A

APPENDIX A

Public Participation Materials

Presentation Outline

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

Onterra LLC
Lake Management Planning

Onterra, LLC

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

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Lake Management Planning

Why create a lake management plan?

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

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Elements of an Effective Lake Management Planning Project

Data and Information Gathering

Environmental & Sociological

Planning Process

Brings it all together

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Data and information gathering

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

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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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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Curly-leaf pondweed survey
  - Point-intercept survey

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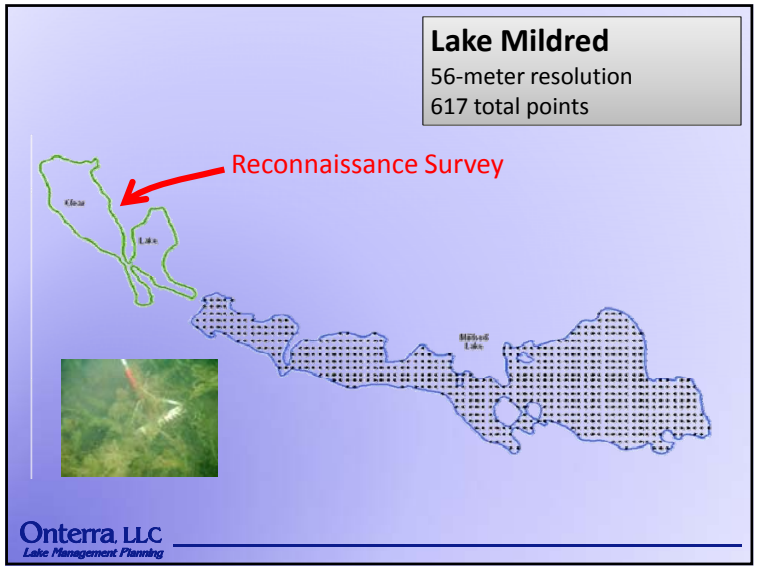
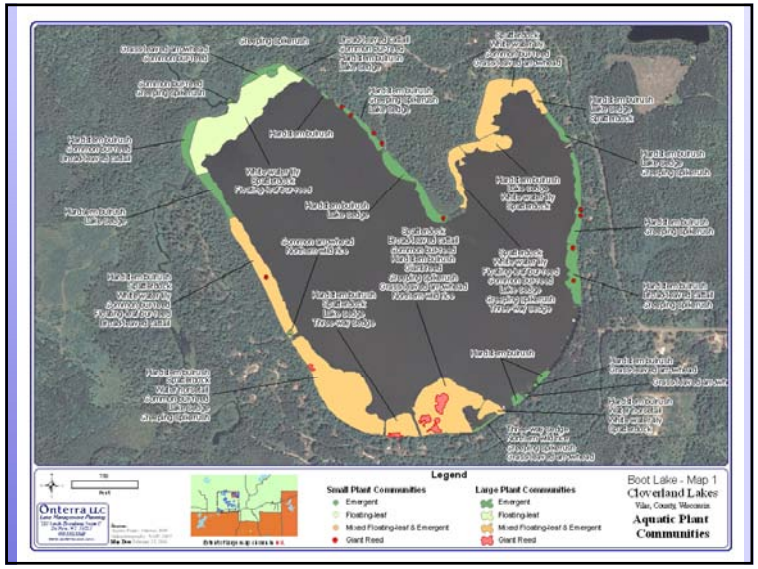
Lake Management Planning



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

Onterra LLC
Lake Management Planning



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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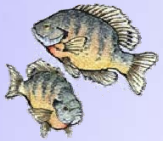
Fisheries Data Integration

- 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**

Range

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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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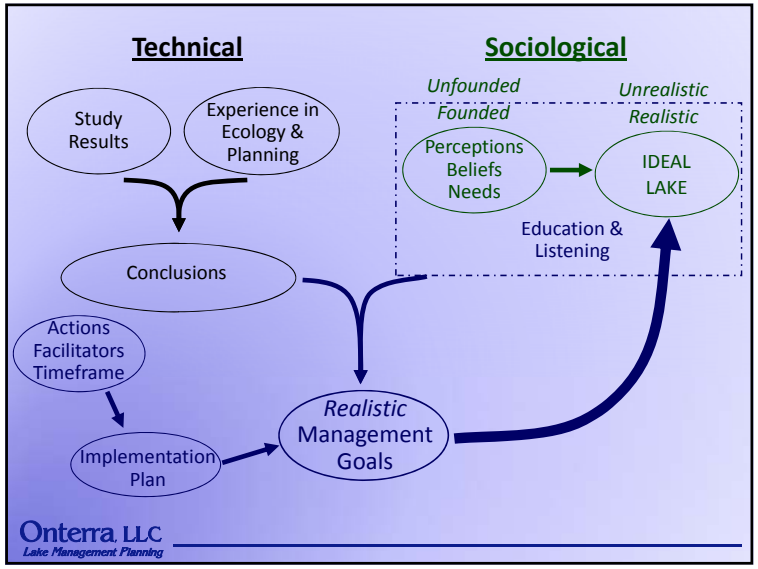
Lake Management Planning

The Planning Process

…it's not as easy as you may think.



Lake Mildred Property Owners Association

Lake Mildred
Management Planning Project
Planning Meeting
April 20, 2012

Dan Cibulka &
Tim Hoyman
Onterra LLC
Lake Management Planning

Presentation Outline

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

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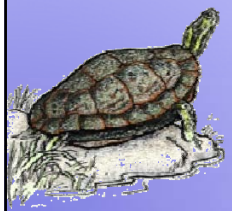
Study and Plan Goals

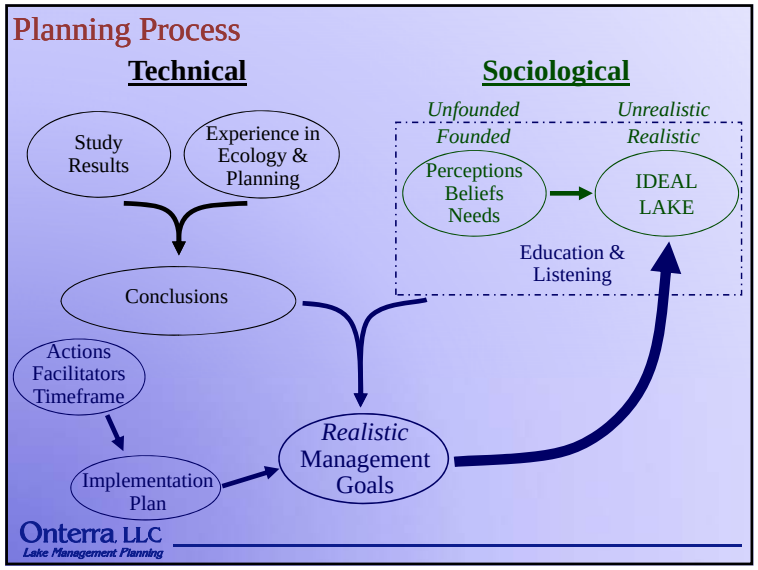
- Collect & Analyze Data
- Construct Long-Term & Useable Plan

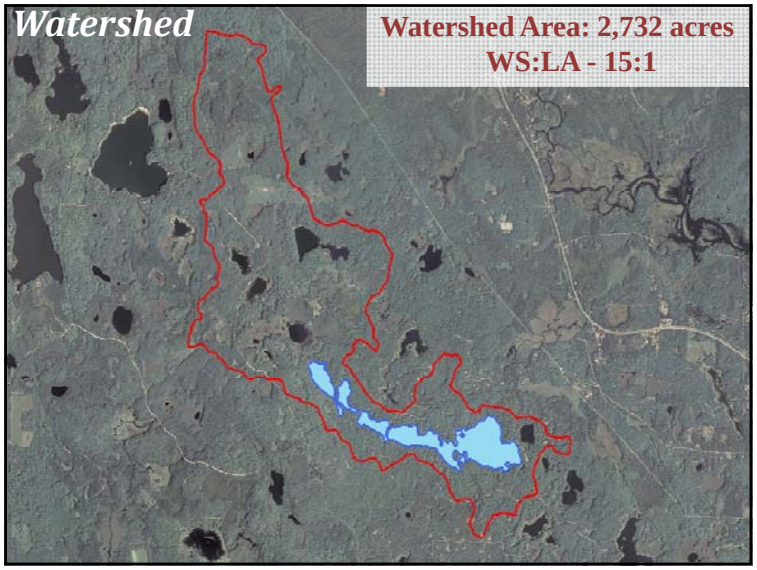


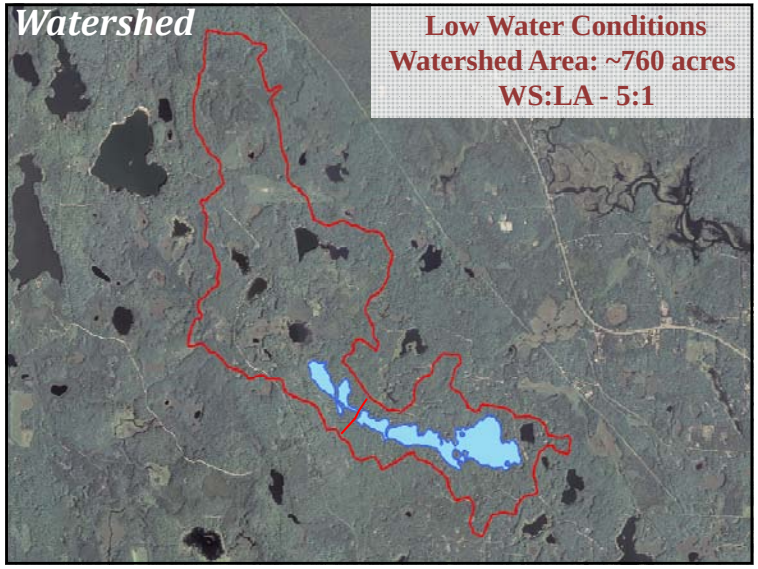
Onterra LLC
Lake Management Planning

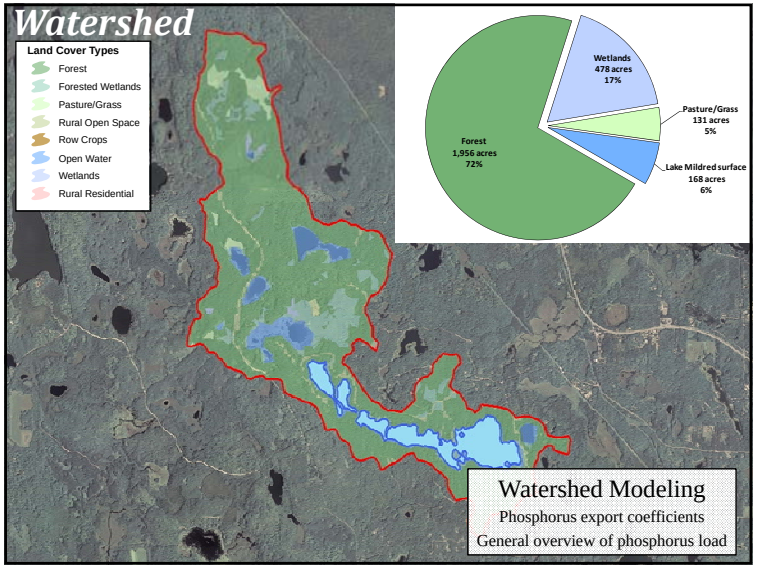
The Planning Process

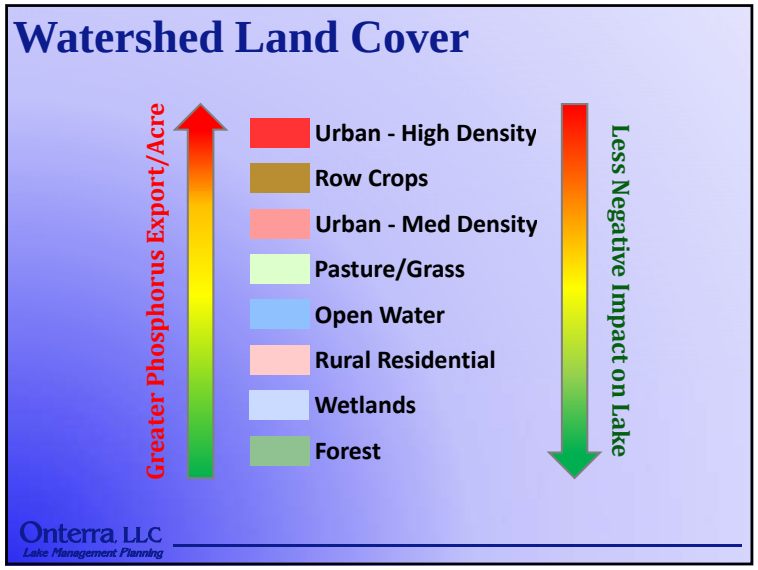
…it's not as easy as you may think.


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 Area: 2,732 acres
WS:LA - 15:1


Watershed
Low Water Conditions
Watershed Area: ~760 acres
WS:LA - 5:1


Watershed
Land Cover Types
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Row Crops
Open Water
Wetlands
Rural Residential
Wetlands
478 acres
17%
Pasture/Grass
131 acres
5%
Forest
1,956 acres
72%
Lake Mildred surface
168 acres
6%
Watershed Modeling
Phosphorus export coefficients
General overview of phosphorus load


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
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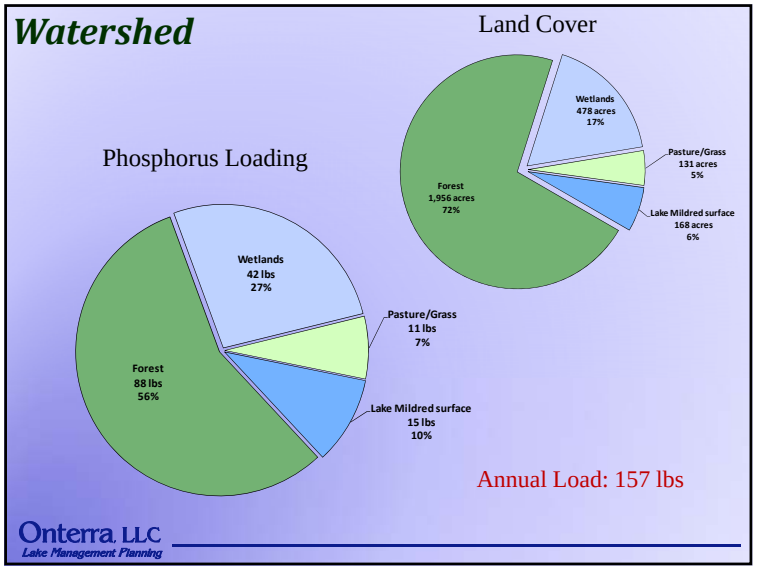
Lake Management Planning


Watershed
Land Cover
Wetlands
478 acres
17%
Pasture/Grass
131 acres
5%
Lake Mildred surface
168 acres
6%
Forest
1,956 acres
72%
Phosphorus Loading
Wetlands
42 lbs
27%
Pasture/Grass
11 lbs
7%
Lake Mildred surface
15 lbs
10%
Forest
88 lbs
56%
Annual Load: 157 lbs
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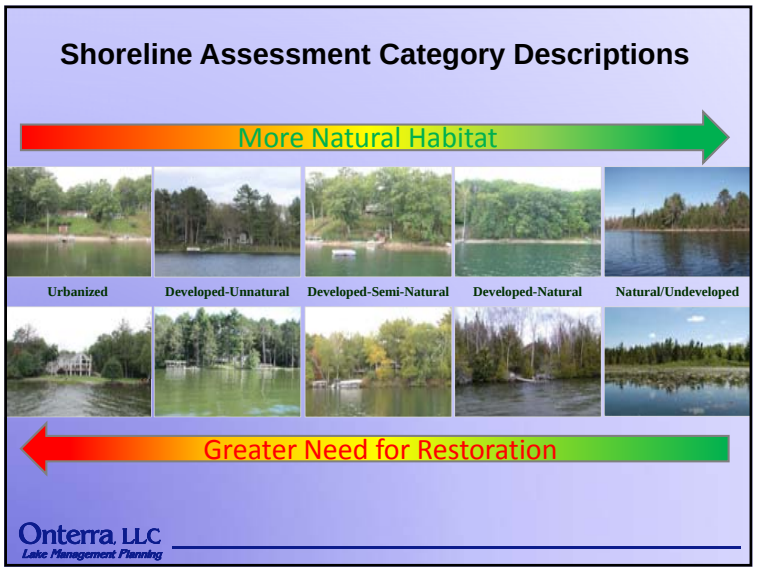
Lake Management Planning


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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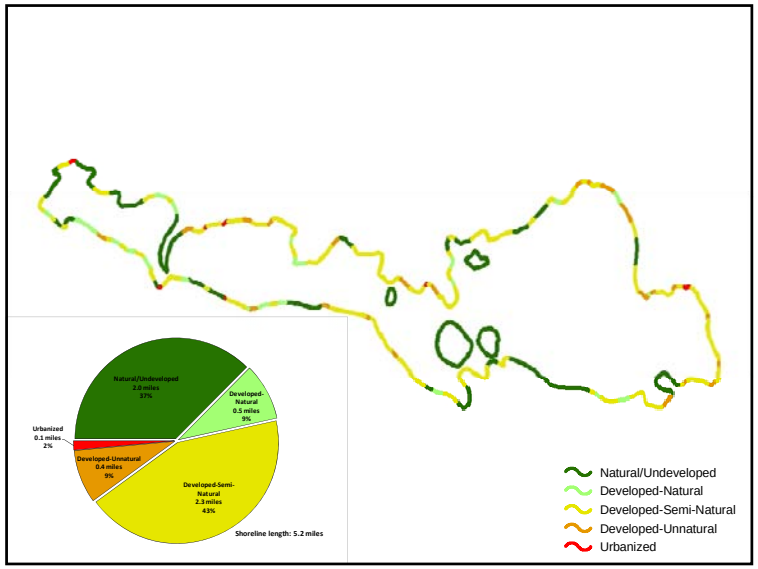
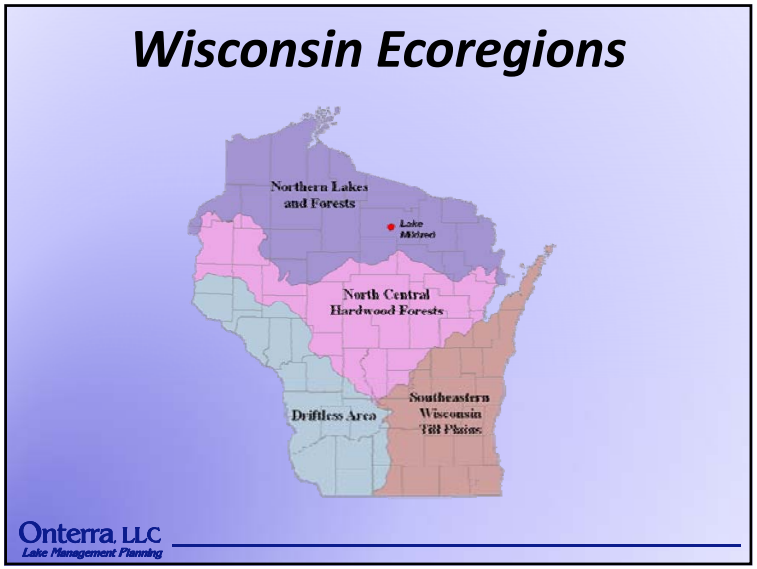
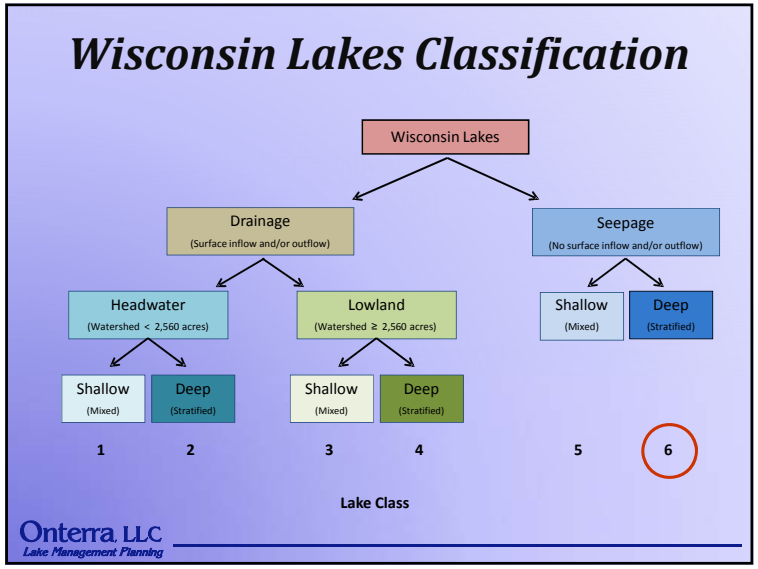
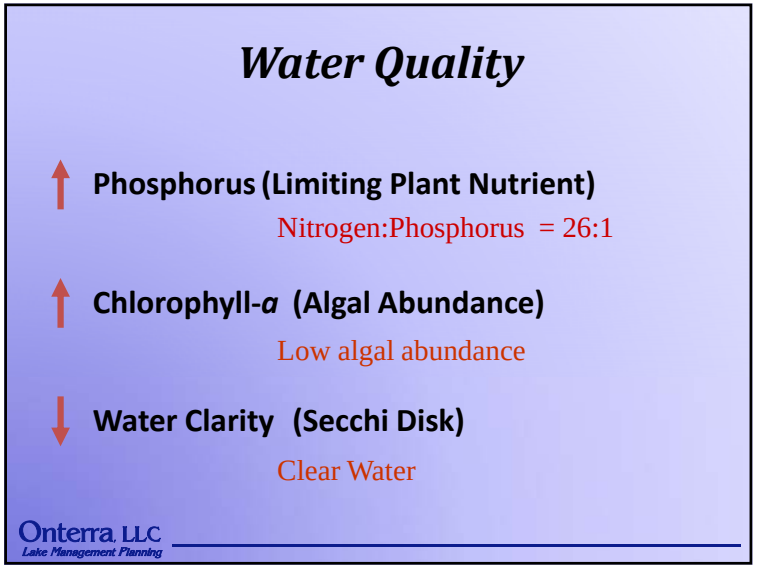

Natural/Undeveloped
2.0 miles
37%
Developed-Natural
0.5 miles
9%
Developed-Semi-Natural
2.3 miles
43%
Developed-Unnatural
0.4 miles
9%
Urbanized
0.1 miles
2%
Shoreline length: 5.2 miles
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized


Wisconsin Ecoregions
Northern Lakes and Forests
Lake Mildred
North Central Hardwood Forests
Driftless Area
Southeastern Wisconsin Till Plains
Onterra, LLC
Lake Management Planning


Wisconsin Lakes Classification
Wisconsin Lakes
Drainage
(Surface inflow and/or outflow)
Seepage
(No surface inflow and/or outflow)
Headwater
(Watershed < 2,560 acres)
Lowland
(Watershed ≥ 2,560 acres)
Shallow
(Mixed)
Deep
(Stratified)
Shallow
(Mixed)
Deep
(Stratified)
Shallow
(Mixed)
Deep
(Stratified)
1
2
3
4
5
6
Lake Class
Onterra, LLC
Lake Management Planning


Water Quality
Phosphorus (Limiting Plant Nutrient)
Nitrogen:Phosphorus = 26:1
Chlorophyll-a (Algal Abundance)
Low algal abundance
Water Clarity (Secchi Disk)
Clear Water
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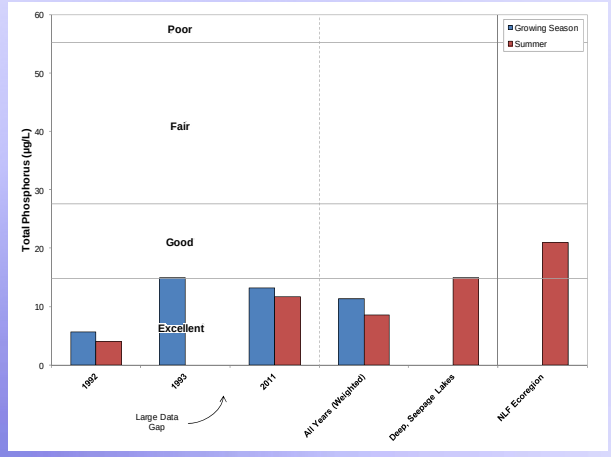
Average Annual TP Concentrations



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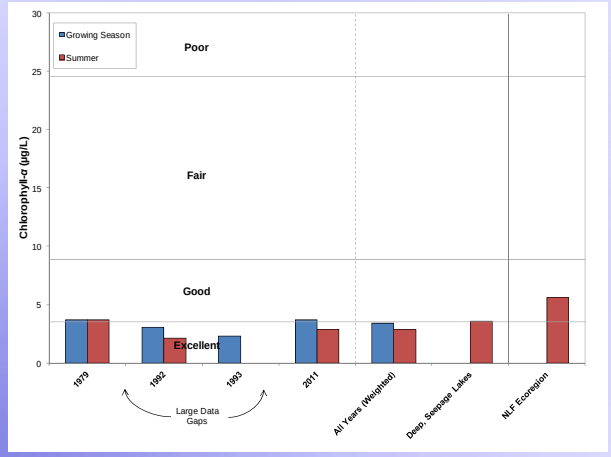
Lake Management Planning

Average Annual Chl-*a* Concentrations



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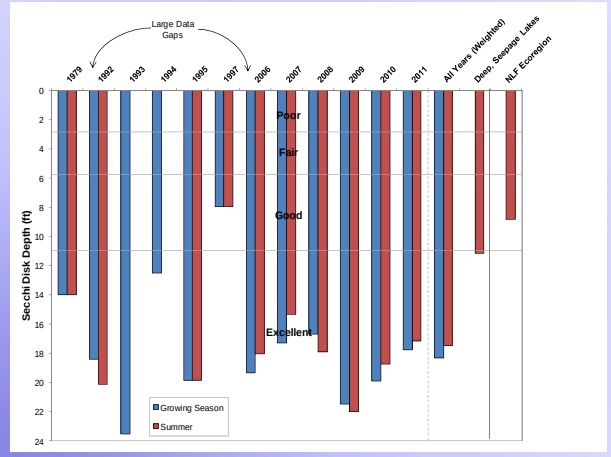
Average Annual Secchi Disk Clarity



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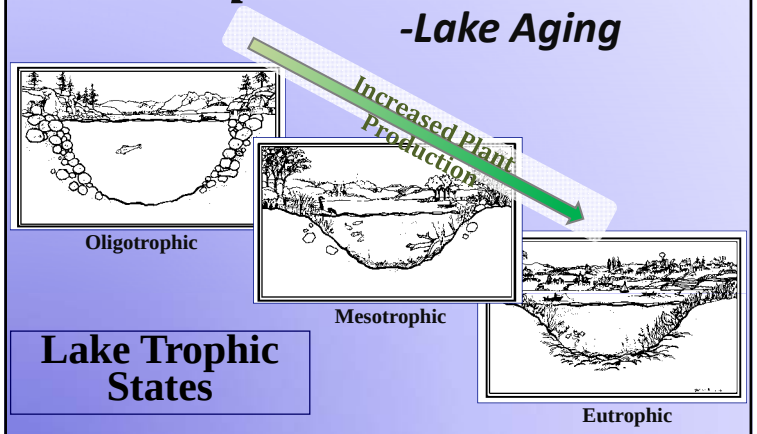
Eutrophication -Lake Aging



Lake Trophic States

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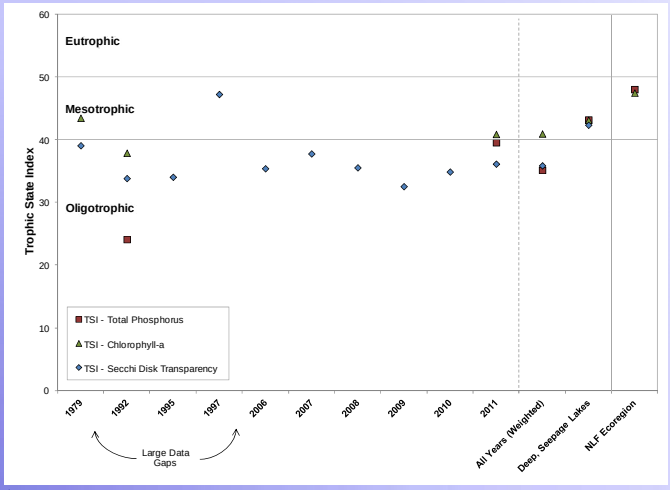
Lake Management Planning



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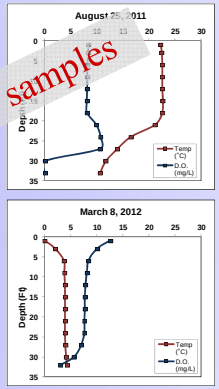
Other Water Quality Results

- Lake thermally stratifies during summer months
- No indication of low winter dissolved oxygen
- Alkalinity = 6.2 mg/L as $CaCO_3$ – indicates some sensitivity to acid rain
- Low calcium concentration (1.7 mg/L)
  - Not suitable for zebra mussel establishment

No veligers observed in 2011 samples



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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
    - Systematic Sampling Method
    - Can compare lakes within same ecoregion
  - Plant community mapping
    - Accurately map floating-leaf & emergent communities
    - May compare to future surveys

NONE FOUND

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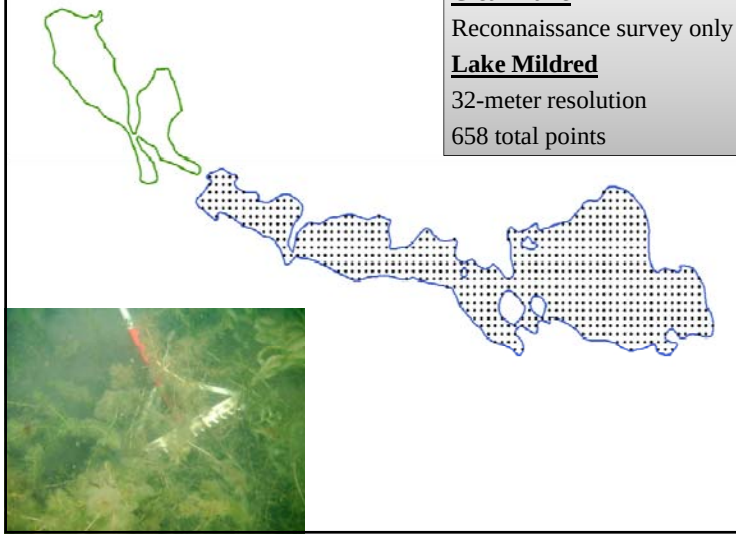


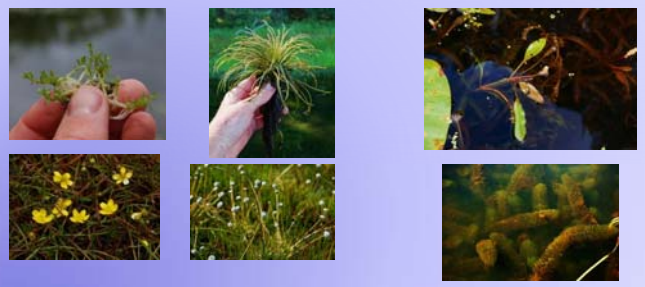
Clear Lake
Reconnaissance survey only
Lake Mildred
32-meter resolution
658 total points

Lake Mildred
Maximum depth of plants = 19 feet
36% of littoral zone points contain plants

Submergent Plant Growth Forms

Isoetid
Turf Species

Elodeid
Leafy Plants



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Bladderworts
Carnivorous Plants

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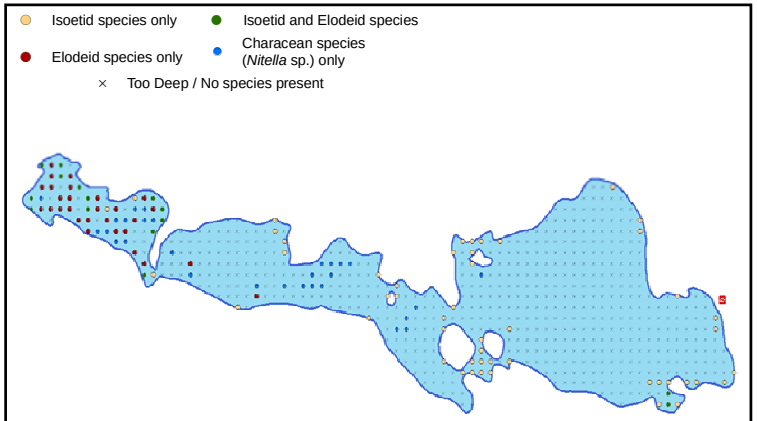
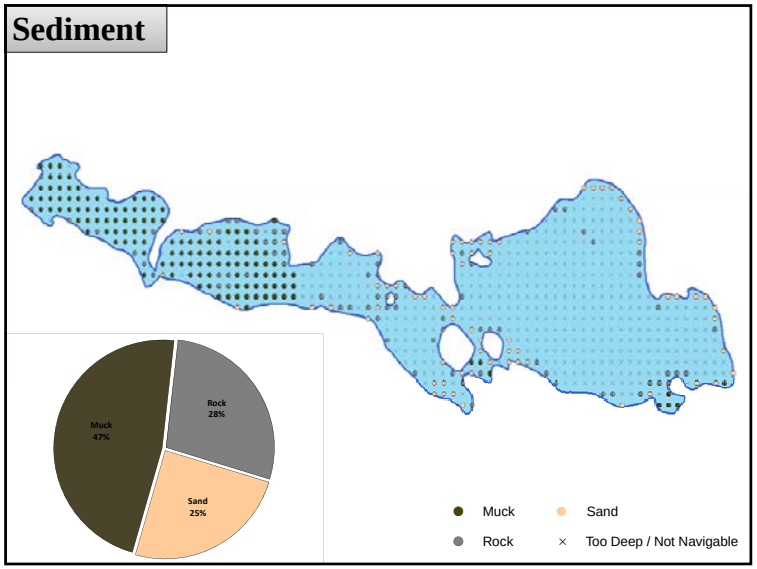


Sediment



Species List

- **33 Native Species**
  - 27 from the PI survey
- **Two special concern species found:**
  - Snail-seed pondweed (Potamogeton bicupulatus)
  - Northeastern bladderwort (Utricularia resupinata)
- **No non-native species found in Lake Mildred or Clear Lake.**

Life Form	Scientific Name	Common Name	Coefficient of Conservatism (c)	2011 (Onterra)
Emergent	Carex scoparia	Broom sedge	4	I
	Dulichium arundinaceum	Three-way sedge	9	X
	Eleocharis obtusa	Blunt spike-rush	3	I
	Juncus brevicaudatus	Narrow-panicle rush	6	I
	Juncus effusus	Soft rush	4	X
	Sagittaria sp.	Arrowhead sp.	N/A	I
	Scirpus pedicellatus	Stalked wool-grass	6	I
	Schoenoplectus subterminalis	Water bulrush	9	X
FL	Brasenia schreberi	Watershield	7	X
	Nuphar variegata	Spatterdock	6	I
	Nymphaea odorata	White water lily	6	X
FL/E	Sparganium angustifolium	Narrow-leaf bur-reed	9	X
	Sparganium natans	Little bur-reed	9	X
Submergent	Elatine minima	Waterwort	9	X
	Eriocaulon aquaticum	Pipewort	9	X
	Gratiola aurea	Golden pert	10	X
	Isoetes sp.	Quillwort species	N/A	X
	Lobelia dortmanna	Water lobelia	10	X
	Myriophyllum farwellii	Farwell's water milfoil	9	X
	Myriophyllum tenellum	Dwarf water milfoil	10	X
	Najas gracillima	Northern naiad	7	X
	Nitella sp.	Stoneworts	7	X
	Potamogeton praelongus	White-stem pondweed	8	X
	Potamogeton pusillus	Small pondweed	7	X
	Potamogeton bicupulatus	Snail-seed pondweed	9	X
	Potamogeton ephydrus	Ribbon-leaf pondweed	8	X
	Utricularia geminiscapa	Twin-stemmed bladderwort	9	X
	Utricularia intermedia	Flat-leaf bladderwort	9	X
	Utricularia resupinata	Northeastern bladderwort	9	X
	Utricularia vulgaris	Common bladderwort	7	X
	Utricularia gibba	Creeping bladderwort	9	X
S/E	Eleocharis acicularis	Needle spikerush	5	X
	Juncus pelocarpus	Brown-fruited rush	8	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

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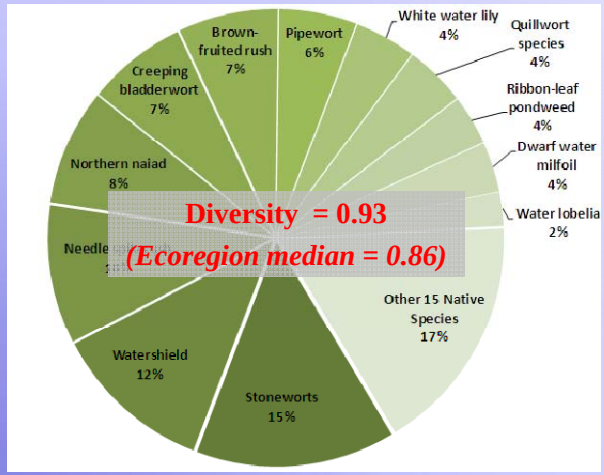
Lake Management Planning

Relative Frequency of Occurrence



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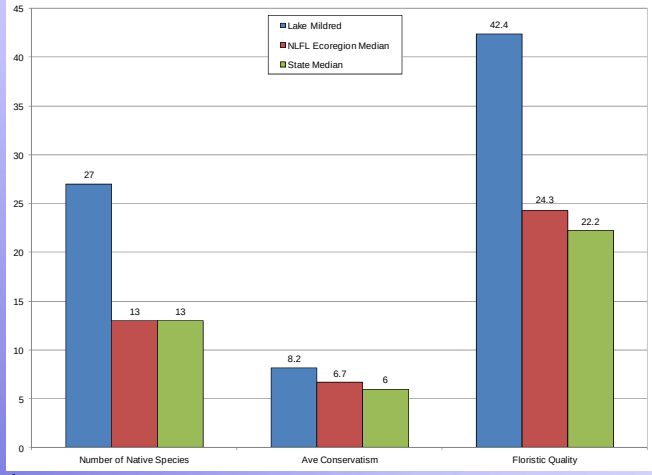
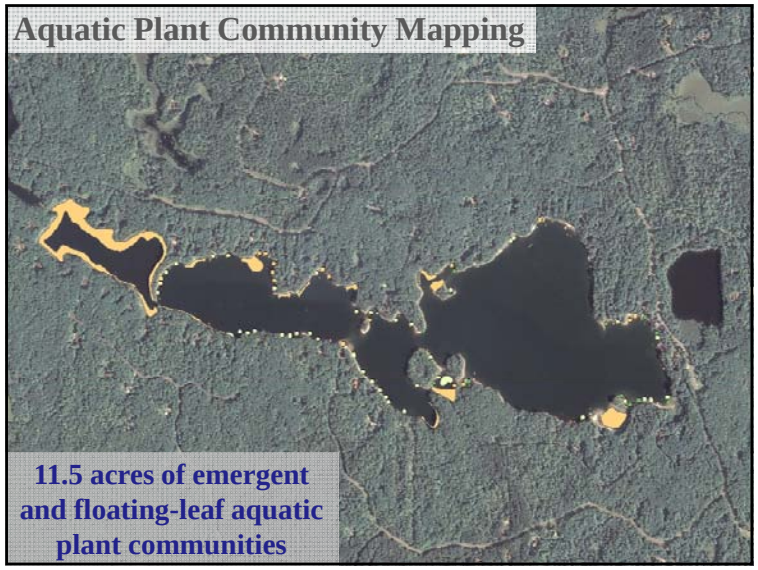
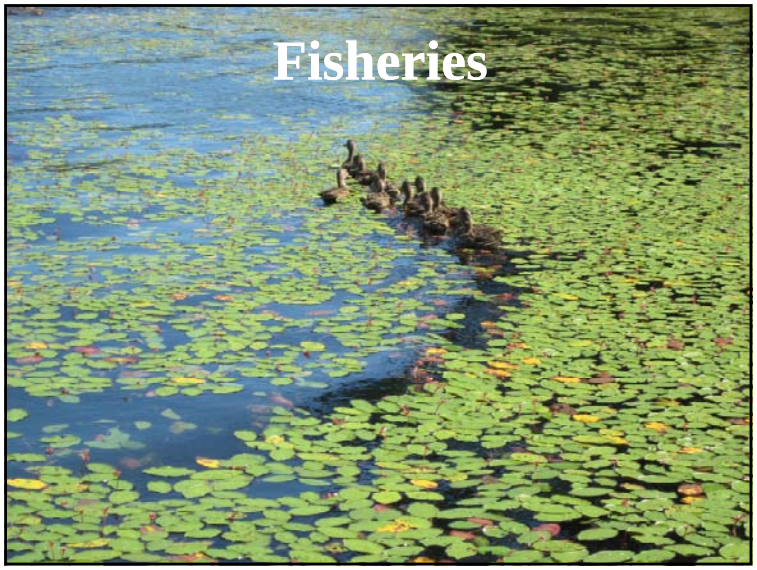
Lake Management Planning

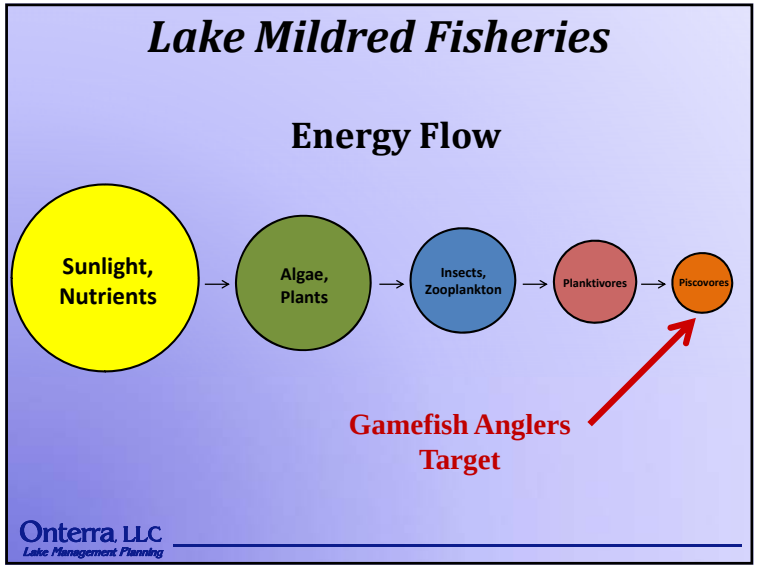
Floristic Quality Analysis

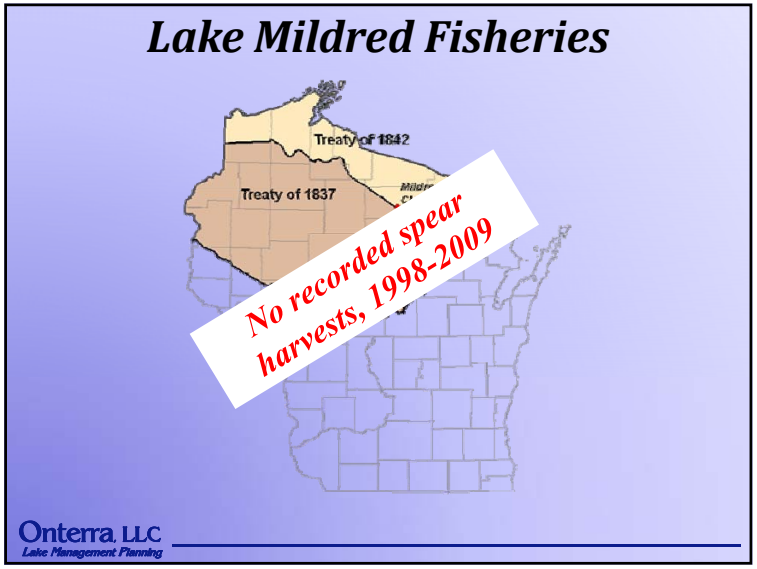


Onterra LLC
Lake Management Planning


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


Fisheries


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


Lake Mildred Fisheries
Treaty of 1842
Treaty of 1837
No recorded spear harvests, 1998-2009
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Lake Management Planning

Lake Mildred Fisheries

- Currently managed as a bass & panfish lake
  - WDNR report: good numbers of bass, poor size
  - Likely due to angler harvest and slow growth
- Muskellunge, pike and walleye in low numbers
  - Low primary productivity in lake
  - Lack of suitable spawning areas

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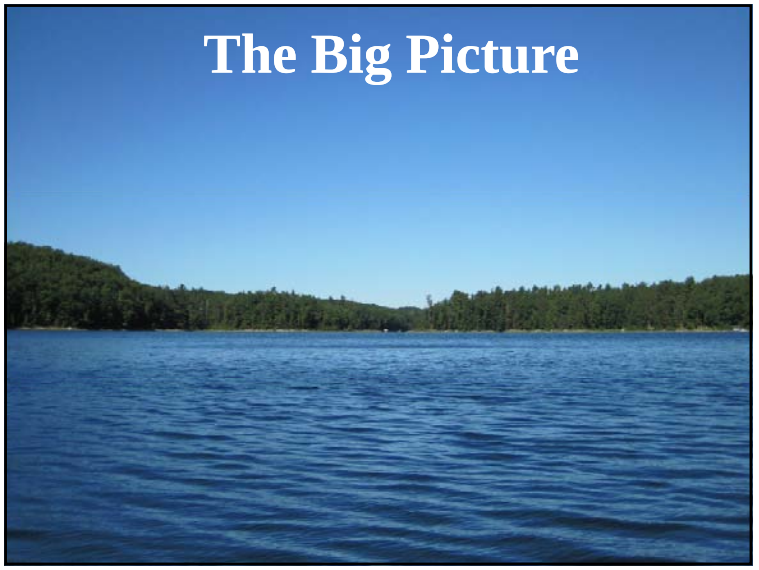
The Big Picture



Conclusions

- Water quality is excellent
- Overall watershed is largely in healthy condition
  - Actual watershed is likely much smaller than topographic watershed
  - Small watershed, with several seepage lakes reduces water input to Lake Mildred
  - Minimal phosphorus input
- Aquatic plant community
  - Based on standard analysis, native community is of high quality
  - Lake has diverse plant community, but it is of low biomass

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Thank You

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Study and Plan Goals

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

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Timeline of Activities

- August 2010 – Grant application submitted to WDNR
- October 2010 – Notice received; $22,000 project awarded to LMPOA with 75% match from State of Wisconsin
- Spring/Summer/Fall 2011 – Ecological studies conducted
- June 2011 – Project Kick-Off Meeting held
- October 2011 – Stakeholder Survey circulated
- April 2012 – Planning Meeting held
- October 2012 – Implementation Plan sent to committee, revisions follow
- December 2012 – Draft Management Plan sent to WDNR for review
- August 2013 – WDNR finalizes review of Management Plan

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Overall Project Results

- **Watershed (drainage basin)**
  - Fairly small – creates a seepage lake with fluctuating water levels
  - Consists of forests/wetlands; phosphorus load expected to be minimal
- **Water Quality (nutrients, algae and clarity)**
  - Water quality is good to excellent
  - Minimal historic data exists
- **Shoreland Condition (pollution buffering, habitat)**
  - Much developed shoreland exists
- **Aquatic plant community (native and non-native)**
  - Native plant community is of high diversity and quality
  - No aquatic invasive species found
- **Fishery (fish and fish habitat)**
  - Concerns over fish habitat availability

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Water Quality

- **Phosphorus (Limiting Plant Nutrient)**
  Levels expected for a seepage lake
- **Chlorophyll-*a* (Algal Abundance)**
  Low/moderate abundance
- **Water Clarity (Secchi Disk)**
  High clarity

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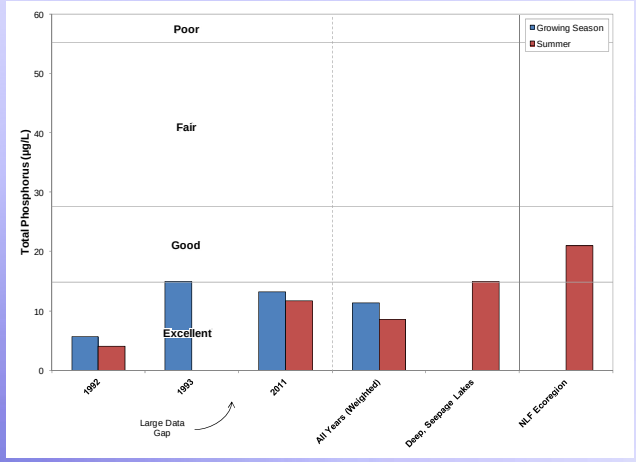
Average Annual Total Phosphorus



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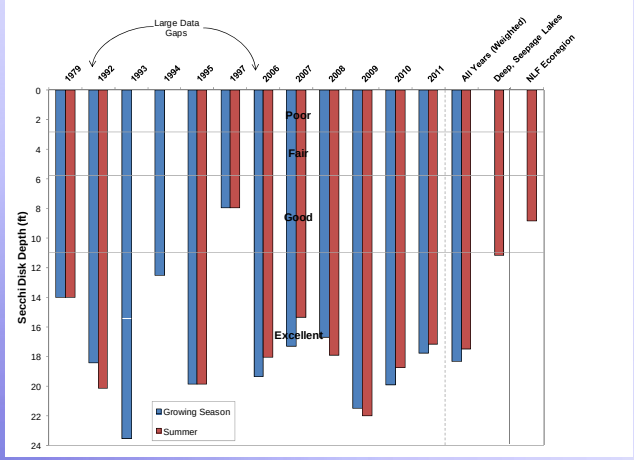
Average Annual Secchi Clarity



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Management Goal:
Maintain Current Water Quality Conditions

Management Actions

1. **Monitor water quality through the WDNR Citizen Lake Monitoring Network.**
   Expand to annual water chemistry monitoring

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Overall Project Results

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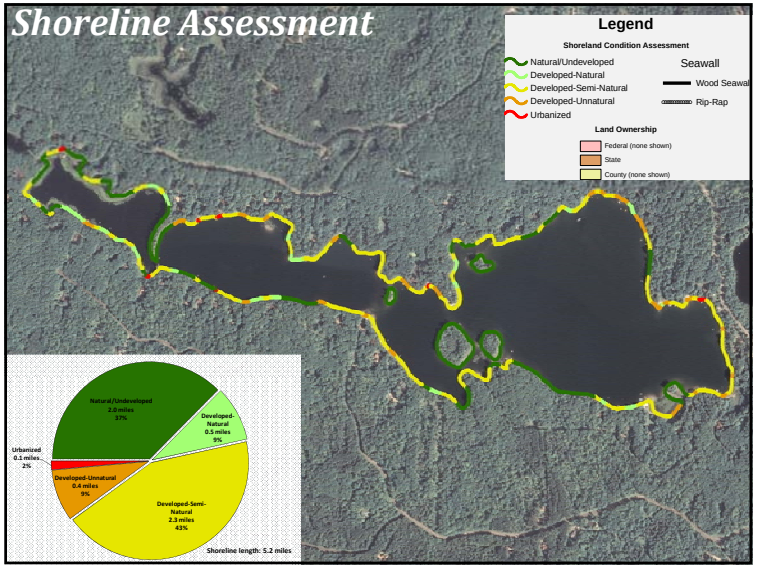
Shoreline Assessment



Management Goal:
Increase LMPOA Capacity to Communicate with Lake Stakeholders

Management Actions

1. **Support an Education Committee to promote safe boating, water quality, public safety and quality of life on Lake Mildred.**
   Form Education Committee
2. **Raise riparian owners' awareness on lake shoreline condition.**
   Educate stakeholders on protecting natural shoreline, enhancing developed shoreline, protecting newly exposed shoreline

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Overall Project Results

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  - Concerns over fish habitat availability

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AIS Prevention

- 105,854 watercraft inspected in 2011
- 227,993 boaters contacted
- 92% of boaters aware of AIS law
- 96% of boaters inspect and remove plants
- 89% of boaters dispose of bait

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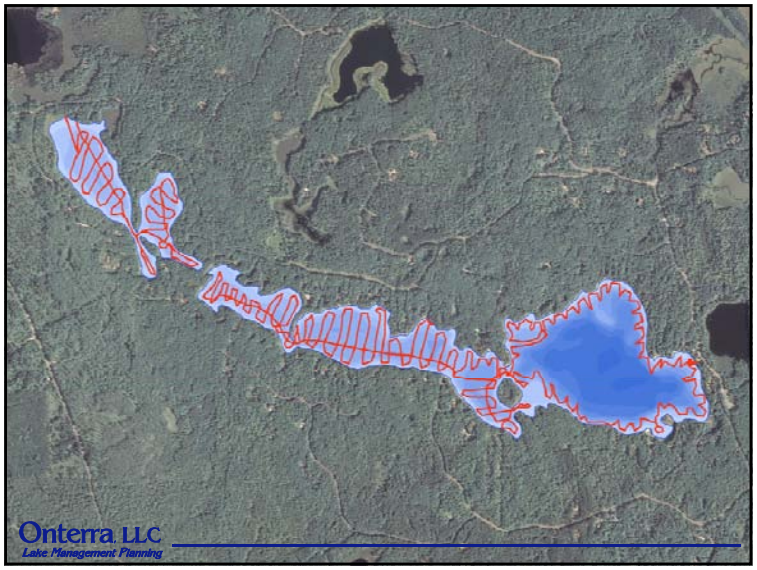

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Management Goal:
Prevent AIS Introductions to Lake Mildred and Clear Lake

Management Actions

1. **Continue Clean Boats Clean Waters watercraft inspections at Lake Mildred public access.**
   Continue current effort
2. **Coordinate annual volunteer monitoring for AIS.**
   Lake Sweeps conducted with assistance from Oneida County AIS Coordinator

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Overall Project Results

- **Watershed (drainage basin)**
  - Fairly small – creates a seepage lake with fluctuating water levels
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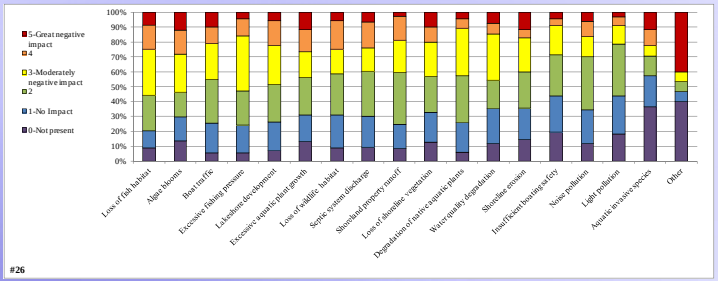
Fish Habitat

Stakeholder survey: To what level do you believe these factors may be negatively impacting Lake Mildred/Clear Lake?



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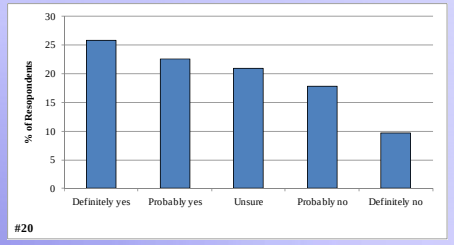
Fish Habitat

Stakeholder survey: Do you believe that habitat improvements for fish need to be made on Lake Mildred/Clear Lake?



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Management Goal:
Maximize Fishery Resources and Fishing on Lake Mildred

Management Actions

1. **Work with fisheries managers to enhance the fishery.**
   Understand fishery (positive attributes and limitations)
   Work with WDNR fisheries biologist to enhance fisheries habitat.

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B

APPENDIX B

Stakeholder Survey Response Charts and Comments

Returned Surveys	79
Sent Surveys	138
Response Rate (%)	57.2

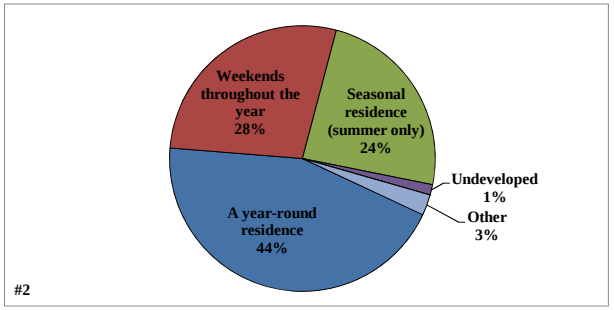
LAKE MILDRED OR CLEAR LAKE PROPERTY

#1 On which lake is your property located?

	Total	%
Lake Mildred	59	*74.7*
Clear Lake	20	*25.3*
	79	*100.0*

#2 What type of property do you own on Lake Mildred or Clear Lake?

	Total	%
A year-round residence	35	*44.3*
Weekends throughout the year	22	*27.8*
Seasonal residence (summer only)	19	*24.1*
Undeveloped	1	*1.3*
Resort property	0	*0.0*
Rental property	0	*0.0*
Other	2	*2.5*
	79	*100.0*

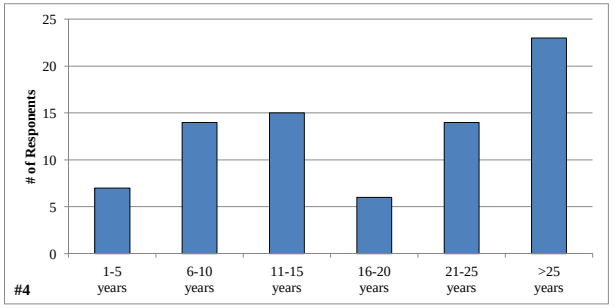


#3 How many days each year is your property used by you or others?

Answered Question	75
Average	161.7
Standard deviation	140.9

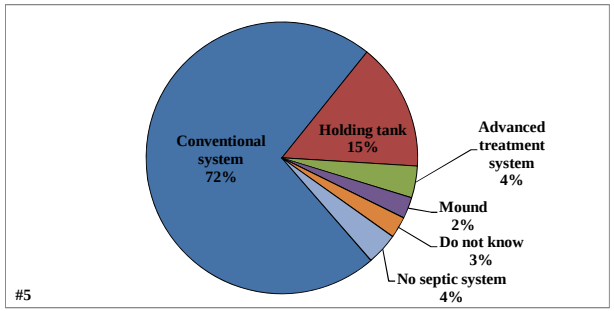
#4 How long have you owned your property on Lake Mildred or Clear Lake?

	Total	%
1-5 years	7	*8.9*
6-10 years	14	*17.7*
11-15 years	15	*19.0*
16-20 years	6	*7.6*
21-25 years	14	*17.7*
>25 years	23	*29.1*
	79	*100.0*



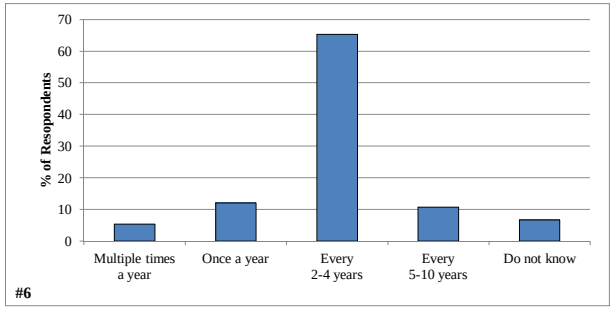
#5 What type of septic system does your property utilize?

	Total	%
Conventional system	57	*72.2*
Holding tank	12	*15.2*
Advanced treatment system	3	*3.8*
Mound	2	*2.5*
Municipal sewer	0	*0.0*
Do not know	2	*2.5*
No septic system	3	*3.8*
	79	*100.0*



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

	Total	%
Multiple times a year	4	*5.3*
Once a year	9	*12.0*
Every 2-4 years	49	*65.3*
Every 5-10 years	8	*10.7*
Do not know	5	*6.7*
	75	*100.0*



#7 Are you on the Oneida County Septic Maintenance Program?

	Total	%
Yes	49	*64.5*
No	10	*13.2*
Do not know	17	*22.4*
	76	*100.0*

RECREATIONAL USE ON LAKE MILDRED AND CLEAR LAKE

#8 How many years ago did you first visit Lake Mildred or Clear Lake?

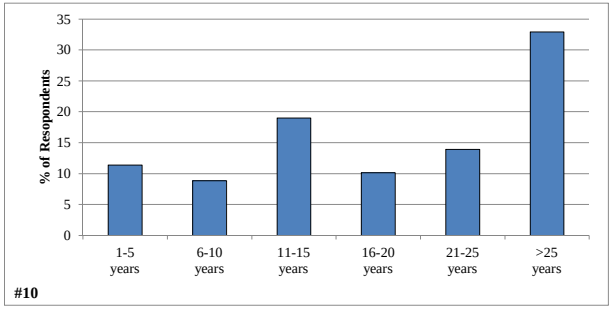
Answered Question	77
Average	25.7
Standard deviation	15.2

#9 Have you or others in your household personally fished on Lake Mildred or Clear Lake?

	Total	%
Yes, both I and others in my household have fished the lake	63	*81.8*
Only I have fished the lake	4	*5.2*
I have not fished the lake, but others in my household have	8	*10.4*
No one in my household has fished the lake	2	*2.6*
	77	*100.0*

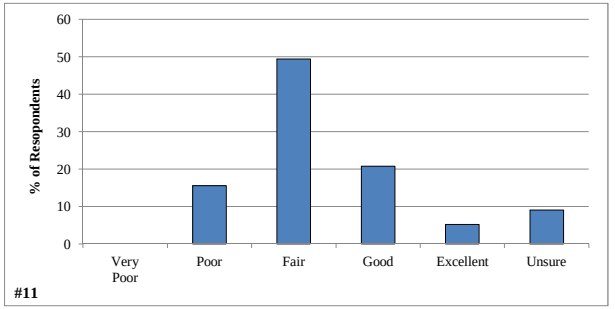
#10 For how many years have you or others in your household fished Lake Mildred or Clear Lake?

	Total	%
1-5 years	9	*11.4*
6-10 years	7	*8.9*
11-15 years	15	*19.0*
16-20 years	8	*10.1*
21-25 years	11	*13.9*
>25 years	26	*32.9*
	76	*96.2*



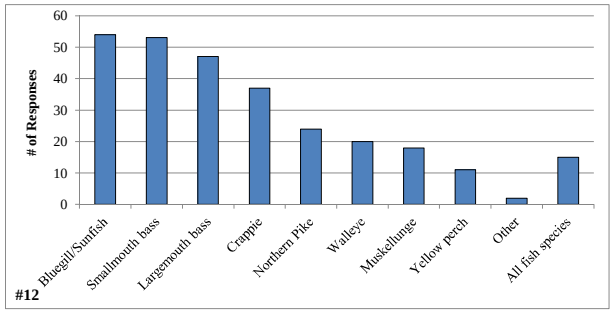
#11 How would you describe the current quality of fishing on Lake Mildred or Clear Lake?

	Total	%
Very Poor	0	*0.0*
Poor	12	*15.6*
Fair	38	*49.4*
Good	16	*20.8*
Excellent	4	*5.2*
Unsure	7	*9.1*
	77	*100.0*



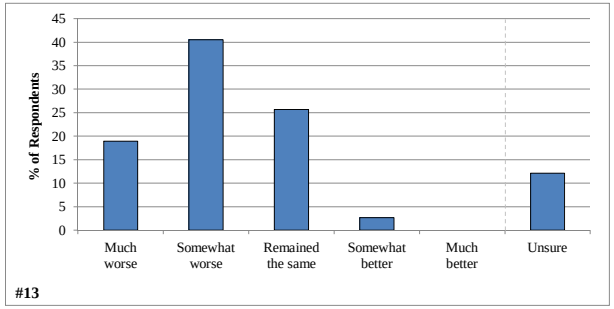
#12 What species of fish do you like to catch on Lake Mildred or Clear Lake?

	Total
Bluegill/Sunfish	54
Smallmouth bass	53
Largemouth bass	47
Crappie	37
Northern Pike	24
Walleye	20
Muskellunge	18
Yellow perch	11
Other	2
All fish species	15



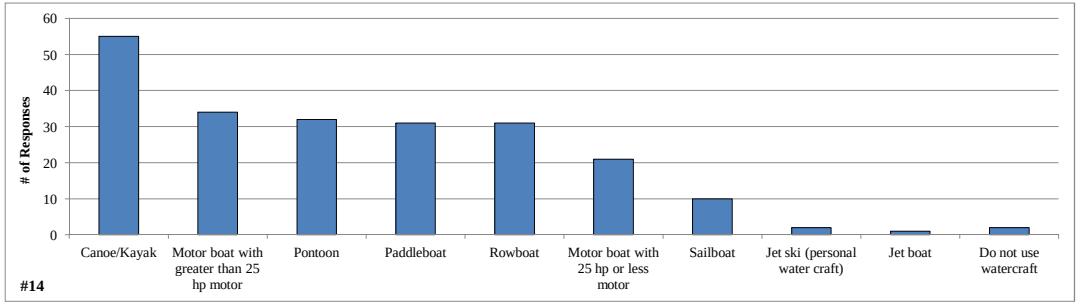
#13 How has the quality of fishing changed since you or others in your household started fishing the lake?

	Total	%
Much worse	14	*18.9*
Somewhat worse	30	*40.5*
Remained the Same	19	*25.7*
Somewhat better	2	*2.7*
Much better	0	*0.0*
Unsure	9	*12.2*
	74	*100.0*



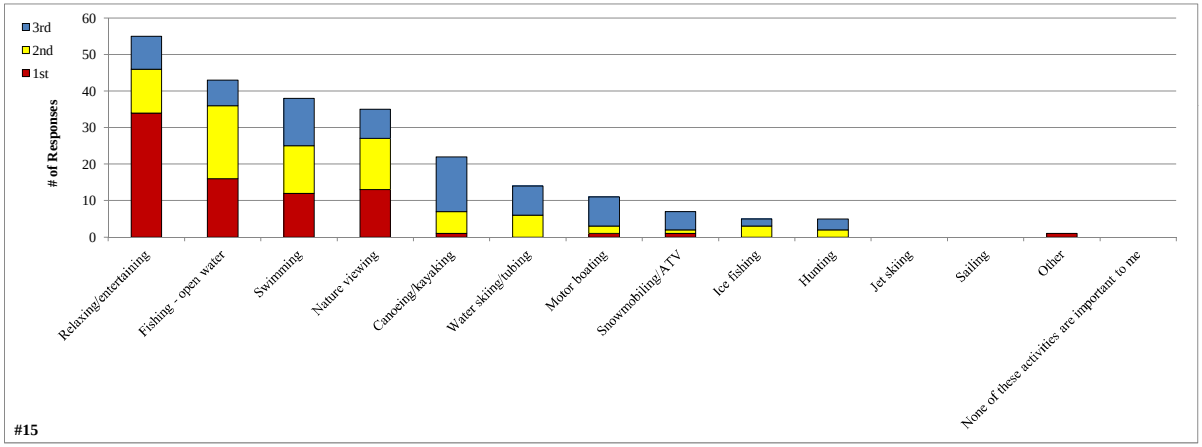
#14 What types of watercraft do you currently use on the lake?

	Total
Canoe/Kayak	55
Motor boat with greater than 25 hp motor	34
Pontoon	32
Paddleboat	31
Rowboat	31
Motor boat with 25 hp or less motor	21
Sailboat	10
Jet ski (personal water craft)	2
Jet boat	1
Do not use watercraft	2



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

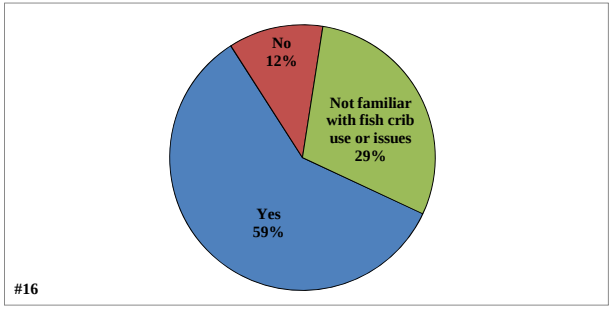
	1st	2nd	3rd	*% ranked*
Relaxing/entertaining	34	12	9	*23.3*
Fishing - open water	16	20	7	*18.2*
Swimming	12	13	13	*16.1*
Nature viewing	13	14	8	*14.8*
Canoeing/kayaking	1	6	15	*9.3*
Water skiing/tubing	0	6	8	*5.9*
Motor boating	1	2	8	*4.7*
Snowmobiling/ATV	1	1	5	*3.0*
Ice fishing	0	3	2	*2.1*
Hunting	0	2	3	*2.1*
Jet skiing	0	0	0	*0.0*
Sailing	0	0	0	*0.0*
Other	1	0	0	*0.4*
None of these activities are important to me	0	0	0	*0.0*
	79	79	78	*100.0*



ARTIFICIAL FISHING HABITAT ON LAKE MILDRED AND CLEAR LAKE

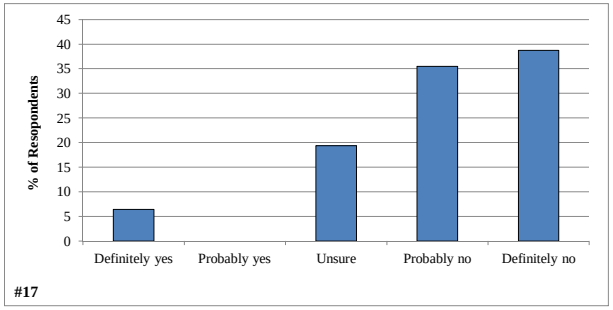
#16 Are you aware that WDNR guidelines must be followed to sink a fish crib in Lake Mildred or Clear Lake, and a WDNR fisheries biologist must be notified of its location?

	Total	%
Yes	46	*59.0*
No	9	*11.5*
Not familiar with fish crib use or issues	23	*29.5*
	78	*100.0*



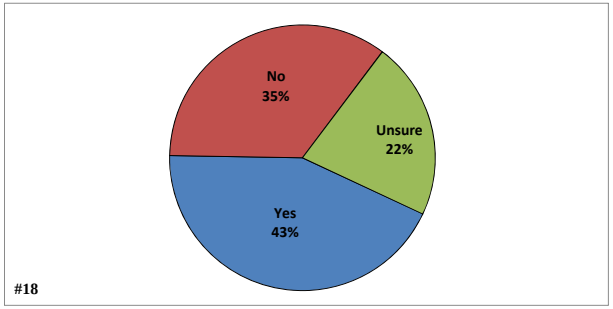
#17 Are the addition of fish cribs (made from natural or man-made materials) causing any problems in the lake where your property is located?

	Total	%
Definitely yes	4	*6.5*
Probably yes	0	*0.0*
Unsure	12	*19.4*
Probably no	22	*35.5*
Definitely no	24	*38.7*
	62	*100.0*



#18 Should the lake association work with the WDNR to remove fish cribs in the lake where your property is located if the cribs are made of man-made materials (plastic barrels, etc.)?

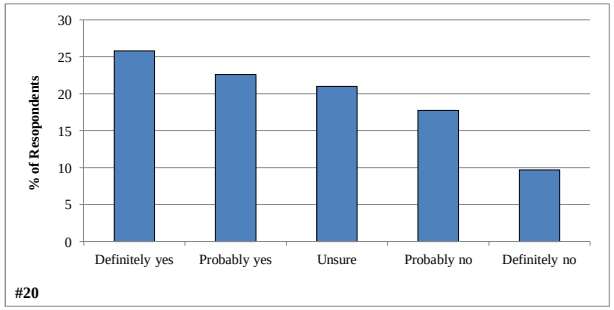
	Total	%
Yes	26	*43.3*
No	21	*35.0*
Unsure	13	*21.7*
	60	*100.0*



#19 *This Question was mistakenly repeated during the survey design process, and thus has been left out of the analysis.*

#20 Do you believe that habitat improvements for fish need to be made in the lake where your property is located?

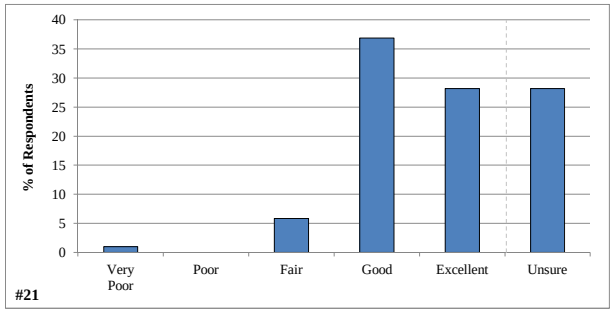
	Total	%
Definitely yes	16	*25.8*
Probably yes	14	*22.6*
Unsure	13	*21.0*
Probably no	11	*17.7*
Definitely no	6	*9.7*
	60	*96.8*



LAKE MILDRED AND CLEAR LAKE CURRENT AND HISTORIC CONDITION, HEALTH AND MANAGEMENT

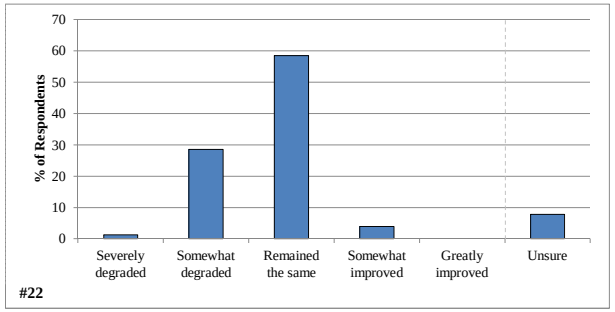
#21 How would you describe the current water quality of Lake Mildred or Clear Lake?

	Total	%
Very Poor	1	*1.0*
Poor	0	*0.0*
Fair	6	*5.8*
Good	38	*36.9*
Excellent	29	*28.2*
Unsure	29	*28.2*
	103	*100.0*



#22 How has the water quality changed in Lake Mildred or Clear Lake since you visited the lake?

	Total	%
Severely degraded	1	*1.3*
Somewhat degraded	22	*28.6*
Remained the same	45	*58.4*
Somewhat improved	3	*3.9*
Greatly improved	0	*0.0*
Unsure	6	*7.8*
	77	*100.0*



#23 Have you ever heard of aquatic invasive species?

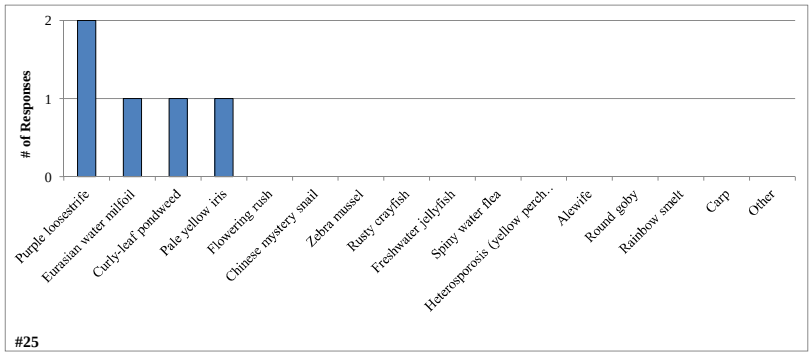
	Total	%
Yes	77	*98.7*
No	1	*1.3*
	78	*100.0*

#24 Are you aware of aquatic invasive species in the lake?

	Total	%
Yes	3	*4.0*
No	72	*96.0*
	75	*100.0*

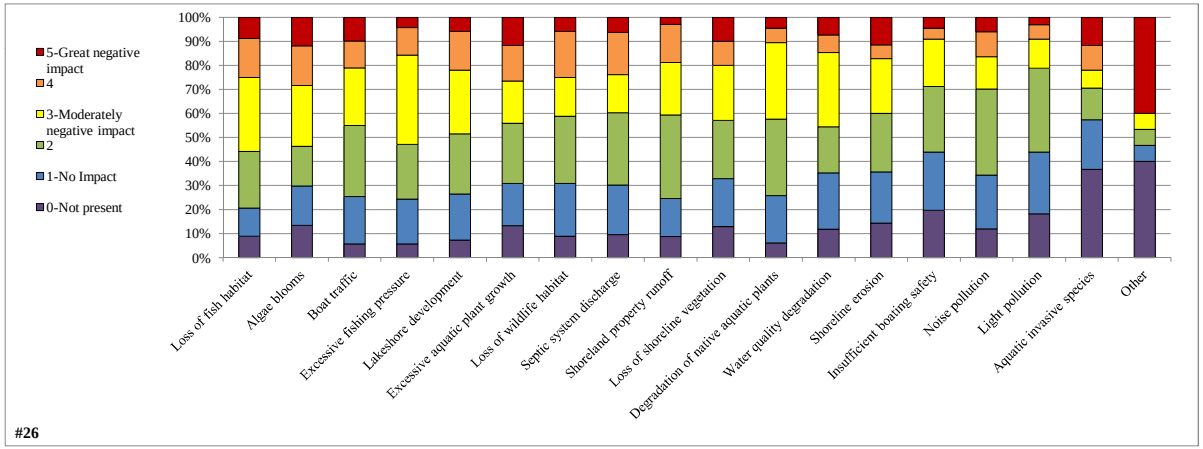
#25 Which aquatic invasive species are you aware of in the lake?

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



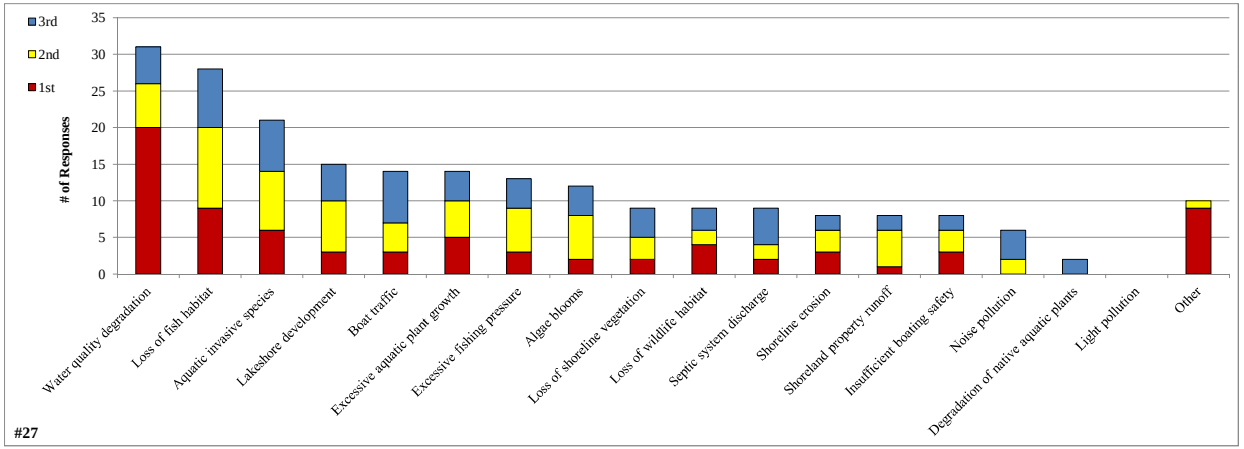
#26 To what level do you believe each of the following factors may be negatively impacting Lake Mildred or Clear Lake?

	0-Not present	1-No Impact	2	3-Moderately negative impact	4	5-Great negative impact	*Total*	*Average*
Loss of fish habitat	6	8	16	21	11	6	*62*	*2.6*
Algae blooms	9	11	11	17	11	8	*58*	*2.5*
Boat traffic	4	14	21	17	8	7	*67*	*2.5*
Excessive fishing pressure	4	13	16	26	8	3	*66*	*2.4*
Lakeshore development	5	13	17	18	11	4	*63*	*2.4*
Excessive aquatic plant growth	9	12	17	12	10	8	*59*	*2.4*
Loss of wildlife habitat	6	15	19	11	13	4	*62*	*2.3*
Septic system discharge	6	13	19	10	11	4	*57*	*2.3*
Shoreland property runoff	6	11	24	15	11	2	*63*	*2.3*
Loss of shoreline vegetation	9	14	17	16	7	7	*61*	*2.3*
Degradation of native aquatic plants	4	13	21	21	4	3	*62*	*2.3*
Water quality degradation	8	16	13	21	5	5	*60*	*2.2*
Shoreline erosion	10	15	17	16	4	8	*60*	*2.2*
Insufficient boating safety	13	16	18	13	3	3	*53*	*2.1*
Noise pollution	8	15	24	9	7	4	*59*	*2.1*
Light pollution	12	17	23	8	4	2	*54*	*1.7*
Aquatic invasive species	25	14	9	5	7	8	*43*	*1.7*
Other	6	1	1	1	0	6	*9*	*2.4*



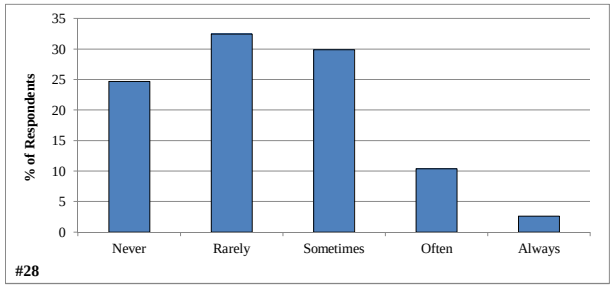
#27 From the list below, please rank your top three concerns regarding the lake.

	1st	2nd	3rd	*% Ranked*
Water quality degradation	20	6	5	*14.3*
Loss of fish habitat	9	11	8	*12.9*
Aquatic invasive species	6	8	7	*9.7*
Lakeshore development	3	7	5	*6.9*
Boat traffic	3	4	7	*6.5*
Excessive aquatic plant growth	5	5	4	*6.5*
Excessive fishing pressure	3	6	4	*6.0*
Algae blooms	2	6	4	*5.5*
Loss of shoreline vegetation	2	3	4	*4.1*
Loss of wildlife habitat	4	2	3	*4.1*
Septic system discharge	2	2	5	*4.1*
Shoreline erosion	3	3	2	*3.7*
Shoreland property runoff	1	5	2	*3.7*
Insufficient boating safety	3	3	2	*3.7*
Noise pollution	0	2	4	*2.8*
Degradation of native aquatic plants	0	0	2	*0.9*
Light pollution	0	0	0	*0.0*
Other	9	1	0	*4.6*
	75	74	68	*100.0*



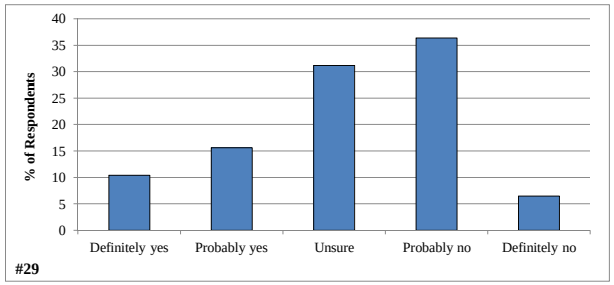
#28 During open water season how often does aquatic plant growth, including algae, negatively impact your enjoyment of the lake?

	Total	%
Never	19	*24.7*
Rarely	25	*32.5*
Sometimes	23	*29.9*
Often	8	*10.4*
Always	2	*2.6*
	77	*100.0*



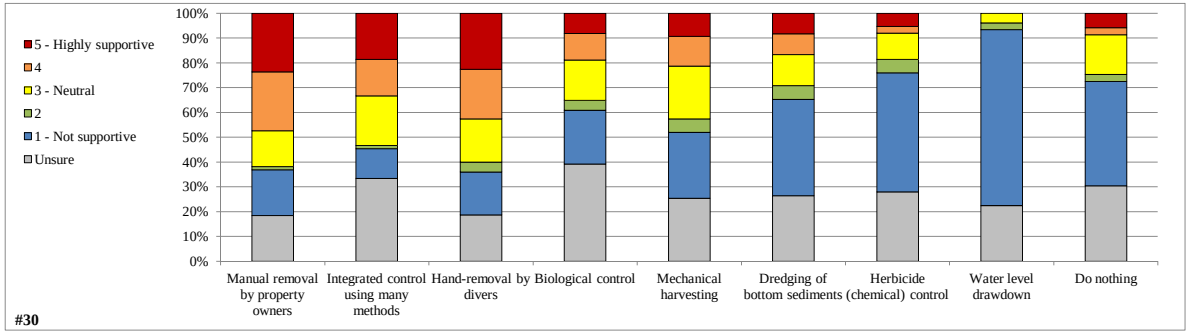
#29 Considering your answer to the question above, do you believe aquatic plant control is needed on the lake?

	Total	%
Definitely yes	8	*10.4*
Probably yes	12	*15.6*
Unsure	24	*31.2*
Probably no	28	*36.4*
Definitely no	5	*6.5*
	77	*100.0*



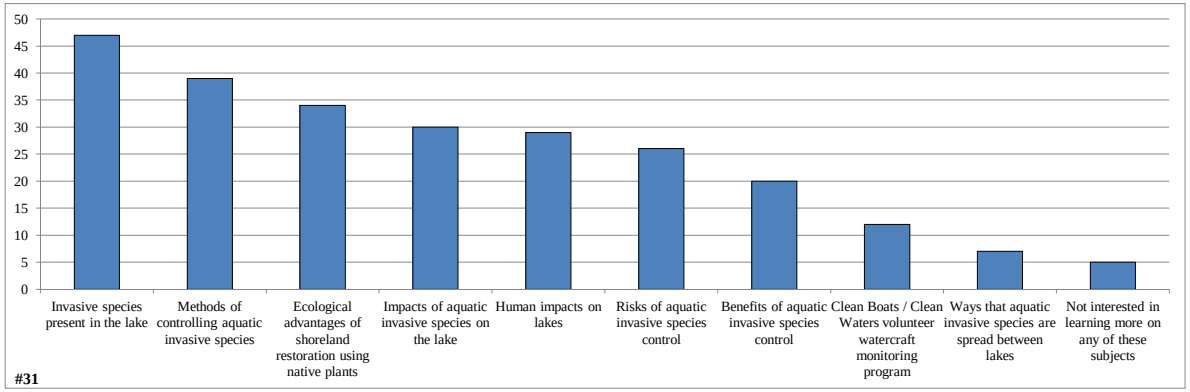
#30 What is your level of support for the responsible use of the following techniques on the lake?

	1 - Not supportive	2	3 - Neutral	4	5 - Highly supportive	Unsure	Total	Average
Manual removal by property owners	14	1	11	18	18	14	*62*	*3.4*
Integrated control using many methods	9	1	15	11	14	25	*50*	*3.4*
Hand-removal by divers	13	3	13	15	17	14	*61*	*3.3*
Biological control	16	3	12	8	6	29	*45*	*2.7*
Mechanical harvesting	20	4	16	9	7	19	*56*	*2.6*
Dredging of bottom sediments	28	4	9	6	6	19	*53*	*2.2*
Herbicide (chemical) control	36	4	8	2	4	21	*54*	*1.8*
Water level drawdown	54	2	3	0	0	17	*59*	*1.1*
Do nothing	29	2	11	2	4	21	*48*	*2.0*



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

	Total
Invasive species present in the lake	47
Methods of controlling aquatic invasive species	39
Ecological advantages of shoreland restoration using native plants	34
Impacts of aquatic invasive species on the lake	30
Human impacts on lakes	29
Risks of aquatic invasive species control	26
Benefits of aquatic invasive species control	20
Clean Boats / Clean Waters volunteer watercraft monitoring program	12
Ways that aquatic invasive species are spread between lakes	7
Not interested in learning more on any of these subjects	5



LAKE MILDRED PROPERTY OWNERS ASSOCIATION

#32 Before receiving this mailing, have you ever heard of the Lake Mildred Property Owners Association?

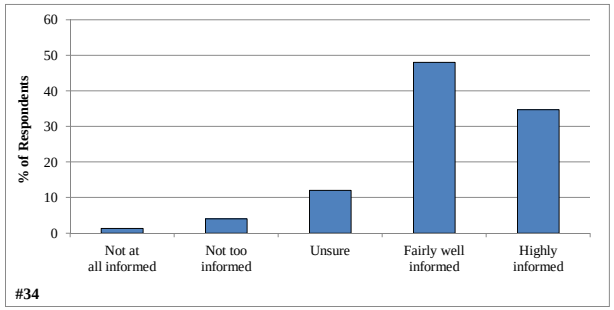
	Total	%
Yes	75	*98.7*
No	1	*1.3*
	76	*100.0*

#33 What is your membership status with the Lake Mildred Property Owners Association?

	Total	%
Current member	49	*67.1*
Former member	8	*11.0*
Never been a member	16	*21.9*
	73	*100.0*

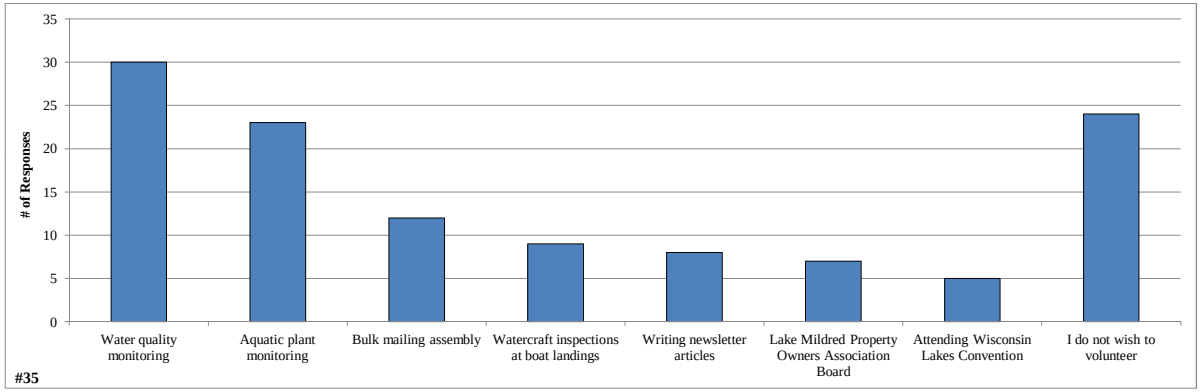
#34 How informed has the Lake Mildred Property Owners Association kept you regarding issues with the lake and its management?

	Total	%
Not at all informed	1	*1.3*
Not too informed	3	*4.0*
Unsure	9	*12.0*
Fairly well informed	36	*48.0*
Highly informed	26	*34.7*
	75	*100.0*



#35 Please circle the activities you would be willing to participate in if the Lake Mildred Property Owners Association requires additional assistance.

	Total
Water quality monitoring	30
Aquatic plant monitoring	23
Bulk mailing assembly	12
Watercraft inspections at boat landings	9
Writing newsletter articles	8
Lake Mildred Property Owners Association Board	7
Attending Wisconsin Lakes Convention	5
I do not wish to volunteer	24



Survey Number	Lake	2g Comment	12i Comment	15m Comment	25p Comment	26r Comment	27r Comment	Other Comments (and Question 36)
1	Lake Mildred							
2	Lake Mildred			family vacations				I have noticed a difference in the small part of the lake(section closests to Clear Lake) There appears to be much more veg/plant growth. Years ago it was clearer
3	Clear Lake							
4	Clear Lake					low water level	low water level	I understand why Lake Mildred was studied extensively in the lst grant. I would hop that in the future any studies will include Clear Lake as a equal participant
5	Lake Mildred							The boat landing is becoming an attractive nuisance. There is garbage and noise at the boat landing. Also a safety issue for all at the landing. Visitors at the landing swim at the area when boats are being launched. Needs to be controlled
6	Lake Mildred							We have been on Lake Mildred for 8 years now and love the lake. We've noticed however, the lack of panfish in the last few years. Whether its because of the low water level (fish staying deeper), overfishing or abundant bass population I don't know. We used to catch some walleyes and about 10 bluegills in 8 years, released the rest. Maybe some regulations to get the bass populations under control and some stocking of other species would help to diversify the fishery. I also would like to see some fish cribs installed. I would be more than willing to donate some time and money for both.
7	Lake Mildred							Would like to see the removal of the bolders in the channel between Lake Mildred and Clear Lake
8	Lake Mildred							
9	Clear Lake							
11	Lake Mildred							
12	Lake Mildred							Excellent survey and thank you for your hard work
13	Lake Mildred					Certain types of boats cause wakes on shoreline		Please promote catch and release of all game fish
14	Lake Mildred							
15	Lake Mildred							Having been born and raised in Rhinelander and now owning property on a lake that was introduced to my as a kid, I am totally grateful to all those involved in the care and upkeep of this magnificant natural jewel. We presently live in MN and because of a growing demand on family obligations, we are not able to enjoy our property as we once did. We therefore appreciate all the LMPOA is attempting to do to preserve our oasis which will ultimately benefit all for generations. Thank you!
16	Lake Mildred	Its heated for year round use, but used about 150 days a year						
17	Clear Lake						lowering of lake levels	
18	Clear Lake							Musky fishing has improved. Walleye fishing never existed much other than walleyes people released. Get rid of small mouth bass and get some walley plantings
19	Clear Lake							
20	Lake Mildred							
21	Clear Lake							
22	Lake Mildred							I think the low water conditions we are experiencing the last few years is the reason for some of my responses. I think it is a natural occurrence and feel it will come back to higher levels and this would change many of my answers. Sometime doing nothing is the best solution and let nature take her course.
23	Lake Mildred							
24	Lake Mildred							Our concern is the concrete structure that is on the property located between *(name removed)* and the large white house on the south shore of Lake Mildred. Apparently the structure went in during September or late August of 2011. It is very close to the shoreline. Trees have been cleared from this property.
25	Clear Lake						Fishing pressure . Does not understand the importance of catch and release	Appreciate and compiment efforts extended by Lake Mildred Property Owners Association
26	Lake Mildred							The board is doing a good job
27	Lake Mildred						Illegal fish crib & debris filling the lake	
28	Lake Mildred							Do not widen the canal by *(name removed)* 's house. It's already been widened once. People on the east end of the lake from *(name removed)* 's paid a premium for their lots because it was accessible for the larger boats. The west end is a good place to go for quiet fishing.
29	Lake Mildred							
30	Lake Mildred							
31	Lake Mildred							
32	Lake Mildred							I think it is necessary to remove rocks, dredge and open up the narrows
33	Lake Mildred		bullheads					
34	Clear Lake							Open up passage between lakes to provide access to both lakes. Dredge out channels on Clear Lake to provide access to all three branches of lake
35	Lake Mildred							
36	Lake Mildred							
37	Clear Lake							Our family lives out of state. We are interested in the issues, but distance makes full participation difficult
38	Clear Lake							
39	Lake Mildred	5-6 weeks in summer, 3-4 weeks rest of year						
40	Clear Lake							
41	Lake Mildred							
42	Clear Lake							The lack of water and the enormous growth of plants
43	Clear Lake							
44	Lake Mildred							
45	Lake Mildred							My wife and I are limited by health issues
46	Lake Mildred							Thanks for your efforts
47	Lake Mildred							
48	Lake Mildred							
49	Lake Mildred					jet skiis	jet skiis and water level	Too many smallmouth bass, more every year. Crappies and bluegills have declined. Walleyes need stocking & habitat work. Water level is a huge concern. Jet skiis should not be allowed. Jet skiis have crossed over lines we just cast out – and this clown has a place on the lake. Structures built too close to OHWM. The mansion on the point that used to be a cottage. The new storage shed that is essentially a bungalow with a dormer – north shore moveable? Portable? - heck, it has a block basement. Lake association needs to deal with it – file complaint with zoning or you have no credibility.
50	Lake Mildred							
51	Clear Lake							
52	Clear Lake							
53	Lake Mildred							
54	Lake Mildred							
55	Lake Mildred							
56	Lake Mildred							
57	Lake Mildred							
58	Lake Mildred							Please restore the island that *(name removed)* filled in
59	Clear Lake							
60	Lake Mildred					lawn creation & clearing the shoreline		Let's keep the shoreline as natural as possible with control of new buildings built close to the water. No fertilized lawns
61	Lake Mildred							
62	Lake Mildred					tiger muskies	townies, DNR stocking muskies	The stockholder attached an article from the Lake Mildred website on a fisheries study that was done in 2005. They highlighted a section that said " we handled 3 adult muskies (all were males from 42 to 44 inches in length) and a large number of juvenile muskies (Mildred was stocked with 190 12 inch muskies by the Musky Club Alliance of Wisconsin last fall) . Thier comment was: THIS IS THE LARGEST LAKE PROBLEM, WHO LET THEM DO THE STOCKING AND NOW 6 YEARS LATER YOU ASK WHERE ARE THE FISH?
63	Clear Lake							
64	Lake Mildred					low water level		
65	Lake Mildred							
66	Lake Mildred							

Survey Number	Lake	2g Comment	12i Comment	15m Comment	25p Comment	26r Comment	27r Comment	Other Comments (and Question 36)
67	Lake Mildred							
68	Lake Mildred					expanding small mouth bass population		
69	Clear Lake							
70	Lake Mildred							Wish to see a fisheries management plan for the lakes. Wish to see a plan for managing and improving lake access to Clear Lake and west end of Mildred Lake during low water periods that cause passages to become too shallow for boat passage
71	Lake Mildred							
72	Lake Mildred							
73	Lake Mildred							
74	Clear Lake							Would like Clear Lake to remain a non motor area and the channel between Mildred & Clear Lakes remain untouched
75	Lake Mildred						lack of variety, of easily accessible fish species seems like all bass in this lake	To us, it seems as though most of the fish in this lake are bass, and fishing becomes boring on the lake since species are limited and nearly all fish are too small to keep, contributing to the problem. We swim a lot, and the water quality seems good, for a time. I think with bloom or pollen or something. I am very concerned about water level, but obviously we have no control over it. Maybe some ? cribs and fish introduction might help improve fishing. I don't think this lake is a very nutrient rich lake.
76	Lake Mildred							
77	Lake Mildred							Great core group in LMPOA. More volunteers and subcommittes a good idea. Group study to see effects of bag limits and size limits on bass. Ie:catch & release. Either get a pier at the boat landing or close it!
78	Lake Mildred							
79	Lake Mildred							Too many property owners have removed trees and structures from the shoreline and the lake bed! People should not alter the existing shoreline conditions without permission from the adjoining property owners. People should not remove excess amounts of foliage (clear cut) from their property just for a view of the lake

C

APPENDIX C

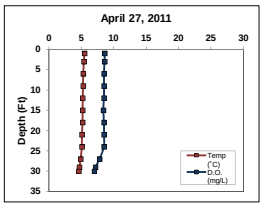
Water Quality Data

Lake Mildred

Date: 4/27/2011
Time: 14:20
Weather: 100% clouds, light rain, light wind, 40°F
Entry: TWH

Max Depth: 32.2
LMS Depth (ft): 3.0
LMB Depth (ft): 29.0
Secchi Depth (ft): 16.4

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	5.5	8.6	6.9	
3	5.4	8.6	6.7	
6	5.3	8.5	6.6	
9	5.3	8.5	6.5	
12	5.2	8.5	6.5	
15	5.2	8.4	6.4	
18	5.2	8.5	6.4	
21	5.1	8.5	6.3	
24	5.1	8.5	6.3	
27	4.9	7.8	6.3	
29	4.7	7.2	6.2	
30	4.6	7.0	6.2	



Parameter	LMS	LMB
Total P (µg/L)	16.00	20.00
Dissolved P (µg/L)	ND	ND
Chl-a (µg/L)	2.52	
TKN (µg/L)	440.00	550.00
$NO_3 + NO_2$-N (µg/L)	220.00	217.00
NH_3-N (µg/L)	45.00	65.00
Total N (µg/L)	440.00	550.00
Lab Cond. (µS/cm)	20.00	20.00
Lab pH	6.18	6.04
Alkalinity (mg/L $CaCO_3$)	4.70	4.70
Total Susp. Solids (mg/L)	ND	ND
Calcium (mg/L)	1.70	

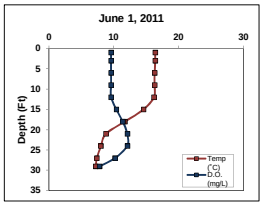
Data collected by TWH (Onterra)

Lake Mildred

Date: 6/1/2011
Time: 15:40
Weather: 95% sun, windy, 75°F
Entry: TWH

Max Depth: 33.3
LMS Depth (ft): 3.0
LMB Depth (ft): 29.0
Secchi Depth (ft): 16.8

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	16.4	9.6	8.0	17.0
3	16.4	9.6	7.9	17.0
6	16.3	9.6	7.9	17.0
9	16.3	9.6	7.8	17.0
12	16.2	9.6	7.8	17.0
15	14.6	10.4	8.3	17.0
18	11.7	11.4	8.7	18.0
21	8.8	12.1	8.6	17.0
24	8.0	12.1	8.5	17.0
27	7.4	10.2	7.8	18.0
29	7.2	7.8	7.2	20.0



Parameter	LMS	LMB
Total P (µg/L)	14.00	24.00
Dissolved P (µg/L)		
Chl-a (µg/L)	2.82	
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)	ND	3.00
Calcium (mg/L)		

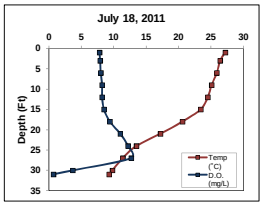
Data collected by TWH and MMF (Onterra)

Lake Mildred

Date: 7/18/2011
Time: 16:15
Weather: clear with a light breeze 85˚F
Entry: MMF

Max Depth: 31.8
LMS Depth (ft): 3.0
LMB Depth (ft): 28.0
Secchi Depth (ft): 15.6

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	27.2	7.8		
3	26.4	7.9		
6	25.9	8.0		
9	25.1	8.2		
12	24.5	8.2		
15	23.4	8.5		
18	20.6	9.4		
21	17.2	11.0		
24	13.5	12.2		
27	11.4	12.7		
30	9.8	3.7		
31	9.3	0.7		



Parameter	LMS	LMB
Total P (µg/L)	10.00	56.00
Dissolved P (µg/L)	ND	ND
Chl-a (µg/L)	2.98	
TKN (µg/L)	300.00	1090.00
$NO_3 + NO_2$-N (µg/L)	ND	ND
NH_3-N (µg/L)	ND	ND
Total N (µg/L)	300.00	1090.00
Lab Cond. (µS/cm)	23.00	24.00
Lab pH	7.36	6.57
Alkalinity (mg/L $CaCO_3$)	7.70	6.40
Total Susp. Solids (mg/L)	ND	4.00
Calcium (mg/L)		

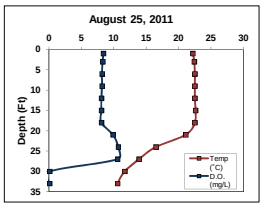
Data collected by TAH, MJH, and MKH (Onterra)

Lake Mildred

Date: 8/25/2011
Time: 9:45
Weather: clear, light breeze, 64°
Entry: TWH

Max Depth: 34
LMS Depth (ft): 3
LMB Depth (ft): 30
Secchi Depth (ft): 17.2

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	22.2	8.4		
3	22.4	8.3		
6	22.5	8.2		
9	22.5	8.2		
12	22.5	8.1		
15	22.6	8.1		
18	22.5	8.1		
21	21.1	9.9		
24	16.5	10.7		
27	13.9	10.6		
30	11.7	0.1		
33	10.6	0.1		



Parameter	LMS	LMB
Total P (µg/L)	11.0	56.0
Dissolved P (µg/L)		
Chl-a (µg/L)	2.78	
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)	ND	10
Calcium (mg/L)		

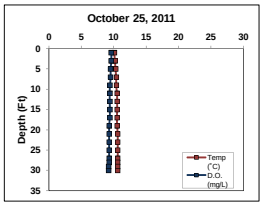
Data collected by TAH (Onterra)

Lake Mildred

Date: 10/25/2011
Time: 2:17
Weather: 100% clouds, breezy, 45°F
Entry: TWH

Max Depth: 31
LMS Depth (ft): 3
LMB Depth (ft): 28
Secchi Depth (ft): 12

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	10.1	9.6		
3	10.2	9.6		
5	10.3	9.5		
7	10.4	9.5		
9	10.4	9.4		
11	10.5	9.4		
13	10.5	9.4		
15	10.5	9.4		
17	10.5	9.4		
19	10.5	9.3		
21	10.6	9.3		
23	10.6	9.3		
25	10.6	9.3		
27	10.6	9.3		
28	10.6	9.3		
29	10.6	9.2		
30	10.6	9.2		



Parameter	LMS	LMB
Total P (µg/L)	15.0	14.0
Dissolved P (µg/L)		
Chl-a (µg/L)	7.4	
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)	ND	ND
Calcium (mg/L)		

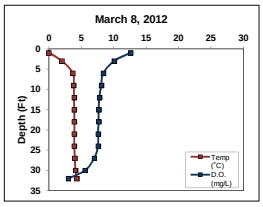
Data collected by TWH (Onterra)

Lake Mildred

Date: 3/8/2012
Time: 15:40
Weather: 80% sun, 33°F
Entry: TWH

Max Depth: 33.1
LMS Depth (ft): 3
LMB Depth (ft): 30
Secchi Depth (ft): 14.2

Depth (ft)	Temp (˚C)	D.O. (mg/L)	pH	Sp. Cond. (µS/cm)
1	0	12.6	8.6	21
3	2	10.1	8.3	19
6	3.7	8.4	8.1	19
9	3.8	8.1	8	19
12	3.9	7.8	7.9	19
15	3.9	7.7	7.7	19
18	3.9	7.7	7.7	19
21	3.9	7.6	7.6	19
24	3.9	7.6	7.5	19
27	4	7	7.4	19
30	4.1	5.6	7.3	20
32	4.3	3	7.1	24



Parameter	LMS	LMB
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 TAH and TWH (Onterra) Ice depth: 1.7ft.

Water Quality Data

2010	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	6	15.4	NA	NA
Total P (µg/L)	5	13.2	5	34.0
Dissolved P (µg/L)	2	ND	2	ND
Chl a (µg/L)	5	3.7	0	NA
TKN (µg/L	2	370.0	2	820.0
NO3+NO2-N (µg/L)	2	220.0	2	217.0
NH3-N (µg/L)	2	45.0	2	65.0
Total N (µg/L)	2	370.0	2	820.0
Lab Cond. (µS/cm)	2	21.5	2	22.0
Lab pH	2	6.8	2	6.3
Alkal (mg/l CaCO3)	2	6.2	2	5.6
Total Susp Sol (mg/l)	5	ND	5	5.7
Calcium (µg/L)	1	1.7	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			

Trophic State Index (WTSI)

Year	TP	Chl-a	Secchi
1979		43.5	39.1
1992	24.1	37.9	33.9
1995			34.1
1997			47.3
2006			35.4
2007			37.8
2008			35.6
2009			32.6
2010			34.9
2011	39.6	40.9	36.2
All Years (Weighted)	35.2	41.0	35.9
Deep, Seepage Lakes	43.2	43.2	42.4
NLF Ecoregion	48.1	47.5	45.7

	Secchi (feet)				Chlorophyll-a (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1979	1	14.0	1	14.0	1	3.7	1	3.7				
1986												
1987												
1988												
1989												
1990												
1991												
1992	7	18.4	5	20.1	2	3.1	1	2.1	3	5.7	2.0	4.0
1993	2	23.5	0		1	2.3	0		2	15.0	0.0	
1994	1	12.5	0									
1995	3	19.8	3	19.8								
1996												
1997	4	7.9	4	7.9								
1998												
1999												
2000												
2001												
2002												
2003												
2004												
2005												
2006	16	19.4	10	18.1								
2007	19	17.3	10	15.3								
2008	9	16.7	6	17.9								
2009	12	21.5	6	22.0								
2010	12	19.9	7	18.7								
2011	8	17.8	4	17.2	5	3.7	3	2.9	5	13.2	3.0	11.7
All Years (Weighted)		18.3		17.5		3.4		2.9		11.3		8.6
Deep, Seepage Lakes				11.2				3.6				15.0
NLF Ecoregion				8.9				5.6				21.0

Summer 2010 N: 300.0
Summer 2010 P: 11.7

Summer 2011 N:P 26 :1

D

APPENDIX D

Watershed Analysis WiLMS Results

Date: 3/23/2012 Scenario: Lake Mildred Current

Lake Id: 1004600
Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 2564.0 acre
Total Unit Runoff: 12.2 in.
Annual Runoff Volume: 2607.8 acre-ft
Lake Surface Area <As>: 168 acre
Lake Volume <V>: 3722 acre-ft
Lake Mean Depth <z>: 21.6 ft
Precipitation - Evaporation: 5.8 in.
Hydraulic Loading: 2690.9 acre-ft/year
Areal Water Load <qs>: 15.6 ft/year
Lake Flushing Rate <p>: 0.72 1/year
Water Residence Time: 1.38 year
Observed spring overturn total phosphorus (SPO): 16.0 mg/m^3
Observed growing season mean phosphorus (GSM): 13.2 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	0.0	0.50	1.00	3.00	0.0	0	0	0
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	131	0.10	0.30	0.50	12.5	5	16	27
HD Urban (1/8 Ac)	0.0	1.00	1.50	2.00	0.0	0	0	0
MD Urban (1/4 Ac)	0.0	0.30	0.50	0.80	0.0	0	0	0
Rural Res (>1 Ac)	0.0	0.05	0.10	0.25	0.0	0	0	0
Wetlands	478	0.10	0.10	0.10	15.2	19	19	19
Forest	1956	0.05	0.09	0.18	55.9	40	71	142
Lake Surface	168.0	0.10	0.30	1.00	16.4	7	21	70

POINT SOURCE DATA

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

SEPTIC TANK DATA

Description		Low	Most Likely	High	Loading %
Septic Tank Output (kg/capita-year)		0.3	0.5	0.8	
# capita-years	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)	156.9	280.8	568.7	100.0
Total Loading (kg)	71.2	127.4	257.9	100.0
Areal Loading (lb/ac-year)	0.91	1.63	3.31	0.0
Areal Loading (mg/m^2-year)	102.27	182.99	370.58	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)	141.6	234.8	415.2	100.0
Total NPS Loading (kg)	64.2	106.5	188.3	100.0

Phosphorus Prediction and Uncertainty Analysis Module

Date: 3/23/2012 Scenario: 34
Observed spring overturn total phosphorus (SPO): 16.0 mg/m^3
Observed growing season mean phosphorus (GSM): 13.2 mg/m^3
Back calculation for SPO total phosphorus: 0.0 mg/m^3
Back calculation GSM phosphorus: 0.0 mg/m^3
% Confidence Range: 70%
Nurenberg Model Input - Est. Gross Int. Loading: 0 kg

Lake Phosphorus Model	Low Total P (mg/m^3)	Most Likely Total P (mg/m^3)	High Total P (mg/m^3)	Predicted -Observed (mg/m^3)	% Dif.
Walker, 1987 Reservoir	10	18	37	5	38
Canfield-Bachmann, 1981 Natural Lake	12	19	32	6	45
Canfield-Bachmann, 1981 Artificial Lake	12	18	29	5	38
Rechow, 1979 General	6	11	21	-2	-15
Rechow, 1977 Anoxic	16	28	57	15	114
Rechow, 1977 water load<50m/year	8	15	30	2	15
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	11	20	40	4	25
Vollenweider, 1982 Combined OECD	10	16	29	1	7
Dillon-Rigler-Kirchner	6	11	22	-5	-31
Vollenweider, 1982 Shallow Lake/Res.	8	13	24	-2	-14
Larsen-Mercier, 1976	10	18	36	2	13
Nurnberg, 1984 Oxic	7	13	27	0	0

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	11	31	FIT	0	GSM
Canfield-Bachmann, 1981 Natural Lake	6	55	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	6	52	FIT	1	GSM
Rechow, 1979 General	6	19	FIT	0	GSM
Rechow, 1977 Anoxic	18	48	FIT	0	GSM
Rechow, 1977 water load<50m/year	9	26	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	10	37	FIT	0	SPO
Vollenweider, 1982 Combined OECD	8	29	FIT	0	ANN
Dillon-Rigler-Kirchner	7	19	FIT	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	7	24	FIT	0	ANN
Larsen-Mercier, 1976	12	30	P Pin	0	SPO
Nurnberg, 1984 Oxic	7	24	FIT	0	ANN

Water and Nutrient Outflow Module

Date: 3/23/2012 Scenario: 21
Average Annual Surface Total Phosphorus: 13.2mg/m^3
Annual Discharge: 2.69E+003 AF => 3.32E+006 m^3
Annual Outflow Loading: 92.4 LB => 41.9 kg

E

APPENDIX E

Aquatic Plant Survey Data

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
1	45.678033	-89.549195	6	Muck	Pole		V						1				1				1					1							1		
2	45.677745	-89.549197	5	Rock	Pole		V						1				1		V										1						
3	45.678895	-89.548777	1	Muck	Pole		1	1			1		1						V				1		1	1	1					1			
4	45.678607	-89.548780	1	Rock	Pole		V												1																
5	45.678319	-89.548782	6	Muck	Pole		1										1									1									
6	45.678031	-89.548784	8	Muck	Pole													1																	
7	45.677743	-89.548787	7	Muck	Pole													1																1		
8	45.678893	-89.548366	6	Muck	Pole		1										2			1															
9	45.678605	-89.548369	8	Muck	Pole																					1						1	1		
10	45.678317	-89.548371	9	Muck	Pole															1															
11	45.678029	-89.548373	9	Muck	Pole																														
12	45.677741	-89.548376	6	Muck	Pole		1										1		V							1									
13	45.677453	-89.548378	0			NONNAVIGABLE (PLANTS)																														
14	45.678892	-89.547956	2	Muck	Pole						1								1			1				1									1
15	45.678604	-89.547958	5	Muck	Pole		1																			1									1
16	45.678316	-89.547960	9	Muck	Pole																														
17	45.678028	-89.547962	9	Muck	Pole															1															
18	45.677740	-89.547965	6	Muck	Pole												1									1						1			
19	45.678890	-89.547545	0			NONNAVIGABLE (PLANTS)																														
20	45.678602	-89.547547	2	Muck	Pole		1												1							1									
21	45.678314	-89.547549	6	Muck	Pole		V										1																		
22	45.678026	-89.547552	9	Muck	Pole															1										1						
23	45.677738	-89.547554	8	Muck	Pole												1																1		
24	45.677450	-89.547556	1	Rock	Pole		1												V																
25	45.678889	-89.547134	0			NONNAVIGABLE (PLANTS)																														
26	45.678312	-89.547138	3	Muck	Pole		1												1							1									1
27	45.678024	-89.547141	7	Muck	Pole																														
28	45.677736	-89.547143	9	Muck	Pole																														
29	45.677448	-89.547145	7	Muck	Pole		V										1																		
30	45.678311	-89.546728	0			NONNAVIGABLE (PLANTS)																														
31	45.678023	-89.546730	6	Muck	Pole					1							2																		
32	45.677735	-89.546732	8	Muck	Pole															1						1									2
33	45.677447	-89.546734	9	Muck	Pole																					2									
34	45.677159	-89.546737	3	Muck	Pole														1	1															
35	45.678021	-89.546319	2	Muck	Pole		1												1							1				1					
36	45.677733	-89.546321	6	Muck	Pole												1																1		
37	45.677445	-89.546324	8	Muck	Pole																														
38	45.677157	-89.546326	9	Rock	Pole													1																	
39	45.678020	-89.545908	0			NONNAVIGABLE (PLANTS)																														
40	45.677732	-89.545910	2	Muck	Pole					1									2																
41	45.677444	-89.545913	8	Muck	Pole												1																		
42	45.677156	-89.545915	10	Muck	Pole													2																	
43	45.677730	-89.545500	5	Muck	Pole		1												V							1									
44	45.677442	-89.545502	8	Muck	Pole													1																	
45	45.677154	-89.545504	10	Muck	Pole															1						1				1					
46	45.676866	-89.545507	9	Muck	Pole													1																	
47	45.677728	-89.545089	7	Muck	Pole		V																												
48	45.677440	-89.545091	10	Muck	Pole													2																	
49	45.677152	-89.545093	10	Muck	Pole													1		1															
50	45.676864	-89.545096	10	Muck	Pole													2																	
51	45.678015	-89.544675	3	Muck	Pole		1						1						1																
52	45.677727	-89.544678	8	Muck	Pole													2																	
53	45.677439	-89.544680	10	Muck	Pole													2								1									

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
54	45.677151	-89.544682	11	Muck	Pole												1	1								1									
55	45.676863	-89.544685	11	Muck	Pole																														
56	45.676575	-89.544687	9	Rock	Pole												1	1																	
57	45.678013	-89.544265	6	Muck	Pole		1										1																		
58	45.677725	-89.544267	10	Muck	Pole													2																	
59	45.677437	-89.544269	10	Muck	Pole													1																	
60	45.677149	-89.544272	11	Muck	Pole																														
61	45.676861	-89.544274	11	Muck	Pole																														
62	45.676573	-89.544276	12	Muck	Pole																														
63	45.676285	-89.544279	7	Rock	Pole												1	1																	
64	45.675997	-89.544281	3	Muck	Pole								1			1	1		V																
65	45.678011	-89.543854	5	Muck	Pole					1	1																1								
66	45.677723	-89.543856	8	Muck	Pole												1	1																	
67	45.677435	-89.543858	9	Muck	Pole													1																	
68	45.677147	-89.543861	5	Rock	Pole		V			1							1	1																	
69	45.675995	-89.543870	3	Rock	Pole								1																						
70	45.677722	-89.543445	5	Muck	Pole					1			1				1																		
71	45.677434	-89.543448	3	Muck	Pole					1	1		1				1														1				
72	45.676570	-89.543455	0			TEMPORARY OBSTACLE																														
73	45.676282	-89.543457	12	Muck	Pole																														
74	45.675994	-89.543459	5	Sand	Pole																														
75	45.676856	-89.543041	11	Muck	Pole																														
76	45.676568	-89.543044	12	Muck	Pole													1																	
77	45.676280	-89.543046	13	Muck	Pole																														
78	45.675992	-89.543048	12	Muck	Pole																														
79	45.677142	-89.542628	5	Sand	Pole																														
80	45.676854	-89.542630	14	Muck	Rope																														
81	45.676566	-89.542633	14	Muck	Rope																										1				
82	45.676278	-89.542635	14	Muck	Rope																										1				
83	45.675990	-89.542638	13		Rope																														
84	45.676853	-89.542220	13	Muck	Pole																														
85	45.676565	-89.542222	13	Muck	Pole																										1				
86	45.676277	-89.542224	13	Muck	Pole																	1													
87	45.675989	-89.542227	14	Muck	Pole													1													1				
88	45.677139	-89.541806	11	Rock	Pole																														
89	45.676851	-89.541809	13	Muck	Pole																										1				
90	45.676563	-89.541811	14	Muck	Pole																										2				
91	45.676275	-89.541813	14	Muck	Rope																										1				
92	45.675987	-89.541816	13	Muck	Pole																										1				
93	45.675699	-89.541818	13	Muck	Pole																														
94	45.677137	-89.541396	13	Sand	Pole																														
95	45.676849	-89.541398	14	Muck	Pole																														
96	45.676561	-89.541400	16	Muck	Pole																										1				
97	45.676273	-89.541403	13	Muck	Rope																														
98	45.675985	-89.541405	12	Muck	Rope																										1				
99	45.675697	-89.541407	13	Muck	Rope																														
100	45.677136	-89.540985	12	Rock	Pole																														
101	45.676848	-89.540987	14	Muck	Rope																														
102	45.676560	-89.540989	14	Muck	Rope																										1				
103	45.676272	-89.540992	13	Muck	Pole																														
104	45.675984	-89.540994	8	Rock	Pole																														
105	45.675696	-89.540996	10	Rock	Pole																														
106	45.675408	-89.540999	13	Muck	Pole																														

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
107	45.677422	-89.540571	5	Rock	Pole																														
108	45.677134	-89.540574	13	Muck	Pole																									1					
109	45.676846	-89.540576	0			TEMPORARY OBSTACLE																														
110	45.676558	-89.540579	15	Muck	Rope																									1					
111	45.676270	-89.540581	14	Muck	Rope																									1					
112	45.675982	-89.540583	8	Rock	Pole																														
113	45.675694	-89.540586	12	Rock	Pole																														
114	45.675406	-89.540588	15	Muck	Pole																														
115	45.677421	-89.540161	10	Rock	Pole																														
116	45.677133	-89.540163	14	Muck	Rope																									1					
117	45.676844	-89.540165	15	Muck	Rope																									1					
118	45.676556	-89.540168	12	Muck	Rope																									2					
119	45.676268	-89.540170	14	Muck	Rope																									1					
120	45.675980	-89.540172	14	Muck	Rope																									1					
121	45.675692	-89.540175	14	Muck	Rope																														
122	45.675404	-89.540177	14	Muck	Rope																									1					
123	45.675116	-89.540179	4	Sand	Pole		V						1																						
124	45.677131	-89.539752	13	Muck	Rope																														
125	45.676843	-89.539754	14	Muck	Rope																									1					
126	45.676555	-89.539757	15	Muck	Rope																														
127	45.676267	-89.539759	15	Muck	Rope																														
128	45.675979	-89.539762	9	Rock	Pole																														
129	45.675691	-89.539764	14	Muck	Rope																														
130	45.675403	-89.539766	14	Muck	Rope																									1					
131	45.675115	-89.539769	6	Muck	Pole																														
132	45.677129	-89.539341	10	Rock	Pole																														
133	45.676841	-89.539344	15	Muck	Rope																														
134	45.676553	-89.539346	14	Muck	Rope																														
135	45.676265	-89.539348	14	Muck	Rope																														
136	45.675977	-89.539351	16	Muck	Rope																														
137	45.675689	-89.539353	15	Muck	Rope													1												1					
138	45.675401	-89.539355	14	Muck	Rope												1																		
139	45.677128	-89.538930	0			ROCKS																													
140	45.676840	-89.538933	9	Rock	Pole																														
141	45.676552	-89.538935	14	Muck	Rope																														
142	45.676263	-89.538937	15	Muck	Rope																														
143	45.675975	-89.538940	13	Muck	Rope																									1					
144	45.675687	-89.538942	15	Muck	Rope																									2					
145	45.675399	-89.538945	15	Muck	Pole																														
146	45.677414	-89.538517	6	Muck	Pole					2																									
147	45.677126	-89.538519	7	Rock	Pole					1				1																					
148	45.676838	-89.538522	10	Rock	Pole																														
149	45.676550	-89.538524	11	Rock	Pole																														
150	45.676262	-89.538527	10	Muck	Rope																														
151	45.675974	-89.538529	13	Muck	Rope																									1					
152	45.675686	-89.538531	15	Muck	Pole																														
153	45.675398	-89.538534	16	Muck	Rope																														
154	45.677124	-89.538109	5	Rock	Pole																														
155	45.676836	-89.538111	6	Sand	Pole					1			1																						
156	45.676548	-89.538113	6	Rock	Pole					1																									
157	45.676260	-89.538116	3	Rock	Pole																														
158	45.675972	-89.538118	13	Muck	Pole																														
159	45.675684	-89.538120	15	Muck	Rope													1												1					

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
160	45.675396	-89.538123	16	Muck	Rope																									1					
161	45.675970	-89.537707	14	Muck	Rope																														
162	45.675682	-89.537710	16	Muck	Pole																														
163	45.675394	-89.537712	150	Muck	Rope																														
164	45.675969	-89.537296	14		Rope																														
165	45.675681	-89.537299	16		Rope													1												1					
166	45.675393	-89.537301	16		Rope																									1					
167	45.676255	-89.536883	5	Rock	Pole																														
168	45.675967	-89.536885	14		Rope													1												1					
169	45.675679	-89.536888	16		Rope													1												1					
170	45.675391	-89.536890	15		Rope																									1					
171	45.675103	-89.536893	6	Sand	Pole		1																												
172	45.676254	-89.536472	14		Rope													1												1					
173	45.675965	-89.536475	14		Rope																														
174	45.675677	-89.536477	14		Rope													1												1					
175	45.675389	-89.536479	12	Rock	Pole																														
176	45.676540	-89.536059	14		Rope																														
177	45.676252	-89.536061	15		Rope													1												1					
178	45.675964	-89.536064	14		Rope													1												1					
179	45.675676	-89.536066	15		Rope																									1					
180	45.675388	-89.536069	14		Rope																														
181	45.675100	-89.536071	9	Sand	Pole																														
182	45.676826	-89.535646	6	Rock	Pole																														
183	45.676538	-89.535648	15		Rope																														
184	45.676250	-89.535651	15		Rope													1																	
185	45.67596215	-89.5356529	15		Rope																									1					
186	45.67567413	-89.5356553	15		Rope																														
187	45.67538611	-89.5356577	14		Rope																														
188	45.67509809	-89.5356601	9	Rock	Pole																														
189	45.67653651	-89.5352373	8	Sand	Pole																														
190	45.67624849	-89.5352397	15		Rope													1																	
191	45.67596048	-89.5352421	15		Rope																														
192	45.67567246	-89.5352444	15		Rope																														
193	45.67538444	-89.5352468	15		Rope																										1				
194	45.67509642	-89.5352492	10	Rock	Pole																														
195	45.67624682	-89.5348288	16		Rope																														
196	45.6759588	-89.5348312	16		Rope																														
197	45.67567079	-89.5348336	18		Rope																														
198	45.67538277	-89.534836	18		Rope																														
199	45.67509475	-89.5348384	12		Rope																														
200	45.67624515	-89.534418	16		Rope																														
201	45.67595713	-89.5344203	8	Rock	Pole																														
202	45.67566911	-89.5344227	14		Rope																														
203	45.6753811	-89.5344251	18		Rope																										1				
204	45.67509308	-89.5344275	6	Rock	Pole																														
205	45.67480506	-89.5344299	1	Sand	Pole			1	1	1	1	1												1										1	
206	45.67653149	-89.5340047	2	Sand	Pole		1																												
207	45.67624347	-89.5340071	7	Rock	Pole																														
208	45.67595546	-89.5340095	1	Rock	Pole						1																								
209	45.67566744	-89.5340119	7	Sand	Pole																														
210	45.67537942	-89.5340143	6	Rock	Pole																														
211	45.6750914	-89.5340167	6	Sand	Pole																														
212	45.67480338	-89.534019	5	Rock	Pole																														

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
213	45.67566576	-89.533601	4	Sand	Pole																														
214	45.67537774	-89.5336034	1	Rock	Pole										1																				
215	45.67508973	-89.5336058	3	Rock	Pole																														
216	45.67480171	-89.5336082	13		Rope																														
217	45.67451369	-89.5336106	15		Rope																														
218	45.67422567	-89.533613	10	Rock	Pole																														
219	45.67566408	-89.5331902	5	Sand	Pole					1																									
220	45.67537607	-89.5331926	3	Rock	Pole						1																								
221	45.67508805	-89.533195	10	Rock	Pole																														
222	45.67480003	-89.5331973	15		Rope																									1					
223	45.67451201	-89.5331997	15		Rope													1												1					
224	45.67422399	-89.5332021	16		Rope																														
225	45.67393598	-89.5332045	16		Rope																														
226	45.6756624	-89.5327793	2	Rock	Pole																														
227	45.67537439	-89.5327817	13		Rope																														
228	45.67508637	-89.5327841	16		Rope																														
229	45.67479835	-89.5327865	15		Rope													1												1					
230	45.67451033	-89.5327889	15		Rope													1												1					
231	45.67422231	-89.5327913	14		Rope																														
232	45.6739343	-89.5327937	15		Rope																									1					
233	45.67364628	-89.5327961	13		Rope																														
234	45.67537271	-89.5323708	10	Sand	Pole																														
235	45.67508469	-89.5323732	15		Rope													1												1					
236	45.67479667	-89.5323756	15		Rope																									1					
237	45.67450865	-89.532378	16		Rope																									1					
238	45.67422063	-89.5323804	14		Rope																														
239	45.67393262	-89.5323828	15		Rope																									1					
240	45.6736446	-89.5323852	16		Rope																									1					
241	45.67335658	-89.5323876	9	Rock	Pole																														
242	45.67537102	-89.53196	112	Sand	Pole																														
243	45.675083	-89.5319624	15		Rope																														
244	45.67479499	-89.5319648	17		Rope																									1					
245	45.67450697	-89.5319672	16		Rope																									0					
246	45.67421895	-89.5319696	16		Rope																									1					
247	45.67393093	-89.531972	17		Rope																														
248	45.67364292	-89.5319744	17		Rope																														
249	45.6733549	-89.5319768	18		Rope																														
250	45.67306688	-89.5319792	14		Rope																														
251	45.67536934	-89.5315491	14		Rope																														
252	45.67508132	-89.5315515	16		Rope																														
253	45.6747933	-89.5315539	18		Rope																														
254	45.67450529	-89.5315563	17		Rope																									1					
255	45.67421727	-89.5315588	12	Rock	Pole																														
256	45.67392925	-89.5315612	13		Rope																														
257	45.67364123	-89.5315636	15		Rope																														
258	45.67335321	-89.531566	16		Rope																														
259	45.6730652	-89.5315684	12	Sand	Pole																														
260	45.67277718	-89.5315708	1	Sand	Pole		1																												
261	45.67507964	-89.5311407	6	Sand	Pole																														
262	45.67479162	-89.5311431	12	Rock	Pole								1																						
263	45.6745036	-89.5311455	3	Rock	Pole						1																								
264	45.67363955	-89.5311527	1	Sand	Pole					1	1			1																					
265	45.67335153	-89.5311551	14		Rope																														

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
266	45.67306351	-89.5311575	12	Sand	Rope																														
267	45.67277549	-89.5311599	5	Sand	Pole																														
268	45.67680606	-89.5307154	4	Sand	Pole		1												1																
269	45.67651804	-89.5307178	2	Sand	Pole		V				1				1																				
270	45.67507795	-89.5307298	2	Sand	Pole										1																				
271	45.67478993	-89.5307322	10	Sand	Pole																														
272	45.67334984	-89.5307443	10	Rock	Pole																														
273	45.67306182	-89.5307467	13		Rope																														
274	45.67277381	-89.5307491	11	Sand	Pole																														
275	45.67680437	-89.5303045	3	Sand	Pole		1							1																					
276	45.67651635	-89.5303069	5	Rock	Pole																														
277	45.67622833	-89.5303093	7	Sand	Pole																														
278	45.67594031	-89.5303118	14		Rope																														
279	45.6756523	-89.5303142	14		Rope																														
280	45.67536428	-89.5303166	5	Rock	Pole																														
281	45.67507626	-89.530319	14		Rope																														
282	45.67478824	-89.5303214	16		Rope																														
283	45.67450022	-89.5303238	0			TERRESTRIAL																													
284	45.67334815	-89.5303334	3	Sand	Pole		1							1	1																				
285	45.67306014	-89.5303359	8	Rock	Pole																														
286	45.67277212	-89.5303383	15		Rope																														
287	45.6724841	-89.5303407	10	Sand	Pole																														
288	45.67680268	-89.5298937	5	Sand	Pole											1																			
289	45.67651466	-89.5298961	3	Sand	Pole		1		1					1																					
290	45.67622664	-89.5298985	3	Rock	Pole				1					1																					
291	45.67593862	-89.5299009	15		Rope																														
292	45.67565061	-89.5299033	22			DEEP																													
293	45.67536259	-89.5299057	22			DEEP																													
294	45.67507457	-89.5299081	24			DEEP																													
295	45.67478655	-89.5299105	20		Rope																														
296	45.67449854	-89.529913	12	Sand	Pole																														
297	45.67421052	-89.5299154	0			TERRESTRIAL																													
298	45.67363448	-89.5299202	2	Muck	Pole					1		1																	1						
299	45.67334646	-89.5299226	2	Sand	Pole		1				1			1		1																			
300	45.67248241	-89.5299298	3	Rock	Pole																														
301	45.67680099	-89.5294828	5	Sand	Pole									1		1																			
302	45.67593693	-89.52949	19		Rope													1													1				
303	45.67564891	-89.5294925	0			DEEP																													
304	45.6753609	-89.5294949	0			DEEP																													
305	45.67507288	-89.5294973	0			DEEP																													
306	45.67478486	-89.5294997	19		Rope																														
307	45.67449684	-89.5295021	10	Rock	Pole																														
308	45.67420883	-89.5295045	2	Sand	Pole				1																										
309	45.67392081	-89.5295069	2	Sand	Pole										1	1																			
310	45.67363279	-89.5295094	6	Muck	Pole		1			1																									
311	45.67334477	-89.5295118	2	Rock	Pole		1									1																			
312	45.67679929	-89.5290719	6	Sand	Pole																														
313	45.67651128	-89.5290744	6	Sand	Pole		1																												
314	45.67593524	-89.5290792	19		Rope																														
315	45.67564722	-89.5290816	0			DEEP																													
316	45.6753592	-89.529084	0			DEEP																													
317	45.67507119	-89.5290864	0			DEEP																													
318	45.67478317	-89.5290888	17		Rope																														

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
319	45.67449515	-89.5290913	5	Rock	Pole																														
320	45.6736311	-89.5290985	1	Sand	Pole									1	1	1												1							
321	45.67334308	-89.5291009	2	Muck	Pole		1			1	1					1			1																
322	45.6767976	-89.5286611	8	Sand	Pole					1																									
323	45.67650958	-89.5286635	14		Rope																														
324	45.67622156	-89.5286659	13		Rope																														
325	45.67593355	-89.5286683	25			DEEP																													
326	45.67564553	-89.5286707	0			DEEP																													
327	45.67535751	-89.5286732	0			DEEP																													
328	45.67506949	-89.5286756	0			DEEP																													
329	45.67478147	-89.528678	15		Rope																														
330	45.67449346	-89.5286804	5	Rock	Pole																														
331	45.6736294	-89.5286877	0			TERRESTRIAL																													
332	45.6767959	-89.5282502	12		Rope																														
333	45.67650788	-89.5282526	23			DEEP																													
334	45.67621987	-89.528255	24			DEEP																													
335	45.67593185	-89.5282575	0			DEEP																													
336	45.67564383	-89.5282599	0			DEEP																													
337	45.67535581	-89.5282623	0			DEEP																													
338	45.6750678	-89.5282647	0			DEEP																													
339	45.67477978	-89.5282671	0			DEEP																													
340	45.67449176	-89.5282696	16		Rope					1																									
341	45.67420374	-89.528272	112	Sand	Pole																														
342	45.67391573	-89.5282744	5	Sand	Pole		V																												
343	45.67362771	-89.5282768	1	Sand	Pole							1		1																					
344	45.67679421	-89.5278393	18		Rope																														
345	45.67650619	-89.5278418	24			DEEP																													
346	45.67621817	-89.5278442	0			DEEP																													
347	45.67593015	-89.5278466	0			DEEP																													
348	45.67564213	-89.527849	0			DEEP																													
349	45.67535412	-89.5278515	0			DEEP																													
350	45.6750661	-89.5278539	0			DEEP																													
351	45.67477808	-89.5278563	0			DEEP																													
352	45.67449006	-89.5278587	0			DEEP																													
353	45.67420205	-89.5278611	17		Rope																														
354	45.67391403	-89.5278636	12	Sand	Pole																														
355	45.67362601	-89.527866	1	Sand	Pole																														
356	45.67708052	-89.5274261	9	Rock	Pole																														
357	45.67679251	-89.5274285	25			DEEP																													
358	45.67650449	-89.5274309	0			DEEP																													
359	45.67621647	-89.5274333	0			DEEP																													
360	45.67592845	-89.5274358	0			DEEP																													
361	45.67564044	-89.5274382	0			DEEP																													
362	45.67535242	-89.5274406	0			DEEP																													
363	45.6750644	-89.527443	0			DEEP																													
364	45.67477638	-89.5274454	0			DEEP																													
365	45.67448837	-89.5274479	0			DEEP																													
366	45.67420035	-89.5274503	0			DEEP																													
367	45.67391233	-89.5274527	0			DEEP																													
368	45.67362431	-89.5274551	8	Sand	Pole																														
369	45.67707882	-89.5270152	23			DEEP																													
370	45.67679081	-89.5270176	0			DEEP																													
371	45.67650279	-89.52702	0			DEEP																													

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
372	45.67621477	-89.5270225	0			DEEP																													
373	45.67592675	-89.5270249	0			DEEP																													
374	45.67563874	-89.5270273	0			DEEP																													
375	45.67535072	-89.5270297	0			DEEP																													
376	45.6750627	-89.5270322	0			DEEP																													
377	45.67477468	-89.5270346	0			DEEP																													
378	45.67448667	-89.527037	0			DEEP																													
379	45.67419865	-89.5270395	0			DEEP																													
380	45.67391063	-89.5270419	0			DEEP																													
381	45.67362261	-89.5270443	12	Rock	Pole																														
382	45.67736514	-89.5266019	14		Rope																														
383	45.67707712	-89.5266043	25			DEEP																													
384	45.6767891	-89.5266067	0			DEEP																													
385	45.67650109	-89.5266092	0			DEEP																													
386	45.67621307	-89.5266116	0			DEEP																													
387	45.67592505	-89.526614	0			DEEP																													
388	45.67563703	-89.5266165	0			DEEP																													
389	45.67534902	-89.5266189	0			DEEP																													
390	45.675061	-89.5266213	0			DEEP																													
391	45.67477298	-89.5266237	0			DEEP																													
392	45.67448496	-89.5266262	0			DEEP																													
393	45.67419695	-89.5266286	0			DEEP																													
394	45.67390893	-89.526631	0			DEEP																													
395	45.67362091	-89.5266335	20		Pole																														
396	45.67333289	-89.5266359	11	Rock	Pole																														
397	45.67765145	-89.5261886	6	Rock	Pole																														
398	45.67736344	-89.526191	16		Rope																														
399	45.67707542	-89.5261935	0			DEEP																													
400	45.6767874	-89.5261959	0			DEEP																													
401	45.67649938	-89.5261983	0			DEEP																													
402	45.67621137	-89.5262007	0			DEEP																													
403	45.67592335	-89.5262032	0			DEEP																													
404	45.67563533	-89.5262056	0			DEEP																													
405	45.67534731	-89.526208	0			DEEP																													
406	45.6750593	-89.5262105	0			DEEP																													
407	45.67477128	-89.5262129	0			DEEP																													
408	45.67448326	-89.5262153	0			DEEP																													
409	45.67419524	-89.5262178	0			DEEP																													
410	45.67390723	-89.5262202	0			DEEP																													
411	45.67361921	-89.5262226	0			DEEP																													
412	45.67333119	-89.5262251	0			DEEP																													
413	45.67304317	-89.5262275	10	Rock	Pole																														
414	45.67764975	-89.5257777	8	Rock	Pole																														
415	45.67736173	-89.5257802	21			DEEP																													
416	45.67707371	-89.5257826	0			DEEP																													
417	45.6767857	-89.525785	0			DEEP																													
418	45.67649768	-89.5257875	0			DEEP																													
419	45.67620966	-89.5257899	0			DEEP																													
420	45.67592164	-89.5257923	0			DEEP																													
421	45.67563363	-89.5257948	0			DEEP																													
422	45.67534561	-89.5257972	0			DEEP																													
423	45.67505759	-89.5257996	0			DEEP																													
424	45.67476957	-89.525802	0			DEEP																													

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
425	45.67448156	-89.5258045	0			DEEP																													
426	45.67419354	-89.5258069	0			DEEP																													
427	45.67390552	-89.5258093	0			DEEP																													
428	45.6736175	-89.5258118	0			DEEP																													
429	45.67332949	-89.5258142	0			DEEP																													
430	45.67304147	-89.5258166	28			DEEP																													
431	45.67764804	-89.5253669	13		Rope																														
432	45.67736003	-89.5253693	14		Rope																														
433	45.67707201	-89.5253717	17		Rope																														
434	45.67678399	-89.5253742	0			DEEP																													
435	45.67649597	-89.5253766	0			DEEP																													
436	45.67620796	-89.525379	0			DEEP																													
437	45.67591994	-89.5253815	0			DEEP																													
438	45.67563192	-89.5253839	0			DEEP																													
439	45.6753439	-89.5253863	0			DEEP																													
440	45.67505589	-89.5253888	0			DEEP																													
441	45.67476787	-89.5253912	0			DEEP																													
442	45.67447985	-89.5253936	0			DEEP																													
443	45.67419183	-89.5253961	0			DEEP																													
444	45.67390381	-89.5253985	0			DEEP																													
445	45.6736158	-89.5254009	0			DEEP																													
446	45.67332778	-89.5254034	0			DEEP																													
447	45.67303976	-89.5254058	0			DEEP																													
448	45.67822237	-89.5249511	6	Sand	Pole																														
449	45.67793435	-89.5249535	14		Rope																														
450	45.67764633	-89.524956	15		Rope																														
451	45.67735832	-89.5249584	13		Rope																														
452	45.6770703	-89.5249609	11	Rock	Pole																														
453	45.67678228	-89.5249633	24			DEEP																													
454	45.67649427	-89.5249657	0			DEEP																													
455	45.67620625	-89.5249682	0			DEEP																													
456	45.67591823	-89.5249706	0			DEEP																													
457	45.67563021	-89.524973	0			DEEP																													
458	45.6753422	-89.5249755	0			DEEP																													
459	45.67505418	-89.5249779	0			DEEP																													
460	45.67476616	-89.5249804	0			DEEP																													
461	45.67447814	-89.5249828	0			DEEP																													
462	45.67419012	-89.5249852	0			DEEP																													
463	45.67390211	-89.5249877	0			DEEP																													
464	45.67361409	-89.5249901	0			DEEP																													
465	45.67332607	-89.5249925	0			DEEP																													
466	45.67303805	-89.524995	0			DEEP																													
467	45.67822066	-89.5245402	10	Sand	Pole																														
468	45.67793264	-89.5245427	17		Rope																														
469	45.67764463	-89.5245451	17		Rope																														
470	45.67735661	-89.5245475	13		Rope																														
471	45.67706859	-89.52455	15		Rope																														
472	45.67678057	-89.5245524	11	Rock	Pole																														
473	45.67649256	-89.5245549	22			DEEP																													
474	45.67620454	-89.5245573	0			DEEP																													
475	45.67591652	-89.5245597	0			DEEP																													
476	45.6756285	-89.5245622	0			DEEP																													
477	45.67534049	-89.5245646	0			DEEP																													

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
478	45.67505247	-89.5245671	0			DEEP																													
479	45.67476445	-89.5245695	0			DEEP																													
480	45.67447643	-89.5245719	0			DEEP																													
481	45.67418842	-89.5245744	0			DEEP																													
482	45.6739004	-89.5245768	0			DEEP																													
483	45.67361238	-89.5245793	0			DEEP																													
484	45.67332436	-89.5245817	0			DEEP																													
485	45.67303635	-89.5245841	0			DEEP																													
486	45.67821895	-89.5241294	9	Sand	Pole																														
487	45.67793093	-89.5241318	17		Rope																														
488	45.67764292	-89.5241342	21			DEEP																													
489	45.6773549	-89.5241367	21			DEEP																													
490	45.67706688	-89.5241391	21			DEEP																													
491	45.67677886	-89.5241416	14		Rope																														
492	45.67649085	-89.524144	0			DEEP																													
493	45.67620283	-89.5241464	0			DEEP																													
494	45.67591481	-89.5241489	0			DEEP																													
495	45.67562679	-89.5241513	0			DEEP																													
496	45.67533878	-89.5241538	0			DEEP																													
497	45.67505076	-89.5241562	0			DEEP																													
498	45.67476274	-89.5241587	0			DEEP																													
499	45.67447472	-89.5241611	0			DEEP																													
500	45.67418671	-89.5241635	0			DEEP																													
501	45.67389869	-89.524166	0			DEEP																													
502	45.67361067	-89.5241684	0			DEEP																													
503	45.67332265	-89.5241709	0			DEEP																													
504	45.67303463	-89.5241733	0			DEEP																													
505	45.67274662	-89.5241757	10	Rock	Pole																														
506	45.67821724	-89.5237185	6	Sand	Pole					1																									
507	45.67792922	-89.5237209	16		Rope																														
508	45.6776412	-89.5237234	22			DEEP																													
509	45.67735319	-89.5237258	0			DEEP																													
510	45.67706517	-89.5237283	0			DEEP																													
511	45.67677715	-89.5237307	0			DEEP																													
512	45.67648913	-89.5237331	0			DEEP																													
513	45.67620112	-89.5237356	0			DEEP																													
514	45.6759131	-89.523738	0			DEEP																													
515	45.67562508	-89.5237405	0			DEEP																													
516	45.67533706	-89.5237429	0			DEEP																													
517	45.67504905	-89.5237454	0			DEEP																													
518	45.67476103	-89.5237478	0			DEEP																													
519	45.67447301	-89.5237502	0			DEEP																													
520	45.67418499	-89.5237527	0			DEEP																													
521	45.67389698	-89.5237551	0			DEEP																													
522	45.67360896	-89.5237576	0			DEEP																													
523	45.67332094	-89.52376	0			DEEP																													
524	45.67303292	-89.5237625	0			DEEP																													
525	45.67274491	-89.5237649	12	Rock	Pole																														
526	45.67792751	-89.5233101	10	Sand	Pole																														
527	45.67763949	-89.5233125	23			DEEP																													
528	45.67735147	-89.5233149	0			DEEP																													
529	45.67706345	-89.5233174	0			DEEP																													
530	45.67677544	-89.5233198	0			DEEP																													

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
531	45.67648742	-89.5233223	23			DEEP																													
532	45.6761994	-89.5233247	19		Rope																									1					
533	45.67591138	-89.5233272	21			DEEP																													
534	45.67562337	-89.5233296	0			DEEP																													
535	45.67533535	-89.5233321	0			DEEP																													
536	45.67504733	-89.5233345	0			DEEP																													
537	45.67475932	-89.523337	0			DEEP																													
538	45.6744713	-89.5233394	0			DEEP																													
539	45.67418328	-89.5233418	0			DEEP																													
540	45.67389526	-89.5233443	0			DEEP																													
541	45.67360724	-89.5233467	0			DEEP																													
542	45.67331923	-89.5233492	0			DEEP																													
543	45.67303121	-89.5233516	0			DEEP																													
544	45.67274319	-89.5233541	18		Rope																														
545	45.67245517	-89.5233565	3	Sand	Pole																														
546	45.67763777	-89.5229016	12	Sand	Pole																														
547	45.67734976	-89.5229041	17		Rope																														
548	45.67706174	-89.5229065	15		Rope																														
549	45.67677372	-89.522909	14		Rope																														
550	45.6764857	-89.5229114	18		Rope																														
551	45.67619769	-89.5229139	24			DEEP																													
552	45.67590967	-89.5229163	28			DEEP																													
553	45.67562165	-89.5229188	0			DEEP																													
554	45.67533364	-89.5229212	0			DEEP																													
555	45.67504562	-89.5229237	0			DEEP																													
556	45.6747576	-89.5229261	0			DEEP																													
557	45.67446958	-89.5229286	0			DEEP																													
558	45.67418157	-89.522931	0			DEEP																													
559	45.67389355	-89.5229334	0			DEEP																													
560	45.67360553	-89.5229359	0			DEEP																													
561	45.67331751	-89.5229383	0			DEEP																													
562	45.67302949	-89.5229408	0			DEEP																													
563	45.67274148	-89.5229432	12		Rope																														
564	45.67734804	-89.5224932	5	Sand	Pole									1																					
565	45.67706002	-89.5224957	8	Sand	Pole																								1						
566	45.67677201	-89.5224981	8	Sand	Pole																														
567	45.67648399	-89.5225006	9	Rock	Pole																														
568	45.67619597	-89.522503	10	Rock	Pole																														
569	45.67590795	-89.5225055	11	Rock	Pole																														
570	45.67561994	-89.5225079	15		Rope																														
571	45.67533192	-89.5225104	31			DEEP																													
572	45.6750439	-89.5225128	0			DEEP																													
573	45.67475588	-89.5225153	0			DEEP																													
574	45.67446787	-89.5225177	0			DEEP																													
575	45.67417985	-89.5225202	0			DEEP																													
576	45.67389183	-89.5225226	0			DEEP																													
577	45.67360381	-89.5225251	0			DEEP																													
578	45.6733158	-89.5225275	0			DEEP																													
579	45.67302778	-89.52253	20		Rope																									1					
580	45.67273976	-89.5225324	9	Rock	Pole																														
581	45.6753302	-89.5220995	13		Rope																														
582	45.67504218	-89.522102	30			DEEP																													
583	45.67475417	-89.5221044	0			DEEP																													

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
584	45.67446615	-89.5221069	0			DEEP																													
585	45.67417813	-89.5221093	0			DEEP																													
586	45.67389011	-89.5221118	0			DEEP																													
587	45.6736021	-89.5221142	0			DEEP																													
588	45.67331408	-89.5221167	0			DEEP																													
589	45.67302606	-89.5221191	10	Rock	Pole											1																			
590	45.67273804	-89.5221216	2	Sand	Pole																														
591	45.67504046	-89.5216911	6	Rock	Pole																														
592	45.67475245	-89.5216936	31			DEEP																													
593	45.67446443	-89.521696	0			DEEP																													
594	45.67417641	-89.5216985	0			DEEP																													
595	45.67388839	-89.5217009	0			DEEP																													
596	45.67360038	-89.5217034	0			DEEP																													
597	45.67331236	-89.5217058	0			DEEP																													
598	45.67302434	-89.5217083	8	Rock	Pole					1																									
599	45.67273632	-89.5217107	0			TERRESTRIAL																													
600	45.67244831	-89.5217132	1	Muck	Pole		1			1				1																					
601	45.67532676	-89.5212778	6	Sand	Pole																														
602	45.67503874	-89.5212803	16		Rope																														
603	45.67475073	-89.5212827	0			DEEP																													
604	45.67446271	-89.5212852	0			DEEP																													
605	45.67417469	-89.5212876	0			DEEP																													
606	45.67388667	-89.5212901	0			DEEP																													
607	45.67359866	-89.5212925	0			DEEP																													
608	45.67331064	-89.521295	7	Rock	Pole																														
609	45.67302262	-89.5212974	1	Rock	Pole				1					1																					
610	45.6727346	-89.5212999	2	Muck	Pole		2							1												1									
611	45.67244659	-89.5213024	3	Muck	Pole		2													1								1	1						
612	45.67532504	-89.5208669	4	Sand	Pole					1				1																					
613	45.67503702	-89.5208694	21			DEEP																													
614	45.674749	-89.5208719	0			DEEP																													
615	45.67446099	-89.5208743	0			DEEP																													
616	45.67417297	-89.5208768	0			DEEP																													
617	45.67388495	-89.5208792	0			DEEP																													
618	45.67359693	-89.5208817	23		Rope																									1					
619	45.67330892	-89.5208841	5	Rock	Pole																														
620	45.67244486	-89.5208915	1	Muck	Pole		1	1			1			1					1																
621	45.6750353	-89.5204585	18		Rope																														
622	45.67474728	-89.520461	0			DEEP																													
623	45.67445926	-89.5204635	0			DEEP																													
624	45.67417124	-89.5204659	0			DEEP																													
625	45.67388323	-89.5204684	0			DEEP																													
626	45.67359521	-89.5204708	0			DEEP																													
627	45.67330719	-89.5204733	9	Rock	Pole																														
628	45.67301917	-89.5204758	1						1																										
629	45.67532159	-89.5200452	11	Sand	Pole																														
630	45.67503357	-89.5200477	16		Rope																														
631	45.67474555	-89.5200502	23		Rope																									1					
632	45.67445754	-89.5200526	0			DEEP																													
633	45.67416952	-89.5200551	30			DEEP																													
634	45.6738815	-89.5200575	0			DEEP																													
635	45.67359348	-89.52006	0			DEEP																													
636	45.67330547	-89.5200625	13		Rope																														

Point Number	LATITUDE	LONGITUDE	DEPTH	SEDIMENT	POLE_ROPE	COMMENTS	Brasenia schreberi	Dulichium arundinaceum	Elatine minima	Eleocharis acicularis	Eriocaulon aquaticum	Gratiola aurea	Isoetes sp.	Juncus pelocarpus	Lobelia dortmanna	Myriophyllum tenellum	Najas gracillima	Nitella sp.	Nymphaea odorata	Potamogeton epihydrus	Potamogeton praelongus	Potamogeton pusillus	Sparganium angustifolium	Sparganium natans	Utricularia geminiscapa	Utricularia gibba	Utricularia intermedia	Utricularia resupinata	Utricularia vulgaris	Aquatic Moss	Freshwater Sponge	Myriophyllum farwellii	Potamogeton bicupulatus	Juncus effusus	Schoenoplectus subterminalis
637	45.67301745	-89.5200649	1	Sand	Pole					1				1																					
638	45.67531986	-89.5196344	7	Sand	Pole																														
639	45.67503184	-89.5196368	15		Rope																														
640	45.67474383	-89.5196393	18		Rope																														
641	45.67445581	-89.5196418	14		Rope																														
642	45.67416779	-89.5196442	20		Rope																														
643	45.67387978	-89.5196467	0			DEEP																													
644	45.67359176	-89.5196492	0			DEEP																													
645	45.67330374	-89.5196516	18		Rope																														
646	45.67503012	-89.519226	5	Sand	Pole																														
647	45.6747421	-89.5192285	7	Sand	Pole					1																									
648	45.67445408	-89.5192309	7	Rock	Pole					1																									
649	45.67416606	-89.5192334	14		Rope																														
650	45.67387805	-89.5192359	18		Rope																														
651	45.67359003	-89.5192383	24		Rope																										1				
652	45.67330201	-89.5192408	20		Rope																										1				
653	45.673014	-89.5192433	1	Sand	Pole		1																	1											
654	45.67387632	-89.518825	8	Sand	Pole																														
655	45.6735883	-89.5188275	15		Rope																														
656	45.67330028	-89.51883	16		Rope																														
657	45.67301227	-89.5188324	4	Muck	Pole		V							1																					
658	45.67329855	-89.5184191	4	Sand	Pole						1																								

F

APPENDIX F

WDNR 2005 Fisheries Report.

Comprehensive Fisheries Survey of Mildred Lake, Oneida County Wisconsin during 2005.

Waterbody Identification Code 1004600

John Kubisiak
Senior Fisheries Biologist
Rhinelander
April, 2006

WISCONSIN
DEPT. OF NATURAL RESOURCES

SPORT FISH RESTORATION

Your purchase of fishing equipment and motor boat fuel supports boating access and Sport Fish Restoration.

Comprehensive Fisheries Survey of Mildred Lake, Oneida County Wisconsin during 2005.

John Kubisiak
Senior Fisheries Biologist
April, 2006

EXECUTIVE SUMMARY

A comprehensive fisheries survey of Mildred Lake was conducted during spring, 2005. Smallmouth bass (population estimate, PE = 8.2 per acre) and largemouth bass (PE = 2.9 per acre) were the dominant gamefish, with low numbers of walleye (PE = 0.8 adults per acre), northern pike (PE = 0.7 per acre) and muskellunge. Bass were somewhat slow-growing, while growth of other gamefish was close to the regional average. Panfish species included black crappie, bluegill, pumpkinseed, bluegillxpumpkinseed hybrids, yellow perch, and yellow bullheads. White sucker and Iowa darter were also present. Panfish abundance was low, with poor size structure. Bluegill length-at-age was below average, especially for ages 6 and under. Black crappie, yellow perch and pumpkinseed growth rates were average or above.

I recommend continuing to manage Mildred Lake for bass and panfish. Muskellunge may provide a low-density stocked fishery with potential for quality size.

Lake and location: Mildred Lake, Oneida County, T37N R8E Sec20. Located in south-central Oneida County in the town of Newbold, about 7 miles northwest of Rhinelander. Mildred is part of the Upper Wisconsin River watershed and is connected to Clear Lake by a narrow channel.

Physical/Chemical attributes (Andrews and Threinen 1966):
Morphometry: 191 acres, maximum depth 45 feet.
Watershed: 3 square miles, including 2 acres of adjoining wetlands.
Lake type: Seepage (No outlet. Connected to Clear Lake by a narrow channel; Maud Lake has an overflow connection to Clear).
Basic water chemistry: Very soft – alkalinity 6 mg/l, conductance 18 μmhos.
Water clarity: Clear water of high transparency.
Littoral substrate: 65% sand, 15% rubble, 10% gravel and some boulders and muck.
Aquatic vegetation: Floating and submergent plants moderate in the west bay and along scattered portions of shoreline.
Winterkill: None.
Boat landing: Asphalt and concrete ramp with parking for four vehicles with trailers.
Other features: Shoreline 99% upland with a limited area of bog wetland.

Purpose of Survey: Assess status of gamefish, panfish and non-game species and develop management recommendations.

Dates of fieldwork: Walleye netting, April 12-18 2005.
Panfish netting June 13-17 2005.
Mini-fyke netting August 9-10 2005.
Hook & line bass marking June 2 2005.
Electroshocking (entire shoreline) April 18, May 24, June 6 and September 20 2005.

BACKGROUND

Little historic survey information exists for Mildred Lake. An August 15 1955 visit indicated presence of perch, bluegill, northern pike and largemouth bass. A temperature and dissolved oxygen profile was taken, and likely set the stage for stocking of brook trout in 1957 and 58. However, trout stocking was discontinued, probably because of the lack of public access at that time. Four seine hauls on August 19 1980 found yellow perch, bluegill, largemouth bass and pumpkinseed (file data).

METHODS

Ice still covered portions of the west basin of Mildred Lake when eight standard fyke nets (3/4" bar measure) were set on April 12, 2005. These nets targeted walleye and northern pike and were fished through April 17 (when five were pulled) or 18. Six standard fyke nets were fished June 13-17 (targeting panfish). Six mini-fyke nets (3/16" bar mesh with 1" bar mesh exclusion netting across the mouth) were fished one night on August 9-10 (targeting juvenile and non-game fish). A WDNR-standard alternating current electrofishing boat was used to collect fish on April 18, May 24, June 6 and September 20, 2005. Hook and line marking of bass was conducted on June 2. Length or length category (nearest half-inch) was recorded for all gamefish and on panfish during June. Adult gamefish were given a right-ventral fin clip and juveniles were given a top-tail clip for use in mark-recapture population estimates. Age structures (scales or spines) were removed from ten fish per species, per half-inch group.

RESULTS AND DISCUSSION

Walleye

During walleye netting, 128 walleye were captured in 6 nights (including 36 recaptures), at a rate of 2.7 walleye per net night (Table 1). Another 3 unmarked walleye were captured during panfish netting. The first electrofishing sample on April 18 yielded 26 walleye (5.1 fish per mile), and subsequent electrofishing runs produced 0 and 1 walleye. The mark-recapture population estimate of 154 adult walleye ($\pm$ 21.7 SD), or 0.8 per acre, is below the 1.0 per acre benchmark to be considered a fishable-size population. There is no record of walleye being stocked in Mildred Lake since a 1934 stocking of 172,440 (presumably fry,Table 2). However, it is rumored that undocumented stocking of both walleye and muskellunge occurred about 10 to 15 years ago. The limited amount of suitable spawning gravel and the presence of only a few yearclasses are consistent with this scenario. Walleye growth varied widely among individual fish, but mean length-at-age was mostly near the regional average (Appendix A).

Table 1. Fish catch per unit effort during spring, 2005 comprehensive survey of Mildred Lake, Oneida County Wisconsin. Netting catch rates are reported as number of fish per net night, while electrofishing catch rates are number of fish per mile of shoreline. Panfish data were not collected during all sampling events and were only collected on two 0.5-mile index stations on September 20.

species	walleye netting	April 18 shocking	May 24 shocking	June 6 shocking	panfish netting	Aug 10 mini-fyke	Sept 20 shocking
walleye	3.4	5.1	0	0.2	0.1	0	0.2
largemouth bass	0.3	11.8	8.6	12.9	0.8	8.8	8.2
smallmouth bass	0.4	18.8	22.9	21.2	1.2	2.3	18.0
muskellunge	0.2	1.8	0.8	1.0	0.08	0	0.6
northern pike	1.1	0.2	1.0	0.4	1.3	0	0
black crappie	15.5				3.7	2.2	1.0
bluegill	12.4				19.9	39.2	55.0
hybrid bluegill xpumpkinseed	0.1				0.04	0	0
Iowa darter	0				0	0.3	0
pumpkinseed	0.1				0.5	0.3	1.0
white sucker	1.9				0.1	0	0
yellow bullhead	0.7				1.8	1.7	1.0
yellow perch	1.8				0.08	6.5	7.0

Figure 1. Length-frequency of adult walleye during 2005 in Mildred Lake, Oneida County Wisconsin.

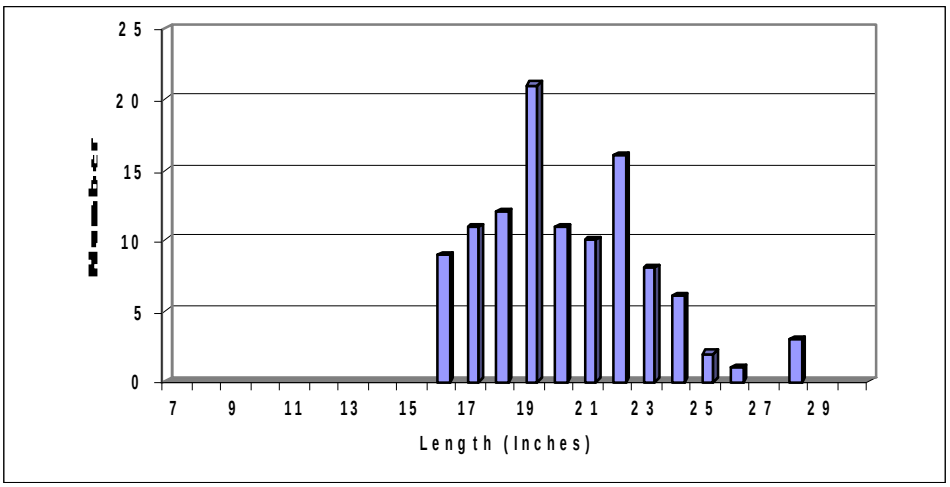


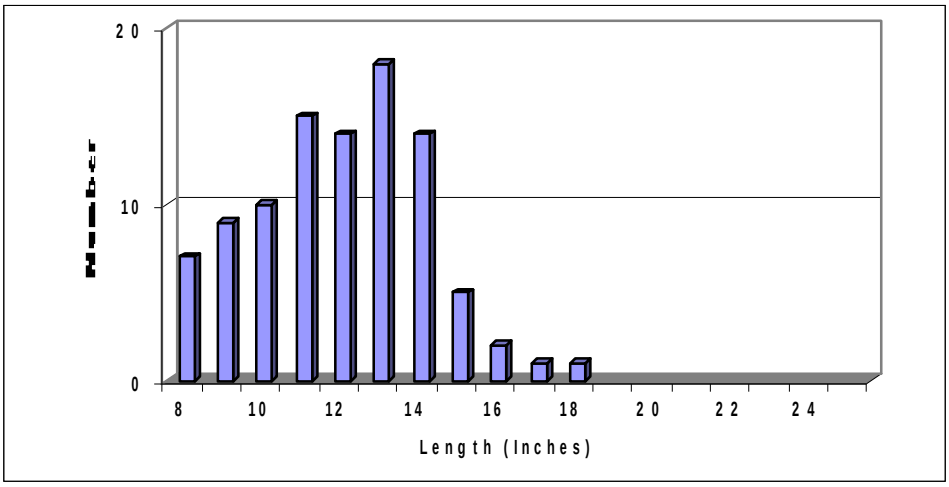
Table 2. Fish stocking record through 2005 in Mildred Lake, Oneida County Wisconsin.

Year	Species	Size	Number
1934	walleye		172,440
1936	bass		140
1936	perch		3,500
1941	bullhead	adult	2,500
1941	perch	adult	300
1941	perch	fingerling	2,700
1941	shiners	fingerling	1,000
1941	sucker	adult	2,000
1941	sunfish	adult	500
1957	brook trout	fingerling	21,420
1958	brook trout	fingerling	13,965
1980	muskellunge	large fingerling	400
2004	muskellunge	large fingerling	191

Smallmouth Bass

Three hundred seventy-seven smallmouth bass were captured (including recaptures and juvenile fish) during spring sampling. The adult (greater than 8 inches) smallmouth bass population was estimated at 1,569 (± 420 SD), or 8.2 per acre. Smallmouth bass length-at-age was behind the regional average after age two (Appendix A), likely due to high abundance and competition for food. Smallmouth bass length-frequency (Figure 2) indicates adult size centered on 13 inches, with a decline in numbers after 14 inches. The proportion of the population (Relative Stock Density, RSD) contributed by 14-inch and larger fish (i.e., RSD-14) was 4%. The largest smallmouth handled was 18.1 inches.

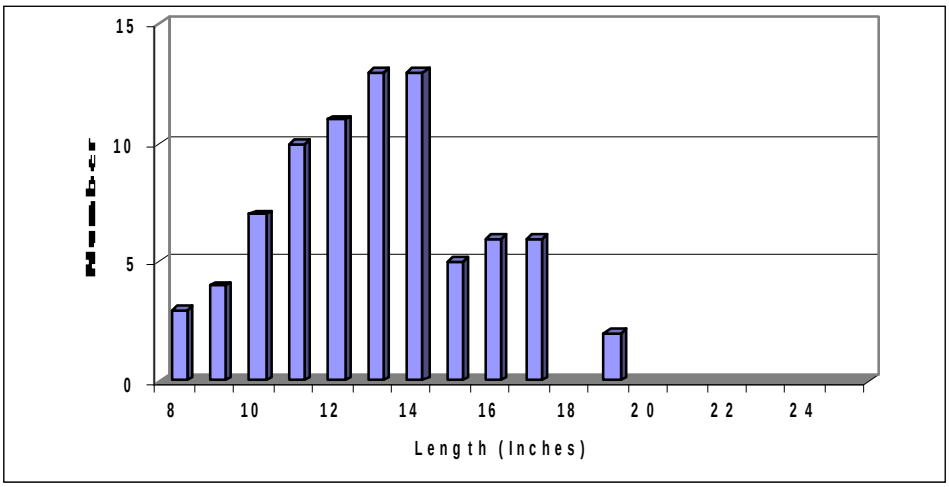
Figure 2. Length-frequency of smallmouth bass during 2005 in Mildred Lake, Oneida County Wisconsin.



Largemouth Bass

The adult largemouth bass population was estimated at 544 (± 134 SD), or 2.9 per acre. The largest largemouth was 19.9 inches. Most of the 211 handled were less than 15 inches (Figure 3), but the RSD-14 shows that 40% of the sample was contributed by fish 14 inches and larger. Growth rates were slightly below average (Appendix A). Length-frequencies for both species of bass show an abrupt decrease in the abundance of bass 15 inches and larger, likely due to angler harvest of legal-size bass coupled with slow growth.

Figure 3. Length-frequency of largemouth bass during 2005 in Mildred Lake, Oneida County Wisconsin.



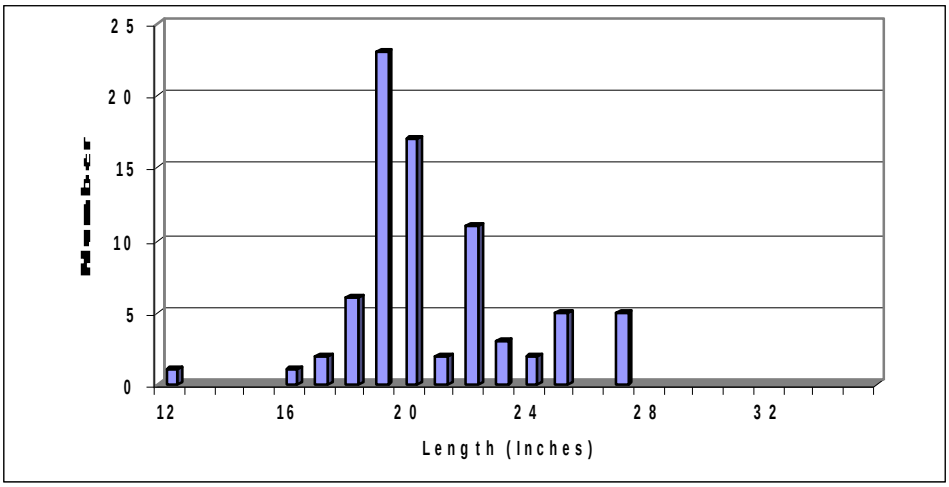
Northern Pike

Eighty-nine northern pike were captured (including 3 juveniles and 16 recaptures), all gears combined. The northern pike population (including sexually mature fish and all fish over 12 inches) was estimated at 134 (± 33 SD), or 0.7 per acre using the Schnabel multiple-capture method (Ricker 1975). Northern pike populations less than 2 adults per acre are considered low-density. Average size of adult northern pike was 20.9 inches and the largest northern pike was a 27.9 inch female (Figure 4). Northern pike length-at-age varied widely among individual fish, but averaged very close to regional values (Appendix A). Spawning habitat for northern pike is very limited, but pike may immigrate to Mildred from connected Clear Lake.

Muskellunge

Three adult male and 26 juvenile muskellunge were captured during the spring survey. One adult male and two juvenile muskellunge were captured during fall shocking. The adult muskellunge measured 37.4, 41.1, 41.2 and just over 44 inches long. Muskellunge were stocked in Mildred Lake in 1980 and 2004 (Table 2). It is likely that the adult fish originated from undocumented stockings over a decade ago. The juveniles were all stocked in 2004. They averaged about 11 inches in spring samples and 17.5 inches in fall.

Figure 4. Length-frequency of adult northern pike during 2005 in Mildred Lake, Oneida County Wisconsin.



Panfish

Mildred is a clear, relatively infertile lake with a low amount of aquatic vegetation. This results in low abundance of panfish species, with the exception of black crappie. Size structure of all panfish species was generally poor, but a few quality-size bluegill and black crappie were found (Figures 5 – 9). Bluegill were slow-growing (Appendix A), possibly due to the low primary productivity of Mildred. However, other panfish species were growing at or above the regional averages (Appendix A). Early spring netting showed good catches of bluegill and black crappie, while a moderate catch of bluegill dominated June panfish netting (Table 1). June bluegill catch rates of 20 per net night are low, but within the normal range. Bluegill size was centered at 4 to 4.5 inches, and large numbers of these smaller fish were concentrated in vegetated shallows. A few larger bluegill could be found scatted in deeper water around the lake. Black crappie length-frequency (Figure 7) was centered on 7.5 inches. Several yearclasses were present, including a few quality-size crappie up to 13.2 inches. Most yellow perch were age 2 and 3, resulting in poor size despite adequate growth rates (Figure 8). This could be due to sporadic recruitment, or because older fish were cropped off by predators. No rock bass were encountered in the survey, and it appears that this species is absent from the lake.

Figure 5. Length-frequency of bluegill during 2005 in Mildred Lake, Oneida County Wisconsin.

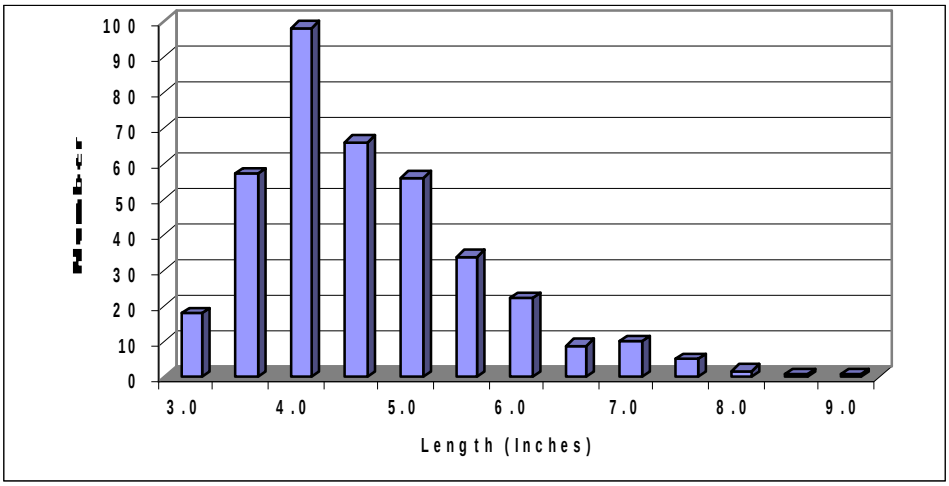


Figure 6. Length-frequency of pumpkinseed during 2005 in Mildred Lake, Oneida County WI.

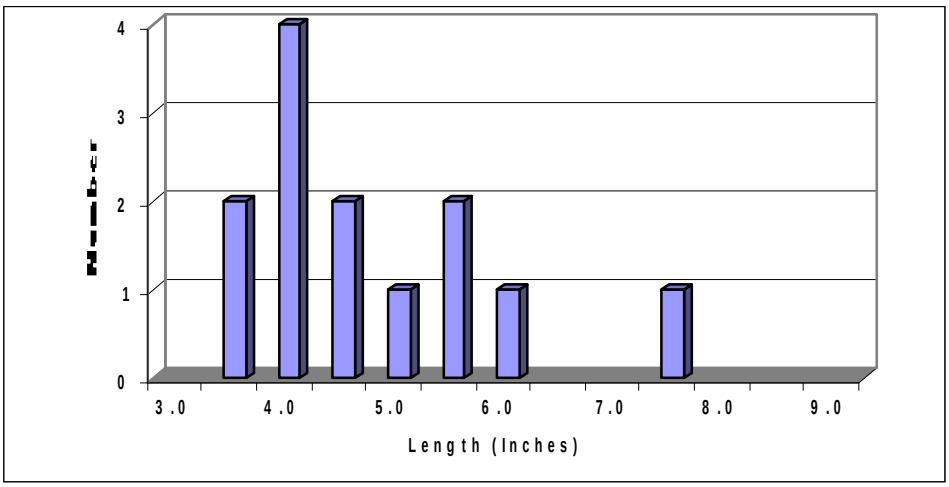


Figure 7. Length-frequency of black crappie during 2005 in Mildred Lake, Oneida County WI.

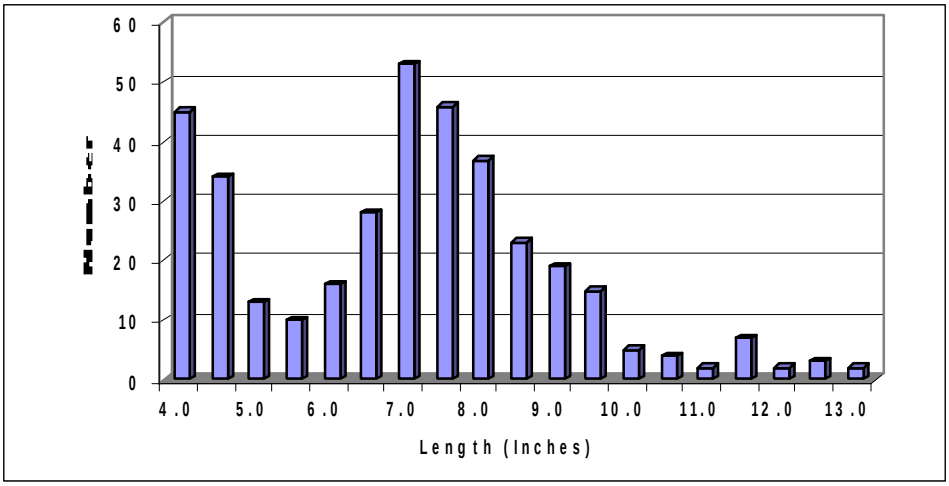


Figure 8. Length-frequency of yellow perch during 2005 in Mildred Lake, Oneida County WI.

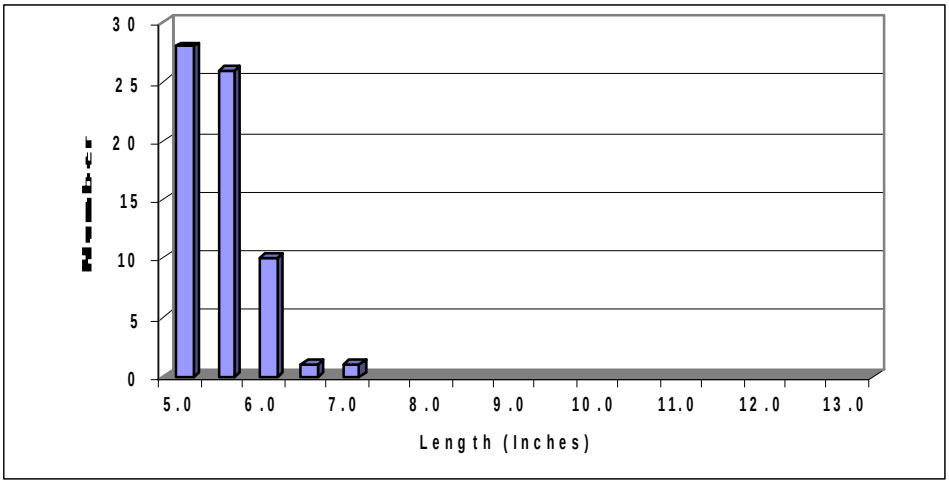
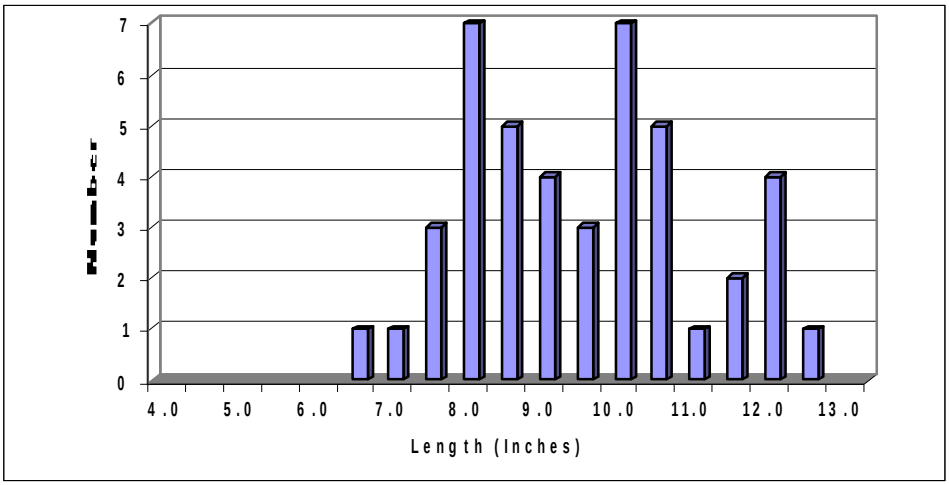


Figure 9. Length-frequency of yellow bullhead during 2005 in Mildred Lake, Oneida County WI.



MANAGEMENT RECOMMENDATIONS

Mildred Lake supported a strong bass fishery, although numbers of both species dropped off dramatically at 15 inches, likely due to angler harvest and slow growth. Northern pike, muskellunge and walleye were present at low densities, with the latter two populations likely a result of undocumented stockings reported from around a decade ago. Bluegill were the dominant panfish, showing moderate density for that species. Black crappie were relatively abundant, with several yearclasses present. Yellow bullhead showed good size and abundance, while low numbers of yellow perch and pumpkinseed were present. Mildred is best managed as a bass-panfish fishery. Muskellunge and walleye are unlikely to be sustained with natural reproduction, but may be supported with maintenance stocking. Muskellunge may provide some additional angling opportunity and have trophy potential if maintained at a low density. Walleye stocking would likely show poor success given the current populations of bass and crappie.

ACKNOWLEDGEMENTS

Steve Gilbert, Dennis Goulee, Fred Hagstrom, Aaron Nelson, Steve Timler, Mike Vogelsang and Doug Yonker assisted in the field. Aaron Nelson and I assigned ages from fish scales. Aaron Nelson entered and summarized data. Mike Coshun calculated walleye and bass population estimates.

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Andrews, L. M. and C. W. Threinen. 1966. Surface water resources of Oneida County. Wisconsin Conservation Department, Madison, Wisconsin. 284 pages.

Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish populations. Bull 191, Dept. Env. Fish. Mar. Sci., Ottawa.

Cover image courtesy of TerraServer-USA website and the United States Geological Survey. http://terraserver-usa.com

APPENDIX A
FISH AGE RESULTS

Age structures (scales or spines) were removed from ten fish per species, per half-inch group. The aged sub-samples were applied against the spring length-frequency to eliminate bias when average lengths were calculated for species with more than 50 lengths recorded. Lengths are reported in inches and weights are in pounds.

Table A.1. Female walleye length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2000 and 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
3			13.0	
4			14.7	
5			16.0	
6			17.6	
7	1	22.3	19.5	3.75
8	2	18.8	21.2	2.31
9	5	23.9	22.6	4.56
10	7	21.8	23.8	3.72
11	10	22.6	24.9	4.25
12	3	22.5	25.8	4.21
13	3	23.6	26.9	4.69
14	0		27.5	
15	2	22.9	28.0	3.97
16	1	28.3	27.7	9.30

Table A.2. Male walleye length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2000 and 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
3			11.6	
4			13.0	
5	1	17.3	14.5	1.63
6	5	16.5	15.8	1.43
7	4	18.0	16.9	1.89
8	7	18.2	18.1	1.99
9	11	19.2	18.9	2.28
10	8	19.5	19.7	2.27
11	6	19.9	20.4	2.53
12	2	21.5	20.6	2.91
13	3	21.1	21.3	2.96
14	3	21.8	22.0	3.25
15	1	24.3	21.6	4.44

Table A.3. Smallmouth bass length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
1	1	4.3	3.5	
2	12	6.4	6.9	0.13
3	33	8.9	9.3	0.40
4	19	11.1	11.8	0.72
5	7	12.8	13.5	1.03
6	13	13.7	15.2	1.24
7	15	14.1	16.1	1.53
8	2	13.9	17.1	1.72
9	1	18.3	17.7	3.13

Table A.4. Largemouth bass length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
3	9	8.9	8.9	0.19
4	16	10.2	10.5	0.43
5	9	11.9	12.1	0.73
6	13	13.3	13.6	1.20
7	14	13.5	14.9	1.18
8	10	14.1	15.8	1.58
9	8	15.4	16.2	1.78
10	5	16.6	17.1	2.40
11	2	16.9	17.8	3.25
14	1	19.8		5.06

Table A.5. Female northern pike length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
1			13.1	
2			14.4	
3	2	19.1	16.9	1.38
4			20.4	
5	4	22.9	23.1	2.28
6	3	22.1	24.4	2.04
7	2	27.6	27.3	3.72
8	2	22.3	28.8	2.09
9			32.1	
10	1	27.6	33.8	3.31

Table A.6. Male northern pike length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
1			10.7	
2			13.4	
3	2	17.2	16.2	1.00
4	8	19.6	18.9	1.51
5	1	23.3	20.6	2.50
6	5	19.9	22.3	1.61
7	2	22.0	23.4	2.03
8	1	19.2	24.8	1.38
9	1	20.3	23.9	1.75
10	1	22.5	21.5	

Table A.7. Male muskellunge length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005. No females were captured.

Age	Number of fish	Mildred length	Northern WI avg	Mildred avg weight
10	1	41.2	37.3	19.10
18	1	44.0		
20	1	41.1		18.19

Table A.8. Bluegill length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
1	1	2.3	2.5	0.007
2	8	3.2	3.9	0.015
3	20	4.2	5.0	0.039
4	30	4.8	6.2	0.096
5	12	5.6	6.8	0.146
6	5	5.8	7.8	0.159
7	10	7.2	8.2	0.300
8	3	6.9	8.7	0.328
9	2	7.8	8.7	0.386

Table A.9. Black crappie length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
1	28	4.5	3.4	0.037
2	41	6.7	5.3	0.138
3	34	7.7	7.1	0.234
4	20	9.3	9.0	0.542
5	19	10.0	10.0	0.649
6	10	10.8	10.7	0.821
7	2	12.3	11.6	1.280
8	2	12.8	11.7	1.312
9	3	12.4	10.4	1.105

Table A.10. Yellow perch length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
1			3.0	
2	11	5.6	4.6	0.068
3	22	6.0	6.0	0.088
4	7	6.7	6.9	0.127
5	1	7.8	7.9	0.194
6			9.0	
7			9.9	
8			10.8	
9			12.1	

Table A.11. Pumpkinseed length- and weight-at-age in Mildred Lake, Oneida County Wisconsin during 2005.

Age	Number of fish	Mildred avg length	Northern WI avg	Mildred avg weight
1			2.2	
2			3.6	
3	3	5.0	4.8	0.109
4	3	5.1	5.7	0.108
5	1	6.2	6.5	
6			6.8	
7			7.3	

G

APPENDIX G

WDNR Fisheries Habitat Materials.

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WISCONSIN
DEPT. OF NATURAL RESOURCES

March 23, 2011

Subject: Fish habitat structures

Here is the information you requested on fish cribs and other habitat structures.

A permit is required to place these structures on waters designated "Area of Special Natural Resource Interest" (ASNRI). You are exempt from a permit on non-ASNRI waters as long as you follow our guidelines. ASNRI status can be found on the DNR websitehttp://dnr.wi.gov/waterways/shoreline_habitat/fish_wildlife.html or you may submit a Chapter 30 Exemption Determination Request.

Fish Cribs (design advice enclosed) are good for attracting and increasing harvest on fish, but the jury is still out as to whether they provide much benefit in increasing overall fish numbers. Cribs are also below the thermocline and are unavailable during summer in most lakes, due to oxygen depletion. I believe they do provide some positive benefits if placed in large numbers (to spread the fish out and distribute angler pressure), are properly constructed (lots and lots of brush woven in the structure) and in the proper situation (lakes without much natural vegetation or other habitat). A poor choice on lakes with stunted panfish, because adding more cover simply increases the number of places for overabundant fish to hide from predators.

Tree-drop structures consist of a whole tree or tree top dropped near shore. The butt is cabled to the stump or anchored with earth anchors to prevent being pulled offshore by waves or ice. A tree should not be placed over gravel spawning areas because it may cause silt to build up. Studies have shown that loss of nearshore trees and brush (as often happens when shorelines are developed) has a negative impact on fish abundance and growth rates. Tree-drops help correct this situation by increasing the amount of nearshore cover, thereby providing more locations for young-of-year fishes and panfish to hide and grow.

Half-log structures are created by attaching a hardwood log that has been halved lengthwise to two cinder blocks using rebar. Half logs provide spawning cover for bass, especially smallmouth. Appropriate to enhance bass fisheries where little natural cover and underwater structure exists.

I hope this information is of use.

Sincerely,

John Kubisiak
Fisheries Biologist – Oneida County

Certain activities in navigable waters are exempt from needing a permit under chapter 30, Wisconsin Statutes. Using this checklist, you can determine if your project qualifies for an exemption.

Your proposed **fish crib** is eligible for an exemption if your project will meet all the following conditions:

- ❑ The fish crib may not be located in an area of special natural resource interest (ASNRI) – see the Designated Waters Search on DNR's website to determine if your waterway is an ASNRI or has another special designation.
- ❑ The fish crib may be placed and maintained only by a riparian, and shall be placed entirely within the riparian's zone of interest.
- ❑ The fish crib must be placed solely for the purpose of improving fish habitat.
- ❑ The riparian shall report the placement of the structure to the local department fisheries biologist within 30 days after placement. The report shall contain a description of the project and its purpose, the name of the waterway and a map showing where the structure was placed.
- ❑ A deposit of sand, gravel or stone may be associated with the placement of a fish crib provided the deposit is limited to the area immediately underneath or within one foot of the structure and is less than 2 cubic yards.
- ❑ Dredging is not allowed for the placement of a fish crib.
- ❑ To protect fish habitat during spawning seasons, the fish crib may not be placed during the following time periods:
  - (a) For trout streams and perennial tributaries to trout streams, September 15 through May 15.
  - (b) For all waters not identified in (a) and south of State Highway 29, March 15 through May 15.
  - (c) For all waters not identified in (a) and north of State Highway 29, April 1 through June 1.
- ❑ Fish cribs shall have a minimum of 5 feet of water over the top of the structure. The depth and clearance of the fish cribs shall be based on the normal lowest water level condition in a calendar year.
- ❑ Fish cribs shall be constructed of biological materials, with the exception of fastening and anchoring devices.
- ❑ The dimensions of a fish crib shall be no larger than 8 feet tall by 8 feet long by 8 feet wide.
- ❑ Fish cribs may not be placed within 100 feet of swimming beaches or swim rafts.
- ❑ Fish cribs may not be located in soft sediment or muck that is greater than 12 inches in depth.
- ❑ Fish cribs may not be placed where the bottom contour of the waterway exceeds a slope of 4-foot horizontal to one-foot vertical.
- ❑ Proper erosion control measures shall be used during installation (to prevent soils from eroding into the waterway), removed after work is complete, and any disturbed areas restored.

f your project does not meet all of these conditions, submit a permit application to the Department.

If you have any questions about whether you meet these conditions, you may request an Exemption Determination from DNR. Obtain Form 3500-107, "Chapter 30 Exemption Determination Request" from a DNR service center or visit the website **http://dnr.wi.gov/org/water/fhp/waterway/permits/exemptionrequest.pdf** or search for it on our website at www.dnr.wi.gov under the topic "Waterway and Wetland Permits." Complete the form and submit it to the DNR office identified on the form.

Certain activities in navigable waters are exempt from needing a permit under chapter 30, Wisconsin Statutes. Using this checklist, you can determine if your project qualifies for an exemption.

Your proposed **half-log structure** is eligible for an exemption if your project will meet all the following conditions:

- ❑ The half-log structure may not be located in an area of special natural resource interest (ASNRI) – see the Designated Waters Search on DNR's website to determine if your waterway is an ASNRI or has another special designation.
- ❑ The half-log structure may be placed and maintained only by a riparian, and shall be placed entirely within the riparian's zone of interest.
- ❑ The half-log structure must be placed solely for the purpose of improving fish habitat.
- ❑ The riparian shall report the placement of the structure to the local department fisheries biologist within 30 days after placement. The report shall contain a description of the project and its purpose, the name of the waterway and a map showing where the structure was placed.
- ❑ A deposit of sand, gravel or stone may be associated with the placement of a half-log structure provided the deposit is limited to the area immediately underneath or within one foot of the structure and is less than 2 cubic yards.
- ❑ Dredging is not allowed for the placement of a half-log.
- ❑ To protect fish habitat during spawning seasons, the half-log may not be placed during the following time periods:
  - (a) For trout streams and perennial tributaries to trout streams, September 15 through May 15.
  - (b) For all waters not identified in (a) and south of State Highway 29, March 15 through May 15.
  - (c) For all waters not identified in (a) and north of State Highway 29, April 1 through June 1.
- ❑ Half-logs shall be constructed from green logs with a minimum diameter of 10 inches and spacers may not exceed 12 inches in height.
- ❑ Half-logs shall be placed where the bottom substrate composition consists of sand and/or gravel.
- ❑ Half-logs may not be placed in water deeper than 5 feet.
- ❑ Half-logs placed in lakes or flowages may not be located greater than 100 feet from shore, or within 100 feet of a swim raft.
- ❑ Proper erosion control measures shall be used during installation (to prevent soils from eroding into the waterway), removed after work is complete, and any disturbed areas restored.

If your project does not meet all of these conditions, submit a permit application to the Department.

If you have any questions about whether you meet these conditions, you may request an Exemption Determination from DNR. Obtain Form 3500-107, "Chapter 30 Exemption Determination Request" from a DNR service center or visit the website **http://dnr.wi.gov/org/water/fhp/waterway/permits/exemptionrequest.pdf** or search for it on our website at www.dnr.wi.gov under the topic "Waterway and Wetland Permits." Complete the form and submit it to the DNR office identified on the form.

Certain activities in navigable waters are exempt from needing a permit under chapter 30, Wisconsin Statutes. Using this checklist, you can determine if your project qualifies for an exemption.

Your proposed **tree drop** is eligible for an exemption if your project will meet all the following conditions:

- ❑ The tree drop may not be located in an area of special natural resource interest (ASNRI) or within a public rights feature (PRF) – see the Designated Waters Search on DNR's website to determine if your waterway is an ASNRI, PRF or has another special designation.
- ❑ The tree drop may be placed and maintained only by a riparian
- ❑ The tree drop shall be placed entirely within the riparian's zone of interest.
- ❑ The tree drop must be placed solely for the purpose of improving fish habitat.
- ❑ The riparian shall report the placement of the structure to the local department fisheries biologist within 30 days after placement. The report shall contain a description of the project and its purpose, the name of the waterway and a map showing where the structure was placed.
- ❑ A deposit of sand, gravel or stone may be associated with the placement of a tree drop provided the deposit is limited to the area immediately underneath or within one foot of the structure and is less than 2 cubic yards.
- ❑ Dredging is not allowed for the placement of a tree drop.
- ❑ To protect fish habitat during spawning seasons, the tree drop may not be placed during the following time periods:

  (a) For trout streams and perennial tributaries to trout streams, September 15 through May 15.

  (b) For all waters not identified in (a) and south of State Highway 29, March 15 through May 15.

  (c) For all waters not identified in (a) and north of State Highway 29, April 1 through June 1.
- ❑ Tree drops may only be placed in lakes or flowages.
- ❑ Tree drops shall use live trees having a minimum diameter of 12 inches at the base.
- ❑ Tree drops shall be securely anchored to the shore at intervals no less than 50 feet apart.

  Note: Local zoning ordinances may place restrictions on cutting trees in the shoreland zone. The riparian is responsible for ensuring that their tree drop project is in compliance with any local zoning requirements.
- ❑ Proper erosion control measures shall be used during installation (to prevent soils from eroding into the waterway), removed after work is complete, and any disturbed areas restored.

If your project does not meet all of these conditions, submit a permit application to the Department.

If you have any questions about whether you meet these conditions, you may request an Exemption Determination from DNR. Obtain Form 3500-107, "Chapter 30 Exemption Determination Request" from a DNR service center or visit the website **http://dnr.wi.gov/org/water/fhp/waterway/permits/exemptionrequest.pdf** or search for it on our website at www.dnr.wi.gov under the topic "Waterway and Wetland Permits." Complete the form and submit it to the DNR office identified on the form.