	50	7	Sand	Pole	SAMPLED			1																				1		
51	46.223644	-89.845111	230	Birch Lake	Vilas	7/20/2016	EEH & LJS	51	4	Muck	Pole	SAMPLED			2																			2	1		
52	46.215949	-89.845132	84	Birch Lake	Vilas	7/20/2016	EEH & LJS	52	12	Muck	Pole	SAMPLED			0																					
53	46.215436	-89.845134	79	Birch Lake	Vilas	7/20/2016	EEH & LJS	53	12	Muck	Pole	SAMPLED			0																					
54	46.214923	-89.845135	76	Birch Lake	Vilas	7/20/2016	EEH & LJS	54	4	Sand	Pole	SAMPLED			1													1									3
55	46.214410	-89.845137	75	Birch Lake	Vilas	7/20/2016	EEH & LJS	55	7	Rock	Pole	SAMPLED			1																				1		
56	46.213897	-89.845138	73	Birch Lake	Vilas	7/20/2016	EEH & LJS	56	31			DEEP																									
57	46.213384	-89.845140	0	Birch Lake	Vilas	7/20/2016		57	0			DEEP																									
58	46.212871	-89.845141	0	Birch Lake	Vilas	7/20/2016		58	0			DEEP																									
59	46.212358	-89.845143	0	Birch Lake	Vilas	7/20/2016		59	0			DEEP																									

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
60	46.211845	-89.845144	0	Birch Lake	Vilas	7/20/2016		60	0			DEEP																								
61	46.211332	-89.845145	50	Birch Lake	Vilas	7/20/2016	EEH & LJS	61	31			DEEP																								
62	46.210819	-89.845147	51	Birch Lake	Vilas	7/20/2016	EEH & LJS	62	19			DEEP																								
63	46.210306	-89.845148	52	Birch Lake	Vilas	7/20/2016	EEH & LJS	63	12	Muck	Pole	SAMPLED			0																				
64	46.228260	-89.844359	214	Birch Lake	Vilas	7/20/2016	EEH & LJS	64	6	Muck	Pole	SAMPLED			0																				
65	46.227747	-89.844360	219	Birch Lake	Vilas	7/20/2016	EEH & LJS	65	10	Muck	Pole	SAMPLED			0																				
66	46.227234	-89.844362	220	Birch Lake	Vilas	7/20/2016	EEH & LJS	66	12	Muck	Pole	SAMPLED			0																				
67	46.226721	-89.844363	223	Birch Lake	Vilas	7/20/2016	EEH & LJS	67	10	Muck	Pole	SAMPLED			0																				
68	46.226208	-89.844364	224	Birch Lake	Vilas	7/20/2016	EEH & LJS	68	12	Muck	Pole	SAMPLED			0																				
69	46.225695	-89.844366	225	Birch Lake	Vilas	7/20/2016	EEH & LJS	69	15	Muck	Pole	SAMPLED			0																				
70	46.225182	-89.844367	226	Birch Lake	Vilas	7/20/2016	EEH & LJS	70	13	Muck	Pole	SAMPLED			0																				
71	46.224669	-89.844369	227	Birch Lake	Vilas	7/20/2016	EEH & LJS	71	11	Muck	Pole	SAMPLED			0																				
72	46.224156	-89.844370	228	Birch Lake	Vilas	7/20/2016	EEH & LJS	72	9	Muck	Pole	SAMPLED			1																			1	
73	46.223643	-89.844372	229	Birch Lake	Vilas	7/20/2016	EEH & LJS	73	7	Muck	Pole	SAMPLED			3		1																	3	
74	46.216974	-89.844391	89	Birch Lake	Vilas	7/20/2016	EEH & LJS	74	3	Sand	Pole	SAMPLED			2													2			1				1	
75	46.216461	-89.844392	88	Birch Lake	Vilas	7/20/2016	EEH & LJS	75	0			NONNAVIGABLE (PLANTS)																								
76	46.215948	-89.844393	85	Birch Lake	Vilas	7/20/2016	EEH & LJS	76	15	Muck	Pole	SAMPLED			0																				
77	46.215435	-89.844395	78	Birch Lake	Vilas	7/20/2016	EEH & LJS	77	20			DEEP																								
78	46.214922	-89.844396	77	Birch Lake	Vilas	7/20/2016	EEH & LJS	78	28			DEEP																								
79	46.214409	-89.844398	74	Birch Lake	Vilas	7/20/2016	EEH & LJS	79	36			DEEP																								
80	46.213896	-89.844399	0	Birch Lake	Vilas	7/20/2016		80	0			DEEP																								
81	46.213383	-89.844401	0	Birch Lake	Vilas	7/20/2016		81	0			DEEP																								
82	46.212870	-89.844402	0	Birch Lake	Vilas	7/20/2016		82	0			DEEP																								
83	46.212357	-89.844404	0	Birch Lake	Vilas	7/20/2016		83	0			DEEP																								
84	46.211844	-89.844405	0	Birch Lake	Vilas	7/20/2016		84	0			DEEP																								
85	46.211331	-89.844407	44	Birch Lake	Vilas	7/20/2016	EEH & LJS	85	21			DEEP																								
86	46.210818	-89.844408	43	Birch Lake	Vilas	7/20/2016	EEH & LJS	86	15			DEEP																								
87	46.210305	-89.844409	42	Birch Lake	Vilas	7/20/2016	EEH & LJS	87	9	Sand	Pole	SAMPLED			1																			1	
88	46.226207	-89.843625	213	Birch Lake	Vilas	7/20/2016	EEH & LJS	88	10	Muck	Pole	SAMPLED			2																			2	
89	46.225694	-89.843627	212	Birch Lake	Vilas	7/20/2016	EEH & LJS	89	15	Muck	Pole	SAMPLED			0																				
90	46.225181	-89.843628	211	Birch Lake	Vilas	7/20/2016	EEH & LJS	90	15	Muck	Pole	SAMPLED			0																				
91	46.224668	-89.843630	210	Birch Lake	Vilas	7/20/2016	EEH & LJS	91	11	Muck	Pole	SAMPLED			0																				
92	46.224155	-89.843631	209	Birch Lake	Vilas	7/20/2016	EEH & LJS	92	11	Muck	Pole	SAMPLED			0																				
93	46.223642	-89.843633	208	Birch Lake	Vilas	7/20/2016	EEH & LJS	93	4	Sand	Pole	SAMPLED			1																		1	1	
94	46.218512	-89.843647	97	Birch Lake	Vilas	7/20/2016	EEH & LJS	94	6	Sand	Pole	SAMPLED			2			1															2	
95	46.217999	-89.843649	94	Birch Lake	Vilas	7/20/2016	EEH & LJS	95	12	Sand	Pole	SAMPLED			0																				
96	46.217486	-89.843650	93	Birch Lake	Vilas	7/20/2016	EEH & LJS	96	14	Muck	Pole	SAMPLED			0																				
97	46.216973	-89.843652	90	Birch Lake	Vilas	7/20/2016	EEH & LJS	97	16	Muck	Pole	SAMPLED			0																				
98	46.216460	-89.843653	87	Birch Lake	Vilas	7/20/2016	EEH & LJS	98	19			DEEP																								
99	46.215947	-89.843654	86	Birch Lake	Vilas	7/20/2016	EEH & LJS	99	20			DEEP																								
100	46.215434	-89.843656	0	Birch Lake	Vilas	7/20/2016		100	0			DEEP																								
101	46.214921	-89.843657	0	Birch Lake	Vilas	7/20/2016		101	0			DEEP																								
102	46.214408	-89.843659	0	Birch Lake	Vilas	7/20/2016		102	0			DEEP																								
103	46.213895	-89.843660	0	Birch Lake	Vilas	7/20/2016		103	0			DEEP																								
104	46.213382	-89.843662	0	Birch Lake	Vilas	7/20/2016		104	0			DEEP																								
105	46.212869	-89.843663	0	Birch Lake	Vilas	7/20/2016		105	0			DEEP																								
106	46.212356	-89.843665	0	Birch Lake	Vilas	7/20/2016		106	0			DEEP																								
107	46.211843	-89.843666	47	Birch Lake	Vilas	7/20/2016	EEH & LJS	107	18			DEEP																								
108	46.211330	-89.843668	45	Birch Lake	Vilas	7/20/2016	EEH & LJS	108	0			NONNAVIGABLE (PLANTS)																								
109	46.210817	-89.843669	41	Birch Lake	Vilas	7/20/2016	EEH & LJS	109	5	Muck	Pole	SAMPLED			3																			3	
110	46.224667	-89.842891	207	Birch Lake	Vilas	7/20/2016	EEH & LJS	110	19			DEEP																								
111	46.224154	-89.842892	206	Birch Lake	Vilas	7/20/2016	EEH & LJS	111	15	Muck	Pole	SAMPLED			0																				
112	46.223641	-89.842894	205	Birch Lake	Vilas	7/20/2016	EEH & LJS	112	3	Sand	Pole	SAMPLED			2																			2		1
113	46.219537	-89.842905	99	Birch Lake	Vilas	7/20/2016	EEH & LJS	113	3	Sand	Pole	SAMPLED			1			1										1						1	
114	46.219024	-89.842907	98	Birch Lake	Vilas	7/20/2016	EEH & LJS	114	16			DEEP																								
115	46.218511	-89.842908	96	Birch Lake	Vilas	7/20/2016	EEH & LJS	115	18			DEEP																								
116	46.217998	-89.842910	95	Birch Lake	Vilas	7/20/2016	EEH & LJS	116	22			DEEP																								
117	46.217485	-89.842911	92	Birch Lake	Vilas	7/20/2016	EEH & LJS	117	22			DEEP																								
118	46.216972	-89.842913	91	Birch Lake	Vilas	7/20/2016	EEH & LJS	118	22			DEEP																								

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
119	46.216459	-89.842914	0	Birch Lake	Vilas	7/20/2016		119	0			DEEP																									
120	46.215946	-89.842915	0	Birch Lake	Vilas	7/20/2016		120	0			DEEP																									
121	46.215433	-89.842917	0	Birch Lake	Vilas	7/20/2016		121	0			DEEP																									
122	46.214920	-89.842918	0	Birch Lake	Vilas	7/20/2016		122	0			DEEP																									
123	46.214407	-89.842920	0	Birch Lake	Vilas	7/20/2016		123	0			DEEP																									
124	46.213894	-89.842921	0	Birch Lake	Vilas	7/20/2016		124	0			DEEP																									
125	46.213381	-89.842923	0	Birch Lake	Vilas	7/20/2016		125	0			DEEP																									
126	46.212868	-89.842924	0	Birch Lake	Vilas	7/20/2016		126	0			DEEP																									
127	46.212355	-89.842926	49	Birch Lake	Vilas	7/20/2016	EEH & LJS	127	30			DEEP																									
128	46.211842	-89.842927	48	Birch Lake	Vilas	7/20/2016	EEH & LJS	128	6	Sand	Pole	SAMPLED			2																				2		1
129	46.211329	-89.842929	46	Birch Lake	Vilas	7/20/2016	EEH & LJS	129	0			NONNAVIGABLE (PLANTS)																									
130	46.210816	-89.842930	40	Birch Lake	Vilas	7/20/2016	EEH & LJS	130	5	Muck	Pole	SAMPLED			2																				2		
131	46.224666	-89.842151	203	Birch Lake	Vilas	7/20/2016	EEH & LJS	131	22			DEEP																									
132	46.224153	-89.842153	204	Birch Lake	Vilas	7/20/2016	EEH & LJS	132	18			DEEP																									
133	46.221075	-89.842162	106	Birch Lake	Vilas	7/20/2016	EEH & LJS	133	3	Sand	Pole	SAMPLED			1			1											1								
134	46.220562	-89.842163	103	Birch Lake	Vilas	7/20/2016	EEH & LJS	134	5	Sand	Pole	SAMPLED			1																				1		3
135	46.220049	-89.842165	102	Birch Lake	Vilas	7/20/2016	EEH & LJS	135	9	Rock	Pole	SAMPLED			1															1					1		
136	46.219536	-89.842166	100	Birch Lake	Vilas	7/20/2016	EEH & LJS	136	20			DEEP																									
137	46.219023	-89.842168	0	Birch Lake	Vilas	7/20/2016		137	0			DEEP																									
138	46.218510	-89.842169	0	Birch Lake	Vilas	7/20/2016		138	0			DEEP																									
139	46.217997	-89.842171	0	Birch Lake	Vilas	7/20/2016		139	0			DEEP																									
140	46.217484	-89.842172	0	Birch Lake	Vilas	7/20/2016		140	0			DEEP																									
141	46.216971	-89.842174	0	Birch Lake	Vilas	7/20/2016		141	0			DEEP																									
142	46.216458	-89.842175	0	Birch Lake	Vilas	7/20/2016		142	0			DEEP																									
143	46.215945	-89.842176	0	Birch Lake	Vilas	7/20/2016		143	0			DEEP																									
144	46.215432	-89.842178	0	Birch Lake	Vilas	7/20/2016		144	0			DEEP																									
145	46.214919	-89.842179	0	Birch Lake	Vilas	7/20/2016		145	0			DEEP																									
146	46.214406	-89.842181	0	Birch Lake	Vilas	7/20/2016		146	0			DEEP																									
147	46.213893	-89.842182	0	Birch Lake	Vilas	7/20/2016		147	0			DEEP																									
148	46.213380	-89.842184	0	Birch Lake	Vilas	7/20/2016		148	0			DEEP																									
149	46.212867	-89.842185	0	Birch Lake	Vilas	7/20/2016		149	0			DEEP																									
150	46.212354	-89.842187	0	Birch Lake	Vilas	7/20/2016		150	0			DEEP																									
151	46.211841	-89.842188	37	Birch Lake	Vilas	7/20/2016	EEH & LJS	151	17			DEEP																									
152	46.211328	-89.842190	38	Birch Lake	Vilas	7/20/2016	EEH & LJS	152	3	Rock	Pole	SAMPLED			1																		1				
153	46.210815	-89.842191	39	Birch Lake	Vilas	7/20/2016	EEH & LJS	153	7	Muck	Pole	SAMPLED			3																				3		
154	46.224665	-89.841412	202	Birch Lake	Vilas	7/20/2016	EEH & LJS	154	18			DEEP																									
155	46.224152	-89.841414	189	Birch Lake	Vilas	7/20/2016	EEH & LJS	155	17			DEEP																									
156	46.223639	-89.841415	188	Birch Lake	Vilas	7/20/2016	EEH & LJS	156	17			DEEP																									
157	46.223126	-89.841417	175	Birch Lake	Vilas	7/20/2016	EEH & LJS	157	14	Sand	Pole	SAMPLED			0																						
158	46.222613	-89.841418	174	Birch Lake	Vilas	7/20/2016	EEH & LJS	158	8	Sand	Pole	SAMPLED			2																				2		
159	46.222100	-89.841420	108	Birch Lake	Vilas	7/20/2016	EEH & LJS	159	14	Sand	Pole	SAMPLED			0																						
160	46.221587	-89.841421	107	Birch Lake	Vilas	7/20/2016	EEH & LJS	160	19			DEEP																									
161	46.221074	-89.841423	105	Birch Lake	Vilas	7/20/2016	EEH & LJS	161	17			DEEP																									
162	46.220561	-89.841424	104	Birch Lake	Vilas	7/20/2016	EEH & LJS	162	20			DEEP																									
163	46.220048	-89.841426	101	Birch Lake	Vilas	7/20/2016	EEH & LJS	163	18			DEEP																									
164	46.219535	-89.841427	0	Birch Lake	Vilas	7/20/2016		164	0			DEEP																									
165	46.219022	-89.841429	0	Birch Lake	Vilas	7/20/2016		165	0			DEEP																									
166	46.218509	-89.841430	0	Birch Lake	Vilas	7/20/2016		166	0			DEEP																									
167	46.217996	-89.841432	0	Birch Lake	Vilas	7/20/2016		167	0			DEEP																									
168	46.217483	-89.841433	0	Birch Lake	Vilas	7/20/2016		168	0			DEEP																									
169	46.216970	-89.841434	0	Birch Lake	Vilas	7/20/2016		169	0			DEEP																									
170	46.216457	-89.841436	0	Birch Lake	Vilas	7/20/2016		170	0			DEEP																									
171	46.215944	-89.841437	0	Birch Lake	Vilas	7/20/2016		171	0			DEEP																									
172	46.215431	-89.841439	0	Birch Lake	Vilas	7/20/2016		172	0			DEEP																									
173	46.214918	-89.841440	0	Birch Lake	Vilas	7/20/2016		173	0			DEEP																									
174	46.214405	-89.841442	0	Birch Lake	Vilas	7/20/2016		174	0			DEEP																									
175	46.213892	-89.841443	0	Birch Lake	Vilas	7/20/2016		175	0			DEEP																									
176	46.213379	-89.841445	0	Birch Lake	Vilas	7/20/2016		176	0			DEEP																									
177	46.212866	-89.841446	0	Birch Lake	Vilas	7/20/2016		177	0			DEEP																									

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
178	46.212353	-89.841448	0	Birch Lake	Vilas	7/20/2016		178	0			DEEP																									
179	46.211840	-89.841449	36	Birch Lake	Vilas	7/20/2016	EEH & LJS	179	39			DEEP																									
180	46.211327	-89.841451	35	Birch Lake	Vilas	7/20/2016	EEH & LJS	180	6	Rock	Pole	SAMPLED			0																					
181	46.210814	-89.841452	34	Birch Lake	Vilas	7/20/2016	EEH & LJS	181	5	Rock	Pole	SAMPLED			0																					
182	46.227742	-89.840664	208	Birch Lake	Vilas	7/20/2016	JLW & CMB	182	2	Muck	Pole	SAMPLED			1																				1		
183	46.227229	-89.840666	209	Birch Lake	Vilas	7/20/2016	JLW & CMB	183	5	Muck	Pole	SAMPLED			1																1				1		
184	46.224664	-89.840673	201	Birch Lake	Vilas	7/20/2016	EEH & LJS	184	18			DEEP																									
185	46.224151	-89.840675	190	Birch Lake	Vilas	7/20/2016	EEH & LJS	185	26			DEEP																									
186	46.223638	-89.840676	187	Birch Lake	Vilas	7/20/2016	EEH & LJS	186	25			DEEP																									
187	46.223125	-89.840678	176	Birch Lake	Vilas	7/20/2016	EEH & LJS	187	22			DEEP																									
188	46.222612	-89.840679	173	Birch Lake	Vilas	7/20/2016	EEH & LJS	188	11	Sand	Pole	SAMPLED			0																					
189	46.222099	-89.840681	109	Birch Lake	Vilas	7/20/2016	EEH & LJS	189	8	Sand	Pole	SAMPLED			1				1																	
190	46.221586	-89.840682	112	Birch Lake	Vilas	7/20/2016	EEH & LJS	190	6	Sand	Pole	SAMPLED			1													1								1	
191	46.221073	-89.840684	113	Birch Lake	Vilas	7/20/2016	EEH & LJS	191	24			DEEP																									
192	46.220560	-89.840685	114	Birch Lake	Vilas	7/20/2016	EEH & LJS	192	6	Sand	Pole	SAMPLED			1													1							1		
193	46.220047	-89.840687	115	Birch Lake	Vilas	7/20/2016	EEH & LJS	193	11	Sand	Pole	SAMPLED			0																					
194	46.219534	-89.840688	116	Birch Lake	Vilas	7/20/2016	EEH & LJS	194	20			DEEP																									
195	46.219021	-89.840690	117	Birch Lake	Vilas	7/20/2016	EEH & LJS	195	20			DEEP																									
196	46.218508	-89.840691	118	Birch Lake	Vilas	7/20/2016	EEH & LJS	196	16			DEEP																									
197	46.217995	-89.840693	119	Birch Lake	Vilas	7/20/2016	EEH & LJS	197	18			DEEP																									
198	46.217482	-89.840694	120	Birch Lake	Vilas	7/20/2016	EEH & LJS	198	14	Rock	Pole	SAMPLED			0																					
199	46.216969	-89.840695	121	Birch Lake	Vilas	7/20/2016	EEH & LJS	199	16			DEEP																									
200	46.216456	-89.840697	122	Birch Lake	Vilas	7/20/2016	EEH & LJS	200	21			DEEP																									
201	46.215943	-89.840698	123	Birch Lake	Vilas	7/20/2016	EEH & LJS	201	28			DEEP																									
202	46.215430	-89.840700	0	Birch Lake	Vilas	7/20/2016		202	0			DEEP																									
203	46.214917	-89.840701	0	Birch Lake	Vilas	7/20/2016		203	0			DEEP																									
204	46.214404	-89.840703	0	Birch Lake	Vilas	7/20/2016		204	0			DEEP																									
205	46.213891	-89.840704	0	Birch Lake	Vilas	7/20/2016		205	0			DEEP																									
206	46.213378	-89.840706	0	Birch Lake	Vilas	7/20/2016		206	0			DEEP																									
207	46.212865	-89.840707	0	Birch Lake	Vilas	7/20/2016		207	0			DEEP																									
208	46.212352	-89.840709	30	Birch Lake	Vilas	7/20/2016	EEH & LJS	208	41			DEEP																									
209	46.211839	-89.840710	31	Birch Lake	Vilas	7/20/2016	EEH & LJS	209	31			DEEP																									
210	46.211326	-89.840712	32	Birch Lake	Vilas	7/20/2016	EEH & LJS	210	19			DEEP																									
211	46.210813	-89.840713	33	Birch Lake	Vilas	7/20/2016	EEH & LJS	211	4	Rock	Pole	SAMPLED			0																					
212	46.227740	-89.839925	207	Birch Lake	Vilas	7/20/2016	JLW & CMB	212	7	Muck	Pole	SAMPLED			0																					
213	46.22722748	-89.83992665	210	Birch Lake	Vilas	7/20/2016	JLW & CMB	213	14	Muck	Pole	SAMPLED			0																					
214	46.22671448	-89.83992814	213	Birch Lake	Vilas	7/20/2016	JLW & CMB	214	9	Muck	Pole	SAMPLED			2																				2		
215	46.22517549	-89.83993261	228	Birch Lake	Vilas	7/20/2016	JLW & CMB	215	0			NONNAVIGABLE (PLANTS)	hardstem																								
216	46.22466249	-89.8399341	200	Birch Lake	Vilas	7/20/2016	EEH & LJS	216	4	Sand	Pole	SAMPLED			1																		1				3
217	46.2241495	-89.83993559	191	Birch Lake	Vilas	7/20/2016	EEH & LJS	217	17			DEEP																									
218	46.2236365	-89.83993708	186	Birch Lake	Vilas	7/20/2016	EEH & LJS	218	16			DEEP																									
219	46.2231235	-89.83993858	177	Birch Lake	Vilas	7/20/2016	EEH & LJS	219	19			DEEP																									
220	46.2226105	-89.83994007	172	Birch Lake	Vilas	7/20/2016	EEH & LJS	220	28			DEEP																									
221	46.22209751	-89.83994156	110	Birch Lake	Vilas	7/20/2016	EEH & LJS	221	22			DEEP																									
222	46.22158451	-89.83994305	111	Birch Lake	Vilas	7/20/2016	EEH & LJS	222	16			DEEP																									
223	46.22107151	-89.83994454	155	Birch Lake	Vilas	7/20/2016	EEH & LJS	223	6	Sand	Pole	SAMPLED			2				1									1							2		
224	46.22055851	-89.83994603	154	Birch Lake	Vilas	7/20/2016	EEH & LJS	224	5	Sand	Pole	SAMPLED			1																1				1		2
225	46.22004551	-89.83994752	133	Birch Lake	Vilas	7/20/2016	EEH & LJS	225	5	Sand	Pole	SAMPLED			1				1																1		1
226	46.21953252	-89.83994901	132	Birch Lake	Vilas	7/20/2016	EEH & LJS	226	16			DEEP																									
227	46.21901952	-89.8399505	131	Birch Lake	Vilas	7/20/2016	EEH & LJS	227	27			DEEP																									
228	46.21850652	-89.83995199	130	Birch Lake	Vilas	7/20/2016	EEH & LJS	228	42			DEEP																									
229	46.21799352	-89.83995348	129	Birch Lake	Vilas	7/20/2016	EEH & LJS	229	44			DEEP																									
230	46.21748052	-89.83995497	128	Birch Lake	Vilas	7/20/2016	EEH & LJS	230	35			DEEP																									
231	46.21696753	-89.83995646	127	Birch Lake	Vilas	7/20/2016	EEH & LJS	231	24			DEEP																									
232	46.21645453	-89.83995795	126	Birch Lake	Vilas	7/20/2016	EEH & LJS	232	21			DEEP																									
233	46.21594153	-89.83995944	125	Birch Lake	Vilas	7/20/2016	EEH & LJS	233	25			DEEP																									
234	46.21542853	-89.83996093	124	Birch Lake	Vilas	7/20/2016	EEH & LJS	234	36			DEEP																									
235	46.21491553	-89.83996242	0	Birch Lake	Vilas	7/20/2016		235	0			DEEP																									
236	46.21440254	-89.83996391	0	Birch Lake	Vilas	7/20/2016		236	0			DEEP																									

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
237	46.21388954	-89.8399654	0	Birch Lake	Vilas	7/20/2016		237	0			DEEP																									
238	46.21337654	-89.83996689	0	Birch Lake	Vilas	7/20/2016		238	0			DEEP																									
239	46.21286354	-89.83996838	0	Birch Lake	Vilas	7/20/2016		239	0			DEEP																									
240	46.21235054	-89.83996987	29	Birch Lake	Vilas	7/20/2016	EEH & LJS	240	31			DEEP																									
241	46.21183754	-89.83997136	28	Birch Lake	Vilas	7/20/2016	EEH & LJS	241	4	Rock	Pole	SAMPLED			1																1			1		
242	46.22773944	-89.83918599	206	Birch Lake	Vilas	7/20/2016	JLW & CMB	242	6	Muck	Pole	SAMPLED			1																			1		
243	46.22722644	-89.83918749	211	Birch Lake	Vilas	7/20/2016	JLW & CMB	243	11	Muck	Pole	SAMPLED			1																			1		
244	46.22671344	-89.83918899	212	Birch Lake	Vilas	7/20/2016	JLW & CMB	244	11	Muck	Pole	SAMPLED			0																					
245	46.22620045	-89.83919049	219	Birch Lake	Vilas	7/20/2016	JLW & CMB	245	7	Muck	Pole	SAMPLED			2																			2		
246	46.22568745	-89.83919199	220	Birch Lake	Vilas	7/20/2016	JLW & CMB	246	6	Sand	Pole	SAMPLED			2																			2		
247	46.22517445	-89.83919348	227	Birch Lake	Vilas	7/20/2016	JLW & CMB	247	6	Sand	Pole	SAMPLED			1															1				1		
248	46.22466146	-89.83919498	199	Birch Lake	Vilas	7/20/2016	EEH & LJS	248	20			DEEP																									
249	46.22414846	-89.83919648	192	Birch Lake	Vilas	7/20/2016	EEH & LJS	249	18			DEEP																									
250	46.22363546	-89.83919798	185	Birch Lake	Vilas	7/20/2016	EEH & LJS	250	12	Sand	Pole	SAMPLED			0																					
251	46.22312246	-89.83919947	178	Birch Lake	Vilas	7/20/2016	EEH & LJS	251	30			DEEP																									
252	46.22260947	-89.83920097	171	Birch Lake	Vilas	7/20/2016	EEH & LJS	252	31			DEEP																									
253	46.22209647	-89.83920247	164	Birch Lake	Vilas	7/20/2016	EEH & LJS	253	17			DEEP																									
254	46.22158347	-89.83920397	163	Birch Lake	Vilas	7/20/2016	EEH & LJS	254	7	Sand	Pole	SAMPLED			1																				1		
255	46.22107047	-89.83920547	156	Birch Lake	Vilas	7/20/2016	EEH & LJS	255	6	Sand	Pole	SAMPLED			1				1															1		1
256	46.22055748	-89.83920696	153	Birch Lake	Vilas	7/20/2016	EEH & LJS	256	6	Sand	Pole	SAMPLED			1																			1		
257	46.22004448	-89.83920846	134	Birch Lake	Vilas	7/20/2016	EEH & LJS	257	13	Sand	Pole	SAMPLED			0																					
258	46.21953148	-89.83920996	145	Birch Lake	Vilas	7/20/2016	EEH & LJS	258	28			DEEP																									
259	46.21901848	-89.83921146	144	Birch Lake	Vilas	7/20/2016	EEH & LJS	259	22			DEEP																									
260	46.21850548	-89.83921295	143	Birch Lake	Vilas	7/20/2016	EEH & LJS	260	33			DEEP																									
261	46.21799249	-89.83921445	0	Birch Lake	Vilas	7/20/2016		261	0			DEEP																									
262	46.21747949	-89.83921595	0	Birch Lake	Vilas	7/20/2016		262	0			DEEP																									
263	46.21696649	-89.83921744	0	Birch Lake	Vilas	7/20/2016		263	0			DEEP																									
264	46.21645349	-89.83921894	0	Birch Lake	Vilas	7/20/2016		264	0			DEEP																									
265	46.21594049	-89.83922044	0	Birch Lake	Vilas	7/20/2016		265	0			DEEP																									
266	46.2154275	-89.83922194	0	Birch Lake	Vilas	7/20/2016		266	0			DEEP																									
267	46.2149145	-89.83922343	0	Birch Lake	Vilas	7/20/2016		267	0			DEEP																									
268	46.2144015	-89.83922493	23	Birch Lake	Vilas	7/20/2016	EEH & LJS	268	34			DEEP																									
269	46.2138885	-89.83922643	24	Birch Lake	Vilas	7/20/2016	EEH & LJS	269	26			DEEP																									
270	46.2133755	-89.83922792	25	Birch Lake	Vilas	7/20/2016	EEH & LJS	270	30			DEEP																									
271	46.2128625	-89.83922942	26	Birch Lake	Vilas	7/20/2016	EEH & LJS	271	31			DEEP																									
272	46.21234951	-89.83923092	27	Birch Lake	Vilas	7/20/2016	EEH & LJS	272	7	Rock	Pole	SAMPLED			0																					
273	46.2277384	-89.83844683	205	Birch Lake	Vilas	7/20/2016	JLW & CMB	273	2	Sand	Pole	SAMPLED			1			1				1													
274	46.2272254	-89.83844834	204	Birch Lake	Vilas	7/20/2016	JLW & CMB	274	17			DEEP																									
275	46.2267124	-89.83844984	214	Birch Lake	Vilas	7/20/2016	JLW & CMB	275	17			DEEP																									
276	46.22619941	-89.83845135	218	Birch Lake	Vilas	7/20/2016	JLW & CMB	276	15			DEEP																									
277	46.22568641	-89.83845285	221	Birch Lake	Vilas	7/20/2016	JLW & CMB	277	0			DEEP																									
278	46.22517341	-89.83845436	226	Birch Lake	Vilas	7/20/2016	JLW & CMB	278	14	Muck	Pole	SAMPLED			0																					
279	46.22466041	-89.83845586	198	Birch Lake	Vilas	7/20/2016	EEH & LJS	279	19			DEEP																									
280	46.22414742	-89.83845737	193	Birch Lake	Vilas	7/20/2016	EEH & LJS	280	33			DEEP																									
281	46.22363442	-89.83845887	184	Birch Lake	Vilas	7/20/2016	EEH & LJS	281	25			DEEP																									
282	46.22312142	-89.83846037	179	Birch Lake	Vilas	7/20/2016	EEH & LJS	282	33			DEEP																									
283	46.22260842	-89.83846188	170	Birch Lake	Vilas	7/20/2016	EEH & LJS	283	31			DEEP																									
284	46.22209543	-89.83846338	165	Birch Lake	Vilas	7/20/2016	EEH & LJS	284	26			DEEP																									
285	46.22158243	-89.83846489	162	Birch Lake	Vilas	7/20/2016	EEH & LJS	285	23			DEEP																									
286	46.22106943	-89.83846639	157	Birch Lake	Vilas	7/20/2016	EEH & LJS	286	22			DEEP																									
287	46.22055643	-89.8384679	152	Birch Lake	Vilas	7/20/2016	EEH & LJS	287	28			DEEP																									
288	46.22004344	-89.8384694	135	Birch Lake	Vilas	7/20/2016	EEH & LJS	288	7	Sand	Pole	SAMPLED			0																					
289	46.21953044	-89.83847091	146	Birch Lake	Vilas	7/20/2016	EEH & LJS	289	8	Sand	Pole	SAMPLED			1														1							
290	46.21901744	-89.83847241	147	Birch Lake	Vilas	7/20/2016	EEH & LJS	290	20			DEEP																									
291	46.21850444	-89.83847391	142	Birch Lake	Vilas	7/20/2016	EEH & LJS	291	21			DEEP																									
292	46.21799144	-89.83847542	0	Birch Lake	Vilas	7/20/2016		292	0			DEEP																									
293	46.21747845	-89.83847692	0	Birch Lake	Vilas	7/20/2016		293	0			DEEP																									
294	46.21696545	-89.83847843	0	Birch Lake	Vilas	7/20/2016		294	0			DEEP																									
295	46.21645245	-89.83847993	0	Birch Lake	Vilas	7/20/2016		295	0			DEEP																									

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
296	46.21593945	-89.83848144	0	Birch Lake	Vilas	7/20/2016		296	0			DEEP																									
297	46.21542645	-89.83848294	0	Birch Lake	Vilas	7/20/2016		297	0			DEEP																									
298	46.21491346	-89.83848444	0	Birch Lake	Vilas	7/20/2016		298	0			DEEP																									
299	46.21440046	-89.83848595	20	Birch Lake	Vilas	7/20/2016	EEH & LJS	299	33			DEEP																									
300	46.21388746	-89.83848745	19	Birch Lake	Vilas	7/20/2016	EEH & LJS	300	15	Sand	Pole	SAMPLED			0																					
301	46.21337446	-89.83848895	18	Birch Lake	Vilas	7/20/2016	EEH & LJS	301	14	Sand	Pole	SAMPLED			0																					
302	46.21286146	-89.83849046	17	Birch Lake	Vilas	7/20/2016	EEH & LJS	302	5	Rock	Pole	SAMPLED			0																					
303	46.21234846	-89.83849196	16	Birch Lake	Vilas	7/20/2016	EEH & LJS	303	0			NONNAVIGABLE (PLANTS)																									
304	46.22722435	-89.83770918	203	Birch Lake	Vilas	7/20/2016	JLW & CMB	304	12	Muck	Pole	SAMPLED			0																					
305	46.22671136	-89.83771069	215	Birch Lake	Vilas	7/20/2016	JLW & CMB	305	16			DEEP																									
306	46.22619836	-89.8377122	217	Birch Lake	Vilas	7/20/2016	JLW & CMB	306	23			DEEP																									
307	46.22568536	-89.83771372	222	Birch Lake	Vilas	7/20/2016	JLW & CMB	307	30			DEEP																									
308	46.22517236	-89.83771523	225	Birch Lake	Vilas	7/20/2016	JLW & CMB	308	30			DEEP																									
309	46.22465937	-89.83771674	197	Birch Lake	Vilas	7/20/2016	EEH & LJS	309	19			DEEP																									
310	46.22414637	-89.83771825	194	Birch Lake	Vilas	7/20/2016	EEH & LJS	310	17			DEEP																									
311	46.22363337	-89.83771976	183	Birch Lake	Vilas	7/20/2016	EEH & LJS	311	15			DEEP																									
312	46.22312037	-89.83772127	180	Birch Lake	Vilas	7/20/2016	EEH & LJS	312	20			DEEP																									
313	46.22260738	-89.83772279	169	Birch Lake	Vilas	7/20/2016	EEH & LJS	313	16			DEEP																									
314	46.22209438	-89.8377243	166	Birch Lake	Vilas	7/20/2016	EEH & LJS	314	16			DEEP																									
315	46.22158138	-89.83772581	161	Birch Lake	Vilas	7/20/2016	EEH & LJS	315	17			DEEP																									
316	46.22106838	-89.83772732	158	Birch Lake	Vilas	7/20/2016	EEH & LJS	316	24			DEEP																									
317	46.22055539	-89.83772883	151	Birch Lake	Vilas	7/20/2016	EEH & LJS	317	15	Sand	Pole	SAMPLED			0																					
318	46.22004239	-89.83773034	136	Birch Lake	Vilas	7/20/2016	EEH & LJS	318	6	Sand	Pole	SAMPLED			1													1								
319	46.21952939	-89.83773185	149	Birch Lake	Vilas	7/20/2016	EEH & LJS	319	11	Sand	Pole	SAMPLED			0																					
320	46.21901639	-89.83773336	148	Birch Lake	Vilas	7/20/2016	EEH & LJS	320	18			DEEP																									
321	46.2185034	-89.83773488	141	Birch Lake	Vilas	7/20/2016	EEH & LJS	321	20			DEEP																									
322	46.2179904	-89.83773639	0	Birch Lake	Vilas	7/20/2016		322	0			DEEP																									
323	46.2174774	-89.8377379	0	Birch Lake	Vilas	7/20/2016		323	0			DEEP																									
324	46.2169644	-89.83773941	0	Birch Lake	Vilas	7/20/2016		324	0			DEEP																									
325	46.2164514	-89.83774092	0	Birch Lake	Vilas	7/20/2016		325	0			DEEP																									
326	46.21593841	-89.83774243	0	Birch Lake	Vilas	7/20/2016		326	0			DEEP																									
327	46.21542541	-89.83774394	0	Birch Lake	Vilas	7/20/2016		327	0			DEEP																									
328	46.21491241	-89.83774545	0	Birch Lake	Vilas	7/20/2016		328	0			DEEP																									
329	46.21439941	-89.83774696	21	Birch Lake	Vilas	7/20/2016	EEH & LJS	329	29			DEEP																									
330	46.21388641	-89.83774847	22	Birch Lake	Vilas	7/20/2016	EEH & LJS	330	22			DEEP																									
331	46.21337341	-89.83774999	14	Birch Lake	Vilas	7/20/2016	EEH & LJS	331	16			DEEP																									
332	46.21286042	-89.8377515	15	Birch Lake	Vilas	7/20/2016	EEH & LJS	332	10	Sand	Pole	SAMPLED			0																					
333	46.21234742	-89.83775301	8	Birch Lake	Vilas	7/20/2016	EEH & LJS	333	0			NONNAVIGABLE (PLANTS)																									
334	46.2272233	-89.83697003	202	Birch Lake	Vilas	7/20/2016	JLW & CMB	334	4	Sand	Pole	SAMPLED			1			1																	
335	46.2267103	-89.83697154	201	Birch Lake	Vilas	7/20/2016	JLW & CMB	335	5	Sand	Pole	SAMPLED			0																					
336	46.22619731	-89.83697306	216	Birch Lake	Vilas	7/20/2016	JLW & CMB	336	17			DEEP																									
337	46.22568431	-89.83697458	223	Birch Lake	Vilas	7/20/2016	JLW & CMB	337	0			DEEP																									
338	46.22517131	-89.8369761	224	Birch Lake	Vilas	7/20/2016	JLW & CMB	338	39			DEEP																									
339	46.22465832	-89.83697762	196	Birch Lake	Vilas	7/20/2016	EEH & LJS	339	37			DEEP																									
340	46.22414532	-89.83697914	195	Birch Lake	Vilas	7/20/2016	EEH & LJS	340	25			DEEP																									
341	46.22363232	-89.83698066	182	Birch Lake	Vilas	7/20/2016	EEH & LJS	341	27			DEEP																									
342	46.22311932	-89.83698217	181	Birch Lake	Vilas	7/20/2016	EEH & LJS	342	26			DEEP																									
343	46.22260633	-89.83698369	168	Birch Lake	Vilas	7/20/2016	EEH & LJS	343	11	Sand	Pole	SAMPLED			0																					
344	46.22209333	-89.83698521	167	Birch Lake	Vilas	7/20/2016	EEH & LJS	344	12	Sand	Pole	SAMPLED			0																					
345	46.22158033	-89.83698673	160	Birch Lake	Vilas	7/20/2016	EEH & LJS	345	16			DEEP																									
346	46.22106733	-89.83698825	159	Birch Lake	Vilas	7/20/2016	EEH & LJS	346	14	Muck	Pole	SAMPLED			0																					
347	46.22055434	-89.83698977	150	Birch Lake	Vilas	7/20/2016	EEH & LJS	347	16	Sand	Pole	SAMPLED			0																					
348	46.22004134	-89.83699128	137	Birch Lake	Vilas	7/20/2016	EEH & LJS	348	7	Sand	Pole	SAMPLED			0																					
349	46.21952834	-89.8369928	138	Birch Lake	Vilas	7/20/2016	EEH & LJS	349	6	Sand	Pole	SAMPLED			0																					
350	46.21901534	-89.83699432	139	Birch Lake	Vilas	7/20/2016	EEH & LJS	350	27			DEEP																									
351	46.21850234	-89.83699584	140	Birch Lake	Vilas	7/20/2016	EEH & LJS	351	31			DEEP																									
352	46.21798935	-89.83699736	0	Birch Lake	Vilas	7/20/2016		352	0			DEEP																									
353	46.21747635	-89.83699887	0	Birch Lake	Vilas	7/20/2016		353	0			DEEP																									
354	46.21696335	-89.83700039	0	Birch Lake	Vilas	7/20/2016		354	0			DEEP																									

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
355	46.21645035	-89.83700191	0	Birch Lake	Vilas	7/20/2016		355	0			DEEP																								
356	46.21593735	-89.83700343	0	Birch Lake	Vilas	7/20/2016		356	0			DEEP																								
357	46.21542436	-89.83700495	0	Birch Lake	Vilas	7/20/2016		357	0			DEEP																								
358	46.21491136	-89.83700646	0	Birch Lake	Vilas	7/20/2016		358	0			DEEP																								
359	46.21439836	-89.83700798	0	Birch Lake	Vilas	7/20/2016		359	0			DEEP																								
360	46.21388536	-89.8370095	0	Birch Lake	Vilas	7/20/2016		360	0			DEEP																								
361	46.21337236	-89.83701102	12	Birch Lake	Vilas	7/20/2016	EEH & LJS	361	17			DEEP																								
362	46.21285937	-89.83701253	11	Birch Lake	Vilas	7/20/2016	EEH & LJS	362	7	Sand	Pole	SAMPLED			0																				
363	46.21234637	-89.83701405	7	Birch Lake	Vilas	7/20/2016	EEH & LJS	363	0			NONNAVIGABLE (PLANTS)																								
364	46.20926838	-89.83702316	33	Birch Lake	Vilas	7/20/2016	JLW & CMB	364	9	Rock	Pole	SAMPLED			0																				
365	46.20875538	-89.83702467	31	Birch Lake	Vilas	7/20/2016	JLW & CMB	365	33			DEEP																								
366	46.20824238	-89.83702619	247	Birch Lake	Vilas	7/20/2016	EEH & LJS	366	0			DEEP																								
367	46.20772938	-89.83702771	248	Birch Lake	Vilas	7/20/2016	EEH & LJS	367	0			DEEP																								
368	46.20721638	-89.83702922	25	Birch Lake	Vilas	7/20/2016	JLW & CMB	368	9	Rock	Pole	SAMPLED			0																				
369	46.22722224	-89.83623087	200	Birch Lake	Vilas	7/20/2016	JLW & CMB	369	0			NONNAVIGABLE (PLANTS)																								
370	46.22670925	-89.8362324	199	Birch Lake	Vilas	7/20/2016	JLW & CMB	370	0			NONNAVIGABLE (PLANTS)	hardstem																							
371	46.22619625	-89.83623392	198	Birch Lake	Vilas	7/20/2016	JLW & CMB	371	12	Muck	Pole	0																								
372	46.22568325	-89.83623545	197	Birch Lake	Vilas	7/20/2016	JLW & CMB	372	20			DEEP																								
373	46.22517026	-89.83623697	196	Birch Lake	Vilas	7/20/2016	JLW & CMB	373	23			DEEP																								
374	46.22465726	-89.8362385	195	Birch Lake	Vilas	7/20/2016	JLW & CMB	374	20			DEEP																								
375	46.22414426	-89.83624002	169	Birch Lake	Vilas	7/20/2016	JLW & CMB	375	21			DEEP																								
376	46.22363126	-89.83624155	168	Birch Lake	Vilas	7/20/2016	JLW & CMB	376	16			DEEP																								
377	46.22311827	-89.83624307	157	Birch Lake	Vilas	7/20/2016	JLW & CMB	377	9	Sand	Pole	SAMPLED			0																				
378	46.22260527	-89.8362446	153	Birch Lake	Vilas	7/20/2016	JLW & CMB	378	13	Sand	Pole	SAMPLED																								
379	46.22209227	-89.83624612	154	Birch Lake	Vilas	7/20/2016	JLW & CMB	379	16			DEEP																								
380	46.22157927	-89.83624765	139	Birch Lake	Vilas	7/20/2016	JLW & CMB	380	19			DEEP																								
381	46.22106628	-89.83624917	138	Birch Lake	Vilas	7/20/2016	JLW & CMB	381	22			DEEP																								
382	46.22055328	-89.8362507	130	Birch Lake	Vilas	7/20/2016	JLW & CMB	382	13	Sand	Pole	0																								
383	46.22004028	-89.83625222	129	Birch Lake	Vilas	7/20/2016	JLW & CMB	383	7	Sand	Pole	SAMPLED			1																				1
384	46.21952728	-89.83625375	114	Birch Lake	Vilas	7/20/2016	JLW & CMB	384	8	Sand	Pole	SAMPLED			1																				1
385	46.21901429	-89.83625527	113	Birch Lake	Vilas	7/20/2016	JLW & CMB	385	17			DEEP																								
386	46.21850129	-89.8362568	107	Birch Lake	Vilas	7/20/2016	JLW & CMB	386	25																											
387	46.21798829	-89.83625832	110	Birch Lake	Vilas	7/20/2016	JLW & CMB	387	0			DEEP																								
388	46.21747529	-89.83625985	0	Birch Lake	Vilas	7/20/2016		388	0			DEEP																								
389	46.21696229	-89.83626137	0	Birch Lake	Vilas	7/20/2016		389	0			DEEP																								
390	46.2164493	-89.8362629	0	Birch Lake	Vilas	7/20/2016		390	0			DEEP																								
391	46.2159363	-89.83626442	0	Birch Lake	Vilas	7/20/2016		391	0			DEEP																								
392	46.2154233	-89.83626595	0	Birch Lake	Vilas	7/20/2016		392	0			DEEP																								
393	46.2149103	-89.83626747	0	Birch Lake	Vilas	7/20/2016		393	0			DEEP																								
394	46.2143973	-89.836269	0	Birch Lake	Vilas	7/20/2016		394	0			DEEP																								
395	46.21388431	-89.83627052	0	Birch Lake	Vilas	7/20/2016		395	0			DEEP																								
396	46.21337131	-89.83627205	13	Birch Lake	Vilas	7/20/2016	EEH & LJS	396	23			DEEP																								
397	46.21285831	-89.83627357	10	Birch Lake	Vilas	7/20/2016	EEH & LJS	397	8	Sand	Pole	SAMPLED			0																				
398	46.21234531	-89.8362751	6	Birch Lake	Vilas	7/20/2016	EEH & LJS	398	7	Sand	Pole	SAMPLED			0																				
399	46.21183231	-89.83627662	4	Birch Lake	Vilas	7/20/2016	EEH & LJS	399	2	Sand	Pole	SAMPLED			1																				1
400	46.21131931	-89.83627814	1	Birch Lake	Vilas	7/20/2016	EEH & LJS	400	15	Muck	Pole	SAMPLED			0																				
401	46.21080632	-89.83627967	1	Birch Lake	Vilas	7/20/2016	JLW & CMB	401	11	Sand	Pole	SAMPLED			0																				
402	46.21029332	-89.83628119	35	Birch Lake	Vilas	7/20/2016	JLW & CMB	402	6	Sand	Pole	SAMPLED			0																				
403	46.20978032	-89.83628272	34	Birch Lake	Vilas	7/20/2016	JLW & CMB	403	23			DEEP																								
404	46.20926732	-89.83628424	32	Birch Lake	Vilas	7/20/2016	JLW & CMB	404	39			DEEP																								
405	46.20875432	-89.83628576	0	Birch Lake	Vilas	7/20/2016		405	0			DEEP																								
406	46.20824132	-89.83628729	29	Birch Lake	Vilas	7/20/2016	JLW & CMB	406	45			DEEP																								
407	46.20772832	-89.83628881	27	Birch Lake	Vilas	7/20/2016	JLW & CMB	407	33			DEEP																								
408	46.20721532	-89.83629034	26	Birch Lake	Vilas	7/20/2016	JLW & CMB	408	0			DEEP																								
409	46.20670233	-89.83629186	24	Birch Lake	Vilas	7/20/2016	JLW & CMB	409	20			DEEP																								
410	46.22722118	-89.83549172	189	Birch Lake	Vilas	7/20/2016	JLW & CMB	410	2	Sand	Pole	SAMPLED			1														1	1						1		
411	46.22670819	-89.83549325	190	Birch Lake	Vilas	7/20/2016	JLW & CMB	411	4	Sand	Pole	SAMPLED			1															1					1		
412	46.22619519	-89.83549478	191	Birch Lake	Vilas	7/20/2016	JLW & CMB	412	13	Muck	Pole	SAMPLED			0																				
413	46.22568219	-89.83549631	192	Birch Lake	Vilas	7/20/2016	JLW & CMB	413	14	Muck	Pole	SAMPLED			0																				

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
414	46.2251692	-89.83549784	193	Birch Lake	Vilas	7/20/2016	JLW & CMB	414	16			DEEP																									
415	46.2246562	-89.83549938	194	Birch Lake	Vilas	7/20/2016	JLW & CMB	415	0			DEEP																									
416	46.2241432	-89.83550091	170	Birch Lake	Vilas	7/20/2016	JLW & CMB	416	9	Sand	Pole	SAMPLED			0																					
417	46.2236302	-89.83550244	167	Birch Lake	Vilas	7/20/2016	JLW & CMB	417	5	Sand	Pole	SAMPLED			1									1											1		
418	46.22311721	-89.83550397	158	Birch Lake	Vilas	7/20/2016	JLW & CMB	418	5	Sand	Pole	SAMPLED			1									1											1		
419	46.22260421	-89.83550551	152	Birch Lake	Vilas	7/20/2016	JLW & CMB	419	6	Sand	Pole	SAMPLED			1													1							1		
420	46.22209121	-89.83550704	155	Birch Lake	Vilas	7/20/2016	JLW & CMB	420	9	Sand	Pole	SAMPLED			0																					
421	46.22157821	-89.83550857	140	Birch Lake	Vilas	7/20/2016	JLW & CMB	421	21			DEEP																									
422	46.22106522	-89.8355101	137	Birch Lake	Vilas	7/20/2016	JLW & CMB	422	13	Sand	Pole	0																									
423	46.22055222	-89.83551163	131	Birch Lake	Vilas	7/20/2016	JLW & CMB	423	15			DEEP																									
424	46.22003922	-89.83551317	128	Birch Lake	Vilas	7/20/2016	JLW & CMB	424	5	Sand	Pole	SAMPLED			1																				1		
425	46.21952622	-89.8355147	115	Birch Lake	Vilas	7/20/2016	JLW & CMB	425	12	Sand	Pole	SAMPLED			0																					
426	46.21901323	-89.83551623	112	Birch Lake	Vilas	7/20/2016	JLW & CMB	426	5	Sand	Pole	SAMPLED			2				2																1		
427	46.21850023	-89.83551776	106	Birch Lake	Vilas	7/20/2016	JLW & CMB	427	12	Sand	Pole	SAMPLED			0																					
428	46.21798723	-89.83551929	108	Birch Lake	Vilas	7/20/2016	JLW & CMB	428	31			DEEP																									
429	46.21747423	-89.83552082	0	Birch Lake	Vilas	7/20/2016		429	0			DEEP																									
430	46.21696123	-89.83552236	0	Birch Lake	Vilas	7/20/2016		430	0			DEEP																									
431	46.21644824	-89.83552389	0	Birch Lake	Vilas	7/20/2016		431	0			DEEP																									
432	46.21593524	-89.83552542	0	Birch Lake	Vilas	7/20/2016		432	0			DEEP																									
433	46.21542224	-89.83552695	0	Birch Lake	Vilas	7/20/2016		433	0			DEEP																									
434	46.21490924	-89.83552848	0	Birch Lake	Vilas	7/20/2016		434	0			DEEP																									
435	46.21439624	-89.83553001	0	Birch Lake	Vilas	7/20/2016		435	0			DEEP																									
436	46.21388325	-89.83553155	0	Birch Lake	Vilas	7/20/2016		436	0			DEEP																									
437	46.21337025	-89.83553308	0	Birch Lake	Vilas	7/20/2016		437	0			DEEP																									
438	46.21285725	-89.83553461	9	Birch Lake	Vilas	7/20/2016	EEH & LJS	438	20			DEEP																									
439	46.21234425	-89.83553614	5	Birch Lake	Vilas	7/20/2016	EEH & LJS	439	25			DEEP																									
440	46.21183125	-89.83553767	3	Birch Lake	Vilas	7/20/2016	EEH & LJS	440	31			DEEP																									
441	46.21131825	-89.8355392	2	Birch Lake	Vilas	7/20/2016	EEH & LJS	441	32			DEEP																									
442	46.21080525	-89.83554073	2	Birch Lake	Vilas	7/20/2016	JLW & CMB	442	30			DEEP																									
443	46.21029226	-89.83554226	36	Birch Lake	Vilas	7/20/2016	JLW & CMB	443	32			DEEP																									
444	46.20977926	-89.8355438	0	Birch Lake	Vilas	7/20/2016		444	0			DEEP																									
445	46.20926626	-89.83554533	0	Birch Lake	Vilas	7/20/2016		445	0			DEEP																									
446	46.20875326	-89.83554686	0	Birch Lake	Vilas	7/20/2016		446	0			DEEP																									
447	46.20824026	-89.83554839	0	Birch Lake	Vilas	7/20/2016		447	0			DEEP																									
448	46.20772726	-89.83554992	0	Birch Lake	Vilas	7/20/2016		448	0			DEEP																									
449	46.20721426	-89.83555145	0	Birch Lake	Vilas	7/20/2016		449	0			DEEP																									
450	46.20670127	-89.83555298	23	Birch Lake	Vilas	7/20/2016	JLW & CMB	450	10	Rock	Pole	SAMPLED			0																					
451	46.20618827	-89.83555451	21	Birch Lake	Vilas	7/20/2016	JLW & CMB	451	2	Rock	Pole	SAMPLED			0																					
452	46.20567527	-89.83555604	20	Birch Lake	Vilas	7/20/2016	JLW & CMB	452	3	Sand	Pole	SAMPLED			0																					
453	46.22670712	-89.8347541	188	Birch Lake	Vilas	7/20/2016	JLW & CMB	453	2	Sand	Pole	SAMPLED			1														1							
454	46.22619412	-89.83475564	187	Birch Lake	Vilas	7/20/2016	JLW & CMB	454	8	Muck	Pole	SAMPLED			2																				2		
455	46.22568113	-89.83475718	186	Birch Lake	Vilas	7/20/2016	JLW & CMB	455	14	Muck	Pole	SAMPLED			0																					
456	46.22516813	-89.83475872	185	Birch Lake	Vilas	7/20/2016	JLW & CMB	456	17			DEEP																									
457	46.22465513	-89.83476026	184	Birch Lake	Vilas	7/20/2016	JLW & CMB	457	20			DEEP																									
458	46.22414213	-89.8347618	171	Birch Lake	Vilas	7/20/2016	JLW & CMB	458	23			DEEP																									
459	46.22362914	-89.83476333	166	Birch Lake	Vilas	7/20/2016	JLW & CMB	459	19			DEEP																									
460	46.22311614	-89.83476487	159	Birch Lake	Vilas	7/20/2016	JLW & CMB	460	12	Sand	Pole	SAMPLED			0																					
461	46.22260314	-89.83476641	151	Birch Lake	Vilas	7/20/2016	JLW & CMB	461	8	Sand	Pole	SAMPLED			0																					
462	46.22209015	-89.83476795	156	Birch Lake	Vilas	7/20/2016	JLW & CMB	462	22			DEEP																									
463	46.22157715	-89.83476949	141	Birch Lake	Vilas	7/20/2016	JLW & CMB	463	21			DEEP																									
464	46.22106415	-89.83477103	136	Birch Lake	Vilas	7/20/2016	JLW & CMB	464	6	Sand	Pole	SAMPLED			1															1						
465	46.22055115	-89.83477257	132	Birch Lake	Vilas	7/20/2016	JLW & CMB	465	7	Sand	Pole	SAMPLED			0																					
466	46.22003815	-89.83477411	127	Birch Lake	Vilas	7/20/2016	JLW & CMB	466	7	Sand	Pole	SAMPLED			1																				1		
467	46.21952516	-89.83477565	116	Birch Lake	Vilas	7/20/2016	JLW & CMB	467	5	Sand	Pole	SAMPLED			2									1						1				1		
468	46.21901216	-89.83477718	111	Birch Lake	Vilas	7/20/2016	JLW & CMB	468	6	Sand	Pole	SAMPLED			2									1										1		
469	46.21849916	-89.83477872	105	Birch Lake	Vilas	7/20/2016	JLW & CMB	469	8	Sand	Pole	SAMPLED			1				1															1		
470	46.21798616	-89.83478026	109	Birch Lake	Vilas	7/20/2016	JLW & CMB	470	17			DEEP																									
471	46.21747317	-89.8347818	0	Birch Lake	Vilas	7/20/2016		471	0			DEEP																									
472	46.21696017	-89.83478334	0	Birch Lake	Vilas	7/20/2016		472	0			DEEP																									

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
473	46.21644717	-89.83478488	0	Birch Lake	Vilas	7/20/2016		473	0			DEEP																									
474	46.21593417	-89.83478642	0	Birch Lake	Vilas	7/20/2016		474	0			DEEP																									
475	46.21542117	-89.83478795	0	Birch Lake	Vilas	7/20/2016		475	0			DEEP																									
476	46.21490818	-89.83478949	0	Birch Lake	Vilas	7/20/2016		476	0			DEEP																									
477	46.21439518	-89.83479103	0	Birch Lake	Vilas	7/20/2016		477	0			DEEP																									
478	46.21388218	-89.83479257	0	Birch Lake	Vilas	7/20/2016		478	0			DEEP																									
479	46.21336918	-89.83479411	0	Birch Lake	Vilas	7/20/2016		479	0			DEEP																									
480	46.21285618	-89.83479565	0	Birch Lake	Vilas	7/20/2016		480	0			DEEP																									
481	46.21234318	-89.83479718	0	Birch Lake	Vilas	7/20/2016		481	0			DEEP																									
482	46.21183019	-89.83479872	0	Birch Lake	Vilas	7/20/2016		482	0			DEEP																									
483	46.21131719	-89.83480026	0	Birch Lake	Vilas	7/20/2016		483	0			DEEP																									
484	46.21080419	-89.8348018	3	Birch Lake	Vilas	7/20/2016	JLW & CMB	484	30			DEEP																									
485	46.21029119	-89.83480334	6	Birch Lake	Vilas	7/20/2016	JLW & CMB	485	22			DEEP																									
486	46.20977819	-89.83480487	7	Birch Lake	Vilas	7/20/2016	JLW & CMB	486	23			DEEP																									
487	46.20926519	-89.83480641	10	Birch Lake	Vilas	7/20/2016	JLW & CMB	487	23			DEEP																									
488	46.2087522	-89.83480795	11	Birch Lake	Vilas	7/20/2016	JLW & CMB	488	0			DEEP																									
489	46.2082392	-89.83480949	0	Birch Lake	Vilas	7/20/2016		489	0			DEEP																									
490	46.2077262	-89.83481103	14	Birch Lake	Vilas	7/20/2016	JLW & CMB	490	0			DEEP																									
491	46.2072132	-89.83481256	17	Birch Lake	Vilas	7/20/2016	JLW & CMB	491	0			DEEP																									
492	46.2067002	-89.8348141	22	Birch Lake	Vilas	7/20/2016	JLW & CMB	492	20			DEEP																									
493	46.2061872	-89.83481564	19	Birch Lake	Vilas	7/20/2016	JLW & CMB	493	2	Sand	Pole	SAMPLED			0																					
494	46.22619305	-89.8340165	180	Birch Lake	Vilas	7/20/2016	JLW & CMB	494	5	Sand	Pole	SAMPLED			2															1					2		
495	46.22568006	-89.83401804	181	Birch Lake	Vilas	7/20/2016	JLW & CMB	495	17			DEEP																									
496	46.22516706	-89.83401959	182	Birch Lake	Vilas	7/20/2016	JLW & CMB	496	20			DEEP																									
497	46.22465406	-89.83402114	183	Birch Lake	Vilas	7/20/2016	JLW & CMB	497	17			DEEP																									
498	46.22414106	-89.83402268	172	Birch Lake	Vilas	7/20/2016	JLW & CMB	498	21			DEEP																									
499	46.22362807	-89.83402423	165	Birch Lake	Vilas	7/20/2016	JLW & CMB	499	24			DEEP																									
500	46.22311507	-89.83402577	160	Birch Lake	Vilas	7/20/2016	JLW & CMB	500	29			DEEP																									
501	46.22260207	-89.83402732	150	Birch Lake	Vilas	7/20/2016	JLW & CMB	501	20			DEEP																									
502	46.22208907	-89.83402887	147	Birch Lake	Vilas	7/20/2016	JLW & CMB	502	0			DEEP																									
503	46.22157608	-89.83403041	145	Birch Lake	Vilas	7/20/2016	JLW & CMB	503	0			DEEP																									
504	46.22106308	-89.83403196	142	Birch Lake	Vilas	7/20/2016	JLW & CMB	504	6	Sand	Pole	SAMPLED			2							1								2					1		
505	46.22055008	-89.8340335	133	Birch Lake	Vilas	7/20/2016	JLW & CMB	505	0			NONNAVIGABLE (PLANTS)	hardstem																									
506	46.22003708	-89.83403505	126	Birch Lake	Vilas	7/20/2016	JLW & CMB	506	14	Muck	Pole	SAMPLED			0																					
507	46.21952409	-89.83403659	117	Birch Lake	Vilas	7/20/2016	JLW & CMB	507	20			DEEP																									
508	46.21901109	-89.83403814	118	Birch Lake	Vilas	7/20/2016	JLW & CMB	508	20			DEEP																									
509	46.21849809	-89.83403969	104	Birch Lake	Vilas	7/20/2016	JLW & CMB	509	20			DEEP																									
510	46.21798509	-89.83404123	0	Birch Lake	Vilas	7/20/2016		510	0			DEEP																									
511	46.2174721	-89.83404278	0	Birch Lake	Vilas	7/20/2016		511	0			DEEP																									
512	46.2169591	-89.83404432	0	Birch Lake	Vilas	7/20/2016		512	0			DEEP																									
513	46.2164461	-89.83404587	0	Birch Lake	Vilas	7/20/2016		513	0			DEEP																									
514	46.2159331	-89.83404741	0	Birch Lake	Vilas	7/20/2016		514	0			DEEP																									
515	46.2154201	-89.83404896	0	Birch Lake	Vilas	7/20/2016		515	0			DEEP																									
516	46.21490711	-89.8340505	0	Birch Lake	Vilas	7/20/2016		516	0			DEEP																									
517	46.21439411	-89.83405205	0	Birch Lake	Vilas	7/20/2016		517	0			DEEP																									
518	46.21388111	-89.83405359	0	Birch Lake	Vilas	7/20/2016		518	0			DEEP																									
519	46.21336811	-89.83405514	55	Birch Lake	Vilas	7/20/2016	JLW & CMB	519	28			DEEP																									
520	46.21285511	-89.83405668	54	Birch Lake	Vilas	7/20/2016	JLW & CMB	520	23			DEEP																									
521	46.21234211	-89.83405823	51	Birch Lake	Vilas	7/20/2016	JLW & CMB	521	22			DEEP																									
522	46.21182912	-89.83405977	0	Birch Lake	Vilas	7/20/2016		522	0			DEEP																									
523	46.21131612	-89.83406132	0	Birch Lake	Vilas	7/20/2016		523	0			DEEP																									
524	46.21080312	-89.83406286	4	Birch Lake	Vilas	7/20/2016	JLW & CMB	524	16			DEEP																									
525	46.21029012	-89.83406441	5	Birch Lake	Vilas	7/20/2016	JLW & CMB	525	5	Rock	Pole	SAMPLED			0																					
526	46.20977712	-89.83406595	8	Birch Lake	Vilas	7/20/2016	JLW & CMB	526	11	Rock	Pole	SAMPLED			0																					
527	46.20926412	-89.8340675	9	Birch Lake	Vilas	7/20/2016	JLW & CMB	527	10	Sand	Pole	SAMPLED			0																					
528	46.20875113	-89.83406904	12	Birch Lake	Vilas	7/20/2016	JLW & CMB	528	7	Sand	Pole	SAMPLED			0																					
529	46.20823813	-89.83407059	13	Birch Lake	Vilas	7/20/2016	JLW & CMB	529	20			DEEP																									
530	46.20772513	-89.83407213	15	Birch Lake	Vilas	7/20/2016	JLW & CMB	530	20			DEEP																									
531	46.20721213	-89.83407368	16	Birch Lake	Vilas	7/20/2016	JLW & CMB	531	9	Sand	Pole	SAMPLED			0																					

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
532	46.20669913	-89.83407522	18	Birch Lake	Vilas	7/20/2016	JLW & CMB	532	5	Sand	Pole	SAMPLED			0																					
533	46.22567898	-89.83327891	179	Birch Lake	Vilas	7/20/2016	JLW & CMB	533	4	Sand	Pole	SAMPLED			1													1	1							
534	46.22516598	-89.83328046	178	Birch Lake	Vilas	7/20/2016	JLW & CMB	534	5	Sand	Pole	SAMPLED			2														2						1		
535	46.22465299	-89.83328202	177	Birch Lake	Vilas	7/20/2016	JLW & CMB	535	17			DEEP																									
536	46.22413999	-89.83328357	173	Birch Lake	Vilas	7/20/2016	JLW & CMB	536	23			DEEP																									
537	46.22362699	-89.83328512	164	Birch Lake	Vilas	7/20/2016	JLW & CMB	537	22			DEEP																									
538	46.22311399	-89.83328667	161	Birch Lake	Vilas	7/20/2016	JLW & CMB	538	0			DEEP																									
539	46.222601	-89.83328823	148	Birch Lake	Vilas	7/20/2016	JLW & CMB	539	0			DEEP																									
540	46.222088	-89.83328978	146	Birch Lake	Vilas	7/20/2016	JLW & CMB	540	15	Muck	Pole	SAMPLED			0																					
541	46.221575	-89.83329133	144	Birch Lake	Vilas	7/20/2016	JLW & CMB	541	6	Sand	Pole	SAMPLED			1																				1		
542	46.221062	-89.83329288	143	Birch Lake	Vilas	7/20/2016	JLW & CMB	542	0			NONNAVIGABLE (PLANTS)	hardstem																							
543	46.22054901	-89.83329444	134	Birch Lake	Vilas	7/20/2016	JLW & CMB	543	0			NONNAVIGABLE (PLANTS)	harstem																							
544	46.22003601	-89.83329599	125	Birch Lake	Vilas	7/20/2016	JLW & CMB	544	7	Muck	Pole	SAMPLED			0																					
545	46.21952301	-89.83329754	120	Birch Lake	Vilas	7/20/2016	JLW & CMB	545	27			DEEP																									
546	46.21901001	-89.83329909	119	Birch Lake	Vilas	7/20/2016	JLW & CMB	546	23			DEEP																									
547	46.21849702	-89.83330065	103	Birch Lake	Vilas	7/20/2016	JLW & CMB	547	23			DEEP																									
548	46.21798402	-89.8333022	0	Birch Lake	Vilas	7/20/2016		548	0			DEEP																									
549	46.21747102	-89.83330375	0	Birch Lake	Vilas	7/20/2016		549	0			DEEP																									
550	46.21695802	-89.8333053	83	Birch Lake	Vilas	7/20/2016	JLW & CMB	550	31			DEEP																									
551	46.21644502	-89.83330686	81	Birch Lake	Vilas	7/20/2016	JLW & CMB	551	25			DEEP																									
552	46.21593203	-89.83330841	82	Birch Lake	Vilas	7/20/2016	JLW & CMB	552	0			DEEP																									
553	46.21541903	-89.83330996	68	Birch Lake	Vilas	7/20/2016	JLW & CMB	553	30			DEEP																									
554	46.21490603	-89.83331151	67	Birch Lake	Vilas	7/20/2016	JLW & CMB	554	27			DEEP																									
555	46.21439303	-89.83331306	61	Birch Lake	Vilas	7/20/2016	JLW & CMB	555	26			DEEP																									
556	46.21388003	-89.83331462	60	Birch Lake	Vilas	7/20/2016	JLW & CMB	556	21			DEEP																									
557	46.21336704	-89.83331617	56	Birch Lake	Vilas	7/20/2016	JLW & CMB	557	7	Sand	Pole	SAMPLED			1														1						1		
558	46.21285404	-89.83331772	53	Birch Lake	Vilas	7/20/2016	JLW & CMB	558	4	Sand	Pole	SAMPLED			1																1					
559	46.21234104	-89.83331927	52	Birch Lake	Vilas	7/20/2016	JLW & CMB	559	3	Sand	Pole	SAMPLED			1				1		1															
560	46.21182804	-89.83332082	50	Birch Lake	Vilas	7/20/2016	JLW & CMB	560	22			DEEP																									
561	46.21131504	-89.83332238	0	Birch Lake	Vilas	7/20/2016		561	0			DEEP																									
562	46.21080204	-89.83332393	37	Birch Lake	Vilas	7/20/2016	JLW & CMB	562	23			DEEP																									
563	46.2251649	-89.83254133	176	Birch Lake	Vilas	7/20/2016	JLW & CMB	563	3	Sand	Pole	SAMPLED			0																					
564	46.22465191	-89.83254289	175	Birch Lake	Vilas	7/20/2016	JLW & CMB	564	5	Sand	Pole	SAMPLED			1																				1		
565	46.22413891	-89.83254445	174	Birch Lake	Vilas	7/20/2016	JLW & CMB	565	11	Sand	Pole	SAMPLED			0																					
566	46.22362591	-89.83254601	163	Birch Lake	Vilas	7/20/2016	JLW & CMB	566	8	Muck	Pole	SAMPLED			0																					
567	46.22311291	-89.83254757	162	Birch Lake	Vilas	7/20/2016	JLW & CMB	567	4	Sand	Pole	SAMPLED			1																		1			
568	46.22259992	-89.83254913	149	Birch Lake	Vilas	7/20/2016	JLW & CMB	568	4	Sand	Pole	SAMPLED			0																					
569	46.22054793	-89.83255537	135	Birch Lake	Vilas	7/20/2016	JLW & CMB	569	0			NONNAVIGABLE (PLANTS)	hardstem																							
570	46.22003493	-89.83255693	124	Birch Lake	Vilas	7/20/2016	JLW & CMB	570	7	Sand	Pole	SAMPLED			0																					
571	46.21952193	-89.83255849	121	Birch Lake	Vilas	7/20/2016	JLW & CMB	571	19			DEEP																									
572	46.21900893	-89.83256005	102	Birch Lake	Vilas	7/20/2016	JLW & CMB	572	17			DEEP																									
573	46.21849594	-89.83256161	98	Birch Lake	Vilas	7/20/2016	JLW & CMB	573	22			DEEP																									
574	46.21798294	-89.83256317	92	Birch Lake	Vilas	7/20/2016	JLW & CMB	574	23			DEEP																									
575	46.21746994	-89.83256473	91	Birch Lake	Vilas	7/20/2016	JLW & CMB	575	19			DEEP																									
576	46.21695694	-89.83256629	84	Birch Lake	Vilas	7/20/2016	JLW & CMB	576	6	Muck	Pole	SAMPLED			1														1						1		
577	46.21644394	-89.83256785	80	Birch Lake	Vilas	7/20/2016	JLW & CMB	577	6	Sand	Pole	SAMPLED			1						1															
578	46.21593095	-89.8325694	70	Birch Lake	Vilas	7/20/2016	JLW & CMB	578	7	Sand	Pole	SAMPLED			0																					
579	46.21541795	-89.83257096	69	Birch Lake	Vilas	7/20/2016	JLW & CMB	579	5	Sand	Pole	SAMPLED			1																1					
580	46.21490495	-89.83257252	66	Birch Lake	Vilas	7/20/2016	JLW & CMB	580	5	Sand	Pole	SAMPLED			1						1															
581	46.21439195	-89.83257408	62	Birch Lake	Vilas	7/20/2016	JLW & CMB	581	6	Muck	Pole	SAMPLED			1	1					1									1					1		
582	46.21387895	-89.83257564	59	Birch Lake	Vilas	7/20/2016	JLW & CMB	582	6	Muck	Pole	SAMPLED			1						1														1		
583	46.21336596	-89.8325772	57	Birch Lake	Vilas	7/20/2016	JLW & CMB	583	4	Sand	Pole	SAMPLED			1																1					
584	46.21131396	-89.83258343	49	Birch Lake	Vilas	7/20/2016	JLW & CMB	584	22			DEEP																									
585	46.21080096	-89.83258499	48	Birch Lake	Vilas	7/20/2016	JLW & CMB	585	23			DEEP																									
586	46.21028797	-89.83258655	38	Birch Lake	Vilas	7/20/2016	JLW & CMB	586	23			DEEP																									
587	46.20977497	-89.83258811	39	Birch Lake	Vilas	7/20/2016	JLW & CMB	587	19			DEEP																									
588	46.20926197	-89.83258967	40	Birch Lake	Vilas	7/20/2016	JLW & CMB	588	13	Sand	Pole	SAMPLED			0																					
589	46.20874897	-89.83259123	41	Birch Lake	Vilas	7/20/2016	JLW & CMB	589	14	Sand	Pole	SAMPLED			0																					
590	46.22003384	-89.83181787	123	Birch Lake	Vilas	7/20/2016	JLW & CMB	590	0			NONNAVIGABLE (PLANTS)	hardstem																							

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elodea canadensis	Isoetes spp.	Myriophyllum sibiricum	Myriophyllum tenellum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton gramineus	Potamogeton richardsonii	Potamogeton robbinsii	Schoenoplectus acutus	Sparganium fluctuans	Utricularia vulgaris	Vallisneria americana	Freshwater sponge	Filamentous algae
591	46.21952085	-89.83181944	122	Birch Lake	Vilas	7/20/2016	JLW & CMB	591	0			NONNAVIGABLE (PLANTS)																									
592	46.21900785	-89.831821	100	Birch Lake	Vilas	7/20/2016	JLW & CMB	592	6	Muck	Pole	SAMPLED			0																					
593	46.21849485	-89.83182257	99	Birch Lake	Vilas	7/20/2016	JLW & CMB	593	0			NONNAVIGABLE (PLANTS)																									
594	46.21798185	-89.83182414	93	Birch Lake	Vilas	7/20/2016	JLW & CMB	594	0			NONNAVIGABLE (PLANTS)																									
595	46.21746886	-89.8318257	90	Birch Lake	Vilas	7/20/2016	JLW & CMB	595	0			NONNAVIGABLE (PLANTS)																									
596	46.21695586	-89.83182727	85	Birch Lake	Vilas	7/20/2016	JLW & CMB	596	4	Sand	Pole	SAMPLED			1							1										1					
597	46.21644286	-89.83182884	79	Birch Lake	Vilas	7/20/2016	JLW & CMB	597	4	Sand	Pole	SAMPLED			1					1									1								
598	46.21592986	-89.8318304	71	Birch Lake	Vilas	7/20/2016	JLW & CMB	598	0			NONNAVIGABLE (PLANTS)																									
599	46.21541686	-89.83183197	72	Birch Lake	Vilas	7/20/2016	JLW & CMB	599	0			NONNAVIGABLE (PLANTS)																									
600	46.21490387	-89.83183353	65	Birch Lake	Vilas	7/20/2016	JLW & CMB	600	3	Sand	Pole	SAMPLED			1																	1					
601	46.21439087	-89.8318351	63	Birch Lake	Vilas	7/20/2016	JLW & CMB	601	4	Sand	Pole	SAMPLED			1														1			1					
602	46.21387787	-89.83183666	58	Birch Lake	Vilas	7/20/2016	JLW & CMB	602	3	Sand	Pole	SAMPLED			1																	1					
603	46.21079988	-89.83184606	47	Birch Lake	Vilas	7/20/2016	JLW & CMB	603	8	Sand	Pole	SAMPLED			0																						
604	46.21028688	-89.83184762	46	Birch Lake	Vilas	7/20/2016	JLW & CMB	604	12	Sand	Pole	SAMPLED			0																						
605	46.20977388	-89.83184919	45	Birch Lake	Vilas	7/20/2016	JLW & CMB	605	7	Sand	Pole	SAMPLED			0																						
606	46.20926088	-89.83185076	44	Birch Lake	Vilas	7/20/2016	JLW & CMB	606	20			DEEP																									
607	46.20874789	-89.83185232	43	Birch Lake	Vilas	7/20/2016	JLW & CMB	607	20			DEEP																									
608	46.20823489	-89.83185389	42	Birch Lake	Vilas	7/20/2016	JLW & CMB	608	19			DEEP																									
609	46.21900676	-89.83108196	101	Birch Lake	Vilas	7/20/2016	JLW & CMB	609	2	Sand	Pole	SAMPLED			1					1												1					
610	46.21849376	-89.83108353	97	Birch Lake	Vilas	7/20/2016	JLW & CMB	610	3	Sand	Pole	SAMPLED			1																	1					
611	46.21798076	-89.83108511	94	Birch Lake	Vilas	7/20/2016	JLW & CMB	611	3	Sand	Pole	SAMPLED			1														1								
612	46.21746777	-89.83108668	89	Birch Lake	Vilas	7/20/2016	JLW & CMB	612	4	Sand	Pole	SAMPLED			1										1												
613	46.21695477	-89.83108825	86	Birch Lake	Vilas	7/20/2016	JLW & CMB	613	4	Sand	Pole	SAMPLED			1																	1					
614	46.21644177	-89.83108982	78	Birch Lake	Vilas	7/20/2016	JLW & CMB	614	3	Sand	Pole	SAMPLED			1					1		1															
615	46.21592877	-89.8310914	73	Birch Lake	Vilas	7/20/2016	JLW & CMB	615	0			NONNAVIGABLE (PLANTS)																									
616	46.21541577	-89.83109297	74	Birch Lake	Vilas	7/20/2016	JLW & CMB	616	3	Sand	Pole	SAMPLED			1																	1					
617	46.21490278	-89.83109454	64	Birch Lake	Vilas	7/20/2016	JLW & CMB	617	3	Sand	Pole	SAMPLED			0																						
618	46.21849267	-89.8303445	96	Birch Lake	Vilas	7/20/2016	JLW & CMB	618	2	Sand	Pole	SAMPLED			0																						
619	46.21797967	-89.83034608	95	Birch Lake	Vilas	7/20/2016	JLW & CMB	619	3	Sand	Pole	SAMPLED			1																	1					
620	46.21746667	-89.83034765	88	Birch Lake	Vilas	7/20/2016	JLW & CMB	620	5	Muck	Pole	SAMPLED			1																	1	1				
621	46.21695367	-89.83034923	87	Birch Lake	Vilas	7/20/2016	JLW & CMB	621	4	Sand	Pole	SAMPLED			1							1															
622	46.21644068	-89.83035081	77	Birch Lake	Vilas	7/20/2016	JLW & CMB	622	3	Sand	Pole	SAMPLED			1							1															
623	46.21592768	-89.83035239	76	Birch Lake	Vilas	7/20/2016	JLW & CMB	623	3	Sand	Pole	SAMPLED			1							1															
624	46.21541468	-89.83035397	75	Birch Lake	Vilas	7/20/2016	JLW & CMB	624	2	Sand	Pole	SAMPLED			1							1												1			

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole/Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elocharis palustris	Elodea canadensis	Elodea nuttallii	Heteranthera dubia	Isoetes spp.	Myriophyllum sibiricum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton foliosus	Potamogeton gramineus	Potamogeton natans	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton vaseyi	Potamogeton zosteriformis	Schoenoplectus acutus	Schoenoplectus subterminalis	Sparganium fluctuans	Utricularia intermedia	Utricularia minor	Utricularia vulgaris	Vallisneria americana	Chara sp. 2
1	46.249425	-89.853424	66	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	1	0			NONNAVIGABLE (PLANTS)																																					0
2	46.249424	-89.852905	65	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	2	4	Muck	Pole	SAMPLED			2											1			1														1		1		0
3	46.249424	-89.852386	64	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	3	0			NONNAVIGABLE (PLANTS)																																				0
4	46.249064	-89.852387	63	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	4	2	Muck	Pole	SAMPLED			2				1							1			1	1					1									1		1	1		0
5	46.240064	-89.852411	188	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	5	0			NONNAVIGABLE (PLANTS)																																				0
6	46.249063	-89.851868	67	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	6	5	Muck	Pole	SAMPLED			2		1												1										1		1					1				0
7	46.248703	-89.851869	62	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	7	0			NONNAVIGABLE (PLANTS)																																				0
8	46.240423	-89.851891	185	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	8	0			NONNAVIGABLE (PLANTS)																																				0
9	46.240063	-89.851892	187	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	9	0			NONNAVIGABLE (PLANTS)																																				0
10	46.239703	-89.851893	190	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	10	0			NONNAVIGABLE (PLANTS)																																				0
11	46.239343	-89.851894	195	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	11	0			NONNAVIGABLE (PLANTS)																																				0
12	46.238983	-89.851895	197	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	12	0			NONNAVIGABLE (PLANTS)																																				0
13	46.249062	-89.851349	68	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	13	5	Muck	Pole	SAMPLED			2				1				1			1			1										1		1									0
14	46.248702	-89.851350	61	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	14	5	Muck	Pole	SAMPLED			2											1			1									1	1		1	1				1				0
15	46.248342	-89.851351	53	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	15	4	Muck	Pole	SAMPLED			2				1	2				1			1			1										1	1							1			0
16	46.247982	-89.851352	52	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	16	0			NONNAVIGABLE (PLANTS)																																				0
17	46.240422	-89.851373	184	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	17	0			NONNAVIGABLE (PLANTS)																																				0
18	46.240062	-89.851374	186	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	18	0			NONNAVIGABLE (PLANTS)																																				0
19	46.239702	-89.851375	192	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	19	0			NONNAVIGABLE (PLANTS)																																				0
20	46.239342	-89.851375	199	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	20	0			NONNAVIGABLE (PLANTS)																																				0
21	46.238982	-89.851376	200	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	21	0			NONNAVIGABLE (PLANTS)																																				0
22	46.249062	-89.850830	69	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	22	4	Muck	Pole	SAMPLED			2				1				1		1	1			1									1		1							1			0
23	46.248702	-89.850831	60	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	23	7	Muck	Pole	SAMPLED			1																					1													0
24	46.248342	-89.850832	54	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	24	7	Muck	Pole	SAMPLED			1																						1													0
25	46.247982	-89.850833	51	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	25	5	Muck	Pole	SAMPLED			2								1						1									1									1			0
26	46.247622	-89.850834	36	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	26	4	Muck	Pole	SAMPLED			2													1												1									0
27	46.247262	-89.850835	37	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	27	3	Muck	Pole	SAMPLED			3	1			3						1				1													1							0
28	46.246902	-89.850836	38	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	28	3	Muck	Pole	SAMPLED			2				2										1																				0
29	46.241862	-89.850850	175	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	29	2	Muck	Pole	SAMPLED			2				1									1	1	1			1				1									1	1			0
30	46.241502	-89.850851	177	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	30	0			NONNAVIGABLE (PLANTS)																																				0
31	46.240782	-89.850853	180	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	31	0			NONNAVIGABLE (PLANTS)																																				0
32	46.240422	-89.850854	183	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	32	0			NONNAVIGABLE (PLANTS)																																				0
33	46.240062	-89.850855	182	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	33	3	Muck	Pole	SAMPLED			3																									3						1		1		0
34	46.239702	-89.850856	193	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	34	0			NONNAVIGABLE (PLANTS)																																				0
35	46.239342	-89.850857	202	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	35	0			NONNAVIGABLE (PLANTS)																																				0
36	46.238982	-89.850858	205	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	36	0			NONNAVIGABLE (PLANTS)																																				0
37	46.249061	-89.850311	70	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	37	2	Sand	Pole	SAMPLED			2				2					1		1						1								1									0
38	46.248701	-89.850312	59	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	38	9	Muck	Pole	SAMPLED			0																																		0
39	46.248341	-89.850313	55	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	39	10	Muck	Pole	SAMPLED			0																																		0
40	46.247981	-89.850314	50	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	40	8	Muck	Pole	SAMPLED			2												2																						0
41	46.247621	-89.850315	35	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	41	8	Muck	Pole	SAMPLED			2												2																						0
42	46.247261	-89.850316	40	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	42	7	Muck	Pole	SAMPLED			0																																		0
43	46.246901	-89.850317	39	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	43	8	Muck	Pole	SAMPLED			0																																		0
44	46.246541	-89.850318	45	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	44	4	Muck	Pole	SAMPLED			2														1						1		1		2		1						1	0
45	46.242581	-89.850329	172	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	45	3	Muck	Pole	SAMPLED			2													1												2									0
46	46.242221	-89.850330	173	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	46	4	Muck	Pole	SAMPLED			2																								1	2							1			0
47	46.241861	-89.850331	174	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	47	5	Muck	Pole	SAMPLED			3																									3									0
48	46.241501	-89.850332	176	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	48	5	Muck	Pole	SAMPLED			2																									2									0
49	46.241141	-89.850333	178	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	49	0			NONNAVIGABLE (PLANTS)																																				0
50	46.240781	-89.850334	179	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	50	3	Muck	Pole	SAMPLED			2																					1									1		1		0
51	46.240421	-89.850335	181	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	51	3	Muck	Pole	SAMPLED			3																									3							1		0
52	46.240061	-89.850336	189	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	52	3	Muck	Pole	SAMPLED			3													1												3							1		0
53	46.239701	-89.850337	191	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	53	4	Muck	Pole	SAMPLED			1											1			1																				0
54	46.239341	-89.850338	203	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	54	0			NONNAVIGABLE (PLANTS)																																				0
55	46.238981	-89.850339	206	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	55	0			NONNAVIGABLE (PLANTS)																																				0
56	46.238621	-89.850340	208	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	56	0			NONNAVIGABLE (PLANTS)																																				0
57	46.249060	-89.849792	58	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	57	4	Muck	Pole	SAMPLED			1											1			1		1				1		1									1		1		0
58	46.248700	-89.849793	57	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	58	11	Muck	Pole	SAMPLED			0																																		0
59	46.248340	-89.849794	56	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	59	11			DEEP																																						0
60	46.247980	-89.849795	49	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	60	11	Muck	Pole	SAMPLED			0																																		0
61	46.247620	-89.849796	34	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	61	11	Muck	Pole	SAMPLED			0																																		0
62	46.247260	-89.849797	41	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	62	12	Muck	Pole	SAMPLED			0																																		0
63	46.246900	-89.849798	44	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	63	10	Muck	Pole	SAMPLED			0																																		0
64	46.246540	-89.849799	46	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	64	6	Muck	Pole	SAMPLED			1											1	1									1									1				0
65	46.242940	-89.849809	171	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	65	2	Sand	Pole	SAMPLED			2		1	1															1							1					1		2		0
66	46.242580	-89.849810	170	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	66	5	Muck	Pole	SAMPLED			3																									3									0
67	46.242220	-89.849811	169	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	67	5	Muck	Pole	SAMPLED			2																	1								2									0
68	46.241860	-89.849812	168	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	68	5	Muck	Pole	SAMPLED			3																									3									0
69	46.241500	-89.849813	167	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	69	6	Muck	Pole	SAMPLED			3																									3									0
70	46.241140	-89.849814	166	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	70	5	Muck	Pole	SAMPLED			3																									3							1		0
71	46.240780	-89.849815	165	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	71	3	Muck	Pole	SAMPLED			2				1			1						1	1										2							1		1		0
72	46.240420	-89.849816	164	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	72	3	Muck	Pole	SAMPLED			3																									3								1	0
73	46.240060	-89.849817	225	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	73	4	Muck	Pole	SAMPLED			3																									3									0

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole/Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Elocharis palustris	Elodea canadensis	Elodea nuttallii	Heteranthera dubia	Isoetes spp.	Myriophyllum sibiricum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton foliosus	Potamogeton gramineus	Potamogeton natans	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton vaseyi	Potamogeton zosteriformis	Schoenoplectus acutus	Schoenoplectus subterminalis	Sparganium fluctuans	Utricularia intermedia	Utricularia minor	Utricularia vulgaris	Vallisneria americana	Chara sp. 2
74	46.239700	-89.849818	194	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	74	4	Muck	Pole	SAMPLED			3																							3								1		0
75	46.239340	-89.849819	204	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	75	0			NONNAVIGABLE (PLANTS)																																				0
76	46.238980	-89.849820	207	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	76	0			NONNAVIGABLE (PLANTS)																																				0
77	46.238620	-89.849821	209	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	77	0			NONNAVIGABLE (PLANTS)																																				0
78	46.238260	-89.849822	211	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	78	0			NONNAVIGABLE (PLANTS)																																				0
79	46.237900	-89.849823	213	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	79	0			NONNAVIGABLE (PLANTS)																																				0
80	46.249420	-89.849273	27	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	80	4	Sand	Pole	SAMPLED			2				1					1		1												1					1		1		1	0
81	46.249060	-89.849274	28	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	81	7	Sand	Pole	SAMPLED			1											1																					1	0
82	46.248700	-89.849275	29	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	82	13	Muck	Pole	SAMPLED			0																																	0
83	46.248340	-89.849276	71	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	83	13			DEEP																																				0
84	46.247980	-89.849277	48	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	84	13	Muck	Pole	SAMPLED			0																																	0
85	46.247620	-89.849278	33	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	85	13	Muck	Pole	SAMPLED			0																																	0
86	46.247260	-89.849279	42	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	86	11	Muck	Pole	SAMPLED			0																																	0
87	46.246900	-89.849280	43	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	87	8	Muck	Pole	SAMPLED			0																																	0
88	46.246540	-89.849280	47	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	88	3	Muck	Pole	SAMPLED			2		1														1							1									0
89	46.242940	-89.849290	156	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	89	5	Muck	Pole	SAMPLED			2																									2									0
90	46.242580	-89.849291	157	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	90	5	Muck	Pole	SAMPLED			2																		2															0
91	46.242220	-89.849292	158	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	91	6	Muck	Pole	SAMPLED			2																									2									0
92	46.241860	-89.849293	159	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	92	6	Muck	Pole	SAMPLED			2																									2									0
93	46.241500	-89.849294	160	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	93	6	Muck	Pole	SAMPLED			1																									1									0
94	46.241140	-89.849295	161	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	94	5	Muck	Pole	SAMPLED			3																							1		3									0
95	46.240780	-89.849296	162	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	95	5	Muck	Pole	SAMPLED			3																									3					1				0
96	46.240420	-89.849297	163	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	96	5	Muck	Pole	SAMPLED			3																									3									0
97	46.240060	-89.849298	226	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	97	5	Muck	Pole	SAMPLED			3																									3									0
98	46.239700	-89.849299	224	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	98	4	Muck	Pole	SAMPLED			3																									3					1	1	1		0
99	46.239340	-89.849300	196	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	99	3	Muck	Pole	SAMPLED			2																									2					1				0
100	46.238980	-89.849301	198	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	100	4	Muck	Pole	SAMPLED			2			2											1										1					1	1	1		0
101	46.238620	-89.849302	210	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	101	0			NONNAVIGABLE (PLANTS)																																				0
102	46.238260	-89.849303	212	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	102	0			NONNAVIGABLE (PLANTS)																																				0
103	46.237900	-89.849304	214	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	103	0			NONNAVIGABLE (PLANTS)																																				0
104	46.249779	-89.848753	26	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	104	0			NONNAVIGABLE (PLANTS)																																				0
105	46.249419	-89.848754	25	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	105	3	Sand	Pole	SAMPLED			2	1			2								1																					0
106	46.249059	-89.848755	24	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	106	7	Muck	Pole	SAMPLED			1												1																					0
107	46.248699	-89.848756	23	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	107	14	Muck	Pole	SAMPLED			0																																	0
108	46.248339	-89.848757	30	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	108	13	Muck	Pole	SAMPLED			0																																	0
109	46.247979	-89.848758	31	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	109	13	Muck	Pole	SAMPLED			0																																	0
110	46.247619	-89.848759	32	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	110	10	Sand	Pole	SAMPLED			0																																	0
111	46.243299	-89.848771	155	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	111	4	Muck	Pole	SAMPLED			2																									2					1				0
112	46.242939	-89.848771	154	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	112	5	Muck	Pole	SAMPLED			3																									3									0
113	46.242579	-89.848772	153	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	113	5	Muck	Pole	SAMPLED			2				2																					1					1				0
114	46.242219	-89.848773	152	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	114	7	Muck	Pole	SAMPLED			0																																	0
115	46.241859	-89.848774	151	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	115	7	Muck	Pole	SAMPLED			1																									1									0
116	46.241499	-89.848775	150	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	116	7	Muck	Pole	SAMPLED			1				1																					1									0
117	46.241139	-89.848776	149	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	117	8	Muck	Pole	SAMPLED			0																																	0
118	46.240779	-89.848777	229	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	118	6	Muck	Pole	SAMPLED			0																																	0
119	46.240419	-89.848778	228	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	119	5	Muck	Pole	SAMPLED			2																									2					1	1	1		0
120	46.240059	-89.848779	227	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	120	5	Muck	Pole	SAMPLED			3																									3									0
121	46.239699	-89.848780	223	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	121	4	Muck	Pole	SAMPLED			3																									3									0
122	46.239339	-89.848781	222	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	122	4	Muck	Pole	SAMPLED			3																									3							1		0
123	46.238979	-89.848782	221	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	123	3	Muck	Pole	SAMPLED			2																									2							1		0
124	46.238619	-89.848783	201	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	124	3	Muck	Pole	SAMPLED			2														1						1									1	2			0
125	46.238259	-89.848784	216	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	125	0			NONNAVIGABLE (PLANTS)																																				0
126	46.237899	-89.848785	215	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	126	0			NONNAVIGABLE (PLANTS)																																				0
127	46.249778	-89.848234	21	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	127	3	Muck	Pole	SAMPLED			2				2															1													0
128	46.249418	-89.848235	20	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	128	8	Sand	Pole	SAMPLED			0																																	0
129	46.249058	-89.848236	19	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	129	12	Muck	Pole	SAMPLED			0																																	0
130	46.248698	-89.848237	22	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	130	17			DEEP																																				0
131	46.248338	-89.848238	72	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	131	13			DEEP																																				0
132	46.247978	-89.848239	73	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	132	14			DEEP																																				0
133	46.247618	-89.848240	74	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	133	13			DEEP																																				0
134	46.247258	-89.848241	75	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	134	3	Sand	Pole	SAMPLED			2											2	1																	1					0
135	46.246898	-89.848242	78	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	135	3	Muck	Pole	SAMPLED			3				3														1								1				1		1		0
136	46.242578	-89.848254	144	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	136	4	Sand	Pole	SAMPLED			3				3														1											1		1	1	0
137	46.242218	-89.848255	145	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	137	7	Muck	Pole	SAMPLED			0																																	0
138	46.241858	-89.848256	146	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	138	9	Muck	Pole	SAMPLED			0																																	0
139	46.241498	-89.848257	147	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	139	10	Muck	Pole	SAMPLED			0																																	0
140	46.241138	-89.848258	148	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	140	9	Muck	Pole	SAMPLED			0																																	0
141	46.240778	-89.848259	230	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	141	8	Muck	Pole	SAMPLED			0																																	0
142	46.240418	-89.848260	231	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	142	5	Muck	Pole	SAMPLED			3																							1		2						1	1	1	0
143	46.240058	-89.848261	232	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	143	4	Muck	Pole	SAMPLED			3																									3								1	0
144	46.239698	-89.848262	233	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	144	3	Muck	Pole	SAMPLED			3																									3									0
145	46.239338	-89.848263	234	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	145	3	Muck	Pole	SAMPLED			3																									3									0
146	46.238978	-89.848264	220	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	146	4	Muck	Pole	SAMPLED			3																									3							1		0

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole/Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Eleocharis palustris	Elodea canadensis	Elodea nuttallii	Heteranthera dubia	Isoetes spp.	Myriophyllum sibiricum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton foliosus	Potamogeton gramineus	Potamogeton natans	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton vaseyi	Potamogeton zosteriformis	Schoenoplectus acutus	Schoenoplectus subterminalis	Sparganium fluctuans	Utricularia intermedia	Utricularia minor	Utricularia vulgaris	Vallisneria americana	Chara sp. 2
147	46.238618	-89.848265	217	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	147	3	Muck	Pole	SAMPLED			3																						3							1	1			0
148	46.238258	-89.848266	218	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	148	0			NONNAVIGABLE (PLANTS)																																					0
149	46.249778	-89.847715	16	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	149	6	Muck	Pole	SAMPLED			1											1																						0
150	46.249418	-89.847716	17	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	150	17		Rope	SAMPLED			0																																	0
151	46.249058	-89.847717	18	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	151	30			DEEP																																				0
152	46.248698	-89.847718	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	152	0			DEEP																																				0
153	46.248338	-89.847719	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	153	0			DEEP																																				0
154	46.247978	-89.847720	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	154	0			DEEP																																				0
155	46.247618	-89.847721	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	155	0			DEEP																																				0
156	46.247258	-89.847722	76	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	156	18			DEEP																																				0
157	46.246898	-89.847723	77	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	157	17			DEEP																																				0
158	46.246538	-89.847724	79	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	158	17			DEEP																																				0
159	46.246178	-89.847725	80	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	159	8	Sand	Pole	SAMPLED			0																																	0
160	46.245818	-89.847726	83	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	160	4	Sand	Pole	SAMPLED			1				1				1			1									1		1	1	1					1			0
161	46.245458	-89.847727	84	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	161	4	Sand	Pole	SAMPLED			2	1										1									1				2				1				0
162	46.242938	-89.847734	143	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	162	3	Muck	Pole	SAMPLED			2				2													1			1												0
163	46.242578	-89.847735	142	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	163	6	Muck	Pole	SAMPLED			2																								2									0
164	46.242218	-89.847736	141	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	164	11	Muck	Pole	SAMPLED			1			1								1											1	1									0
165	46.241858	-89.847737	140	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	165	9	Muck	Pole	SAMPLED			0																																	0
166	46.241498	-89.847738	139	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	166	10	Muck	Pole	SAMPLED			0																																	0
167	46.241138	-89.847739	240	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	167	9	Muck	Pole	SAMPLED			0																																	0
168	46.240778	-89.847740	239	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	168	8	Muck	Pole	SAMPLED			0																																	0
169	46.240418	-89.847741	238	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	169	6	Muck	Pole	SAMPLED			2																																1	0
170	46.240058	-89.847742	237	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	170	4	Muck	Pole	SAMPLED			2																1					1			2						1	1	1	0
171	46.239698	-89.847743	236	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	171	3	Muck	Pole	SAMPLED			3																								3									0
172	46.239338	-89.847744	235	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	172	3	Muck	Pole	SAMPLED			3																								3									0
173	46.238978	-89.847745	219	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	173	0			NONNAVIGABLE (PLANTS)																																					0
174	46.249777	-89.847196	15	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	174	4	Sand	Pole	SAMPLED			2		1									1					1							1	1						1			0
175	46.249417	-89.847197	14	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	175	16		Rope	SAMPLED			0																																	0
176	46.249057	-89.847198	12	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	176	25			DEEP																																				0
177	46.248697	-89.847199	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	177	0			DEEP																																				0
178	46.248337	-89.847200	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	178	0			DEEP																																				0
179	46.247977	-89.847201	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	179	0			DEEP																																				0
180	46.247617	-89.847202	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	180	0			DEEP																																				0
181	46.247257	-89.847203	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	181	0			DEEP																																				0
182	46.246897	-89.847204	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	182	0			DEEP																																				0
183	46.246537	-89.847205	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	183	0			DEEP																																				0
184	46.246177	-89.847206	81	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	184	16			DEEP																																				0
185	46.245817	-89.847207	82	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	185	22			DEEP																																				0
186	46.245457	-89.847208	85	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	186	16			DEEP																																				0
187	46.245097	-89.847209	86	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	187	11			DEEP																																				0
188	46.244737	-89.847210	87	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	188	4	Sand	Pole	SAMPLED			0																																	0
189	46.242937	-89.847215	134	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	189	4	Sand	Pole	SAMPLED			2				2					1		1								1													0
190	46.242577	-89.847216	135	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	190	7	Muck	Pole	SAMPLED			1																								1									0
191	46.242217	-89.847217	136	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	191	8	Muck	Pole	SAMPLED			0																																	0
192	46.241857	-89.847218	137	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	192	8	Muck	Pole	SAMPLED			1												1																					0
193	46.241497	-89.847219	138	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	193	9	Muck	Pole	SAMPLED			0																																	0
194	46.241137	-89.847220	241	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	194	9	Muck	Pole	SAMPLED			0																																	0
195	46.240777	-89.847221	242	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	195	7	Muck	Pole	SAMPLED			1																						1											0
196	46.240417	-89.847222	243	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	196	7	Muck	Pole	SAMPLED			1																						1											0
197	46.240057	-89.847223	244	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	197	5	Muck	Pole	SAMPLED			2		1								1											1			1					1		1	0
198	46.239697	-89.847224	245	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	198	0			NONNAVIGABLE (PLANTS)																																					0
199	46.249056	-89.846679	13	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	199	15	Muck	Pole	SAMPLED			0																																	0
200	46.248696	-89.846680	11	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	200	25			DEEP																																				0
201	46.248336	-89.846681	10	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	201	28			DEEP																																				0
202	46.247976	-89.846682	7	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	202	32			DEEP																																				0
203	46.247616	-89.846683	6	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	203	31			DEEP																																				0
204	46.247256	-89.846684	3	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	204	32			DEEP																																				0
205	46.246896	-89.846685	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	205	0			DEEP																																				0
206	46.246536	-89.846686	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	206	0			DEEP																																				0
207	46.246176	-89.846687	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	207	0			DEEP																																				0
208	46.245816	-89.846688	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	208	0			DEEP																																				0
209	46.245456	-89.846689	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	209	0			DEEP																																				0
210	46.245096	-89.846690	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	210	0			DEEP																																				0
211	46.244736	-89.846691	88	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	211	16			DEEP																																				0
212	46.244376	-89.846692	89	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	212	4	Sand	Pole	SAMPLED			2		1	1					1		1							1				1	1		1	1							1	0
213	46.24293618	-89.84669607	133	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	213	3	Sand	Pole	SAMPLED			1				1																													0
214	46.24257618	-89.84669707	132	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	214	4	Muck	Pole	SAMPLED			2																	1					1			2									0
215	46.24221618	-89.84669808	131	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	215	6	Muck	Pole	SAMPLED			1																								1									0
216	46.24185619	-89.84669908	130	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	216	6	Muck	Pole	SAMPLED			3												3																					0
217	46.24149619	-89.84670008	129	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	217	8	Muck	Pole	SAMPLED			0																																	0
218	46.24113619	-89.84670108	128	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	218	8	Muck	Pole	SAMPLED			0																																	0
219	46.2407762	-89.84670209	249	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	219	8	Muck	Pole	SAMPLED			1																							1										0

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole/Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Eleocharis palustris	Elodea canadensis	Elodea nuttallii	Heteranthera dubia	Isoetes spp.	Myriophyllum sibiricum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton foliosus	Potamogeton gramineus	Potamogeton natans	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton vaseyi	Potamogeton zosteriformis	Schoenoplectus acutus	Schoenoplectus subterminalis	Sparganium fluctuans	Utricularia intermedia	Utricularia minor	Utricularia vulgaris	Vallisneria americana	Chara sp. 2
220	46.2404162	-89.84670309	248	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	220	8	Muck	Pole	SAMPLED			0																																	0
221	46.2400562	-89.84670409	247	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	221	6	Muck	Pole	SAMPLED			1				1																													0
222	46.2396962	-89.8467051	246	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	222	0			NONNAVIGABLE (PLANTS)																																					0
223	46.24833544	-89.84616212	9	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	223	5	Muck	Pole	SAMPLED			2																									2								0
224	46.24797544	-89.84616313	8	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	224	16		Rope	SAMPLED			0																																	0
225	46.24761544	-89.84616414	5	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	225	16		Rope	SAMPLED			0																																	0
226	46.24725545	-89.84616514	4	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	226	19		Rope	SAMPLED			0																																	0
227	46.24689545	-89.84616615	2	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	227	30		Rope	DEEP																																					0
228	46.24653545	-89.84616716	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	228	0			DEEP																																					0
229	46.24617546	-89.84616816	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	229	0			DEEP																																					0
230	46.24581546	-89.84616917	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	230	0			DEEP																																					0
231	46.24545546	-89.84617017	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	231	0			DEEP																																					0
232	46.24509546	-89.84617118	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	232	0			DEEP																																					0
233	46.24473547	-89.84617219	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	233	0			DEEP																																					0
234	46.24437547	-89.84617319	90	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	234	16			DEEP																																					0
235	46.24401547	-89.8461742	91	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	235	3	Muck	Pole	SAMPLED	plants in way got as close as i could get		2							1	1									1								1	1			1		1		0
236	46.24293548	-89.84617722	122	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	236	3	Sand	Pole	SAMPLED			2				2																								1					0
237	46.24257549	-89.84617822	123	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	237	3	Sand	Pole	SAMPLED			2				2	1				1																							0
238	46.24221549	-89.84617923	124	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	238	7	Muck	Pole	SAMPLED			3												3																					0
239	46.24185549	-89.84618024	125	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	239	7	Muck	Pole	SAMPLED			3												3																					0
240	46.24149549	-89.84618124	126	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	240	8	Muck	Pole	SAMPLED			0																																	0
241	46.2411355	-89.84618225	127	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	241	9	Muck	Pole	SAMPLED			0																																	0
242	46.2407755	-89.84618325	250	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	242	10	Muck	Pole	SAMPLED			0																																	0
243	46.2404155	-89.84618426	251	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	243	9	Muck	Pole	SAMPLED			0																																	0
244	46.2400555	-89.84618527	252	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	244	6	Muck	Pole	SAMPLED			2				1						1			1											2								0
245	46.23969551	-89.84618627	253	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	245	0			NONNAVIGABLE (PLANTS)																																					0
246	46.24689475	-89.84564726	1	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	246	12	Muck	Pole	SAMPLED			0																																	0
247	46.24653475	-89.84564827	337	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	247	13			DEEP																																					0
248	46.24617476	-89.84564928	336	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	248	16			DEEP																																					0
249	46.24581476	-89.84565029	335	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	249	16			DEEP																																					0
250	46.24545476	-89.8456513	334	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	250	16			DEEP																																					0
251	46.24509477	-89.84565231	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	251	0			DEEP																																					0
252	46.24473477	-89.84565332	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	252	0			DEEP																																					0
253	46.24437477	-89.84565433	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	253	0			DEEP																																					0
254	46.24401477	-89.84565534	92	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	254	17			DEEP																																					0
255	46.24329478	-89.84565735	96	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	255	5	Muck	Pole	SAMPLED			2		1																							1							1		0
256	46.24293478	-89.84565836	97	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	256	6	Muck	Pole	SAMPLED			1																									1								0
257	46.24257479	-89.84565937	98	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	257	6	Muck	Pole	SAMPLED			2											1													1	1					1		1	1	0
258	46.24221479	-89.84566038	99	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	258	9	Muck	Pole	SAMPLED			0																																	0
259	46.24185479	-89.84566139	100	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	259	7	Muck	Pole	SAMPLED			3												3																					0
260	46.24149479	-89.8456624	101	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	260	8	Muck	Pole	SAMPLED			2												2																					0
261	46.2411348	-89.84566341	102	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	261	8	Muck	Pole	SAMPLED			1												1																					0
262	46.2407748	-89.84566442	264	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	262	9	Muck	Pole	SAMPLED			0																																	0
263	46.2404148	-89.84566543	256	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	263	10	Muck	Pole	SAMPLED			0																																	0
264	46.24005481	-89.84566644	254	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	264	8	Muck	Pole	SAMPLED			2												2																					0
265	46.23969481	-89.84566745	255	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	265	0			NONNAVIGABLE (PLANTS)																																					0
266	46.24509406	-89.84513343	333	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	266	11	Rock	Pole	SAMPLED			0																																	0
267	46.24473407	-89.84513445	332	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	267	14			DEEP																																					0
268	46.24437407	-89.84513546	331	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	268	17			DEEP																																					0
269	46.24401407	-89.84513647	93	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	269	23			DEEP																																					0
270	46.24365408	-89.84513748	94	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	270	11	Muck	Pole	SAMPLED			0																																	0
271	46.24329408	-89.8451385	95	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	271	9	Muck	Pole	SAMPLED			0																																	0
272	46.24293408	-89.84513951	108	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	272	9	Muck	Pole	SAMPLED			0																																	0
273	46.24257408	-89.84514052	107	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	273	9	Muck	Pole	SAMPLED			0																																	0
274	46.24221409	-89.84514154	106	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	274	9	Muck	Pole	SAMPLED			0																																	0
275	46.24185409	-89.84514255	105	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	275	8	Muck	Pole	SAMPLED			2												2																					0
276	46.24149409	-89.84514356	104	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	276	4	Sand	Pole	SAMPLED			2																	1								2								0
277	46.2411341	-89.84514457	103	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	277	4	Sand	Pole	SAMPLED			2																	1								1								0
278	46.2407741	-89.84514559	263	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	278	6	Sand	Pole	SAMPLED			1			1								1													1	1							0
279	46.2404141	-89.8451466	257	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	279	10	Muck	Pole	SAMPLED			0																																	0
280	46.2400541	-89.84514761	258	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	280	6	Sand	Pole	SAMPLED			1												1																			1		0
281	46.24437337	-89.84461659	330	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	281	5	Sand	Pole	SAMPLED			0																																	0
282	46.24401337	-89.84461761	328	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	282	16			DEEP																																					0
283	46.24365337	-89.84461862	327	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	283	18			DEEP																																					0
284	46.24329337	-89.84461964	121	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	284	12	Muck	Pole	SAMPLED			0																																	0
285	46.24293338	-89.84462066	109	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	285	11	Muck	Pole	SAMPLED			0																																	0
286	46.24257338	-89.84462167	110	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	286	12	Muck	Pole	SAMPLED			0																																	0
287	46.24221338	-89.84462269	111	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	287	10	Muck	Pole	SAMPLED			0																																	0
288	46.24185339	-89.84462371	112	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	288	9	Muck	Pole	SAMPLED			0																																	0
289	46.24149339	-89.84462472	113	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	289	4	Muck	Pole	SAMPLED			2				1							1									1					1						1		0
290	46.24113339	-89.84462574	114	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	290	3	Sand	Pole	SAMPLED			2					2														1								1					0
291	46.24077339	-89.84462675	262	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	291	3	Sand	Pole	SAMPLED			2					2														1					1	1						1	0
292	46.2404134	-89.84462777	261	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	292	4	Sand	Pole	SAMPLED			2										1		1																					1

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole/Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Eleocharis palustris	Elodea canadensis	Elodea nuttallii	Heteranthera dubia	Isoetes spp.	Myriophyllum sibiricum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton foliosus	Potamogeton gramineus	Potamogeton natans	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton vaseyi	Potamogeton zosteriformis	Schoenoplectus acutus	Schoenoplectus subterminalis	Sparganium fluctuans	Utricularia intermedia	Utricularia minor	Utricularia vulgaris	Vallisneria americana	Chara sp. 2
293	46.2400534	-89.84462879	260	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	293	12	Muck	Pole	SAMPLED			0																																	0
294	46.2396934	-89.8446298	259	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	294	4	Sand	Pole	SAMPLED			1				1							1												1	1	1								0
295	46.24401266	-89.84409874	329	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	295	3	Sand	Pole	SAMPLED			1	1										1			1				1			1		1							1		0
296	46.24365267	-89.84409976	326	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	296	5	Sand	Pole	SAMPLED			2																							2										0
297	46.24329267	-89.84410078	325	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	297	5	Sand	Pole	SAMPLED			2		1																1					2										0
298	46.24293267	-89.8441018	120	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	298	9	Sand	Pole	SAMPLED			0																																	0
299	46.24257267	-89.84410282	119	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	299	12			DEEP																																				0
300	46.24221268	-89.84410384	118	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	300	14			DEEP																																				0
301	46.24185268	-89.84410486	117	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	301	11			DEEP																																				0
302	46.24149268	-89.84410588	116	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	302	11	Muck	Pole	SAMPLED			0																																	0
303	46.24113269	-89.8441069	115	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	303	4	Sand	Pole	SAMPLED			2																									2										0
304	46.24077269	-89.84410792	265	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	304	3	Sand	Pole	SAMPLED			2					2			1			1	1					1									1							0
305	46.24041269	-89.84410894	266	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	305	7	Sand	Pole	SAMPLED			2												2																					0
306	46.24005269	-89.84410996	267	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	306	12	Muck	Pole	SAMPLED			0																																	0
307	46.2396927	-89.84411098	268	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	307	5	Sand	Pole	SAMPLED			2						1		1			1							1															0
308	46.2393327	-89.844112	269	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	308	2	Sand	Pole	SAMPLED			1					1						1				1								1				1						0
309	46.24329196	-89.84358193	324	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	309	3	Sand	Pole	SAMPLED			2				2														1									1						0
310	46.24293196	-89.84358295	323	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	310	4	Sand	Pole	SAMPLED			2		1		2		1					1																					1	0
311	46.24257197	-89.84358397	322	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	311	10	Muck	Pole	SAMPLED			0																																	0
312	46.24221197	-89.843585	278	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	312	14			DEEP																																				0
313	46.24185197	-89.84358602	277	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	313	18			DEEP																																				0
314	46.24149197	-89.84358704	276	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	314	18			DEEP																																				0
315	46.24113198	-89.84358806	275	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	315	12			DEEP																																				0
316	46.24077198	-89.84358909	274	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	316	12	Muck	Pole	SAMPLED			0																																	0
317	46.24041198	-89.84359011	273	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	317	10	Muck	Pole	SAMPLED			0																																	0
318	46.24005199	-89.84359113	272	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	318	14			DEEP																																				0
319	46.23969199	-89.84359216	271	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	319	11	Muck	Pole	SAMPLED			0																																	0
320	46.23933199	-89.84359318	270	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	320	2	Sand	Pole	SAMPLED			1				1				1		1								1													1		0
321	46.24257125	-89.84306512	321	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	321	4	Sand	Pole	SAMPLED			2		1																					2										0
322	46.24221126	-89.84306615	279	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	322	7	Sand	Pole	SAMPLED			1																		1														1		0
323	46.24185126	-89.84306717	280	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	323	11	Muck	Pole	SAMPLED			0																																	0
324	46.24149126	-89.8430682	281	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	324	11			DEEP																																				0
325	46.24113127	-89.84306923	282	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	325	17			DEEP																																				0
326	46.24077127	-89.84307025	283	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	326	22			DEEP																																				0
327	46.24041127	-89.84307128	284	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	327	21			DEEP																																				0
328	46.24005127	-89.84307231	285	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	328	23			DEEP																																				0
329	46.23969128	-89.84307333	286	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	329	14			DEEP																																				0
330	46.23933128	-89.84307436	287	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	330	3	Sand	Pole	SAMPLED			1					1					1		1						1				1									1		0
331	46.24257054	-89.84254627	320	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	331	3	Sand	Pole	SAMPLED			2											1			1					1							1				1	1		1		0
332	46.24221054	-89.8425473	319	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	332	6	Sand	Pole	SAMPLED			1																			1													1		0
333	46.24185055	-89.84254833	315	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	333	5	Sand	Pole	SAMPLED			2				2							1									1							1							0
334	46.24149055	-89.84254936	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	334	0			DEEP																																				0
335	46.24113055	-89.84255039	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	335	0			DEEP																																				0
336	46.24077056	-89.84255142	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	336	0			DEEP																																				0
337	46.24041056	-89.84255245	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	337	0			DEEP																																				0
338	46.24005056	-89.84255348	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	338	0			DEEP																																				0
339	46.23969056	-89.84255451	289	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	339	12			DEEP																																				0
340	46.23933057	-89.84255554	288	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	340	10	Muck	Pole	SAMPLED			0																																	0
341	46.24220983	-89.84202845	318	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	341	6	Muck	Pole	SAMPLED			1			1																					1										0
342	46.24184983	-89.84202949	316	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	342	9	Muck	Pole	SAMPLED			0																																	0
343	46.24148983	-89.84203052	314	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	343	10	Muck	Pole	SAMPLED			0																																	0
344	46.24112984	-89.84203155	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	344	0			DEEP																																				0
345	46.24076984	-89.84203259	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	345	0			DEEP																																				0
346	46.24040984	-89.84203362	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	346	0			DEEP																																				0
347	46.24004985	-89.84203465	0	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	347	0			DEEP																																				0
348	46.23968985	-89.84203569	290	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	348	16			DEEP																																				0
349	46.23932985	-89.84203672	291	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	349	15			DEEP																																				0
350	46.23896985	-89.84203775	292	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	350	2	Sand	Pole	SAMPLED			1															1	1																1		0
351	46.23860986	-89.84203879	293	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	351	0			TERRESTRIAL																																				0
352	46.24184911	-89.84151064	317	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	352	4	Sand	Pole	SAMPLED			1				1																			1		1								1	0
353	46.24148912	-89.84151168	313	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	353	9	Muck	Pole	SAMPLED			0																																	0
354	46.24112912	-89.84151272	311	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	354	11	Muck	Pole	SAMPLED			0																																	0
355	46.24076912	-89.84151375	310	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	355	12	Muck	Pole	SAMPLED			0																																	0
356	46.24040912	-89.84151479	306	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	356	12			DEEP																																				0
357	46.24004913	-89.84151583	305	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	357	12			DEEP																																				0
358	46.23968913	-89.84151686	302	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	358	13			DEEP																																				0
359	46.23932913	-89.8415179	299	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	359	15	Muck	Pole	SAMPLED			0																																	0
360	46.23896914	-89.84151894	298	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	360	11	Muck	Pole	SAMPLED			0																																	0
361	46.23860914	-89.84151997	294	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	361	6	Muck	Pole	SAMPLED			1												1						1							1									0
362	46.23824914	-89.84152101	295	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	362	2	Sand	Pole	SAMPLED			1				1							1			1	1																1		0
363	46.2411284	-89.84099388	312	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	363	2	Sand	Pole	SAMPLED			2						1																					1					1	0
364	46.2407684	-89.84099492	309	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	364	5	Sand	Pole	SAMPLED			2																1								2							1		0
365	46.2404084	-89.84099596	307	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	365	3	Sand	Pole	SAMPLED			2				2																													0

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole/Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum echinatum	Chara spp.	Eleocharis palustris	Elodea canadensis	Elodea nuttallii	Heteranthera dubia	Isoetes spp.	Myriophyllum sibiricum	Najas flexilis	Nitella spp.	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton foliosus	Potamogeton gramineus	Potamogeton natans	Potamogeton praelongus	Potamogeton pusillus	Potamogeton richardsonii	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton vaseyi	Potamogeton zosterformis	Schoenoplectus acutus	Schoenoplectus subterminalis	Sparganium fluctuans	Utricularia intermedia	Utricularia minor	Utricularia vulgaris	Vallisneria americana	Chara sp. 2
366	46.24004841	-89.840997	304	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	366	6	Muck	Pole	SAMPLED			1																	1																	0
367	46.23968841	-89.84099804	301	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	367	7	Muck	Pole	SAMPLED			0																																			0
368	46.23932841	-89.84099908	300	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	368	8	Muck	Pole	SAMPLED			0																																			0
369	46.23896842	-89.84100012	297	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	369	10	Muck	Pole	SAMPLED			0																																			0
370	46.23860842	-89.84100116	296	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	370	7	Muck	Pole	SAMPLED			0																																			0
371	46.24040768	-89.84047713	308	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	371	0			NONNAVIGABLE (PLANTS)																																							0
372	46.24004768	-89.84047817	303	Rainbow Lake	Vilas	7/20/2016	BTB & JMB	372	3	Sand	Pole	SAMPLED			2																															1			1	1			0

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole,Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum demersum	Chara spp.	Eriocaulon aquaticum	Isoetes spp.	Lemna trisulca	Myriophyllum sibiricum	Najas flexilis	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton berchtoldii	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton zosteriformis	Sparganium fluctuans	Utricularia minor	Utricularia vulgaris	Aquatic moss	Freshwater sponge
1	46.229434	-89.861004	41	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	1	0			NONNAVIGABLE (PLANTS)																											
2	46.229101	-89.861005	43	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	2	2	Muck	Pole	SAMPLED			2				1							1	1				1						1	
3	46.228768	-89.861006	70	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	3	2	Muck	Pole	SAMPLED			1											1	1										1	
4	46.228435	-89.861007	72	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	4	2	Muck	Pole	SAMPLED			2		1									2											1	
5	46.228102	-89.861008	102	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	5	2	Muck	Pole	SAMPLED			1										1	1	1										1	
6	46.227769	-89.861009	104	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	6	2	Muck	Pole	SAMPLED			1										1	1	1				1						1	
7	46.227436	-89.861009	133	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	7	3	Muck	Pole	SAMPLED			1											1					1						1	
8	46.227103	-89.861010	135	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	8	4	Muck	Pole	SAMPLED			1											1						1					1	
9	46.226770	-89.861011	160	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	9	3	Muck	Pole	SAMPLED			1				1							1											1	
10	46.226437	-89.861012	162	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	10	2	Muck	Pole	SAMPLED			1			1	1						1		1										1	
11	46.229434	-89.860525	40	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	11	4	Muck	Pole	SAMPLED			3				3							1						1						
12	46.229101	-89.860525	42	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	12	5	Muck	Pole	SAMPLED			3											1						1				1	1	1	
13	46.228768	-89.860526	69	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	13	6	Muck	Pole	SAMPLED			3																	3						
14	46.228435	-89.860527	71	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	14	6	Muck	Pole	SAMPLED			2																	2					1		
15	46.228102	-89.860528	101	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	15	6	Muck	Pole	SAMPLED			3																	3							1
16	46.227769	-89.860529	103	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	16	6	Muck	Pole	SAMPLED			2																	2					1	1	
17	46.227436	-89.860530	132	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	17	7	Muck	Pole	SAMPLED			3																	3					1		
18	46.227103	-89.860530	134	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	18	8	Muck	Pole	SAMPLED			3																	3							
19	46.226770	-89.860531	159	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	19	6	Muck	Pole	SAMPLED			3																	3			1		1	1	
20	46.226437	-89.860532	161	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	20	4	Muck	Pole	SAMPLED			1											1						1				1	1	
21	46.226104	-89.860533	188	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	21	0			NONNAVIGABLE (PLANTS)																											
22	46.229433	-89.860045	39	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	22	5	Muck	Pole	SAMPLED			3										1							2			1				
23	46.229100	-89.860046	44	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	23	8	Muck	Pole	SAMPLED			3																	3							1
24	46.228767	-89.860046	68	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	24	13	Muck	Pole	SAMPLED			0																						1		
25	46.228434	-89.860047	73	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	25	9	Muck	Pole	SAMPLED			0																						1		
26	46.228101	-89.860048	100	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	26	9	Muck	Pole	SAMPLED			1																	1							
27	46.227768	-89.860049	105	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	27	10	Muck	Pole	SAMPLED			0																								
28	46.227435	-89.860050	131	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	28	10	Muck	Pole	SAMPLED			0																								
29	46.227102	-89.860051	136	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	29	12	Muck	Pole	SAMPLED			0																								
30	46.226769	-89.860052	158	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	30	11	Muck	Pole	SAMPLED			0																								
31	46.226436	-89.860052	163	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	31	6	Muck	Pole	SAMPLED			3																	3							
32	46.226103	-89.860053	187	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	32	2	Muck	Pole	SAMPLED			2											1	1				1						1	
33	46.229432	-89.859565	38	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	33	5	Muck	Pole	SAMPLED			3													1				3							
34	46.229099	-89.859566	45	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	34	9	Muck	Pole	SAMPLED			1																	1							
35	46.228766	-89.859567	67	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	35	13	Muck	Pole	SAMPLED			0																								
36	46.228433	-89.859567	74	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	36	11	Muck	Pole	SAMPLED			0																								
37	46.228100	-89.859568	99	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	37	11	Muck	Pole	SAMPLED			0																								
38	46.227767	-89.859569	106	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	38	11	Muck	Pole	SAMPLED			0																								
39	46.227434	-89.859570	130	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	39	10	Muck	Pole	SAMPLED			0																								
40	46.227101	-89.859571	137	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	40	11	Muck	Pole	SAMPLED			0																								
41	46.226768	-89.859572	157	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	41	10	Muck	Pole	SAMPLED			0																								
42	46.226435	-89.859573	164	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	42	6	Muck	Pole	SAMPLED			2																	2							
43	46.226103	-89.859573	186	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	43	3	Muck	Pole	SAMPLED			2											1										1		1	
44	46.229432	-89.859085	37	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	44	5	Muck	Pole	SAMPLED			3																	3							
45	46.229099	-89.859086	46	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	45	5	Muck	Pole	SAMPLED			3		1															3							
46	46.228766	-89.859087	66	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	46	6	Muck	Pole	SAMPLED			3																	3					1		
47	46.228433	-89.859088	75	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	47	7	Muck	Pole	SAMPLED			3																	3							
48	46.228100	-89.859089	98	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	48	9	Muck	Pole	SAMPLED			0																								
49	46.227767	-89.859089	107	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	49	10	Muck	Pole	SAMPLED			0																								
50	46.227434	-89.859090	129	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	50	9	Muck	Pole	SAMPLED			1															1									
51	46.227101	-89.859091	138	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	51	10	Muck	Pole	SAMPLED			0																								
52	46.226768	-89.859092	156	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	52	10	Muck	Pole	SAMPLED			0																							1		
53	46.226435	-89.859093	165	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	53	7	Muck	Pole	SAMPLED			2																	2						1	
54	46.226102	-89.859094	185	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	54	4	Muck	Pole	SAMPLED			2											1						2							
55	46.229098	-89.858606	47	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	55	5	Muck	Pole	SAMPLED			V																	3							
56	46.228765	-89.858607	65	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	56	4	Muck	Pole	SAMPLED			3		1												1			2					1		
57	46.228432	-89.858608	76	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	57	5	Muck	Pole	SAMPLED			3		1															3					1		1
58	46.228099	-89.858609	97	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	58	8	Muck	Pole	SAMPLED			2																	2							
59	46.227766	-89.858610	108	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	59	10	Muck	Pole	SAMPLED			0																								

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole,Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum demersum	Chara spp.	Eriocaulon aquaticum	Isoetes spp.	Lemna trisulca	Myriophyllum sibiricum	Najas flexilis	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton berchtoldii	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton zosteriformis	Sparganium fluctuans	Utricularia minor	Utricularia vulgaris	Aquatic moss	Freshwater sponge
60	46.227433	-89.858610	128	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	60	9	Muck	Pole	SAMPLED			1															1		1							
61	46.227100	-89.858611	139	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	61	13	Muck	Pole	SAMPLED			1			1																					
62	46.226767	-89.858612	155	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	62	12	Muck	Pole	SAMPLED			0																								
63	46.226434	-89.858613	166	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	63	7	Muck	Pole	SAMPLED			3																	3							1
64	46.226101	-89.858614	179	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	64	0			NONNAVIGABLE (PLANTS)																												
65	46.229098	-89.858126	48	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	65	5	Muck	Pole	SAMPLED			3		1														3							1
66	46.228765	-89.858127	64	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	66	5	Muck	Pole	SAMPLED			3		1														3					2		1
67	46.228432	-89.858128	77	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	67	6	Muck	Pole	SAMPLED			3																3							
68	46.228099	-89.858129	96	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	68	8	Muck	Pole	SAMPLED			1															1								
69	46.227766	-89.858130	109	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	69	10	Muck	Pole	SAMPLED			0																								
70	46.227433	-89.858131	127	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	70	10	Muck	Pole	SAMPLED			0																								
71	46.227100	-89.858131	140	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	71	13	Muck	Pole	SAMPLED			0																								
72	46.226767	-89.858132	154	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	72	15	Muck	Pole	SAMPLED			0																								
73	46.226434	-89.858133	167	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	73	11	Muck	Pole	SAMPLED			0																							1	
74	46.226101	-89.858134	178	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	74	2	Muck	Pole	SAMPLED			3		1	1				1				3					1						1	
75	46.229430	-89.857646	36	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	75	5	Muck	Pole	SAMPLED			3																3						1	1
76	46.229097	-89.857646	49	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	76	4	Rock	Pole	SAMPLED			1								1								1		1					
77	46.228764	-89.857647	63	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	77	6	Muck	Pole	SAMPLED			3		1														3							
78	46.228431	-89.857648	78	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	78	10	Muck	Pole	SAMPLED			1										1													
79	46.228098	-89.857649	95	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	79	11	Muck	Pole	SAMPLED			0																								
80	46.227765	-89.857650	110	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	80	11	Muck	Pole	SAMPLED			0																								
81	46.227432	-89.857651	126	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	81	12	Muck	Pole	SAMPLED			0																							1	
82	46.227099	-89.857652	141	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	82	0			DEEP																											
83	46.226766	-89.857653	153	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	83	0			DEEP																											
84	46.226433	-89.857653	168	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	84	0			DEEP																											
85	46.226100	-89.857654	177	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	85	5	Muck	Pole	SAMPLED			3																3							
86	46.225767	-89.857655	180	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	86	2	Muck	Pole	SAMPLED			2			1							1	1	1			1							1	
87	46.229763	-89.857165	24	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	87	3	Muck	Pole	SAMPLED			3																3						1	1
88	46.229430	-89.857166	35	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	88	5	Muck	Pole	SAMPLED			3																3							
89	46.229097	-89.857167	50	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	89	4	Muck	Pole	SAMPLED			3																3							
90	46.228764	-89.857168	62	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	90	5	Muck	Pole	SAMPLED			2																2							
91	46.228431	-89.857168	79	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	91	10	Muck	Pole	SAMPLED			0																								
92	46.228098	-89.857169	94	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	92	12	Muck	Pole	SAMPLED			0																								
93	46.227765	-89.857170	111	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	93	15	Muck	Pole	SAMPLED			0																								
94	46.227432	-89.857171	125	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	94	0			DEEP																											
95	46.227099	-89.857172	142	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	95	0			DEEP																											
96	46.226766	-89.857173	152	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	96	0			DEEP																											
97	46.226433	-89.857174	169	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	97	0			DEEP																											
98	46.226100	-89.857174	176	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	98	8	Muck	Pole	SAMPLED			2																2							
99	46.225767	-89.857175	181	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	99	4	Muck	Pole	SAMPLED			2				2						1						2			1			1	
100	46.230095	-89.856684	23	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	100	5	Muck	Pole	SAMPLED			3										1						3							
101	46.229762	-89.856685	25	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	101	5	Muck	Pole	SAMPLED			3																3							
102	46.229429	-89.856686	34	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	102	5	Muck	Pole	SAMPLED			3																3							
103	46.229096	-89.856687	51	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	103	4	Muck	Pole	SAMPLED			3		2														2					1		1
104	46.228763	-89.856688	61	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	104	5	Muck	Pole	SAMPLED			3		1														3							
105	46.228430	-89.856689	80	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	105	11	Muck	Pole	SAMPLED			0																								
106	46.228097	-89.856689	93	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	106	14	Muck	Pole	SAMPLED			0																								
107	46.227764	-89.856690	112	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	107	0			DEEP																											
108	46.227431	-89.856691	124	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	108	0			DEEP																											
109	46.227098	-89.856692	143	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	109	0			DEEP																											
110	46.226765	-89.856693	151	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	110	0			DEEP																											
111	46.226432	-89.856694	170	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	111	0			DEEP																											
112	46.226099	-89.856695	175	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	112	8	Muck	Pole	SAMPLED			2																2							
113	46.225766	-89.856696	182	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	113	5	Muck	Pole	SAMPLED			3																3							
114	46.231759	-89.856200	6	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	114	0			NONNAVIGABLE (PLANTS)																												
115	46.231426	-89.856201	8	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	115	2	Sand	Pole	SAMPLED			1											1	1		1			1							
116	46.231093	-89.856202	10	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	116	2	Muck	Pole	SAMPLED			2										1	1	1					1					1	
117	46.230760	-89.856203	14	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	117	4	Muck	Pole	SAMPLED			3																3					1		1
118	46.230427	-89.856204	15	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	118	5	Muck	Pole	SAMPLED			3																3							1

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole;Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum demersum	Chara spp.	Eriocaulon aquaticum	Isoetes spp.	Lemna trisulca	Myriophyllum sibiricum	Najas flexilis	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton berchtoldii	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton zosteriformis	Sparganium fluctuans	Utricularia minor	Utricularia vulgaris	Aquatic moss	Freshwater sponge
119	46.230094	-89.856204	22	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	119	5	Muck	Pole	SAMPLED			3																3							
120	46.229761	-89.856205	26	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	120	5	Muck	Pole	SAMPLED			3																3							
121	46.229428	-89.856206	33	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	121	5	Muck	Pole	SAMPLED			3		1														3							
122	46.229095	-89.856207	52	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	122	4	Muck	Pole	SAMPLED			3		2											1			3					2		
123	46.228762	-89.856208	60	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	123	6	Muck	Pole	SAMPLED			3		1														3					1		1
124	46.228429	-89.856209	81	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	124	9	Muck	Pole	SAMPLED			0																							
125	46.228096	-89.856210	92	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	125	12	Muck	Pole	SAMPLED			0																							
126	46.227763	-89.856211	113	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	126	0			DEEP																											
127	46.227430	-89.856211	123	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	127	0			DEEP																											
128	46.227097	-89.856212	144	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	128	0			DEEP																											
129	46.226764	-89.856213	150	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	129	0			DEEP																											
130	46.226431	-89.856214	171	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	130	10	Muck	Pole	SAMPLED			1																1							
131	46.226098	-89.856215	174	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	131	6	Muck	Pole	SAMPLED			3																3					1		
132	46.225765	-89.856216	183	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	132	4	Muck	Pole	SAMPLED			3																3							
133	46.232425	-89.855718	3	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	133	0			TERRESTRIAL																											
134	46.232092	-89.855719	4	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	134	4	Muck	Pole	SAMPLED			2		1		2					1		1												
135	46.231759	-89.855720	5	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	135	4	Muck	Pole	SAMPLED			2			1	2							1				1							
136	46.231426	-89.855721	7	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	136	5	Muck	Pole	SAMPLED			3		1														3							
137	46.231093	-89.855722	9	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	137	5	Muck	Pole	SAMPLED			2																2							
138	46.230760	-89.855723	13	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	138	5	Muck	Pole	SAMPLED			3																3							
139	46.230427	-89.855724	16	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	139	4	Muck	Pole	SAMPLED			3																3							
140	46.230094	-89.855725	21	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	140	5	Muck	Pole	SAMPLED			3																3							
141	46.229761	-89.855725	27	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	141	4	Muck	Pole	SAMPLED			3																3							
142	46.229428	-89.855726	32	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	142	4	Muck	Pole	SAMPLED			3																3							
143	46.229095	-89.855727	53	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	143	5	Muck	Pole	SAMPLED			3																3							
144	46.228762	-89.855728	59	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	144	6	Muck	Pole	SAMPLED			3																3					1		1
145	46.228429	-89.855729	82	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	145	6	Muck	Pole	SAMPLED			3																3							1
146	46.228096	-89.855730	91	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	146	8	Muck	Pole	SAMPLED			3																2					1		
147	46.227763	-89.855731	114	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	147	9	Muck	Pole	SAMPLED			0																							
148	46.227430	-89.855732	122	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	148	10	Muck	Pole	SAMPLED			0																							
149	46.227097	-89.855732	145	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	149	8	Muck	Pole	SAMPLED			2																2					1		
150	46.226764	-89.855733	149	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	150	5	Muck	Pole	SAMPLED			3		1														3					1		
151	46.226431	-89.855734	172	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	151	4	Muck	Pole	SAMPLED			3		1														3							
152	46.226098	-89.855735	173	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	152	4	Muck	Pole	SAMPLED			3																3			1				1
153	46.225765	-89.855736	184	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	153	2	Muck	Pole	SAMPLED			1	1										1	1											
154	46.233090	-89.855237	1	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	154	1	Sand	Pole	SAMPLED	7-20-16		1												1								1			
155	46.232757	-89.855238	2	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	155	0			TERRESTRIAL																											
156	46.231092	-89.855242	11	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	156	4	Muck	Pole	SAMPLED			2				2					1	1							1						
157	46.230759	-89.855243	12	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	157	4	Muck	Pole	SAMPLED			3				3				1								1					1		
158	46.230426	-89.855244	17	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	158	3	Rock	Pole	SAMPLED			2				2	1	1			1							1							
159	46.230093	-89.855245	20	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	159	4	Muck	Pole	SAMPLED			3																3							1
160	46.229760	-89.855246	28	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	160	4	Muck	Pole	SAMPLED			3																3							1
161	46.229427	-89.855247	31	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	161	4	Muck	Pole	SAMPLED			3																3							1
162	46.229094	-89.855247	54	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	162	5	Muck	Pole	SAMPLED			3																3							1
163	46.228761	-89.855248	58	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	163	5	Muck	Pole	SAMPLED			3																3							
164	46.228428	-89.855249	83	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	164	5	Muck	Pole	SAMPLED			3																3					1		
165	46.228095	-89.855250	90	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	165	5	Muck	Pole	SAMPLED			3		2														2					1		
166	46.227762	-89.855251	115	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	166	5	Muck	Pole	SAMPLED			3		1														3							1
167	46.227429	-89.855252	121	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	167	4	Muck	Pole	SAMPLED			3		2														3							
168	46.227096	-89.855253	146	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	168	4	Muck	Pole	SAMPLED			2				2				1		1	1										1		
169	46.226763	-89.855254	148	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	169	2	Muck	Pole	SAMPLED			2		1	1								1	1											
170	46.230425	-89.854764	18	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	170	3	Muck	Pole	SAMPLED			2		1		2							1										1		
171	46.230092	-89.854765	19	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	171	4	Muck	Pole	SAMPLED			3				2												1			1		1		
172	46.229759	-89.854766	29	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	172	4	Muck	Pole	SAMPLED			3				3																	1		
173	46.229426	-89.854767	30	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	173	4	Muck	Pole	SAMPLED			2														1		2							1
174	46.229093	-89.854768	55	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	174	2	Rock	Pole	SAMPLED			1				1	1										1							
175	46.228760	-89.854768	57	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	175	4	Muck	Pole	SAMPLED			2		1		2												1							
176	46.228427	-89.854769	84	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	176	5	Muck	Pole	SAMPLED			3		1														3							
177	46.228094	-89.854770	89	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	177	5	Muck	Pole	SAMPLED			2																2							

Point Number	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	ID	Lake Name	County	Date	Field Crew	Point Number	Depth (ft)	Sediment	Pole,Rope	Comments	Notes	Nuisance	Total Rake Fullness	Brasenia schreberi	Bidens beckii	Ceratophyllum demersum	Chara spp.	Eriocaulon aquaticum	Isoetes spp.	Lemna trisulca	Myriophyllum sibiricum	Najas flexilis	Nuphar variegata	Nymphaea odorata	Pontederia cordata	Potamogeton amplifolius	Potamogeton berchtoldii	Potamogeton epihydrus	Potamogeton gramineus	Potamogeton robbinsii	Potamogeton spirillus	Potamogeton zosteriformis	Sparganium fluctuans	Utricularia minor	Utricularia vulgaris	Aquatic moss	Freshwater sponge
178	46.227761	-89.854771	116	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	178	5	Muck	Pole	SAMPLED			3																3							
179	46.227429	-89.854772	120	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	179	4	Muck	Pole	SAMPLED			3																3							1
180	46.227096	-89.854773	147	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	180	3	Muck	Pole	SAMPLED			2				2							1					1							
181	46.228760	-89.854289	56	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	181	3	Muck	Pole	SAMPLED			2				2							1												
182	46.228427	-89.854290	85	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	182	4	Muck	Pole	SAMPLED			3																3							
183	46.228094	-89.854290	88	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	183	4	Muck	Pole	SAMPLED			3																3							
184	46.227761	-89.854291	117	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	184	4	Muck	Pole	SAMPLED			3		1														3							
185	46.227428	-89.854292	119	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	185	3	Muck	Pole	SAMPLED			2				2							1												
186	46.228426	-89.853810	86	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	186	3	Muck	Pole	SAMPLED			1				1							1												
187	46.228093	-89.853811	87	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	187	4	Muck	Pole	SAMPLED			3				2									1				2						
188	46.227760	-89.853811	118	Tamarack Lake	Vilas	7/20/2016	TWH & CJF	188	3	Muck	Pole	SAMPLED			3				3																	1		