A

APPENDIX A

Public Participation Materials

Presentation Outline

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

Onterra LLC
Lake Management Planning

Onterra, LLC

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

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Lake Management Planning

Why create a lake management plan?

- To create a better understanding of the 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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Lake Management Planning

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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Lake Management Planning

Water Quality Analysis

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

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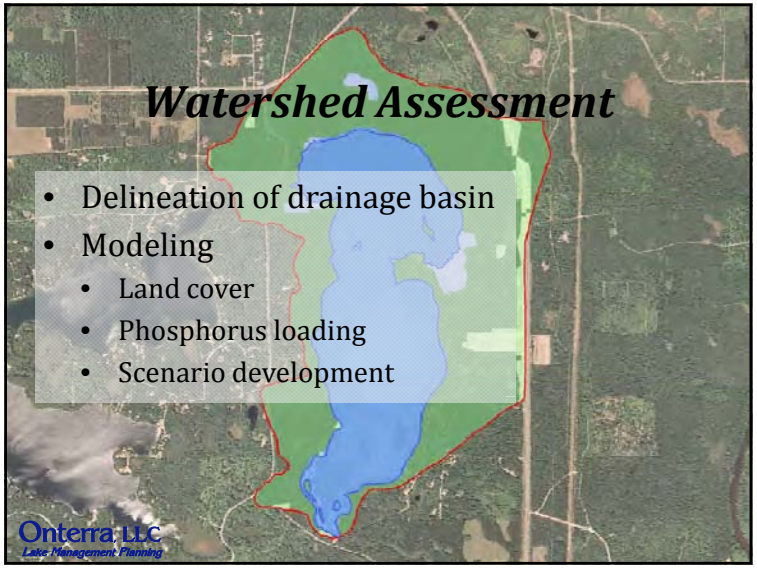
Lake Management Planning

Watershed Assessment

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



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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Curly-leaf pondweed Survey
  - Point-intercept survey
  - Aquatic plant community mapping
  - Eurasian water milfoil mapping

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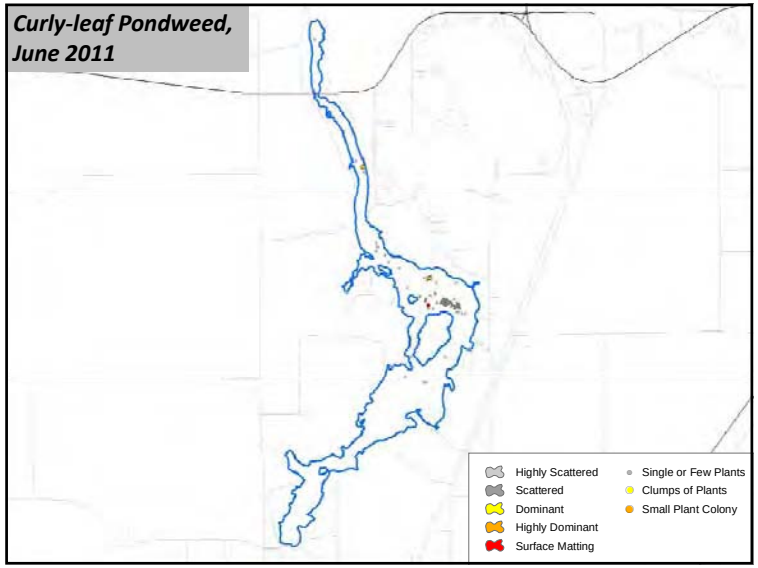
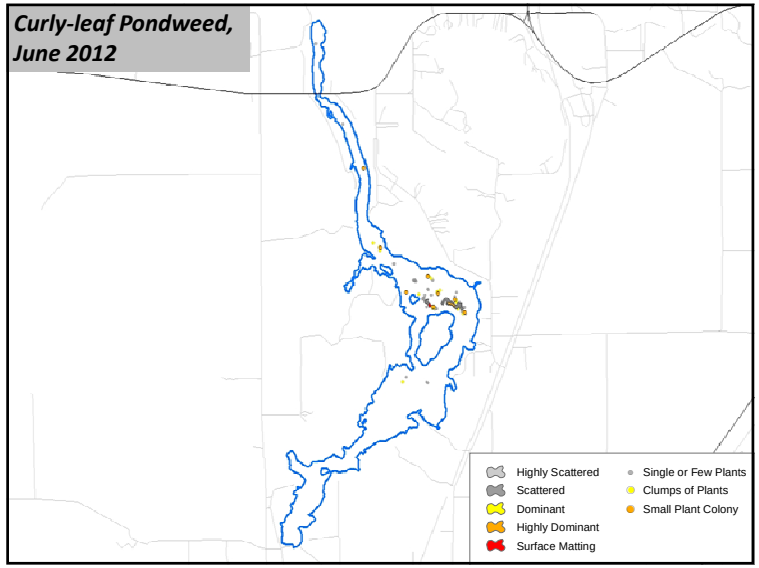
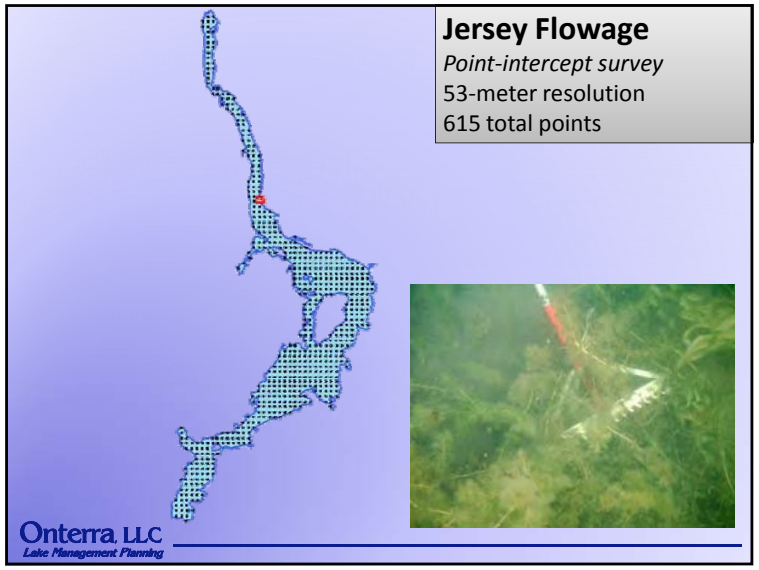
Non-native Aquatic Plants

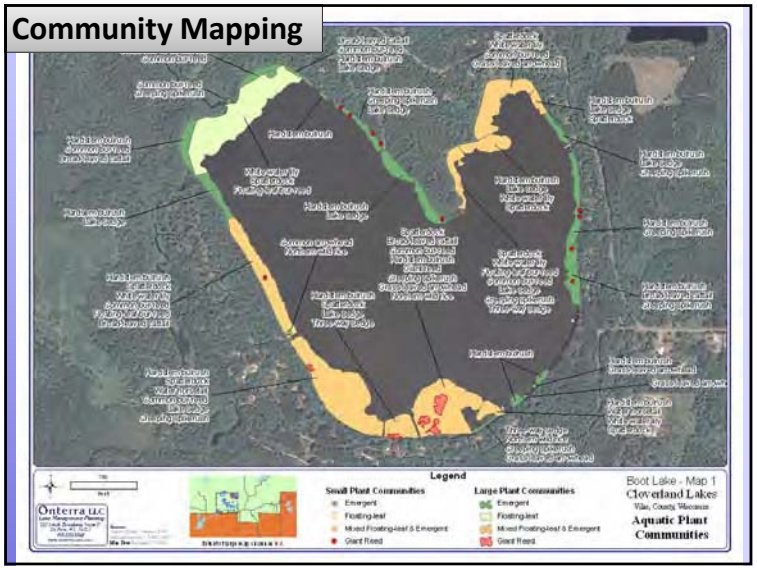
Curly-leaf Pondweed

Onterra LLC
Lake Management Planning






Jersey Flowage
Point-intercept survey
53-meter resolution
615 total points
Onterra LLC
Lake Management Planning


Community Mapping
Legend
Small Plant Communities
Large Plant Communities
Boot Lake - Map 1
Cloverland Lakes
Aquatic Plant Communities

Non-native Aquatic Plants
Eurasian Water Milfoil
First Documented in 2009
Onterra LLC
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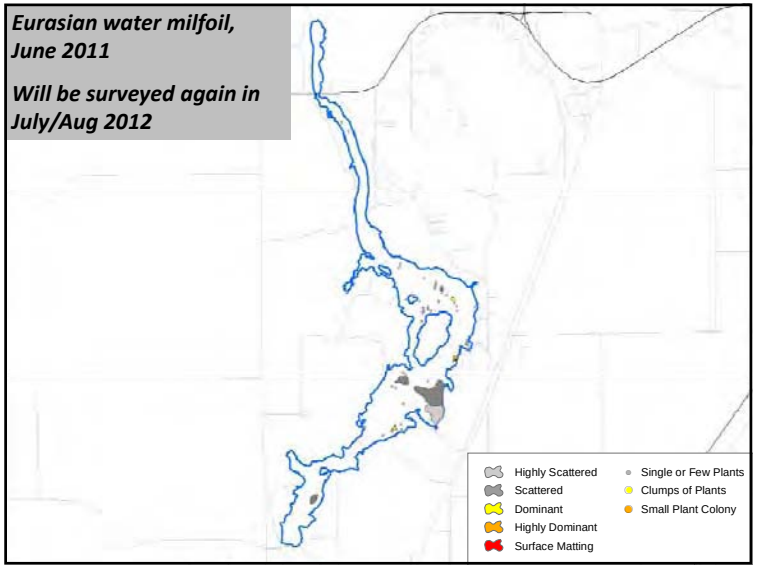
Eurasian water milfoil, June 2011
Will be surveyed again in July/Aug 2012
Highly Scattered
Scattered
Dominant
Highly Dominant
Surface Matting
Single or Few Plants
Clumps of Plants
Small Plant Colony

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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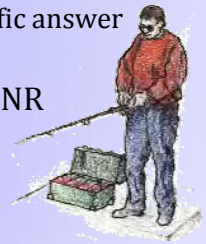
Stakeholder Survey

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



Onterra, LLC
Lake Management Planning

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

Onterra, LLC
Lake Management Planning

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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Lake Management Planning

Thank You

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

Wisconsin Lakes Partnership

Extension

WISCONSIN DEPT. OF NATURAL RESOURCES

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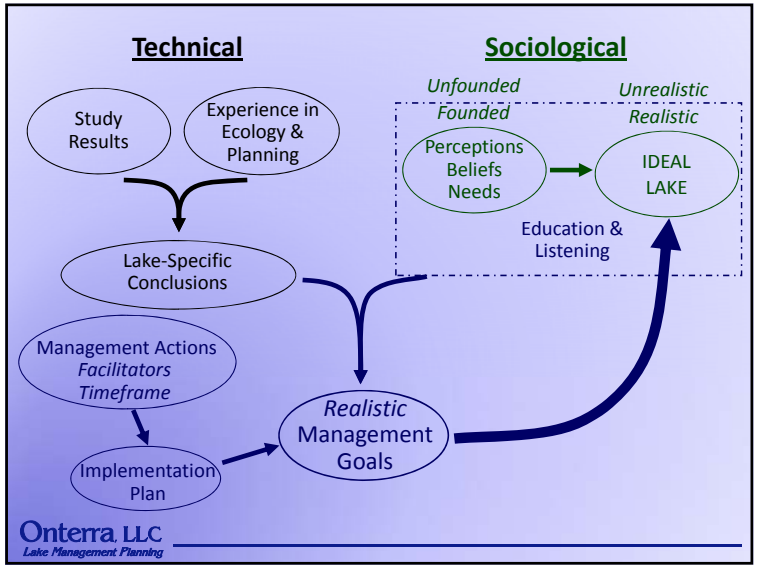
Lake Management Planning



Jersey Flowage Lake Management Planning Project

November 2012 Update

Submitted by: Dan Cibulka, Onterra, LLC

With the help of a Lake Management Planning Grant totaling over $20,000 from the Wisconsin Department of Natural Resources (WDNR), a project is underway to create a lake management plan for the Jersey Flowage. The lake management plan will contain historic and current data from the lake as well as provide guidance for its management by integrating stakeholder perceptions and goals with what is ecologically beneficial for the lake.

As described further below, numerous field studies were carried out upon Jersey Flowage during 2012. Because of the wealth of data that was collected just within the past few months, much of the data analysis has yet to be completed. This update intends to bring the Friends of the Jersey Flowage (FOTJF) up-to-date on the scientific studies that have occurred, provide some initial observations on the ecology of the Jersey Flowage, and project a rough timeline for the remaining actions that will be taken as a part of this planning project.

Onterra staff had their first glimpse of the Jersey Flowage with a visit in early April. During this time, ecologists collected the first of several water quality samples. This water is preserved and sent to the State Lab of Hygiene in Madison, WI for chemical analysis. During the summer months (June, July and August) as well as the fall (October) the water was sampled yet again, while a final sample will be collected through the ice in February of 2013. Water samples targeting the larval stage of the invasive zebra mussel were also taken by Onterra staff and sent to the WDNR for analysis as part of efforts to monitor the lake for this invasive species.

All aquatic plant surveys were conducted as scheduled, first by visiting the lake on June 6, 2012 to complete the curly-leaf pondweed (CLP) survey. This survey's purpose was to map the CLP that is known to be located on the lake. Initial results from this survey suggest that the aerial coverage of curly-leaf pondweed has expanded slightly (less than an acre) from 2011, while density has increased at known locations substantially (Map 1). Another invasive plant, Eurasian water milfoil (EWM), was mapped on September 19th by Onterra ecologists. Unlike CLP, EWM has increased its distribution dramatically within the lake since 2011, as well as increasing its density (Map 2). Currently, EWM covers over 148 acres of the lake in a colonized form. As this project continues, management options the FOTJF may consider in addressing the spread of these invasive plants will be discussed thoroughly.

On June 27th, three crews visited the Jersey Flowage to complete the point-intercept survey. This is a grid-based survey designed to sample all plants (native and non-native) within the lake. An additional aquatic plant survey, the community mapping survey, was completed on July 26th. The purpose of this survey is to map the floating-leaf and emergent species that are found within the lake and are typically underestimated in the point intercept survey. During these aquatic plant surveys, many interesting native species were observed, including one species that is listed as being of 'special concern' in Wisconsin due to its rarity and vulnerability to environmental degradation – Vasey's pondweed (*Potamogeton vaseyi*). In fact, this species was the fourth most common plant sampled during the point-intercept survey. Aquatic plants were found to grow to a maximum depth of 7 feet. Wild celery, a submerged aquatic plant with ribbon-shaped floating leaves, was the most common plant encountered during the point-intercept survey (Figure 1).

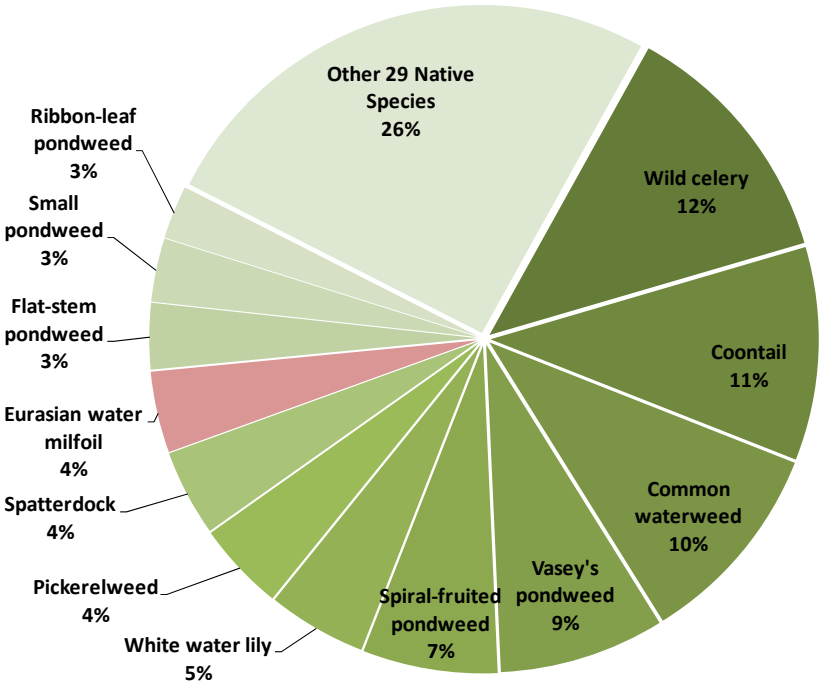


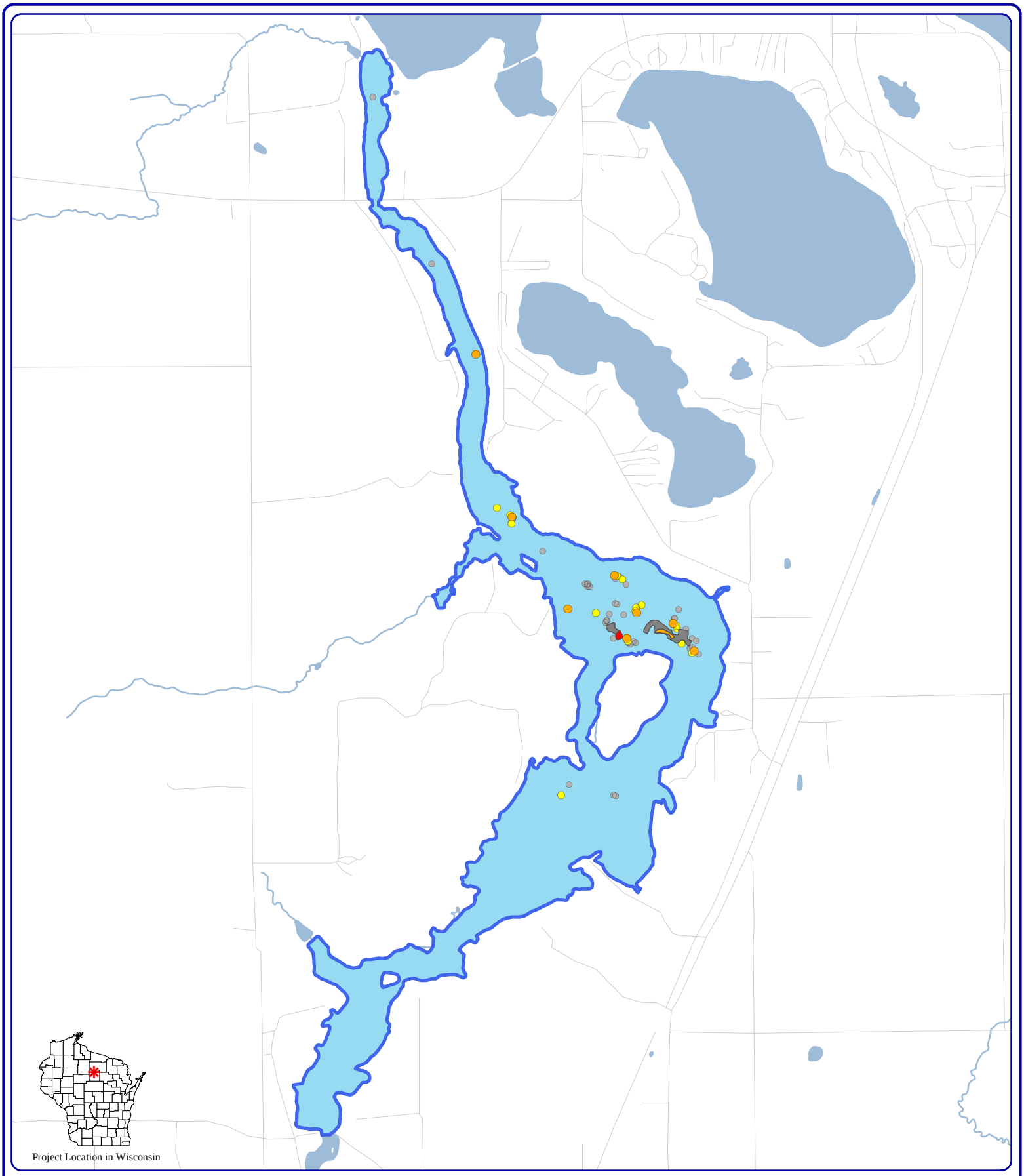
Figure 1. Jersey Flowage aquatic plant relative frequency of occurrence. Created using data from a June 2012 aquatic plant point-intercept survey.

On October 9th, a crew visited Jersey the Flowage to conduct a shoreline assessment survey. During this survey, the lake's shoreline is examined and classified into one of five development categories, based upon its level of human disturbance. The results of this survey may be used to prioritize areas for restoration, if the FOTJF wishes to pursue this.

In addition to collected ecological data from the Jersey Flowage, sociological data will be collected from the people who use and care for the Jersey Flowage. With assistance from Onterra staff, a planning committee comprised of FOTJF volunteers will design a survey to be distributed to all riparian property owners. The results of this survey will be helpful in the development of management goals and actions for the Jersey Flowage.

In the coming months, Onterra will be sorting through the immense amount of water quality, aquatic plant, shoreline assessment and stakeholder survey data that has been or will be collected. Additionally, the watershed surrounding the lake will be delineated and modeled using a computer program to estimate the amount of nutrients the lake receives on an annual basis. The WDNR will also be contacted to discuss the management of the fishery. And finally, discussions will ensue between the FOTJF, WDNR and Onterra staff regarding the spread and impact of invasive species on the Jersey Flowage and what management actions may be taken.

In summary, all project components are on schedule. Following data analysis and report creation, the Jersey Flowage Planning Committee and Onterra staff will meet to discuss the project results and begin creation of management goals and actions the FOTJF will pursue to manage their lake in both a recreationally enjoyable and ecologically sound manner.



N
W E
S

2,000
Feet

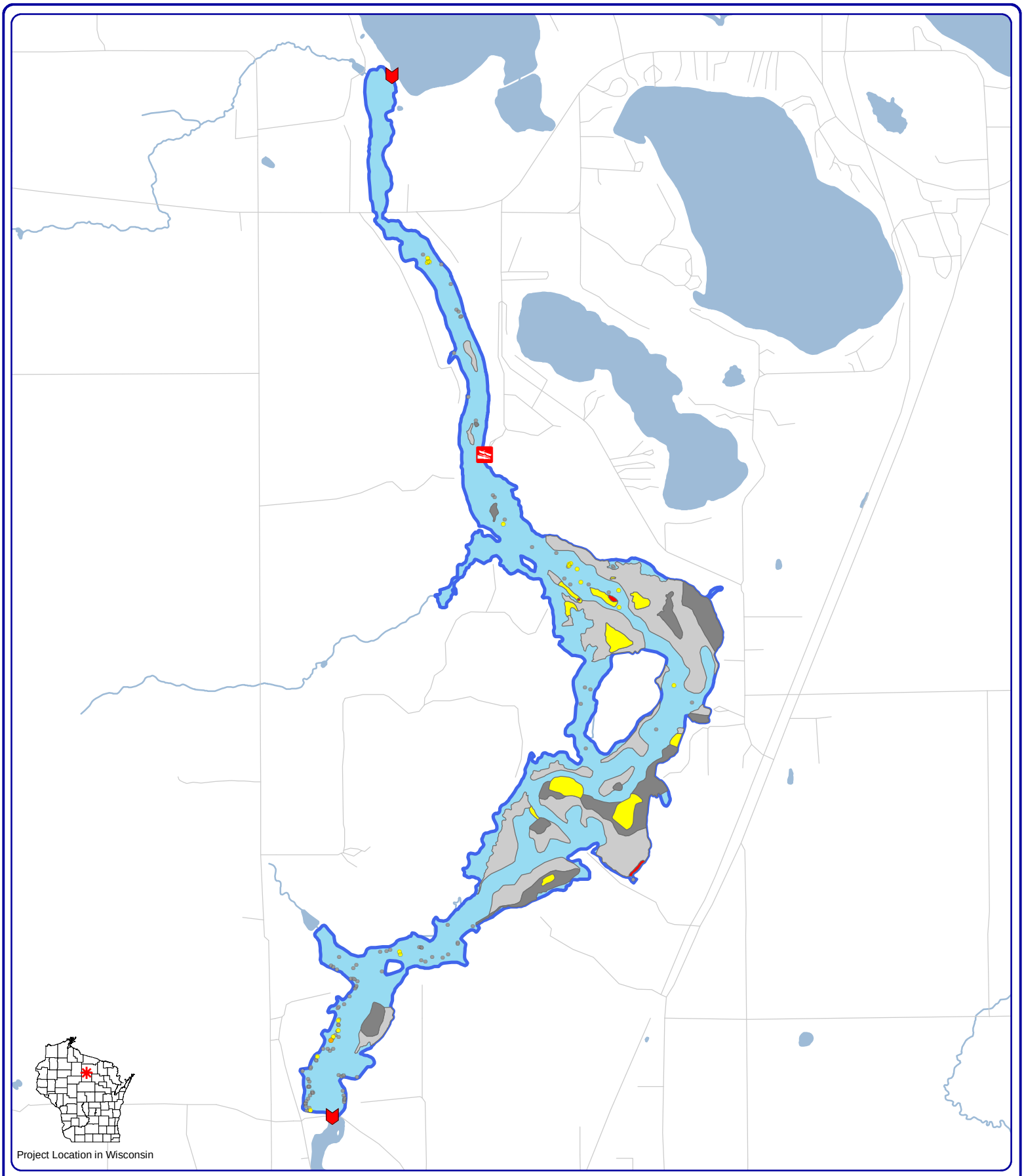
Onterra LLC
Lake Management Planning
815 Prosper Rd.
De Pere, WI 54115
920.338.8860
www.onterra-eco.com

Sources:
Roads & Hydro: WDNR
Aquatic Plants: Onterra 2012
Map date: June 18, 2012
File Name: JerseyFlowage_CLP_PB_June12.mxd

CLP Survey Results (June 2012)

- Highly Scattered *(none found)*
- Scattered
- Dominant *(none found)*
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Many or Clumps of Plants
- Small Plant Colony

Map 1
Jersey Flowage
Lincoln County, Wisconsin
2012 Curly-leaf pondweed Locations



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Feet

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815 Prosper Road
De Pere, WI 54115
920.338.8860
www.onterra-eco.com

Sources:
Data: Roads and Hydro: WDNR
Aquatic Plant Survey: Onterra, 2012
Map Date: September 21, 2012
Filename: JFlwgS_EWM_PB_Sept12.mxd

EWM Survey Results (September 2012)

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant *(none found)*
- Surface Matting
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony

Map 2

Jersey Flowage

Lincoln County, Wisconsin

2012 Eurasian water milfoil Locations

Presentation Outline

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

  Stakeholder Survey
- **"Big Picture"**

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Study and Plan Goals

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

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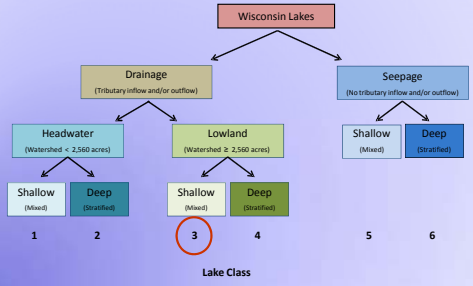
Onterra LLC
Lake Management Planning

Wisconsin Lakes Classification



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Water Quality

↑ **Phosphorus (Limiting Plant Nutrient)**

Nitrogen:Phosphorus = 13:1

↑ **Chlorophyll-*a* (Algal Abundance)**

Moderate abundance

↓ **Water Clarity (Secchi Disk)**

Relatively low water clarity

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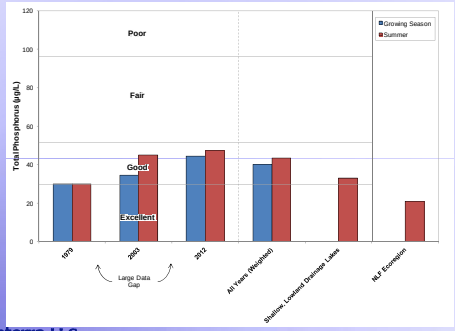
Average Annual Total Phosphorus



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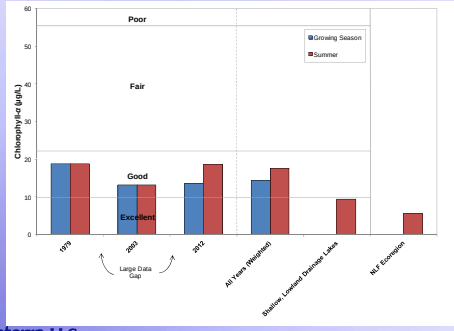
Average Annual Chlorophyll-α



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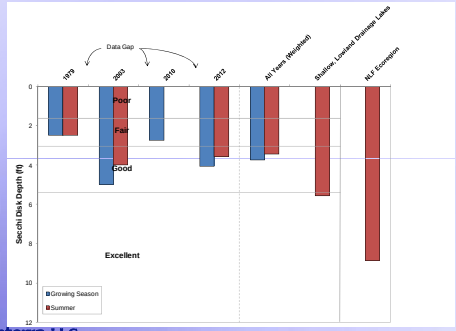
Average Annual Secchi Disk Clarity



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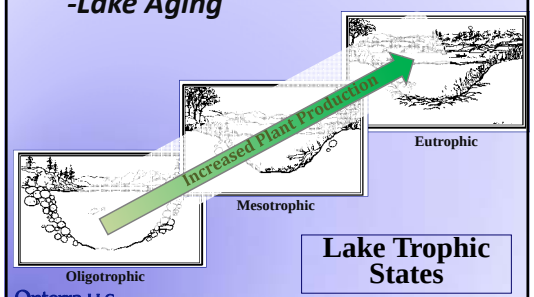
Eutrophication
-Lake Aging



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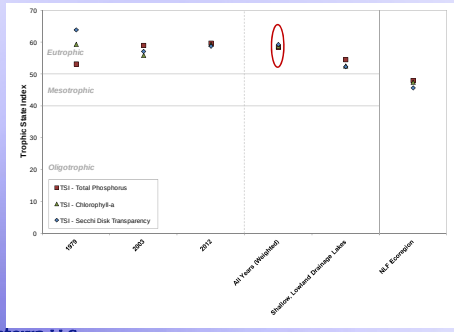
Trophic State Index



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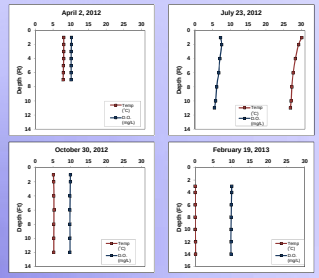
Dissolved Oxygen / Temperature



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Other Water Quality Results

- Alkalinity = 31.0 mg/L as $CaCO_3$ – indicates very little sensitivity to acid rain
- Low calcium concentrations (9.4 mg/L)
  - Not suitable for zebra mussel establishment

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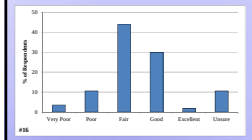
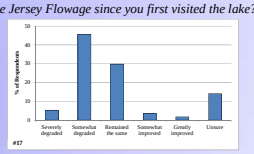
Stakeholder Survey – Water Quality

How would you describe the current water quality of the Jersey Flowage?



How has the water quality changed in the Jersey Flowage since you first visited the lake?



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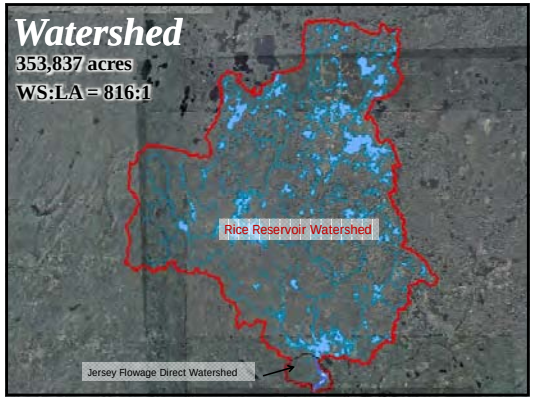
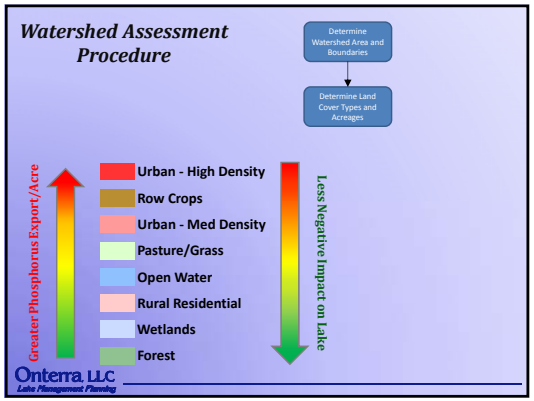
Lake Management Planning

Watershed

353,837 acres
WS:LA = 816:1

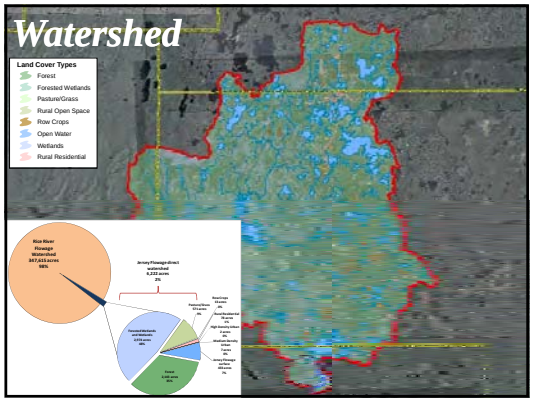


Watershed Assessment Procedure



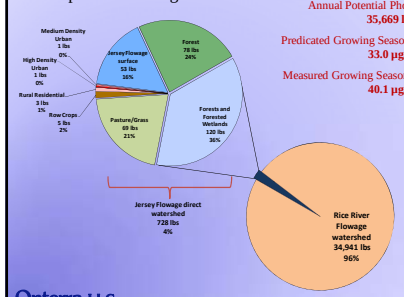
Onterra LLC
Lake Management Planning

Watershed



Watershed

Phosphorus Loading



Annual Potential Phosphorus Load:
35,669 lbs

Predicated Growing Season Mean Phosphorus:
33.0 µg/L

Measured Growing Season Mean Phosphorus:
40.1 µg/L

Onterra LLC
Lake Management Planning

Watershed Assessment Procedure

Annual Potential Phosphorus Load:
35,669 lbs

Predicated Growing Season Mean Phosphorus:
33.0 µg/L

Measured Growing Season Mean Phosphorus:
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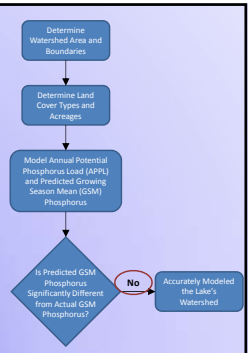


Onterra LLC
Lake Management Planning

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

Onterra LLC
Lake Management Planning

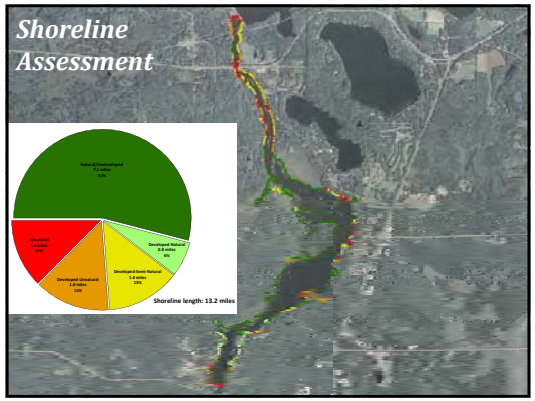
Shoreline Assessment Category Descriptions

More Natural Habitat

Greater Need for Restoration

Onterra LLC
Lake Management Planning

Shoreline Assessment

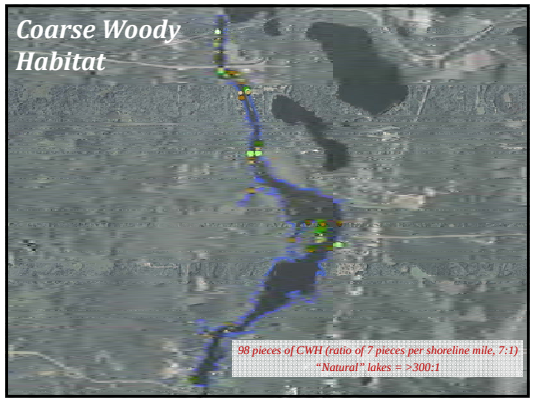


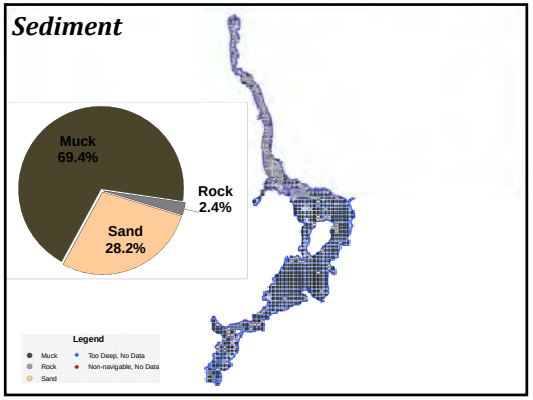
Coarse Woody Habitat

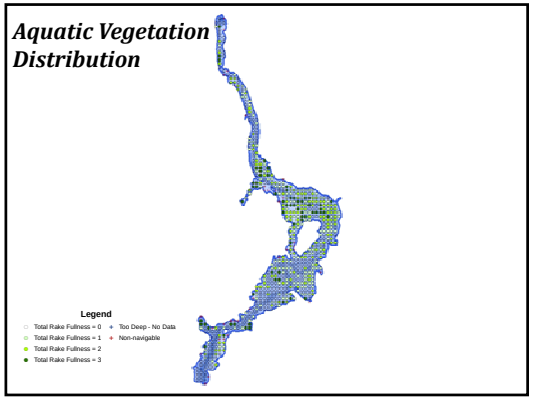
- Provides shoreland erosion control and prevents suspension of sediments.
- Preferred habitat for a variety of aquatic life.
  - Periphyton growth fed upon by insects.
  - Refuge, foraging and spawning habitat for fish.
  - Complexity of CWH important.
- Changing of logging and shoreland development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

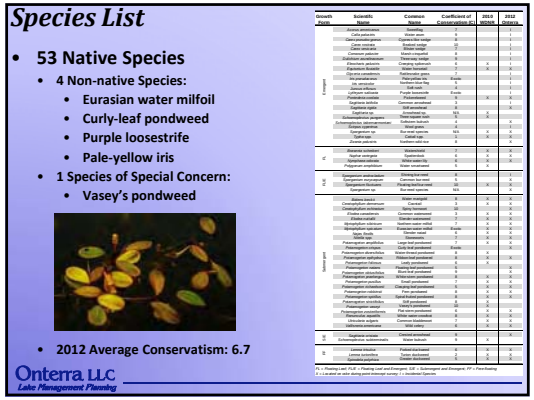
Onterra LLC
Lake Management Planning

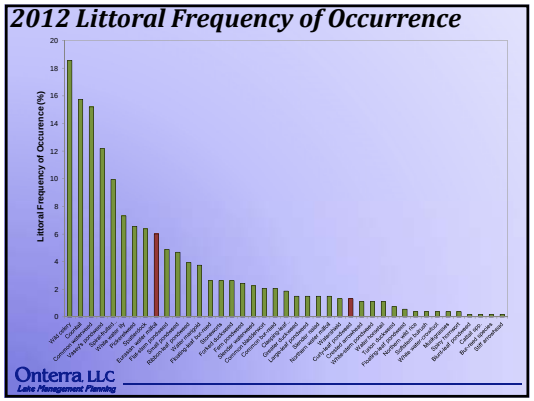
Coarse Woody Habitat




Sediment
Muck
69.4%
Rock
2.4%
Sand
28.2%
Legend
Muck
Rock
Sand
Too Deep, No Data
Non-navigable, No Data


Aquatic Vegetation Distribution
Legend
Total Rake Fullness = 0
Total Rake Fullness = 1
Total Rake Fullness = 2
Total Rake Fullness = 3
Too Deep - No Data
Non-navigable


Species List
53 Native Species
4 Non-native Species:
Eurasian water milfoil
Curly-leaf pondweed
Purple loosestrife
Pale-yellow iris
1 Species of Special Concern:
Vasey's pondweed
2012 Average Conservatism: 6.7
Onterra LLC
Lake Management Planning


2012 Littoral Frequency of Occurrence
Littoral Frequency of Occurrence (%)
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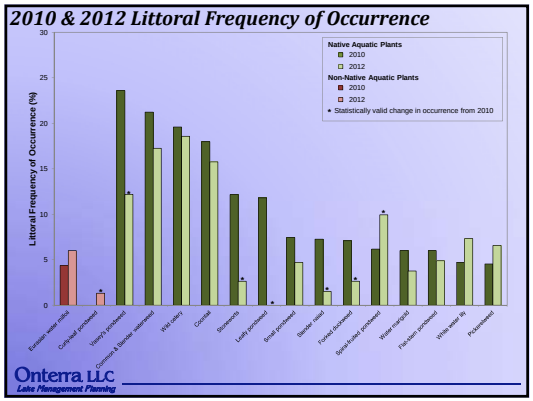
Lake Management Planning


2010 & 2012 Littoral Frequency of Occurrence
Littoral Frequency of Occurrence (%)
Native Aquatic Plants
2010
2012
Non-Native Aquatic Plants
2010
2012
Statistically valid change in occurrence from 2010
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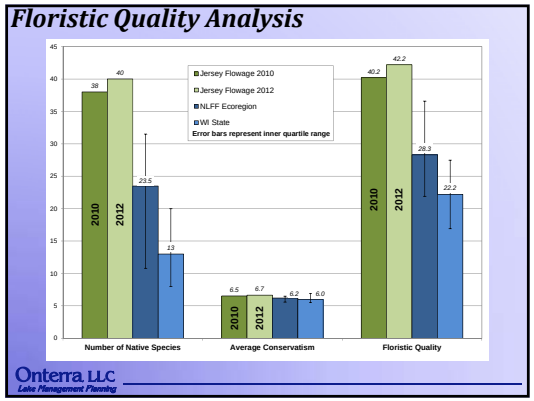
Floristic Quality Analysis
Jersey Flowage 2010
Jersey Flowage 2012
NLFF Ecoregion
WI State
Error bars represent inner quartile range
38
40
23.5
13
6.5
6.7
6.2
6.0
40.2
42.2
28.3
22.2
Number of Native Species
Average Conservatism
Floristic Quality
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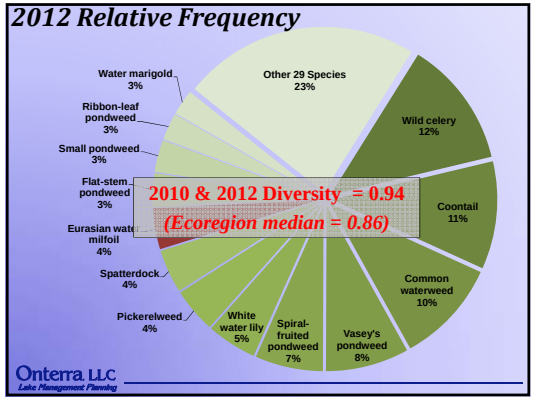
2012 Relative Frequency
Water marigold 3%
Other 29 Species 23%
Ribbon-leaf pondweed 3%
Wild celery 12%
Small pondweed 3%
Flat-stem pondweed 3%
2010 & 2012 Diversity = 0.94
(Ecoregion median = 0.86)
Coontail 11%
Eurasian water milfoil 4%
Spatterdock 4%
Common waterweed 10%
Pickerelweed 4%
White water lily 5%
Spiral-fruited pondweed 7%
Vasey's pondweed 8%
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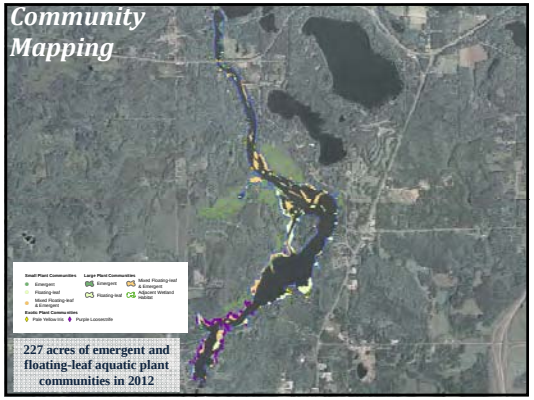
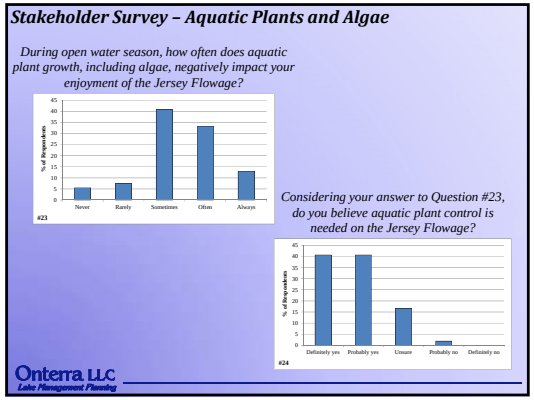

Community Mapping
227 acres of emergent and floating-leaf aquatic plant communities in 2012


Stakeholder Survey – Aquatic Plants and Algae
During open water season, how often does aquatic plant growth, including algae, negatively impact your enjoyment of the Jersey Flowage?
Never
Rarely
Sometimes
Often
Always
#23
Considering your answer to Question #23, do you believe aquatic plant control is needed on the Jersey Flowage?
Definitely yes
Probably yes
Unsure
Probably no
Definitely no
#24
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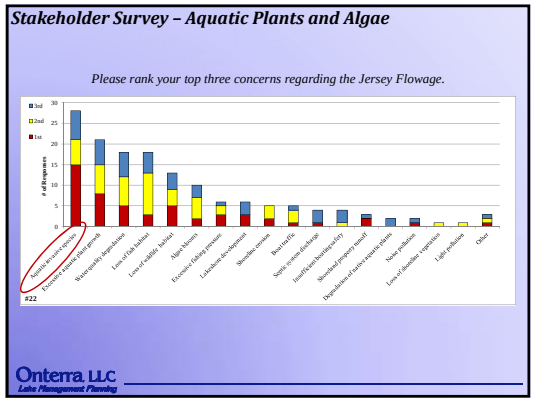
Stakeholder Survey – Aquatic Plants and Algae
Please rank your top three concerns regarding the Jersey Flowage.
1st
2nd
3rd
#22
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Exotic Plants
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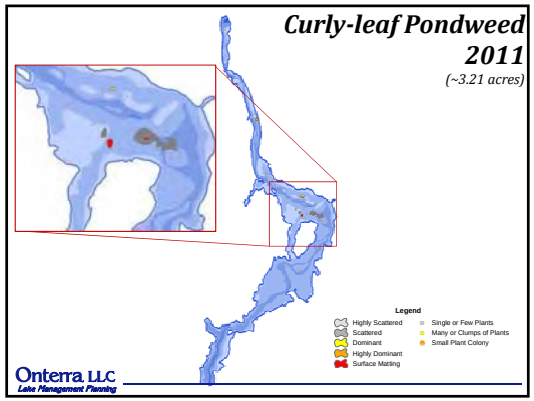
Curly-leaf Pondweed 2011
(~3.21 acres)
Legend
Highly Scattered
Scattered
Dominant
Highly Dominant
Surface Matting
Single or Few Plants
Many or Clumps of Plants
Small Plant Colony
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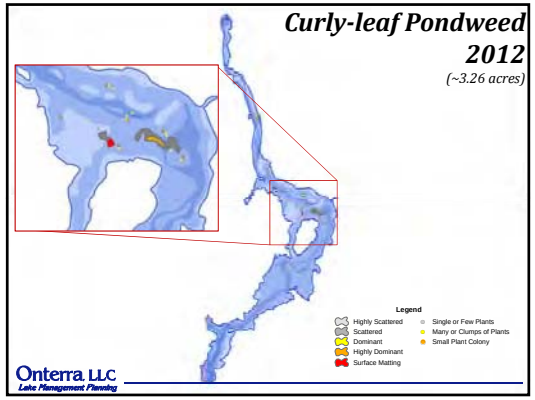
Curly-leaf Pondweed
2012
(~3.26 acres)
Legend
Highly Scattered
Scattered
Dominant
Highly Dominant
Surface Matting
Single or Few Plants
Many or Clumps of Plants
Small Plant Colony
Onterra LLC
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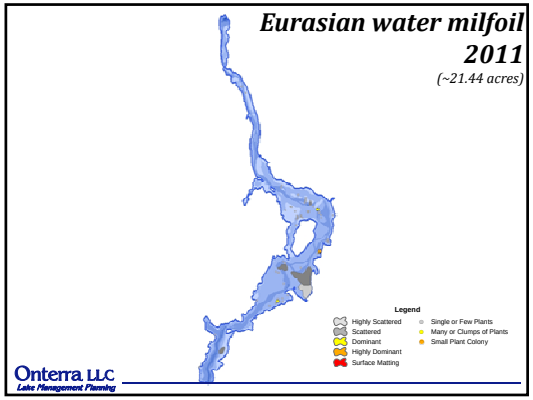
Eurasian water milfoil
2011
(~21.44 acres)
Legend
Highly Scattered
Scattered
Dominant
Highly Dominant
Surface Matting
Single or Few Plants
Many or Clumps of Plants
Small Plant Colony
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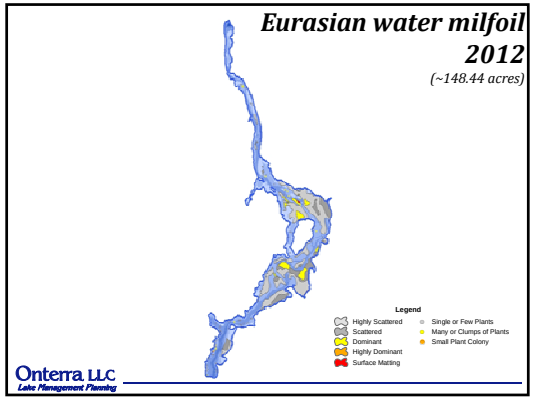
Eurasian water milfoil
2012
(~148.44 acres)
Legend
Highly Scattered
Scattered
Dominant
Highly Dominant
Surface Matting
Single or Few Plants
Many or Clumps of Plants
Small Plant Colony
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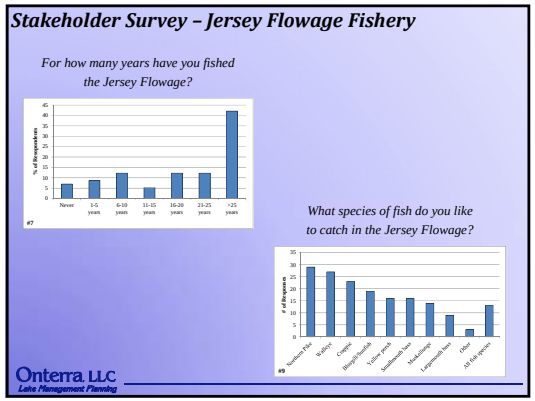
Stakeholder Survey – Jersey Flowage Fishery
For how many years have you fished the Jersey Flowage?
% of Respondents
Never
1-5 years
6-10 years
11-15 years
16-20 years
21-25 years
>25 years
#7
What species of fish do you like to catch in the Jersey Flowage?
# of Responses
Northern Pike
Walleye
Crappie
Bluegill/Sunfish
Yellow perch
Smallmouth bass
Muskellunge
Largemouth bass
Other
All Fish species
#9
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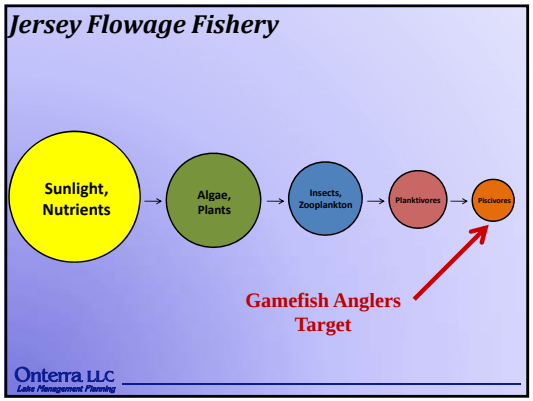
Jersey Flowage Fishery
Sunlight, Nutrients
Algae, Plants
Insects, Zooplankton
Planktivores
Piscivores
Gamefish Anglers Target
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Native American Spear Harvest
Treaty of 1837
Treaty of 1842
Jersey Flowage
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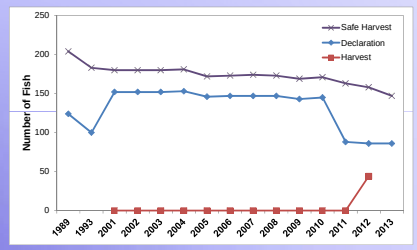
Jersey Flowage Fishery

Walleye Spear Harvest



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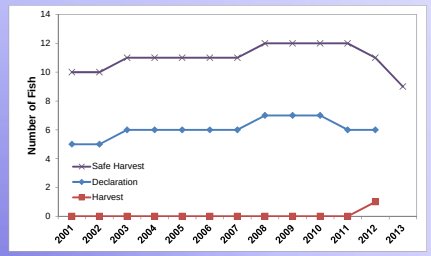
Jersey Flowage Fishery

Muskellunge Spear Harvest



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Jersey Flowage Fishery

- Bullhead concerns listed on stakeholder survey.
  - Concern over increasing population.
  - Young bullhead are important forage species for gamefish.
  - Increase noted in other area flowages by WDNR biologists.
  - Population cycle: increase until maturity (5-7 yrs) then die of natural causes.
- WDNR comprehensive survey scheduled for 2015.

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Conclusions

- Water quality for shallow, lowland drainage lake is good.
  - Limited historic data.
  - Lake is productive, though not to an unhealthy extent.
- Overall watershed is in excellent condition.
  - Land cover is mostly natural.
  - Sheer size of watershed means that phosphorus input is hard to control.
  - Shoreland zone is mostly undeveloped.

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Conclusions continued

- Aquatic plant community
  - Based upon standard analysis, native plant community is of high quality.
  - Abundance of organic substrate and high-nutrient water creates abundant aquatic plant growth.
  - Perfect conditions for Vasey's pondweed.
- Fisheries
  - Productive lake leads to robust fishery.
  - Walleye and muskellunge spearing occurred in 2012.
  - Minimal coarse woody habitat.

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Develop Control Strategy & Monitoring Plan

Control Strategy

- Realistic and ecologically beneficial for the lake
- Inline with lake group's lake management goals
- Based upon lake group's support for various methods (e.g. drawdown, herbicide use)
- Prioritization based upon financial limitations and/or volunteerism
- Obtain support from additional management entities

Monitoring Plan

- Collection of Pretreatment & Post Treatment Data

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AIS Control Project Strategy

- Hand removal
- Herbicide treatment
- Winter drawdown
- Mechanical harvesting
- Do Nothing (monitor)

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Herbicide Use Patterns

- **Dissipation/Dilution:** horizontal and vertical movement of herbicide within the water column
  - Water flow
  - Wind
  - Treatment area relative to lake
  - Water depth
- **Degradation:** physical breakdown of herbicide into inert components
  - Microbial
  - Photolytic

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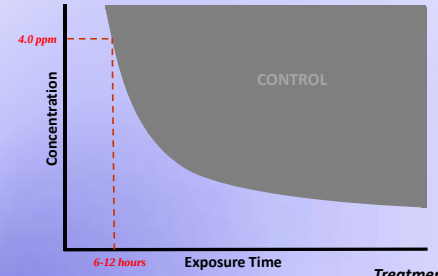
Herbicide Use Patterns



High Dose ▶ Short Exposure Time

Treatment Type
Spot

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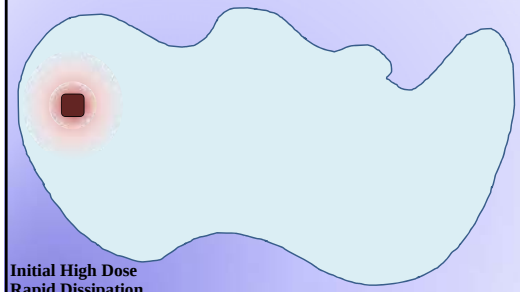
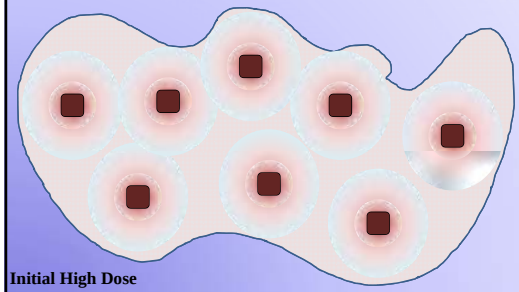
Spot Treatment Use Pattern



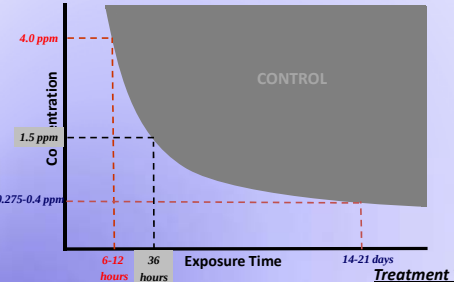
Initial High Dose
Rapid Dissipation
Herbicide concentrations too low outside of Treatment Area to cause impact

Whole-lake Use Pattern



Initial High Dose
Rapid Dissipation
Low-dose lake-wide concentration significant to cause control

Herbicide Use Patterns



High Dose ▶ Short Exposure Time
Low Dose ▶ Long Exposure Time

Treatment Type
Spot
Whole-lake

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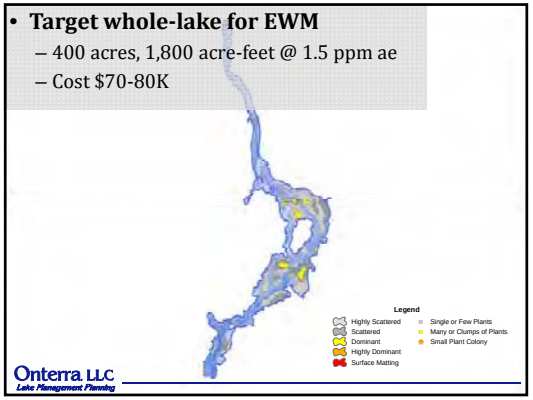
- **Target whole-lake for EWM**
  - 400 acres, 1,800 acre-feet @ 1.5 ppm ae
  - Cost $70-80K



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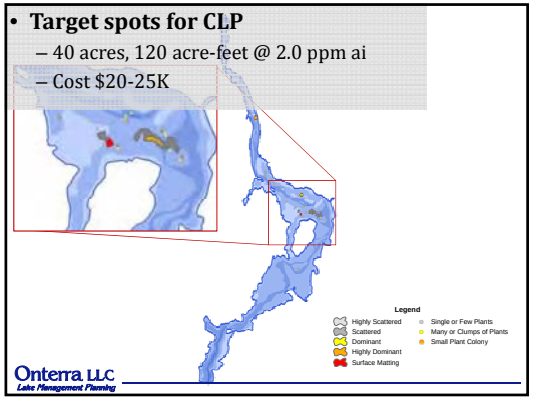
- **Target spots for CLP**
  - 40 acres, 120 acre-feet @ 2.0 ppm ai
  - Cost $20-25K



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NR 107 – Aquatic Plant Management Conditions

(1) The department may stop or limit the application of chemicals to a body of water if at any time it determines that chemical treatment will be ineffective, or will result in unreasonable restrictions on current water uses, or will produce unnecessary adverse side effects on non-target organisms.

(4) Treatment of areas containing high value species of aquatic plants shall be done in a manner which will not result in adverse long–term or permanent changes to a plant community in a specific aquatic ecosystem.

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Large to whole-lake scale treatment expectations

- Approved APM plan following APM Guide
- A recent (year prior to implementation) baseline aquatic plant survey using the Point-intercept (PI) method
- A map documenting the proposed treatment areas
- Monitoring and evaluation plan
- Technical review by statewide team (esp. for first – time, whole-lake, or experimental projects)
- Meets NR107 and NR150 requirements

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How do they work?

- **2,4-D –** absorbed by plant tissue; inhibits plant growth and cell division (auxin hormone mimic)
- **Triclopyr –** absorbed by plant tissue; inhibits plant growth and cell division(auxin hormone mimic)
- **Endothall –** commonly referred to as a contact herbicide, inhibits respiration and protein synthesis, disrupts cell membranes
- **Fluridone –** inhibits plant-specific enzyme (carotene) which protects chlorophyll from UV (sun) damage
- **Diquat –** Inhibits photosynthesis & destroys cell membranes

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Are herbicides "safe?"

Registration by the EPA does not mean that the use of the herbicide poses no risk to humans or the environment, only that the benefits have been determined to outweigh the risks .

Because product use is not without risk, the EPA does not define any pesticide as "safe."

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Lake Management Planning

Jersey Flowage Lake Management Planning Project

July 2013 Update

Submitted by: Dan Cibulka, Onterra, LLC

With the help of a Lake Management Planning Grant totaling over $20,000 from the Wisconsin Department of Natural Resources (WDNR), a project is underway to create a lake management plan for the Jersey Flowage. The lake management plan will contain historic and current data from the lake as well as provide guidance for its management by integrating stakeholder perceptions and goals with what is ecologically beneficial for the lake.

Numerous field studies were conducted by Onterra on the Jersey Flowage during 2012-2013. In addition, a planning committee comprised of Friends of the Jersey Flowage (FOJF) members created a stakeholder survey which was distributed to households around the lake in March of 2013. On June 6, 2013, Onterra ecologists Dan Cibulka and Eddie Heath met with the FOJF Planning Committee to present and discuss the results of these studies in detail. A brief summary of the results are discussed below.

Water Quality

The water quality of the Jersey Flowage was monitored during the open water season of 2012 and in the winter of 2013. Additionally, available historic water quality data was researched from state databases in an effort to determine if any trends in water quality are occurring. While minimal historic data exists, 2012 monitoring data indicate that the phosphorus and algal content of the Jersey Flowage's water may be categorized as "Good", and is comparable to similar types of lakes across the state of Wisconsin. While the water is not as clear as in some other lakes, this is not due to pollution, but rather can be attributed to a natural staining (tannins) from decomposing matter found in surrounding wetlands.

Watershed

The Jersey Flowage watershed is quite large, at 353,873 acres. It includes land directly contributing surface water to the lake as well as land contributing water into the upstream Rice River Reservoir. While this is an immense watershed, the land is mostly natural and undeveloped which is advantageous from a lake ecosystem's perspective. High amounts of developed land may impact a lake through unnecessary nutrient and sediment inputs.

Shoreland Assessment

Onterra ecologists surveyed the immediate shoreland of the Jersey Flowage to determine how developed this area is, and what habitat potential it provides. Over 50% of the flowage's shoreland area was determined to be completely natural/undeveloped, while roughly 27% was highly developed and 19% of the shoreland was classified as developed but somewhat natural. Occurrences of coarse woody habitat, a beneficial habitat type for many aquatic organisms, were noted during this survey and found to be in lesser abundance than what might be found in a completely natural lake ecosystem.

Aquatic Plants

Numerous surveys were conducted in 2012 that focused upon the native and non-native (invasive) plant community of the Jersey Flowage. During these surveys, an incredible 57 species of native aquatic plants were located within the lake and on its shorelands. One of these species, Vasey's pondweed (*Potamogeton vaseyi*) is listed by the Wisconsin Natural Heritage Inventory as a species of "special concern" due to its rarity and vulnerability to environmental degradation. Standard analyses indicate that the native aquatic plant community in the Jersey Flowage is of high quality, with high species richness and diversity.

Unfortunately, several aquatic invasive species were encountered during surveys including curly-leaf pondweed, Eurasian water milfoil, pale yellow iris and purple loosestrife. Of these species, curly-leaf pondweed and Eurasian water milfoil are of most concern to the Jersey Flowage's health and ecology. Onterra staff conducted special surveys to document the distribution and density of these species within the Jersey Flowage.

Fisheries Data

Although fisheries data collection was not conducted as a part of this study, Onterra ecologists worked with local WDNR biologists to understand the fishery of the Jersey Flowage and will document this within the management plan. Numerous components of the fishery including habitat availability, Native American spear harvest data, angling regulations and bullhead population concerns were discussed with the FOJF planning committee. WDNR biologists have tentatively scheduled a 2015 comprehensive fishery study on the Jersey Flowage.

Next Steps

The Jersey Flowage is currently in good health; however the presence of aquatic invasive species may pose a substantial threat to the lake. Later this summer, Onterra ecologists will be meeting with the FOJF Planning Committee once again to assist in the creation of realistic and implementable management goals. The goals will address numerous components of lake management, including water quality monitoring, FOJF educational activities and management of aquatic invasive species to name a few. These goals will ultimately guide the FOJF as they strive to protect and manage their beloved lake for years to come.

B

APPENDIX B

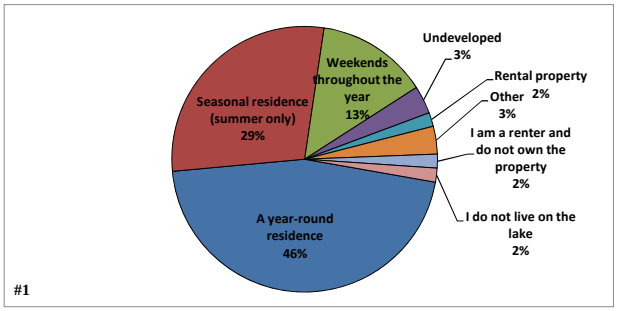
Stakeholder Survey Response Charts and Comments

Returned Surveys	58
Sent Surveys	150
Response Rate (%)	38.7

JERSEY FLOWAGE PROPERTY

#1 How is your property on the Jersey Flowage utilized?

	Total	%
A year-round residence	27	*45.8*
Seasonal residence (summer only)	17	*28.8*
Weekends throughout the year	8	*13.6*
Undeveloped	2	*3.4*
Rental property	1	*1.7*
Other	2	*3.4*
I am a renter and do not own the property	1	*1.7*
I do not live on the lake	1	*1.7*
	59	100.0

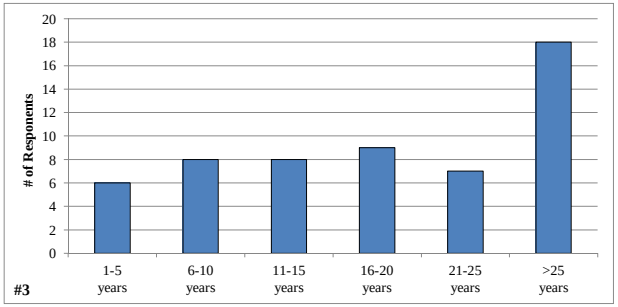


#2 How many days each year is your property used by you or others?

Answered Question	55
Average	197.2
Standard deviation	153.6

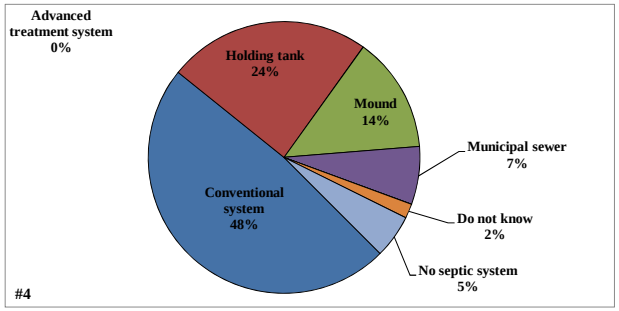
#3 How long have you owned or rented your property on the Jersey Flowage?

	Total	%
1-5 years	6	*10.7*
6-10 years	8	*14.3*
11-15 years	8	*14.3*
16-20 years	9	*16.1*
21-25 years	7	*12.5*
>25 years	18	*32.1*
	56	*100.0*



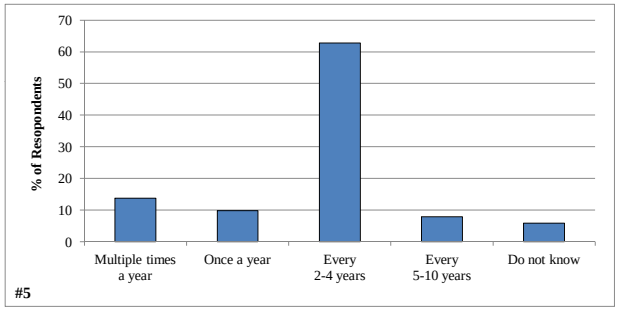
#4 What type of septic system does your property utilize?

	Total	%
Conventional system	28	*48.3*
Holding tank	14	*24.1*
Mound	8	*13.8*
Municipal sewer	4	*6.9*
Advanced treatment system	0	*0.0*
Do not know	1	*1.7*
No septic system	3	*5.2*
	58	*100.0*



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

	Total	%
Multiple times a year	7	*13.7*
Once a year	5	*9.8*
Every 2-4 years	32	*62.7*
Every 5-10 years	4	*7.8*
Do not know	3	*5.9*
	51	*100.0*



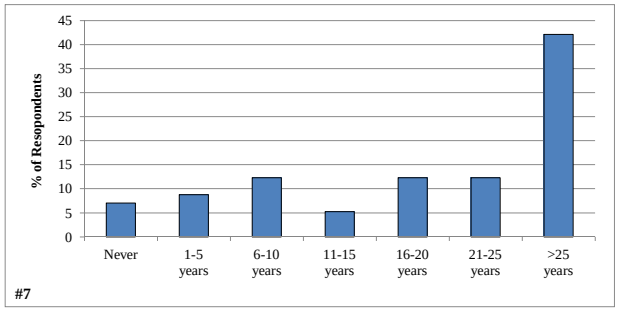
RECREATIONAL ACTIVITY ON THE JERSEY FLOWAGE

#6 How many years ago did you first visit the Jersey Flowage?

Answered Question	57
Average	31.6
Standard deviation	20.1

#7 For how many years have you fished the Jersey Flowage?

	Total	%
Never	4	*7.0*
1-5 years	5	*8.8*
6-10 years	7	*12.3*
11-15 years	3	*5.3*
16-20 years	7	*12.3*
21-25 years	7	*12.3*
>25 years	24	*42.1*
	57	*100.0*

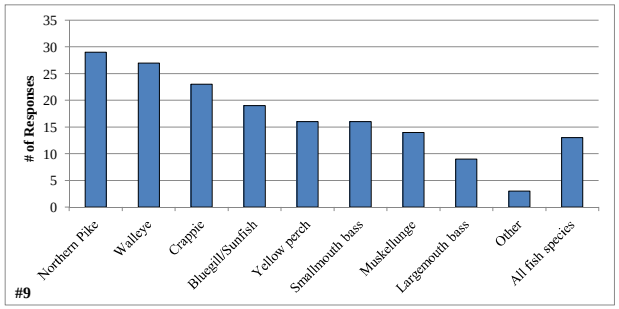


#8 Have you personally fished on the Jersey Flowage in the past three years?

	Total	%
Yes	46	*82.1*
No	10	*17.9*
	56	*100.0*

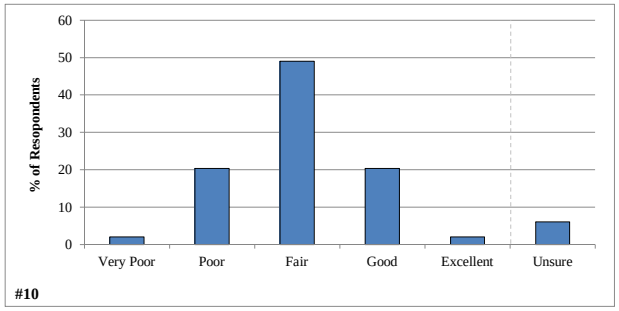
#9 What species of fish do you like to catch on the Jersey Flowage?

	Total
Northern Pike	29
Walleye	27
Crappie	23
Bluegill/Sunfish	19
Yellow perch	16
Smallmouth bass	16
Muskellunge	14
Largemouth bass	9
Other	3
All fish species	13



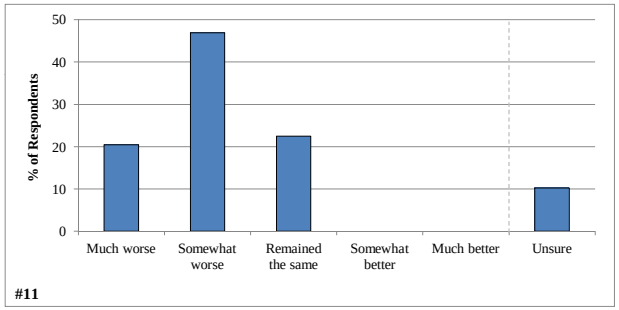
#10 How would you describe the current quality of fishing on the Jersey Flowage?

	Total	%
Very Poor	1	*2.0*
Poor	10	*20.4*
Fair	24	*49.0*
Good	10	*20.4*
Excellent	1	*2.0*
Unsure	3	*6.1*
	49	*100.0*



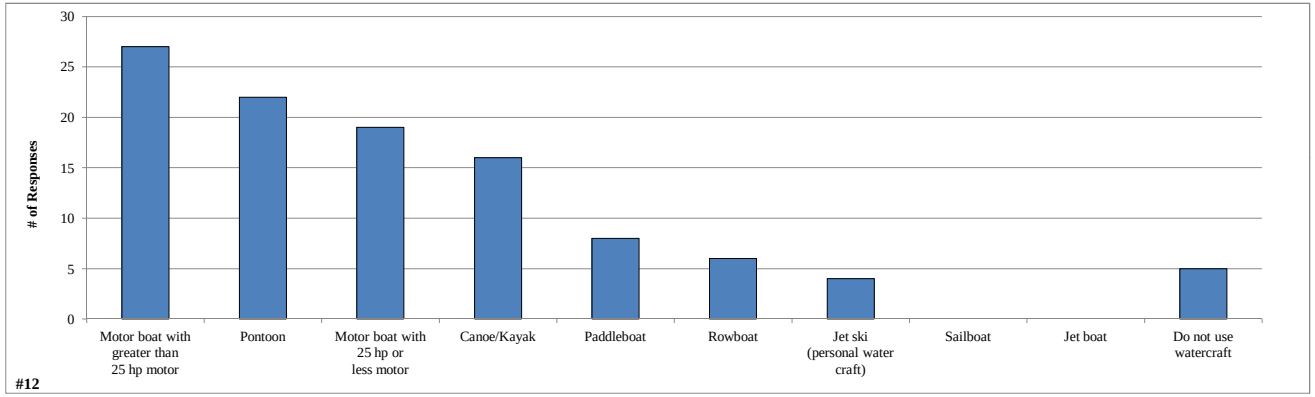
#11 How has the quality of fishing changed since you started fishing on the lake?

	Total	%
Much worse	10	*20.4*
Somewhat worse	23	*46.9*
Remained the Same	11	*22.4*
Somewhat better	0	*0.0*
Much better	0	*0.0*
Unsure	5	*10.2*
	49	*100.0*



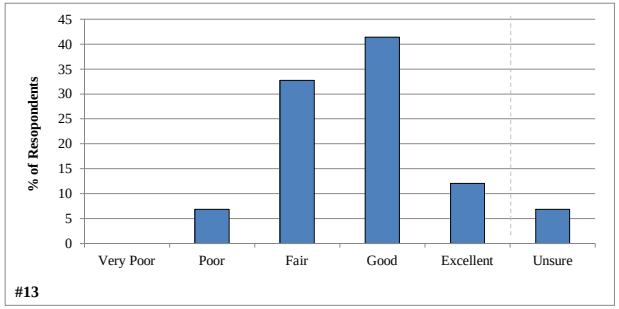
#12 What types of watercraft do you currently use on the Jersey Flowage?

	Total
Motor boat with greater than 25 hp motor	27
Pontoon	22
Motor boat with 25 hp or less motor	19
Canoe/Kayak	16
Paddleboat	8
Rowboat	6
Jet ski (personal water craft)	4
Sailboat	0
Jet boat	0
Do not use watercraft	5



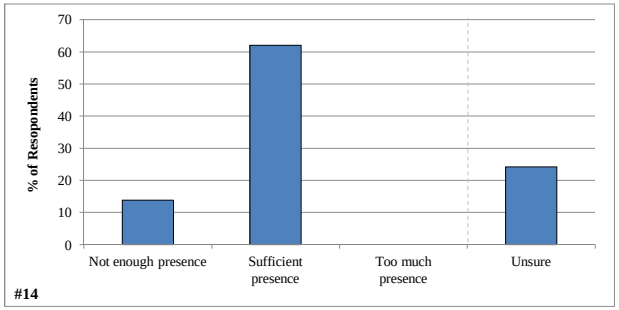
#13 How would you rate the level of safety exhibited by other watercraft users on the Jersey Flowage?

	Total	%
Very Poor	0	*0.0*
Poor	4	*6.9*
Fair	19	*32.8*
Good	24	*41.4*
Excellent	7	*12.1*
Unsure	4	*6.9*
	58	*100.0*



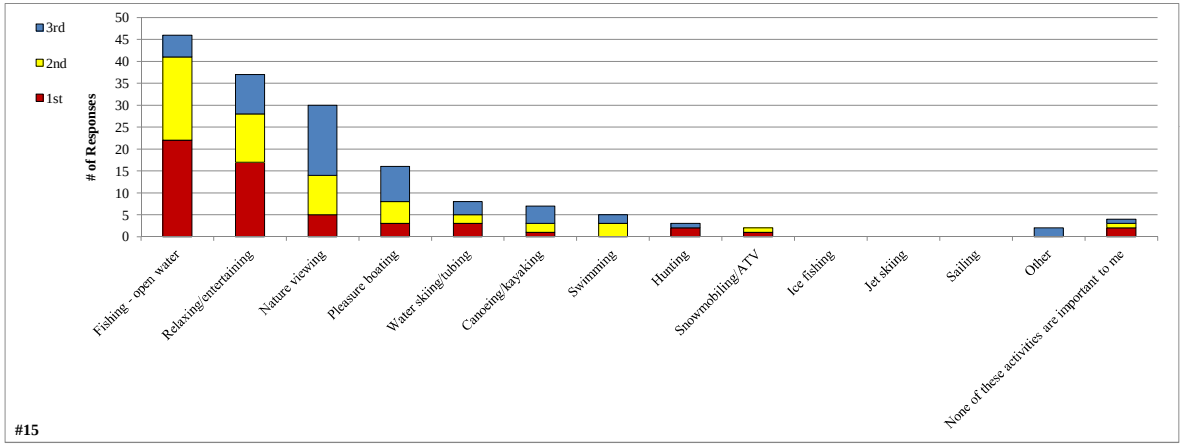
#14 How would you rate the amount of law enforcement present on the Jersey Flowage?

	Total	%
Not enough presence	8	*13.8*
Sufficient presence	36	*62.1*
Too much presence	0	*0.0*
Unsure	14	*24.1*
	58	*100.0*



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

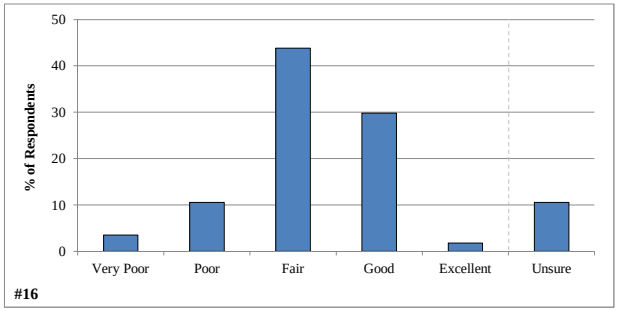
	1st	2nd	3rd	*% ranked*
Fishing - open water	22	19	5	*28.8*
Relaxing/entertaining	17	11	9	*23.1*
Nature viewing	5	9	16	*18.8*
Pleasure boating	3	5	8	*10.0*
Water skiing/tubing	3	2	3	*5.0*
Canoeing/kayaking	1	2	4	*4.4*
Swimming	0	3	2	*3.1*
Hunting	2	0	1	*1.9*
Snowmobiling/ATV	1	1	0	*1.3*
Ice fishing	0	0	0	*0.0*
Jet skiing	0	0	0	*0.0*
Sailing	0	0	0	*0.0*
Other	0	0	2	*1.3*
None of these activities are important to me	2	1	1	*2.5*
	56	53	51	*100.0*



JERSEY FLOWAGE CURRENT AND HISTORIC CONDITION, HEALTH AND MANAGEMENT

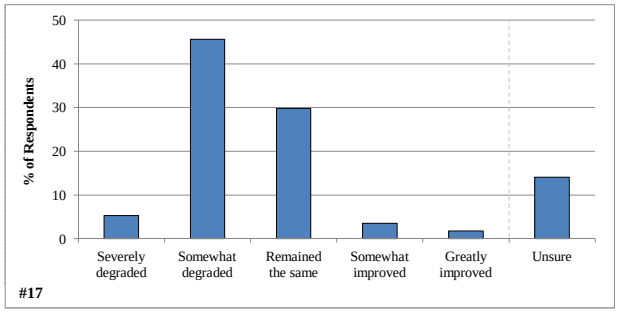
#16 How would you describe the current water quality of the Jersey Flowage?

	Total	%
Very Poor	2	*3.5*
Poor	6	*10.5*
Fair	25	*43.9*
Good	17	*29.8*
Excellent	1	*1.8*
Unsure	6	*10.5*
	57	*100.0*



#17 How has the water quality changed in the Jersey Flowage since you first visited the lake?

	Total	%
Severely degraded	3	*5.3*
Somewhat degraded	26	*45.6*
Remained the same	17	*29.8*
Somewhat improved	2	*3.5*
Greatly improved	1	*1.8*
Unsure	8	*14.0*
	57	*100.0*



#18 Have you ever heard of aquatic invasive species?

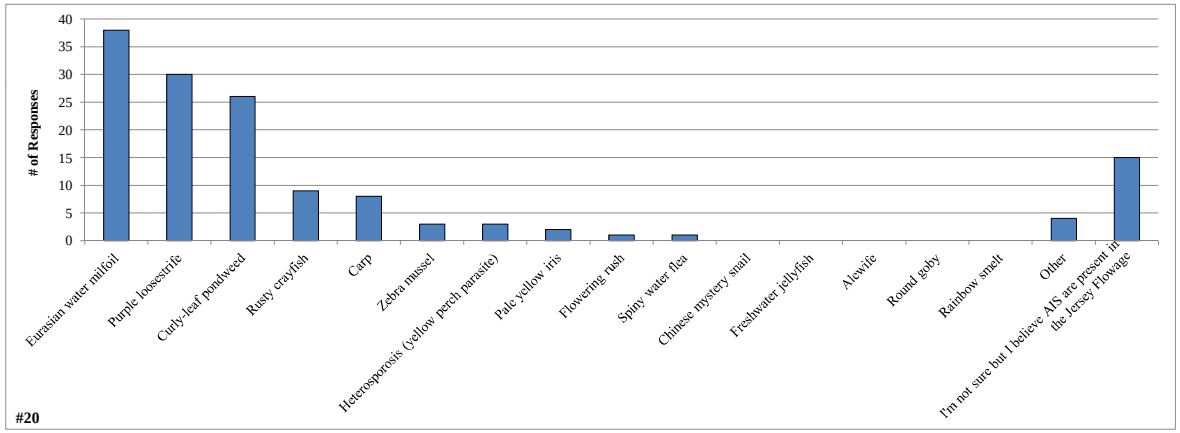
	Total	%
Yes	54	*94.7*
No	3	*5.3*
	57	*100.0*

#19 Do you believe aquatic invasive species are present within the Jersey Flowage?

	Total	%
Yes	55	*98.2*
No	1	*1.8*
	56	*100.0*

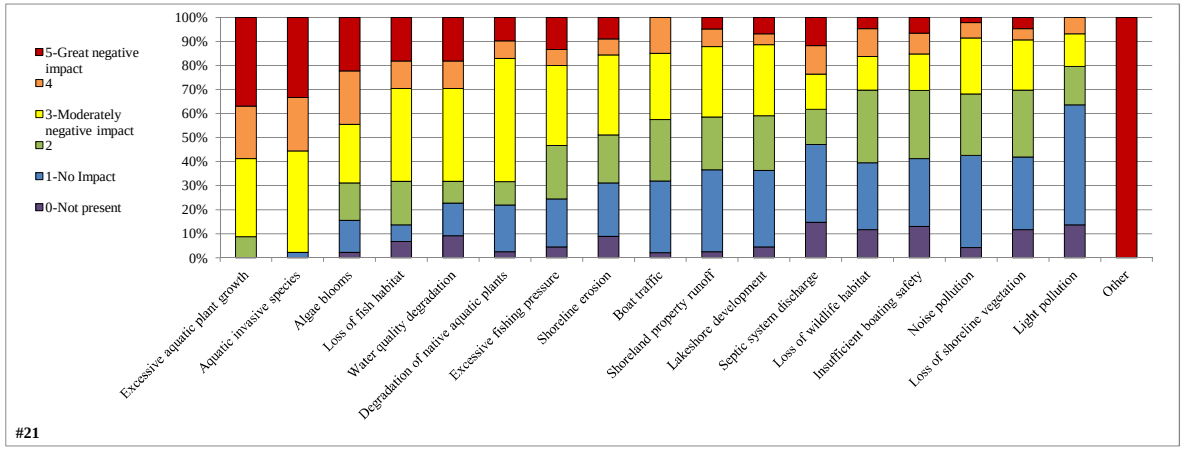
#20 Which aquatic invasive species are you aware of in the lake?

	Total
Eurasian water milfoil	38
Purple loosestrife	30
Curly-leaf pondweed	26
Rusty crayfish	9
Carp	8
Zebra mussel	3
Heterosporosis (yellow perch parasite)	3
Pale yellow iris	2
Flowering rush	1
Spiny water flea	1
Chinese mystery snail	0
Freshwater jellyfish	0
Alewife	0
Round goby	0
Rainbow smelt	0
Other	4
I'm not sure but I believe AIS are present in the Jersey Flowage	15



#21 To what level do you believe each of the following factors may be negatively impacting the Jersey Flowage?

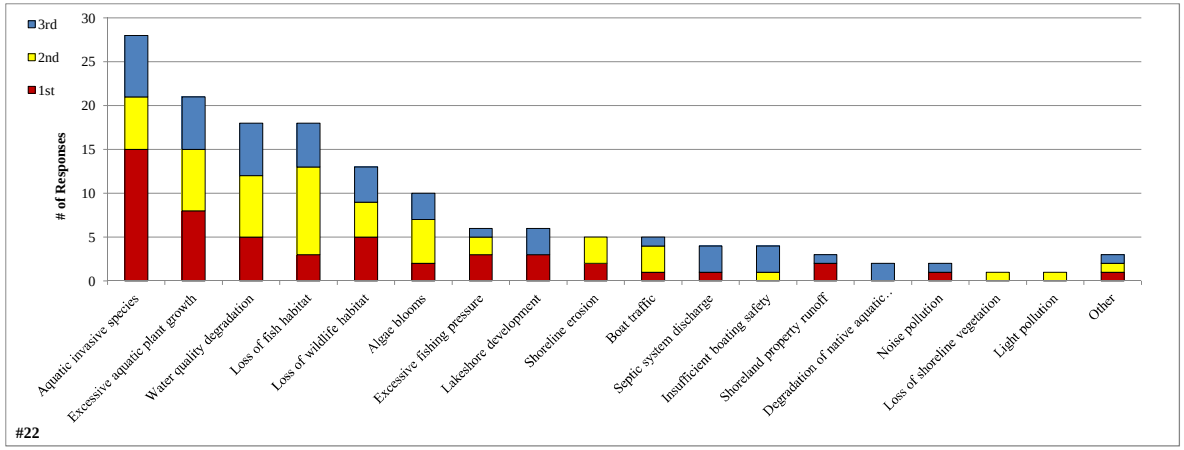
	0-Not present	1-No Impact	2	3-Moderately negative impact	4	5-Great negative impact	Unsure	*Total*	*Average*
Excessive aquatic plant growth	0	0	4	15	10	17	4	*46*	*3.9*
Aquatic invasive species	0	1	0	19	10	15	5	*45*	*3.8*
Algae blooms	1	6	7	11	10	10	5	*44*	*3.2*
Loss of fish habitat	3	3	8	17	5	8	6	*41*	*3.0*
Water quality degradation	4	6	4	17	5	8	6	*40*	*2.8*
Degradation of native aquatic plants	1	8	4	21	3	4	8	*40*	*2.7*
Excessive fishing pressure	2	9	10	15	3	6	6	*43*	*2.6*
Shoreline erosion	4	10	9	15	3	4	6	*41*	*2.3*
Boat traffic	1	14	12	13	7	0	4	*46*	*2.2*
Shoreland property runoff	1	14	9	12	3	2	8	*40*	*2.2*
Lakeshore development	2	14	10	13	2	3	6	*42*	*2.2*
Septic system discharge	5	11	5	5	4	4	16	*29*	*2.1*
Loss of wildlife habitat	5	12	13	6	5	2	7	*38*	*2.0*
Insufficient boating safety	6	13	13	7	4	3	5	*40*	*2.0*
Noise pollution	2	18	12	11	3	1	4	*45*	*2.0*
Loss of shoreline vegetation	5	13	12	9	2	2	6	*38*	*1.9*
Light pollution	6	22	7	6	3	0	6	*38*	*1.5*
Other	0	0	0	0	0	5	5	*5*	*5.0*



#21

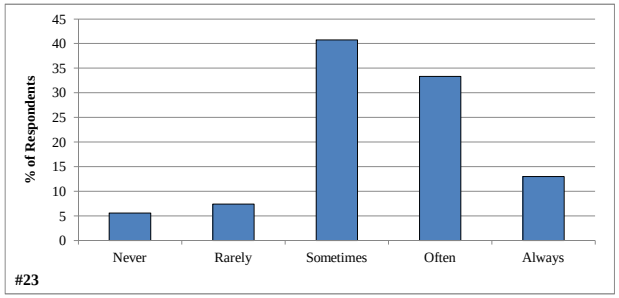
#22 From the list below, please rank your top three concerns regarding the Jersey Flowage.

	1st	2nd	3rd	*% Ranked*
Aquatic invasive species	15	6	7	*18.7*
Excessive aquatic plant growth	8	7	6	*14.0*
Water quality degradation	5	7	6	*12.0*
Loss of fish habitat	3	10	5	*12.0*
Loss of wildlife habitat	5	4	4	*8.7*
Algae blooms	2	5	3	*6.7*
Excessive fishing pressure	3	2	1	*4.0*
Lakeshore development	3	0	3	*4.0*
Shoreline erosion	2	3	0	*3.3*
Boat traffic	1	3	1	*3.3*
Septic system discharge	1	0	3	*2.7*
Insufficient boating safety	0	1	3	*2.7*
Shoreland property runoff	2	0	1	*2.0*
Degradation of native aquatic plants	0	0	2	*1.3*
Noise pollution	1	0	1	*1.3*
Loss of shoreline vegetation	0	1	0	*0.7*
Light pollution	0	1	0	*0.7*
Other	1	1	1	*2.0*
	52	51	47	*100.0*



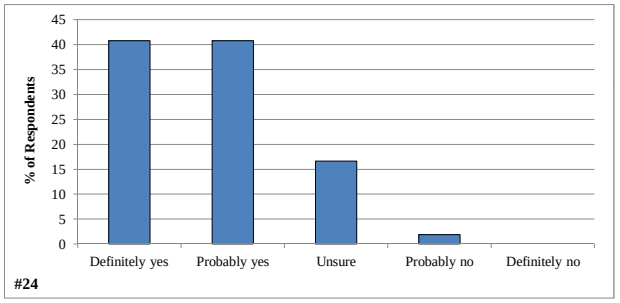
#23 During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of the Jersey Flowage?

	Total	%
Never	3	*5.6*
Rarely	4	*7.4*
Sometimes	22	*40.7*
Often	18	*33.3*
Always	7	*13.0*
	54	*100.0*



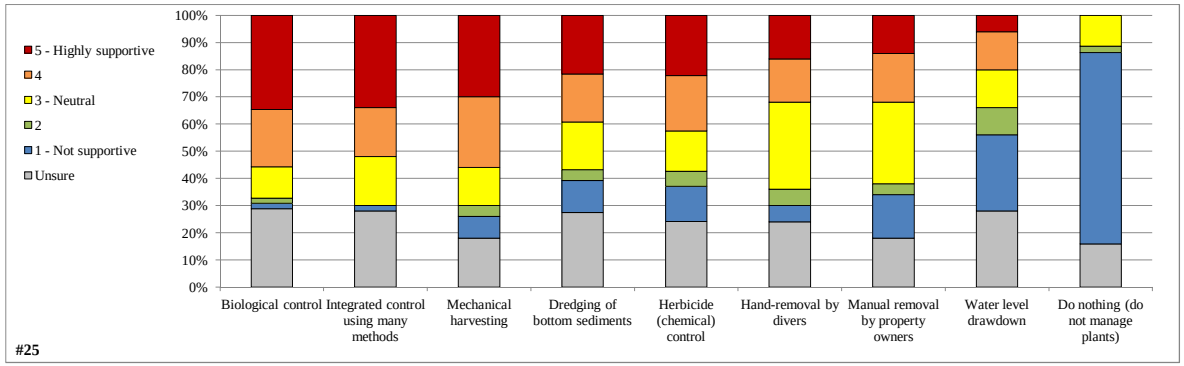
#24 Considering your answer to the question #23, do you believe aquatic plant control is needed on the Jersey Flowage?

	Total	%
Definitely yes	22	*40.7*
Probably yes	22	*40.7*
Unsure	9	*16.7*
Probably no	1	*1.9*
Definitely no	0	*0.0*
	54	*100.0*



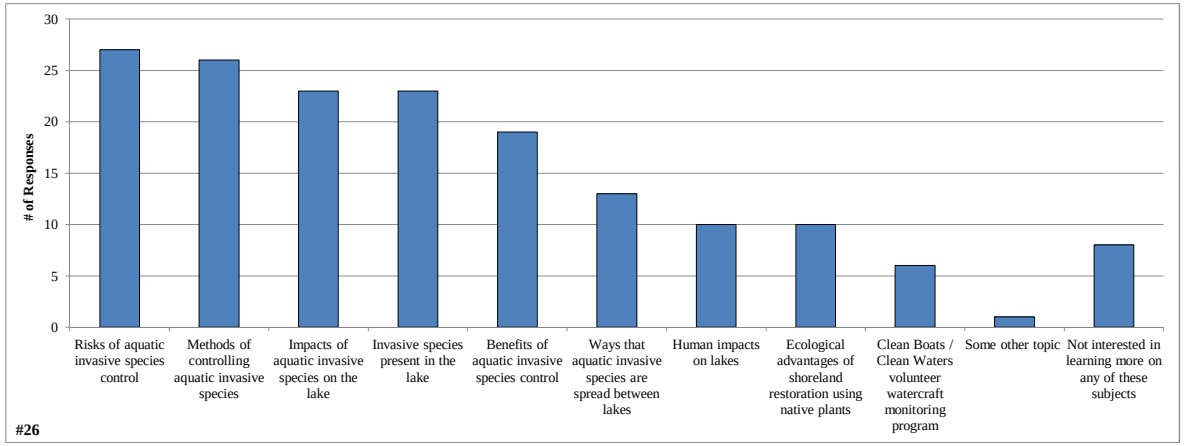
#25 Aquatic plants can be professionally managed using many techniques. What is your level of support for the responsible use of the following techniques on the Jersey Flowage?

	1 - Not supportive	2	3 - Neutral	4	5 - Highly supportive	Unsure	Total	Average
Biological control	1	1	6	11	18	15	*37*	*4.2*
Integrated control using many methods	1	0	9	9	17	14	*36*	*4.1*
Mechanical harvesting	4	2	7	13	15	9	*41*	*3.8*
Dredging of bottom sediments	6	2	9	9	11	14	*37*	*3.5*
Herbicide (chemical) control	7	3	8	11	12	13	*41*	*3.4*
Hand-removal by divers	3	3	16	8	8	12	*38*	*3.4*
Manual removal by property owners	8	2	15	9	7	9	*41*	*3.1*
Water level drawdown	14	5	7	7	3	14	*36*	*2.4*
Do nothing (do not manage plants)	31	1	5	0	0	7	*37*	*1.3*



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

	Total
Risks of aquatic invasive species control	27
Methods of controlling aquatic invasive species	26
Impacts of aquatic invasive species on the lake	23
Invasive species present in the lake	23
Benefits of aquatic invasive species control	19
Ways that aquatic invasive species are spread between lakes	13
Human impacts on lakes	10
Ecological advantages of shoreland restoration using native plants	10
Clean Boats / Clean Waters volunteer watercraft monitoring program	6
Some other topic	1
Not interested in learning more on any of these subjects	8



Friends of the Jersey Flowage, Inc.

#27 Before receiving this mailing, have you ever heard of the Friends of the Jersey Flowage?

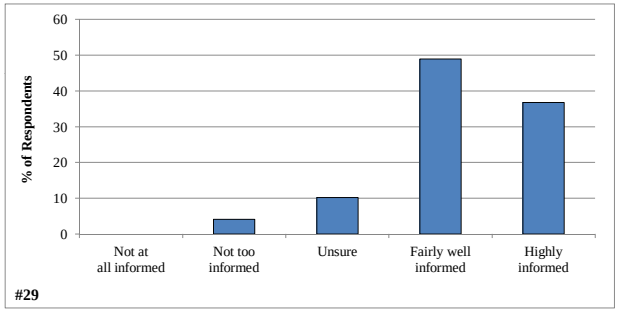
	Total	%
Yes	56	*100.0*
No	0	*0.0*
	56	*100.0*

#28 What is your membership status with the Friends of the Jersey Flowage?

	Total	%
Current member	40	*71.4*
Former member	4	*7.1*
Never been a member	12	*21.4*
	56	*100.0*

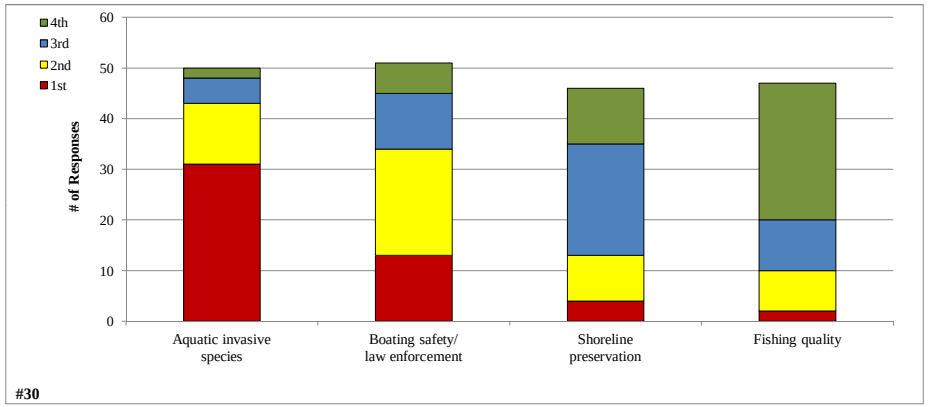
#29 How informed has the Friends of the Jersey Flowage kept you regarding issues with the lake and its management?

	Total	%
Not at all informed	0	*0.0*
Not too informed	2	*4.1*
Unsure	5	*10.2*
Fairly well informed	24	*49.0*
Highly informed	18	*36.7*
	49	*100.0*



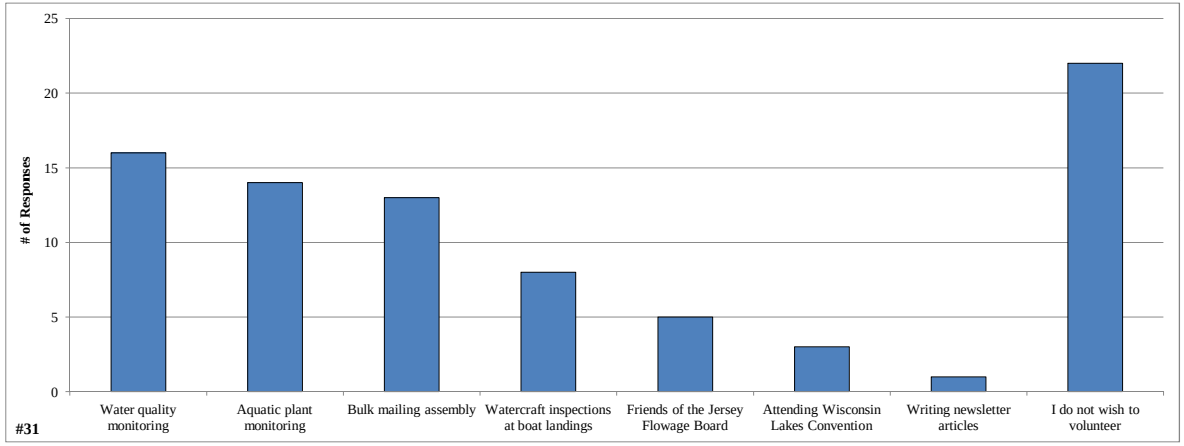
#30 Please indicate, in order of importance, the priorities you believe the Friends of the Jersey Flowage should focus upon.

	1st	2nd	3rd	4th	*Weighted Rank*
Aquatic invasive species	31	12	5	2	*1*
Boating safety/law enforcement	13	21	11	6	*2*
Shoreline preservation	4	9	22	11	*3*
Fishing quality	2	8	10	27	*4*
	50	50	48	46	



#31 Please circle the activities you would be willing to participate in if the the Jersey Flowage Lake Association requires additional assistance.

	Total
Water quality monitoring	16
Aquatic plant monitoring	14
Bulk mailing assembly	13
Watercraft inspections at boat landings	8
Friends of the Jersey Flowage Board	5
Attending Wisconsin Lakes Convention	3
Writing newsletter articles	1
I do not wish to volunteer	22



C

APPENDIX C

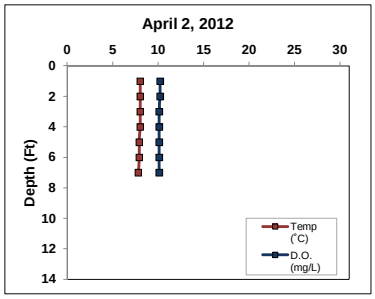
Water Quality Data

Jersey Flowage

Date: 4/2/2012
Time: 9:15
Weather: 75% sun, breezy, 41°F
Entry: TWH

Max Depth: 8.3
JFS Depth (ft): 3.0
JFB Depth (ft): 6.0
Secchi Depth (ft): 3.8

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	8.0	10.2	8.5	69.0
2	8.0	10.2	8.4	69.0
3	8.0	10.1	8.4	69.0
4	8.0	10.1	8.4	69.0
5	7.9	10.1	8.3	70.0
6	7.9	10.1	8.3	70.0
7	7.8	10.1	8.3	70.0



Parameter	JFS	JFB
Total P (µg/L)	38.00	37.00
Dissolved P (µg/L)	5.00	4.00
Chl-*a* (µg/L)	7.55	NA
TKN (µg/L)	530.00	ND
NO_3 + NO_2-N (µg/L)	142.00	135.00
NH_3-N (µg/L)	ND	20.00
Total N (µg/L)	672.00	20.00
Lab Cond. (µS/cm)	74.00	87.00
Lab pH	7.28	7.55
Alkalinity (mg/L $CaCO_3$)	26.20	30.40
Total Susp. Solids (mg/L)	3.00	3.00
Calcium (mg/L)	8.50	NA
Magnesium (mg/L)	2.60	NA
Hardness (mg/L)	32.10	NA
Color (SU)	60.00	NA
Turbidity (NTU)	1.50	NA

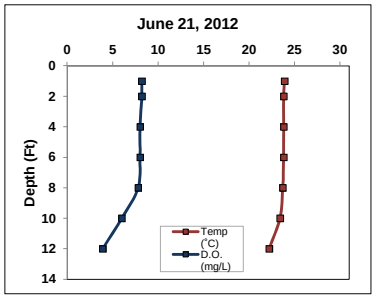
Data collected by TWH (Onterra)

Jersey Flowage

Date: 6/21/2012
Time: 10:16
Weather: 50% clouds, 65F, moderate breeze
Entry: EEC

Max Depth: 12.6
JFS Depth (ft): 3.0
JFB Depth (ft): 10.0
Secchi Depth (ft): 3.5

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	23.9	8.2		
2	23.8	8.2		
4	23.8	8.0	7.7	
6	23.8	8.0		
8	23.7	7.8		
10	23.4	6.0		
12	22.2	3.9		



Parameter	JFS	JFB
Total P (µg/L)	44.00	48.00
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	14.20	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

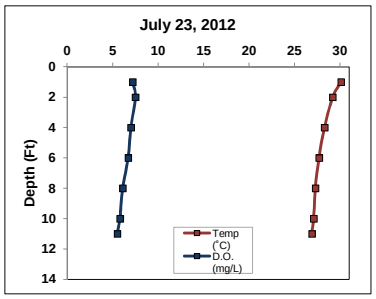
Data collected by TAH and DAC (Onterra)

Jersey Flowage

Date: 7/23/2012
Time: 14:30
Weather: Clear, breezy, 85F
Entry: EEC

Max Depth: 12.0
JFS Depth (ft): 3.0
JFB Depth (ft): 9.0
Secchi Depth (ft): 3.0

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	30.1	7.2		
2	29.2	7.5		
4	28.3	7.0		
6	27.7	6.7		
8	27.3	6.1		
10	27.1	5.8		
11	26.9	5.5		



Parameter	JFS	JFB
Total P (µg/L)	51.00	52.00
Dissolved P (µg/L)	2.00	2.00
Chl-*a* (µg/L)	23.80	NA
TKN (µg/L)	680.00	620.00
$NO_3 + NO_2$-N (µg/L)	ND	ND
NH_3-N (µg/L)	ND	ND
Total N (µg/L)	680.00	620.00
Lab Cond. (µS/cm)	86.00	86.00
Lab pH	7.52	7.41
Alkalinity (mg/L $CaCO_3$)	35.80	35.80
Total Susp. Solids (mg/L)	7.00	7.00
Calcium (mg/L)	10.20	NA
Magnesium (mg/L)	3.20	NA
Hardness (mg/L)	38.70	NA
Color (SU)	50.00	NA
Turbidity (NTU)	NA	NA

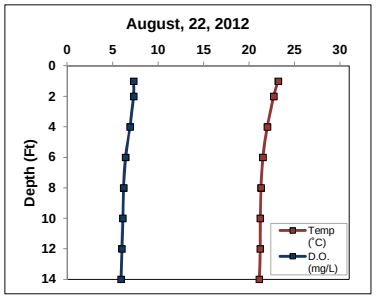
Data collected by TAH (Onterra) - water brownish green

Jersey Flowage

Date: 8/22/2012
Time: 15:00
Weather: 0% clouds, breezy, 80F
Entry: EEC

Max Depth: 16.9
JFS Depth (ft): 3
JFB Depth (ft): 14
Secchi Depth (ft): 4.2

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	23.2	7.3		
2	22.7	7.3		
4	22	6.9		
6	21.5	6.4		
8	21.3	6.2		
10	21.2	6.1		
12	21.2	6		
14	21.1	5.9		



Parameter	JFS	JFB
Total P (µg/L)	41	43
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	18.1	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

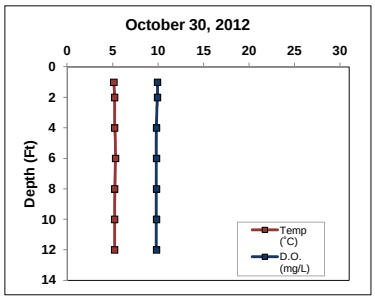
Data collected by TAH (Onterra), MJH, and MKH

Jersey Flowage

Date: 10/30/2012
Time: 11:00
Weather: 60% clouds, windy, 40F
Entry: EEC

Max Depth: 15.2
JFS Depth (ft): 3
JFB Depth (ft): 12
Secchi Depth (ft): 5.9

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	5.1	9.9		
2	5.2	9.9	7.4	
4	5.2	9.8		
6	5.3	9.8		
8	5.2	9.8		
10	5.2	9.8		
12	5.2	9.8	7.4	



Parameter	JFS	JFB
Total P (µg/L)	42	42
Dissolved P (µg/L)	NA	NA
Chl-*a* (µg/L)	4.46	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)	2	3
Calcium (mg/L)	NA	NA
Magnesium (mg/L)	NA	NA
Hardness (mg/L)	NA	NA
Color (SU)	NA	NA
Turbidity (NTU)	NA	NA

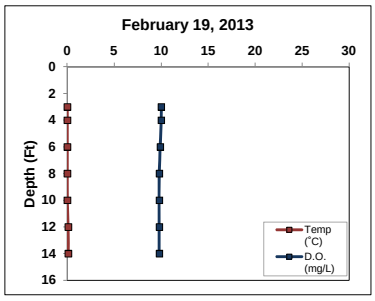
Data collected by TWH (Onterra)

Jersey Flowage

Date: 2/19/2013
Time: 11:00
Weather: 100% clouds, windy, snowy, 8˚F
Entry: TWH

Max Depth: 14.8
JFS Depth (ft): 3
JFB Depth (ft): 12
Secchi Depth (ft): 5

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1				
3	0	10		
4	0	10		
6	0	9.9		
8	0	9.8		
10	0	9.8		
12	0.1	9.8		
14	0.1	9.8		



Parameter	JFS	JFB
Total P (µg/L)	70.00	24.00
Dissolved P (µg/L)	6.00	6.00
Chl-*a* (µg/L)	NA	NA
TKN (µg/L)	590.00	310.00
$NO_3 + NO_2$-N (µg/L)	181.00	171.00
NH_3-N (µg/L)	59.00	66.00
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 TWH and EJG (Onterra) Ice thickness: 0.8'

Water Quality Data

2012	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	6	4.2	NA	NA
Total P (µg/L)	6	47.7	6	41.0
Dissolved P (µg/L)	3	4.3	3	4.0
Chl a (µg/L)	5	13.6	0	NA
TKN (µg/L	3	600.0	3	465.0
NO3+NO2-N (µg/L)	3	161.5	3	153.0
NH3-N (µg/L)	3	59.0	3	43.0
Total N (µg/L)	2	676.0	2	320.0
Lab Cond. (µS/cm)	2	80.0	2	86.5
Lab pH	2	7.4	2	7.5
Alkal (mg/l CaCO3)	2	31.0	2	33.1
Total Susp. Solids (mg/l)	3	4.0	3	4.3
Calcium (µg/L)	2	9.4	0	NA
Magnesium (mg/L)	2	2.9	0	NA
Hardness (mg/L)	2	35.4	0	NA
Color (SU)	2	55.0	0	NA
Turbidity (NTU)	1	1.5	0	NA

Trophic State Index (TSI)

Year	TP	Chl-a	Secchi
1979	53.2	59.4	63.9
2003	59.0	55.9	57.1
2011			59.3
2012	59.8	59.3	58.8
#REF!			
All Years (Weighted)	58.5	58.7	59.3
Shallow, Lowland Drainage Lakes	54.6	52.6	52.4
NLF Ecoregion	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	2.5	1	2.5	1	18.8	1	18.8	1	30.0	1.0	30.0
2003	2	5.0	1	4.0	1	13.2	1	13.2	2	34.5	1.0	45.0
2010	3	2.8	0									
2011	9	3.7	5	3.4								
2012	5	4.1	3	3.6	5	13.6	3	18.7	5	44.4	3.0	47.3
All Years (Weighted)		3.7		3.4		14.3		17.6		40.1		43.4
Shallow, Lowland Drainage Lakes				5.6				9.4				33.0
NLF Ecoregion				8.9				5.6				21.0

July 2012 N: 680.0
July 2012 P: 51.0

Summer 2012 N:P 13 :1

D

APPENDIX D

Watershed Analysis WiLMS Results

Date: 3/6/2013 Scenario: 112

Lake Id: Jersey Flowage

Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 5788.0 acre
Total Unit Runoff: 11.70 in.
Annual Runoff Volume: 5643.3 acre-ft
Lake Surface Area <As>: 433.0 acre
Lake Volume <V>: 1794.0 acre-ft
Lake Mean Depth <z>: 4.1 ft
Precipitation - Evaporation: 5.2 in.
Hydraulic Loading: 370651.8 acre-ft/year
Areal Water Load <qs>: 856.0 ft/year
Lake Flushing Rate <p>: 206.61 1/year
Water Residence Time: 0.00 year
Observed spring overturn total phosphorus (SPO): 38.0 mg/m^3
Observed growing season mean phosphorus (GSM): 40.1 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre (ac)	Low	Most Likely	High	Loading %	Low	Most Likely	High
		|---- Loading (kg/ha-year) ----|				|----- Loading (kg/year) ----|		
Row Crop AG	13.0	0.50	1.00	3.00	0.0	3	5	16
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	571.0	0.10	0.30	0.50	0.4	23	69	116
HD Urban (1/8 Ac)	2.0	1.00	1.50	2.00	0.0	1	1	2
MD Urban (1/4 Ac)	7.0	0.30	0.50	0.80	0.0	1	1	2
Rural Res (>1 Ac)	78.0	0.05	0.10	0.25	0.0	2	3	8
Wetlands	2974.0	0.10	0.10	0.10	0.7	120	120	120
Forest	2143.0	0.05	0.09	0.18	0.5	43	78	156
Lake Surface	433.0	0.10	0.30	1.00	0.3	18	53	175

POINT SOURCE DATA

Point Sources	Water Load (m^3/year)	Low (kg/year)	Most Likely (kg/year)	High (kg/year)	Loading %
Lake Nokomis Input	4.5E+008	0.0	15849.0	0.0	98.0

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)	463.5	35671.2	1311.3	100.0
Total Loading (kg)	210.2	16180.4	594.8	100.0
Areal Loading (lb/ac-year)	1.07	82.38	3.03	
Areal Loading (mg/m^2-year)	119.97	9233.84	339.44	
Total PS Loading (lb)	0.0	34940.7	0.0	98.0
Total PS Loading (kg)	0.0	15849.0	0.0	98.0
Total NPS Loading (lb)	424.8	614.6	925.0	2.0
Total NPS Loading (kg)	192.7	278.8	419.6	2.0

Phosphorus Prediction and Uncertainty Analysis Module

Date: 3/6/2013 Scenario: 74
Observed spring overturn total phosphorus (SPO): 38.0 mg/m^3
Observed growing season mean phosphorus (GSM): 40.1 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	0	36	1	-4	-10
Canfield-Bachmann, 1981 Natural Lake	0	35	1	-5	-12
Canfield-Bachmann, 1981 Artificial Lake	0	33	1	-7	-17
Rechow, 1979 General	0	29	1	-11	-27
Rechow, 1977 Anoxic	0	32	1	-8	-20
Rechow, 1977 water load<50m/year	N/A	N/A	N/A	N/A	N/A
Rechow, 1977 water load>50m/year	0	26	1	-14	-35
Walker, 1977 General	0	34	1	-4	-11
Vollenweider, 1982 Combined OECD	1	28	2	-11	-28
Dillon-Rigler-Kirchner	0	35	1	-3	-8
Vollenweider, 1982 Shallow Lake/Res.	1	23	1	-16	-41
Larsen-Mercier, 1976	0	34	1	-4	-11
Nurnberg, 1984 Oxic	0	35	1	-5	-12

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	12	61	z Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	11	101	L p	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	10	95	FIT	1	GSM
Rechow, 1979 General	9	50	qs	0	GSM
Rechow, 1977 Anoxic	11	54	FIT	0	GSM
Rechow, 1977 water load<50m/year	N/A	N/A	N/A	N/A	N/A
Rechow, 1977 water load>50m/year	10	41	FIT	0	GSM
Walker, 1977 General	9	62	FIT	0	SPO
Vollenweider, 1982 Combined OECD	8	53	Tw	0	ANN
Dillon-Rigler-Kirchner	12	59	P L qs p	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	6	43	Tw	0	ANN
Larsen-Mercier, 1976	12	56	P Pin p	0	SPO
Nurnberg, 1984 Oxic	10	63	L qs	0	ANN

Water and Nutrient Outflow Module

Date: 3/6/2013 Scenario: 65
Average Annual Surface Total Phosphorus: 39.1mg/m^3
Annual Discharge: 3.58E+005 AF => 4.41E+008 m^3
Annual Outflow Loading: 36341.5 LB => 16484.4 kg

E

APPENDIX E

Aquatic Plant Survey Data

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAUFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
1	45.49186	-89.750357				OTHER																																												
2	45.49234	-89.751712	6	Muck	Pole																																													
3	45.492338	-89.751034	6	Rock																																														
4	45.492337	-89.750355	14			DEEP																																												
5	45.492817	-89.75171	6	Muck	Pole																																													
6	45.492815	-89.751032	8	Rock	Pole																																													
7	45.492814	-89.750353	9	Muck	Pole																																													
8	45.492812	-89.749675				TERRESTRIAL																																												
9	45.493294	-89.751708	5	Rock	Pole																																													
10	45.493292	-89.751029	11	Muck	Pole																																													
11	45.493291	-89.750351	7	Muck	Pole																																													
12	45.493771	-89.751706	8	Muck	Pole																																													
13	45.493769	-89.751027	13			DEEP																																												
14	45.493768	-89.750349	6	Sand	Pole																																													
15	45.493766	-89.749671	5	Muck	Pole																																													
16	45.493765	-89.749992	7	Muck	Pole																																													
17	45.494246	-89.751025	9	Muck	Pole																																													
18	45.494245	-89.750347	12	Muck	Pole																																													
19	45.494243	-89.749669	10	Muck	Pole																																													
20	45.494242	-89.74899	9	Muck	Pole																																													
21	45.49424	-89.748312	2	Muck	Pole		2			1																							1	1												1				
22	45.494723	-89.751023	4	Muck	Pole																																													
23	45.494722	-89.750345	6	Rock	Pole																																													
24	45.49472	-89.749666	11	Rock	Pole																																													
25	45.494719	-89.748988	3	Sand	Pole		1																			1					1															1				
26	45.495199	-89.750343	3	Muck	Pole		1							1													1							1																
27	45.495197	-89.749664	10	Muck	Pole																																													
28	45.495196	-89.748986	8	Muck	Pole																																													
29	45.495194	-89.748308	6	Muck	Pole																																													
30	45.495677	-89.751019				NONNAVIGABLE (PLANTS)																																												
31	45.495676	-89.750341	3	Muck	Pole		2																	1									1	2																
32	45.495674	-89.749662	11	Muck	Pole																																													
33	45.495673	-89.748984	6	Muck	Pole																																													
34	45.495672	-89.748306	3	Sand	Pole		2																							1			1	1												2				
35	45.49567	-89.747627	4	Muck	Pole																																													
36	45.496153	-89.750338	1	Sand	Pole		1																	1																									1	
37	45.496152	-89.74966	7	Muck	Pole																																													
38	45.49615	-89.748982	11	Sand	Pole																																													
39	45.496149	-89.748303	3	Muck	Pole		2	1																		1	1			1																				
40	45.496147	-89.747625	3	Muck	Pole		2	1			1																			1		1			1															
41	45.496146	-89.746947	3	Muck	Pole		2																										1													2			1	
42	45.49663	-89.750336	2	Sand	Pole		3										1							1									2	1	1									1						
43	45.496629	-89.749658	7	Muck	Pole																																													
44	45.496627	-89.74898	10	Sand	Pole																																													
45	45.496626	-89.748301	7	Muck	Pole																																													
46	45.496624	-89.747623	4	Muck	Pole		1	1			1																																							
47	45.496623	-89.746945	2	Sand	Pole		1																										1													1				
48	45.497106	-89.749656	2	Sand	Pole		1																								1		1													1				
49	45.497104	-89.748978	8	Muck	Pole																																													
50	45.497103	-89.748299	11	Muck	Pole																																													
51	45.497101	-89.747621	1	Sand	Pole		2									2		1																																
52	45.4971	-89.746943	2	Muck	Pole		2			1		1				1	1															1											1							
53	45.497581	-89.748975	6	Sand	Pole																																													
54	45.49758	-89.748297	8	Muck	Pole																																													
55	45.497578	-89.747619				NONNAVIGABLE (PLANTS)																																												
56	45.497577	-89.74694				NONNAVIGABLE (PLANTS)																																												
57	45.498058	-89.748973	6	Muck	Pole																																													
58	45.498057	-89.748295	10	Sand	Pole																																													
59	45.498055	-89.747617	3	Sand	Pole		2	1																			1				1		1	1																
60	45.498054	-89.746938	3	Muck	Pole		3				2						1						1	1								2		1																
61	45.498052	-89.74626				NONNAVIGABLE (PLANTS)																																												
62	45.498538	-89.750328	3	Muck	Pole																																												1	
63	45.498537	-89.74965	4	Muck	Pole																																													
64	45.498535	-89.748971	6	Muck	Pole																																													
65	45.498534	-89.748293	11	Sand	Pole																																													
66	45.498532	-89.747615	7	Muck	Pole																																													
67	45.499017	-89.751004	4	Muck	Pole		1				1																																			1	1			
68	45.499015	-89.750326	6	Muck	Pole																																													
69	45.499014	-89.749647	3	Muck	Pole		3			1	2								1					1	1																		1		1					
70	45.499012	-89.748969				NONNAVIGABLE (PLANTS)																																												
71	45.499011	-89.748291	4	Sand	Pole		2																										1													2				
72	45.499009	-89.747612	9	Rock	Pole																																													
73	45.499008	-89.746934	4	Rock	Pole		1																																							1				
74	45.499006	-89.746256	9	Rock	Pole																																													
75	45.499005	-89.745577	7	Rock	Pole																																													
76	45.499003	-89.744899	5	Muck	Pole		1				1																																			1				

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAJFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
77	45.499002	-89.744221	8	Sand	Pole																																														
78	45.499	-89.743542	5	Muck	Pole		1																																							1					
79	45.498999	-89.742864	3	Muck	Pole		3				1													1								3		1								1							1	
80	45.498997	-89.742185	2	Muck	Pole		3			1	3													1				1				1																		
81	45.499494	-89.751002	4	Muck	Pole		3				1												1	1		2																			1					
82	45.499492	-89.750324	2	Sand	Pole		3									2							1	1																			1					1		
83	45.499485	-89.746932				NONNAVIGABLE (PLANTS)																																													
84	45.499483	-89.746254	5	Rock	Pole																																														
85	45.499482	-89.745575	5	Muck	Pole		3																																							3					
86	45.49948	-89.744897	4	Muck	Pole		3																				2																			1			1		
87	45.499479	-89.744218	7	Sand	Pole																																														
88	45.499477	-89.74354	7	Sand	Pole																																														
89	45.499476	-89.742862	8	Sand	Pole																																														
90	45.499474	-89.742183	3	Muck	Pole		3										1		1					1								2											1		1			1			
91	45.499971	-89.751	4	Muck	Pole		3			1	2								1					1																		1		1						
92	45.499959	-89.745573				NONNAVIGABLE (PLANTS)																																													
93	45.499957	-89.744895				NONNAVIGABLE (PLANTS)																																													
94	45.499956	-89.744216				NONNAVIGABLE (PLANTS)																																													
95	45.499954	-89.743538	6	Muck	Pole																																														
96	45.499953	-89.742859	8	Muck	Pole																																														
97	45.499951	-89.742181	3	Sand	Pole		1	1																																											
98	45.500448	-89.750998				NONNAVIGABLE (PLANTS)																																													
99	45.500432	-89.743536	3	Muck	Pole		1																1		1																										
100	45.50043	-89.742857	6	Muck	Pole																																														
101	45.500428	-89.742179	9	Muck	Pole																																														
102	45.500427	-89.741501	5	Muck	Pole		1																												1														1	
103	45.500907	-89.742855	2	Sand	Pole		1																		1															1									1	
104	45.500906	-89.742177	6	Sand	Pole																																														
105	45.500904	-89.741498	7	Muck	Pole																																														
106	45.500902	-89.74082	6	Muck	Pole																																														
107	45.501383	-89.742175				NONNAVIGABLE (PLANTS)																																													
108	45.501381	-89.741496	10	Sand	Pole																																														
109	45.501379	-89.740818	6	Muck	Pole																	1																													
110	45.501378	-89.740139	6	Muck	Pole																																														
111	45.501376	-89.739461	6	Muck	Pole																																												1		
112	45.501375	-89.738783	5	Muck	Pole																																												1		
113	45.501373	-89.738104	1	Sand	Pole																																														
114	45.501857	-89.740816	9	Muck	Pole																																														
115	45.501855	-89.740137	7	Muck	Pole		1																														1														
116	45.501853	-89.739459	6	Muck	Pole																																												1		
117	45.501852	-89.73878	5	Muck	Pole																																												1		
118	45.50185	-89.738102	5	Muck	Pole		2																						2																				1		
119	45.501849	-89.737424	5	Muck	Pole																																												1		
120	45.501847	-89.736745	2	Muck	Pole		1																1																			1				1					
121	45.502334	-89.740813	6	Muck	Pole																																												1		
122	45.502332	-89.740135	9	Muck	Pole																																														
123	45.502331	-89.739457	7	Muck	Pole																																														
124	45.502329	-89.738778	5	Muck	Pole																																												1		
125	45.502327	-89.7381	5	Muck	Pole		1																																							1			1		
126	45.502326	-89.737421	5	Muck	Pole		1	1																																						1			1		
127	45.502324	-89.736743	4	Muck	Pole		2	1						1					1																														1		
128	45.502323	-89.736065	4	Muck	Pole		3	1																										3	1											1			1		
129	45.502321	-89.735386	4	Muck	Pole		2				1								1																							2									
130	45.502312	-89.731316				TERRESTRIAL																																													
131	45.502812	-89.7149				NONNAVIGABLE (PLANTS)																																													
132	45.502811	-89.740811	4				1																1	1																										1		
133	45.502809	-89.740133	5	Muck	Pole																																														
134	45.502808	-89.739454	6	Muck	Pole																																														
135	45.502806	-89.738776	8	Muck	Pole																																														
136	45.502804	-89.738098	6	Sand	Pole																																														
137	45.502803	-89.737419	5	Muck	Pole																																												1		
138	45.502801	-89.736741	5	Muck	Pole			V																																									1		
139	45.5028	-89.736062	5	Muck	Pole		1	1																																									1		
140	45.502798	-89.735384	4	Muck	Pole		1																1										1		1														1		
141	45.502797	-89.734706	4	Muck	Pole		3	1			2						1			1						1				1		1														1				
142	45.502795	-89.734027		Sand	Pole		1				1						1			1							1																		1	1				
143	45.50279	-89.731992	4	Muck	Pole		3				2			1					1	1			1																							1					
144	45.502789	-89.731313	5	Muck	Pole																																														
145	45.503289	-89.741487	2	Muck	Pole		3				1		2	1			1							1	1					1		1			1		1														

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R=Rock)	Pole (P); Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAUFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
146	45.503288	-89.740809	2	Sand	Pole		1																		1																									1	
147	45.503286	-89.740131	4	Muck	Pole																																													1	
148	45.503285	-89.739452	6	Muck	Pole																																													1	
149	45.503283	-89.738774	6	Muck	Pole		2																																							2				
150	45.503282	-89.738095	7	Muck	Pole																																													
151	45.50328	-89.737417	8	Muck	Pole																																													
152	45.503278	-89.736739	5	Muck	Pole		1															1																												
153	45.503277	-89.73606	5	Muck	Pole																																												1	
154	45.503275	-89.735382	3	Muck	Pole		1																																							1			1	
155	45.503274	-89.734703	2	Muck	Pole		2	1						1																																2				
156	45.503269	-89.732668	4	Muck	Pole		1				1			1																															1					
157	45.503267	-89.73199	4	Muck	Pole		1				1												1												1																
158	45.503266	-89.731311	4	Muck	Pole		1																												1															1	
159	45.503264	-89.730633	4	Muck	Pole		2	V																																					1	1			1	
160	45.503765	-89.740807	3	Muck	Pole		2				1						1		1					1		1										1												1		1	
161	45.503763	-89.740128	5	Muck	Pole																																												1	
162	45.503762	-89.73945	5	Muck	Pole																																												1	
163	45.50376	-89.738772	5	Muck	Pole																																												1	
164	45.503759	-89.738093	5	Muck	Pole																																													
165	45.503757	-89.737415	6	Muck	Pole																																												1	
166	45.503755	-89.736736	6	Muck	Pole																																													
167	45.503754	-89.736058	7	Muck	Pole																																													
168	45.503752	-89.735379	8	Muck	Pole																																													
169	45.503748	-89.733344	3	Muck	Pole		1							1			1			1													1																		
170	45.503746	-89.732666	5	Muck	Pole																																												1	
171	45.503744	-89.731987	4	Muck	Pole																																												1	
172	45.503743	-89.731309	3	Sand	Pole			V																																									1	
173	45.503741	-89.73063	4	Muck	Pole		2				1												1									1										1								1	
174	45.504242	-89.740805	2	Muck	Pole		2				1						1							1	1							1			1														1		
175	45.50424	-89.740126	4	Muck	Pole		2																										1									2								1	
176	45.504239	-89.739448	5	Muck	Pole																								1																					1	
177	45.504237	-89.738769	5	Muck	Pole		2																						2																					1	
178	45.504236	-89.738091	5	Muck	Pole																																												1	
179	45.504234	-89.737413	5	Muck	Pole																																													
180	45.504233	-89.736734	5	Muck	Pole																																												1	
181	45.504231	-89.736056	5	Muck	Pole																																												1	
182	45.504229	-89.735377	5	Muck	Pole																																												1	
183	45.504228	-89.734699	5	Muck	Pole		2																										1													2			1	
184	45.504226	-89.73402	9	Muck	Pole																																													
185	45.5042246	-89.73334193	5	Muck	Pole		2																																							2			1	
186	45.5042231	-89.7326635	5	Muck	Pole		1	V																																						1			1	
187	45.5042215	-89.73198507	4	Muck	Pole		1	1																																									1	
188	45.5042199	-89.73130665	4	Muck	Pole			V																																									1	
189	45.5042183	-89.73062822	4	Muck	Pole		1							1									1										1		1															1	
190	45.5047158	-89.73944558	5	Muck	Pole		2																				1																							1	
191	45.5047142	-89.73876715	5	Muck	Pole																																												1	
192	45.5047127	-89.73808871	5	Muck	Pole																																												1	
193	45.5047111	-89.73741028	5	Muck	Pole																																													
194	45.5047096	-89.73673185	5	Muck	Pole		1							1																																			1	
195	45.504708	-89.7365341	5	Muck	Pole		2	1																																						2			1	
196	45.5047064	-89.73537498	6	Muck	Pole		1															1																												
197	45.5047049	-89.73469654	9	Muck	Pole																																												1	
198	45.5047033	-89.73401811	6	Muck	Pole		1															1																												1	
199	45.5047017	-89.73333968	6	Muck	Pole		1														1																													1	
200	45.5047001	-89.73266124	5	Muck	Pole		1																										1																	
201	45.5046985	-89.73198281	5	Muck	Pole		2	1																																						1				
202	45.5046969	-89.73130438	4	Muck	Pole		1	1						1																																			1	
203	45.5046953	-89.73062594	4	Muck	Pole		1	1						1									1											1															1	
204	45.5051928	-89.73944338	4	Muck	Pole		1																	1																										1	
205	45.5051913	-89.73876494	5	Muck	Pole																																												1	
206	45.5051897	-89.7380865	5	Muck	Pole																																												1	
207	45.5051882	-89.73740806	5	Muck	Pole		3																																							3				
208	45.5051866	-89.73672962	5	Muck	Pole		3																																							3				
209	45.5051851	-89.73605118	6	Muck	Pole																																												1	
210	45.5051835	-89.73537274	6	Muck	Pole		1							1								1																												
211	45.5051819	-89.7346943	6	Muck	Pole		2																																							2				
212	45.5061803	-89.73401586	6	Muck	Pole																																												1	
213	45.5051788	-89.73333742	5	Muck	Pole			V																																									1	
214	45.5051772	-89.73265899	5	Muck	Pole			V																																									1	
215	45.5051756	-89.73198055	5	Muck	Pole		1	1																						1																				1	
216	45.505174	-89.73130211	5	Muck	Pole		2	1																																						1				1	
217	45.5051724	-89.73062367	4	Muck	Pole		1	1																																						1				1	
218	45.5056699	-89.73944118	3	Muck	Pole		2				1						1		1														1														2				
219	45.5056683	-89.73876273	5	Muck	Pole																																												1	
220	45.5056668	-89.73808429	5	Muck	Pole		2																											2																
221	45.5056652	-89.73740584	4	Muck	Pole		2																1							1																	2				

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R-Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAUFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
222	45.5056637	-89.7367274	5	Muck	Pole																																													1	
223	45.5056621	-89.73604895	5	Muck	Pole																																													1	
224	45.5056605	-89.73537051	5	Muck	Pole																																													1	
225	45.505659	-89.73469206	5	Muck	Pole																																													1	
226	45.5056574	-89.73401362	5	Muck	Pole																																													1	
227	45.5056558	-89.73333517	4	Muck	Pole		1																											1																1	
228	45.5056542	-89.73265673	5	Muck	Pole			V																																										1	
229	45.5056526	-89.73197828	5	Muck	Pole		1	1																										1			1													1	
230	45.505651	-89.73129984	5	Muck	Pole		2	1						1																																				1	
231	45.5056494	-89.73062139	5	Muck	Pole		1	V						1																																				1	
232	45.5061454	-89.73876053	5	Muck	Pole																																													1	
233	45.5061439	-89.73808208	4	Muck	Pole		3																							1				3																1	
234	45.5061423	-89.73740363	9	Muck	Pole																																													
235	45.5061407	-89.73672517		Muck	Pole		3																							3																				
236	45.5061392	-89.73604672	5	Muck	Pole		1															1																												
237	45.5061376	-89.73536827	5	Muck	Pole																																													
238	45.506136	-89.73468982	5	Muck	Pole		1	1																																										1	
239	45.5061344	-89.73401137	4	Muck	Pole		2	V																										1													2				
240	45.5061329	-89.73333292	8	Muck	Pole																																													1	
241	45.5061313	-89.73265447	7	Muck	Pole																																													
242	45.5061297	-89.73197602	6	Sand	Pole		1	1																									1																	
243	45.5061281	-89.73129757	5	Muck	Pole		1	V			1																																							1	
244	45.5061265	-89.73061912	5	Muck	Pole		1	1																																										1	
245	45.5061233	-89.72926222				NONNAVIGABLE (PLANTS)																																												
246	45.5066209	-89.73807986	5	Muck	Pole																																										1			
247	45.5066193	-89.73740141	5	Muck	Pole		2																																							2			2	
248	45.5066178	-89.73672295	5	Muck	Pole		1							1																																1			1	
249	45.5066162	-89.73604449	5	Muck	Pole		1	V																										1																1	
250	45.5066147	-89.73536604	4	Muck	Pole		1	1																										1																
251	45.5066131	-89.73468758	4	Muck	Pole		1	V																										1																
252	45.5066115	-89.73400912	6	Muck	Pole																																													1	
253	45.5066099	-89.73333067	5	Muck	Pole																																													1	
254	45.5066083	-89.73265221	5	Muck	Pole																																													1	
255	45.5066067	-89.73197376	5	Muck	Pole		2																																							2			1	
256	45.5066051	-89.7312953	7	Muck	Pole																																													
257	45.5066035	-89.73061684	5	Muck	Pole		1	1																																										1	
258	45.5066019	-89.72993839	1	Sand	Pole		1																		1																									1	
259	45.5066003	-89.72925993	2	Muck	Pole		1	1											1					1	1																						1				
260	45.507098	-89.73807765	4	Muck	Pole		1																1										1																V		
261	45.5070964	-89.73739919	5	Muck	Pole																																													1	
262	45.5070948	-89.73672073	9	Muck	Pole																																													
263	45.5070933	-89.73604226	6	Muck	Pole																																													
264	45.5070917	-89.7353638	6	Muck	Pole																																													
265	45.5070901	-89.73468534	7	Muck	Pole																																													
266	45.5070886	-89.73400688	5	Muck	Pole																																													1	
267	45.507087	-89.73332842	5	Muck	Pole																																													1	
268	45.5070854	-89.73264995	6	Muck	Pole																																													
269	45.5070838	-89.73197149	5	Muck	Pole																																													1	
270	45.5070822	-89.73129303	7	Muck	Pole																																													
271	45.5070806	-89.73061457	5	Muck	Pole		1				1																																							1	
272	45.507079	-89.72993611	3	Sand	Pole		2							1							1	1																								1			1	
273	45.5075735	-89.73739697	2	Muck	Pole		1																		1																										
274	45.5075719	-89.7367185	3	Sand	Pole		1																		1																						1			1	
275	45.5075703	-89.73604003	4	Muck	Pole		2																																							2			1	
276	45.5075688	-89.73536157	3	Sand	Pole		1																		1																									1	
277	45.5075672	-89.7346831	2	Sand	Pole		1																		1																						1			1	
278	45.5075656	-89.73400463	6	Muck	Pole																																													1	
279	45.507564	-89.73332616	5	Muck	Pole																																													1	
280	45.5075624	-89.73264769	5	Muck	Pole																																													1	
281	45.5075609	-89.73196923	5	Muck	Pole																																													1	
282	45.5075593	-89.73129076	5	Muck	Pole																																													1	
283	45.5075577	-89.73061229	7	Muck	Pole																																													
284	45.5075561	-89.72993382	5	Muck	Pole		1																										1																	1	
285	45.5080489	-89.73671628				NONNAVIGABLE (PLANTS)																																												
286	45.5080474	-89.7360378	2	Sand	Pole		2				1						1		1				1		1																								1	
287	45.5080427	-89.73400238	5	Muck	Pole		1																																											1	
288	45.5080411	-89.73332391	2	Sand	Pole		1							1										1	1									1																	
289	45.5080395	-89.73264544	4	Muck	Pole		2																				1																							1	
290	45.5080379	-89.73196696	5	Muck	Pole		22																																											2	
291	45.5080363	-89.73128849	5	Muck	Pole																																													
292	45.5080347	-89.73061002	5	Muck	Pole		2															1																									1			2	
293	45.5080331	-89.72993154	6	Muck	Pole																																													
294	45.5080315	-89.72925307	5	Muck	Pole		2															1																												2	
295	45.5085213	-89.73467862	3	Muck	Pole		1				1													1	1																									
296	45.5085197	-89.73400014	2	Sand	Pole		2			2	1																															1								
297	45.508515	-89.7319647	4	Muck	Pole		2																						2																				1	

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R-Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAJFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
298	45.5085134	-89.73128622	6	Muck	Pole		1																																											1	
299	45.5085118	-89.73060774	5	Muck	Pole		1																																											1	
300	45.5085102	-89.72992926	7	Muck	Pole																																														
301	45.5085086	-89.72925078	5	Muck	Pole		1																																											1	
302	45.5085069	-89.7285723	5	Muck	Pole		2																				1																			1				1	
303	45.5089999	-89.73535486				NONNAVIGABLE (PLANTS)																																													
304	45.5089983	-89.73467637	5	Muck	Pole		2																																							1				2	
305	45.5089968	-89.73399789				NONNAVIGABLE (PLANTS)																																													
306	45.5089904	-89.73128395	5	Sand	Pole		1																																											1	
307	45.5089888	-89.73060546	6	Muck	Pole		1																																											1	
308	45.5089872	-89.72992698	5	Muck	Pole		2																																							2				1	
309	45.5089856	-89.7292485	7	Muck	Pole		1																																											1	
310	45.508984	-89.72857001	5	Muck	Pole		2																																											2	
311	45.5094754	-89.73467413	2	Muck	Pole		2				2													1								1			1							1				1					
312	45.5094738	-89.73399564				NONNAVIGABLE (PLANTS)																																													
313	45.5094659	-89.7060319	5	Muck	Pole		2																																											2	
314	45.5094643	-89.7299247	5	Muck	Pole																																														
315	45.5094627	-89.72924621	5	Muck	Pole		1																																											1	
316	45.5094611	-89.72856772	7	Muck	Pole																																														
317	45.5099525	-89.73467189	4	Muck	Pole		3				1																																			1				3	
318	45.5099509	-89.7339934				NONNAVIGABLE (PLANTS)																																													
319	45.5099413	-89.72992242	5	Muck	Pole		2																																											2	
320	45.5099397	-89.72924392	6	Muck	Pole		1							1																																				1	
321	45.5099381	-89.72856542	5	Muck	Pole		2																																							2				1	
322	45.5099365	-89.72788693	8	Sand	Pole																																														
323	45.5099349	-89.72720843	4	Muck	Pole		2	1			1																								1															1	
324	45.5099333	-89.72652994	2	Muck	Pole		2										1																																	2	
325	45.5104295	-89.73466965	4	Muck	Pole		2				1																																							2	
326	45.5104279	-89.73399115	1	Muck	Pole		1				1						1					1		1	1																			1					
327	45.5104168	-89.72924163	6	Muck	Pole																																													
328	45.5104152	-89.72856313	6	Muck	Pole																																													
329	45.5104136	-89.72788463	6	Muck	Pole		1																																											1	
330	45.5104119	-89.72720613	6	Muck	Pole		2																																											2	
331	45.5109066	-89.73466741	2	Muck	Pole		1				1								1					1																										
332	45.510905	-89.7339889	3	Muck	Pole		2				1																																			1				1	
333	45.5108938	-89.72923935	5	Muck	Pole		1																																											1	
334	45.5108922	-89.72856084	6	Muck	Pole																																													
335	45.5108906	-89.72788233	5	Muck	Pole		2																																							1				2	
336	45.510889	-89.72720382	6	Muck	Pole		2																																											2	
337	45.5108874	-89.72652532	7	Muck	Pole																																													
338	45.5113836	-89.73466517	2	Muck	Pole		2			1	2												1	1	1																					1				
339	45.511382	-89.73398665	4	Muck	Pole		1																																											1	
340	45.5113709	-89.72923706	4	Muck	Pole		1																																											1	
341	45.5113693	-89.72855855	6	Sand	Pole		1																																											1	
342	45.5113677	-89.72788003	6	Muck	Pole		1																																							1				1	
343	45.511366	-89.72720152	5	Muck	Pole		1																																											1	
344	45.5113644	-89.72652301	7	Muck	Pole		1																																											1	
345	45.5118607	-89.73466293	1	Muck	Pole		1				1													1	1																1			1							
346	45.5118591	-89.73398441	2	Muck	Pole		2				1			1																			1									2									
347	45.5118575	-89.73330589	4	Muck	Pole		1																												1																1	
348	45.5118479	-89.72923477	2	Sand	Pole																																														
349	45.5118463	-89.72855625	6	Sand	Pole																																														
350	45.5118447	-89.72787773	5	Muck	Pole		2															1																								2					
351	45.5118431	-89.72719921	6	Muck	Pole		1							1																																				1	
352	45.5118415	-89.7265207	6	Muck	Pole																																														
353	45.5123361	-89.73398216	3	Muck	Pole		3				1								1								1						1																	
354	45.5123346	-89.73330363	4	Muck	Pole		2																																											2	
355	45.512333	-89.73262511	2	Sand	Pole		1																	1	1																1										
356	45.5123234	-89.72855396	6	Sand	Pole																																														
357	45.5123218	-89.72787543	5	Muck	Pole		2																											1																2	
358	45.5123201	-89.72719691	5	Muck	Pole		1																											1												1					
359	45.5123185	-89.72651838	6	Muck	Pole		2																																											2	
360	45.5128164	-89.73533697	2	Muck	Pole		1																		1																1										
361	45.5128148	-89.73465844	2	Muck	Pole		2				1																															1				1					
362	45.5128116	-89.73330138	4	Muck	Pole		2																																											2	
363	45.51281	-89.73262285	4	Muck	Pole		3																																							3					
364	45.5128084	-89.73194432	3	Sand	Pole		1																																											1	
365	45.5128069	-89.73126579	2	Sand	Pole		1																																							1					
366	45.512802	-89.7292302	6	Muck	Pole																																														
367	45.5128004	-89.72855167	6	Muck	Pole		2							1																																				2	
368	45.5127988	-89.72787313	5	Muck	Pole		2																																											2	
369	45.5127972	-89.7271946	5	Muck	Pole		2																											1												2				1	
370	45.5127956	-89.72651607	6	Muck	Pole		2																																											2	
371	45.5132934	-89.73533474	3	Muck	Pole		2				1																															1									
372	45.5132918	-89.7346562	2	Muck	Pole		2				2																					1																			
373	45.5132903	-89.73397766	3	Muck	Pole		1													1						1							1																		
374	45.5132887	-89.73329913	4	Muck	Pole		1																								1																				1	

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R-Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAUFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
375	45.5132871	-89.73262059	4	Muck	Pole		3							1													3																							1	
376	45.5132855	-89.73194205	4	Sand	Pole		3							1																1			1	3																1	
377	45.5132839	-89.73126352	5	Muck	Pole		2																																											2	
378	45.5132823	-89.73058498	6	Sand	Pole																																													
379	45.5132807	-89.72990644	6	Sand	Pole																																													
380	45.5132791	-89.72922791	5	Muck	Pole		2																																							1			1	
381	45.5132775	-89.72854937	4	Muck	Pole		2								1															1			1																1	
382	45.5132759	-89.72787084	4	Muck	Pole		3				1																			1				3															1	
383	45.5132743	-89.7271923	6	Muck	Pole		1																																										1	
384	45.5132726	-89.72651376	5	Muck	Pole		2																																										2	
385	45.513271	-89.72583523	4	Muck	Pole		1																												1															
386	45.513772	-89.73601104	2	Muck	Pole		3				1		1				1		2				1													1						1									
387	45.5137705	-89.7353325	4	Muck	Pole		2															1					1						1													1			2	
388	45.5137689	-89.73465396	1	Muck	Pole		2				1							1						1	1							1											1							
389	45.5137673	-89.73397542	3	Muck	Pole		2																										1																1	
390	45.5137657	-89.7329687	4	Muck	Pole		2																											2																
391	45.5137641	-89.73261833	4	Muck	Pole		3							1																1				3																
392	45.5137626	-89.73193979	5	Muck	Pole		1																																										1	
393	45.513761	-89.73126125	5	Muck	Pole		1																										1													1				
394	45.5137594	-89.7305827	5	Muck	Pole		3	1						1																				2	2															
395	45.5137578	-89.72990416	4	Muck	Pole		3		1					3																				1																
396	45.5137562	-89.72922562	5	Muck	Pole		3		2					1																				1																
397	45.5137545	-89.72854708	4	Muck	Pole		3	V	V		1			3																				1	1											1				
398	45.5137529	-89.72786854	5	Muck	Pole		2																																										2	
399	45.5137513	-89.72718999	6	Muck	Pole		2							1																																			2	
400	45.5137497	-89.72651145	5	Muck	Pole		2																																							2			1	
401	45.5137481	-89.7258291	4	Muck	Pole		1							1																																			1	
402	45.5142491	-89.73600881	3	Muck	Pole		2				1									1											1		1																	
403	45.5142475	-89.73533026	4	Muck	Pole		1							1																																			1	
404	45.5142428	-89.73329462	4	Sand	Pole		3		1																		1			1				3																
405	45.5142412	-89.73261607	4	Muck	Pole		2																				1																							1	
406	45.5142396	-89.73193752	4	Muck	Pole		2							1													2							1																1	
407	45.514238	-89.73125898	10	Muck	Pole																																													
408	45.5142364	-89.73058043	9	Sand	Pole																																													
409	45.5142348	-89.72990188	6	Muck	Pole																																													
410	45.5142332	-89.72922333	4	Muck	Pole		3	V						3																				1												1				
411	45.5142316	-89.72854478	4	Muck	Pole		2																																										2	
412	45.51423	-89.72786624	5	Muck	Pole		1																																										1	
413	45.5142284	-89.72718769	5	Muck	Pole		2																																							1			1	
414	45.5142267	-89.72650914	5	Muck	Pole		2																				1																			2			1	
415	45.5147261	-89.73600658	3	Muck	Pole		2				2			1									1																											
416	45.5147246	-89.73532803	3	Muck	Pole		3	1			1			3																																				
417	45.514723	-89.73464947	4	Muck	Pole		3																										1	3																
418	45.5147214	-89.7397092	5	Sand	Pole		3		1					1																				3																
419	45.5147198	-89.73329237	5	Muck	Pole		2							1																			1	2																
420	45.5147183	-89.73261381	5	Muck	Pole		2		1																								1	1																
421	45.5147167	-89.73193526	6	Sand	Pole		2				1			1																																				
422	45.5147151	-89.73125671	3	Muck	Pole		3	1						3													1			1																1				
423	45.5147135	-89.73057815	4	Muck	Pole		2				1												1										1	1	1															1	
424	45.5147119	-89.7298996	7	Muck	Pole																																													
425	45.5147103	-89.72922104	3	Muck	Pole		3				1				1								1										1	3	1										1					
426	45.5147086	-89.72854249	5	Muck	Pole		2							1																																			1	
427	45.514707	-89.72786394	5	Muck	Pole		2																																										2	
428	45.5147054	-89.72718538	5	Muck	Pole		2																																										2	
429	45.5147038	-89.7265083	4	Muck	Pole		2																																										2	
430	45.5152202	-89.74346851	2	Muck	Pole		3				3																			1				1																
431	45.5152048	-89.73668291				NONNAVIGABLE (PLANTS)																																												
432	45.5152032	-89.73600435	4	Muck	Pole		3													2											1																1				
433	45.5152016	-89.73532579	3	Muck	Pole		2				1			2																						1														
434	45.5152001	-89.73464723	5	Muck	Pole		1																											1																
435	45.5151985	-89.7396867	6	Muck	Pole		1							1																																			1	
436	45.5151969	-89.73329011	5	Muck	Pole		3							3																																				
437	45.5151953	-89.73261155	3	Muck	Pole		3	1						1													1						1	3	1											1				
438	45.5151937	-89.73193299	5	Sand	Pole		1							1																			1																	
439	45.5151921	-89.73125443	3	Muck	Pole		2	V			2			1									1										1																1	
440	45.5151905	-89.73057588	5	Muck	Pole		2	V																									1														1			1	
441	45.5151889	-89.72989732	6	Muck	Pole		2																																										2	
442	45.5151873	-89.72921876	4	Muck	Pole		2				1			1									1										1	2																1	
443	45.5151857	-89.7285402	4	Muck	Pole		2																																										2	
444	45.5151841	-89.72786164	4	Muck	Pole		1															1																												1	
445	45.5151825	-89.72718308	4	Muck	Pole		3																																								3			1	
446	45.5156957	-89.74278778	4	Muck	Pole		1				1																																							
447	45.5156802	-89.73600212				NONNAVIGABLE (PLANTS)																																												
448	45.5156787	-89.73532356	5	Muck	Pole		1				1			1																				1																
449	45.5156771	-89.73464499	5	Muck	Pole		3																																							3				
450	45.5156755	-89.73396643	3	Muck	Pole		3				1			3									1																												
451	45.5156739	-89.73328786	4	Sand	Pole		2								1																		1	1																
452	45.5156724	-89.73260929	6	Sand	Pole		1																											1																
453	45.5156708	-89.73193073	3	Sand	Pole		3				3												1	1										1	1						1										
454	45.5156692	-89.73125216	4	Muck	Pole		3		1																									3																1	
455	45.5156676	-89.7305736	5	Muck	Pole		2																																										2	
456	45.515666	-89.72989503	5	Muck	Pole		2																																										2	
457	45.5156644	-89.72921647	7	Muck	Pole		1																											1																1	
458	45.5156628	-89.7285379	3	Sand	Pole		1		1		1				1								1										1	1													1			1	

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAUFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
459	45.5156611	-89.72785934	9	Muck	Pole																																														
460	45.5161713	-89.74210703	1	Muck	Pole		1				1													1	1										1																
461	45.5161604	-89.73735703	2	Muck	Pole		3				1								3				1		1																1										
462	45.5161589	-89.73667846	2	Sand	Pole		1																	1	1															1										
463	45.5161573	-89.73599989	5	Sand	Pole		2				1				1												2																								
464	45.5161557	-89.73532132	6	Sand	Pole		1				1				1																																				
465	45.5161542	-89.73464275	6	Sand	Pole		1								1																																				
466	45.5161526	-89.73396418	6	Sand	Pole																																														
467	45.516151	-89.73328561	5	Muck	Pole		2																							1																2			1	
468	45.5161494	-89.73260704	5	Muck	Pole		2																											2															1	
469	45.5161478	-89.73192846	5	Muck	Pole										1														2																	1				
470	45.5161462	-89.73124989	4	Muck	Pole																																														
471	45.5161446	-89.73057132	3	Muck	Pole		2																											2	1																
472	45.516143	-89.72989275	4	Muck	Pole		1				1								1																															1	
473	45.5166483	-89.74210486	4	Muck	Pole		2				2												1																												
474	45.5166421	-89.73939055				NONNAVIGABLE (PLANTS)																																													
475	45.5166406	-89.73871197				NONNAVIGABLE (PLANTS)																																													
476	45.5166375	-89.73735481				NONNAVIGABLE (PLANTS)																																													
477	45.5166359	-89.73667624	7	Sand	Pole																																														
478	45.5166344	-89.73599766	6	Sand	Pole																																														
479	45.5166328	-89.73531908	3	Sand	Pole		3																1										1	3																	
480	45.5166312	-89.73464051	6	Sand	Pole		1																																										1		
481	45.5166296	-89.73396193	4	Muck	Pole		2				1												1										1	1															1		
482	45.5166281	-89.73328335	4	Muck	Pole		1																																										1		
483	45.5166265	-89.73260478	3	Muck	Pole		1																																										1		
484	45.5166249	-89.7319262	3	Muck	Pole		1												1										1																					1		
485	45.5166233	-89.73124762	3	Muck	Pole		1																										1																	1		
486	45.5166217	-89.73056905	3	Muck	Pole		1				1								1	1														1													1			1	
487	45.5171238	-89.74142409	3	Muck	Pole		3				3													1				1							1																
488	45.5171223	-89.74074551	1	Muck	Pole		3				3													1	1																	1									
489	45.5171207	-89.74006693	1	Muck	Pole		1				1														1																										
490	45.5171192	-89.73938834				NONNAVIGABLE (PLANTS)																																													
491	45.5171161	-89.73803118	7	Sand	Pole																																														
492	45.5171145	-89.73735259	6	Sand	Pole		1							1																																					
493	45.517113	-89.73667401	5	Muck	Pole		1																																										1		
494	45.5171114	-89.73599543	5	Muck	Pole		1																																										1		
495	45.5171098	-89.73531685	4	Sand	Pole		3																										1	3													1				
496	45.5171083	-89.73463826	4	Sand	Pole		2																				2							1													1				
497	45.5176009	-89.74142191	1	Muck	Pole		3				3													1																											
498	45.5175993	-89.74074332	3	Muck	Pole		3				3												1																												
499	45.5175978	-89.74006473	4	Sand	Pole		2				2															1									1																
500	45.5175963	-89.73938614	4	Sand	Pole																																														
501	45.5175947	-89.73870755	7	Sand	Pole																																														
502	45.5175932	-89.73802896	5	Muck	Pole		2							1																1																2			1	
503	45.5175916	-89.73735038	5	Muck	Pole		2							1																1																2			1	
504	45.51759	-89.73667179	5	Muck	Pole		1																																										1		
505	45.5175885	-89.7359932	4	Muck	Pole		1							1													1								1															1	
506	45.5180749	-89.74006253	2	Sand	Pole		1									1																																			
507	45.5180733	-89.73938394	6	Sand	Pole																																														
508	45.5180718	-89.73870534	5	Sand	Pole		1																											1																
509	45.5180702	-89.73802675	4	Muck	Pole		1												1																															1	
510	45.5180655	-89.73599097				NONNAVIGABLE (PLANTS)																																													
511	45.5185535	-89.74073894	8	Sand	Pole																																														
512	45.5185519	-89.74006034	4	Sand	Pole		3							3	1															1																					
513	45.5185504	-89.73938174	5	Sand	Pole		2																											1													2				
514	45.5185488	-89.73870314	4	Sand	Pole		3		V																									3																	
515	45.5185473	-89.73802454	2	Muck	Pole		2					2												1	1	1															1										
516	45.519032	-89.74141535	5	Sand	Pole																																														
517	45.5190305	-89.74073675	2	Sand	Pole		1								1	1								1	1								1	1					1		1										
518	45.519029	-89.74005814	4	Sand	Pole		3																							1				1													3				
519	45.5190274	-89.73937953	5	Sand	Pole		1																										1																		
520	45.5190259	-89.73870093	2	Sand	Pole		2				2																				1									1											
521	45.5195091	-89.74141317	7	Sand	Pole																																														
522	45.5195076	-89.74073456	3	Sand	Pole		3				1					1								1	1o					1				3																	
523	45.519506	-89.74005594	4	Sand	Pole		3				1				3												1			1				1													1				
524	45.5195045	-89.73937733	5	Sand	Pole																																														
525	45.5195029	-89.73869872	2	Sand	Pole		3				3													1	1																										
526	45.5199862	-89.74141098	6	Sand	Pole																																														
527	45.5199846	-89.74073236	5	Sand	Pole		2								2																																				
528	45.5199831	-89.74005375	4	Sand	Pole		2				2								1											1	1		1	1																	
529	45.5199815	-89.73937513	2	Sand	Pole		1																		1															1							1				
530	45.5204632	-89.7414088	6	Sand	Pole																																														
531	45.5204617	-89.74073017	3	Sand	Pole		2				2												1	1	1															1							1				
532	45.5204601	-89.74005155	5	Sand	Pole																																														
533	45.5204586	-89.73937293	2	Muck	Pole		3				2												1					1																							1
534	45.5209403	-89.74140661	6	Sand	Pole																																														
535	45.5209387	-89.74072798	3	Sand	Pole		1																		1													1		1							1				
536	45.5214173	-89.74140443	6	Sand	Pole																																														
537	45.5214158	-89.74072579	2	Sand	Pole		2							1							1				1								1					1									1				
538	45.5218959	-89.74208088	3	Sand	Pole		1							1									1																												
539	45.5218944	-89.74140224	5	Sand	Pole		2				1																																					2				
540	45.522373	-89.7420787	4	Sand	Pole																																														
541	45.5223714	-89.74140006	3	Sand	Pole		2	V			2			1																																					
542	45.5223699	-89.74072141	4	Muck	Pole		1							1																	1						1														
543	45.52285	-89.74207652	3	Sand	Pole		1														1																													1		
544	45.5228485	-89.74139787	3	Sand	Pole		1							1							1																													1		
545	45.5228469	-89.74071922	7	Sand	Pole																																														

Sampling Point	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Depth (ft)	Sediment type (M-Muck, S-Sand, R=Rock)	Pole (P), Rake (R)	Comments	Total Rake Fullness	EWM	CLP	BRASC	CERDE	CEREC	CHARA	ELOCA	ELONU	EQUFL	LEMTR	LEMTU	BIDBE	MYRSI	NAUFL	NITELLA	NUPVA	NYMOD	PONCO	POTAM	POTEP	POTNA	POTPR	POTPU	POTRI	POTRO	POTSP	POTVA	POTZO	RANAQ	SAGCR	SAGRI	SCHTA	SPA_SP	SPAEU	SPARL	SPIPO	TYP_SP	UTRVU	VALAM	ZIZPA	PW_SPONGE	F_AGLAE	POTOB
546	45.5233271	-89.74207434	2	Sand	Pole		1							1											1																										
547	45.5233255	-89.74139568	5	Sand	Pole																																														
548	45.523324	-89.74071703	7	Sand	Pole																																														
549	45.5238026	-89.7413935	4	Sand	Pole		2							1																																1			2	
550	45.523801	-89.74071483	6	Sand	Pole																																														
551	45.5242796	-89.74139131	5	Sand	Pole																																														
552	45.5242781	-89.74071264	6	Sand	Pole																																														
553	45.5247567	-89.74138913	6	Sand	Pole																																														
554	45.5247551	-89.74071045	5	Sand	Pole																																														
555	45.5252337	-89.74138694	5	Sand	Pole																																														
556	45.5252322	-89.74070826	5	Muck	Pole		1							1																																					
557	45.5257123	-89.74206344	5	Sand	Pole																																											1			
558	45.5257108	-89.74138475	6	Sand	Pole																																														
559	45.5257093	-89.74070607	4	Muck	Pole																																														
560	45.5261909	-89.74273995				NONNAVIGABLE (PLANTS)																																														
561	45.5261894	-89.74206126	5	Sand	Pole																																														
562	45.5261878	-89.74138257	5	Sand	Pole		1							1																																					
563	45.5266664	-89.74205908	4	Sand	Pole		2							1																																2			1	
564	45.5266649	-89.74138038	4	Sand	Pole																																														
565	45.527145	-89.7427356	6	Sand	Pole																																														
566	45.5271435	-89.7420569	3	Sand	Pole		2							1										1						1																1				
567	45.5276221	-89.74273343	5	Sand	Pole																																														
568	45.5276205	-89.74205472	4	Sand	Pole		1							1									1																												
569	45.5280991	-89.74273125	4	Sand	Pole																																														
570	45.5280976	-89.74205254	5	Sand	Pole		1							1																																					
571	45.5285777	-89.7434078	6	Sand	Pole		1							1																																					
572	45.5285762	-89.74272908	5	Sand	Pole		1							1																					1																
573	45.5290548	-89.74340563	5	Sand	Pole		1																																							1					
574	45.5290532	-89.74272691	2	Muck	Pole		2							1				1						1	1								1																		
575	45.5295333	-89.7440822	3	Sand	Pole		2							1							1												1								1						1			1	
576	45.5295318	-89.74340346	5	Sand	Pole																																														
577	45.5295303	-89.74272473	4	Sand	Pole		1							1																																					
578	45.5300119	-89.74475877				TERRESTRIAL																																													
579	45.5300104	-89.74408003	5	Muck	Pole		2							2																																			1		
580	45.5300089	-89.74340129	3	Sand	Pole		1																														1														
581	45.5304905	-89.74543536	3	Muck	Pole		2				2								1																																
582	45.530489	-89.74475661	5	Sand	Pole		2							1																																2					
583	45.530487	-89.74407787	6	Sand	Pole																																														
584	45.5309675	-89.7454332	3	Sand	Pole		2							1																	1		2																1		
585	45.530966	-89.74475445	3	Sand	Pole		2							2																			1																		
586	45.5309645	-89.7440757	6	Sand	Pole																																														
587	45.5314476	-89.74678856				TEMPORARY OBSTACLE																																													
588	45.5314461	-89.74610981	4	Rock	Pole																																														
589	45.5314446	-89.74543105	5	Sand	Pole																																														
590	45.5314431	-89.7447523	5	Muck	Pole		1							1																																					
591	45.5319246	-89.74678642	5	Sand	Pole																																														
592	45.5319231	-89.74610766				NONNAVIGABLE (PLANTS)																																													
593	45.5324032	-89.74746305	6	Rock	Pole																																														
594	45.5328803	-89.74746091	4	Sand	Pole		2																										1													2					
595	45.5333573	-89.74745878	2	Sand	Pole		3							2							1																									1			1		
596	45.5338344	-89.74745664	1	Sand	Pole		3							3																																					
597	45.5338329	-89.74677786	3	Sand	Pole																																														
598	45.5343114	-89.74745451	3	Muck	Pole		2							1																																2					
599	45.5343099	-89.74677572	2	Sand	Pole																																														
600	45.5347885	-89.74745237	5	Sand	Pole																																														
601	45.5352655	-89.74745024	5	Sand	Pole		1														1																														
602	45.5357426	-89.7474481	2	Sand	Pole		2				1																																			2					
603	45.5357411	-89.7467693	4	Sand	Pole																																														
604	45.5362196	-89.74744597	5	Sand	Pole																																														
605	45.5362181	-89.74676715	4	Sand	Pole																																														
606	45.5366967	-89.74744383	4	Sand	Pole																																														
607	45.5371737	-89.7474417	2	Sand	Pole																																														
608	45.5371722	-89.74676287				NONNAVIGABLE (PLANTS)																																													
609	45.5376523	-89.74811839	5	Sand	Pole		1															1																														
610	45.5376508	-89.74743956	2	Sand	Pole		3							3																																					
611	45.5381293	-89.74811626	5	Rock	Pole																																														
612	45.5381278	-89.74743742	11	Sand	Pole																																														
613	45.5381263	-89.74675859	10	Sand	Pole																																														
614	45.5386049	-89.74743529	12	Rock	Pole																																														
615	45.5386034	-89.74675645				OTHER																																													