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

Onterra LLC Lake Management Planning

Why create a lake management plan?

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

A goal without a plan is just a wish!

Onterra LLC 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
  - Stakeholder Survey
  - Shoreline Assessment

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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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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
  - Plant community mapping
  - Volunteer survey findings

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Non-native Aquatic Plants

Curly-leaf Pondweed

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Non-native Aquatic Plants

Eurasian Water Milfoil

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Pesobic Lake
47-meter resolution
265 total points

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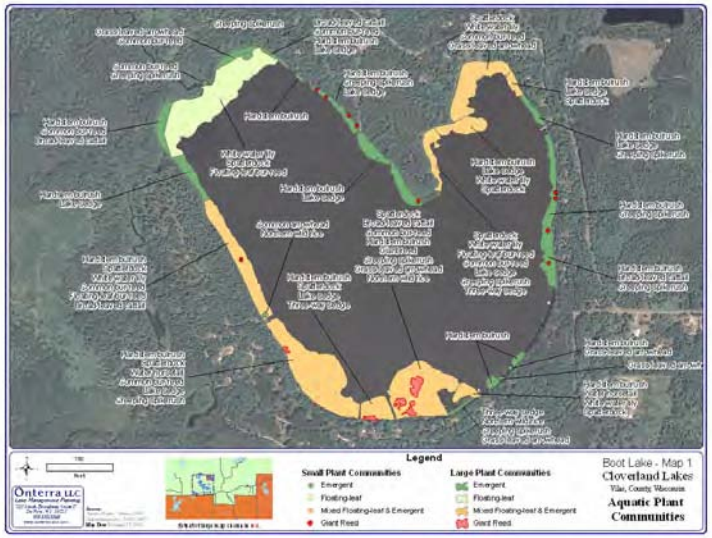
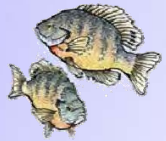
Lake Management Planning



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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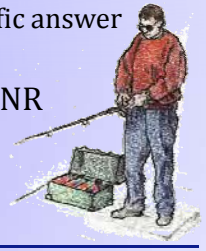
Stakeholder Survey

- 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



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Shoreland Assessment

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

Urbanized **Natural**

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Planning Process

Planning Committee Meetings

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

Implementation Plan

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Lake Management Planning

Thank You

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

Wisconsin Lakes Partnership

UWEX Extension

Wisconsin Dept. of Natural Resources

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Lake Management Planning

The Planning Process

…it's not as easy as you may think.

Technical **Sociological**

Study Results
Experience in Ecology & Planning
Conclusions
Actions Facilitators Timeframe
Implementation Plan
Realistic Management Goals

Unfounded *Founded*
Unrealistic *Realistic*
Perceptions Beliefs Needs
IDEAL LAKE
Education & Listening

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Lake Management Planning

Presentation Outline

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

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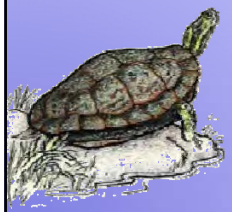
Lake Management Planning

Study and Plan Goals

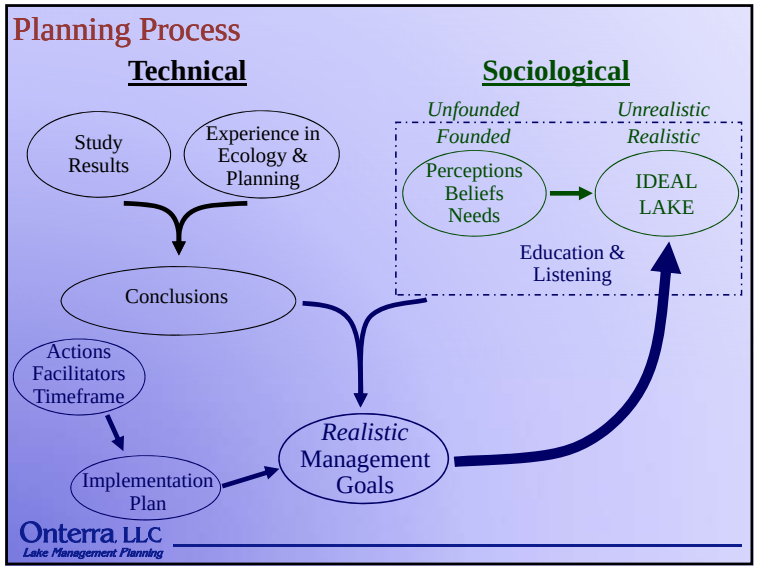
- Collect & Analyze Data
- Construct Long-Term & Useable Plan



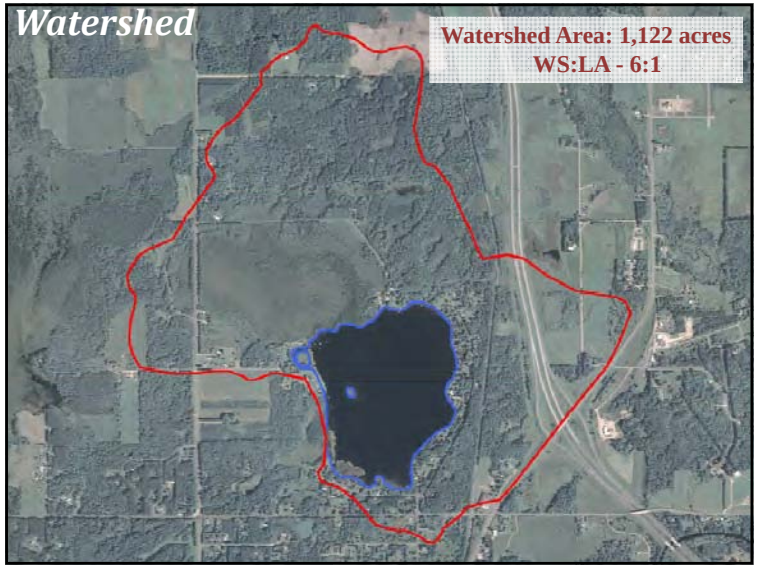
Onterra LLC
Lake Management Planning

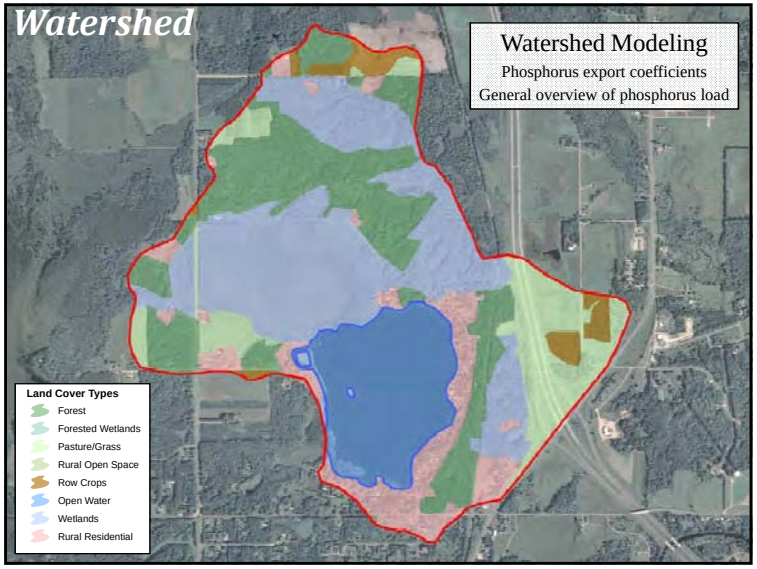
The Planning Process

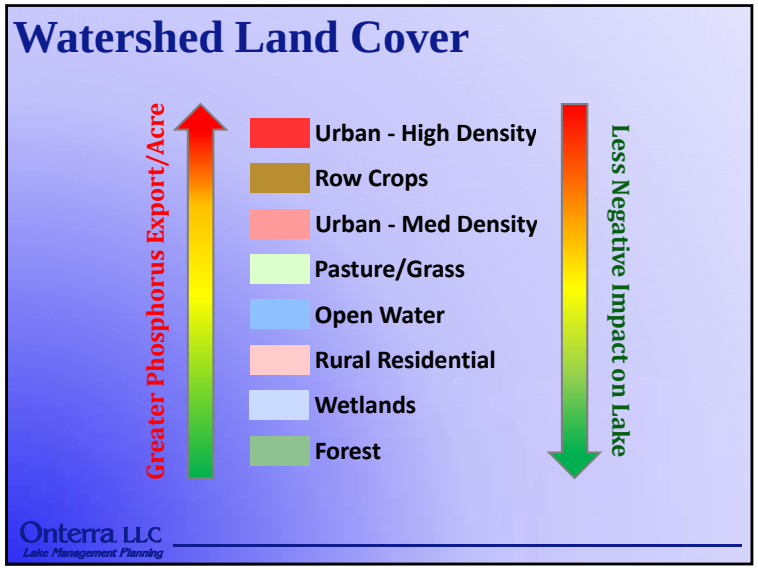
…it's not as easy as you may think.

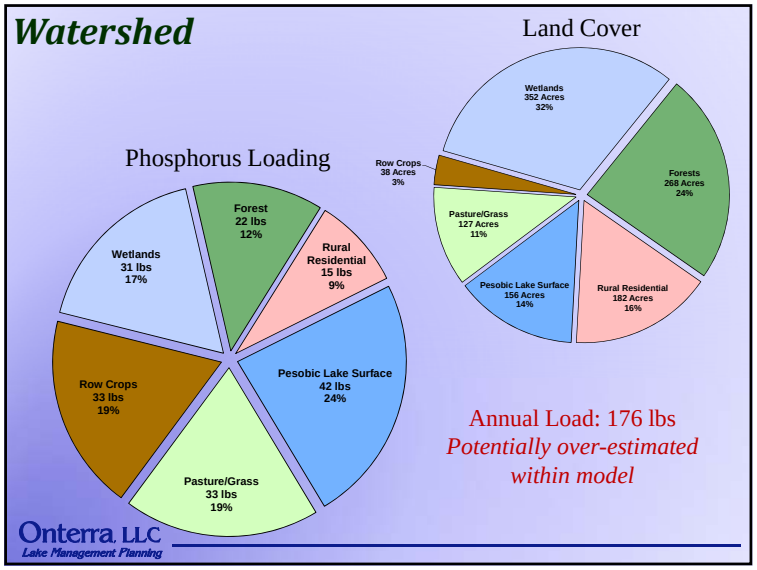

Planning Process
Technical
Sociological
Study Results
Experience in Ecology & Planning
Unfounded
Founded
Unrealistic
Realistic
Perceptions Beliefs Needs
IDEAL LAKE
Education & Listening
Conclusions
Actions Facilitators Timeframe
Realistic Management Goals
Implementation Plan
Onterra LLC
Lake Management Planning


Watershed


Watershed
Watershed Area: 1,122 acres
WS:LA - 6:1


Watershed
Watershed Modeling
Phosphorus export coefficients
General overview of phosphorus load
Land Cover Types
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Row Crops
Open Water
Wetlands
Rural Residential


Watershed Land Cover
Greater Phosphorus Export/Acre
Urban - High Density
Row Crops
Urban - Med Density
Pasture/Grass
Open Water
Rural Residential
Wetlands
Forest
Less Negative Impact on Lake
Onterra LLC
Lake Management Planning


Watershed
Land Cover
Phosphorus Loading
Wetlands 352 Acres 32%
Forests 268 Acres 24%
Row Crops 38 Acres 3%
Pasture/Grass 127 Acres 11%
Pesobic Lake Surface 156 Acres 14%
Rural Residential 182 Acres 16%
Forest 22 lbs 12%
Rural Residential 15 lbs 9%
Wetlands 31 lbs 17%
Pesobic Lake Surface 42 lbs 24%
Row Crops 33 lbs 19%
Pasture/Grass 33 lbs 19%
Annual Load: 176 lbs
Potentially over-estimated within model
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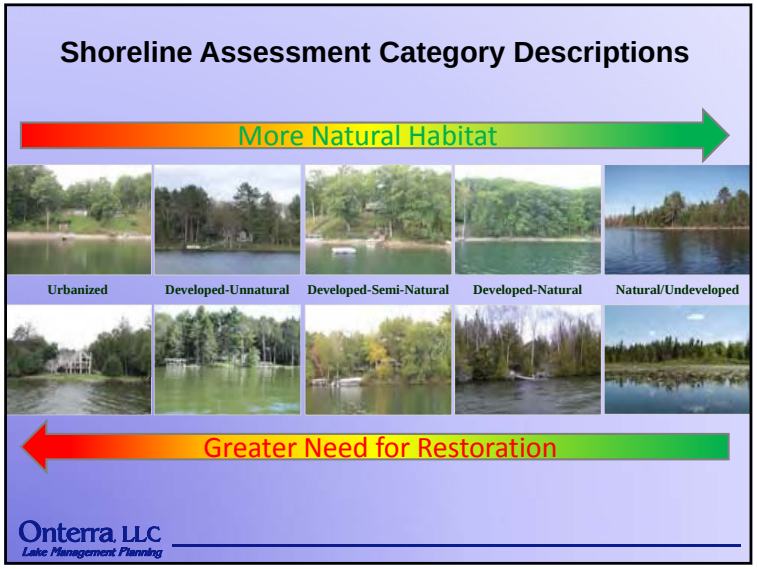
Lake Management Planning


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
Natural
Range
Onterra LLC
Lake Management Planning


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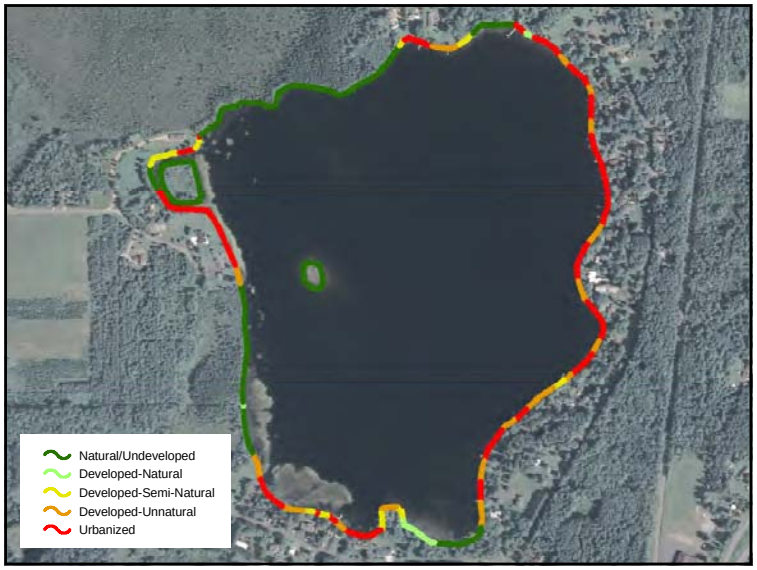
Lake Management Planning


Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized


Water Quality
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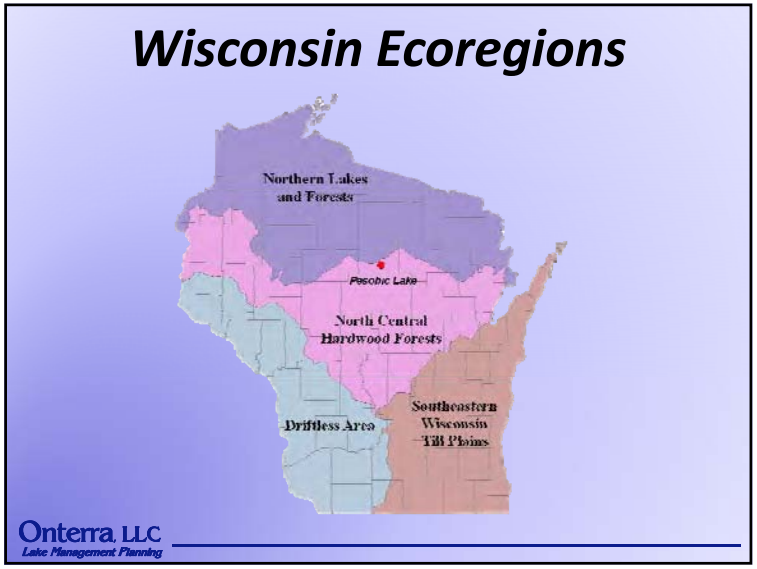
Lake Management Planning


Wisconsin Ecoregions
Northern Lakes and Forests
Pesobic Lake
North Central Hardwood Forests
Driftless Area
Southeastern Wisconsin Till Plains
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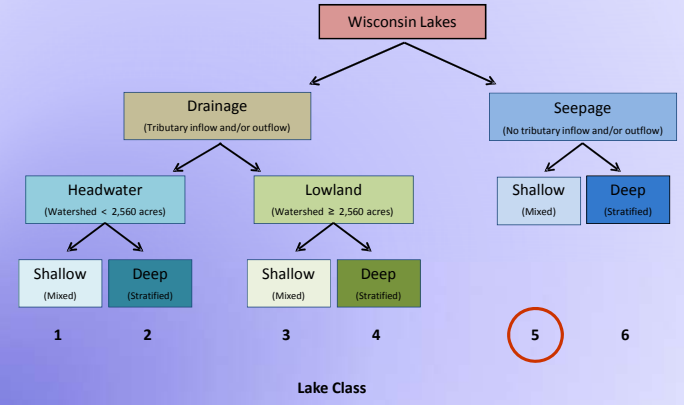
Lake Management Planning

Wisconsin Lakes Classification



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Water Quality

Phosphorus (Limiting Plant Nutrient)

Nitrogen:Phosphorus = 27:1

Chlorophyll-*a* (Algal Abundance)

Low algal abundance

Water Clarity (Secchi Disk)

Moderately Clear Water

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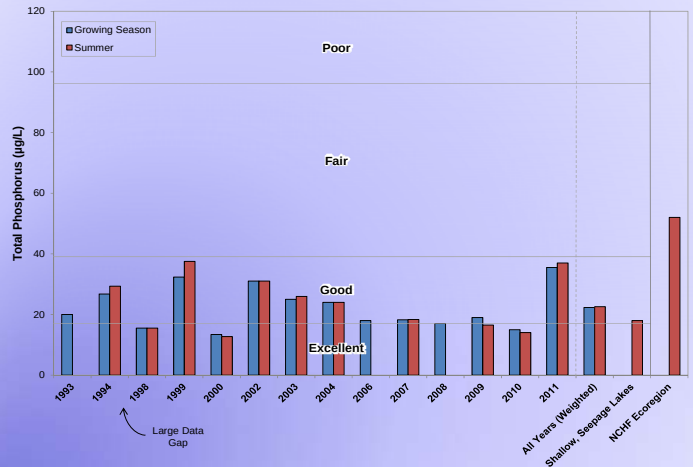
Total Phosphorus



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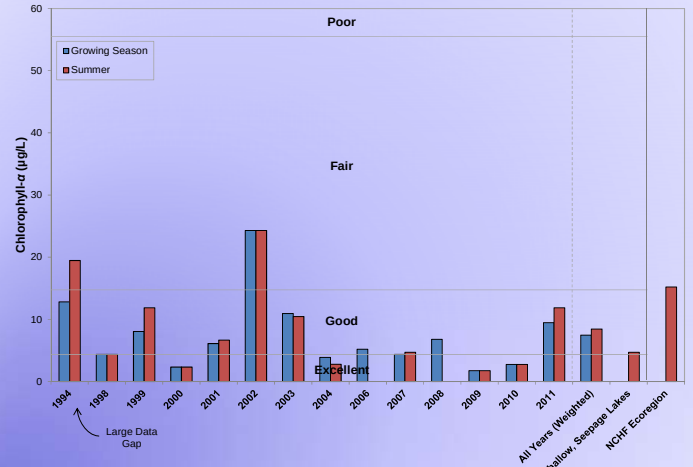
Chlorophyll-α



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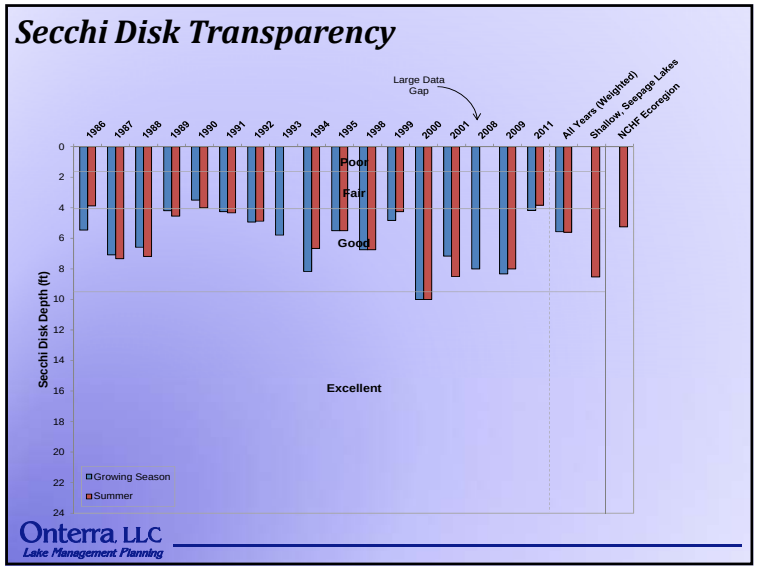
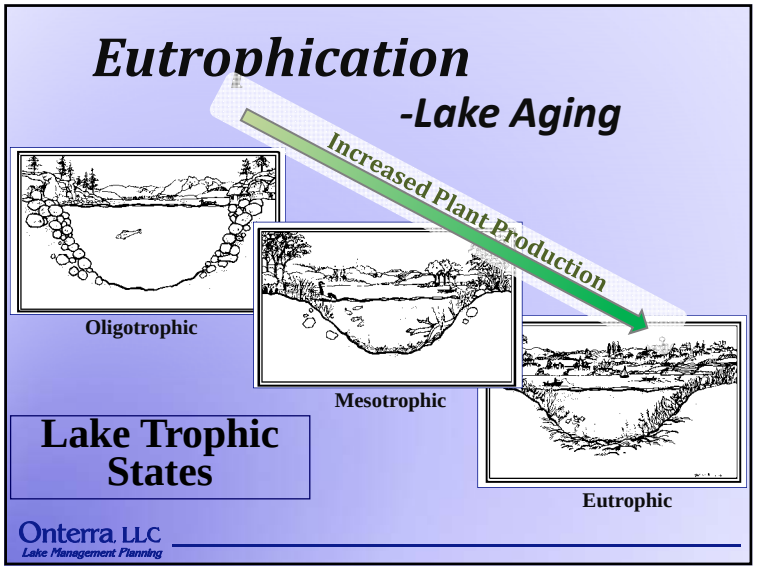
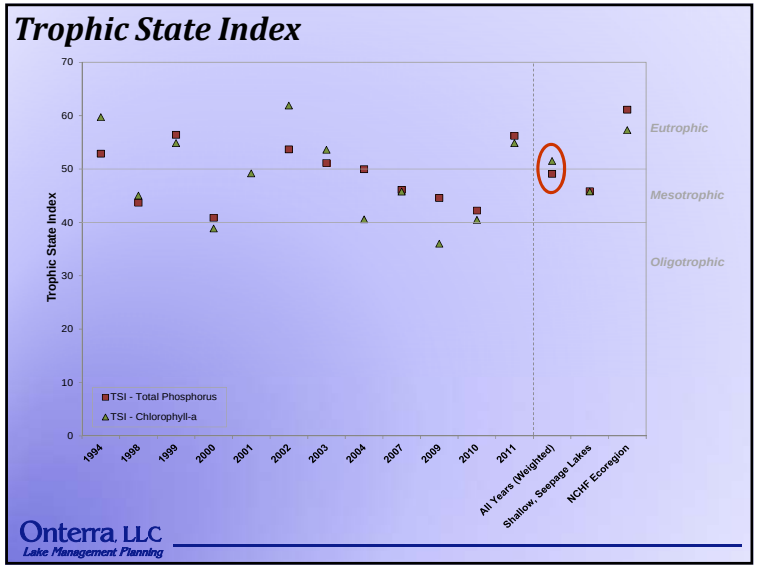
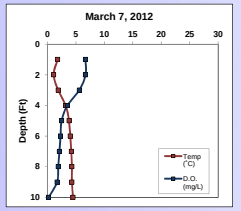






Other Water Quality Results

- Lake does not strongly stratify during summer months
- No indication of low winter dissolved oxygen
- Alkalinity = 4.9 mg/L as $CaCO_3$ – indicates moderate sensitivity to acid rain
- Low calcium concentrations (2.3 mg/L)
  - Not suitable for zebra mussel establishment



No veligers observed in 2011 samples

Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Curly-leaf pondweed survey **NONE FOUND**
  - Point-intercept survey
    - Systematic sampling method
    - Can compare lakes within same ecoregion
  - Plant community mapping
    - Accurately map floating-leaf & emergent communities
    - May compare to future surveys

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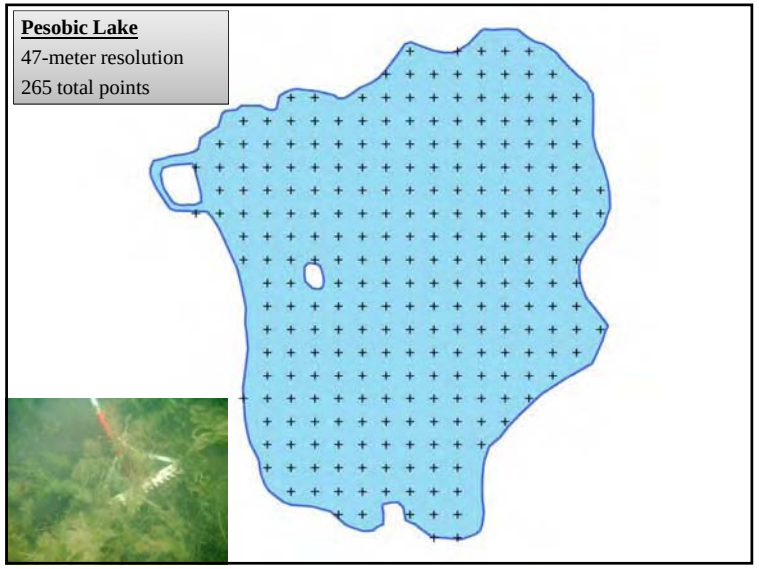

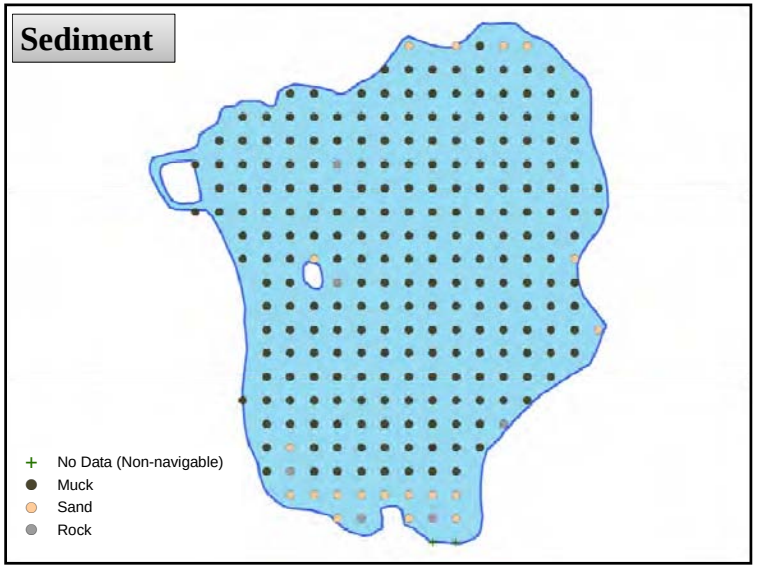

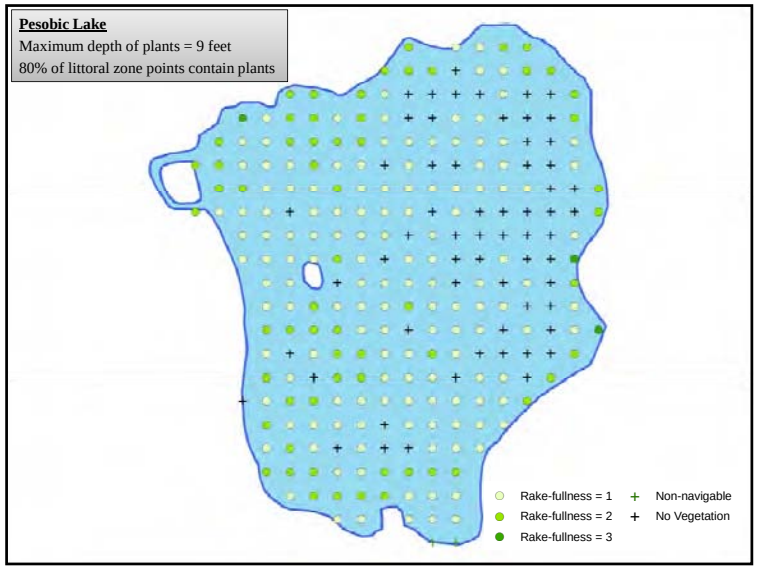

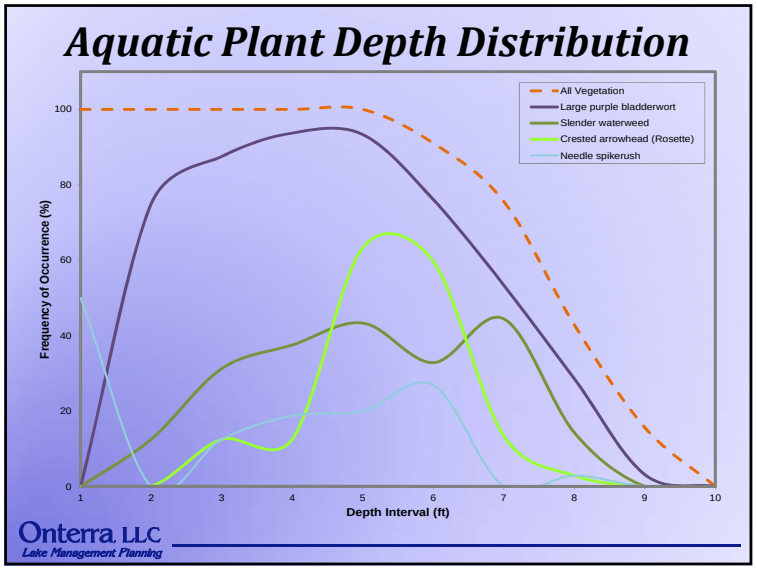

Species List

- **35 Native Species**
  - 18 from the PI survey
- **1 Non-native species**
  - Reed canary grass
- **1 native species of 'special concern'**
  - Snail-seed pondweed

Life Form	Scientific Name	Common Name	Coefficient of Conservatism (c)	2011 (Onterra)
Emergent	*Calla palustris*	Water arum	9	I
	Carex crinita	Fringed sedge	6	I
	Carex rostrata	Beaked sedge	10	I
	Decodon verticillatus	Water-willow	7	I
	Dulichium arundinaceum	Three-way sedge	9	I
	Eleocharis palustris	Creeping spikerush	6	X
	Glyceria borealis	Northern manna grass	8	I
	Glyceria canadensis	Rattlesnake grass	7	I
	Iris versicolor	Northern blue flag	5	I
	Juncus effusus	Soft rush	4	I
	Phalaris arundinacea	Reed canary grass	Exotic	I
	Sagittaria latifolia	Common arrowhead	3	I
	Sagittaria rigida	Stiff arrowhead	8	I
	Schoenoplectus tabernaemontani	Softstem bulrush	4	I
	Zizania palustris	Northern wild rice	8	I
FL	*Brasenia schreberi*	Watershield	7	X
	Nuphar variegata	Spatterdock	6	I
FL/E	*Sparganium americanum*	Eastern bur-reed	8	I
	Sparganium fluctuans	Floating-leaf bur-reed	10	X
	Sparganium natans	Little bur-reed	9	I
Submergent	*Chara spp.*	Muskgrasses	7	X
	Elatine minima	Waterwort	9	X
	Elodea nuttallii	Slender waterweed	7	X
	Isoetes spp.	Quillwort species	N/A	X
	Myriophyllum farwellii	Farwell's water milfoil	9	X
	Myriophyllum tenellum	Dwarf water milfoil	10	X
	Najas gracillima	Northern naiad	7	X
	Nitella spp.	Stoneworts	7	X
	*Potamogeton bicupulatus**	Snail-seed pondweed	9	X
	Potamogeton epihydrus	Ribbon-leaf pondweed	8	X
	Utricularia purpurea	Large purple bladderwort	9	X
	Utricularia vulgaris	Common bladderwort	7	X
S/E	*Eleocharis acicularis*	Needle spikerush	5	X
	Hypericum boreale	Northern St. John's-wort	6	I
	Juncus pelocarpus	Brown-fruited rush	8	X
	Sagittaria cristata (Rosette)	Crested arrowhead	9	X

FL = Floating Leaf; FL/E = Floating Leaf and Emergent; S/E = Submergent and Emergent
X = Located on rake during point-intercept survey; I = Incidental Species
** Listed as a species of 'special concern' in Wisconsin*

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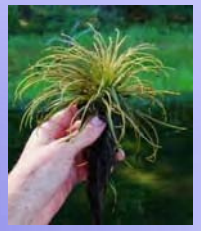
Lake Management Planning

Submergent Plant Growth Forms

Isoetid
Turf Species



Elodeid
Leafy Plants

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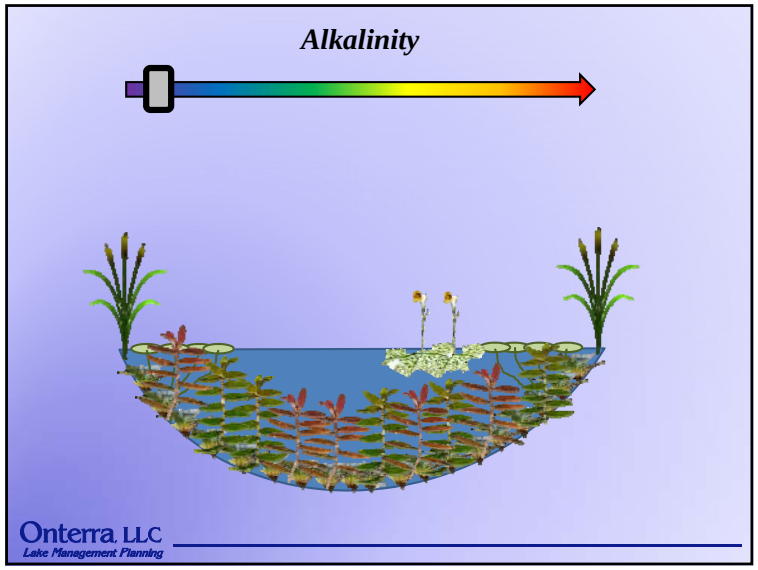
Alkalinity
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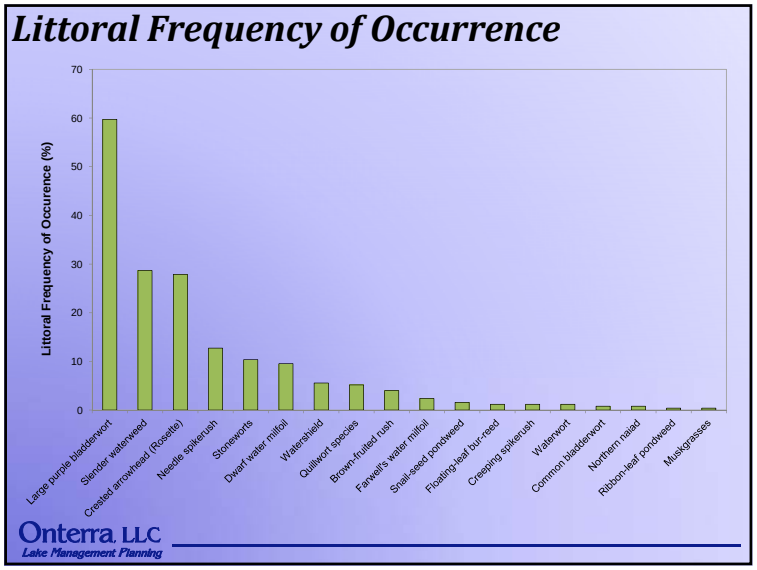
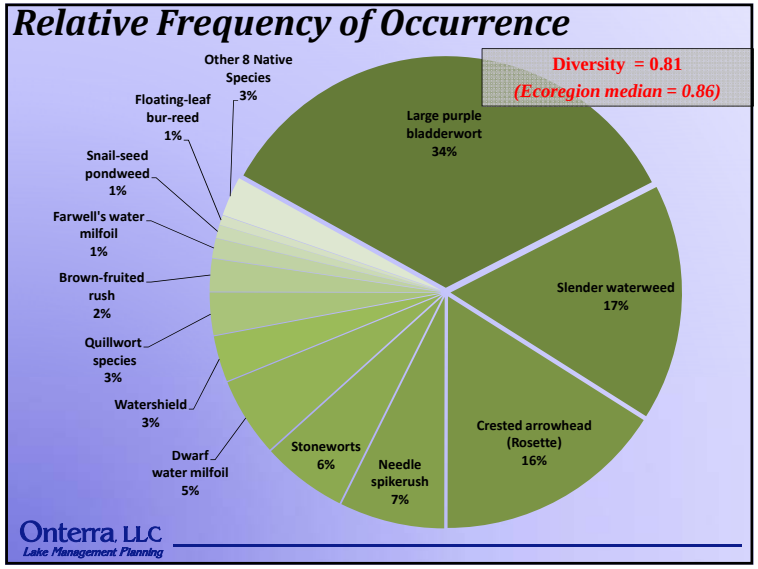
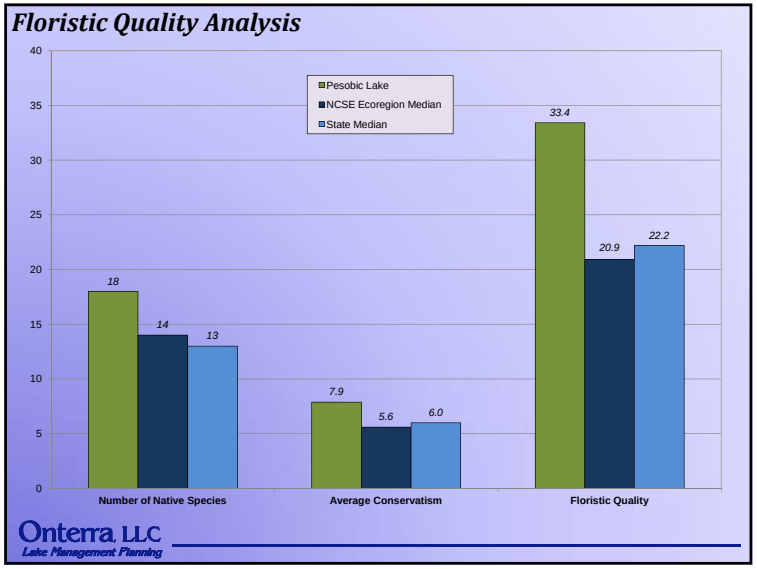
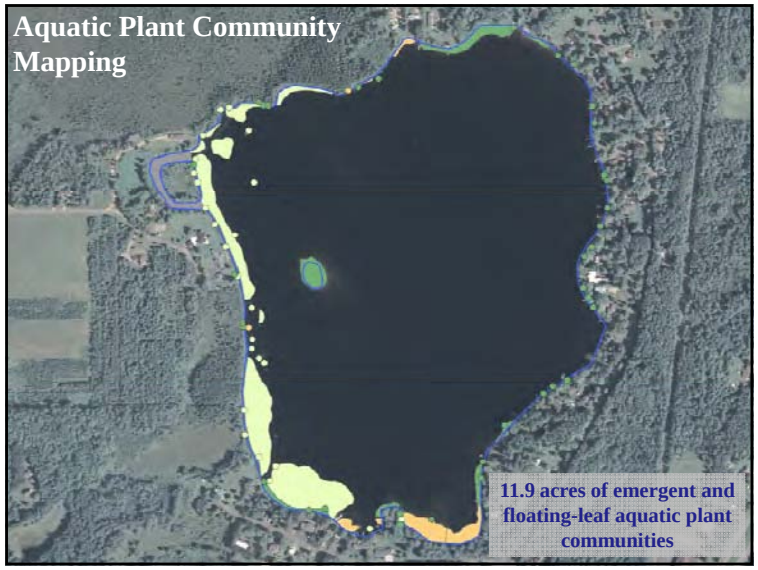
Lake Management Planning

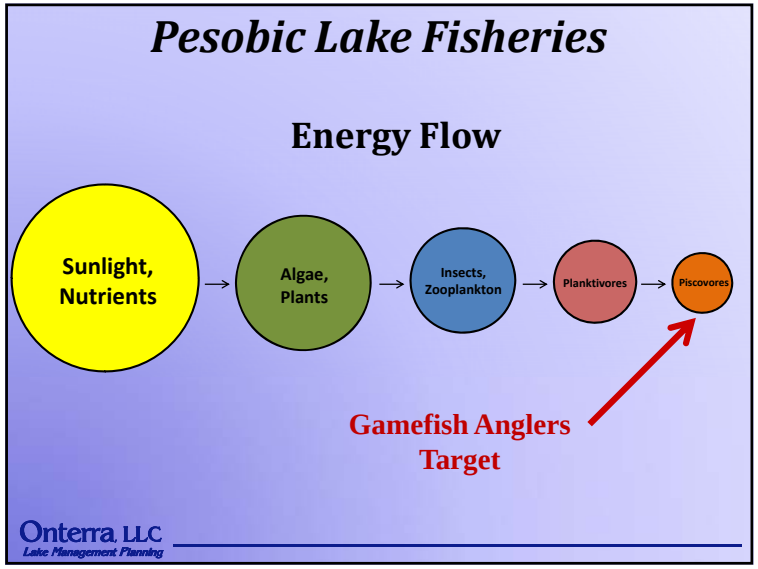

Littoral Frequency of Occurrence
Littoral Frequency of Occurence (%)
70
60
50
40
30
20
10
0
Large purple bladderwort
Slender waterweed
Crested arrowhead (Rosette)
Needle spikerush
Stoneworts
Dwarf water milfoil
Watershield
Quillwort species
Brown-fruited rush
Farwell's water milfoil
Snail-seed pondweed
Floating-leaf bur-reed
Creeping spikerush
Waterwort
Common bladderwort
Northern naiad
Ribbon-leaf pondweed
Muskgrasses
Onterra LLC
Lake Management Planning

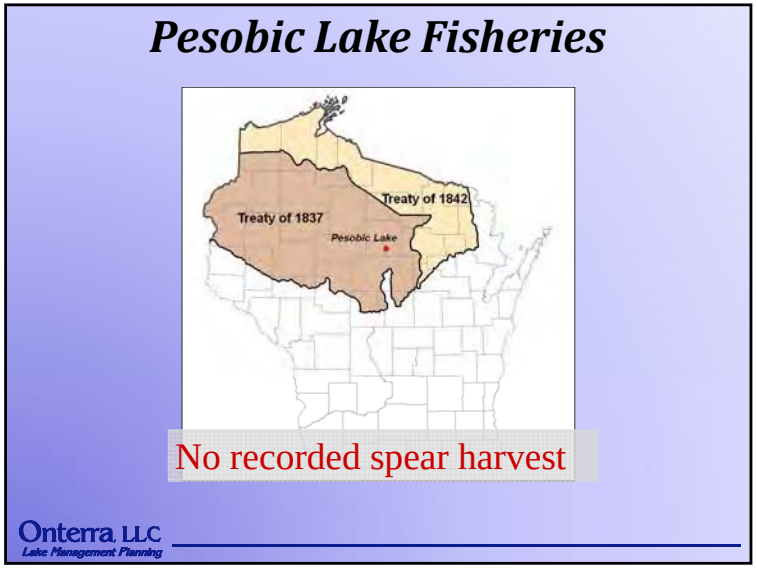

Relative Frequency of Occurrence
Diversity = 0.81
(Ecoregion median = 0.86)
Large purple bladderwort 34%
Slender waterweed 17%
Crested arrowhead (Rosette) 16%
Needle spikerush 7%
Stoneworts 6%
Dwarf water milfoil 5%
Watershield 3%
Quillwort species 3%
Brown-fruited rush 2%
Farwell's water milfoil 1%
Snail-seed pondweed 1%
Floating-leaf bur-reed 1%
Other 8 Native Species 3%
Onterra LLC
Lake Management Planning


Floristic Quality Analysis
Pesobic Lake
NCSE Ecoregion Median
State Median
40
35
30
25
20
15
10
5
0
18
14
13
7.9
5.6
6.0
33.4
20.9
22.2
Number of Native Species
Average Conservatism
Floristic Quality
Onterra LLC
Lake Management Planning


Aquatic Plant Community Mapping
11.9 acres of emergent and floating-leaf aquatic plant communities


Fisheries


Pesobic Lake Fisheries
Energy Flow
Sunlight, Nutrients
Algae, Plants
Insects, Zooplankton
Planktivores
Piscovores
Gamefish Anglers Target
Onterra LLC
Lake Management Planning


Pesobic Lake Fisheries
Treaty of 1837
Treaty of 1842
Pesobic Lake
No recorded spear harvest
Onterra LLC
Lake Management Planning

Pesobic Lake Fisheries

- Currently managed as a "mixed fishery"
  - Walleye, largemouth bass, panfish, northern pike, crappies
- WDNR walleye stocking occurs every other year in even years to bolster population

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Lake Management Planning

Conclusions

- Overall, water quality is good
- Watershed is generally in healthy condition
  - Minimal phosphorus input; ecologically valuable land cover types present
  - Over 50% of shoreline has been disturbed
    - Potential area for enhancement / restoration
- Aquatic plant community
  - Based on standard analysis, native community is of high quality
  - Plants present indicate a carbon-limited environment

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Lake Management Planning

Thank You

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

Wisconsin Lakes Partnership

UWEX Extension

Wisconsin Dept. of Natural Resources

Onterra LLC
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Project Components

Stakeholder Participation

Stakeholder participation is very important in any environmental planning exercise. The project included several elements to educate Pesobic Lake stakeholders about their lake, and also solicit their input. These included project meetings, an anonymous written survey, and this publication.

Water Quality Monitoring

Monitoring of the water chemistry and clarity was conducted by Onterra as well as PLA volunteers. In addition to analyzing 2011 data, Onterra examined historic data to determine if trends or changes in the lakes water quality were occurring.

Watershed Delineation & Modeling

The watershed, or the drainage basin, plays a vital role in a lake's ecology. Pesobic Lake's watershed was determined, and modeled using computer software to examine its impacts on the lake. Additionally, the shoreline of the lake was surveyed for its level of human disturbance.

Aquatic Plant Surveys

Aquatic plants are called the foundation of a lake's ecology due to their importance in food web interactions and providing habitat, spawning area, etc. Several aquatic plant surveys were conducted by Onterra, including those to document invasive species (if any were found), quantify native submersed species, and map emergent and floating-leaf species.

Fisheries Data Integration

During the proposed project, Onterra staff worked with regional WDNR fisheries biologists to assimilate data regarding the fishery of the lake. These data included fish stocking, creel surveys, comprehensive fishery studies, and spear harvest data if available. Compiled data was considered as it pertained to the management plan and management actions analyzed as they pertain to the characteristics of the fishery.

Project Results

Stakeholder Survey

- Seven-page, 29 question survey was mailed to 56 riparian property owners and PLA members.
- Stakeholders asked about numerous aspects of Pesobic Lake, including their recreational hobbies, time spent on/near the lake, and perceptions of the lakes health and condition.
- Information obtained was used in the planning process and integrated within management plan.

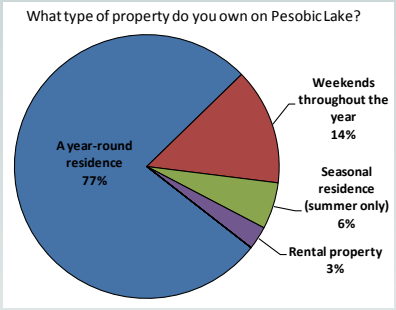


Figure 1: Sample question from the Pesobic Lake stakeholder survey. Stakeholders were polled on many aspects of the lake.

Water Quality

- Historical and current water chemistry data suggest that phosphorus, the nutrient of concern in most Wisconsin lakes, is not found in excess in Pesobic Lake.
- Algae concentrations are normal for a lake such as Pesobic, with blooms occurring on a rare basis.
- Water clarity is good for a central Wisconsin seepage lake, with visibility anywhere from 6 to 10 feet in most summers.

Watershed

- Pesobic Lake is a seepage lake, meaning that the lake is fed primarily by groundwater and precipitation.
- The lake's watershed is 1,122 acres, and consists largely of wetlands, forests, pasture and some rural residential area. Phosphorus inputs from the watershed are low.
- Over 50% of the immediate watershed, or shoreline of the lake, was found to have significant human disturbance (Figure 2).

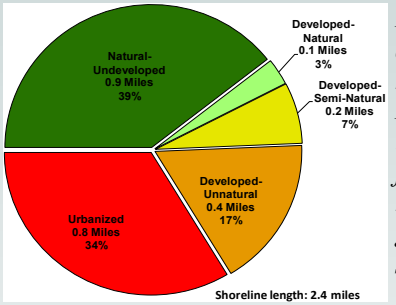


Figure 2: Results of a shoreline assessment survey, Pesobic Lake, 2011. Over 50% of the shoreline falls within two highly disturbed categories on this ranking system.

Aquatic Plants

- Pesobic Lake holds 35 species of native aquatic plants.
- Large purple bladderwort (*Utricularia purpurea*) was the most frequently encountered species during the point-intercept survey (Figure 3). This submergent plant possesses small, sac-like bladders which it uses to capture and digest small crustaceans in the water.
- One Pesobic Lake plant, snail-seed pondweed (*Potamogeton bicuplulatus*), is listed as a species of special concern by the Wisconsin Natural Heritage Inventory (NHI) Program because of its rarity and vulnerability to degradation.
- Data collected from the 2011 point-intercept survey indicates that Pesobic Lake holds many species of high ecological value.
- No submergent aquatic invasive species (such as Eurasian water milfoil or curly-leaf pondweed) were found within the lake during 2011 studies.

Project Results (continued)

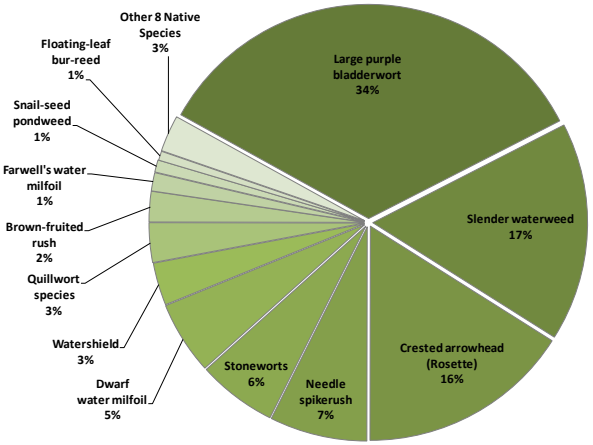


Figure 3: Pesobic Lake aquatic plant relative littoral frequency of occurrence. Chart displays the frequency of plants found within the near-shore (to 9 ft of depth) zone.

- PLA members expressed concern over watershield (*Brasenia schreberi*) on the lake. Watershield is a floating-leaf plant with football shaped leaves. This plant grows well in lakes with receding water levels.
- The increase in watershield has residents concerned, though it has not reached levels that warrant intensive management.
- Because intensive management of native aquatic plants can be detrimental to the plant community and open niche areas for invasive plant residence, this is discouraged by the WDNR.
- Residents may access open water from their property through manual removal of plants, which is allowed in a 30 ft removal zone extending directly outwards from the residents' property.

Fisheries Data Integration

- 79% of residents fish on Pesobic Lake, and 24% have fished for a period greater than 25 years.
- Bluegill/sunfish, largemouth bass, northern pike and crappie are the species anglers enjoy catching most on the lake.
- WDNR is currently managing Pesobic Lake for a mixed fishery, which includes largemouth bass, walleye, panfish, northern pike and crappies as the primary gamefish species.

Implementation Plan for Managing Pesobic Lake

The purpose of this study was to provide the PLA with baseline data on the health of the Pesobic Lake ecosystem, collect information on aquatic invasive species on the lake (if any were found) collect sociological information from Pesobic Lake stakeholders, and formulate a strategy that the PLA would follow to protect their lake for future generations. This Implementation Plan is the result of conversations between PLA lake stakeholders, Onterra staff, and WDNR specialists on ways that the PLA may recreate on this unique resource while also enjoying its natural beauty.

Management Goal 1: Increase PLA's Capacity to Communicate with Lake Stakeholders.

Action: Support an Education Committee

- Distribute newsletter and other educational material which will facilitate education, communication as well as a sense of community between lake residents.
- Investigate construction of a kiosk at the public access to further distribute educational material.

Management Goal 2: Maintain Current Water Quality Conditions.

- Continue to collect water quality data on Pesobic Lake as part of the WDNR's Citizens Lake Monitoring Network (CLMN).

Management Goal 3: Prevent Aquatic Invasive Species Introductions to Pesobic Lake.

- Receive training (monitoring and identification skills) from qualified state and local agencies (WDNR, UW-Extension, County AIS Coordinator, etc.
- Coordinate annual volunteer monitoring for aquatic invasive species on Pesobic Lake.

Pesobic Lake

Lake Management Planning Project Summary

In 2010, members of the Pesobic Lake Association (PLA) approached the Wisconsin Department of Natural Resources (WDNR) and Onterra staff about creating a lake management plan for Pesobic Lake, and applying for financial assistance through the state to do so. The lake management planning project was funded by grants through the WDNR's lake grant program in August 2010, with studies beginning the following year.

The intent of this publication is to provide you, the Pesobic Lake stakeholder, with a summary of the scientific studies that were conducted in 2011 and the resulting management plan that has been produced in 2013. This management planning effort was a team-based project and was produced with the hard work of individuals from the PLA, WDNR, and the environmental consulting group over seeing the project, Onterra, LLC.

Mission Statement

The Pesobic Lake Association is a non-profit corporation dedicated to maintain, protect and enhance the quality of the lake and its surroundings for the collective interest of its members.

For more information about the Pesobic Lake Association or the Lake Management Planning Project, contact:
Scott Voight
vip@dwave.net

Pamphlet created by:
Onterra LLC
Lake Management Planning
www.onterra-eco.com

B

APPENDIX B

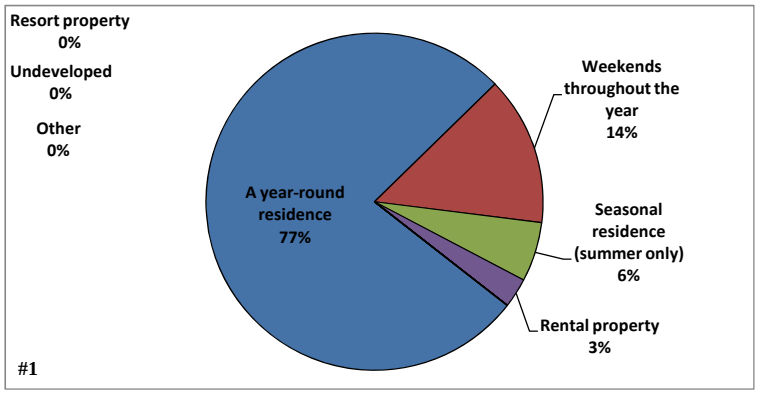
Stakeholder Survey Response Charts and Comments

Returned Surveys	39
Sent Surveys	56
Response Rate (%)	69.6

PESOBIC LAKE PROPERTY

#1 What type of property do you own on Pesobic Lake?

	Total	%
A year-round residence	27	*71.1*
Weekends throughout the year	5	*13.2*
Seasonal residence (summer only)	2	*5.3*
Rental property	1	*2.6*
Resort property	0	*0.0*
Undeveloped	0	*0.0*
Other	0	*0.0*
I do not live on the lake - *Go to Question 6*	3	*7.9*
	38	*100.0*

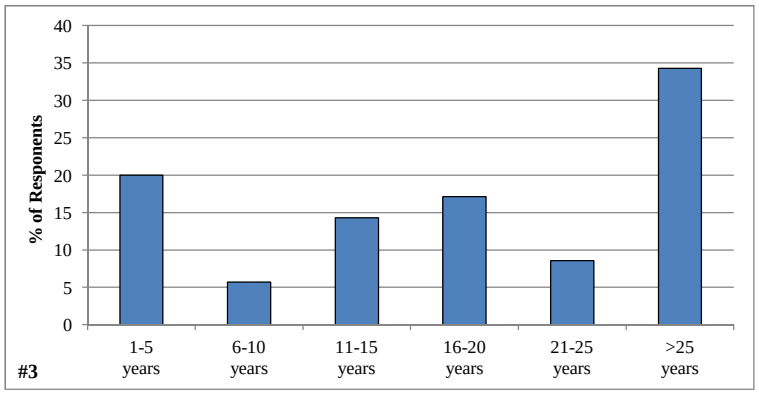


#2 How many days each year is your property used by you or others?

Answered Question	35
Average	277.0
Standard deviation	139.4

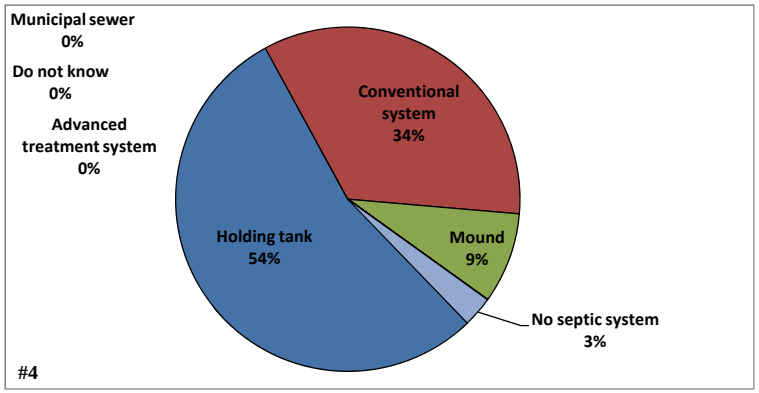
#3 How long have you owned your property on Pesobic Lake?

	Total	%
1-5 years	7	*20.0*
6-10 years	2	*5.7*
11-15 years	5	*14.3*
16-20 years	6	*17.1*
21-25 years	3	*8.6*
>25 years	12	*34.3*
	35	*100.0*



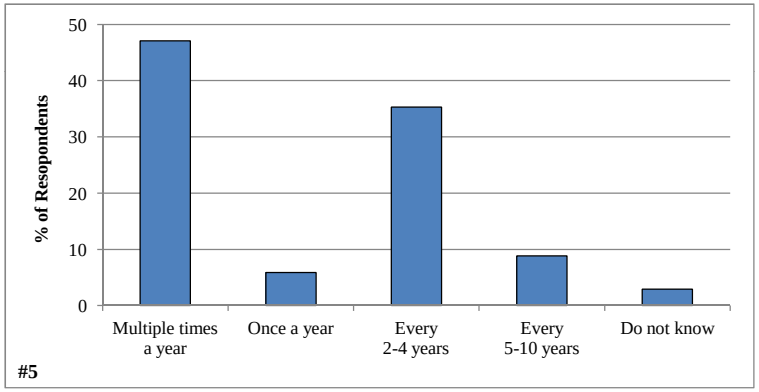
#4 What type of septic system does your property utilize?

	Total	%
Holding tank	19	*54.3*
Conventional system	12	*34.3*
Mound	3	*8.6*
Advanced treatment system	0	*0.0*
Municipal sewer	0	*0.0*
Do not know	0	*0.0*
No septic system - *Go to Question 6*	1	*2.9*
	35	*100.0*



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

	Total	%
Multiple times a year	16	*47.1*
Once a year	2	*5.9*
Every 2-4 years	12	*35.3*
Every 5-10 years	3	*8.8*
Do not know	1	*2.9*
	34	*100.0*



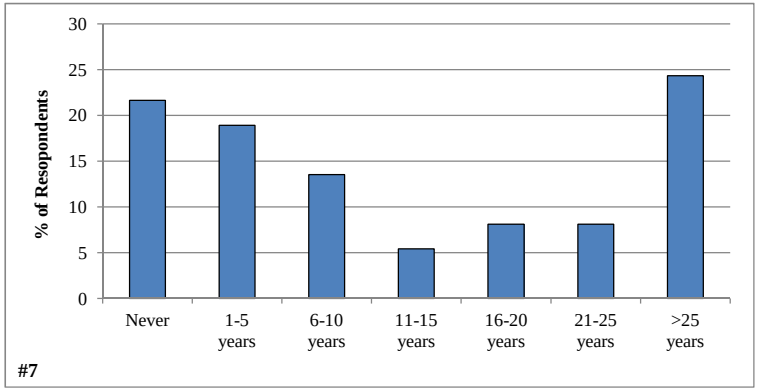
Recreational Use on Pesobic Lake

#6 How many years ago did you first visit Pesobic Lake?

Answered Question	37
Average	33.8
Standard deviation	21.7

#7 For how many years have you fished Pesobic Lake?

	Total	%
Never	8	*21.6*
1-5 years	7	*18.9*
6-10 years	5	*13.5*
11-15 years	2	*5.4*
16-20 years	3	*8.1*
21-25 years	3	*8.1*
>25 years	9	*24.3*
	37	*100.0*

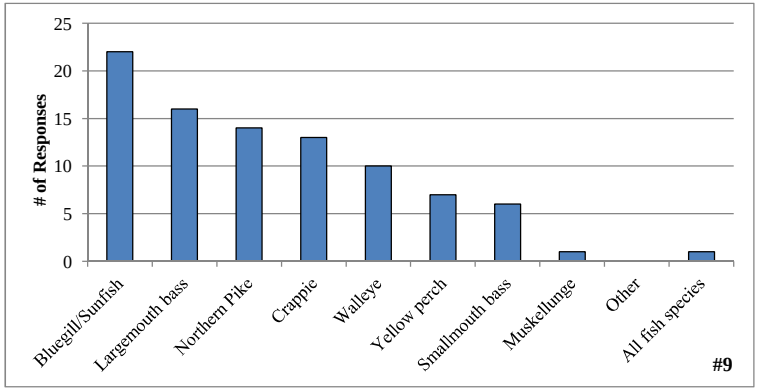


#8 Have you personally fished on Pesobic Lake in the past 3 years?

	Total	%
Yes	25	*67.6*
No - *Go to Question 12*	12	*32.4*
	37	*100.0*

#9 What species of fish do you like to catch on Pesobic Lake?

	Total
Bluegill/Sunfish	22
Largemouth bass	16
Northern Pike	14
Crappie	13
Walleye	10
Yellow perch	7
Smallmouth bass	6
Muskellunge	1
Other	0
All fish species	1
	90

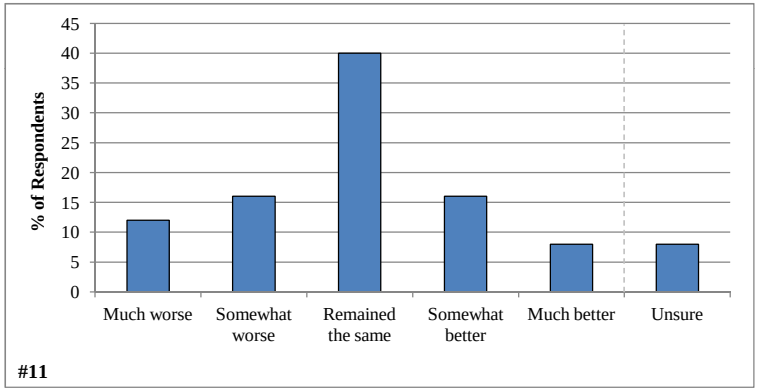


#10 How would you describe the current quality of fishing on Pesobic Lake?

	Total	%
Very Poor	0	*0.0*
Poor	3	*12.5*
Fair	14	*58.3*
Good	7	*29.2*
Excellent	0	*0.0*
Unsure	1	*4.2*
	24	*100.0*

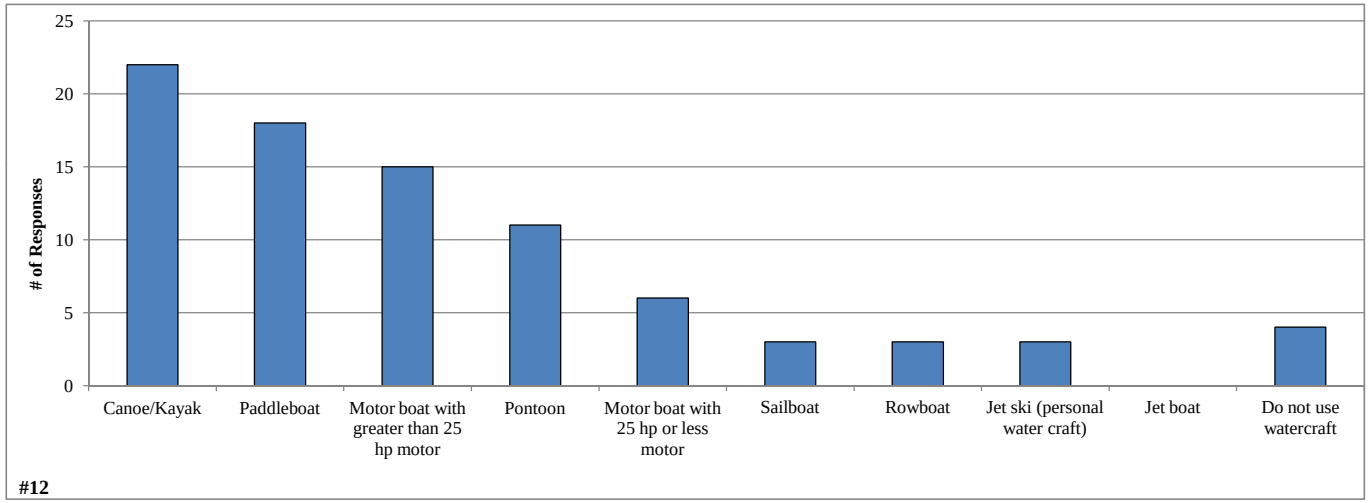
#11 How has the quality of fishing changed on Pesobic Lake since you started fishing on the lake?

	Total	%
Much worse	3	*12.0*
Somewhat worse	4	*16.0*
Remained the Same	10	*40.0*
Somewhat better	4	*16.0*
Much better	2	*8.0*
Unsure	2	*8.0*
	25	*100.0*



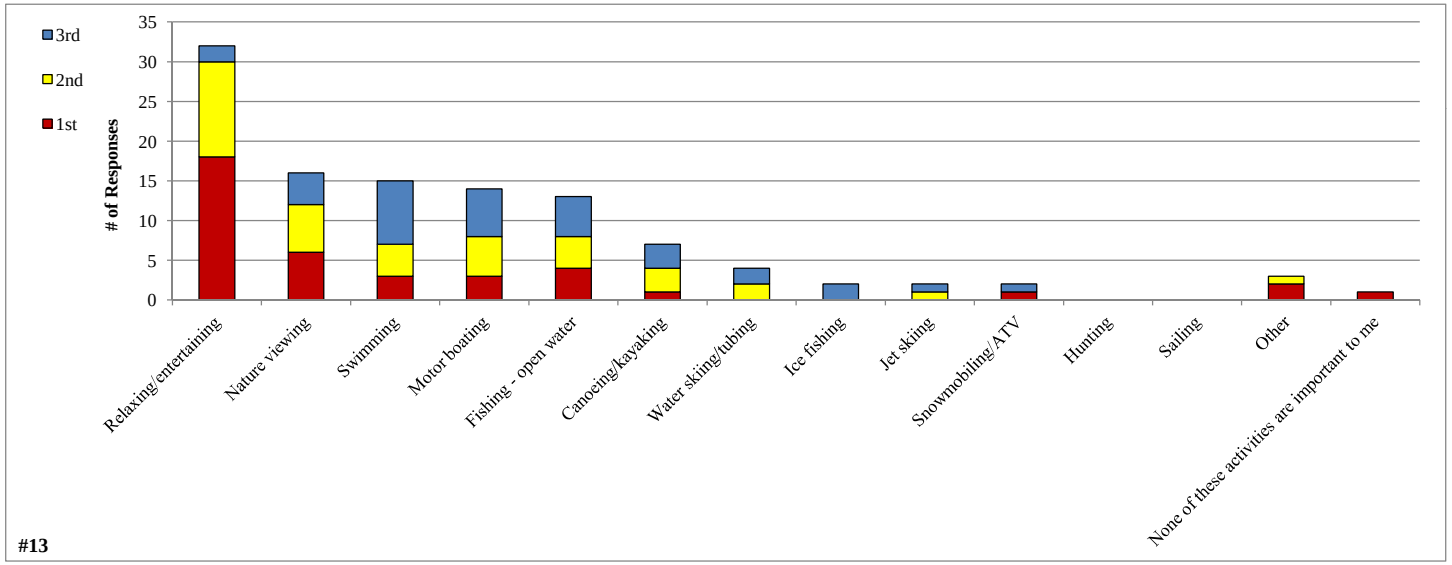
#12 What types of watercraft do you currently use on the lake?

	Total
Canoe/Kayak	22
Paddleboat	18
Motor boat with greater than 25 hp motor	15
Pontoon	11
Motor boat with 25 hp or less motor	6
Sailboat	3
Rowboat	3
Jet ski (personal water craft)	3
Jet boat	0
Do not use watercraft	4



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

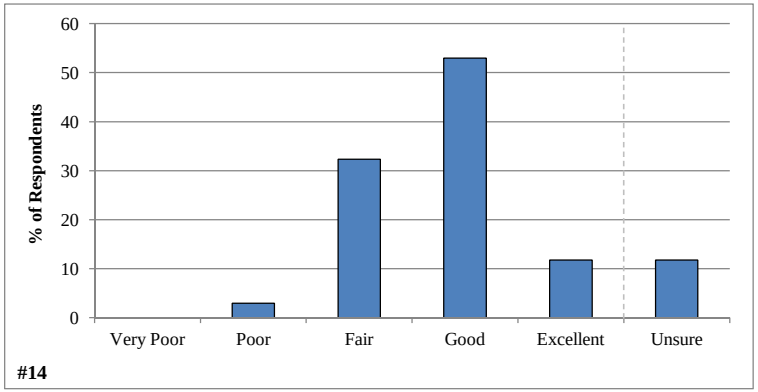
	1st	2nd	3rd	*% ranked*
Relaxing/entertaining	18	12	2	*28.8*
Nature viewing	6	6	4	*14.4*
Swimming	3	4	8	*13.5*
Motor boating	3	5	6	*12.6*
Fishing - open water	4	4	5	*11.7*
Canoeing/kayaking	1	3	3	*6.3*
Water skiing/tubing	0	2	2	*3.6*
Ice fishing	0	0	2	*1.8*
Jet skiing	0	1	1	*1.8*
Snowmobiling/ATV	1	0	1	*1.8*
Hunting	0	0	0	*0.0*
Sailing	0	0	0	*0.0*
Other	2	1	0	*2.7*
None of these activities are important to me	1	0	0	*0.9*
	39	38	34	*100.0*



PESOBIC LAKE CURRENT AND HISTORIC CONDITION, HEALTH AND MANAGEMENT

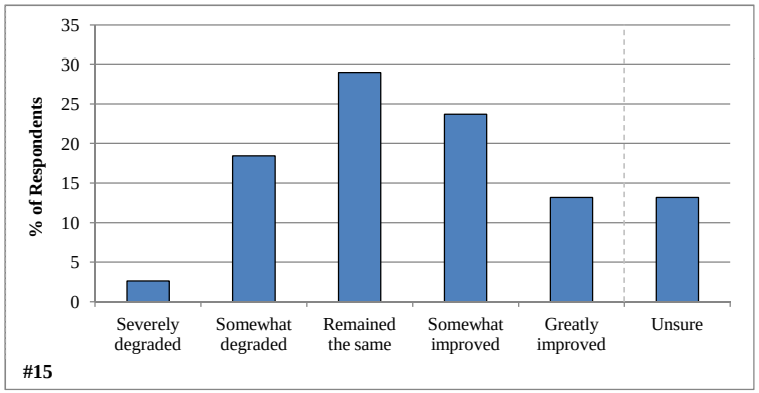
#14 How would you describe the current water quality of Pesobic Lake?

	Total	%
Very Poor	0	*0.0*
Poor	1	*2.9*
Fair	11	*32.4*
Good	18	*52.9*
Excellent	4	*11.8*
Unsure	4	*11.8*
	34	*100.0*



#15 How has the water quality changed in Pesobic Lake since you visited the lake?

	Total	%
Severely degraded	1	*2.6*
Somewhat degraded	7	*18.4*
Remained the same	11	*28.9*
Somewhat improved	9	*23.7*
Greatly improved	5	*13.2*
Unsure	5	*13.2*
	38	*100.0*



#16 Have you ever heard of aquatic invasive species?

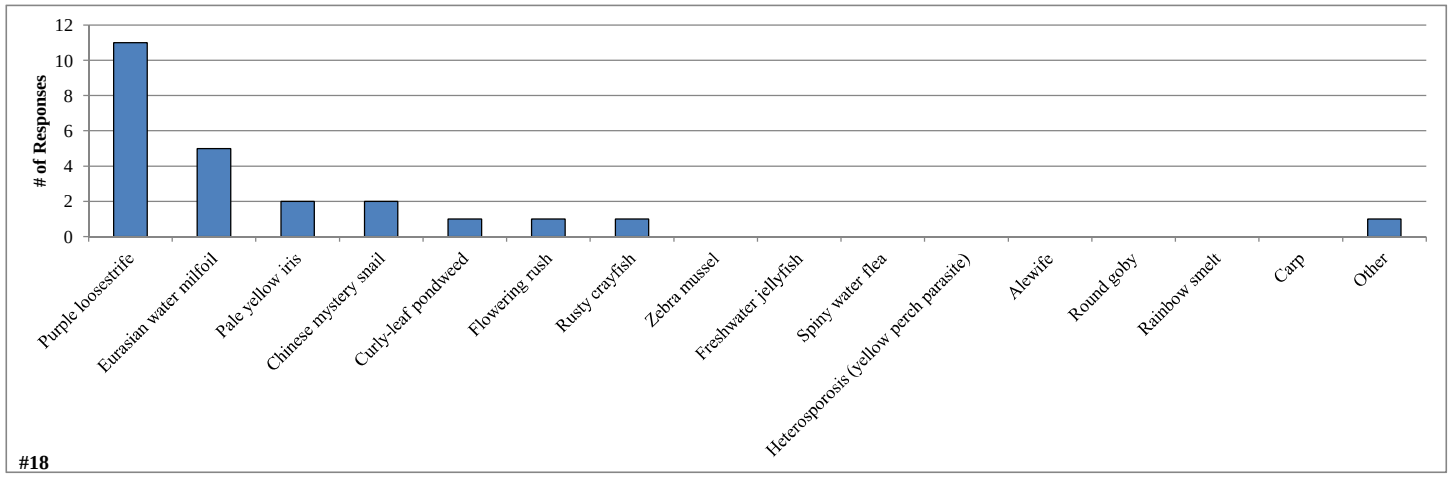
	Total	%
Yes	37	*94.9*
No - *Go to Question 19*	2	*5.1*
	39	*100.0*

#17 Are you aware of aquatic invasive species in Pesobic Lake?

	Total	%
Yes	18	*52.9*
No - *Go to Question 19*	16	*47.1*
	34	*100.0*

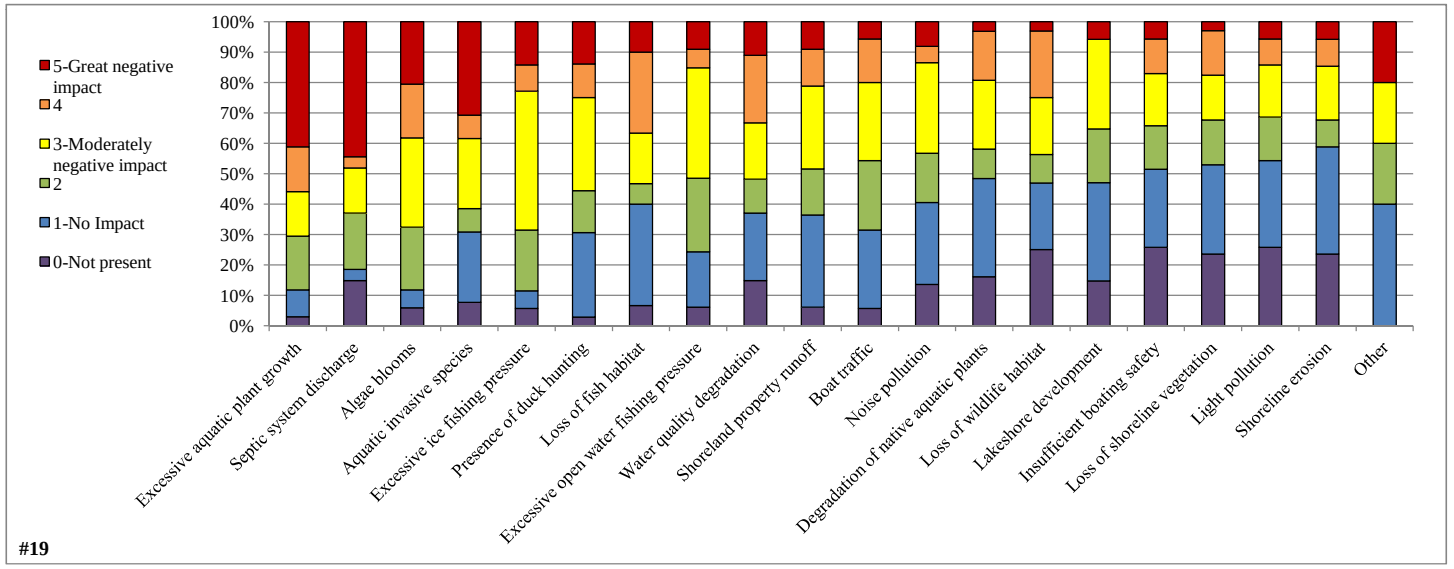
#18 Which aquatic invasive species are you aware of in Pesobic Lake?

	Total
Purple loosestrife	11
Eurasian water milfoil	5
Pale yellow iris	2
Chinese mystery snail	2
Curly-leaf pondweed	1
Flowering rush	1
Rusty crayfish	1
Zebra mussel	0
Freshwater jellyfish	0
Spiny water flea	0
Heterosporosis (yellow perch parasite)	0
Alewife	0
Round goby	0
Rainbow smelt	0
Carp	0
Other	1



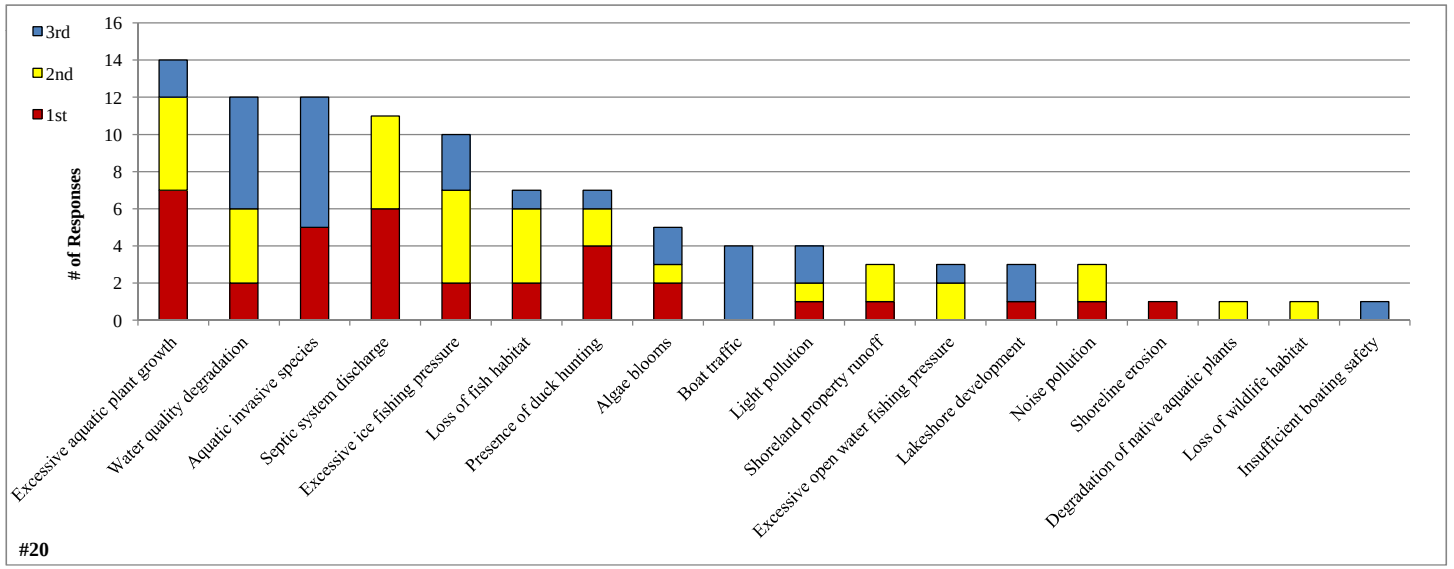
#19 To what level do you believe each of the following factors may be negatively impacting Pesobic Lake?

	0-Not present	1-No Impact	2	3-Moderately negative impact	4	5-Great negative impact	*Total*	*Average*
Excessive aquatic plant growth	1	3	6	5	5	14	*33*	*3.5*
Septic system discharge	4	1	5	4	1	12	*23*	*3.2*
Algae blooms	2	2	7	10	6	7	*32*	*3.1*
Aquatic invasive species	2	6	2	6	2	8	*24*	*2.9*
Excessive ice fishing pressure	2	2	7	16	3	5	*33*	*2.9*
Presence of duck hunting	1	10	5	11	4	5	*35*	*2.6*
Loss of fish habitat	2	10	2	5	8	3	*28*	*2.5*
Excessive open water fishing pressure	2	6	8	12	2	3	*31*	*2.5*
Water quality degradation	4	6	3	5	6	3	*23*	*2.4*
Shoreland property runoff	2	10	5	9	4	3	*31*	*2.4*
Boat traffic	2	9	8	9	5	2	*33*	*2.3*
Noise pollution	5	10	6	11	2	3	*32*	*2.1*
Degradation of native aquatic plants	5	10	3	7	5	1	*26*	*2.0*
Loss of wildlife habitat	8	7	3	6	7	1	*24*	*2.0*
Lakeshore development	5	11	6	10	0	2	*29*	*1.9*
Insufficient boating safety	9	9	5	6	4	2	*26*	*1.8*
Loss of shoreline vegetation	8	10	5	5	5	1	*26*	*1.8*
Light pollution	9	10	5	6	3	2	*26*	*1.7*
Shoreline erosion	8	12	3	6	3	2	*26*	*1.7*
Other	0	2	1	1	0	1	*5*	*2.4*



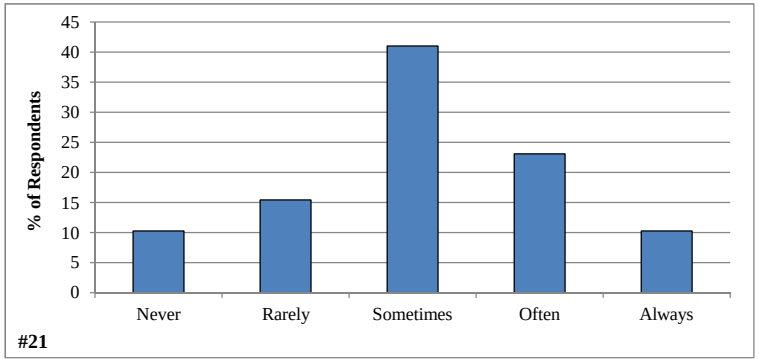
#20 From the list below, please rank your top three concerns regarding Pesobic Lake.

	1st	2nd	3rd	*% Ranked*
Excessive aquatic plant growth	7	5	2	*13.5*
Water quality degradation	2	4	6	*11.5*
Aquatic invasive species	5	0	7	*11.5*
Septic system discharge	6	5	0	*10.6*
Excessive ice fishing pressure	2	5	3	*9.6*
Loss of fish habitat	2	4	1	*6.7*
Presence of duck hunting	4	2	1	*6.7*
Algae blooms	2	1	2	*4.8*
Boat traffic	0	0	4	*3.8*
Light pollution	1	1	2	*3.8*
Shoreland property runoff	1	2	0	*2.9*
Excessive open water fishing pressure	0	2	1	*2.9*
Lakeshore development	1	0	2	*2.9*
Noise pollution	1	2	0	*2.9*
Shoreline erosion	1	0	0	*1.0*
Degradation of native aquatic plants	0	1	0	*1.0*
Loss of wildlife habitat	0	1	0	*1.0*
Insufficient boating safety	0	0	1	*1.0*
Loss of shoreline vegetation	0	0	0	*0.0*
Other	2	0	0	*1.9*
	37	35	32	*100.0*



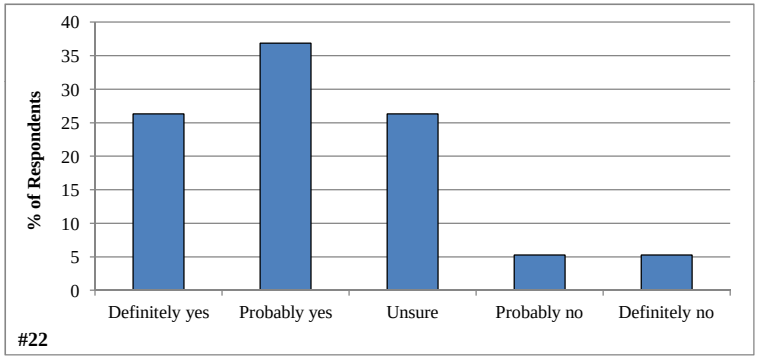
#21 During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of the lake?

	Total	%
Never	4	*10.3*
Rarely	6	*15.4*
Sometimes	16	*41.0*
Often	9	*23.1*
Always	4	*10.3*
	39	*100.0*



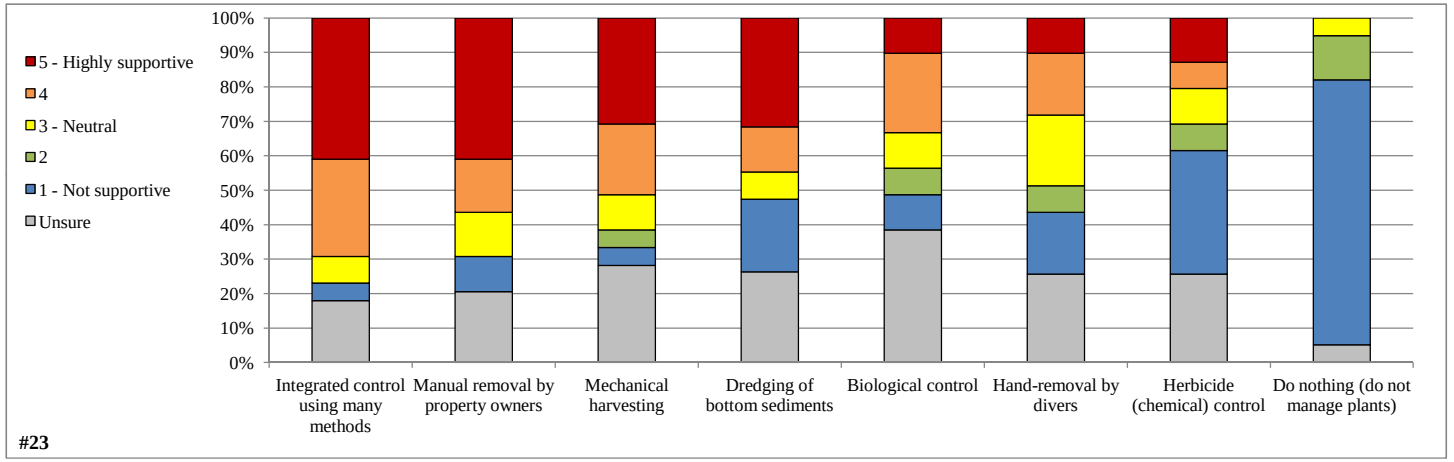
#22 Considering your answer to the question above, do you believe aquatic plant control is needed on the lake?

	Total	%
Definitely yes	10	*26.3*
Probably yes	14	*36.8*
Unsure	10	*26.3*
Probably no	2	*5.3*
Definitely no	2	*5.3*
	38	*100.0*



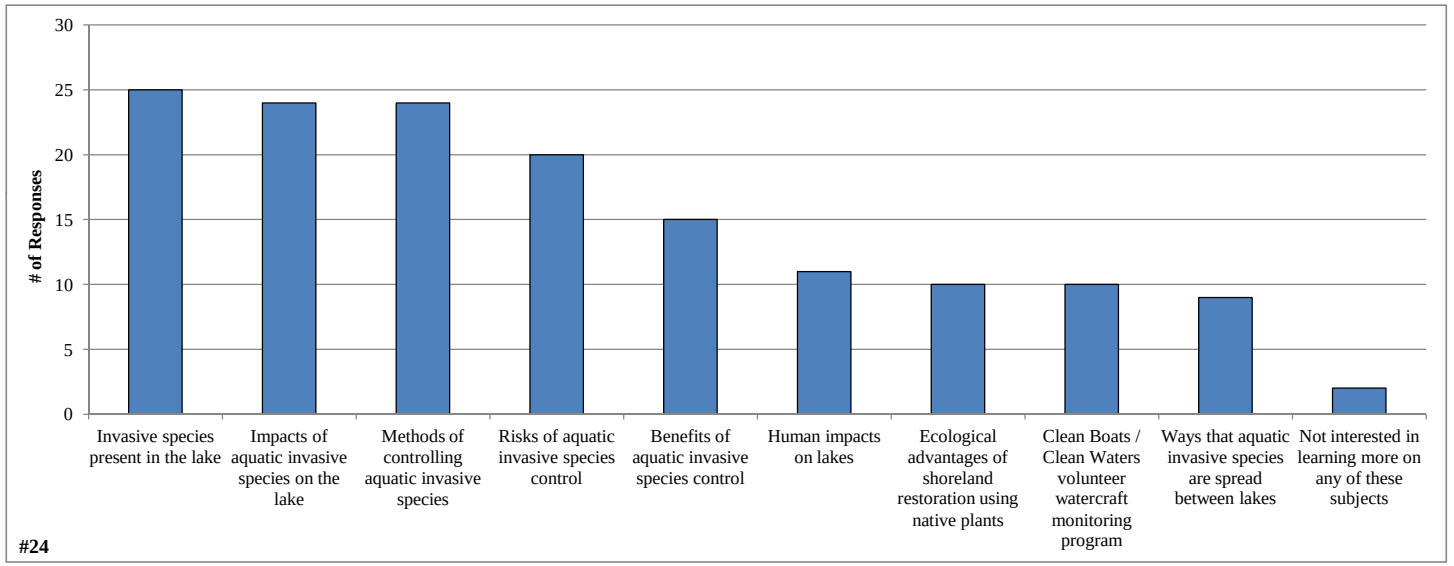
#23 What is your level of support for the responsible use of the following techniques on Pesobic Lake?

	1 - Not supportive	2	3 - Neutral	4	5 - Highly supportive	Unsure	Total	Average
Integrated control using many methods	2	0	3	11	16	7	*32*	*4.2*
Manual removal by property owners	4	0	5	6	16	8	*31*	*4.0*
Mechanical harvesting	2	2	4	8	12	11	*28*	*3.9*
Dredging of bottom sediments	8	0	3	5	12	10	*28*	*3.5*
Biological control	4	3	4	9	4	15	*24*	*3.3*
Hand-removal by divers	7	3	8	7	4	10	*29*	*2.9*
Herbicide (chemical) control	14	3	4	3	5	10	*29*	*2.4*
Do nothing (do not manage plants)	30	5	2	0	0	2	*37*	*1.2*



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

	Total
Invasive species present in the lake	25
Impacts of aquatic invasive species on the lake	24
Methods of controlling aquatic invasive species	24
Risks of aquatic invasive species control	20
Benefits of aquatic invasive species control	15
Human impacts on lakes	11
Ecological advantages of shoreland restoration using native plants	10
Clean Boats / Clean Waters volunteer watercraft monitoring program	10
Ways that aquatic invasive species are spread between lakes	9
Not interested in learning more on any of these subjects	2



PESOBIC LAKE ASSOCIATION

#25 Before receiving this mailing, have you ever heard of the Pesobic Lake Association?

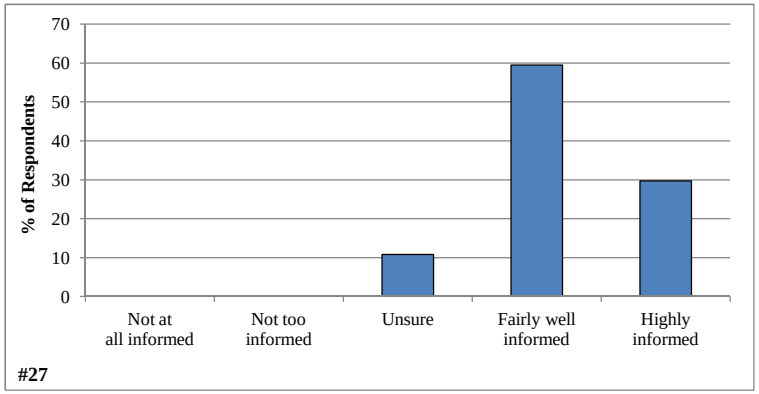
	Total	%
Yes	39	*100.0*
No - *Go to Question 28*	0	*0.0*
	39	*100.0*

#26 What is your membership status with the Pesobic Lake Association?

	Total	%
Current member	36	*97.3*
Former member - *Go to Question 28*	1	*2.7*
Never been a member - *Go to Question 28*	0	*0.0*
	37	*100.0*

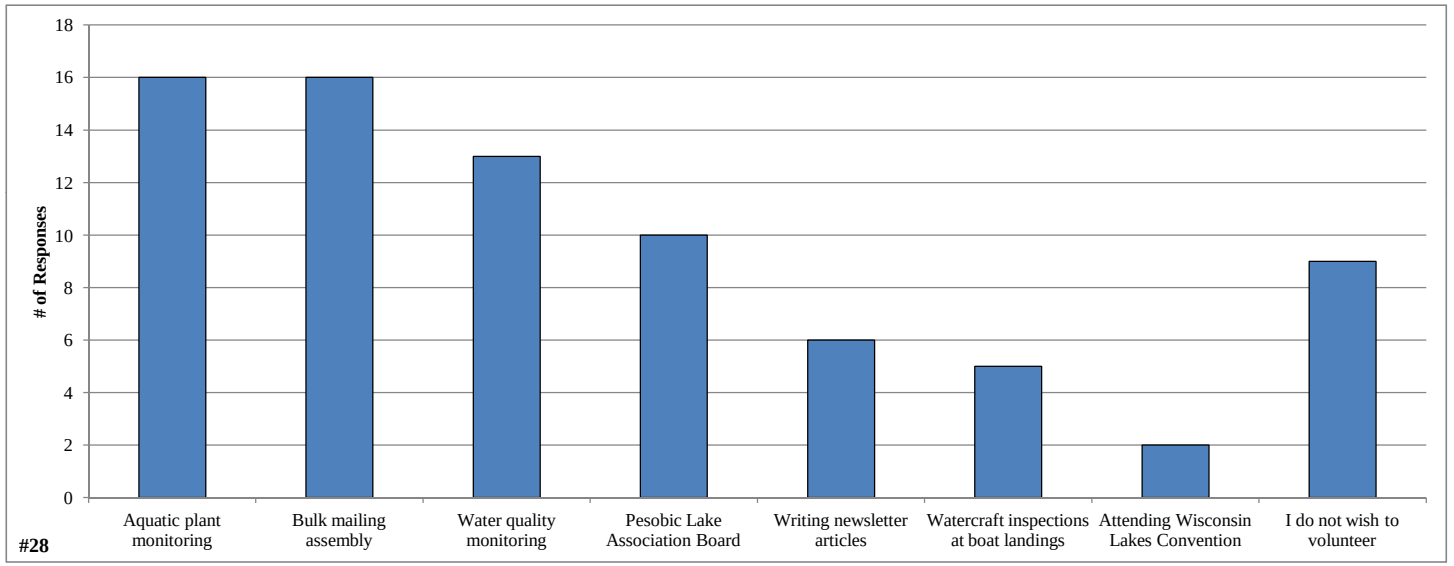
#27 How informed has the Pesobic Lake Association kept you regarding issues with the lake and its management?

	Total	%
Not at all informed	0	*0.0*
Not too informed	0	*0.0*
Unsure	4	*10.8*
Fairly well informed	22	*59.5*
Highly informed	11	*29.7*
	37	*100.0*



#28 Please circle the activities you would be willing to participate in if the Pesobic Lake Association requires additional assistance.

	Total
Aquatic plant monitoring	16
Bulk mailing assembly	16
Water quality monitoring	13
Pesobic Lake Association Board	10
Writing newsletter articles	6
Watercraft inspections at boat landings	5
Attending Wisconsin Lakes Convention	2
I do not wish to volunteer	9



Survey Number	1g Comment	13m Comment	18p Comment	19t Comment	20t Comment	Other Comments (and Question 29)
1						A main concern is the debris left by ice fishermen along with the dumping of garbage on the ice and near the boat landing. Boater safety is sometimes an issue.
2						To my knowledge the water quality is excellent and we are not aware of any invasive aquatic species at this time. Our concern is to maintain the quality of the lake.
3						Something needs to be done about all the garbage left on the ice from the ice fishermen.
4						
5				Chasing loons with boats. Gun shots early in the morning, lead shot? Garbage left on the lake by fishermen. Dock lights shining into my house all night.		Consider closing boat landing. Eliminate shoreline lights shining across the lake.
6						Needs boat landing cleanup especially in spring. Noticed human feces on ground and black top several times last summer and late fall. Last summer/early fall fish were left laying around to rot. Garbage not picked up although a container is provided. Take out food containers thrown out - not in can. I picked up a lot of debris! I do walk my dog there daily and pick up after him, only to see human waste lying there.
7						We must not take for granted the treasure that is Lake Pesobic.
8						
9		Love the tranquil wooded area		Blockage of area swamp water run off to the lake on the east side because the water is trapped on the other side of the tracks.		I do think a lot of water never gets to the lake because so many years of growth and the rail I'm sure doesn't really care about it as long as the tracks are fine. But I'm sure many gallons of water never get to the lake and it just dries up.
10						Fishing pressure could be a problem all year round. Have never seen or heard of any kind of census on this lake. Also if there is invasive species that should be a priority with quality water. No septic systems. Also stay clear of the loons - it's wonderful seeing them.
11						
12						
13						
14						
15						
16				Fireworks/FW Debris	Fireworks debris	
17						The lake is being taken over by aquatic vegetation. If it isn't controlled/maintained regularly it will take a long time to recover. One of the main drawbacks to any effort is the state law allowing anyone to have access to waterways. People who do not live on the lake will trash it and continue to be unconcerned about invasive vegetation. The state, not the lake front property owners need to correct and maintain waters used by the whole world. Another issue is noise pollution - especially in the winter with snowmobile trails. We need to look for alternate routes so homeowners don't have to put up with all the noise by again - non property owners.
18		it's home				
19				With increased residential homes on the lake there doesn't seem to be as much recreational activity on the lake in the summer as compared to 25 yrs ago. Since I'm not present during the entire summer my observation may not be correct.		Am concerned about the varying water levels noted previous years. Also the increased algae noted more recently. When the water level dropped I noticed a lot of snail shells on shore. When water level was low several years ago noted black oily substance on shoreline. I love Lake Pesobic - would be nice if old septic systems could be updated on old cottages etc.
20						
21						
22						There has been a dramatic increase in watershield on the lake on all shorelines especially the south shore. This is affecting recreation and property values. Something has to be done. A duck blind, located on north central island is effecting recreation for all activities in the fall. It is hard to use the lake with gun shots over your head. Our lake is too small and populated for this activity.
23						
24						
25						
26						Substantial use of lawn fertilizer is a huge concern. Construction w/o permits. Docks that extend beyond legal length. Garbage left during ice fishing.
27			Eurasian water milfoil (I think)			This is a beautiful lake that for the most part remains quiet and peaceful. I am glad I bought property here. I am also happy to call this my primary residence year-round.

Survey Number	1g Comment	13m Comment	18p Comment	19t Comment	20t Comment	Other Comments (and Question 29)
28				Train going through and blowing whistle at night.		
29			Don't know what kind of snails we have.	Water lilies or other species have taken over the south shore and west side of the lake and need to be minimized.	If aquatic invasive species were identified of course it would be our greatest concern.	
30						I feel the lake is in good shape. We need to be very careful in any activity such as weed control that we do not upset the balance of the lake. We do need to watch carefully invasive species both plants and animals.
31						
32						
33					Water depth not like it used to be. Lots of snails.	The board's 8 present volunteers are doing an excellent job
34						
35						Garbage and trash left from ice fishers - never even checked or verified from DNR - (non-existent). Snowmobilers and trail going across private property. People changing the shoreline by dumping river rock, sand etc. If the DNR doesn't care, like it has consistently shown, close it down as a public lake! Old shotgun shells from the duck hunters only get cleaned up if they make it to the shorelines and if the property owners rake and clean their shoreline - which they should be doing.
36						Am concerned about quality of fishing - it has declined due to excessive over harvest. Lilypads are gone.
37						
38						It seems to me that quite a few years ago the runoff channel just north of the boat launch area was lowered which did not let the lake fill beyond a certain level (that level was lowered) - seems like down 6-8" is my guess. Any truth to this?
39						
40						

C

APPENDIX C

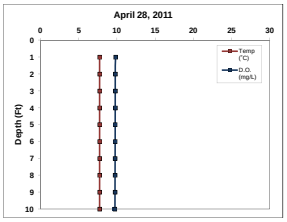
Water Quality Data

Pesobic Lake

Date: 4/28/2011
Time: 12:25
Weather: 100% clouds, light rain, 35°F
Entry: TWH

Max Depth: 10.5
PESS Depth (ft): 3.0
PESB Depth (ft): 8.0
Secchi Depth (ft): 3.4

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	7.8	9.8	6.6	
2	7.8	9.8	6.5	
3	7.8	9.8	6.5	
4	7.7	9.8	6.4	
5	7.8	9.8	6.4	
6	7.8	9.8	6.4	
7	7.7	9.7	6.4	
8	7.7	9.7	6.4	
9	7.7	9.7	6.4	
10	7.7	9.7	6.4	



Parameter	PESS	PESB
Total P (µg/L)		
Dissolved P (µg/L)		
Chl-a (µg/L)		
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

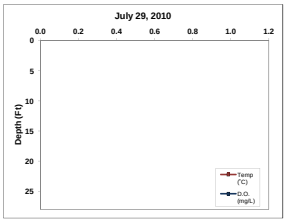
Data collected by TWH (Onterra)

Pesobic Lake

Date:
Time:
Weather:
Entry:

Max Depth:
PESS Depth (ft):
PESB Depth (ft):
Secchi Depth (ft):

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



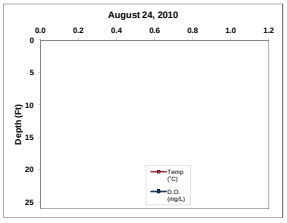
Parameter	PESS	PESB
Total P (µg/L)		
Dissolved P (µg/L)		
Chl-a (µg/L)		
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

Pesobic Lake

Date:
Time:
Weather:
Entry:

Max Depth:
PESS Depth (ft):
PESB Depth (ft):
Secchi Depth (ft):

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



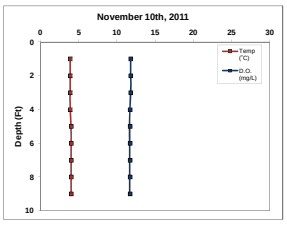
Parameter	PESS	PESB
Total P (µg/L)		
Dissolved P (µg/L)		
Chl-a (µg/L)		
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

Pesobic Lake

Date: 11/10/2011
Time: 12:10
Weather: 100% clouds, breezy, 33°
Entry: EEC

Max Depth: 10.6
PESS Depth (ft): 3
PESB Depth (ft): 8
Secchi Depth (ft): 4.7

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	3.9	11.8		
2	3.9	11.8		
3	3.9	11.8		
4	3.9	11.7		
5	4	11.7		
6	4	11.7		
7	4	11.7		
8	4	11.7		
9	4	11.7		
10				



Parameter	PESS	PESB
Total P (µg/L)		
Dissolved P (µg/L)		
Chl-a (µg/L)		
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

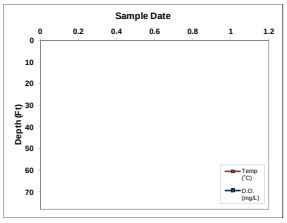
Data collected by TWH (Onterra)

Pesobic Lake

Date:
Time:
Weather:
Entry:

Max Depth:
PESS Depth (ft):
PESB Depth (ft):
Secchi Depth (ft):

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1				
3				
6				
9				
12				
15				
18				
21				
24				
27				
30				
33				
36				
39				
42				
45				
48				
51				
54				
57				
60				
63				
66				
69				
72				
75				
78				



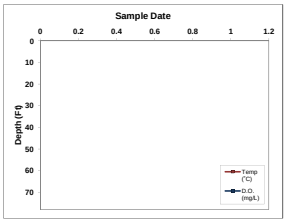
Parameter	PESS	PESB
Total P (µg/L)		
Dissolved P (µg/L)		
Chl-a (µg/L)		
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

Pesobic Lake

Date:
Time:
Weather:
Entry:

Max Depth:
PESS Depth (ft):
PESB Depth (ft):
Secchi Depth (ft):

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1				
3				
6				
9				
12				
15				
18				
21				
24				
27				
30				
33				
36				
39				
42				
45				
48				
51				
54				
57				
60				
63				
66				
69				
72				
75				
78				



Parameter	PESS	PESB
Total P (µg/L)		
Dissolved P (µg/L)		
Chl-a (µg/L)		
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)		
Lab pH		
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

Water Quality Data

2010	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)			NA	NA
Total P (µg/L)			0	NA
Dissolved P (µg/L)			0	NA
Chl a (µg/L)			0	NA
TKN (µg/L			0	NA
NO3+NO2-N (µg/L)			0	NA
NH3-N (µg/L)			0	NA
Total N (µg/L)			0	NA
Lab Cond. (µS/cm)			0	NA
Lab pH			0	NA
Alkal (mg/l CaCO3)			0	NA
Total Susp Sol (mg/l)			0	NA
Calcium (µg/L)			0	NA

Morphological / Geographical Data

Parameter	Value
Acreage	
Volume (acre-feet)	
Perimeter (miles)	
Shoreland Developmetnt Factor	
Maximum Depth (feet)	
County	
WBIC	
Lillie Mason Region (1983)	NLF Ecoregion
Nichols Ecoregion (1999)	NLFL

Watershed Data

WiLMS Class	Acreage	kg/yr	lbs/yr
Forest			0.0
Open Water			0.0
Pasture/Grass			0.0
Row Crops			0.0
Urban - Rural Residential			0.0
Wetland			0.0
Watershed to Lake Area			

Wisconsin Trophic State Index (WTSI)

Year	TP	Chl-a	Secchi
1979			
1986			
1987			
1988			
1989			
1990			
1991			
1992			
1993			
1994			
1995			
1996			
1997			
1998			
1999			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
All Years (Weighted)			
Deep, Seepage Lakes	49.2		42.4
NLF Ecoregion	51.8		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												
1986												
1987												
1988												
1989												
1990												
1991												
1992												
1993												
1994												
1995												
1996												
1997												
1998												
1999												
2000												
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
All Years (Weighted)		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!
Deep, Seepage Lakes				11.2								15.0
NLF Ecoregion				8.9								21.0
WI Natural Lakes				7.9				13.4				25
Northeast Region				8.9								

Summer 2010 N: 0.0
Summer 2010 P: 0.0

Summer 2011 N:P #DIV/0! :1

D

APPENDIX D

Watershed Analysis WiLMS Results

Date: 7/3/2012 Scenario: Pesobic Lake Current

Lake Id: Pesobic Lake Current
Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 967.0 acre
Total Unit Runoff: 11.7 in.
Annual Runoff Volume: 942.8 acre-ft
Lake Surface Area <As>: 156 acre
Lake Volume <V>: 936 acre-ft
Lake Mean Depth <z>: 6.0 ft
Precipitation - Evaporation: 5.2 in.
Hydraulic Loading: 1010.4 acre-ft/year
Areal Water Load <qs>: 6.5 ft/year
Lake Flushing Rate <p>: 1.08 1/year
Water Residence Time: 0.93 year
Observed spring overturn total phosphorus (SPO): 26.0 mg/m^3
Observed growing season mean phosphorus (GSM): 22.3 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	38	0.50	1.00	3.00	19.0	8	15	46
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	127	0.10	0.30	0.50	19.0	5	15	26
HD Urban (1/8 Ac)	0.0	1.00	1.50	2.00	0.0	0	0	0
MD Urban (1/4 Ac)	0.0	0.30	0.50	0.80	0.0	0	0	0
Rural Res (>1 Ac)	182	0.05	0.10	0.25	9.1	4	7	18
Wetlands	352	0.10	0.10	0.10	17.6	14	14	14
Forest	268	0.05	0.09	0.18	12.0	5	10	20
Lake Surface	156.0	0.10	0.30	1.00	23.4	6	19	63

POINT SOURCE DATA

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

SEPTIC TANK DATA

Description		Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)		0.3	0.5	0.8	
# capita-years	0.0				
% Phosphorus Retained by Soil		98	90	80	
Septic Tank Loading (kg/year)		0.00	0.00	0.00	0.0

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	93.7	178.8	412.6	100.0
Total Loading (kg)	42.5	81.1	187.1	100.0
Areal Loading (lb/ac-year)	0.60	1.15	2.64	0.0
Areal Loading (mg/m^2-year)	67.31	128.48	296.45	0.0
Total PS Loading (lb)	0.0	0.0	0.0	0.0
Total PS Loading (kg)	0.0	0.0	0.0	0.0
Total NPS Loading (lb)	79.8	137.1	273.4	100.0
Total NPS Loading (kg)	36.2	62.2	124.0	100.0

Phosphorus Prediction and Uncertainty Analysis Module

Date: 7/3/2012 Scenario: Pesobic Lake Current
Observed spring overturn total phosphorus (SPO): 26.0 mg/m^3
Observed growing season mean phosphorus (GSM): 22.3 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	19	37	86	15	67
Canfield-Bachmann, 1981 Natural Lake	19	32	59	10	45
Canfield-Bachmann, 1981 Artificial Lake	18	28	48	6	27
Rechow, 1979 General	5	9	21	-13	-58
Rechow, 1977 Anoxic	26	51	117	29	130
Rechow, 1977 water load<50m/year	14	26	60	4	18
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	19	36	84	10	38
Vollenweider, 1982 Combined OECD	16	27	54	3	12
Dillon-Rigler-Kirchner	9	16	38	-10	-38
Vollenweider, 1982 Shallow Lake/Res.	13	22	46	-2	-8
Larsen-Mercier, 1976	17	33	77	7	27
Nurnberg, 1984 Oxic	8	16	37	-6	-27

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	22	70	FIT	0	GSM
Canfield-Bachmann, 1981 Natural Lake	10	92	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	9	81	FIT	1	GSM
Rechow, 1979 General	5	17	FIT	0	GSM
Rechow, 1977 Anoxic	31	95	FIT	0	GSM
Rechow, 1977 water load<50m/year	15	49	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	18	72	FIT	0	SPO
Vollenweider, 1982 Combined OECD	13	52	FIT	0	ANN
Dillon-Rigler-Kirchner	10	30	P	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	11	42	FIT	0	ANN
Larsen-Mercier, 1976	21	61	P Pin	0	SPO
Nurnberg, 1984 Oxic	8	31	FIT	0	ANN

E

APPENDIX E

Aquatic Plant Survey Data

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Chara spp.	Elatine minima	Eleocharis acicularis	Eleocharis palustris	Elodea nuttallii	Isoetes sp.	Juncus pelocarpus	Myriophyllum sibiricum	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Potamogeton epihydrus	Potamogeton vaseyi	Sagitaria sp. (rosette)	Sparganium fluctuans	Utricularia purpurea	Utricularia vulgaris	SP_1	Aquatic Moss	Freshwater Sponge	Potamogeton bicupulatus	Myriophyllum farwellii
1	45.207940	-89.679638	0			NONNAVIGABLE (PLANTS)																							
2	45.207939	-89.679040	0			NONNAVIGABLE (PLANTS)																							
3	45.208370	-89.682030	0	Sand	pole					1				1									1			1			
4	45.208369	-89.681431	3	Rock	pole			1						1		1							1						
5	45.208365	-89.680234	2	Sand	pole						1																		
6	45.208363	-89.679636	2	Rock	pole																		1				1		
7	45.208362	-89.679037	3	Sand	pole											1							1				1		
8	45.208797	-89.683224	2	Sand	pole		1																1						
9	45.208795	-89.682626	3	Sand	pole		2										1						1						
10	45.208793	-89.682027	3	Sand	pole		1					1											2			1			
11	45.208792	-89.681429	5	Sand	pole					1				1		1					1		2						
12	45.208790	-89.680830	4	Sand	pole				1	2				1									1			1			
13	45.208788	-89.680232	4	Sand	pole					1													1						
14	45.208787	-89.679633	3	Sand	pole				1					1		1							1						
15	45.208785	-89.679035	4	Sand	pole							1		1		1							1						
16	45.209221	-89.683821	2	Muck	pole		1										1					1	1	1					
17	45.209220	-89.683222	3	Rock	pole		2																1						
18	45.209218	-89.682624	5	Muck	pole		1					1											1			1			
19	45.209216	-89.682025	6	Muck	pole							1											1						
20	45.209215	-89.681427	6	Muck	pole					1											1		1						
21	45.209213	-89.680828	6	Muck	pole							1									1		2						
22	45.209211	-89.680230	6	Muck	pole					1		1		1							2		1						
23	45.209210	-89.679631	5	Muck	pole					1								1			1		2				1		
24	45.209208	-89.679033	6	Muck	pole					1											2		1						
25	45.209644	-89.683818	4	Muck	Pole		1															1	1						
26	45.209643	-89.683220	5	Sand	Pole																		2						
27	45.209641	-89.682621	6	Muck	Pole							1									1		1						
28	45.209639	-89.682023	7	Muck	Pole																								
29	45.209638	-89.681424	6	Muck	Pole							1	1								1		1						
30	45.209636	-89.680826	6	Muck	Pole																								
31	45.209634	-89.680227	7	Muck	Pole																								
32	45.209633	-89.679629	6	Muck	Pole																		1						
33	45.209631	-89.679030	6	Muck	Pole							1											1						
34	45.209629	-89.678432	3	Muck	Pole									1		1							1				1		
35	45.210067	-89.683816	4	Muck	Pole		V															1	1						
36	45.210066	-89.683217	5	Muck	Pole							1											1						
37	45.210064	-89.682619	6	Muck	Pole							1				1							1						
38	45.210062	-89.682020	7	Muck	Pole																1								
39	45.210061	-89.681422	6	Muck	Pole							1									1								
40	45.210059	-89.680823	7	Muck	Pole																								
41	45.210057	-89.680225	8	Muck	Pole																		1						
42	45.210056	-89.679626	7	Muck	Pole							1																	
43	45.210054	-89.679028	6	Muck	Pole							1											1						
44	45.210052	-89.678429	6	Muck	Pole							1																	
45	45.210051	-89.677831	3	Rock	Pole							1											1						
46	45.210492	-89.684412	2	Muck	Pole		1																						
47	45.210491	-89.683814	5	Muck	Pole		1																1						

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Chara spp.	Elatine minima	Eleocharis acicularis	Eleocharis palustris	Elodea nuttallii	Isoetes sp.	Juncus pelocarpus	Myriophyllum sibiricum	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Potamogeton epihydrus	Potamogeton vaseyi	Sagitaria sp. (rosette)	Sparganium fluctuans	Utricularia purpurea	Utricularia vulgaris	SP_1	Aquatic Moss	Freshwater Sponge	Potamogeton bicupulatus	Myriophyllum farwellii
48	45.210489	-89.683215	6	Muck	Pole																1		1						
49	45.210487	-89.682617	6	Muck	Pole																1		2			1			
50	45.210486	-89.682018	7	Muck	Pole							1																	
51	45.210484	-89.681419	7	Muck	Pole							1																	
52	45.210482	-89.680821	7	Muck	Pole																		1						
53	45.210481	-89.680222	7	Muck	Pole							1						1					1						
54	45.210479	-89.679624	7	Muck	Pole							1																	
55	45.210477	-89.679025	7	Muck	Pole							1											1						
56	45.210475	-89.678427	7	Muck	Pole							1																	
57	45.210474	-89.677828	7	Muck	Pole																		1						
58	45.210472	-89.677230	4	Muck	Pole								1										2			1			
59	45.210914	-89.683811	4	Muck	Pole											2							1				1		
60	45.210912	-89.683213	6	Muck	Pole																					1			
61	45.210910	-89.682614	6	Muck	Pole																								
62	45.210909	-89.682016	6	Muck	Pole																2		1						
63	45.210907	-89.681417	6	Muck	Pole																1		1						
64	45.210905	-89.680819	7	Muck	Pole																1		1						
65	45.210904	-89.680220	7	Muck	Pole							1											1			1			
66	45.210902	-89.679622	7	Muck	Pole							1																	
67	45.210900	-89.679023	8	Muck	Pole																					1			
68	45.210899	-89.678425	9	Muck	Pole																					1			
69	45.210897	-89.677826	8	Muck	Pole													1								1			
70	45.210895	-89.677227	8	Muck	Pole																								
71	45.210893	-89.676629	6	Muck	Pole																1		1			2			
72	45.211337	-89.683809	4	Muck	Pole		1									1							1						
73	45.211335	-89.683210	6	Muck	Pole																								
74	45.211333	-89.682612	6	Muck	Pole																1		1			1			
75	45.211332	-89.682013	6	Muck	Pole																2		1				1		
76	45.211330	-89.681415	7	Muck	Pole																2		1						
77	45.211328	-89.680816	7	Muck	Pole							1						1					1			1			
78	45.211327	-89.680218	7	Muck	Pole							1						1					1			1			
79	45.211325	-89.679619	6	Muck	Pole							1						1		1			2						
80	45.211323	-89.679021	8	Muck	Pole																					1			
81	45.211322	-89.678422	9	Muck	Pole																								
82	45.211320	-89.677824	9	Muck	Pole																								
83	45.211318	-89.677225	9	Muck	Pole																								
84	45.211317	-89.676627	8	Muck	Pole																								
85	45.211315	-89.676028	6	Muck	Pole					1		1	1								1		1			2			
86	45.211760	-89.683807	5	Muck	Pole								1			2							1				1		
87	45.211758	-89.683208	6	Muck	Pole																2		1						
88	45.211756	-89.682609	6	Muck	Pole					1		1									1		1						
89	45.211755	-89.682011	5	Muck	Pole								1								1		2			1	1		
90	45.211753	-89.681412	6	Muck	Pole																		1			1			
91	45.211751	-89.680814	7	Muck	Pole																		1			1			
92	45.211750	-89.680215	6	Muck	Pole																								
93	45.211748	-89.679617	6	Muck	Pole							1											1			1			
94	45.211746	-89.679018	8	Muck	Pole																					1			

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Chara spp.	Elatine minima	Eleocharis acicularis	Eleocharis palustris	Elodea nuttallii	Isoetes sp.	Juncus pelocarpus	Myriophyllum sibiricum	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Potamogeton epihydrus	Potamogeton vaseyi	Sagitaria sp. (rosette)	Sparganium fluctuans	Utricularia purpurea	Utricularia vulgaris	SP_1	Aquatic Moss	Freshwater Sponge	Potamogeton bicupulatus	Myriophyllum farwellii
95	45.211745	-89.678420	9	Muck	Pole													1											
96	45.211743	-89.677821	9	Muck	Pole																								
97	45.211741	-89.677223	9	Muck	Pole																					1			
98	45.211740	-89.676624	9	Muck	Pole																								
99	45.211738	-89.676026	7	Muck	Pole							1											1			1			
100	45.211736	-89.675427	3	Sand	Pole							3																	
101	45.212183	-89.683804	6	Muck	Pole							1				1							1			1	1		
102	45.212181	-89.683206	6	Muck	Pole					1								1					1						
103	45.212179	-89.682607	4	Muck	Pole											1							2				1		
104	45.212178	-89.682009	4	Muck	Pole				1							1					1					1	1		
105	45.212176	-89.681410	6	Muck	Pole					1													1			1			
106	45.212174	-89.680811	7	Muck	Pole							1						1					1			1			
107	45.212173	-89.680213	6	Muck	Pole																1		1			1	1		
108	45.212171	-89.679614	8	Muck	Pole													1					1						
109	45.212169	-89.679016	8	Muck	Pole																					1			
110	45.212168	-89.678417	9	Muck	Pole																					1			
111	45.212166	-89.677819	10	Muck	Pole																					1			
112	45.212164	-89.677220	10	Muck	Pole																								
113	45.212163	-89.676622	8	Muck	Pole																								
114	45.212161	-89.676023	7	Muck	Pole							1						1								1			
115	45.212606	-89.683802	6	Muck	Pole											1		1					1						
116	45.212604	-89.683203	5	Muck	Pole											1					1		1				1		
117	45.212601	-89.682006	2	Rock	Pole																		1				1		
118	45.212599	-89.681408	5	Muck	Pole											1					1						1		
119	45.212598	-89.680809	6	Muck	Pole							1											1						
120	45.212596	-89.680211	6	Muck	Pole																1		1			1			
121	45.212594	-89.679612	7	Muck	Pole																		1						
122	45.212593	-89.679014	8	Muck	Pole																								
123	45.212591	-89.678415	9	Muck	Pole																					1			
124	45.212589	-89.677816	9	Muck	Pole																								
125	45.212587	-89.677218	10	Muck	Pole																					1			
126	45.212586	-89.676619	9	Muck	Pole																								
127	45.212584	-89.676021	5	Muck	Pole							1											1			2			
128	45.213031	-89.684398	5	Muck	Pole		1					1									1		1						
129	45.213029	-89.683799	6	Muck	Pole					1		1						1			1		1						
130	45.213027	-89.683201	5	Muck	Pole											1							1				1		
131	45.213026	-89.682602	2	Sand	Pole						1												1						
132	45.213024	-89.682004	5	Muck	Pole							1				2					1					1	1		
133	45.213022	-89.681405	7	Muck	Pole																1					1			
134	45.213021	-89.680807	7	Muck	Pole																								
135	45.213019	-89.680208	7	Muck	Pole							1											1						
136	45.213017	-89.679610	8	Muck	Pole																					1			
137	45.213016	-89.679011	10	Muck	Pole																					1			
138	45.213014	-89.678413	10	Muck	Pole																								
139	45.213012	-89.677814	9	Muck	Pole																					1			
140	45.213011	-89.677215	10	Muck	Pole																								
141	45.213009	-89.676617	9	Muck	Pole																								

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Chara spp.	Elatine minima	Eleocharis acicularis	Eleocharis palustris	Elodea nuttallii	Isoetes sp.	Juncus pelocarpus	Myriophyllum sibiricum	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Potamogeton epihydrus	Potamogeton vaseyi	Sagitaria sp. (rosette)	Sparganium fluctuans	Utricularia purpurea	Utricularia vulgaris	SP_1	Aquatic Moss	Freshwater Sponge	Potamogeton bicupulatus	Myriophyllum farwellii
142	45.213007	-89.676018	4	Sand	Pole							1	1										1			3	1		
143	45.213454	-89.684396	6	Muck	Pole							1							1		1								
144	45.213452	-89.683797	6	Muck	Pole					1								1			1								
145	45.213450	-89.683199	6	Muck	Pole					1			1								1		1			1			
146	45.213449	-89.682600	5	Muck	Pole					1											1		1			1	1		
147	45.213447	-89.682001	8	Muck	Pole					1		1									1		1						
148	45.213445	-89.681403	7	Muck	Pole																1		1						
149	45.213444	-89.680804	7	Muck	Pole							1											1			1			
150	45.213442	-89.680206	8	Muck	Pole																								
151	45.213440	-89.679607	8	Muck	Pole																					1			
152	45.213439	-89.679009	9	Muck	Pole																								
153	45.213437	-89.678410	10	Muck	Pole																								
154	45.213435	-89.677812	11	Muck	Pole																								
155	45.213434	-89.677213	9	Muck	Pole																								
156	45.213432	-89.676615	10	Muck	Pole																								
157	45.213430	-89.676016	8	Muck	Pole																					1			
158	45.213880	-89.685590	1	Muck	Pole		1			1	V								V			V		1					1
159	45.213878	-89.684992	5	Muck	Pole		V			1		1			1								1						
160	45.213877	-89.684393	6	Muck	Pole													1					1						
161	45.213875	-89.683795	6	Muck	Pole																1		1						
162	45.213873	-89.683196	6	Muck	Pole					1		1						1								1			
163	45.213872	-89.682598	6	Muck	Pole																1					1			
164	45.213870	-89.681999	6	Muck	Pole					1											1						1		
165	45.213868	-89.681401	6	Muck	Pole					1											1		1			1	1		
166	45.213867	-89.680802	7	Muck	Pole							1									1		1			1			
167	45.213865	-89.680203	7	Muck	Pole																		1						
168	45.213863	-89.679605	8	Muck	Pole																		1			1			
169	45.213862	-89.679006	10	Muck	Pole																					1			
170	45.213860	-89.678408	9	Muck	Pole																								
171	45.213858	-89.677809	9	Muck	Pole																								
172	45.213857	-89.677211	9	Muck	Pole																								
173	45.213855	-89.676612	9	Muck	Pole																								
174	45.213853	-89.676014	9	Muck	Pole																								
175	45.213852	-89.675415	5	Muck	Pole							2											1			1			
176	45.214301	-89.684990	5	Muck	Pole							1									1		1			1			
177	45.214300	-89.684391	6	Muck	Pole																1		2			1			
178	45.214298	-89.683792	7	Muck	Pole																		1						
179	45.214296	-89.683194	7	Muck	Pole																					1			
180	45.214295	-89.682595	7	Muck	Pole																		1						
181	45.214293	-89.681997	6	Muck	Pole													1			1		1				1		
182	45.214291	-89.681398	6	Muck	Pole																1		1			1			
183	45.214290	-89.680800	8	Muck	Pole							1											1		1	1			
184	45.214288	-89.680201	7	Muck	Pole							1											1			1			
185	45.2142865	-89.6796025	8	Muck	Pole																		1			1			
186	45.2142848	-89.679004	9	Muck	Pole																					1			
187	45.2142831	-89.6784054	9	Muck	Pole													1								1			
188	45.2142814	-89.6778069	9	Muck	Pole																		1						

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Chara spp.	Elatine minima	Eleocharis acicularis	Eleocharis palustris	Elodea nuttallii	Isoetes sp.	Juncus pelocarpus	Myriophyllum sibiricum	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Potamogeton epihydrus	Potamogeton vaseyi	Sagitaria sp. (rosette)	Sparganium fluctuans	Utricularia purpurea	Utricularia vulgaris	SP_1	Aquatic Moss	Freshwater Sponge	Potamogeton bicupulatus	Myriophyllum farwellii
189	45.2142797	-89.6772083	9	Muck	Pole													1								1			
190	45.214278	-89.6766098	10	Muck	Pole																								
191	45.2142763	-89.6760112	9	Muck	Pole																								
192	45.2142746	-89.6754126	5	Muck	Pole							1											1			2			
193	45.2147262	-89.6855858	4	Muck	Pole		2					1										V	1						
194	45.2147245	-89.6849872	5	Muck	Pole							1									1		2			1			1
195	45.2147229	-89.6843887	6	Muck	Pole																1		1			1			
196	45.2147212	-89.6837901	6	Muck	Pole					1											1		1						
197	45.2147195	-89.6831915	6	Muck	Pole																1					1			
198	45.2147179	-89.682593	6	Muck	Pole																1		2			1			
199	45.2147162	-89.6819944	3	Rock	Pole																		1			1	1		
200	45.2147145	-89.6813959	6	Muck	Pole					1								1					1						
201	45.2147129	-89.6807973	7	Muck	Pole																								
202	45.2147112	-89.6801987	7	Muck	Pole							1											1			1	1		
203	45.2147095	-89.6796002	8	Muck	Pole																								
204	45.2147078	-89.6790016	8	Muck	Pole																		1			1			
205	45.2147062	-89.678403	8	Muck	Pole													1					1			1			
206	45.2147045	-89.6778045	8	Muck	Pole													1								1			
207	45.2147028	-89.6772059	9	Muck	Pole																								
208	45.2147011	-89.6766074	8	Muck	Pole																								
209	45.2146994	-89.6760088	7	Muck	Pole							1																	
210	45.2151476	-89.6849849	4	Muck	Pole		1					1									1		1			1			
211	45.2151459	-89.6843863	5	Muck	Pole					1		1									1		1						
212	45.2151443	-89.6837878	6	Muck	Pole					1											1		1					1	
213	45.2151426	-89.6831892	5	Muck	Pole																1		1			1			
214	45.2151409	-89.6825906	5	Muck	Pole								1								2		1			1			
215	45.2151393	-89.6819921	5	Muck	Pole																2		1			1	1		
216	45.2151376	-89.6813935	6	Muck	Pole																1		1			1	1		
217	45.2151359	-89.6807949	7	Muck	Pole																		1			1			
218	45.2151343	-89.6801964	7	Muck	Pole																		1						
219	45.2151326	-89.6795978	8	Muck	Pole							1																	
220	45.2151309	-89.6789992	8	Muck	Pole																		1			1			
221	45.2151292	-89.6784007	8	Muck	Pole							1											1			1			
222	45.2151275	-89.6778021	9	Muck	Pole																					1			2
223	45.2151258	-89.6772035	9	Muck	Pole																								
224	45.2151242	-89.676605	9	Muck	Pole																								
225	45.2151225	-89.6760064	6	Muck	Pole																		1			1			
226	45.215569	-89.684384	4	Muck	Pole							1											1			2			2
227	45.2155673	-89.6837854	5	Muck	Pole							1									1		1			1			1
228	45.2155657	-89.6831868	4	Muck	Pole					1						1							1			1			
229	45.215564	-89.6825883	4	Muck	Pole							1				2							1			1			
230	45.2155623	-89.6819897	5	Muck	Pole					1						1							1					1	
231	45.2155607	-89.6813911	6	Muck	Pole																2					1	1		
232	45.215559	-89.6807926	6	Muck	Pole								1										1			1			
233	45.2155573	-89.680194	7	Muck	Pole																								
234	45.2155557	-89.6795954	7	Muck	Pole																								
235	45.215554	-89.6789968	8	Muck	Pole																					1			

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Chara spp.	Elatine minima	Eleocharis acicularis	Eleocharis palustris	Elodea nuttallii	Isoetes sp.	Juncus pelocarpus	Myriophyllum sibiricum	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Potamogeton epihydrus	Potamogeton vaseyi	Sagitaria sp. (rosette)	Sparganium fluctuans	Utricularia purpurea	Utricularia vulgaris	SP_1	Aquatic Moss	Freshwater Sponge	Potamogeton bicupulatus	Myriophyllum farwellii
236	45.2155523	-89.6783983	8	Muck	Pole													1								1			
237	45.2155506	-89.6777997	8	Muck	Pole																								
238	45.2155489	-89.6772011	9	Muck	Pole																								
239	45.2155472	-89.6766026	9	Muck	Pole																								
240	45.2155455	-89.676004	6	Muck	Pole																1		1			2			
241	45.2159887	-89.6831845	3	Muck	Pole					1				1							1		2			1			1
242	45.2159871	-89.6825859	3	Muck	Pole								1			1							2			1			
243	45.2159837	-89.6813888	5	Muck	Pole																1		1			2			
244	45.2159821	-89.6807902	6	Muck	Pole					1		1						1											
245	45.2159804	-89.6801916	7	Muck	Pole																								
246	45.2159787	-89.679593	7	Muck	Pole																								
247	45.215977	-89.6789945	8	Muck	Pole																								
248	45.2159754	-89.6783959	8	Muck	Pole																								
249	45.2159737	-89.6777973	8	Muck	Pole							1																	
250	45.215972	-89.6771987	8	Muck	Pole																								
251	45.2159703	-89.6766002	8	Muck	Pole																								
252	45.2159686	-89.6760016	5	Muck	Pole								1								1		1			1			
253	45.2164051	-89.6807878	3	Muck	Pole							2																1	
254	45.2164035	-89.6801892	5	Muck	Pole							1	1								1		1			2	1		
255	45.2164018	-89.6795907	6	Muck	Pole							2											1						
256	45.2164001	-89.6789921	6	Muck	Pole																								
257	45.2163984	-89.6783935	7	Muck	Pole																					1			
258	45.2163967	-89.6777949	6	Muck	Pole					1											1		1			1			
259	45.2163951	-89.6771963	6	Muck	Pole							1						1			2		1						
260	45.2163934	-89.6765978	5	Muck	Pole								1								1		2				1		
261	45.2168265	-89.6801869	2	Sand	Pole							1						1					1			2			
262	45.2168232	-89.6789897	1	Sand	Pole						1																		
263	45.2168215	-89.6783911	3	Muck	Pole											1							1			1	1		
264	45.2168198	-89.6777925	3	Sand	Pole					1		1		1									1			1			
265	45.2168181	-89.677194	3	Sand	Pole																1		1			2	1		

F

APPENDIX F

WDNR Aquatic Plant Management Materials

AQUATIC PLANT MANAGEMENT STRATEGY

Northern Region WDNR
Summer, 2007

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

ISSUES

- Protect desirable native aquatic plants.
- Reduce the risk that invasive species replace desirable native aquatic plants.
- Promote "whole lake" management plans
- Limit the number of permits to control native aquatic plants.

BACKGROUND

As a general rule, the Northern Region has historically taken a protective approach to allow removal of native aquatic plants by harvesting or by chemical herbicide treatment. This approach has prevented lakes in the Northern Wisconsin from large-scale loss of native aquatic plants that represent naturally occurring high quality vegetation. Naturally occurring native plants provide a *diversity of habitat* that *helps maintain water quality*, helps *sustain the fishing* quality known for Northern Wisconsin, supports common lakeshore wildlife from loons to frogs, and helps to provide the *aesthetics* that collectively create the "up-north" appeal of the northwoods lake resources.

In Northern Wisconsin lakes, an inventory of aquatic plants may often find 30 different species or more, whereas a similar survey of a Southern Wisconsin lake may often discover less than half that many species. Historically, similar species diversity was present in Southern Wisconsin, but has been lost gradually over time from stresses brought on by cultural land use changes (such as increased development, and intensive agriculture). Another point to note is that while there may be a greater variety of aquatic vegetation in Northern Wisconsin lakes, the vegetation itself is often *less dense*. This is because northern lakes have not suffered as greatly from nutrients and runoff as have many waters in Southern Wisconsin.

The newest threat to native plants in Northern Wisconsin is from invasive species of aquatic plants. The most common include Eurasian Water Milfoil (EWM) and CurlyLeaf Pondweed (CLP). These species are described as *opportunistic invaders*. This means that these "invaders" benefit where an opening occurs from removal of plants, and without competition from other plants may successfully become established in a lake. Removal of native vegetation not only diminishes the natural qualities of a lake, it *may increase the risk that an invasive species can successfully invade onto the site where native plants have been removed*. There it may more easily establish itself without the native plants to compete against. This concept is easily observed on land where bared soil is quickly taken over by replacement species (often weeds) that crowd in and establish themselves as new occupants of the site. While not a providing a certain guarantee against invasive plants, protecting and allowing the native plants to remain may reduce the success of an invasive species becoming established on a lake. Once established, the invasive species cause far more inconvenience for all lake users, riparian and others included; can change many of the natural features of a lake; and often lead to *expensive annual control plans*. Native vegetation may cause localized concerns to some users, but as a natural feature of lakes, they generally do not cause harm.

To the extent we can maintain the normal growth of native vegetation, Northern Wisconsin lakes can continue to offer the water resource appeal and benefits they've historically provided. A regional position on removal of aquatic plants that carefully recognizes how native aquatic plants benefit lakes in Northern Region can help prevent a gradual decline in the overall quality and recreational benefits that make these lakes attractive to people and still provide abundant fish, wildlife, and northwoods appeal.

GOALS OF STRATEGY:

1. Preserve native species diversity which, in turn, fosters natural habitat for fish and other aquatic species, from frogs to birds.
2. Prevent openings for invasive species to become established in the absence of the native species.
3. Concentrate on a" whole-lake approach" for control of aquatic plants, thereby fostering systematic documentation of conditions and specific targeting of invasive species as they exist.
4. Prohibit removal of wild rice. WDNR – Northern Region will not issue permits to remove wild rice unless a request is subjected to the full consultation process via the Voigt Tribal Task Force. We intend to discourage applications for removal of this ecologically and culturally important native plant.
5. To be consistent with our WDNR Water Division Goals (work reduction/disinvestment), established in 2005, to "not issue permits for chemical or large scale mechanical control of native aquatic plants – develop general permits as appropriate or inform applicants of exempted activities." This process is similar to work done in other WDNR Regions, although not formalized as such.

BASIS OF STRATEGY IN STATE STATUTE AND ADMINISTRATIVE CODE

State Statute 23.24 (2)(c) states:

"The requirements promulgated under par. (a) 4. may specify any of the following:

1. The **quantity** of aquatic plants that may be managed under an aquatic plant management permit.
2. The **species** of aquatic plants that may be managed under an aquatic plant management permit.
3. The **areas** in which aquatic plants may be managed under an aquatic plant management permit.
4. The **methods** that may be used to manage aquatic plants under an aquatic plant management permit.
5. The **times** during which aquatic plants may be managed under an aquatic plant management permit.
6. The **allowable methods** for disposing or using aquatic

plants that are removed or controlled under an aquatic plant management permit.

7. The requirements for plans that the department may require under sub. (3) (b). “

State Statute 23.24(3)(b) states:
“The department may require that an application for an aquatic plant management permit contain a plan for the department’s approval as to how the aquatic plants will be introduced, removed, or controlled.“

Wisconsin Administrative Code NR 109.04(3)(a) states:
“The department may require that an application for an aquatic plant management permit contain an aquatic plant management plan that describes how the aquatic plants will be introduced, controlled, removed or disposed. Requirements for an aquatic plant management plan shall be made in writing stating the reason for the plan requirement. In deciding whether to require a plan, the department shall consider the potential for effects on protection and development of diverse and stable communities of native aquatic plants, for conflict with goals of other written ecological or lake management plans, for cumulative impacts and effect on the ecological values in the body of water, and the long-term sustainability of beneficial water use activities.”

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

APPROACH

1. After January 1, 2009* no individual permits for control of native aquatic plants will be issued. Treatment of native species may be allowed under the auspices of an approved lake management plan, and only if the plan clearly documents "impairment of navigation" and/or "nuisance conditions". Until January 1, 2009, individual permits will be issued to previous permit holders, only with adequate documentation of "impairment of navigation" and/or "nuisance conditions". No new individual permits will be issued during the interim.

2. Control of aquatic plants (if allowed) in documented sensitive areas will follow the conditions specified in the report.

3. Invasive species must be controlled under an approved lake management plan, with two exceptions (these exceptions are designed to allow sufficient time for lake associations to form and subsequently submit an approved lake management plan):
   a. Newly-discovered infestations. If found on a lake with an approved lake management plan, the invasive species can be controlled via an amendment to the approved plan. If found on a lake without an approved management plan, the invasive species can be controlled under the WDNR's Rapid Response protocol (see definition), and the lake owners will be encouraged to form a lake association and subsequently submit a lake management plan for WNDR review and approval.
   b. Individuals holding past permits for control of *invasive* aquatic plants and/or "mixed stands" of native and invasive species will be allowed to treat via individual permit until January 1, 2009 if "impairment of navigation" and/or "nuisance conditions" is adequately documented, unless there is an approved lake management plan for the lake in question.

4. Control of invasive species or "mixed stands" of invasive and native plants will follow current best management practices approved by the Department and contain an explanation of the strategy to be used. Established stands of invasive plants will generally use a control strategy based on Spring treatment. (typically, a water temperature of less than 60 degrees Fahrenheit, or approximately May 31st, annually).

5. Manual removal (see attached definition) is allowed (Admin. Code NR 109.06).

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* *Exceptions to the Jan. 1, 2009 deadline will be considered only on a very limited basis and will be intended to address unique situations that do not fall within the intent of this approach.*

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

DOCUMENTATION OF IMPAIRED NAVIGATION AND/OR NUISANCE CONDITIONS

Navigation channels can be of two types:

- Common use navigation channel. This is a common navigation route for the general lake user. It often is off shore and connects areas that boaters commonly would navigate to or across, and should be of public benefit.

- Individual riparian access lane. This is an access lane to shore that normally is used by an individual riparian shore owner.

Severe impairment or nuisance will generally mean vegetation grows thickly and forms mats on the water surface. Before issuance of a permit to use a regulated control method, a riparian will be asked to document the problem and show what efforts or adaptations have been made to use the site. (This is currently required in NR 107 and on the application form, but the following helps provide a specific description of what impairments exist from native plants).

Documentation of *impairment of navigation* by native plants must include:

a. Specific locations of navigation routes (preferably with GPS coordinates)
b. Specific dimensions in length, width, and depth
c. Specific times when plants cause the problem and how long the problem persists
d. Adaptations or alternatives that have been considered by the lake shore user to avoid or lessen the problem
e. The species of plant or plants creating the nuisance (documented with samples or a from a Site inspection)

Documentation of the *nuisance* must include:

a. Specific periods of time when plants cause the problem, e.g. when does the problem start and when does it go away.
b. Photos of the nuisance are encouraged to help show what uses are limited and to show the severity of the problem.
c. Examples of specific activities that would normally be done where native plants occur naturally on a site but can not occur because native plants have become a nuisance.

AQUATIC PLANT MANAGEMENT STRATEGY
Northern Region WDNR

DEFINITIONS

Manual removal:	Removal by hand or hand-held devices without the use or aid of external or auxiliary power. Manual removal cannot exceed 30 ft. in width and can only be done where the shore is being used for a dock or swim raft. The 30 ft. wide removal zone cannot be moved, relocated, or expanded with the intent to gradually increase the area of plants removed. Wild rice may not be removed under this waiver.
Native aquatic plants:	Aquatic plants that are indigenous to the waters of this state.
Invasive aquatic plants:	Non-indigenous species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
Sensitive area:	Defined under s. NR 107.05(3)(i) (sensitive areas are areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the body of water).
Rapid Response protocol:	This is an internal WDNR document designed to provide guidance for grants awarded under NR 198.30 (Early Detection and Rapid Response Projects). These projects are intended to control pioneer infestations of aquatic invasive species before they become established.

Chapter NR 109

AQUATIC PLANTS: INTRODUCTION, MANUAL REMOVAL AND MECHANICAL CONTROL REGULATIONS

NR 109.01 Purpose. The purpose of this chapter is to establish procedures and requirements for the protection and regulation of aquatic plants pursuant to ss. 23.24 and 30.07, Stats. Diverse and stable communities of native aquatic plants are recognized to be a vital and necessary component of a healthy aquatic ecosystem. This chapter establishes procedures and requirements for issuing aquatic plant management permits for introduction of aquatic plants or control of aquatic plants by manual removal, burning, use of mechanical means or plant inhibitors. This chapter identifies other permits issued by the department for aquatic plant management that contain the appropriate conditions as required under this chapter for aquatic plant management, and for which no separate permit is required under this chapter. Introduction and control of aquatic plants shall be allowed in a manner consistent with sound ecosystem management, shall consider cumulative impacts, and shall minimize the loss of ecological values in the body of water. The purpose of this chapter is also to prevent the spread of invasive and non−native aquatic organisms by prohibiting the launching of watercraft or equipment that has any aquatic plants or zebra mussels attached.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03; **correction made under s. 13.92 (4) (b) 7., Stats., Register March 2011 No. 663.**

NR 109.02 Applicability. A person sponsoring or conducting manual removal, burning or using mechanical means or aquatic plant inhibitors to control aquatic plants in navigable waters, or introducing non−native aquatic plants to waters of this state shall obtain an aquatic plant management permit from the department under this chapter.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.03 Definitions. In this chapter:

(1) "Aquatic community" means lake or river biological resources.

(2) "Beneficial water use activities" mean angling, boating, swimming or other navigational or recreational water use activity.

(3) "Body of water" means any lake, river or wetland that is a water of this state.

(4) "Complete application" means a completed and signed application form, the information specified in s. NR 109.04 and any other information which may reasonably be required from an applicant and which the department needs to make a decision under applicable provisions of law.

(5) "Department" means the Wisconsin department of natural resources.

(6) "Manual removal" means the control of aquatic plants by hand or hand−held devices without the use or aid of external or auxiliary power.

(7) "Navigable waters" means those waters defined as navigable under s. 30.10, Stats.

(8) "Permit" means aquatic plant management permit.

(9) "Plan" means aquatic plant management plan.

(10) "Wetlands" means an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.04 Application requirements and fees. **(1)** Permit applications shall be made on forms provided by the department and shall be submitted to the regional director or designee for the region in which the project is located. Permit applications for licensed aquatic nursery growers may be submitted to the department of agriculture, trade and consumer protection.

Note: Applications may be obtained from the department's regional headquarters or service centers. DATCP has agreed to send application forms and instructions provided by the department to aquatic nursery growers along with license renewal forms. DATCP will forward all applications to the department for processing.

(2) The application shall be accompanied by all of the following unless the application is made by licensed aquatic nursery growers for selective harvesting of aquatic plants for nursery stock. Applications made by licensed aquatic nursery growers for harvest of nursery stock do not have to include the information required by par. (d), (e), (h), (i) or (j).

(a) A nonrefundable application fee. The application fee for an aquatic plant management permit is:

1. $30 for a proposed project to manage aquatic plants on less than one acre.

2. $30 per acre to a maximum of $300 for a proposed project to manage aquatic plants on one acre or larger. Partial acres shall be rounded up to the next full acre for fee determination. An annual renewal of this permit may be requested with an additional application fee of one−half the original application fee, but not less than $30.

(b) A legal description of the body of water including township, range and section number.

(c) One copy of a detailed map of the body of water with the proposed introduction or control area dimensions clearly shown. Private individuals doing plant introduction or control shall provide the name of the owner riparian to the management area, which includes the street address or block, lot and fire number where available and local telephone number or other pertinent information necessary to locate the property.

(d) One copy of any existing aquatic management plan for the body of water, or detailed reference to the plan, citing the plan references to the proposed introduction or control area, and a description of how the proposed introduction or control of aquatic plants is compatible with any existing plan.

(e) A description of the impairments to water use caused by the aquatic plants to be managed.

(f) A description of the aquatic plants to be controlled or removed.

(g) The type of equipment and methods to be used for introduction, control or removal.

(h) A description of other introduction or control methods considered and the justification for the method selected.

(i) A description of any other method being used or intended for use for plant management by the applicant or on the area abutting the proposed management area.

(j) The area used for removal, reuse or disposal of aquatic plants.

(k) The name of any person or commercial provider of control or removal services.

(3) (a) The department may require that an application for an aquatic plant management permit contain an aquatic plant management plan that describes how the aquatic plants will be introduced, controlled, removed or disposed. Requirements for an aquatic plant management plan shall be made in writing stating the reason for the plan requirement. In deciding whether to require a plan, the department shall consider the potential for effects on protection and development of diverse and stable communities of native aquatic plants, for conflict with goals of other written ecological or lake management plans, for cumulative impacts and effect on the ecological values in the body of water, and the long−term sustainability of beneficial water use activities.

(b) Within 30 days of receipt of the plan, the department shall notify the applicant of any additional information or modifications to the plan that are required. If the applicant does not submit the additional information or modify the plan as requested by the department, the department may dismiss the aquatic plant management permit application.

(c) The department shall approve the aquatic plant management plan before an application may be considered complete.

(4) The permit sponsor may request an annual renewal in writing from the department under s. NR 109.05 if there is no change proposed in the conditions of the original permit issued.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.05 Permit issuance. (1) The department shall issue or deny issuance of the requested permit within 15 working days after receipt of a completed application and approved plan as required under s. NR 109.04 (3).

(2) The department may specify any of the following as conditions of the permit:

(a) The quantity of aquatic plants that may be introduced or controlled.

(b) The species of aquatic plants that may be introduced or controlled.

(c) The areas in which aquatic plants may be introduced or controlled.

(d) The methods that may be used to introduce or control aquatic plants.

(e) The times during which aquatic plants may be introduced or controlled.

(f) The allowable methods used for disposing of or using aquatic plants that are removed or controlled.

(g) Annual or other reporting requirements to the department that may include information related to pars. (a) to (f).

(3) The department may deny issuance of the requested permit if the department determines any of the following:

(a) Aquatic plants are not causing significant impairment of beneficial water use activities.

(b) The proposed introduction or control will not remedy the water use impairments caused by aquatic plants as identified as a part of the application in s. NR 109.04 (2) (e).

(c) The proposed introduction or control will result in a hazard to humans.

(d) The proposed introduction or control will cause significant adverse impacts to threatened or endangered resources.

(e) The proposed introduction or control will result in a significant adverse effect on water quality, aquatic habitat or the aquatic community including the native aquatic plant community.

(f) The proposed introduction or control is in locations identified by the department as sensitive areas, under s. NR 107.05 (3) (i) 1., except when the applicant demonstrates to the satisfaction of the department that the project can be conducted in a manner that will not alter the ecological character or reduce the ecological value of the area.

(g) The proposed management will result in significant adverse long−term or permanent changes to a plant community or a high value species in a specific aquatic ecosystem. High value species are individual species of aquatic plants known to offer important values in specific aquatic ecosystems, including Potamogeton amplifolius, Potamogeton Richardsonii, Potamogeton praelongus, Stuckenia pectinata (Potamogeton pectinatus), Potamogeton illinoensis, Potamogeton robbinsii, Eleocharis spp., Scirpus spp., Valisneria spp., Zizania spp., Zannichellia palustris and Brasenia schreberi.

(h) If wild rice is involved, the stipulations incorporated by *Lac Courte Oreilles v. Wisconsin*, 775 F. Supp. 321 (W.D. Wis. 1991) shall be complied with.

(i) The proposed introduction or control will interfere with the rights of riparian owners.

(j) The proposed management is inconsistent with a department approved aquatic plant management plan for the body of water.

(4) The department may approve the application in whole or in part consistent with the provisions of sub. (3). A denial shall be in writing stating the reasons for the denial.

(5) (a) The department may issue an aquatic plant management permit on less than one acre in a single riparian area for a 3−year term.

(b) The department may issue an aquatic plant management permit for a one−year term for more than one acre or more than one riparian area. The permit may be renewed annually for up to a total of 3 years in succession at the written request of the permit holder, provided no modifications or changes are made from the original permit.

(c) The department may issue an aquatic plant management permit containing a department−approved plan for a 3 to 5 year term.

(d) The department may issue an aquatic plant management permit to a licensed nursery grower for a 3−year term for the harvesting of aquatic plants from a publicly owned lake bed or for a 5−year term for harvesting of aquatic plants from privately owned beds with the permission of the property owner.

(6) The approval of an aquatic plant management permit does not represent an endorsement of the permitted activity, but represents that the applicant has complied with all criteria of this chapter.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03; reprinted to restore dropped language from rule order, Register October 2003 No. 574.

NR 109.06 Waivers. The department waives the permit requirements under this chapter for any of the following:

(1) Manual removal or use of mechanical devices to control or remove aquatic plants from a body of water 10 acres or less that is entirely confined on the property of one person with the permission of that property owner.

Note: A person who introduces native aquatic plants or removes aquatic plants by manual or mechanical means in the course of operating an aquatic nursery as authorized under s. 94.10, Stats., on privately owned non−navigable waters of the state is not required to obtain a permit for the activities.

(2) A riparian owner who manually removes aquatic plants from a body of water or uses mechanical devices designed for cutting or mowing vegetation to control plants on an exposed lake bed that abuts the owner's property provided that the removal meets all of the following:

(a) 1. Removal of native plants is limited to a single area with a maximum width of no more than 30 feet measured along the shoreline provided that any piers, boatlifts, swimrafts and other recreational and water use devices are located within that 30−foot wide zone and may not be in a new area or additional to an area where plants are controlled by another method; or

2. Removal of nonnative or invasive aquatic plants as designated under s. NR 109.07 when performed in a manner that does not harm the native aquatic plant community; or

3. Removal of dislodged aquatic plants that drift on−shore and accumulate along the waterfront.

(b) Is not located in a sensitive area as defined by the department under s. NR 107.05 (3) (i) 1., or in an area known to contain threatened or endangered resources or floating bogs.

(c) Does not interfere with the rights of other riparian owners.

(d) If wild rice is involved, the procedures of s. NR 19.09 (1) shall be followed.

(4) Control of purple loosestrife by manual removal or use of mechanical devices when performed in a manner that does not harm the native aquatic plant community or result in or encourage re−growth of purple loosestrife or other nonnative vegetation.

(5) Any aquatic plant management activity that is conducted by the department and is consistent with the purposes of this chapter.

(6) Manual removal and collection of native aquatic plants for lake study or scientific research when performed in a manner that does not harm the native aquatic plant community.

Note: Scientific collectors permit requirements are still applicable.

(7) Incidental cutting, removal or destroying of aquatic plants when engaged in beneficial water use activities.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.07 Invasive and nonnative aquatic plants. (1) The department may designate any aquatic plant as an invasive aquatic plant for a water body or a group of water bodies if it has the ability to cause significant adverse change to desirable aquatic habitat, to significantly displace desirable aquatic vegetation, or to reduce the yield of products produced by aquaculture.

(2) The following aquatic plants are designated as invasive aquatic plants statewide: Eurasian water milfoil, curly leaf pondweed and purple loosestrife.

(3) Native and nonnative aquatic plants of Wisconsin shall be determined by using scientifically valid publications and findings by the department.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.08 Prohibitions. (1) No person may distribute an invasive aquatic plant, under s. NR 109.07.

(2) No person may intentionally introduce Eurasian water milfoil, curly leaf pondweed or purple loosestrife into waters of this state without the permission of the department.

(3) No person may intentionally cut aquatic plants in public/navigable waters without removing cut vegetation from the body of water.

(4) (a) No person may place equipment used in aquatic plant management in a navigable water if the person has reason to believe that the equipment has any aquatic plants or zebra mussels attached.

(b) This subsection does not apply to equipment used in aquatic plant management when re−launched on the same body of water without having visited different waters, provided the re−launching will not introduce or encourage the spread of existing aquatic species within that body of water.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.09 Plan specifications and approval. (1) Applicants required to submit an aquatic plant management plan, under s. NR 109.04 (3), shall develop and submit the plan in a format specified by the department.

(2) The plan shall present and discuss each of the following items:

(a) The goals and objectives of the aquatic plant management and protection activities.

(b) A physical, chemical and biological description of the waterbody.

(c) The intensity of water use.

(d) The location of aquatic plant management activities.

(e) An evaluation of chemical, mechanical, biological and physical aquatic plant control methods.

(f) Recommendations for an integrated aquatic plant management strategy utilizing some or all of the methods evaluated in par. (e).

(g) An education and information strategy.

(h) A strategy for evaluating the efficacy and environmental impacts of the aquatic plant management activities.

(i) The involvement of local units of government and any lake organizations in the development of the plan.

(3) The approval of an aquatic plant management plan does not represent an endorsement for plant management, but represents that adequate considerations in planning the actions have been made.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.10 Other permits. Permits issued under s. 30.12, 30.20, 31.02 or 281.36, Stats., or under ch. NR 107 may contain provisions which provide for aquatic plant management. If a permit issued under one of these authorities contains the appropriate conditions as required under this chapter for aquatic plant management, a separate permit is not required under this chapter. The permit shall explicitly state that it is intended to comply with the substantive requirements of this chapter.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.

NR 109.11 Enforcement. (1) Violations of this chapter may be prosecuted by the department under chs. 23, 30 and 31, Stats.

(2) Failure to comply with the conditions of a permit issued under or in accordance with this chapter may result in cancellation of the permit and loss of permit privileges for the subsequent year. Notice of cancellation or loss of permit privileges shall be provided by the department to the permit holder.

History: CR 02−061: cr. Register May 2003 No. 569, eff. 6−1−03.