A

APPENDIX A

Public Participation Materials

Presentation Outline

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

Onterra, LLC

- Founded in 2005
- Staff
  - Five full-time ecologists
  - One part-time ecologist
  - One intern
- Services
  - Science and planning
- Philosophy
  - Promote realistic planning
  - Assist, not direct

Why create a lake management plan?

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

Elements of an Effective Lake Management Planning Project

Data and Information Gathering

Environmental & Sociological

Planning Process

Brings it all together

Data and information gathering

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

Water Quality Analysis

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

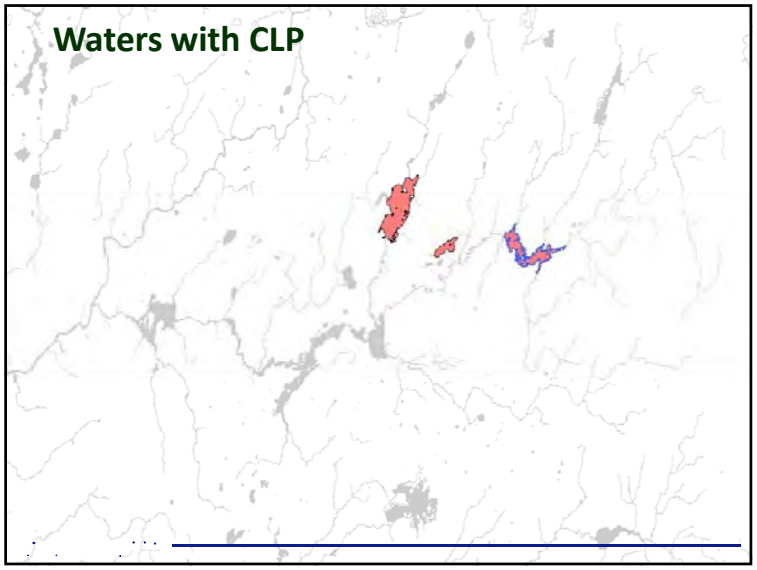
Watershed Assessment

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

Non-native Aquatic Plants

Curly-leaf Pondweed

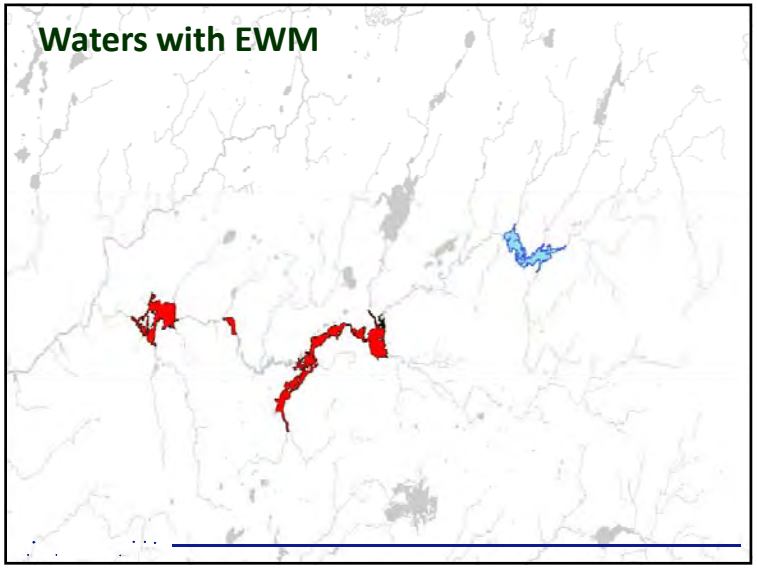
Waters with CLP



Non-native Aquatic Plants

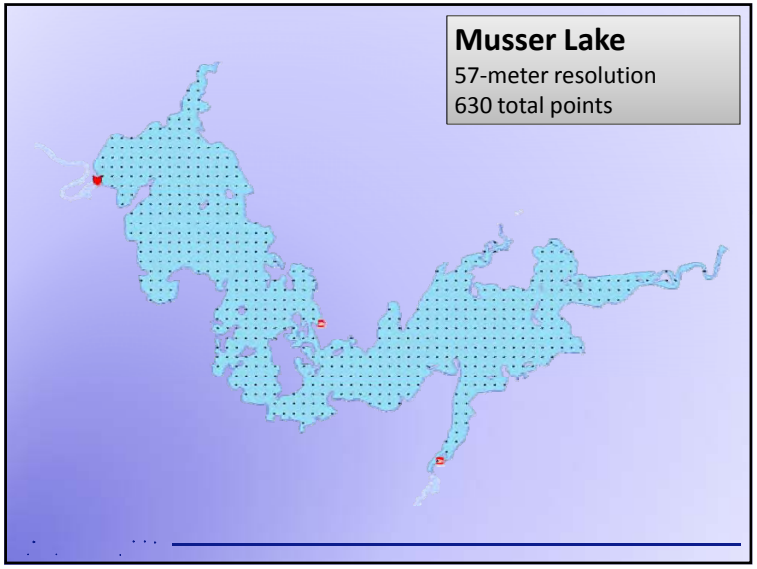
Eurasian Water Milfoil

Waters with EWM



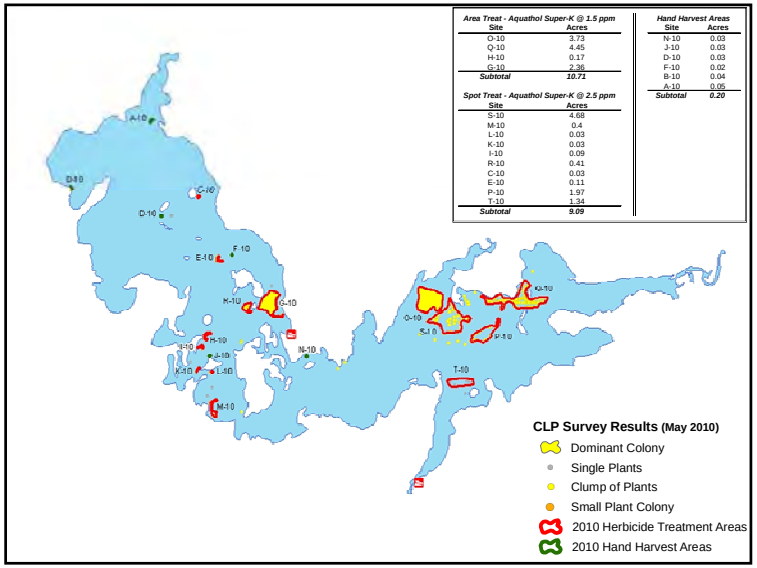
Aquatic Plant Surveys

- 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



CLP Treatment Monitoring

- Two types of monitoring are used to determine treatment effectiveness
  - Qualitative monitoring
    - CLP Mapping
  - Quantitative monitoring
    - Modified point-intercept method using predetermined plots

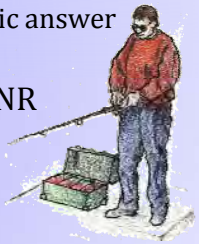


Fisheries Data Integration

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

Stakeholder Survey

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



Shoreland Assessment

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

Urbanized

Range

Natural

Planning Process

Planning Committee Meetings

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

Implementation Plan

AIS Identification Training

Eurasian Water Milfoil

Curly-leaf Pondweed

EWM Identification

Key Characteristics:
- 25 or more total leaflets on at least one leaf
- Almost always in whorls of 4 leaves
- Large spacing between whorls
- Although stem and growing tip of plant can have a red appearance, so can other native milfoils present in the system. Please do not use color alone.

CLP Identification

'Lasagna-noodle' Appearance

Turion

Key Characteristics:
- Leaf tips are rounded
- Leaf margins are serrated (toothed)
- Leaves are alternately arranged
- Leaves are directly attached to the stem (not clasping)
- Leaves are 'ruffled' and can resemble lasagna noodles
- Hard reproductive turions are produced where the leaf meets the stem

Thank You

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

Wisconsin Lakes Partnership

UW Extension

Wisconsin Dept. of Natural Resources

Presentation Outline

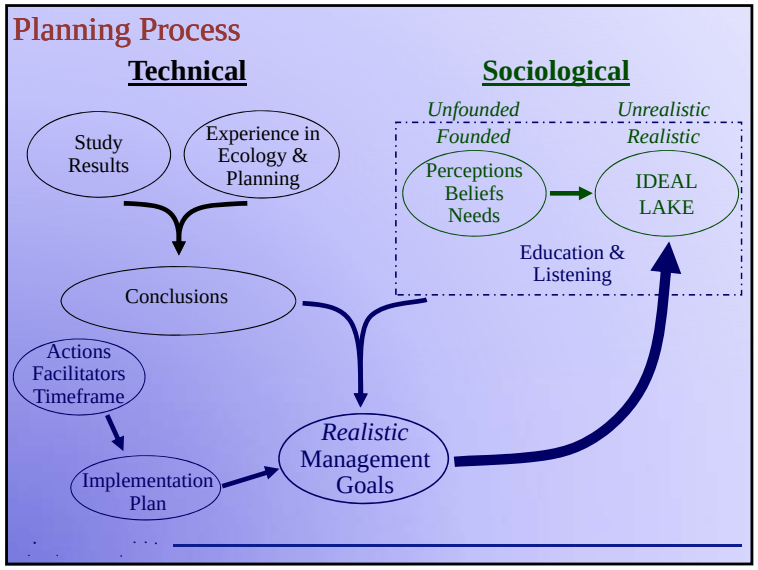
- Lake Management Planning Project Overview
- Study Results
  - Water Quality
  - Watershed
  - Aquatic Plants
  - CLP Control
- "Big Picture"
- Goals and Actions Discussion

Study and Plan Goals

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

The Planning Process

…it's not as easy as you may think.



Overview of Fisheries Data

- **No Native American harvest**
- **Walleye & Muskellunge Stocking**
  - Alternate years
- **Habitat Projects**
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- **WDNR Survey in 2011**
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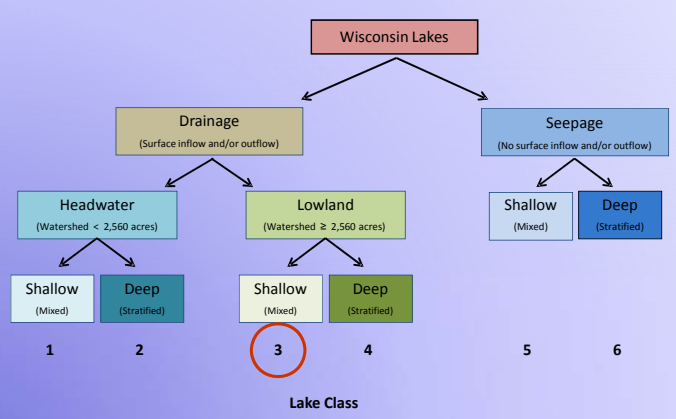
Wisconsin Lakes Classification



Water Quality

Phosphorus (Limiting Plant Nutrient)

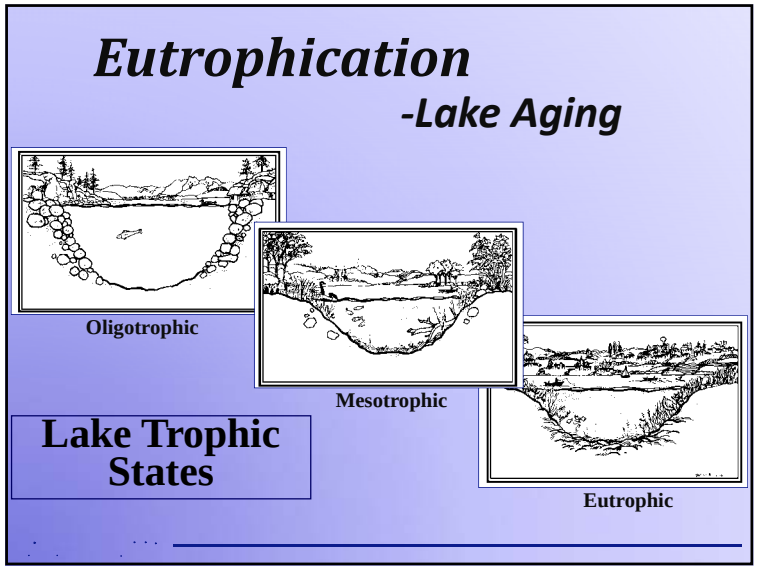
Nitrogen:Phosphorus = 27:1

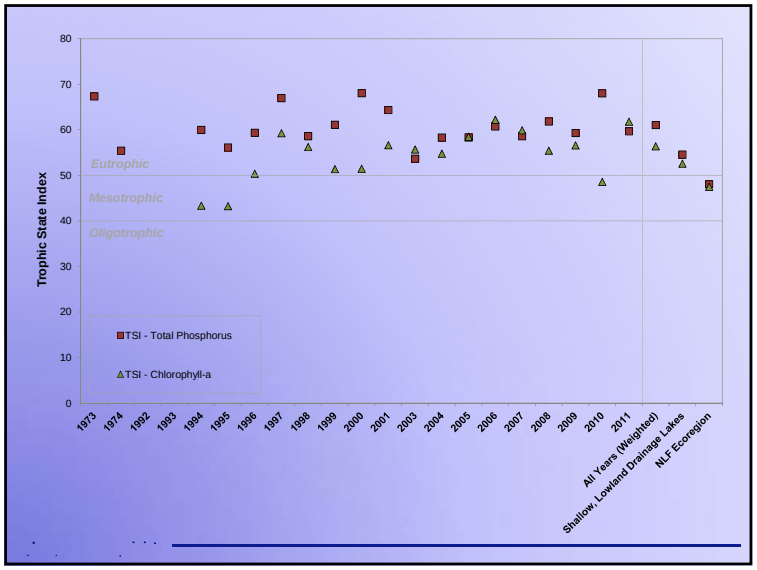
Chlorophyll-*a* (Algal Abundance)

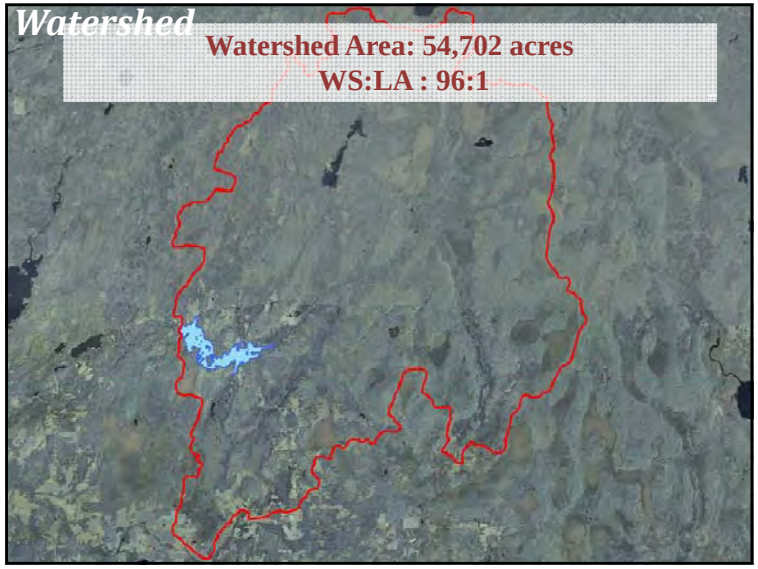
High Flushing Rate

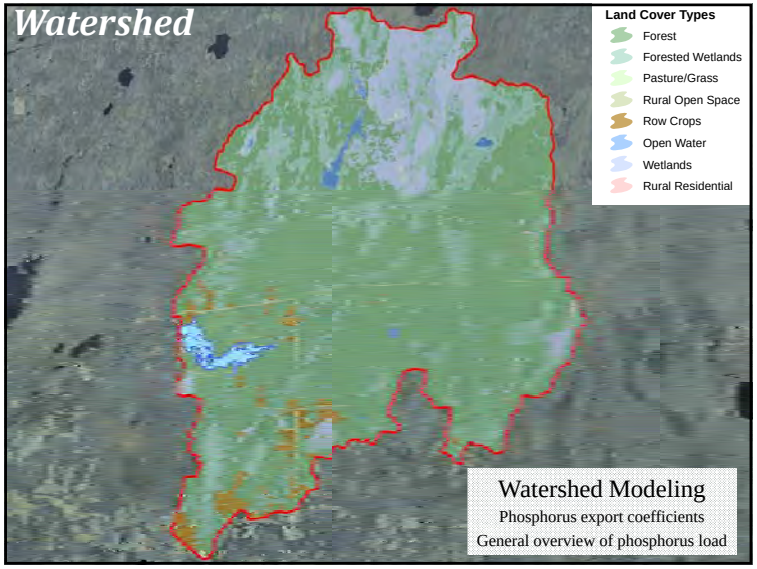
Water Clarity (Secchi Disk)

Stained Water

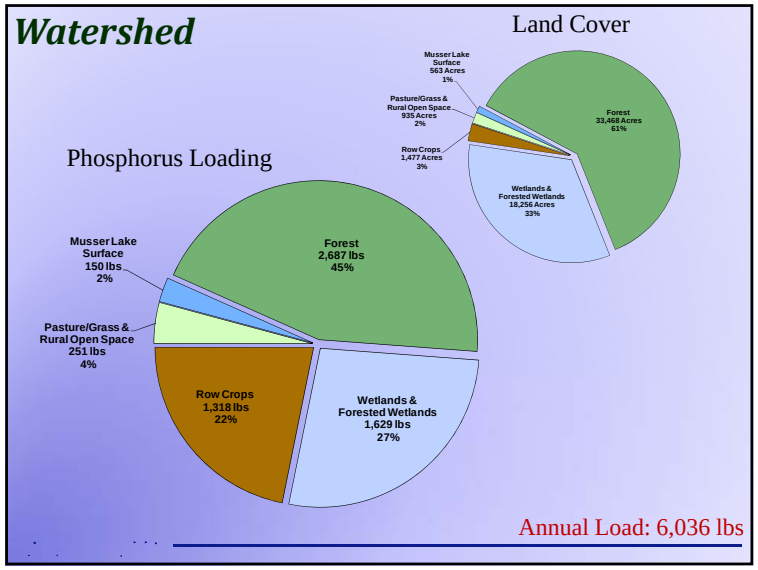

Eutrophication
-Lake Aging
Oligotrophic
Mesotrophic
Eutrophic
Lake Trophic States


Trophic State Index
Eutrophic
Mesotrophic
Oligotrophic
TSI - Total Phosphorus
TSI - Chlorophyll-a
All Years (Weighted)
Shallow, Lowland Drainage Lakes
NLF Ecoregion


Watershed
Watershed Area: 54,702 acres
WS:LA : 96:1


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

Watershed



Annual Load: 6,036 lbs

Watershed

Scenario 1: 50% of Row Crop to Pasture/Grass		Scenario 2: 100% of Row Crop to Pasture/Grass	
Current Total P Load (lbs)	6,036	Current Total P Load (lbs)	6,036
Scenario 1 Total P Load (lbs)	5,573	Scenario 2 Total P Load (lbs)	5,113
Reduction (lbs)	463	Reduction (lbs)	924
Reduction (%)	8%	Reduction (%)	15%
Current Carlson TSI Total P Equation*:	62	Current Carlson TSI Total P Equation*:	62
Scenario 1 Carlson TSI Total P Equation*:	60	Scenario 2 Carlson TSI Total P Equation*:	58

** TSI phosphorus values of 50+ are within the eutrophic range.*

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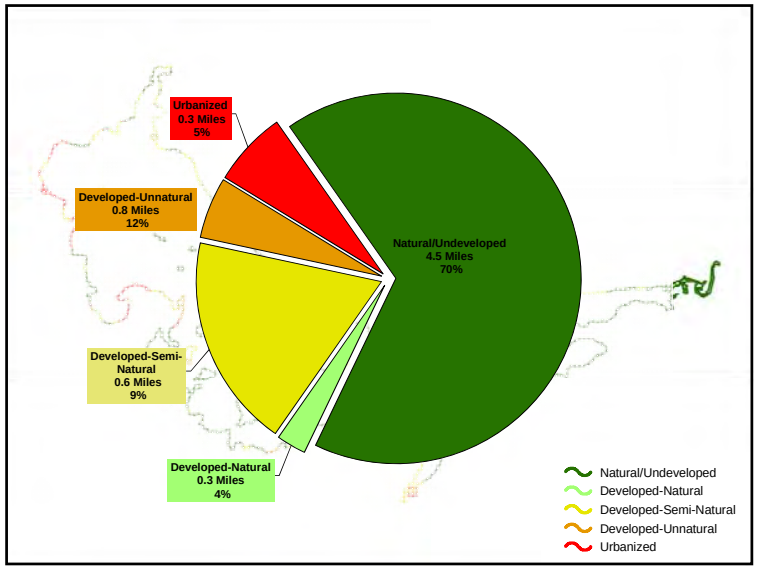
Urbanized → Range → **Natural**

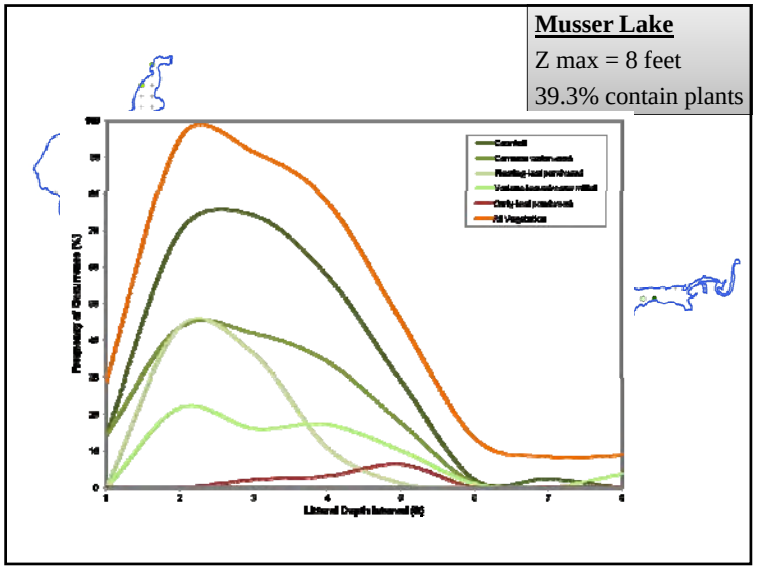
Shoreline Assessment Category Descriptions

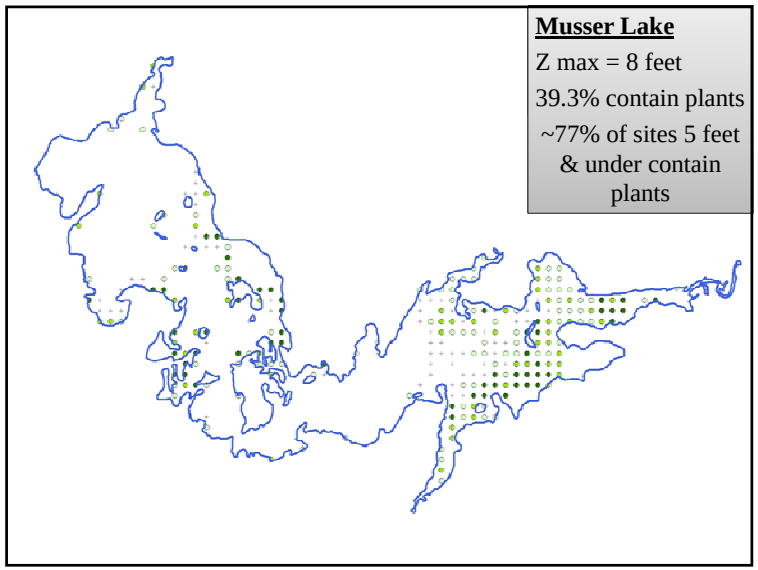
More Natural Habitat

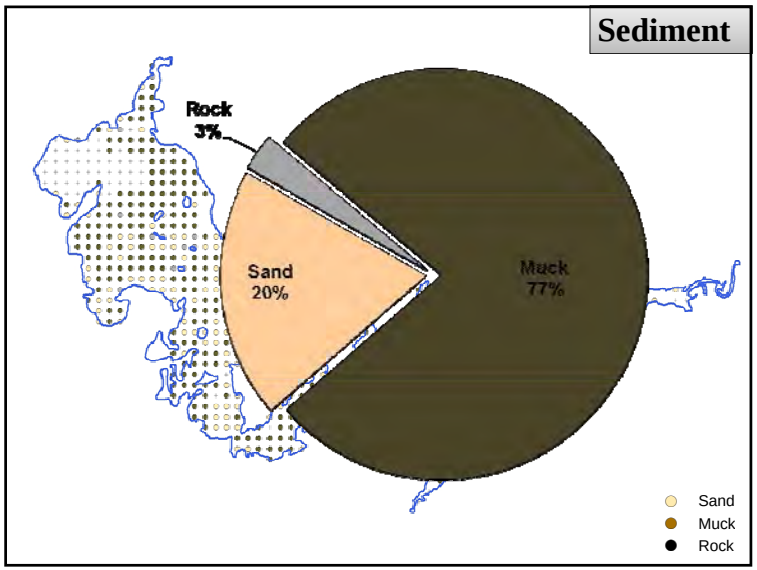
Urbanized	Developed-Unnatural	Developed-Semi-Natural	Developed-Natural	Natural/Undeveloped

Greater Need for Restoration


Urbanized
0.3 Miles
5%
Developed-Unnatural
0.8 Miles
12%
Natural/Undeveloped
4.5 Miles
70%
Developed-Semi-Natural
0.6 Miles
9%
Developed-Natural
0.3 Miles
4%
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized


Musser Lake
Z max = 8 feet
39.3% contain plants


Musser Lake
Z max = 8 feet
39.3% contain plants
~77% of sites 5 feet & under contain plants

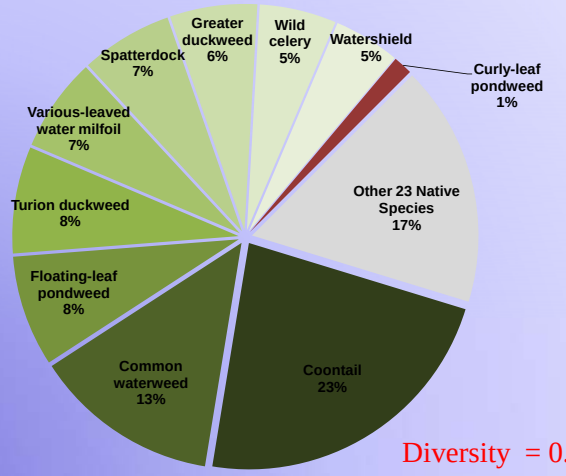

Sediment
Rock
3%
Sand
20%
Muck
77%
Sand
Muck
Rock

Species List

- **49 Native Species**
  - 31 from the PI survey
- **1 Non-native Species**
  - Curly-leaf pondweed

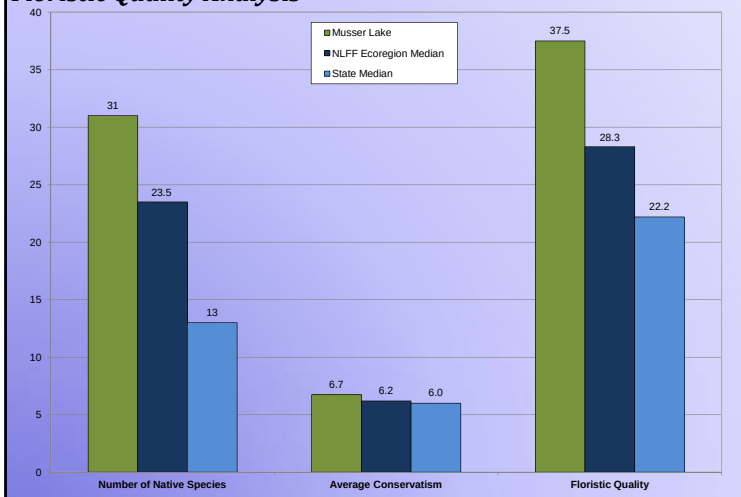
Life Form	Scientific Name	Common Name	Coefficient of Conservatism (c)
Emergent	*Calla palustris*	Water arum	9
	Carex comosa	Bristly sedge	5
	Carex crinita	Fringed sedge	6
	Carex pseudocyperus	Cypress-like sedge	8
	Carex retrorsa	Retrorse sedge	6
	Carex utriculata	Common yellow lake sedge	7
	Dulichium arundinaceum	Three-way sedge	9
	Eleocharis obtusa	Blunt spike-rush	3
	Eleocharis palustris	Creeping spikerush	6
	Equisetum fluviatile	Water horsetail	7
	Iris versicolor	Northern blue flag	5
	Juncus effusus	Soft rush	4
	Sagittaria latifolia	Common arrowhead	3
	Scirpus cyperinus	Wool grass	4
	Schoenoplectus tabernaemontani	Softstem bulrush	4
	Zizania palustris	Northern wild rice	8
FL	*Brasenia schreberi*	Watershield	7
	Nuphar variegata	Spatterdock	6
	Polygonum amphibium	Water smartweed	5
FLIE	*Sparganium americanum*	Eastern bur-reed	8
	Sparganium fluctuans	Floating-leaf bur-reed	10
Submergent	*Ceratophyllum demersum*	Coontail	3
	Elodea canadensis	Common waterweed	3
	Myriophyllum sibiricum	Northern water milfoil	7
	Myriophyllum farwellii	Farwell's water milfoil	9
	Myriophyllum heterophyllum	Various-leaved water milfoil	7
	Nitella sp.	Stoneworts	7
	Potamogeton alpinus	Alpine pondweed	9
	Potamogeton foliosus	Leafy pondweed	6
	Potamogeton pusillus	Small pondweed	7
	Potamogeton strictifolius	Stiff pondweed	8
	Potamogeton amplifolius	Large-leaf pondweed	7
	Potamogeton obtusifolius	Blunt-leaf pondweed	9
	Potamogeton crispus	Curly-leaf pondweed	Exotic
	Potamogeton epihydrus	Ribbon-leaf pondweed	8
	Potamogeton zosteriformis	Flat-stem pondweed	6
	Potamogeton robbinsii	Fern pondweed	8
	Potamogeton natans	Floating-leaf pondweed	5
	Ranunculus aquatilis	White water-crowfoot	8
	Utricularia minor	Small bladderwort	10
	Utricularia intermedia	Flat-leaf bladderwort	9
	Utricularia vulgaris	Common bladderwort	7
	Vallisneria americana	Wild celery	6
FF	*Lemna trisulca*	Forked duckweed	6
	Lemna turionifera	Turion duckweed	2
	Riccia fluitans	Slender riccia	7
	Spirodela polyrhiza	Greater duckweed	5
	Wolffia columbiana	Common watermeal	5

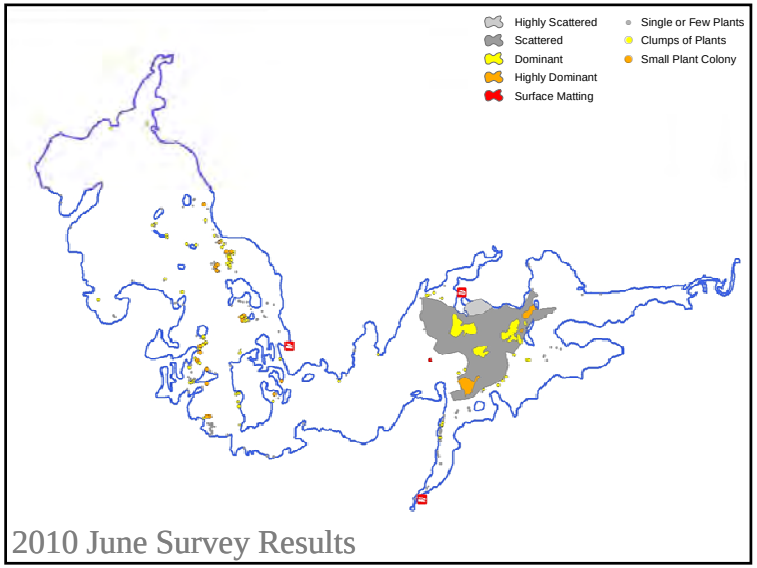
Relative Frequency of Occurrence



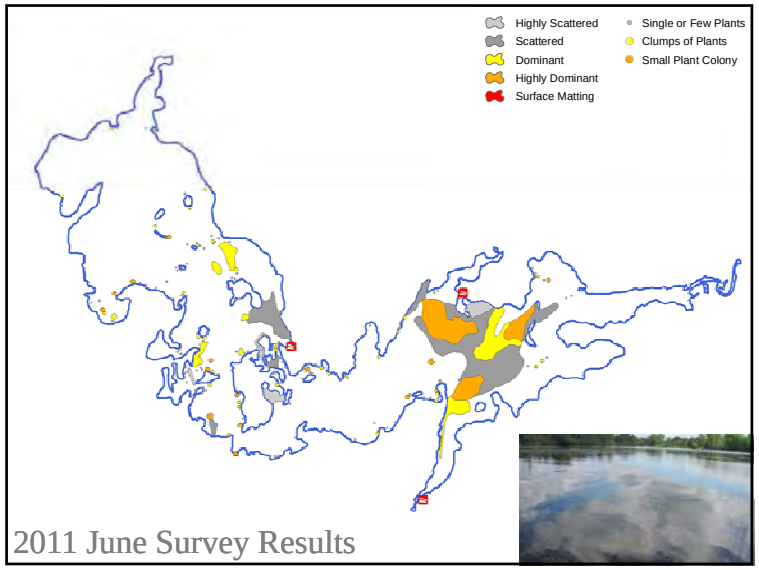
Diversity = 0.90

Floristic Quality Analysis

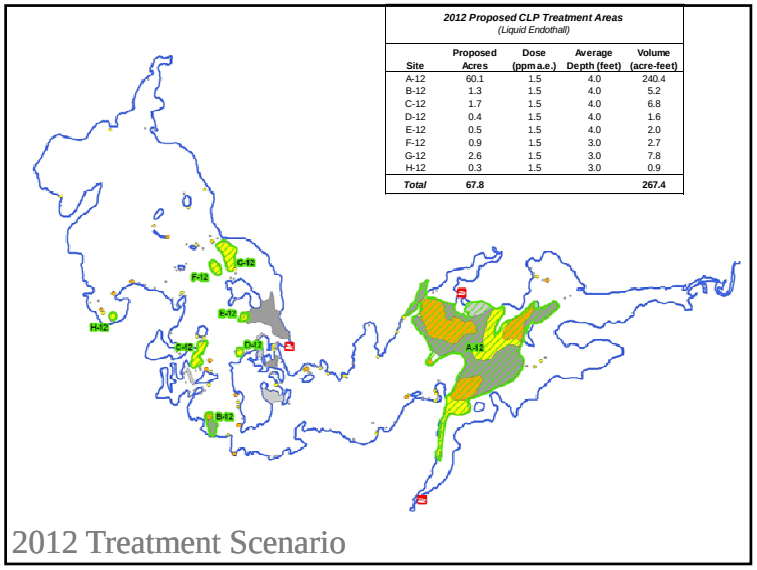




2010 June Survey Results



2011 June Survey Results



2012 Proposed CLP Treatment Areas
(Liquid Endothall)

Site	Proposed Acres	Dose (ppm a.e.)	Average Depth (feet)	Volume (acre-feet)
A-12	60.1	1.5	4.0	240.4
B-12	1.3	1.5	4.0	5.2
C-12	1.7	1.5	4.0	6.8
D-12	0.4	1.5	4.0	1.6
E-12	0.5	1.5	4.0	2.0
F-12	0.9	1.5	3.0	2.7
G-12	2.6	1.5	3.0	7.8
H-12	0.3	1.5	3.0	0.9
Total	67.8			267.4

2012 Treatment Scenario

Conclusions

- Musser Lake has high phosphorus levels, but does not exhibit the normal deleterious effects.
- Overall watershed is largely in healthy condition.
  - Watershed is extremely large!
  - Majority of land cover exports minimal phosphorus.
- Aquatic plant community
  - Based upon standard analysis, native community is of very high quality.
  - Currently the greatest threat is curly-leaf pondweed.

Thank You

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Musser Lake Association

Musser Lake
Management Planning Project
Planning Meeting
November 3, 2011

Eddie Heath
Onterra LLC
Lake Management Planning

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- **Lake Management Planning Project Overview**
- **Study Results**
  - Water Quality
  - Watershed
  - Aquatic Plants
  - CLP Control
- **"Big Picture"**
- **Goals and Actions Discussion**

Onterra LLC
Lake Management Planning

Study and Plan Goals

- Collect & Analyze Data
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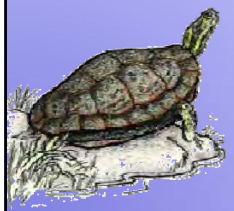
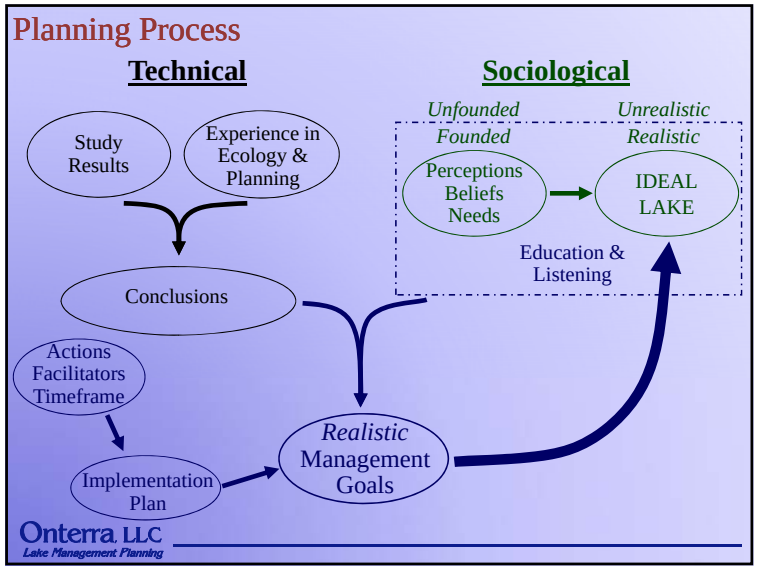


Onterra LLC
Lake Management Planning

The Planning Process

…it's not as easy as you may think.



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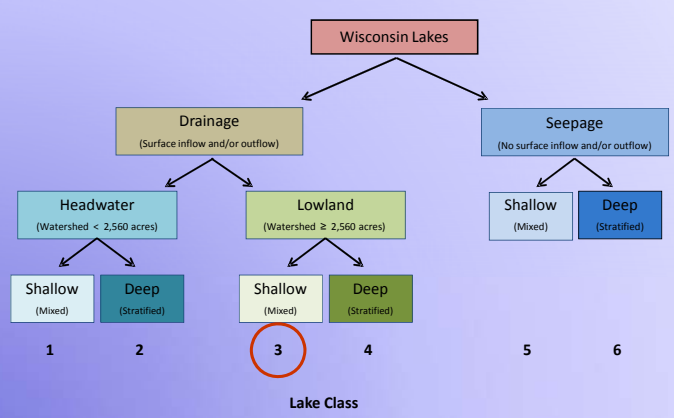

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Phosphorus (Limiting Plant Nutrient)

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Chlorophyll-*a* (Algal Abundance)

High Flushing Rate

Water Clarity (Secchi Disk)

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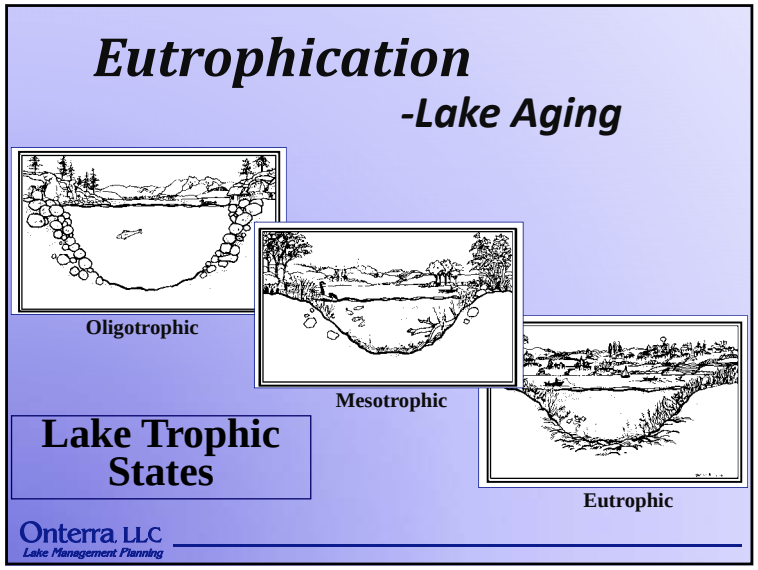
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Eutrophic
Lake Trophic States
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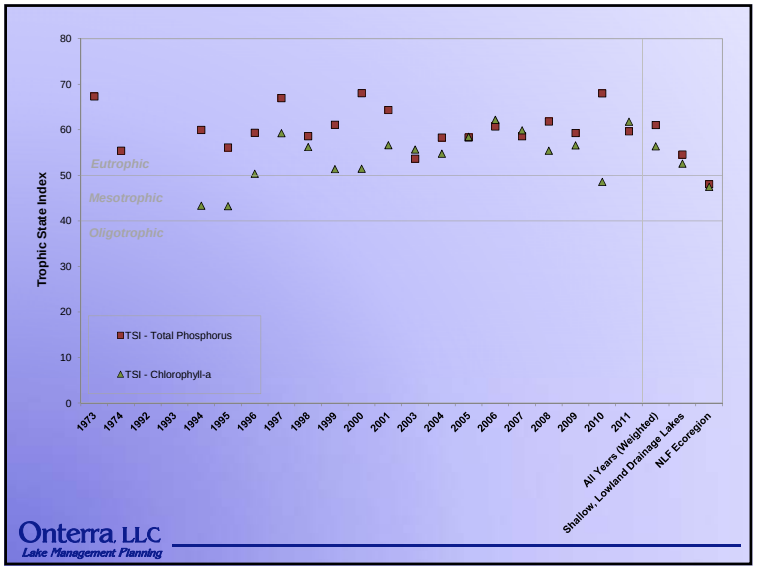
Lake Management Planning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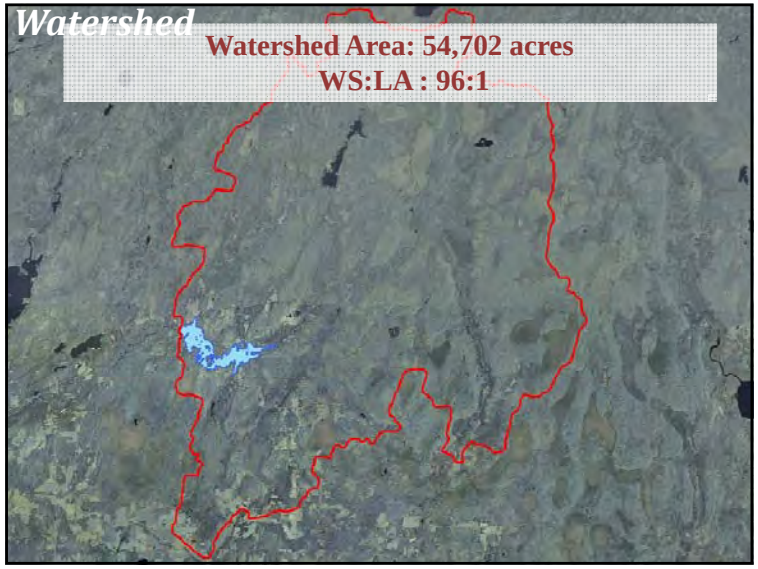
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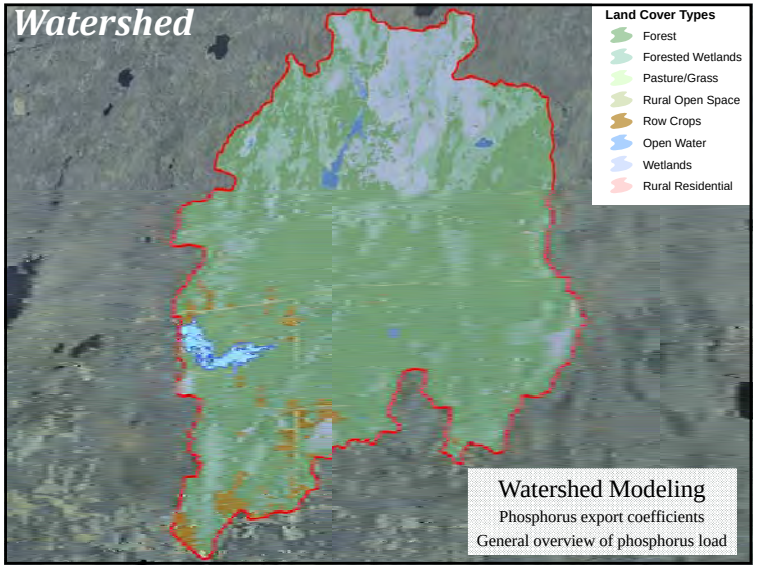
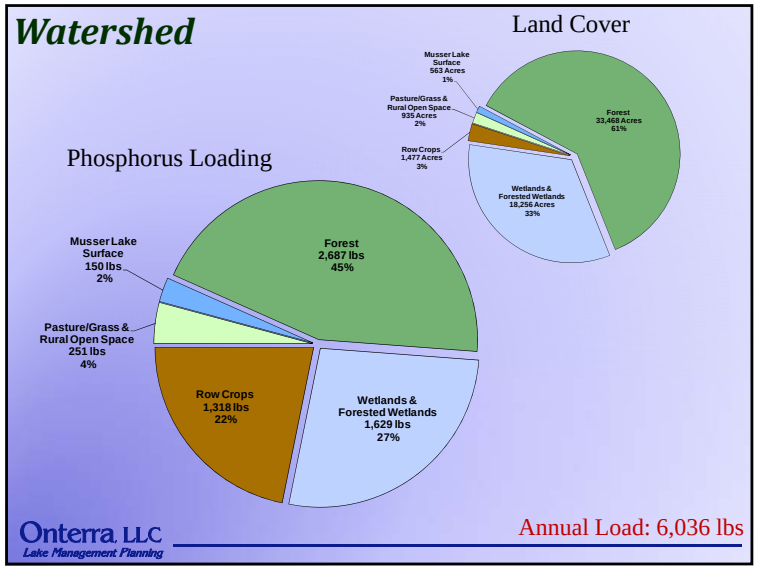

Watershed
Land Cover Types
Forest
Forested Wetlands
Pasture/Grass
Rural Open Space
Row Crops
Open Water
Wetlands
Rural Residential
Watershed Modeling
Phosphorus export coefficients
General overview of phosphorus load

Watershed



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Onterra LLC Lake Management Planning

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Urbanized Range **Natural**

Onterra LLC Lake Management Planning

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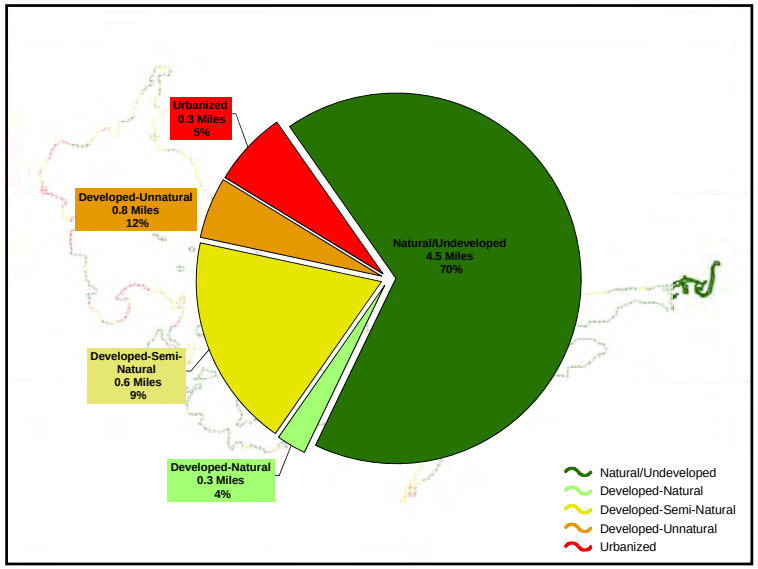
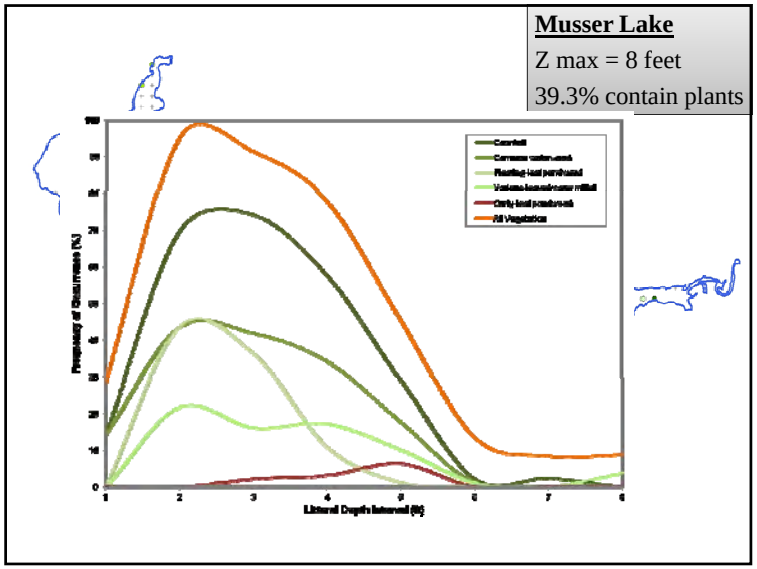
More Natural Habitat

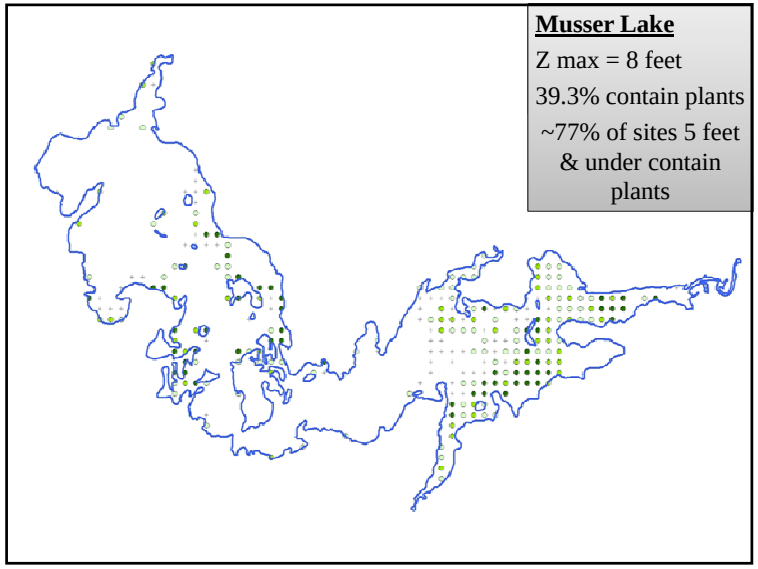
Urbanized | Developed-Unnatural | Developed-Semi-Natural | Developed-Natural | Natural/Undeveloped

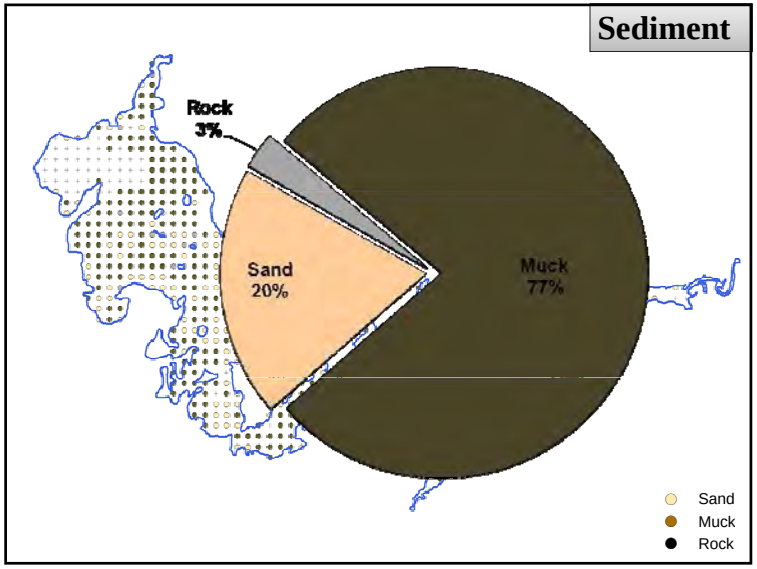
Greater Need for Restoration

Onterra LLC Lake Management Planning


Urbanized
0.3 Miles
5%
Developed-Unnatural
0.8 Miles
12%
Natural/Undeveloped
4.5 Miles
70%
Developed-Semi-Natural
0.6 Miles
9%
Developed-Natural
0.3 Miles
4%
Natural/Undeveloped
Developed-Natural
Developed-Semi-Natural
Developed-Unnatural
Urbanized


Musser Lake
Z max = 8 feet
39.3% contain plants


Musser Lake
Z max = 8 feet
39.3% contain plants
~77% of sites 5 feet & under contain plants


Sediment
Rock
3%
Sand
20%
Muck
77%
Sand
Muck
Rock

Species List

- **49 Native Species**
  - 31 from the PI survey
- **1 Non-native Species**
  - Curly-leaf pondweed

Life Form	Scientific Name	Common Name	Coefficient of Conservatism (c)
Emergent	*Calla palustris*	Water arum	9
	Carex comosa	Bristly sedge	5
	Carex crinita	Fringed sedge	6
	Carex pseudocyperus	Cypress-like sedge	8
	Carex retrorsa	Retrorse sedge	6
	Carex utriculata	Common yellow lake sedge	7
	Dulichium arundinaceum	Three-way sedge	9
	Eleocharis obtusa	Blunt spike-rush	3
	Eleocharis palustris	Creeping spikerush	6
	Equisetum fluviatile	Water horsetail	7
	Iris versicolor	Northern blue flag	5
	Juncus effusus	Soft rush	4
	Sagittaria latifolia	Common arrowhead	3
	Scirpus cyperinus	Wool grass	4
	Schoenoplectus tabernaemontani	Softstem bulrush	4
	Zizania palustris	Northern wild rice	8
FL	*Brasenia schreberi*	Watershield	7
	Nuphar variegata	Spatterdock	6
	Polygonum amphibium	Water smartweed	5
FLIE	*Sparganium americanum*	Eastern bur-reed	8
	Sparganium fluctuans	Floating-leaf bur-reed	10
Submergent	*Ceratophyllum demersum*	Coontail	3
	Elodea canadensis	Common waterweed	3
	Myriophyllum sibiricum	Northern water milfoil	7
	Myriophyllum farwellii	Farwell's water milfoil	9
	Myriophyllum heterophyllum	Various-leaved water milfoil	7
	Nitella sp.	Stoneworts	7
	Potamogeton alpinus	Alpine pondweed	9
	Potamogeton foliosus	Leafy pondweed	6
	Potamogeton pusillus	Small pondweed	7
	Potamogeton strictifolius	Stiff pondweed	8
	Potamogeton amplifolius	Large-leaf pondweed	7
	Potamogeton obtusifolius	Blunt-leaf pondweed	9
	Potamogeton crispus	Curly-leaf pondweed	Exotic
	Potamogeton epihydrus	Ribbon-leaf pondweed	8
	Potamogeton zosteriformis	Flat-stem pondweed	6
	Potamogeton robbinsii	Fern pondweed	8
	Potamogeton natans	Floating-leaf pondweed	5
	Ranunculus aquatilis	White water-crowfoot	8
	Utricularia minor	Small bladderwort	10
	Utricularia intermedia	Flat-leaf bladderwort	9
	Utricularia vulgaris	Common bladderwort	7
	Vallisneria americana	Wild celery	6
FF	*Lemna trisulca*	Forked duckweed	6
	Lemna turionifera	Turion duckweed	2
	Riccia fluitans	Slender riccia	7
	Spirodela polyrhiza	Greater duckweed	5
	Wolffia columbiana	Common watermeal	5

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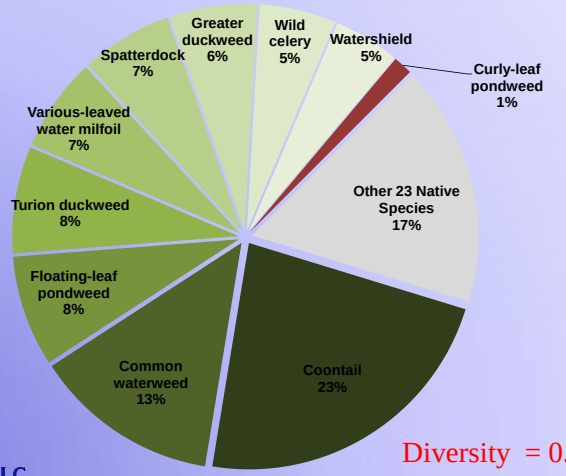
Relative Frequency of Occurrence



Diversity = 0.90

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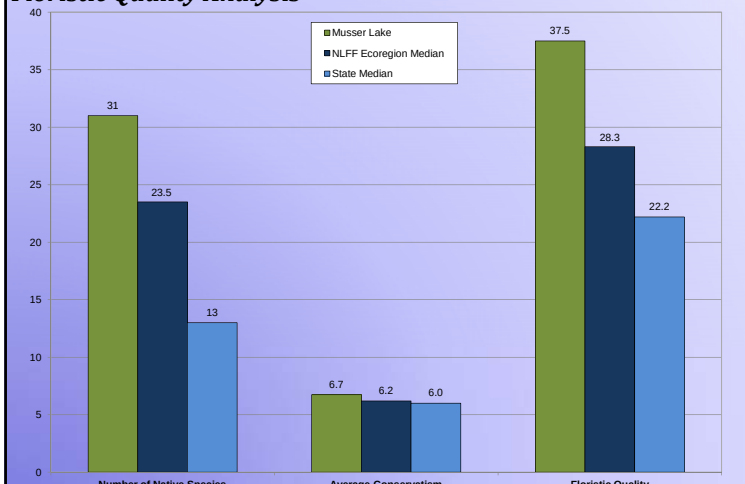
Floristic Quality Analysis



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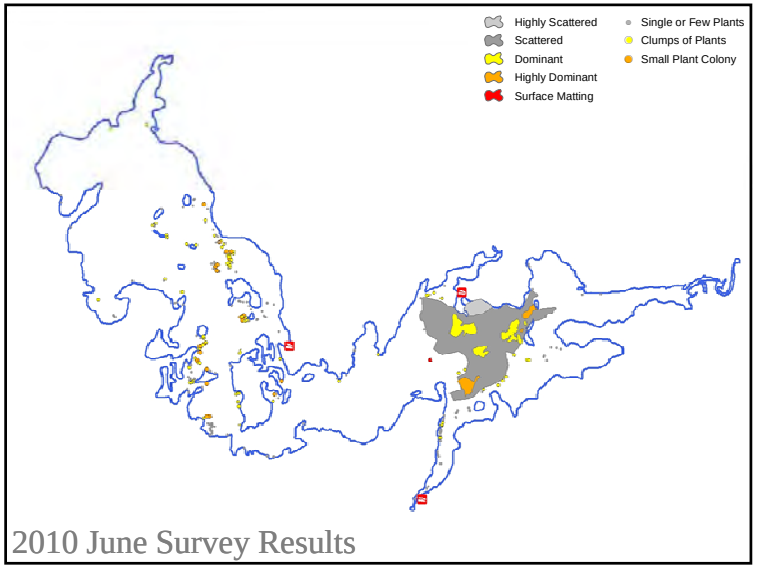
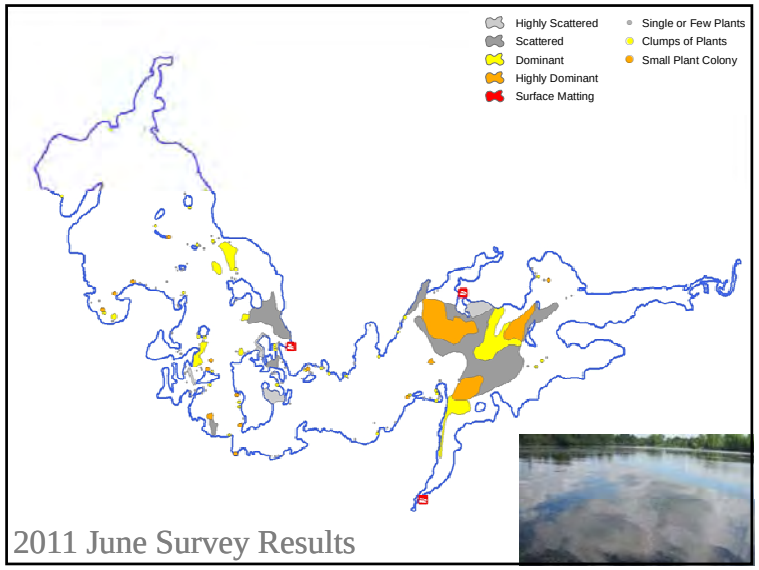
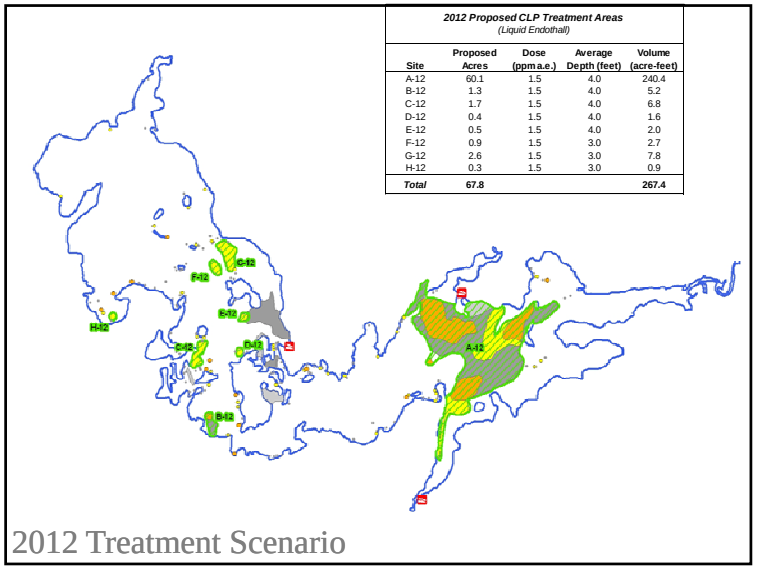


2010 June Survey Results



2011 June Survey Results



2012 Proposed CLP Treatment Areas
(Liquid Endothall)

Site	Proposed Acres	Dose (ppm a.e.)	Average Depth (feet)	Volume (acre-feet)
A-12	60.1	1.5	4.0	240.4
B-12	1.3	1.5	4.0	5.2
C-12	1.7	1.5	4.0	6.8
D-12	0.4	1.5	4.0	1.6
E-12	0.5	1.5	4.0	2.0
F-12	0.9	1.5	3.0	2.7
G-12	2.6	1.5	3.0	7.8
H-12	0.3	1.5	3.0	0.9
Total	67.8			267.4

2012 Treatment Scenario

Conclusions

- Musser Lake has high phosphorus levels, but does not exhibit the normal deleterious effects.
- Overall watershed is largely in healthy condition.
  - Watershed is extremely large!
  - Majority of land cover exports minimal phosphorus.
- Aquatic plant community
  - Based upon standard analysis, native community is of very high quality.
  - Currently the greatest threat is curly-leaf pondweed.

Thank You

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

Wisconsin Lakes Partnership

UW Extension

Wisconsin Dept. of Natural Resources

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Lake Management Planning

B

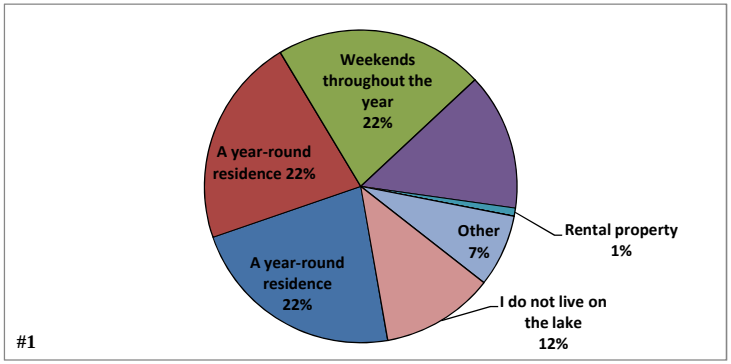
APPENDIX B

Stakeholder Survey Response Charts and Comments

Returned Surveys	121
Sent Surveys	261
Response Rate (%)	46.4

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

	Total	%
Weekends throughout the year	27	*22.5*
A year-round residence	26	*21.7*
Seasonal residence (summer only)	26	*21.7*
Undeveloped	17	*14.2*
Rental property	1	*0.8*
Resort property	0	*0.0*
Other	9	*7.5*
I do not live on the lake	14	*11.7*
	120	*100.0*

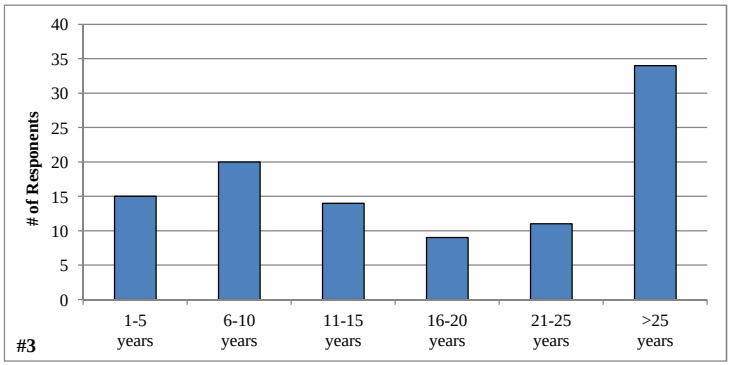


#2 How many days each year is your property used by you or others?

Answered Question	96
Average	110.4
Standard deviation	122.8

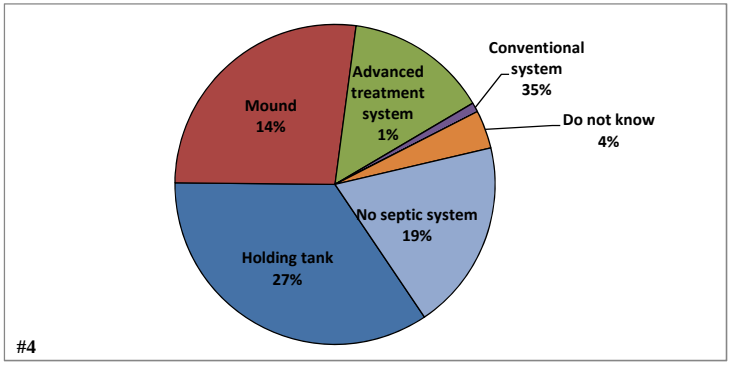
#3 How long have you owned your property on Musser Lake?

	Total	%
1-5 years	15	*14.6*
6-10 years	20	*19.4*
11-15 years	14	*13.6*
16-20 years	9	*8.7*
21-25 years	11	*10.7*
>25 years	34	*33.0*
	103	*100.0*



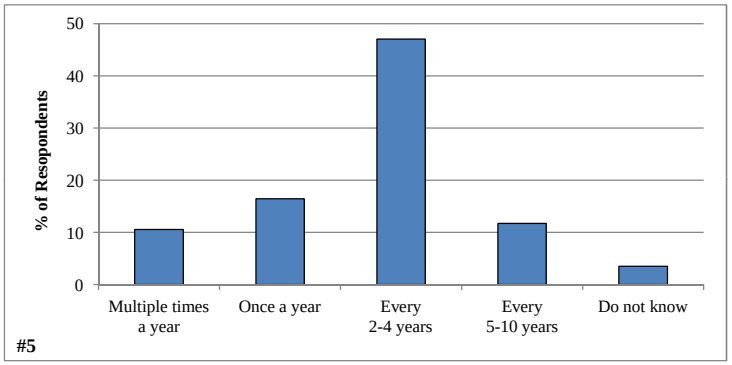
#4 What type of septic system does your property utilize?

	Total	%
Conventional system	36	*34.6*
Holding tank	28	*26.9*
Mound	15	*14.4*
Advanced treatment system	1	*1.0*
Municipal sewer	0	*0.0*
Do not know	4	*3.8*
No septic system	20	*19.2*
	104	*100.0*



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

	Total	%
Multiple times a year	9	*10.6*
Once a year	14	*16.5*
Every 2-4 years	40	*47.1*
Every 5-10 years	10	*11.8*
Never pumped	3	*3.5*
Do not know	9	*10.6*
	85	*100.0*



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

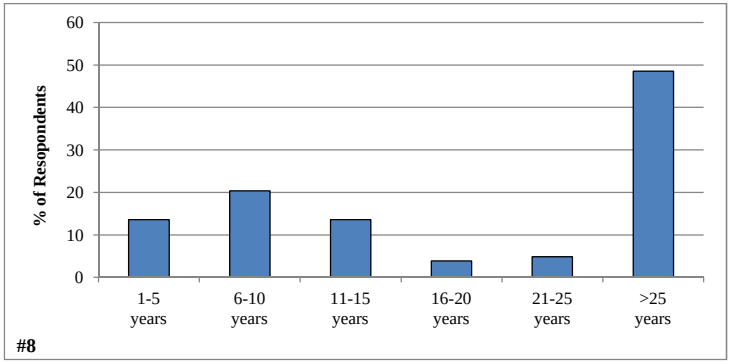
Answered Question	120
Average	26.8
Standard deviation	19.0

#7 Have you personally fished on Musser Lake?

	Total	%
Yes	111	*92.5*
No	9	*7.5*
	120	*100.0*

#8 For how many years have you fished Musser Lake?

	Total	%
1-5 years	14	*13.6*
6-10 years	21	*20.4*
11-15 years	14	*13.6*
16-20 years	4	*3.9*
21-25 years	5	*4.9*
>25 years	50	*48.5*
	108	*104.9*

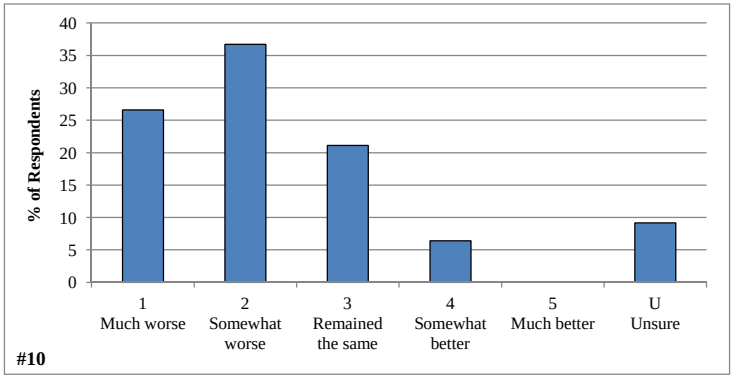


#9 How would you describe the current quality of fishing on Musser Lake?

	Total	%
1 - Poor	15	*13.8*
2 - Fair	54	*49.5*
3 - Unsure	19	*17.4*
4 - Good	21	*19.3*
5 - Excellent	0	*0.0*
	109	*100.0*

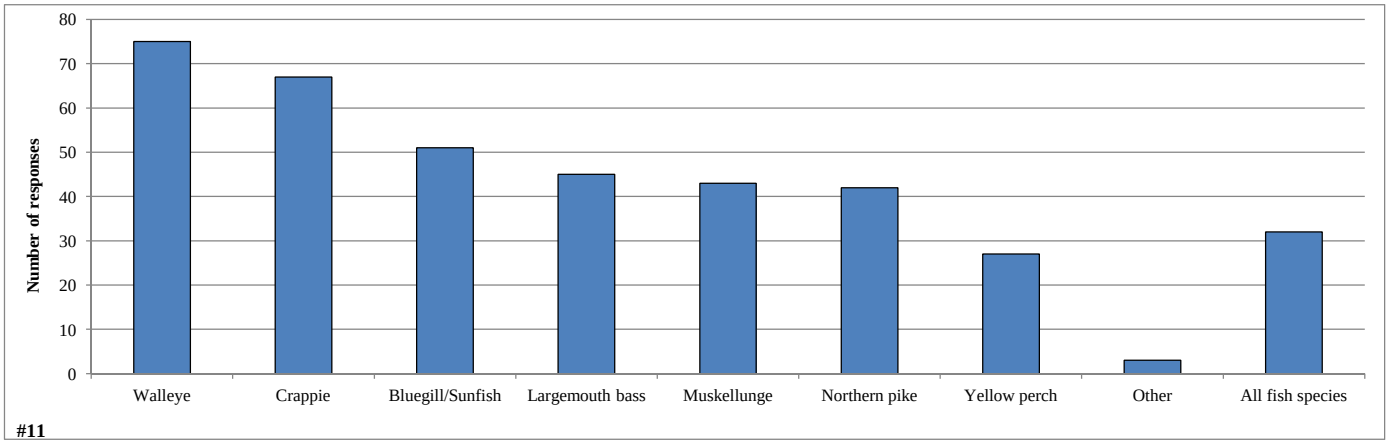
#10 How has the quality of fishing changed since you started fishing on the lake?

	Total	%
1 - Much worse	29	*26.6*
2 - Somewhat worse	40	*36.7*
3 - Remained the Same	23	*21.1*
4 - Somewhat better	7	*6.4*
5 - Much better	0	*0.0*
U - Unsure	10	*9.2*
	109	*100.0*



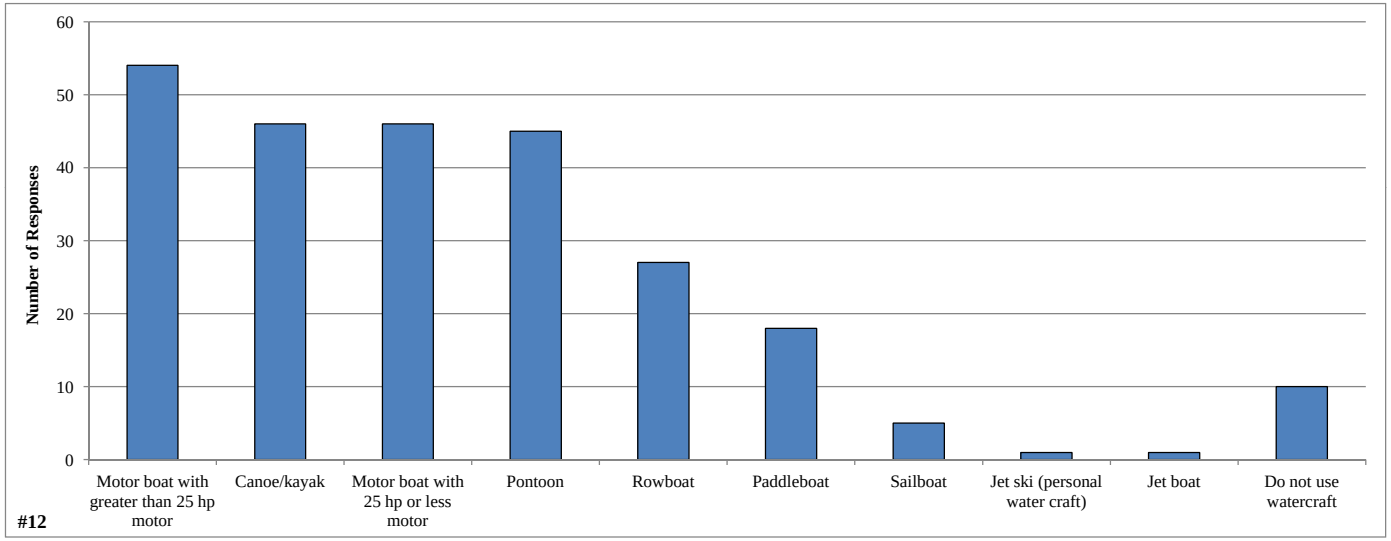
#11 What species of fish do you like to catch on Musser Lake?

	Total
Walleye	75
Crappie	67
Bluegill/Sunfish	51
Largemouth bass	45
Muskellunge	43
Northern pike	42
Yellow perch	27
Other	3
All fish species	32



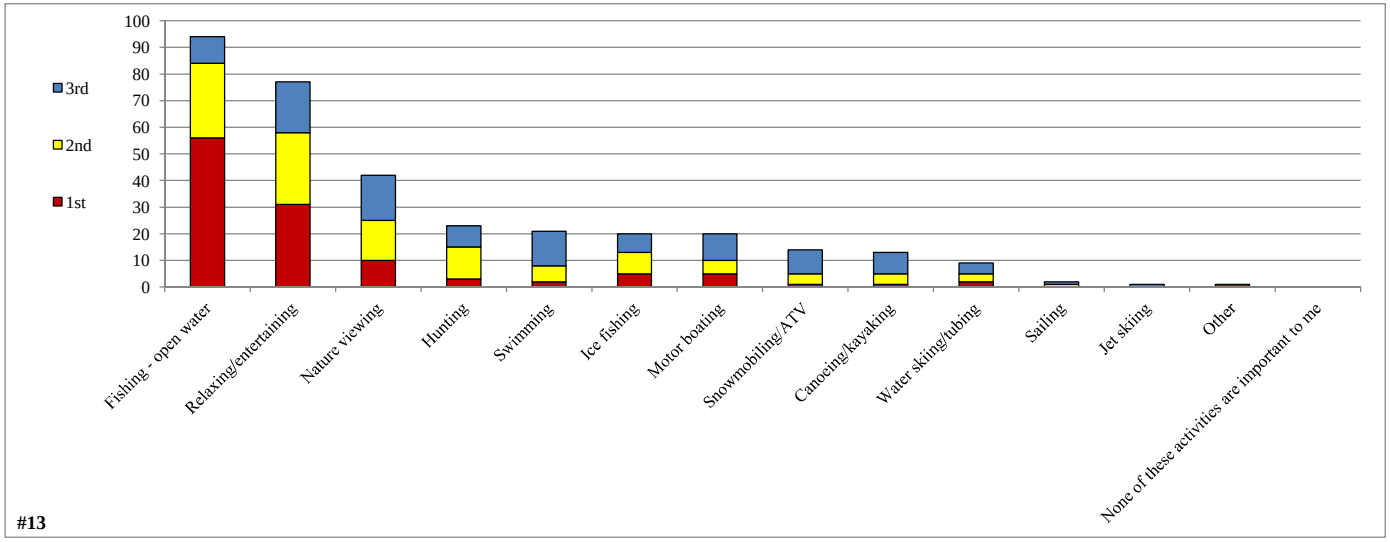
#12 What types of watercraft do you currently use on the lake?

	Total
Motor boat with greater than 25 hp motor	54
Canoe/kayak	46
Motor boat with 25 hp or less motor	46
Pontoon	45
Rowboat	27
Paddleboat	18
Sailboat	5
Jet ski (personal water craft)	1
Jet boat	1
Do not use watercraft	10



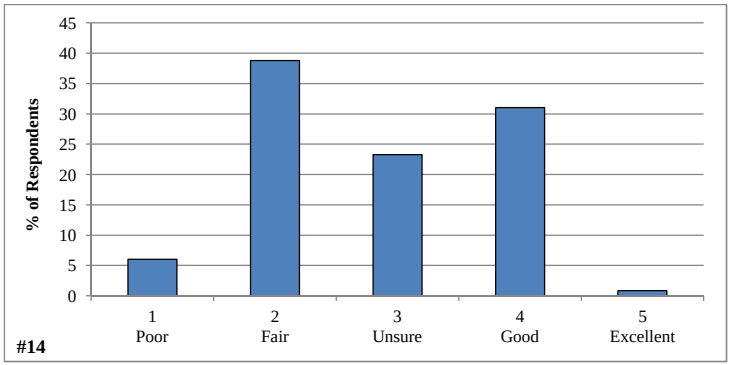
#13 Please rank up to three activities that are important reasons for owning your property on or near the lake.

	1st	2nd	3rd	*% ranked*
Fishing - open water	56	28	10	*27.9*
Relaxing/entertaining	31	27	19	*22.8*
Nature viewing	10	15	17	*12.5*
Hunting	3	12	8	*6.8*
Swimming	2	6	13	*6.2*
Ice fishing	5	8	7	*5.9*
Motor boating	5	5	10	*5.9*
Snowmobiling/ATV	1	4	9	*4.2*
Canoeing/kayaking	1	4	8	*3.9*
Water skiing/tubing	2	3	4	*2.7*
Sailing	0	1	1	*0.6*
Jet skiing	0	0	1	*0.3*
Other	1	0	0	*0.3*
None of these activities are important to me	0	0	0	*0.0*
	117	113	107	*100.0*



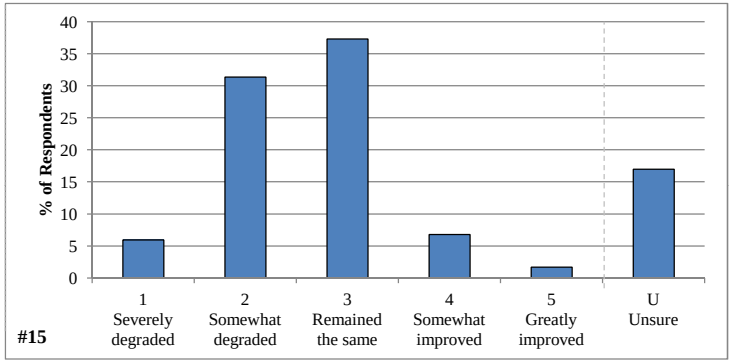
#14 How would you describe the current water quality of Musser Lake?

	Total	%
1 - Poor	7	*6.0*
2 - Fair	45	*38.8*
3 - Unsure	27	*23.3*
4 - Good	36	*31.0*
5 - Excellent	1	*0.9*
	116	*100.0*



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

	Total	%
1 - Severely degraded	7	*5.9*
2 - Somewhat degraded	37	*31.4*
3 - Remained the same	44	*37.3*
4 - Somewhat improved	8	*6.8*
5 - Greatly improved	2	*1.7*
U - Unsure	20	*16.9*
	118	*100.0*



#16 Have you ever heard of aquatic invasive species?

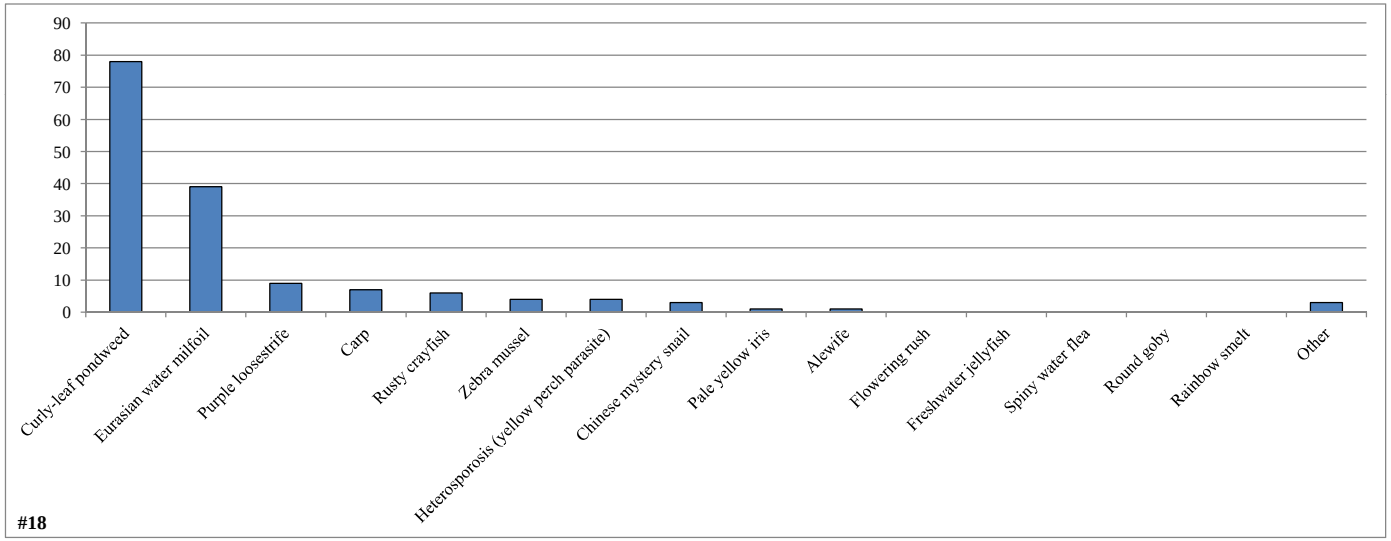
	Total	%
Yes	113	*95.0*
No	6	*5.0*
	119	*100.0*

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

	Total	%
Yes	97	*85.8*
No	16	*14.2*
	113	*100.0*

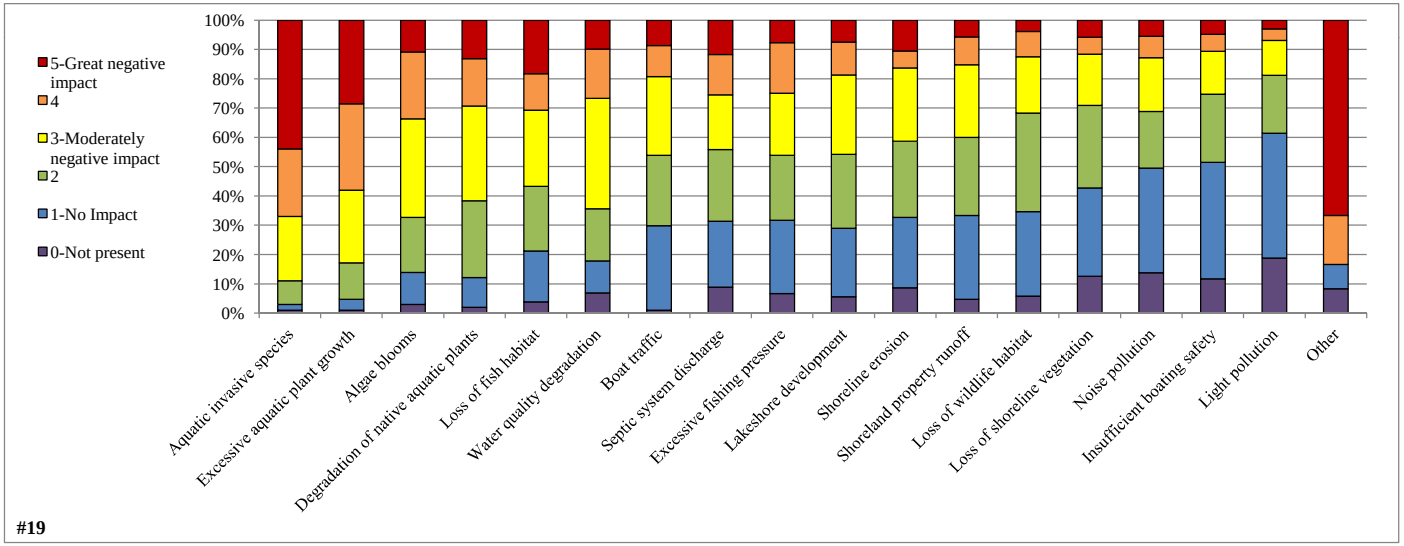
#18 Which aquatic invasive species are you aware of in Musser Lake?

	Total
Curly-leaf pondweed	78
Eurasian water milfoil	39
Purple loosestrife	9
Carp	7
Rusty crayfish	6
Zebra mussel	4
Heterosporosis (yellow perch parasite)	4
Chinese mystery snail	3
Pale yellow iris	1
Alewife	1
Flowering rush	0
Freshwater jellyfish	0
Spiny water flea	0
Round goby	0
Rainbow smelt	0
Other	3



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

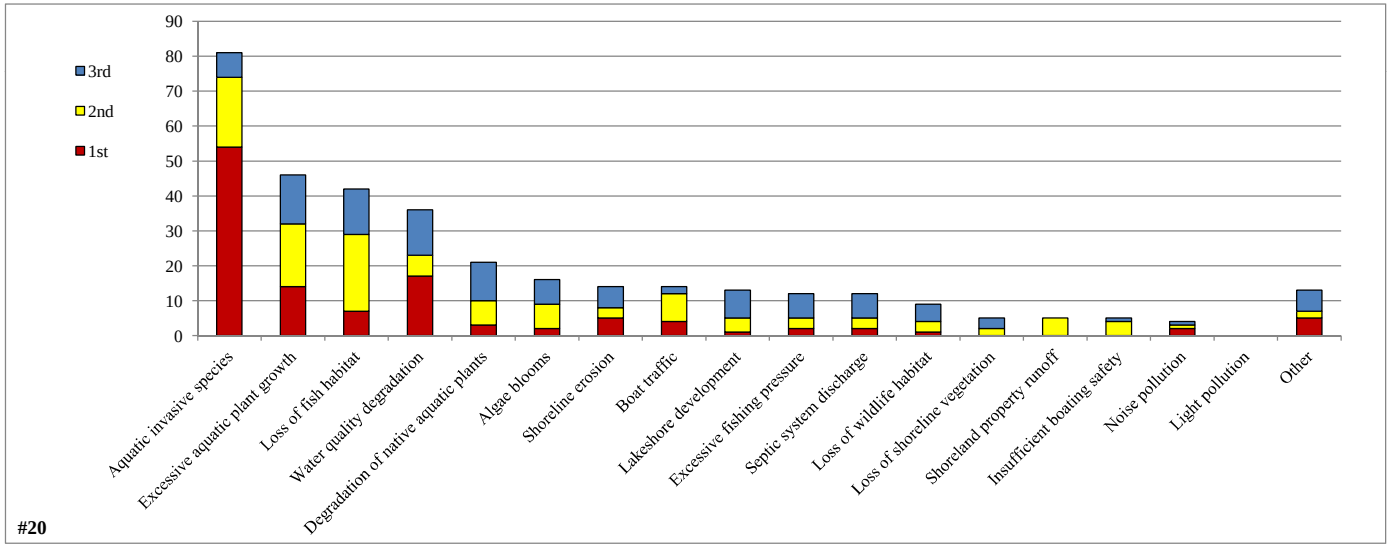
	0-Not present	1-No Impact	2	3-Moderately negative impact	4	5-Great negative impact	*Total*	*Average*
Aquatic invasive species	1	2	8	22	23	44	*99*	*4.0*
Excessive aquatic plant growth	1	4	13	26	31	30	*104*	*3.6*
Algae blooms	3	11	19	34	23	11	*98*	*3.0*
Degradation of native aquatic plants	2	10	26	32	16	13	*97*	*2.9*
Loss of fish habitat	4	18	23	27	13	19	*100*	*2.8*
Water quality degradation	7	11	18	38	17	10	*94*	*2.8*
Boat traffic	1	30	25	28	11	9	*103*	*2.4*
Septic system discharge	9	23	25	19	14	12	*93*	*2.4*
Excessive fishing pressure	7	26	23	22	18	8	*97*	*2.4*
Lakeshore development	6	25	27	29	12	8	*101*	*2.4*
Shoreline erosion	9	25	27	26	6	11	*95*	*2.3*
Shoreland property runoff	5	30	28	26	10	6	*100*	*2.2*
Loss of wildlife habitat	6	30	35	20	9	4	*98*	*2.1*
Loss of shoreline vegetation	13	31	29	18	6	6	*90*	*1.9*
Noise pollution	15	39	21	20	8	6	*94*	*1.9*
Insufficient boating safety	12	41	24	15	6	5	*91*	*1.8*
Light pollution	19	43	20	12	4	3	*82*	*1.5*
Other	1	1	0	0	2	8	*11*	*4.1*



#19

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

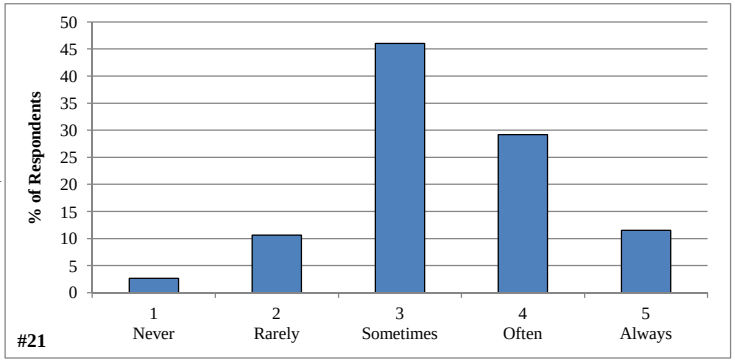
	1st	2nd	3rd	*% Ranked*
Aquatic invasive species	54	20	7	*23.3*
Excessive aquatic plant growth	14	18	14	*13.2*
Loss of fish habitat	7	22	13	*12.1*
Water quality degradation	17	6	13	*10.3*
Degradation of native aquatic plants	3	7	11	*6.0*
Algae blooms	2	7	7	*4.6*
Shoreline erosion	5	3	6	*4.0*
Boat traffic	4	8	2	*4.0*
Lakeshore development	1	4	8	*3.7*
Excessive fishing pressure	2	3	7	*3.4*
Septic system discharge	2	3	7	*3.4*
Loss of wildlife habitat	1	3	5	*2.6*
Loss of shoreline vegetation	0	2	3	*1.4*
Shoreland property runoff	0	5	0	*1.4*
Insufficient boating safety	0	4	1	*1.4*
Noise pollution	2	1	1	*1.1*
Light pollution	0	0	0	*0.0*
Other	5	2	6	*3.7*
	119	118	111	*100.0*



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

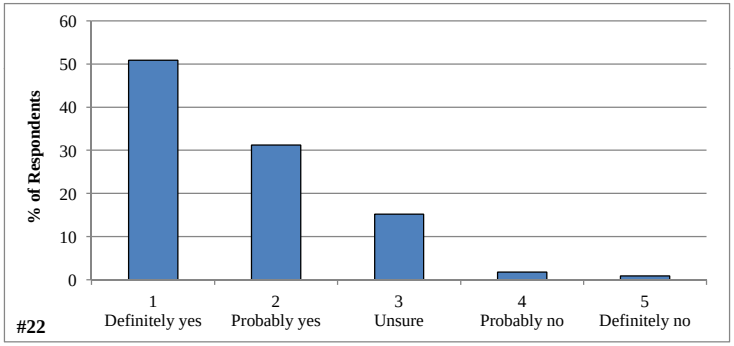
	Total	%
1 - Never	3	*2.7*
2 - Rarely	12	*10.6*
3 - Sometimes	52	*46.0*
4 - Often	33	*29.2*
5 - Always	13	*11.5*
	113	*100.0*

82.1



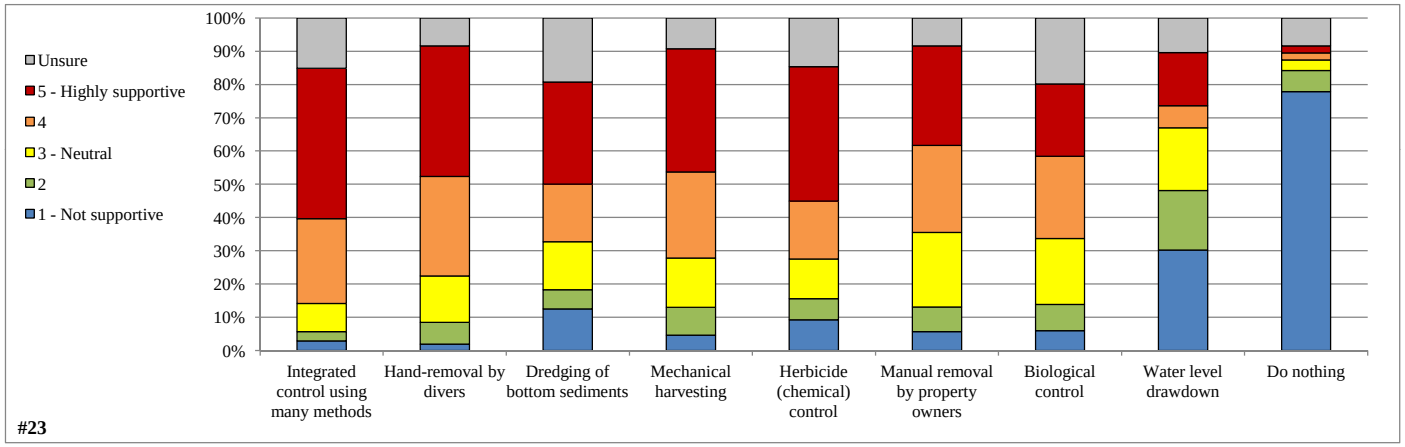
#22 Considering your answer to the question above, do you believe aquatic plant control is needed on the lake?

	Total	%
1 - Definitely yes	57	*50.9*
2 - Probably yes	35	*31.3*
3 - Unsure	17	*15.2*
4 - Probably no	2	*1.8*
5 - Definitely no	1	*0.9*
	112	*100.0*



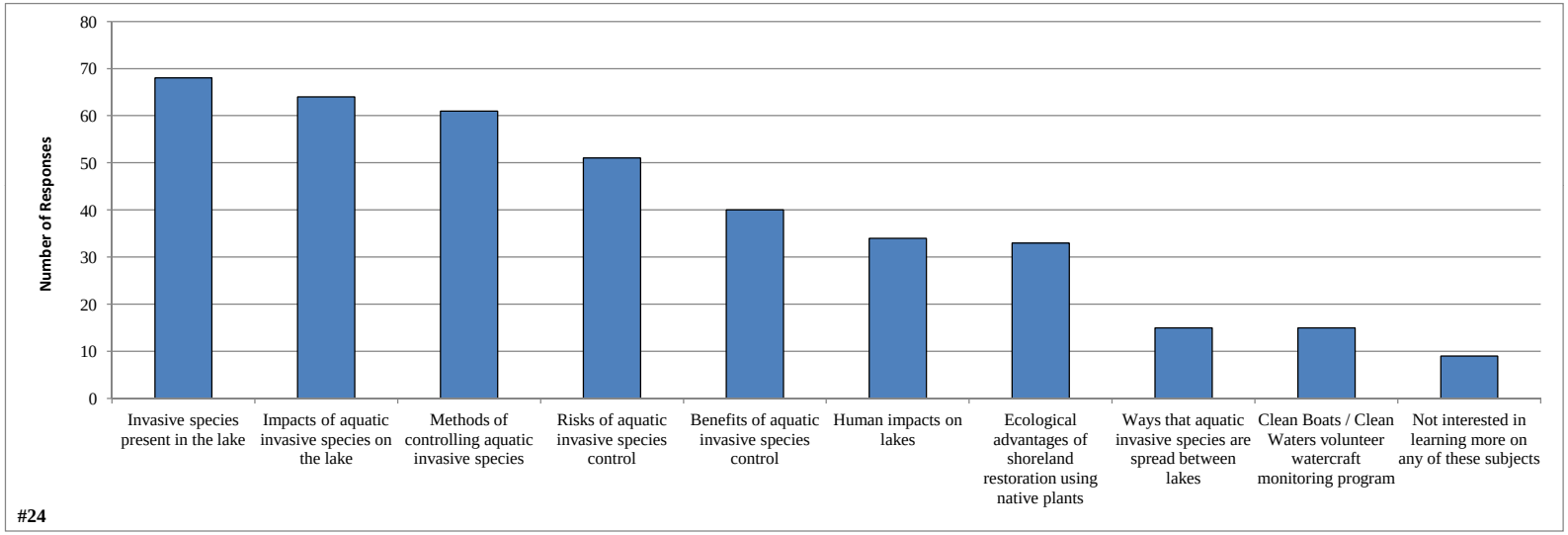
#23 What is your level of support for the responsible use of the following techniques on Musser Lake?

	1 - Not supportive	2	3 - Neutral	4	5 - Highly supportive	Unsure	Total	Average
Integrated control using many methods	3	3	9	27	48	16	*90*	*4.3*
Hand-removal by divers	2	7	15	32	42	9	*98*	*4.1*
Dredging of bottom sediments	13	6	15	18	32	20	*84*	*4.0*
Mechanical harvesting	5	9	16	28	40	10	*98*	*3.9*
Herbicide (chemical) control	10	7	13	19	44	16	*93*	*3.9*
Manual removal by property owners	6	8	24	28	32	9	*98*	*3.7*
Biological control	6	8	20	25	22	20	*81*	*3.6*
Water level drawdown	32	19	20	7	17	11	*95*	*2.6*
Do nothing	74	6	3	2	2	8	*87*	*1.3*



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

	Total
Invasive species present in the lake	68
Impacts of aquatic invasive species on the lake	64
Methods of controlling aquatic invasive species	61
Risks of aquatic invasive species control	51
Benefits of aquatic invasive species control	40
Human impacts on lakes	34
Ecological advantages of shoreland restoration using native plants	33
Ways that aquatic invasive species are spread between lakes	15
Clean Boats / Clean Waters volunteer watercraft monitoring program	15
Not interested in learning more on any of these subjects	9

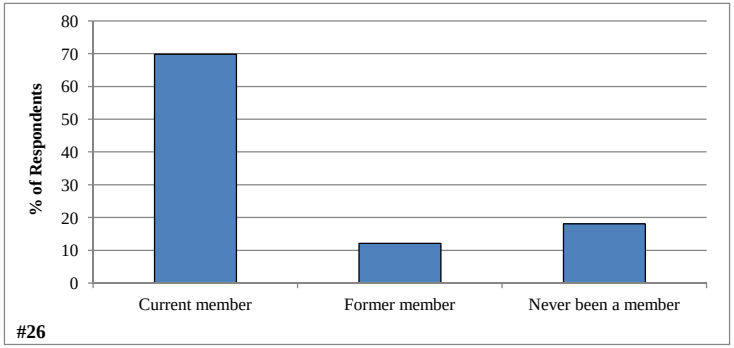


#25 Before receiving this mailing, have you ever heard of the Musser Lake Association?

	Total	%
Yes	116	*99.1*
No	1	*0.9*
	117	*100.0*

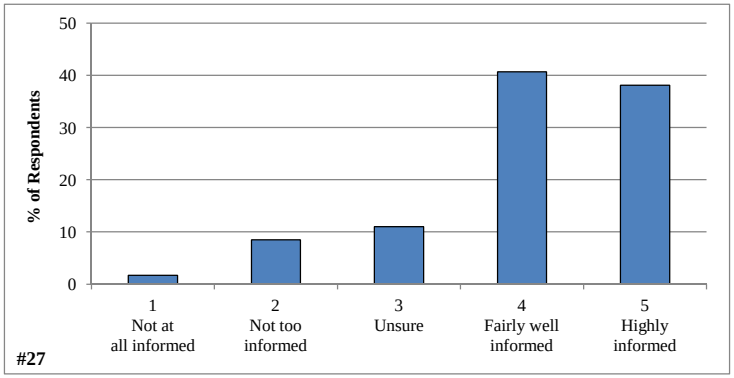
#26 What is your membership status with the Musser Lake Association?

	Total	%
Current member	81	*69.8*
Former member	14	*12.1*
Never been a member	21	*18.1*
	116	*100.0*



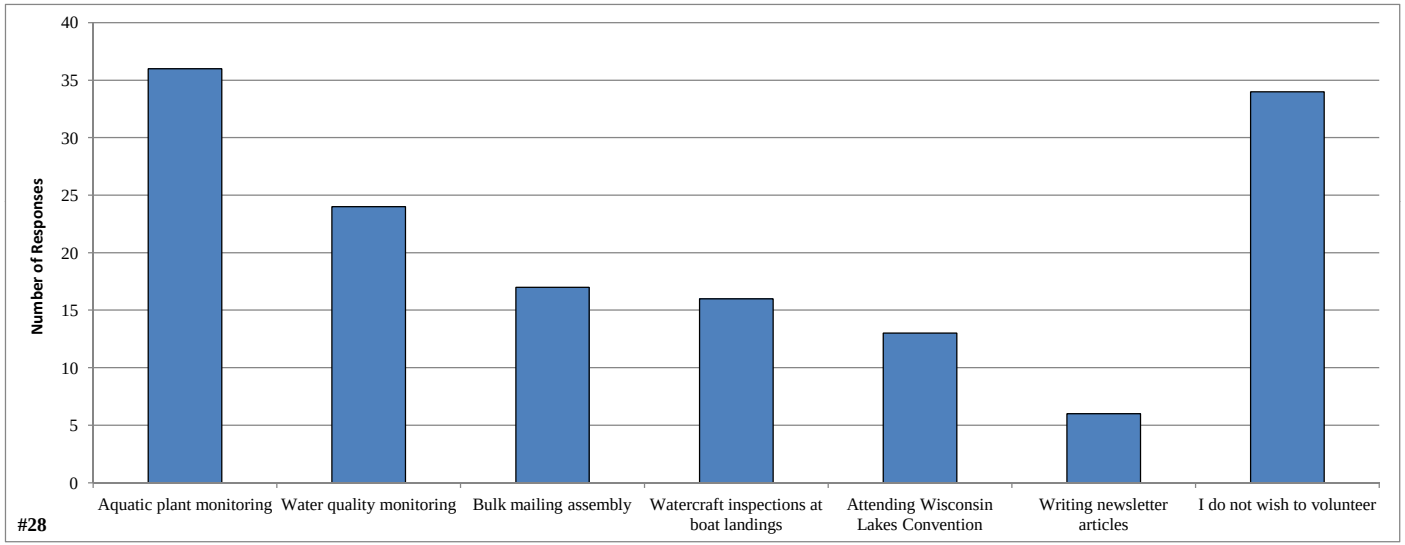
#27 How informed has the Musser Lake Association kept you regarding issues with the lake and its management?

	Total	%
1 - Not at all informed	2	*1.7*
2 - Not too informed	10	*8.5*
3 - Unsure	13	*11.0*
4 - Fairly well informed	48	*40.7*
5 - Highly informed	45	*38.1*
	118	*100.0*



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

	Total
Aquatic plant monitoring	36
Water quality monitoring	24
Bulk mailing assembly	17
Watercraft inspections at boat landings	16
Attending Wisconsin Lakes Convention	13
Writing newsletter articles	6
I do not wish to volunteer	34



Musser Lake Management Planning Project
Stakeholder Survey Comments

Survey Number	1g Comment	11h Comment	13m Comment	18p Comment	19r Comment	20r Comment
1						
2						
3						
4						
5					4th of July fire works	Better boating & fishing etiquette
6						
7	My family has a house we visit a few times a year, but we also are co-owners of the adjacent lot.					
8					Weed poisoning is killing turtles & fish.	
9						
10						

Survey Number	1g Comment	11h Comment	13m Comment	18p Comment	19r Comment	20r Comment
11				Most individuals (including myself) have no clue what these other species look like...kind of a stupid question.		
12						
13						
14		Bullheads			Too many musky.	Too many musky.
15						
16						
17						
18						
19	Only power & outhouse				Boaters ignoring rules (speed, noise, no wake)	Jet ski use.
20						
21						
22	Full time as of June 2012	Have not caught a Northern Pike or Walleye in 2 years.				
23						
24						

Survey Number	1g Comment	11h Comment	13m Comment	18p Comment	19r Comment	20r Comment
25						
26						
27						
28						
29	Plan to live there year round in future.					
30						
31						
32						
33					Geese	Geese
34						
35						
36						
37	At parents year round residence & we own a lot.					
38	Ag & recreational			Wild rice	Wild rice	Wild rice
39						
40						
41			Fixing up my trails & roads.			
42				Wild rice		

Survey Number	1g Comment	11h Comment	13m Comment	18p Comment	19r Comment	20r Comment
43						
44				See question 29		
45						
46						
47						
48		Where are the walleye?				
49					i. Wrong species p. especially 2 yard lights south of rock reef	No fishery plan like other lakes (minimum size, etc.)
50		Zero Walleye				
51						
52				Weeds		
53						
54						
55	Visit relatives regularly					
56						
57		Where are the walleye in this lake?				
58		Bullheads				

Survey Number	1g Comment	11h Comment	13m Comment	18p Comment	19r Comment	20r Comment
59					No wake areas need to be expanded & enforced.	No wake areas need to be expended & enforced.
60						
61						
62						
63						
64						
65						Fish stocking & fish management
66						
67						
68						i. Particularly for birds/loons.
69						
70						
71						No walleye
72						
73	15 weekends & 2 weeks during fall & summer.					
74	About 10-12 days a month year round.					Boat speed & fast traffic & boat noise.

Survey Number	1g Comment	11h Comment	13m Comment	18p Comment	19r Comment	20r Comment
75						
76						
77						
78						Loon protection during nesting season
79						
80					Fishing tournaments	
81			f, h, k, & l			
82					Too many weeds, both native and invasive.	
83						
84						
85	We are often at my parents home	Myself & kids fish for a. & b. My husband fishes for the bigger fish.				
86						
87						
88						
89						
90						

Musser Lake Management Planning Project
Stakeholder Survey Question 29

Survey Number	Response to Question 29
1	
2	
3	
4	
5	Because we are seasonal visitors at Musser Lake, we aren't able to volunteer. We're limited by our jobs and entertaining visitors at our cabin when we're there. We greatly appreciate everything the volunteers do to benefit Musser Lake!
6	Thanks for applying for the grants!
7	
8	The herbicide program has not worked. It has harmed fish, turtles and other wildlife. Please stop poisoning the lake. Use draw-downs to kill the weeds.
9	Leave it alone!
10	
11	General Question: What "improvements" will property owners be allowed to make during the planned draw down in 2012? I. E. removal of logs, weeds, improvement of swimming holes. A Bigger Question: If any improvements are allowed, will we get cooperation from the DNR and Price County zoning?
12	
13	
14	

Survey Number	Response to Question 29
14	
16	Very weedy in fingers, cannot get boats through.
17	We would be willing to help, but due to our age and time spent in the area it seems we're not there when things need to be done.
18	
19	Continue to manage the lake as a fishery with more rules relative to the jet skiing, speed boating, tubing and disturbance to the water fowl (loons).
20	Would like to see the walleye population grow and decrease the large mouth population. MLA is doing a great jog of aggressively addressing invasive plant issue and informing its members of its progress.
21	
22	I would very much like to see walleye populations increased on Musser Lake. I would very much like to help in any project that would help the species thrive in the Musser Flowage.
23	
24	
25	
26	
27	We have never had any real good management until now. Before, I think the lake just ran itself.
28	
29	
30	
31	
32	Thank you so much for taking care of the lake!
33	

Survey Number	Response to Question 29
34	
35	Thank you for the survey and all of your association efforts. Since we are a long distance owner of undeveloped land, we are unable to volunteer for the on site events. But we plan to become a member of the MLA in the near future. Thanks again for all your hard work and a very well written survey.
36	Would like to see the DNR put more walleye into the lake. Musser was always a good walleye lake. I believe the DNR should plant more fingerlings in Musser.
37	
38	To me this has always been "Musser Flowage." Why is it called Musser Lake now?
39	
40	
41	
42	
43	
44	Although wild rice is a native species, it was not on was not on this lake in 1980. It has now almost closed off Musser Creek and until this year has almost closed off Popple Creek and the bay that it runs into. It is also spreading to other areas of the lake. It is very invasive and needs to be controlled by any means possible even though say "no".
45	
46	
47	

Survey Number	Response to Question 29
48	Other lakes you can go out in the evening and actually catch some walleyes consistently. Crappie fishing can be like that occasionally, but always small fish. The lake level should be dropped for a couple of seasons. Then have bull dozers push the dirt into new big islands making the lake deeper and scraping all the weeds onto dry land. In the winter. Thanks for the survey. The mighty Musser is getting choked out by weeds on the east end. This can't last forever. I wish I had the answer. This is a positive step forward and I appreciate all the efforts made so far.
49	Thank you for your work in the MLA. I served as a board member/officer for a decade (1990's). The "½ log" program, the "wttsip" program and the cribbing program created the beginning of a fishery management program on Musser. We currently seem to have (though I haven't seen recent fish counts) a severe species shortage, of numerous sizes, sought by fisherman. On occasion I fish northwestern Wisconsin and the challenges they face are similar to ours, but the difference between us and them is their very aggressive "attack" at boat landings (inspections, limited access, fees, etc.).
50	
51	
52	Fish are small and don't grow.
53	
54	
55	
56	
57	I feel that those who live directly on the lake should be more involved with this organization. A lot of them are not members for whatever reason, but have a big impact on the lake with their activities. The association has done great things with this lake and continues to do so. Keep up the good work.
58	

Survey Number	Response to Question 29
59	Use of volunteers to manage AIS is insufficient to address the issue on Musser Lake. If state and federal funds are not available to have professionals to help manage and execute a coordinated plan, then a special assessment may be required to preserve the lake and property values. Also, shoreline erosion can't be fully addressed by natural solutions and rip rap must be allowed.
60	Management is incompetent.
61	
62	
63	
64	The priority should be weed control. It affects everything around the Musser Lake watershed. All known methods of stopping aquatic invasive plant species should be tried.
65	I feel the lake association should devote more time in fish management duties and maintaining of habitat.
66	
67	
68	
69	
70	
71	
72	
73	

Survey Number	Response to Question 29
83	If I am not a member, please send info on membership!
84	My two biggest concerns are aquatic invasive species getting out of control and the obvious negative impact to fishing and water activities. I am anxious to see the final study and the recommendations for their effective control. Thank you to the MLA leadership - your enthusiasm and commitment to Musser Lake much appreciated!!
85	
86	
87	People who have fished Musser Lake for many years say that the walleye population is way down. It would be nice to see more walleye and larger crappie pan fish in the lake.
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	Want more fish stocked, walleyes and musky in particular.
101	End all fishing contests.

74	I wrote a letter to be read at a meeting several years ago. I was unable to attend. I don't know if it was read, filed or thrown away. My feelings have not changed. This lake was the, or still mostly is what could be considered the perfect example of a "northwoods" lake. Wildlife plentiful, herons, loons, mink, otter, they are still around, but now you're more lucky if you see them. I am aware times change, but the increase of "sport boating" will eventually take its toll. One of the main concerns is the lack of boat manners. Tubing, jet skis, water skiing and other speed boat activity should be discouraged before 8-9 a.m. and after 4-6 p.m. depending on daylight. That is fishing time. You don't need 150 plus horse power to get from one spot to another. Lake users need to stay good distances from piers, if someone is fishing from a pier, slow down. Slow when passing boats anchored, canoes, etc. We've had people come within inches of a cork on a line thrown from shore. Tubers going to close to shore and our docked boat are filled with water in the back. Lake Ripley in Jefferson County, a very busy high traffic lake, has no wake before 11:00 a.m. or after 7:30 p.m. I believe it changes due to length of the days. Tuesday is NO WAKE DAY. That is requested, not enforced and is respected. Main point, Musser is becoming noisy and not the quiet, peaceful retreat it used to be. This must have some impact on the fishing! Learn respect for boaters, shorelines and wildlife.
75	
76	
77	
78	Need to alert lake users of wildlife using lake, especially on holiday weekends.
79	It is very difficult for me to participate because I never know when and if I can come up from Milwaukee. I'm physically unable to come myself now, so it's difficult to commit.
80	The fishing has gotten significantly worse over the years. Pan fishing is terrible. Do we need to be stocking the lake? Is the treatment being used killing the fish? Do not allow fishing tourneys.
81	As the owner of the property, I myself am not able to be at the cottage that often.
82	I believe that Musser Lake can be one of the finest fisheries in the county, but controlling overgrowth of aquatic weeds is a key. Doing so will result in improved water quality and the lake's longevity as well. I support efforts in this objective. Thanks to the lake association for all you do.

Survey Number	Response to Question 29
102	I would live to sell my 580 acres on the south side of Musser Lake. The property taxes are killing me.
103	
104	
105	If chemicals have been used to control aquatic vegetation, has the size of the fish been affected?
106	
107	
108	It has been a nice musky lake and I believe the control of the water level contributes to that. Weed control and AIS control is important as it can really disrupt everything. Thank you.
109	Winter water level draw down could be most effective. No small or young walleyes are ever caught. Have caught walleyes in past. All looked like old fish. Bluegills are stunted in a Class A musky lake, due to excessive aquatic plants. I feel draw down and retardation of aquatic plants would be easiest, cheapest and most effective.
110	
111	
112	
113	
114	At this point in time, our farm activities fill our days.
115	Shoreline protection using rock barriers are much needed. Trees are washed out and fall over - this method is not working.
116	Have a catch and release policy for musky fisherman, if possible.
117	When we start spending more time up in Phillips, this year or next our cabin should be completed, than we would be willing to volunteer.
118	We enjoy the lake, but are unable to help much with projects. We only use the lake randomly throughout the summer. Thanks for all the work you are doing.

C

APPENDIX C

Water Quality Data

Musser Lake

Date: 4/28/2010
Time:
Weather:
Entry: DAC

Max Depth:
MLS Depth (ft):
MLB Depth (ft):
Secchi Depth (ft): 2.3

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

Parameter	MLS	MLB
Total P (µg/L)	39.00	
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)		

Collected by: Alfred & Doris Speich of Musser Lake CLMN

Musser Lake

Date: 5/10/2010
Time:
Weather:
Entry: DAC

Max Depth: 29.1
MLS Depth (ft): 6.0
MLB Depth (ft): NA
Secchi Depth (ft): 2.5

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

Parameter	MLS	MLB
Total P (µg/L)	44.00	
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)		

Collected by: Alfred & Doris Speich of Musser Lake CLMN

Musser Lake

Date: 6/7/2010
Time:
Weather:
Entry: DAC

Max Depth:
MLS Depth (ft):
MLB Depth (ft):
Secchi Depth (ft): 2.5

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

Parameter	MLS	MLB
Total P (µg/L)	35.00	
Dissolved P (µg/L)		
Chl-a (µg/L)	18.30	
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)		

Collected by: Alfred & Doris Speich of Musser Lake CLMN

Musser Lake

Date: 7/23/2010
Time:
Weather:
Entry: DAC

MLS **Max Depth:**
MLS **Depth (ft):**
MLB **Depth (ft):**
Secchi Depth (ft): 1.2

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

Parameter	MLS	MLB
Total P (µg/L)	116.000	
Dissolved P (µg/L)		
Chl-*a* (µg/L)	2.69	
TKN (µg/L)	2240.00	
NO_3 + NO_2-N (µg/L)	31.000	
NH_3-N (µg/L)		
Total N (µg/L)	2240.00	
Lab Cond. (µS/cm)	64	
Lab pH	6.78	
Alkalinity (mg/L $CaCO_3$)	26	
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

Collected by: Craig Roesler, Lakes Long Term Trend Monitoring

Musser Lake

Date: 8/17/2010
Time:
Weather:
Entry: DAC

MLS **Max Depth:**
MLS **Depth (ft):**
MLB **Depth (ft):**
Secchi Depth (ft): 1.5

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

Parameter	MLS	MLB
Total P (µg/L)	83	
Dissolved P (µg/L)		
Chl-*a* (µg/L)	1.67	
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)	59	
Lab pH	6.8	
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

Collected by: Craig Roesler, Lakes Long Term Trend Monitoring

Musser Lake

Date: 9/10/2010
Time:
Weather:
Entry: DAC

MLS **Max Depth:**
MLS **Depth (ft):**
MLB **Depth (ft):**
Secchi Depth (ft): 1.6

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

Parameter	MLS	MLB
Total P (µg/L)	95	
Dissolved P (µg/L)		
Chl-*a* (µg/L)	ND	
TKN (µg/L)		
NO_3 + NO_2-N (µg/L)		
NH_3-N (µg/L)		
Total N (µg/L)		
Lab Cond. (µS/cm)	66	
Lab pH		
Alkalinity (mg/L $CaCO_3$)		
Total Susp. Solids (mg/L)		
Calcium (mg/L)		

Collected by: Craig Roesler, Lakes Long Term Trend Monitoring

Water Quality Data

2010	Surface		Bottom	
Parameter	Count	Mean	Count	Mean
Secchi Depth (feet)	6	1.9	NA	NA
Total P (µg/L)	6	68.7	0	NA
Dissolved P (µg/L)	0	NA	0	NA
Chl a (µg/L)	4	7.6	0	NA
TKN (µg/L	1	2240.0	0	NA
NO3+NO2-N (µg/L)	1	31.0	0	NA
NH3-N (µg/L)	0	NA	0	NA
Total N (µg/L)	1	2240.0	0	NA
Lab Cond. (µS/cm)	3	63.0	0	NA
Lab pH	2	6.8	0	NA
Alkal (mg/l CaCO3)	1	26.0	0	NA
Total Susp Sol (mg/l)	0	NA	0	NA
Calcium (µg/L)	0	NA	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
1973	65.4		61.3
1974	57.3		60.8
1993			59.2
1994	64.8	43.4	55.9
1995	56.1	43.2	57.8
1996	59.4	50.4	55.4
1997	67.0	59.3	61.3
1998	58.6	54.5	59.1
1999	61.1	51.4	63.9
2000	68.0	47.5	63.9
2001	64.3		62.5
2003	53.7	55.7	51.1
2004	58.6	54.2	60.5
2005	58.3	58.5	57.8
2006	60.8	62.2	61.9
2007	58.6	59.9	59.5
2008	61.8	55.4	64.5
2009	59.3	56.6	60.9
2010	68.0	48.6	70.6
All Years (Weighted)	61.3	55.3	60.2
llow, Lowland Drainage La	54.6	52.6	52.4
NLF Ecoregion	48.1	47.5	45.7

	Secchi (feet)				Chlorophyll- *a* (µg/L)				Total Phosphorus (µg/L)			
	Growing Season		Summer		Growing Season		Summer		Growing Season		Summer	
Year	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean	Count	Mean
1973	1	3.0	1	3.0					1	70.0	1.0	70.0
1974	3	3.1	1	3.1					3	46.7	1.0	40.0
1993	9	3.7	6	3.5	1	7.3	0		2	43.0	0.0	
1994	3	3.7	2	4.4	3	3.1	2	3.7	1	67.0	1.0	67.0
1995	5	4.0	3	3.8	5	3.6	4	3.6	5	39.2	4.0	36.8
1996	1	4.5	1	4.5	1	7.5	1	7.5	1	46.0	1.0	46.0
1997	2	2.8	1	3.0	2	10.9	1	18.6	2	80.0	1.0	78.0
1998	4	3.6	3	3.5	3	10.3	2	11.5	4	41.0	3.0	43.7
1999	4	2.8	2	2.5	3	9.9	2	8.3	4	49.3	2.0	52.0
2000	5	2.9	3	2.5	4	5.5	3	5.6	5	64.6	3.0	84.0
2001	4	3.0	2	2.8					4	53.5	2.0	65.0
2003	3	5.8	2	6.1	3	12.7	2	12.9	4	33.0	2.0	31.0
2004	6	3.4	3	3.2	5	11.0	3	11.1	7	42.7	3.0	43.7
2005	9	4.0	6	3.8	7	16.9	5	17.2	9	42.0	5.0	42.8
2006	4	3.0	2	2.9	7	20.7	3	25.1	9	53.7	3.0	50.7
2007	7	3.7	5	3.4	6	19.3	5	19.8	8	41.5	5.0	43.6
2008	7	2.6	5	2.4	6	12.6	5	12.6	8	50.0	5.0	54.6
2009	8	3.3	5	3.1	6	16.3	5	14.1	8	46.0	5.0	45.8
2010	8	2.1	4	1.6	5	5.0	4	6.3	8	69.1	4.0	83.8
All Years (Weighted)		3.3		3.2		12.2		12.4		49.5		52.5
Shallow, Lowland Drainage Lakes				5.6				9.4				33.0
NLF Ecoregion				8.9				5.6				21.0

Summer 2010 N: 2240.0
Summer 2010 P: 68.7

Summer 2011 N:P 33 :1

D

APPENDIX D

Watershed Analysis WiLMS Results

Date: 10/31/2011 Musser Lake – Growing Season Weighted TP

Lake Id: Musser_Current_Wghtd_GSTP
Watershed Id: 0

Hydrologic and Morphometric Data

Tributary Drainage Area: 54139.0 acre
Total Unit Runoff: 12.50 in.
Annual Runoff Volume: 56394.8 acre-ft
Lake Surface Area <As>: 563.0 acre
Lake Volume <V>: 2815.0 acre-ft
Lake Mean Depth <z>: 5.0 ft
Precipitation - Evaporation: 4.7 in.
Hydraulic Loading: 56615.3 acre-ft/year
Areal Water Load <qs>: 100.6 ft/year
Lake Flushing Rate <p>: 20.11 1/year
Water Residence Time: 0.05 year
Observed spring overturn total phosphorus (SPO): 39.0 mg/m^3
Observed growing season mean phosphorus (GSM): 49.3 mg/m^3
% NPS Change: 0%
% PS Change: 0%

NON-POINT SOURCE DATA

Land Use	Acre	Low	Most Likely	High	Loading %	Low	Most Likely	High
	(ac)	Loading (kg/ha-year)				Loading (kg/year)		
Row Crop AG	1477.0	0.50	1.00	3.00	21.8	299	598	1793
Mixed AG	0.0	0.30	0.80	1.40	0.0	0	0	0
Pasture/Grass	935.0	0.10	0.30	0.50	4.1	38	114	189
HD Urban (1/8 Ac)	0.0	1.00	1.50	2.00	0.0	0	0	0
MD Urban (1/4 Ac)	0.0	0.30	0.50	0.80	0.0	0	0	0
Rural Res (>1 Ac)	3.0	0.05	0.10	0.25	0.0	0	0	0
Wetlands	18256.0	0.10	0.10	0.10	27.0	739	739	739
Forest	33468.0	0.05	0.09	0.18	44.5	677	1219	2438
Lake Surface	563.0	0.10	0.30	1.00	2.5	23	68	228

POINT SOURCE DATA

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

SEPTIC TANK DATA

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

TOTALS DATA

Description	Low	Most Likely	High	Loading %
Total Loading (lb)	3914.5	6035.2	11877.1	100.0
Total Loading (kg)	1775.6	2737.6	5387.4	100.0
Areal Loading (lb/ac-year)	6.95	10.72	21.10	
Areal Loading (mg/m^2-year)	779.33	1201.54	2364.58	
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)	3864.3	5884.5	11374.8	100.0
Total NPS Loading (kg)	1752.8	2669.2	5159.6	100.0

Phosphorus Prediction and Uncertainty Analysis Module

Date: 10/31/2011 Musser Lake – Growing Season Weighted TP
Observed spring overturn total phosphorus (SPO): 39.0 mg/m^3
Observed growing season mean phosphorus (GSM): 49.3 mg/m^3
Back calculation for SPO total phosphorus: 0.0 mg/m^3
Back calculation GSM phosphorus: 0.0 mg/m^3
% Confidence Range: 70%
Nurenberg Model Input - Est. Gross Int. Loading: 0 kg

Lake Phosphorus Model	Low Total P (mg/m^3)	Most Likely Total P (mg/m^3)	High Total P (mg/m^3)	Predicted -Observed (mg/m^3)	% Dif.
Walker, 1987 Reservoir	21	33	65	-16	-32
Canfield-Bachmann, 1981 Natural Lake	22	33	63	-16	-32
Canfield-Bachmann, 1981 Artificial Lake	21	30	54	-19	-39
Rechow, 1979 General	16	25	49	-24	-49
Rechow, 1977 Anoxic	22	34	68	-15	-30
Rechow, 1977 water load<50m/year	16	25	48	-24	-49
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	21	32	64	-7	-18
Vollenweider, 1982 Combined OECD	19	27	46	-17	-39
Dillon-Rigler-Kirchner	15	22	44	-17	-44
Vollenweider, 1982 Shallow Lake/Res.	15	22	39	-22	-50
Larsen-Mercier, 1976	21	32	63	-7	-18
Nurnberg, 1984 Oxic	18	27	53	-22	-45

Lake Phosphorus Model	Confidence Lower Bound	Confidence Upper Bound	Parameter Fit?	Back Calculation (kg/year)	Model Type
Walker, 1987 Reservoir	21	56	Tw	0	GSM
Canfield-Bachmann, 1981 Natural Lake	10	95	FIT	1	GSM
Canfield-Bachmann, 1981 Artificial Lake	9	86	FIT	1	GSM
Rechow, 1979 General	15	43	FIT	0	GSM
Rechow, 1977 Anoxic	22	58	FIT	0	GSM
Rechow, 1977 water load<50m/year	16	42	FIT	0	GSM
Rechow, 1977 water load>50m/year	N/A	N/A	N/A	N/A	N/A
Walker, 1977 General	18	59	FIT	0	SPO
Vollenweider, 1982 Combined OECD	14	49	FIT	0	ANN
Dillon-Rigler-Kirchner	15	37	P	0	SPO
Vollenweider, 1982 Shallow Lake/Res.	12	40	FIT	0	ANN
Larsen-Mercier, 1976	22	53	P Pin	0	SPO
Nurnberg, 1984 Oxic	16	48	FIT	0	ANN

Expanded Trophic Response Module

Date: 11/1/2011 Scenario: 2
Total Phosphorus: 30.0 mg/m^3
Growing Season
Chorophyll a: 13.5 mg/m^3
Secchi Disk Depth: 0.97 m

Carlson TSI Equations:

TSI (Total Phosphorus): 53 TSI (Chlorphyll a): 56 TSI (Secchi Disk Depth): 60

E

APPENDIX E

2010 Aquatic Plant Survey Data

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Ricciа fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
1	45.74209375	-90.28689329				Too Deep																																					
2	45.74158072	-90.28689066				Too Deep																																					
3	45.74106768	-90.28688804				Too Deep																																					
4	45.74312166	-90.28616581				Too Deep																																					
5	45.74260863	-90.28616319				Too Deep																																					
6	45.74209559	-90.28616057				Too Deep																																					
7	45.74158255	-90.28615795				Too Deep																																					
8	45.74106952	-90.28615533				Too Deep																																					
9	45.74055648	-90.28615271	3	S	P																																					
10	45.74312350	-90.28543308	9	S	P																																					
11	45.74261046	-90.28543046				Too Deep																																					
12	45.74209742	-90.28542785				Too Deep																																					
13	45.74158439	-90.28542524				Too Deep																																					
14	45.74107135	-90.28542262				Too Deep																																					
15	45.74055831	-90.28542001				Too Deep																																					
16	45.74004528	-90.28541739	9	M	P																																					
17	45.73953224	-90.28541478	6	S	P																																					
18	45.74312533	-90.28470034	1	R	P																																					
19	45.74261229	-90.28469774				Too Deep																																					
20	45.74209925	-90.28469513				Too Deep																																					
21	45.74158622	-90.28469252				Too Deep																																					
22	45.74107318	-90.28468991				Too Deep																																					
23	45.74056014	-90.28468731				Too Deep																																					
24	45.74004711	-90.28468470	6	S	P																																					
25	45.73902103	-90.28467949	3	M	P		2							1		2																											
26	45.73850800	-90.28467688	8	M	P	No Vegetation																																					
27	45.73799496	-90.28467427	8	M	P	No Vegetation																																					
28	45.74312715	-90.28396761				Too Deep																																					
29	45.74261411	-90.28396501				Too Deep																																					
30	45.74210108	-90.28396241				Too Deep																																					
31	45.74158804	-90.28395981				Too Deep																																					
32	45.74107500	-90.28395721				Too Deep																																					
33	45.73953589	-90.28394940	7	S	P	No Vegetation																																					
34	45.73902286	-90.28394680	8	M	P	No Vegetation																																					
35	45.73850982	-90.28394420	8	M	P	No Vegetation																																					
36	45.73799678	-90.28394160	8	M	P	No Vegetation																																					
37	45.73748374	-90.28393900	8	M	P	No Vegetation																																					
38	45.73697071	-90.28393640	7	S	P	No Vegetation																																					
39	45.73645767	-90.28393380	5	S	P		1		1																																		
40	45.73543160	-90.28392860	2	M	P		3		2	1		1				2	1																									
41	45.74364200	-90.28323747	8	M	P																																					
42	45.74312897	-90.28323488				Too Deep																																					
43	45.74261593	-90.28323228				Too Deep																																					
44	45.74210289	-90.28322969				Too Deep																																					
45	45.74158986	-90.28322709				Too Deep																																					
46	45.74107682	-90.28322450	9	M	P																																					
47	45.74056378	-90.28322191	4	S	P		2									2																										
48	45.74005075	-90.28321931	8	M	P		1							1																												
49	45.73953771	-90.28321672	9	M	P	No Vegetation																																					
50	45.73902467	-90.28321412	9	M	P	No Vegetation																																					
51	45.73851164	-90.28321153	8	M	P	No Vegetation																																					
52	45.73799860	-90.28320894	8	M	P	No Vegetation																																					
53	45.73748556	-90.28320634	8	M	P	No Vegetation																																					
54	45.73697253	-90.28320375	8	M	P	No Vegetation																																					
55	45.73645949	-90.28320116	8	M	P	No Vegetation																																					
56	45.73594645	-90.28319856	7	M	P	No Vegetation																																					
57	45.73543341	-90.28319597	5	S	P	No Vegetation																																					
58	45.73492038	-90.28319338	5	S	P	No Vegetation																																					
59	45.73440734	-90.28319078	2	S	P		2		1							2				V																						
60	45.74364382	-90.28250473	3	S	P		1									2																			1								
61	45.74313078	-90.28250214	9	M	P	No Vegetation																																					
62	45.74261775	-90.28249955	9	M	P	No Vegetation																																					
63	45.74210471	-90.28249697				Too Deep																																					
64	45.74159167	-90.28249438				Too Deep																																					
65	45.74107864	-90.28249179				Too Deep																																					

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Ricciа fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
66	45.74056560	-90.28248920				Too Deep																																					
67	45.74005256	-90.28248662	10	M	P	No Vegetation																																					
68	45.73953952	-90.28248403	10	M	P	No Vegetation																																					
69	45.73902649	-90.28248144	8	M	P	No Vegetation																																					
70	45.73851345	-90.28247886	8	M	P	No Vegetation																																					
71	45.73800041	-90.28247627	9	S	P	No Vegetation																																					
72	45.73748738	-90.28247368	8	M	P	No Vegetation																																					
73	45.73697434	-90.28247110	8	M	P	No Vegetation																																					
74	45.73646130	-90.28246851	7	M	P	No Vegetation																																					
75	45.73594827	-90.28246592	6	S	P	No Vegetation																																					
76	45.73543523	-90.28246334	6	S	P	No Vegetation																																					
77	45.73492219	-90.28246075	5	M	P	No Vegetation																																					
78	45.73440915	-90.28245816	4	M	P		2		1					1																													
79	45.74415866	-90.28177457	4	S	P		1									1																											
80	45.74364563	-90.28177199	8	R	P	No Vegetation																																					
81	45.74313259	-90.28176941	9	M	P	No Vegetation																																					
82	45.74261955	-90.28176683				Too Deep																																					
83	45.74210652	-90.28176425				Too Deep																																					
84	45.74159348	-90.28176166				Too Deep																																					
85	45.74108044	-90.28175908				Too Deep																																					
86	45.74056741	-90.28175650	9	M	P	No Vegetation																																					
87	45.74005437	-90.28175392	9	M	P	No Vegetation																																					
88	45.73954133	-90.28175134	6	R	P		1																																				1	
89	45.73902830	-90.28174876	9	M	P	No Vegetation																																					
90	45.73851526	-90.28174618	9	S	P	No Vegetation																																					
91	45.73800222	-90.28174360	8	M	P	No Vegetation																																					
92	45.73748919	-90.28174102	8	S	P	No Vegetation																																					
93	45.73697615	-90.28173844	8	M	P	No Vegetation																																					
94	45.73646311	-90.28173586	7	M	P	No Vegetation																																					
95	45.73595007	-90.28173328	2	R	P	No Vegetation																																					
96	45.73492400	-90.28172812	5	M	P	No Vegetation																																					
97	45.73441096	-90.28172554	2	S	P		1							1		1																											
98	45.74416047	-90.28104182	8	M	P	No Vegetation																																					
99	45.74364743	-90.28103925				Too Deep																																					
100	45.74313440	-90.28103667	9	M	P	No Vegetation																																					
101	45.74262136	-90.28103410	9	M	P	No Vegetation																																					
102	45.74210832	-90.28103152				Too Deep																																					
103	45.74159529	-90.28102895				Too Deep																																					
104	45.74108225	-90.28102638				Too Deep																																					
105	45.74056921	-90.28102380	9	M	P	No Vegetation																																					
106	45.74005618	-90.28102123	11	M	P	No Vegetation																																					
107	45.73954314	-90.28101865	12	M	P	No Vegetation																																					
108	45.73903010	-90.28101608	11	M	P	No Vegetation																																					
109	45.73851706	-90.28101351	8	S	P	No Vegetation																																					
110	45.73800403	-90.28101093	9	S	P	No Vegetation																																					
111	45.73749099	-90.28100836	8	M	P	No Vegetation																																					
112	45.73697795	-90.28100579	8	M	P	No Vegetation																																					
113	45.73646492	-90.28100321	5	S	P	No Vegetation																																					
114	45.74570138	-90.28031678	2	S	P		2		1							1																											
115	45.74518834	-90.28031421	7	M	P	No Vegetation																																					
116	45.74467531	-90.28031164	7	M	P	No Vegetation																																					
117	45.74416227	-90.28030907	9	M	P	No Vegetation																																					
118	45.74364923	-90.28030650	4	S	P		1									1																											
119	45.74313620	-90.28030394	9	M	P	No Vegetation																																					
120	45.74262316	-90.28030137	9	M	P	No Vegetation																																					
121	45.74211012	-90.28029880	10			Too Deep																																					
122	45.74159709	-90.28029624				Too Deep																																					
123	45.74108405	-90.28029367				Too Deep																																					
124	45.74057101	-90.28029110	9	M	P	No Vegetation																																					
125	45.74005797	-90.28028853	9	M	P	No Vegetation																																					
126	45.73954494	-90.28028597	10	M	P	No Vegetation																																					
127	45.73903190	-90.28028340	9	M	P	No Vegetation																																					
128	45.73851886	-90.28028083	8	M	P	No Vegetation																																					
129	45.73800583	-90.28027827	8	M	P	No Vegetation																																					
130	45.73749279	-90.28027570	8	M	P	No Vegetation																																					

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Ricciа fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
131	45.73697975	-90.28027313	8	M	P	No Vegetation																																					
132	45.73646672	-90.28027057	5	S	P	No Vegetation																																					
133	45.74672925	-90.27958913	2	M	P		2		2			1	1		1		1																									
134	45.74621621	-90.27958657	1	R	P	No Vegetation																																					
135	45.74570317	-90.27958401	5	M	P	No Vegetation																																					
136	45.74519014	-90.27958145	6	M	P	No Vegetation																																					
137	45.74467710	-90.27957889	6	M	P	No Vegetation																																					
138	45.74313799	-90.27957120	8	M	P		1							1																												
139	45.74262495	-90.27956864	9	M	P	No Vegetation																																					
140	45.74211192	-90.27956608	9	M	P	No Vegetation																																					
141	45.74159888	-90.27956352	9	M	P	No Vegetation																																					
142	45.74108584	-90.27956096	9	M	P	No Vegetation																																					
143	45.74057281	-90.27955840	9	M	P	No Vegetation																																					
144	45.74005977	-90.27955584	9	M	P	No Vegetation																																					
145	45.73954673	-90.27955328	9	M	P	No Vegetation																																					
146	45.73903370	-90.27955072	4	S	P		1									1																										
147	45.73852066	-90.27954816	6	R	P	No Vegetation																																					
148	45.73800762	-90.27954560	7	S	P	No Vegetation																																					
149	45.73749458	-90.27954304	8	M	P	No Vegetation																																					
150	45.73698155	-90.27954048	8	M	P	No Vegetation																																					
151	45.73646851	-90.27953792	8	S	P	No Vegetation																																					
152	45.73595547	-90.27953536	4	S	P		3		2							1																										
153	45.74262674	-90.27883591	8	M	P		1							1																												
154	45.74211371	-90.27883336	8	M	P	No Vegetation																																					
155	45.74160067	-90.27883081	7	M	P	No Vegetation																																					
156	45.74108763	-90.27882825	8	M	P	No Vegetation																																					
157	45.74057460	-90.27882570	8	M	P	No Vegetation																																					
158	45.74006156	-90.27882314	8	M	P	No Vegetation																																					
159	45.73954852	-90.27882059	3	S	P		2									2																										
160	45.73903549	-90.27881804	7	M	P	No Vegetation																																					
161	45.73852245	-90.27881548	5	R	P	No Vegetation																																					
162	45.73800941	-90.27881293	7	S	P	No Vegetation																																					
163	45.73749637	-90.27881038	8	M	P	No Vegetation																																					
164	45.73698334	-90.27880782	7	M	P	No Vegetation																																					
165	45.73647030	-90.27880527	3	S	P		1							1																												
166	45.73595726	-90.27880272	3	S	P		3									3																										
167	45.74262853	-90.27810319	6	M	P	No Vegetation																																					
168	45.74211549	-90.27810064	7	M	P	No Vegetation																																					
169	45.74160246	-90.27809809	7	M	P	No Vegetation																																					
170	45.74108942	-90.27809554	6	M	P	No Vegetation																																					
171	45.74057638	-90.27809300	7	M	P	No Vegetation																																					
172	45.74006335	-90.27809045	7	M	P	No Vegetation																																					
173	45.73955031	-90.27808790	7	M	P	No Vegetation																																					
174	45.73903727	-90.27808536	6	M	P	No Vegetation																																					
175	45.73852423	-90.27808281	6	S	P	No Vegetation																																					
176	45.73801120	-90.27808026	8	S	P	No Vegetation																																					
177	45.73749816	-90.27807772	8	M	P	No Vegetation																																					
178	45.73698512	-90.27807517	3	R	P		1									1																										
179	45.73647209	-90.27807262	8	M	P	No Vegetation																																					
180	45.73595905	-90.27807008	6	S	P	No Vegetation																																					
181	45.73544601	-90.27806753	2	S	P		2		1	1						2																					1					
182	45.73390690	-90.27805989	5	M	P		3		1			1					1			V																						
183	45.73339386	-90.27805735	3	M	P		2		2		1	1	1		1	1	1																										
184	45.73288082	-90.27805480	3	M	P		3		3		1		1																													
185	45.73185475	-90.27804971	3	M	P		3		1	1	1		1	1			1		1									1	1												1		
186	45.73134171	-90.27804716	3	M	P		1		1	1	1		1	1			1		1	1								1	1													
187	45.73082867	-90.27804462	3	M	P		1		1	1	1		1	1			1		1									1														
188	45.74211728	-90.27736792	6	M	P	No Vegetation																																					
189	45.74160424	-90.27736538	6	M	P	No Vegetation																																					
190	45.74109120	-90.27736284	6	M	P	No Vegetation																																					
191	45.74057816	-90.27736030	5	M	P	No Vegetation																																					
192	45.73955209	-90.27735522	6	M	P	No Vegetation																																					
193	45.73903905	-90.27735268	6	M	P		1							1																												
194	45.73852602	-90.27735014	6	S	P	No Vegetation																																					
195	45.73801298	-90.27734760	3	R	P	No Vegetation																																					

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Ricciа fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
196	45.73749994	-90.27734506	6	S	P	No Vegetation																																					
197	45.73698690	-90.27734252	4	S	P		3									3																											
198	45.73647387	-90.27733998	9	M	P	No Vegetation																																					
199	45.73596083	-90.27733744	9	M	P	No Vegetation																																					
200	45.73493475	-90.27733236	5	S	P	No Vegetation																																					
201	45.73442172	-90.27732982	6	S	P	No Vegetation																																					
202	45.73390868	-90.27732728	6	S	P	No Vegetation																																					
203	45.73339564	-90.27732474	6	M	P																																						
204	45.73288260	-90.27732220	3	S	P		2							1		2																											
205	45.73236957	-90.27731966	2	M	P		3		3		1	1		1	1		1														1											
206	45.73185653	-90.27731712	5	M	P		3		3					1			1																									
207	45.73134349	-90.27731458	3	M	P		2		1									1																									
208	45.74160601	-90.27663266	5	M	P	No Vegetation																																					
209	45.74109298	-90.27663013	5	M	P	No Vegetation																																					
210	45.74057994	-90.27662759	5	M	P	No Vegetation																																					
211	45.74006690	-90.27662506	4	S	P	No Vegetation																																					
212	45.73955387	-90.27662253	5	M	P		1							1																												
213	45.73904083	-90.27661999	5	M	P		2							2																												1	
214	45.73852779	-90.27661746	5	R	P	No Vegetation																																					
215	45.73801475	-90.27661493	1	R	P	No Vegetation																																					
216	45.73750172	-90.27661239	9	M	P	No Vegetation																																					
217	45.73698868	-90.27660986	8	M	P	No Vegetation																																					
218	45.73647564	-90.27660733	10	M	P	No Vegetation																																					
219	45.73596261	-90.27660479	8	M	P	No Vegetation																																					
220	45.73544957	-90.27660226	6	S	P	No Vegetation																																					
221	45.73493653	-90.27659973	8	M	P	No Vegetation																																					
222	45.73442349	-90.27659720	8	M	P	No Vegetation																																					
223	45.73391046	-90.27659466	5	S	P		2		1																																	
224	45.73339742	-90.27659213	7	M	P																																						
225	45.73288438	-90.27658960	3	M	P		3		3	1		1	1		1																											
226	45.73237134	-90.27658707	5	M	P		1							1																												
227	45.73185830	-90.27658453	6	M	P		1											1																									
228	45.73134527	-90.27658200	2	M	P		3		3	1		1	1		1		1			1																						
229	45.73083223	-90.27657947	5	M	P	No Vegetation																																					
230	45.73031919	-90.27657694	7	M	P		1		1																																	
231	45.72980615	-90.27657440	6	M	P	No Vegetation																																					
232	45.74058171	-90.27589489	4	M	P		2									2																											
233	45.73852956	-90.27588479	4	M	P		3							3																												1	
234	45.73801653	-90.27588226	5	S	P	No Vegetation																																				1	
235	45.73750349	-90.27587973	7	M	P	No Vegetation																																					
236	45.73699045	-90.27587721	8	M	P	No Vegetation																																					
237	45.73647741	-90.27587468	10	M	P	No Vegetation																																					
238	45.73596438	-90.27587215	7	S	P	No Vegetation																																					
239	45.73545134	-90.27586963	8	M	P	No Vegetation																																					
240	45.73493830	-90.27586710	8	M	P	No Vegetation																																					
241	45.73442526	-90.27586458	8	M	P	No Vegetation																																					
242	45.73391223	-90.27586205	3	S	P		3		1	1				1		2																											
243	45.73339919	-90.27585952	5	S	P				1	1				1																												
244	45.73288615	-90.27585700	7	M	P																																						
245	45.73237311	-90.27585447	6	M	P	No Vegetation																																					
246	45.73134704	-90.27584942	4	M	P		1		1								1																									
247	45.73083400	-90.27584689	7	M	P	No Vegetation																																					
248	45.73032096	-90.27584437	7	M	P	No Vegetation																																					
249	45.72980792	-90.27584184	5	M	P	No Vegetation																																					
250	45.72929489	-90.27583932	3	M	P		1		1																																	
251	45.73853133	-90.27515211	3	S	P		3		1					3																												
252	45.73801829	-90.27514959	5	S	P	No Vegetation																																					
253	45.73750526	-90.27514707	7	M	P	No Vegetation																																					
254	45.73699222	-90.27514455	2	S	P		1							1		1																											
255	45.73647918	-90.27514203	7	S	P	No Vegetation																																					
256	45.73596614	-90.27513951	8	S	P	No Vegetation																																					
257	45.73545311	-90.27513699	7	M	P	No Vegetation																																					
258	45.73494007	-90.27513447	8	M	P	No Vegetation																																					
259	45.73442703	-90.27513195	9	S	P	No Vegetation																																					
260	45.73391399	-90.27512943	6	S	P	No Vegetation	3									3																											

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Ricciа fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
261	45.73340096	-90.27512692	6	S	P																																					
262	45.73288792	-90.27512440	7	M	P																																					
263	45.73237488	-90.27512188	9	M	P																																					
264	45.73134880	-90.27511684	8	M	P																																					
265	45.73083577	-90.27511432	12			Too Deep																																				
266	45.73032273	-90.27511180	7	S	P	No Vegetation																																				
267	45.72980969	-90.27510928	7	S	P	No Vegetation																																				
268	45.72929665	-90.27510676	6	S	P	No Vegetation																																				
269	45.73802006	-90.27441692	2	S	P		1									1																										
270	45.73750702	-90.27441441	4	M	P		3	1	1																																
271	45.73699398	-90.27441190	5	S	P		1	1								3																									
272	45.73648094	-90.27440938	5	S	P		1									1																									
273	45.73545487	-90.27440436	3	S	P		2		1							2																									
274	45.73494183	-90.27440185	9	S	P	No Vegetation																																				
275	45.73442879	-90.27439933	8	M	P	No Vegetation																																				
276	45.73391575	-90.27439682	7	S	P	No Vegetation																																				
277	45.73340272	-90.27439431	8	M	P																																					
278	45.73288968	-90.27439180	6	S	P																																					
279	45.73237664	-90.27438928	7	S	P																																					
280	45.73186360	-90.27438677																																								
281	45.73135057	-90.27438426	6	S	P																																					
282	45.73083753	-90.27438175	9	M	P	No Vegetation																																				
283	45.73032449	-90.27437923	8	S	P	No Vegetation																																				
284	45.72981145	-90.27437672	7	S	P	No Vegetation																																				
285	45.72929841	-90.27437421	8	S	P	No Vegetation																																				
286	45.73648270	-90.27367674	3	M	P		3		1	1				2		3	1																								1	
287	45.73545662	-90.27367172	3	M	P		3		1	1		1			1		1														1										
288	45.73494359	-90.27366922	7	M	P	No Vegetation																																				
289	45.73443055	-90.27366671	7	S	P	No Vegetation																																				
290	45.73391751	-90.27366421	6	S	P	No Vegetation																																				
291	45.73340447	-90.27366170	8	M	P																																					
292	45.73289144	-90.27365919	5	S	P		3							1		3																									
293	45.73237840	-90.27365669	3	S	P		1			1				1		1																									
294	45.73083928	-90.27364917	3	S	P		1	1										1																								
295	45.73032625	-90.27364667	6	S	P	No Vegetation																																				
296	45.72981321	-90.27364416	8	M	P	No Vegetation																																				
297	45.72930017	-90.27364166	6	S	P	No Vegetation																																				
298	45.72878713	-90.27363915	8	M	P	No Vegetation																																				
299	45.72827409	-90.27363665	7	S	P	No Vegetation																																				
300	45.73494534	-90.27293659	6	S	P	No Vegetation																																				
301	45.73443230	-90.27293409	1	S	P	No Vegetation																																				1
302	45.73391926	-90.27293159	6	M	P	No Vegetation																																				
303	45.73340623	-90.27292909	7	M	P																																					
304	45.73289319	-90.27292659	5	S	P		1		1					1		1																									
305	45.72878888	-90.27290660	8	M	P	No Vegetation																																				
306	45.72827585	-90.27290410	8	S	P	No Vegetation																																				
307	45.73597316	-90.27220895	3	M	P		3		3				1			1	1		1											1					1							
308	45.73546013	-90.27220645	3	M	P		2		1			1	1		1		1																1	1							
309	45.73494709	-90.27220396	6	M	P	No Vegetation																																				
310	45.73443405	-90.27220147	6	M	P	No Vegetation																																				
311	45.73392101	-90.27219898	6	R	P	No Vegetation																																				
312	45.73289494	-90.27219399	4	M	P		2		1			1	1	2	1	1	1																								
313	45.73238190	-90.27219150	3	M	P		1		1			1	1		1		1																								
314	45.72930367	-90.27217655	9	M	P	No Vegetation																																				
315	45.72879063	-90.27217406	8	M	P	No Vegetation																																				
316	45.72827759	-90.27217156	8	M	P	No Vegetation																																				
317	45.73597491	-90.27147630	3	M	P		3		3			1	v			1	1																								
318	45.73546187	-90.27147382	4	M	P	No Vegetation																																				
319	45.73494883	-90.27147133	5	S	P	No Vegetation																																				
320	45.73443579	-90.27146885	6	S	P	No Vegetation																																				
321	45.73392276	-90.27146636	5	R	P		1		1																																	
322	45.73340972	-90.27146388	4	M	P		3		3			1		1			1																									
323	45.73238364	-90.27145890	4	M	P		1		1																																	
324	45.73187060	-90.27145642	4	M	P		2		2			1			1						1																					
325	45.73084453	-90.27145145	6	M	P		1		1				1				1																									

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Riccia fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
326	45.72981845	-90.27144648	6	S	P	No Vegetation																																				
327	45.72930541	-90.27144399				Too Deep																																				
328	45.72879237	-90.27144151	8	M	P	No Vegetation																																				
329	45.72827934	-90.27143902	7	M	P	No Vegetation																																				
330	45.72776630	-90.27143654	4	M	P		2		2			1	1		1		1																								
331	45.73546361	-90.27074118	2	M	P		3					1	v	3			1																	V					v			
332	45.73495057	-90.27073870	2	M	P		3		2	1		1		2		1	1														1										
333	45.73392449	-90.27073375	4	S	P		3			1				1		1																							1	
334	45.73341146	-90.27073127	5	M	P		3		1	1			V																										1	
335	45.73238538	-90.27072631	5	M	P		1																																		
336	45.73135930	-90.27072135	6	M	P	No Vegetation																																			
337	45.73033323	-90.27071640	6	S	P		1		1																																
338	45.72982019	-90.27071392	8	M	P	No Vegetation																																			
339	45.72930715	-90.27071144	8	M	P	No Vegetation																																			
340	45.72879411	-90.27070896	8	M	P	No Vegetation																																			
341	45.72828107	-90.27070648	8	M	P	No Vegetation																																			
342	45.73136104	-90.26998877	8	M	P	No Vegetation																																			
343	45.73084800	-90.26998630	8	M	P	No Vegetation																																			
344	45.73033496	-90.26998383	8	M	P	No Vegetation																																			
345	45.72982192	-90.26998136	7	M	P	No Vegetation																																			
346	45.72930888	-90.26997888	8	M	P	No Vegetation																																			
347	45.72879585	-90.26997641	7	M	P	No Vegetation																																			
348	45.72828281	-90.26997394	6	M	P	No Vegetation																																			
349	45.73187580	-90.26925866	7	M	P	No Vegetation																																			
350	45.73136277	-90.26925619	7	M	P	No Vegetation																																			
351	45.73084973	-90.26925372	8	M	P	No Vegetation																																			
352	45.73033669	-90.26925126	8	M	P	No Vegetation																																			
353	45.72982365	-90.26924879	8	M	P	No Vegetation																																			
354	45.72828454	-90.26924140	4	S	P		1											1																								
355	45.73187753	-90.26852607	5	M	P		1		1																																
356	45.73136449	-90.26852361	7	M	P	No Vegetation																																			
357	45.73085145	-90.26852115	8	M	P	No Vegetation																																			
358	45.73033841	-90.26851869	7	M	P	No Vegetation																																			
359	45.72982537	-90.26851623	7	M	P	No Vegetation																																			
360	45.72931234	-90.26851377	7	M	P	No Vegetation																																			
361	45.73239229	-90.26779593	3	M	P		3		3		1	1	1		1		1																								
362	45.73187925	-90.26779348	4	S	P	No Vegetation		V																																	
363	45.73136621	-90.26779103	7	M	P	No Vegetation																																			
364	45.73085317	-90.26778857	7	M	P	No Vegetation																																			
365	45.73034013	-90.26778612	8	M	P	No Vegetation																																			
366	45.72982709	-90.26778367	7	M	P	No Vegetation																																			
367	45.72931406	-90.26778122	7	S	P	No Vegetation																																			
368	45.73136792	-90.26705845	7	S	P	No Vegetation																																			
369	45.73085489	-90.26705600	7	M	P	No Vegetation																																			
370	45.73034185	-90.26705355	7	M	P	No Vegetation																																			
371	45.72982881	-90.26705111	7	M	P	No Vegetation																																			
372	45.72931577	-90.26704867	7	M	P	No Vegetation																																			
373	45.73136963	-90.26632586	7	M	P	No Vegetation																																			
374	45.73085660	-90.26632343	7	M	P	No Vegetation																																			
375	45.73034356	-90.26632099	7	M	P	No Vegetation																																			
376	45.72983052	-90.26631855	7	M	P	No Vegetation																																			
377	45.72931748	-90.26631611	7	M	P	No Vegetation																																			
378	45.72880444	-90.26631367	3	S	P		1		1																																
379	45.73291045	-90.26560058	3	S	P		1	V	1																																
380	45.73239742	-90.26559815	6	S	P	No Vegetation																																			
381	45.73188438	-90.26559571	7	M	P	No Vegetation																																			
382	45.73137134	-90.26559328	7	M	P	No Vegetation																																			
383	45.73085830	-90.26559085	6	M	P	No Vegetation																																			
384	45.73034526	-90.26558842	7	M	P	No Vegetation																																			
385	45.72983222	-90.26558599	7	M	P	No Vegetation																																			
386	45.72931919	-90.26558356	7	M	P	No Vegetation																																			
387	45.72880615	-90.26558112	6	M	P	No Vegetation																																			
388	45.73393823	-90.26487283	3	M	P	No Vegetation																																			
389	45.73342519	-90.26487040	6	M	P	No Vegetation																																			
390	45.73291215	-90.26486798	6	M	P	No Vegetation																																			

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Ricciа fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
391	45.73239912	-90.26486555	7	M	P	No Vegetation																																					
392	45.73188608	-90.26486312	6	M	P	No Vegetation																																					
393	45.73137304	-90.26486070	7	M	P	No Vegetation																																					
394	45.73086000	-90.26485827	6	M	P	No Vegetation																																					
395	45.73034696	-90.26485585	6	M	P	No Vegetation																																					
396	45.72983392	-90.26485343	7	M	P	No Vegetation																																					
397	45.72932089	-90.26485100	7	M	P	No Vegetation																																					
398	45.72880785	-90.26484858	6	M	P	No Vegetation																																					
399	45.73342689	-90.26413779	3	S	P		1		1	1							1																									
400	45.73291385	-90.26413537	3	S	P	No Vegetation																																					
401	45.73240081	-90.26413295	7	M	P	No Vegetation																																					
402	45.73188777	-90.26413054	7	M	P	No Vegetation																																					
403	45.73137474	-90.26412812	6	M	P	No Vegetation																																					
404	45.73086170	-90.26412570	6	M	P	No Vegetation																																					
405	45.73034866	-90.26412328	7	M	P	No Vegetation																																					
406	45.72983562	-90.26412086	7	M	P	No Vegetation																																					
407	45.72932258	-90.26411845	6	S	P	No Vegetation																																					
408	45.72880954	-90.26411603	1	S	P	No Vegetation																																					
409	45.73291554	-90.26340277	8	M	P	No Vegetation																																					
410	45.73240250	-90.26340036	7	M	P	No Vegetation																																					
411	45.73188947	-90.26339795	7	M	P	No Vegetation																																					
412	45.73137643	-90.26339554	7	M	P	No Vegetation																																					
413	45.73086339	-90.26339312	6	M	P	No Vegetation																																					
414	45.73035035	-90.26339071	6	M	P	No Vegetation																																					
415	45.72983731	-90.26338830	6	M	P	No Vegetation																																					
416	45.72932427	-90.26338589	6	M	P	No Vegetation																																					
417	45.73394331	-90.26267498	6	S	P	No Vegetation																																					
418	45.73343027	-90.26267257	8	M	P	No Vegetation																																					
419	45.73291723	-90.26267017	7	M	P	No Vegetation																																					
420	45.73240419	-90.26266776	7	M	P	No Vegetation																																					
421	45.73189115	-90.26266536	6	M	P	No Vegetation																																					
422	45.73137811	-90.26266295	6	M	P	No Vegetation																																					
423	45.73086507	-90.26266055	6	M	P	No Vegetation																																					
424	45.73035204	-90.26265814	6	M	P	No Vegetation																																					
425	45.72983900	-90.26265574	6	M	P	No Vegetation																																					
426	45.73445803	-90.26194476	6	M	P	No Vegetation																																					
427	45.73394499	-90.26194236	6	M	P	No Vegetation																																					
428	45.73343195	-90.26193997	7	M	P	No Vegetation																																					
429	45.73291891	-90.26193757	6	M	P	No Vegetation																																					
430	45.73240587	-90.26193517	6	M	P	No Vegetation																																					
431	45.73189283	-90.26193277	6	M	P	No Vegetation																																					
432	45.73137980	-90.26193037	7	M	P	No Vegetation																																					
433	45.73086676	-90.26192797	3	S	P		1	V								1																									
434	45.73599882	-90.26121932	3	M	P		1		1	1									1	1		1	1																			
435	45.73548578	-90.26121692	4	M	P	No Vegetation																																					
436	45.73497274	-90.26121453	5	M	P	No Vegetation																																					
437	45.73445970	-90.26121214	5	M	P	No Vegetation																																					
438	45.73394666	-90.26120975	6	M	P	No Vegetation																																					
439	45.73343363	-90.26120736	6	M	P	No Vegetation																																					
440	45.73292059	-90.26120496	6	M	P	No Vegetation																																					
441	45.73240755	-90.26120257	6	M	P	No Vegetation																																					
442	45.73189451	-90.26120018	6	M	P	No Vegetation																																					
443	45.73138147	-90.26119779	5	M	P	No Vegetation																																					
444	45.72573805	-90.26117149				UNREACHABLE																																					
445	45.73548745	-90.26048429	3	M	P	No Vegetation																																					
446	45.73497441	-90.26048190	6	M	P	No Vegetation																																					
447	45.73446138	-90.26047952	5	M	P		1		1	1																															
448	45.73394834	-90.26047713	5	M	P	No Vegetation		V																																	
449	45.73343530	-90.26047475	5	M	P	No Vegetation																																					
450	45.73292226	-90.26047236	5	M	P	No Vegetation																																					
451	45.73240922	-90.26046998	5	M	P	No Vegetation																																					
452	45.73189618	-90.26046759	5	M	P	No Vegetation																																					
453	45.73138314	-90.26046521	7	M	P	No Vegetation																																					
454	45.73087011	-90.26046282	7	S	P	No Vegetation																																					
455	45.72676580	-90.26044375				UNREACHABLE																																					

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Riccia fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
456	45.72625276	-90.26044136				UNREACHABLE																																					
457	45.73600216	-90.25975403	3	M	P		1		1				1				1					1																					
458	45.73548912	-90.25975165	3	M	P	No Vegetation																																					
459	45.73497608	-90.25974927	4	M	P		2	V	1	1																																	
460	45.73446304	-90.25974689	4	M	P		2		1	2								1																									
461	45.73395000	-90.25974452	5	M	P		2	V	2																																		
462	45.73343697	-90.25974214	5	M	P	No Vegetation																																					
463	45.73292393	-90.25973976	5	M	P	No Vegetation																																					
464	45.73241089	-90.25973738	6	M	P	No Vegetation																																					
465	45.73189785	-90.25973500	7	M	P		1		1																																		
466	45.73138481	-90.25973263	1	R	P	No Vegetation																																					
467	45.72933266	-90.25972311				UNREACHABLE																																					
468	45.72881962	-90.25972074				UNREACHABLE																																					
469	45.72830658	-90.25971836	3	M	P		1					1			1							1																					
470	45.72779354	-90.25971598	4	M	P		1					1			1			1																									
471	45.72728050	-90.25971360	3	M	P		2		1	2	1	1			1							1																					
472	45.72676746	-90.25971123	4	M	P		1		1			1	1		1							1																					
473	45.73651686	-90.25902376	5	M	P		1				1						1																									
474	45.73600382	-90.25902139	3	M	P		1		1													1																					
475	45.73549078	-90.25901902	4	M	P		1		1	1				1						1		1																					
476	45.73497774	-90.25901664	4	M	P	No Vegetation																																					
477	45.73446471	-90.25901427	5	S	P		2		1	2																																	
478	45.73395167	-90.25901190	5	M	P		1	1																																	
479	45.73343863	-90.25900953	6	M	P	No Vegetation																																					
480	45.73292559	-90.25900716	5	M	P	No Vegetation																																					
481	45.73241255	-90.25900479	5	M	P	No Vegetation																																					
482	45.73189951	-90.25900241	6	M	P	No Vegetation																																					
483	45.73138648	-90.25900004	5	M	P	No Vegetation																																					
484	45.73087344	-90.25899767	4	M	P	No Vegetation																																					
485	45.73036040	-90.25899530	4	M	P		3		3				1																													
486	45.72984736	-90.25899293	4	M	P		3		3	1	1	1	1		1																											
487	45.72933432	-90.25899056	4	M	P		2		2		1	1			1																											
488	45.72882128	-90.25898819	3	M	P		2		2		1										1	1																				
489	45.72830824	-90.25898582				UNREACHABLE																																					
490	45.72779520	-90.25898344				UNREACHABLE																																					
491	45.73651852	-90.25829111	3	M	P		1		1		1		1				1		1				1						1				1									
492	45.73446636	-90.25828165	5	M	P	No Vegetation																																					
493	45.73395333	-90.25827928	5	M	P		1		1																																	
494	45.73344029	-90.25827692	6	M	P		1			1																																	
495	45.73292725	-90.25827455	5	M	P	No Vegetation																																					
496	45.73241421	-90.25827219	6	M	P	No Vegetation																																					
497	45.73190117	-90.25826983	5	M	P	No Vegetation																																					
498	45.73138813	-90.25826746	5	M	P		1	V		1																																	
499	45.73087510	-90.25826510	5	M	P	No Vegetation																																					
500	45.73036206	-90.25826273	4	M	P		1		1																																	
501	45.72984902	-90.25826037	3	M	P		1		1																																	
502	45.73703321	-90.25756082	3	M	P		1		1	1	1		1	1			1																									
503	45.73652017	-90.25755846	4	M	P		1		1					1									1																			
504	45.73498106	-90.25755139	4	M	P		1		1	1																																	
505	45.73446802	-90.25754903	5	M	P		2		2																																	
506	45.73395498	-90.25754667	5	M	P		1		1	1																																	
507	45.73344194	-90.25754431	6	M	P	No Vegetation																																					
508	45.73292890	-90.25754195	5	M	P		1		1																																	
509	45.73241586	-90.25753959	6	M	P	No Vegetation																																					
510	45.73190283	-90.25753724	5	M	P	No Vegetation																																					
511	45.73138979	-90.25753488	5	M	P		1	1	1																																	
512	45.73087675	-90.25753252	4	M	P		3		3	1																																	
513	45.73036371	-90.25753016	3	M	P		2		2	1			1						1																								
514	45.72985067	-90.25752780	3	M	P		2		2	1	1	1	1	1	1					1				1															1			
515	45.73754790	-90.25683051	3	M	P		1				1		1						1				1																			
516	45.73703486	-90.25682816	3	M	P	No Vegetation																																					
517	45.73498271	-90.25681876	5	M	P		3		3	1																																	
518	45.73446967	-90.25681640	6	M	P	No Vegetation																																					
519	45.73395663	-90.25681405	5	M	P	No Vegetation																																					
520	45.73344359	-90.25681170	5	M	P		1	1	1	1																																	

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Ricciа fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
521	45.73293055	-90.25680935	5	M	P		1	1		1																																	
522	45.73241751	-90.25680700	5	M	P	No Vegetation																																					
523	45.73190448	-90.25680465	4	M	P	No Vegetation																																					
524	45.73139144	-90.25680230	4	M	P		3		3																																		
525	45.73087840	-90.25679994	5	M	P		3		3	1																																	
526	45.73036536	-90.25679759	3	M	P		1		1	1	1	1	1		1				1					1																		
527	45.72985232	-90.25679524	3	M	P		1		1		1		1																													
528	45.73498435	-90.25608613	4	M	P	No Vegetation																																					
529	45.73447131	-90.25608378	4	S	P		1			1																																	
530	45.73395827	-90.25608144	5	M	P		2		1	1																																	
531	45.73344524	-90.25607909	5	M	P	No Vegetation																																					
532	45.73293220	-90.25607675	5	M	P	No Vegetation																																					
533	45.73241916	-90.25607440	5	M	P		1			1																																	
534	45.73190612	-90.25607206	5	M	P		3		3	1																																	
535	45.73139308	-90.25606971	4	M	P		3		1	3																																	
536	45.72985396	-90.25606268	3	M	P		1		1			1	1	1	1		1		1					1	1					1												
537	45.73498599	-90.25535350	4	M	P		2			2																																	
538	45.73447295	-90.25535116	6	M	P	No Vegetation																																					
539	45.73395991	-90.25534882	6	M	P	No Vegetation																																					
540	45.73344688	-90.25534648	4	M	P	No Vegetation																																					
541	45.73293384	-90.25534414	5	M	P		1			1																																	
542	45.73242080	-90.25534181	4	M	P	No Vegetation																																					
543	45.73190776	-90.25533947	5	M	P		1		1					1																												
544	45.73139472	-90.25533713	4	M	P		2		1	1																																	
545	45.73088168	-90.25533479	4	M	P		3		2	1	1			1			1		1																								
546	45.73498763	-90.25462087	4	S	P		1			1																																	
547	45.73447459	-90.25461854	4	M	P	No Vegetation																																					
548	45.73396155	-90.25461620	4	M	P		1	1	1	1																																	
549	45.73344851	-90.25461387	4	M	P		1		1	1																																	
550	45.73293547	-90.25461154	4	M	P		1		1	1				1																													
551	45.73242243	-90.25460921	4	M	P		2		2	1				1																													
552	45.73190939	-90.25460688	4	M	P		3		2	1																																	
553	45.73139636	-90.25460455	4	M	P		3		2	1			1																														
554	45.73088332	-90.25460222				UNREACHABLE																																					
555	45.73550229	-90.25389056	5	M	P	No Vegetation																																					
556	45.73498926	-90.25388824	4	M	P	No Vegetation																																					
557	45.73447622	-90.25388591	4	M	P	No Vegetation																																					
558	45.73396318	-90.25388359	1	R	P		3		3	1																																	
559	45.73293710	-90.25387894	4	M	P		3		1	2				1																													
560	45.73242406	-90.25387661	4	M	P		2		1	1																																	
561	45.73191102	-90.25387429	3	M	P		3		1	3																																	
562	45.73139799	-90.25387196	3	M	P		3		2	1	1	1		1	1				1	1	1			1	1	1																
563	45.73088495	-90.25386964				UNREACHABLE																																					
564	45.73704304	-90.25316488	3	M	P		2	1	1	1	1		1		1				1					1	1																	
565	45.73653000	-90.25316256	3	M	P		2		2																																	
566	45.73601696	-90.25316024	4	M	P		2		2	1	1										1																					
567	45.73550392	-90.25315793	4	M	P	No Vegetation																																					
568	45.73447784	-90.25315329	4	M	P		3		3										1																							
569	45.73396480	-90.25315097	3	M	P		3		3	1	1	1	1		1																											
570	45.73345177	-90.25314865	3	M	P		2		2	1	1	1	1		1																											
571	45.73293873	-90.25314634	3	M	P		1		1	1																																	
572	45.73242569	-90.25314402	3	M	P		3		1	3		1			1																											
573	45.73191265	-90.25314170	3	M	P		3		1	3		1			1																											
574	45.73139961	-90.25313938	3	M	P		3		1	3	1	1	1	1	1			1	1	1	1		1	1		1												1				
575	45.73755769	-90.25243454				UNREACHABLE																																					
576	45.73704466	-90.25243222	3	M	P		1		1		1	1	1		1																											
577	45.73653162	-90.25242991	3	M	P		1		1		1	1			1																											
578	45.73601858	-90.25242760	4	M	P		1		1		1	1			1																											
579	45.73550554	-90.25242529	3	M	P		2		2	1	1		1																												
580	45.73499250	-90.25242298	3	M	P	No Vegetation																																					
581	45.73447946	-90.25242067	3	M	P		2		2	1																															
582	45.73396643	-90.25241835	3	M	P		2				1	1	1		1																											
583	45.73345339	-90.25241604	3	M	P		2		2																1																	
584	45.73294035	-90.25241373	3	M	P		1			1																																	
585	45.73242731	-90.25241142	3	M	P		2		1	2																																	

Point Number	Latitude	Longitude	Depth (ft)	Sediment type (M=muck, S=Sand, R=Rock)	Rope (R); Pole (P); Visual (V)	Notes	Total Rake Fullness	Potamogeton crispus	Ceratophyllum demersum	Elodea canadensis	Potamogeton natans	Lemna turionifera	Nuphar variegata	Myriophyllum heterophyllum	Spirodela polyrhiza	Vallisneria americana	Brasenia schreberi	Potamogeton robbinsii	Utricularia vulgaris	Sparganium fluctuans	Potamogeton zosteriformis	Zizania palustris	Potamogeton ephydrus	Lemna trisulca	Ranunculus aquatilis	Potamogeton obtusifolius	Nitella sp.	Utricularia intermedia	Myriophyllum farwellii	Riccia fluitans	Potamogeton amplifolius	Schoenoplectus tabernaemontani	Equisetum fluviatile	Wolffia columbiana	Myriophyllum sibiricum	Potamogeton pusillus	Potamogeton strictifolius	Sagittaria latifolia	Utricularia purpurea	Utricularia minor	Sparganium americanum	Aquatic Moss	Filamentous algae
586	45.73191427	-90.25240911	3	M	P		3		1	3																																
587	45.73140123	-90.25240680	3	M	P		2		2	1		1	1		1																											
588	45.73704627	-90.25169957	3	M	P		1		1		1	1	1		1																											
589	45.73653323	-90.25169726	3	M	P		1		1	1													1																		
590	45.73602020	-90.25169496	3	M	P		1		1		1	1	1		1																											
591	45.73550716	-90.25169265	3	M	P		1			1																															
592	45.73499412	-90.25169035	4	M	P		1		1		1																														
593	45.73448108	-90.25168804	3	M	P		1		1	1	1	1			1			1																							
594	45.73345500	-90.25168343	3	M	P		1		1		1	1			1					1																					
595	45.73294196	-90.25168113	3	M	P		2		2	1	1	1			1																										
596	45.73242893	-90.25167882	3	M	P		2		2	1								1					1																		
597	45.73191589	-90.25167652	2	M	P		2		1		1		1					1			1		1																	1	
598	45.73704788	-90.25096691				UNREACHABLE																																			
599	45.73653485	-90.25096461				UNREACHABLE																																			
600	45.73602181	-90.25096231	3	M	P		1		1	1	1	1	1		1							1																		
601	45.73550877	-90.25096002	4	M	P		2		2		1																														
602	45.73499573	-90.25095772	3	M	P		1		1		1							1																							
603	45.73448269	-90.25095542	3	M	P		2		1									2																							
604	45.73243054	-90.25094623				UNREACHABLE																																			
605	45.73191750	-90.25094393				UNREACHABLE																																			
606	45.73551038	-90.25022738	2	M	P		1				1	1			1						1					1														
607	45.73499734	-90.25022509	2	M	P		1		1	1	1																													
608	45.73448430	-90.25022280	3	M	P		1		1	1	1		1					1																						
609	45.73191910	-90.25021134				UNREACHABLE																																			
610	45.73551198	-90.24949474	3	M	P		1		1		1										1	1																		
611	45.73499894	-90.24949246	2	M	P		2		1		1	1			1			2																						
612	45.73448590	-90.24949017	3	M	P		1		1		1							1																						
613	45.73551358	-90.24876210	2	M	P		3		3	1	1		1														1												
614	45.73500054	-90.24875983	3	M	P		3		3	1	2	1													1															
615	45.73448750	-90.24875755	3	M	P		2		1			1	1					1																						
616	45.73551517	-90.24802947	2	M	P		2		1	1	1																1												
617	45.73500213	-90.24802720	2	M	P		3		3	1	1	1	1								1																		
618	45.73448909	-90.24802493	3	M	P		3		3									1		1																				
619	45.73551676	-90.24729683	2	M	P		3		1														3			1														
620	45.73500372	-90.24729457	2	M	P		3			2	1										1						3									1				1
621	45.73449068	-90.24729230				UNREACHABLE																																			
622	45.73551834	-90.24656419				UNREACHABLE																																			
623	45.73500530	-90.24656194				UNREACHABLE																																			
624	45.73551992	-90.24583156	3	S	P		1		1	1		1	V					1		V						1													1		
625	45.73552149	-90.24509892	2	S	P		3		1	1	1										2																			
626	45.73603767	-90.24363588	5	S	P	No Vegetation																																			
627	45.73552463	-90.24363364				UNREACHABLE																																			
628	45.73552619	-90.24290101				UNREACHABLE																																			
629	45.73604388	-90.24070530				UNREACHABLE																																			

F

APPENDIX F

Musser Lake Association Treatment Reports

P.O. Box 327, Phillips, WI 54555

March 28, 2008

Summary of Chemical Treatment of Musser Lake for Potamogeton crispus 2005-2007

Potamogeton crispus, commonly known as curly leaf pondweed, and hereafter referred to as CLP, was first observed in Musser Lake near the boat landing by Musser Lake Association (MLA) members. It was also noted that CLP was spreading to a number of small beds in other areas of the lake. A DNR aquatic macrophyte survey was conducted in 2004 and confirmed the distribution and abundance of CLP. See attached map, Figure 3, and Table 1. As noted in Table 1, in the spring of 2004 there was approximately 9,770 square feet of CLP in Musser Lake. That is less than a ¼ of an acre.

Chemical treatment of Musser Lake for CLP was begun in the spring of 2005. The MLA contracted with Schmidt's Landscaping and Nursery, Inc. of Iola, WI to apply Aquathol Super-K herbicide to sites 1-38 as noted on map, Figure 3. A total of one acre was treated with 40 pounds of Aquathol Super-K. Mr. Ken Allington, who oversaw the application and monitored the results for the MLA, wrote the following:

Summary Lake Treatment 2005

> *"Treatment seemed effective on the isolated patches discovered, especially on the western end of the lake. Where the patches were numerous and close together, the treatment did not seem nearly as effective. We may have contained the spread of the weed somewhat, but certainly did not eliminate any of the weeds in these areas.*
>
> *In the area near the launching ramp, and entire eastern end of the lake, it may be more effective to draw a "containment line" around the worst areas and treat the entire area rather than the individual patches. The area inside the containment line can be determined when we see what next year's curly leaf crop looks like. There is no reason to believe it will be less than this year. Outside that containment area we could treat the patches the same as we did this year."*

Due to cost concerns, the MLA chose to use volunteers with assistance from the DNR to treat Musser Lake for CLP in the spring of 2006. A total of 32 pounds of Aquathol Super-K was spread over approximately 32,000 square feet or approximately ¾ of an acre at a rate of 2 ounces per 100 square feet. Again, as in 2005, Mr. Ken Allington oversaw the application and monitored the results. See the attached *Musser Lake Curly Leaf Pondweed Treatment 2006.*

By the fall of 2006 it appeared that CLP was getting the upper hand and that the MLA needed to do more. At a general membership meeting in September 2006 it was determined that should conditions in the spring validate it, the MLA should commit all its' available resources to a chemical treatment of CLP in Musser Lake. In the spring of 2007 an informal survey of the lake by Sue Powers, MLA President, and Al Speich, MLA Vice President, determined that CLP had not diminished its' presence in the lake. In fact, while some small areas treated in 2006 had disappeared; those large areas spot treated had in fact become larger and denser. It was determined that a GPS resurvey should be done and a proposal for a comprehensive treatment of the lake would be brought back to the MLA board of directors.

The MLA board approved the GPS survey which was then conducted. Based on this survey, 600 pounds of Aquathol Super-K was applied to the CLP at a rate of 2.5 ppm on a total of 17 acres within approximately 170 acres or about 10% of the total area.

Treatment Area A, the bay next to the main boat landing off of Woodland Lane, was divided into two sections. See map Figure 1. Section 1, a total of 5.3 acres, was treated as an area using transects set up by GPS coordinates. Within Section 2, an area of 8.2 acres, a total of ½ acre was spot treated.

Treatment Area B, the east end of the lake, was divided into four sections. See map Figure 1. Section 1, a total of 5.9 acres, is the bay where Poplar Creek enters next to the boat landing off Peninsula Drive. This bay was treated as an area using transects set up by GPS coordinates. Within Section 2, an area of approximately 52.4 acres in the main bay, a total of 5.3 acres of CLP mats were spot treated. Section 3, an area of 39.7 acres, was not treated due to the presence of northern wild rice. Section 4, an area of 35.6 acres, was also not treated as we did not have enough chemical.

Monitoring the results of this chemical treatment in 2007 were Sue Powers, Randy Powers, and Al Speich. It was observed that within two weeks the CLP in Area A had almost completely disappeared. Over the course of the summer a few individual plants reappeared immediately next to the boat launch, the pier adjacent to it, and off the south side of Small Eagle Island. A few plants also reappeared in the channel adjacent to the boat launch which connects the eastern and western portions of the lake. A small area approximately 10' x 10' also still exists on the western side of the large island. This can be seen on map Figure 2, points 3, 4, 21, and 22 and Table 2.

The amount of CLP present in Area A 90 days post- treatment represents a dramatic reduction when compared to the solid mats present pre-treatment. While no quantitative sampling was done, it is estimated that prior to treatment Section 1 of Area A was 90% or more covered with CLP mats. Post-treatment observations would represent a reduction in excess of 98%. In Section 2, isolated spot treated areas showed marked improvement with a reduction of about 90%.

While no sampling data was collected during the summer of 2007, it was noted that native vegetation quickly began to fill in the area vacated by the CLP. The following species were observed to reestablish themselves in Area A. Most noted were the bullhead pond lily, *Nuphar*

variegata, watershield, *Brasenia schreberi,* and large-leaf pondweed, *Potamageton amplifolius*. Also observed were various-leaved water milfoil, *Myriophyllum heterophyllum,* common waterweed, elodea, *Elodea Canadensis,* and common bladderwort, *Utricularia vulgaris.*

In Area B, Section 1 a few CLP plants have reappeared over the course of the summer since treatment in the spring of 2007. See map Figure 2, points 15 and 16 and Table 2. Prior to treatment, the western third of the bay was predominantly various-leaved water milfoil, *Myriophyllum heterophyllum,* intermixed with CLP. The western shoreline and the remaining 2/3 of the bay were dominated by CLP. Prior to treatment it is estimated that CLP's density was about 75%, with its' thickest mats closest to the boat landing. Post-treatment in the bay there are isolated small groups of plants along the eastern shoreline and across the bay transect line. Overall the reduction of CLP is estimated to be in excess of 90%.

In Area B, Section 1 native vegetation has filled in where CLP was removed. By far the most common plants to expand into the area are the various-leaved milfoil, *Myriophyllum heterophyllum*, and northern wild rice, *Ziznia palustris*. The milfoil has dominated the western portion of the bay and expanded in an easterly direction. The northern wild rice has increased from a few plants at the mouth of Poplar Creek, north of the treated area, to encompass much of the remaining bay. Also noted in this area was eel-grass, *Vallisneria americana*, coontail, *Ceratophyllum demersum,* large-leaf pondweed, *Potamageton amplifolius,* and softstem bulrush, *Scirpus validus.*

Area B, Section 2 is an area of approximately 52.4 acres located in the main bay on the eastern end of the lake. It is divided into two sections, Section 2a, the western section of approximately 33.2 acres and Section 2b, the eastern section of approximately 19.2 acres. See map Figure 2. Prior to treatment the western end of this section was approximately 75% covered with CLP mats while the eastern portion was at 95%+ coverage. Due to lack of resources Sections 2a and 2b were spot treated rather than area treated. A total of 5.3 acres, or approximately 10%, of CLP mats were treated with concentration on the northern shore of Section 2b and a channel through Sections 2a and 2b to the western part of the lake.

At the end of two weeks post-treatment no effect of the Aquathol Super-K was noted in Section 2. At 4 weeks the CLP was yellowing/browning on the tips, but the plants did not appear to die out at lower levels in the water column. By 60 days the plants in the mats were again green. At the end of 90 days, the mats appeared to be slightly less dense than prior to treatment, but all in all it must be concluded that the spot treatment in Section 2 proved to be ineffective in eliminating CLP in Section 2.

Although no Aquathol Super-K was applied to Area B, Section 3, the CLP in this area of 39.7 acres was dramatically reduced as a result of treatment in 2007. We have attributed this result to the drift of the chemical along the water currents in this end of the lake. It appears that the Aquathol Super-K applied to Section 2 did not remain there, but flushed into Section 3. This would explain not only the positive result in Section 3, but also the negative results in Section 2. Those areas in Section 3 that could be directly observed, the northern half of this section, showed virtually no CLP. The native vegetation that was observed to reestablish itself throughout Section 3 is the northern wild rice, *Ziznia palustris*.

The southern part of Section 3 will require further analysis as will the unsurveyed bay to the east of Section 4. Due to stumpage and other obstructions, these areas are accessible only by canoe or john boat. At this time it is believed that the eastern Big Elk River, which enters Musser Lake at the east side of Section 4, is free of CLP.

Area B, Section 4 was not treated during the summer of 2007. At the end of August it was approximately 90-95% covered with CLP mats. The only partially open area was the channel in the north end of the bay cut by boats moving from the piers in this bay to the main lake. The total of 35.6 acres in Section 4 remains an area that needs to be addressed.

In summary we can conclude that where CLP is in isolated mats a spot treatment appears effective. Treatment for one or two seasons appears to eliminate these isolated mats. Where mats are dense and contiguous, spot treatment appears far less effective. In these instances area treatment has been shown to work well, eliminating the mats. Based on our 2005, 2006, and 2007 experience, the MLA proposes to continue treatment of CLP in Musser Lake during the spring of 2008.

The project goals as stated on January 15, 2005 were to "control and monitor the growth of Curlyleaf Pondweed in Musser Lake before it spreads throughout the lake and down the Big Elk River to Phillips Chain of Lakes." See attached *Musser Lake Early Detection Invasives Control Project Scope and Description.*

Has the MLA met this goal? That is a very good question. To the best of our knowledge, the Big Elk River below the dam does not have CLP. We therefore assume that this portion of our goal has been met. We would also deduce that any CLP found in the Phillips Chain would not have come from Musser unless transported by means other than through the river.

Whether we have met the remainder of our goal is less clear. We have monitored the growth of CLP in Musser Lake and, have controlled its' growth to a degree. Sadly, we have not yet controlled it to a satisfactory level. This is born witness by the fact that in 2005 and 2006 we did not stop the continued escalation of CLP in Musser Lake. The treatment of Musser Lake in 2007 appears as of the fall 2007 observations to have proven successful in controlling growth in Sections A1, A2 and B1. We substantially reclaimed approximately 60 acres of lake from CLP. Yet we have 88+ acres of lake (Sections B2 and B4) left to reclaim. While we will never totally eradicate CLP from Musser Lake, we do need to continue to work to find a way to reclaim our fishery and then control CLP's spread.

Where would Musser Lake be now if the MLA had done nothing? Our observations confirm our lake would be in serious trouble had we not acted. The expediential growth of the CLP in 2005-2007 illustrates that we have caught the situation in the nick of time and cannot stop our vigilance. We are confident that with continued planning and action on the part of the MLA in partnership with the DNR and our local community, Musser Lake can achieve a balanced ecosystem.

Musser Lake Curly Leaf Pondweed Treatment 2006

30 May-

Aquathol K, 10 pounds, hand spread at rate of approximately 2 oz per 100 square feet. Estimated area treated…10,000 square feet.

We treated the Western portion of the lake. Most spots were small and easily treated. Most of the isolated spots which had been treated the year before showed a marked improvement and several showed no evidence of curly leaf at all. The spots near the ramp, from previously identified spot #6 to spot # 13 were either unchanged or worse than last year. Most of the 10 pounds of chemical were used in this area. The spots are run together and it is difficult to keep track of which areas have been treated, even using many painted jugs as we did. I believe we got most patches covered but cannot say with certainty that we got them all. This could be why there was no real improvement from last year in this area. A better approach next year may be to treat the entire area rather than to attempt to spot treat the individual patches. Since we had used our 10 pounds of Aquathol k, we contacted Craig Roesler for permission to treat the remaining areas. We did receive verbal approval to continue treatment.

1 June-

Aquathol K, 10 pounds, hand spread at rate of approximately 2 oz per 100 square feet. Estimated area treated…10,000 square feet

With the additional help of Dan Kephart we started where we had left off on 30 May, near the launching ramp…spots 6-13, and worked our way east. We found several new, isolated patches of curly leaf and treated them. When we got to the Eastern end of the lake, it was obvious that the curly leaf had spread from last year. We found it much further South than it had been last year. The conditions were similar to the area near the launching ramp, but larger and more spread out. We started treating on the SW end, south of spots #28 and #29 and worked our way North. The curly leaf seemed to be in drift swaths running west to east and with a westerly wind we were able to drift down the swaths and treat fairly effectively. But again, even using buoys, we cannot say all areas were covered completely. We used our 10 pounds of Aquathol K up and had only done about half of the Eastern side of the lake. We contacted Craig Roesler again and received permission to continue the treatment. We ordered more Aquathol K.

8 June-

Aquathol K, 12 pounds, hand spread at rate of approximately 2 oz per 100 square feet. Estimated area treated…12,000 square feet

With Dan Kephart's help again, we started where we left off and worked our way North on the eastern end of the lake. Once again we had very good conditions for finding and treating the weeds. With calm to 10 knots of westerly wind we were able to drift down the swaths of curly leaf and the treatment again seemed fairly effective. But, with so many spots, so close together, it was difficult to ensure all patches were treated. Even though we had a gps, the spots were so numerous the most effective way to treat seemed to be to use a reference point on shore and to vary our drift lines gradually from south to north. We worked until we had good confidence that all areas were treated.

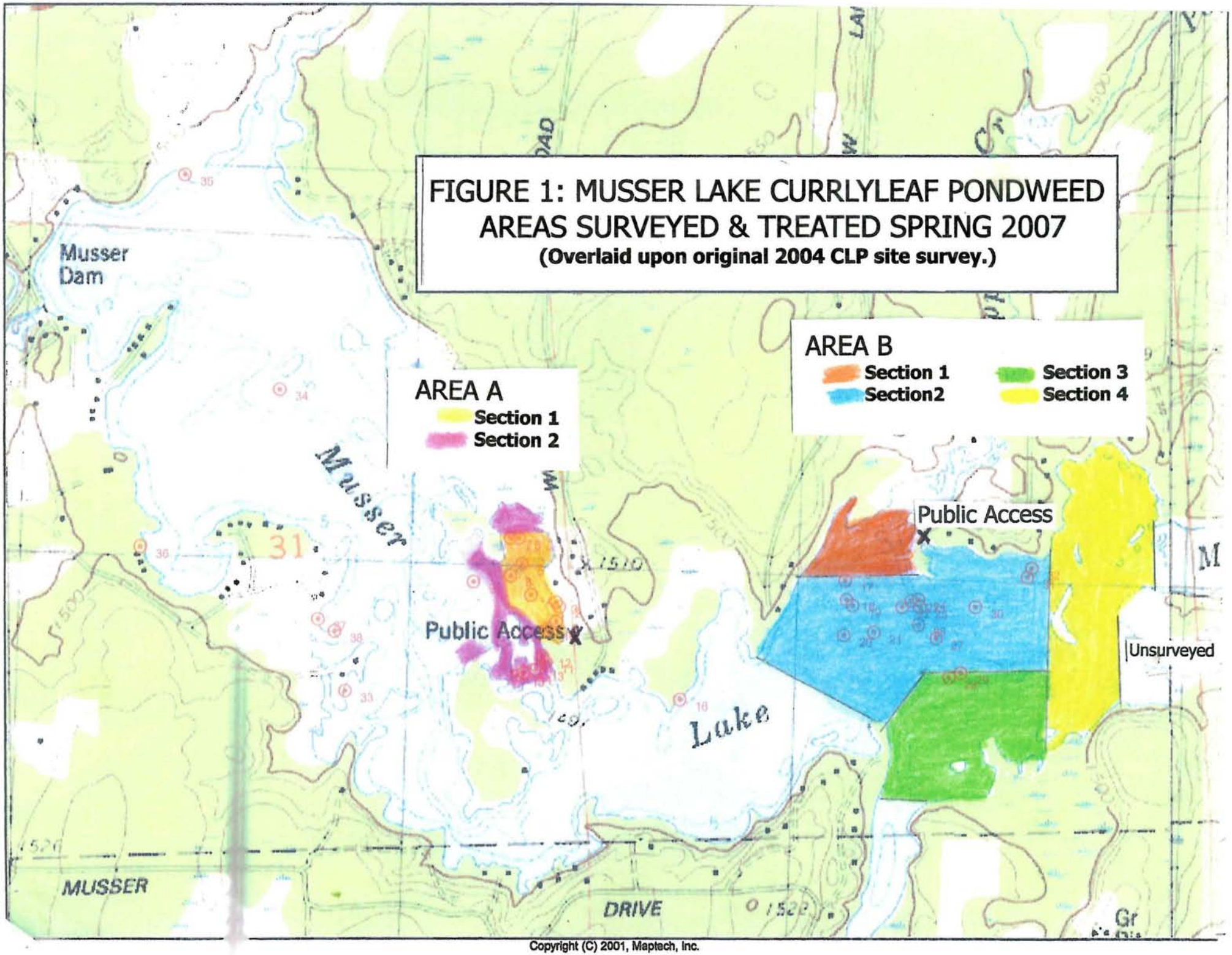


FIGURE 1: MUSSER LAKE CURRLYLEAF PONDWEED
AREAS SURVEYED & TREATED SPRING 2007
(Overlaid upon original 2004 CLP site survey.)
AREA A
Section 1
Section 2
AREA B
Section 1
Section2
Section 3
Section 4
Public Access
Public Access
Unsurveyed
Musser
Dam
Musser
Lake
MUSSER
DRIVE
Copyright (C) 2001, Maptech, Inc.

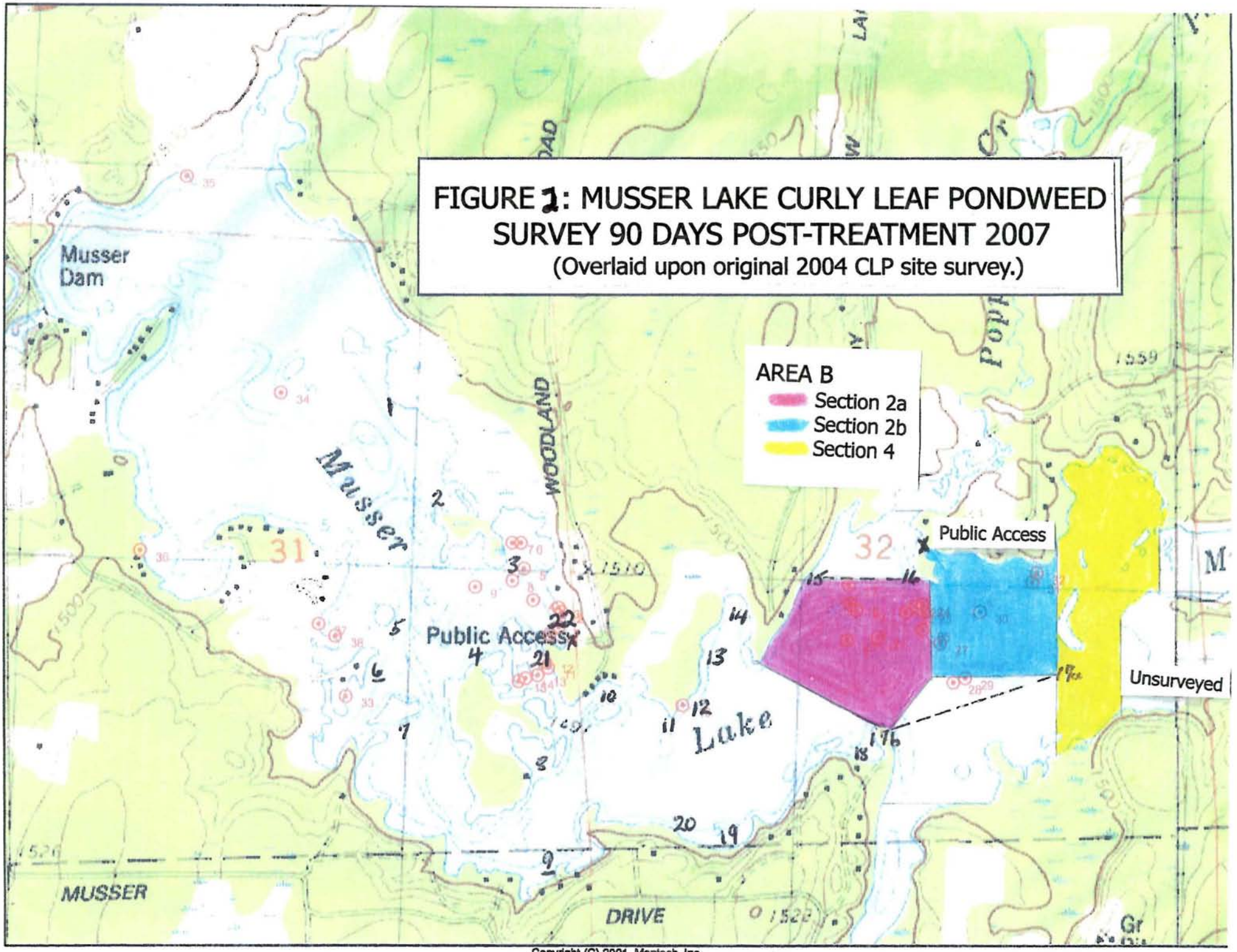


FIGURE 1: MUSSER LAKE CURLY LEAF PONDWEED SURVEY 90 DAYS POST-TREATMENT 2007
(Overlaid upon original 2004 CLP site survey.)
AREA B
Section 2a
Section 2b
Section 4
Public Access
Public Access
Unsurveyed
Musser Dam
Musser
Lake
WOODLAND
MUSSER
DRIVE
31
32
Copyright (C) 2001, Maptech, Inc.

TABLE 2. Musser Lake Plant Survey August 2007 - 90 Days Post Aquathol Super-K Treatment

This survey looked for CLP anywhere it was found during the summer of 2007, at both treated and non-treated sites.
Updated 03/28/08 with addition of quantitative measurements. See Map.

Site #	Coordinates	Treated 2007	Current Status of Curley Leaf Pondweed (CLP)
1	N4544375 W9016647	no	small area off Birch Island western most pier of 2'x 5'
2	N4544375 W9016647	yes	none present on west side of Eagle Island or east side of sand bar
3	N4544374 W9016645	yes	small area off so. side of sm. Eagle Is. -area greatly reduced to 3'x5'
4	N4543980 W9016404	yes	small area off large island - area greatly reduced to10'x 10'
5	N4543982 W9016562	no	none present at this time - several plants seen here in early July
6	N4543943 W9016543	no	several plants present at this time
7	N4543876 W9016540	no	several plants present at this time
8	N4543838 W9016262	no	large area off large island of 60'x 60'
9	N4543676 W9016287	no	small area off and to the right of Allington's pier of 3'x 3'
10	N4543928 W9016287	yes	several plants off Resort - area greatly reduced
11	N4543906 W9016053	yes	none present off point or in small bay
12	N4543910 W9015968	yes	none present off east side of point
13	N4543983 W9015940	no	several plants on east side of bay
14	N4543983 W9015940	no	small area in back of bay of 10' x 5'
15	N4544109 W9015678	yes	scattered plants along line to point #16 - greatly reduced in number
16	N4544125 W9015521	yes	scattered plants along line to point #15 - greatly reduced in number - this is next to boat ramp
17a	N4543953 W9015239	yes	some scattered plants along transect line - greatly reduced
17b	N4543866 W9015577	yes	some scattered plants along transect line - greatly reduced
18	N4543847 W9015615	see status	none present - this small isolated area was hand cut & raked as a test area rather than chemically treated
19	N4543722 W9015929	no	several plants present is back of bay
20	N4543752 W9016063	no	several plants along shoreline
21	N4543943 W9016259	yes	several plants along shoreline
22	N4543986 W9016228	yes	scattered areas along boat landing and adjacent piers - greatly reduced -total area approx. 50 sq. ft.
Area B Section 2a		yes	scattered CLP mats - 75% coverage of 33.2 acres or 25 acres of CLP
Area B Section 2b		yes	dense CLP mats - 95% coverage of 19.2 acres or 18 acres of CLP
Area B Section 4		no	dense CLP mats - 90-95% coverage of 35.6 acres or 33 acres CLP

Musser Lake Association

A non-profit corporation dedicated to the preservation and conservation of Musser Lake and the surrounding lake area.

P.O. Box 327, Phillips, WI 54555

March 15, 2008

2007 Aquathol Super-K Weed Treatment Summary

On May 15th and 17th of 2007 Musser Lake was treated for curly leaf pondweed with 600 pounds of Aquathol Super-K at a rate of 2.5 ppm. Estimated treatment area was approximately 17 acres within a 200 acre area. See Figure 3 Musser Flowage Curly Leaf Pondweed Treatment Map. Treatment was achieved by hand broadcasting Aquathol Super K crystals.

Following is a summary of the treatment results. For specifics see Musser Lake Plant Survey August 2007 - 90 Days Post Aquathol Super-K Treatment.

On the western portion of the lake the major area to be treated was the bay between Eagle Island and the boat launch. The bay by the boat launch prior to treatment was nearly solid curly leaf pondweed. There are currently scattered plants along the shoreline immediately on either side of the boat launch (site 22) and at the entrance to the passage between the eastern and western portions of the lake (site 21). There is also a small area of curly leaf off the large island (site 4). The amount of curly leaf present on the western side of the lake has been drastically reduced in the areas treated.

On the eastern portion of the lake, the areas treated at sites 10, 11, and 12 are nearly cleared of curly leaf, as is the bay near the second boat launch (transect line 15-16). These areas, as did the areas in the western portion of the lake, show a high degree of success due to treatment. Along transect line17a-17b some plants still remain, but the density of curly leaf is greatly reduced. This is even true on the south side of the transect where direct application of Aquathol did not occur. On the north shore of the east bay, where direct application was made, only partial reduction in curly leaf plant density was found. The central portion of the east bay also showed partial reduction in curly leaf plant density. In the east bay central portion the large mats of curly leaf pondweed were only spot-treated due to lack of chemical.

Analysis of the treatment results and study of probable lake current patterns in the lake's main eastern bay by Randy Powers and Sue Powers, biologists, and Buck Curran, Al Speich, and Frank Spring, association board members and long time lake residents, have led to the following conclusions:

1. Treatment of large patches of curly leaf pondweed by Aquathol Super-K at 2.5 ppm when applied to an entire bay area using a transect grid is highly effective.

2. Treatment of isolated small patches of curly leaf pondweed by Aquathol Super-K at 2.5 ppm proves highly effective.

3. Probable lake currants in the main bay on the eastern end of the lake should be taken into account during chemical application.

4. Spot treating individual patches of curly leaf pondweed within a large area dramatically lowers effectiveness of the application.

5. Treating a large area with less than 2.5 ppm of Aquathol Super-K dramatically lowers the effectiveness of the application.

Based on the results of the 2007, 2006, and 2005 applications and the spread rate of curly leaf pondweed when left untreated or only minimally treated, it is our conclusion that our 2007 treatment approach was highly successful. We believe that application of Aquathol Super-K in 2008 using methods outlined in numbers 1, 2, and 3 above is not only warranted, but crucial to the maintenance of our fishery and the survival of our lake's natural ecosystem.

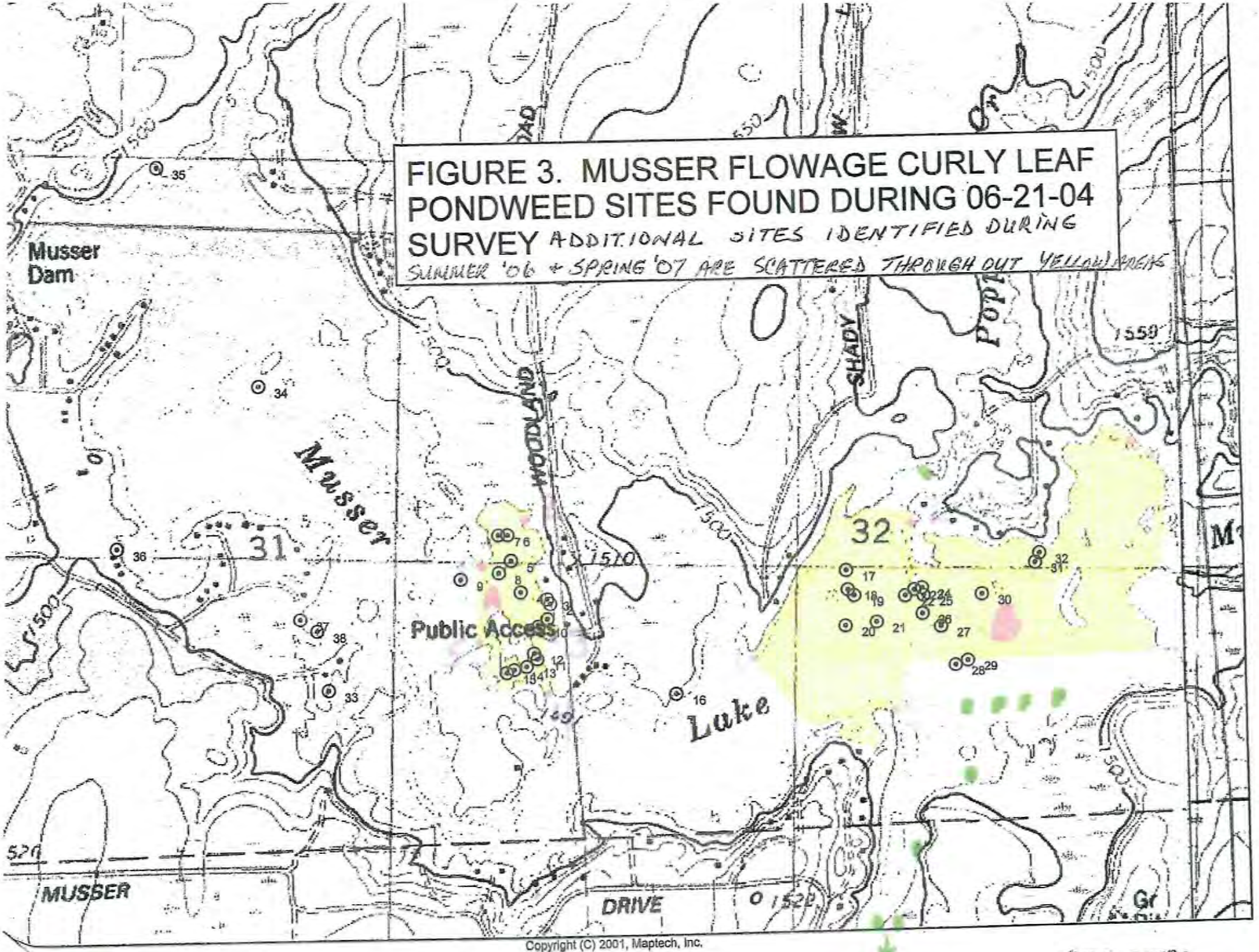


FIGURE 3. MUSSER FLOWAGE CURLY LEAF PONDWEED SITES FOUND DURING 06-21-04 SURVEY ADDITIONAL SITES IDENTIFIED DURING SUMMER '06 + SPRING '07 ARE SCATTERED THROUGH OUT YELLOW CREEK

INDICATES PIPE PLANTS FROM '04 SURVEY

MAIN RICE AREA

GPS SITES AREAS "A" + "B"

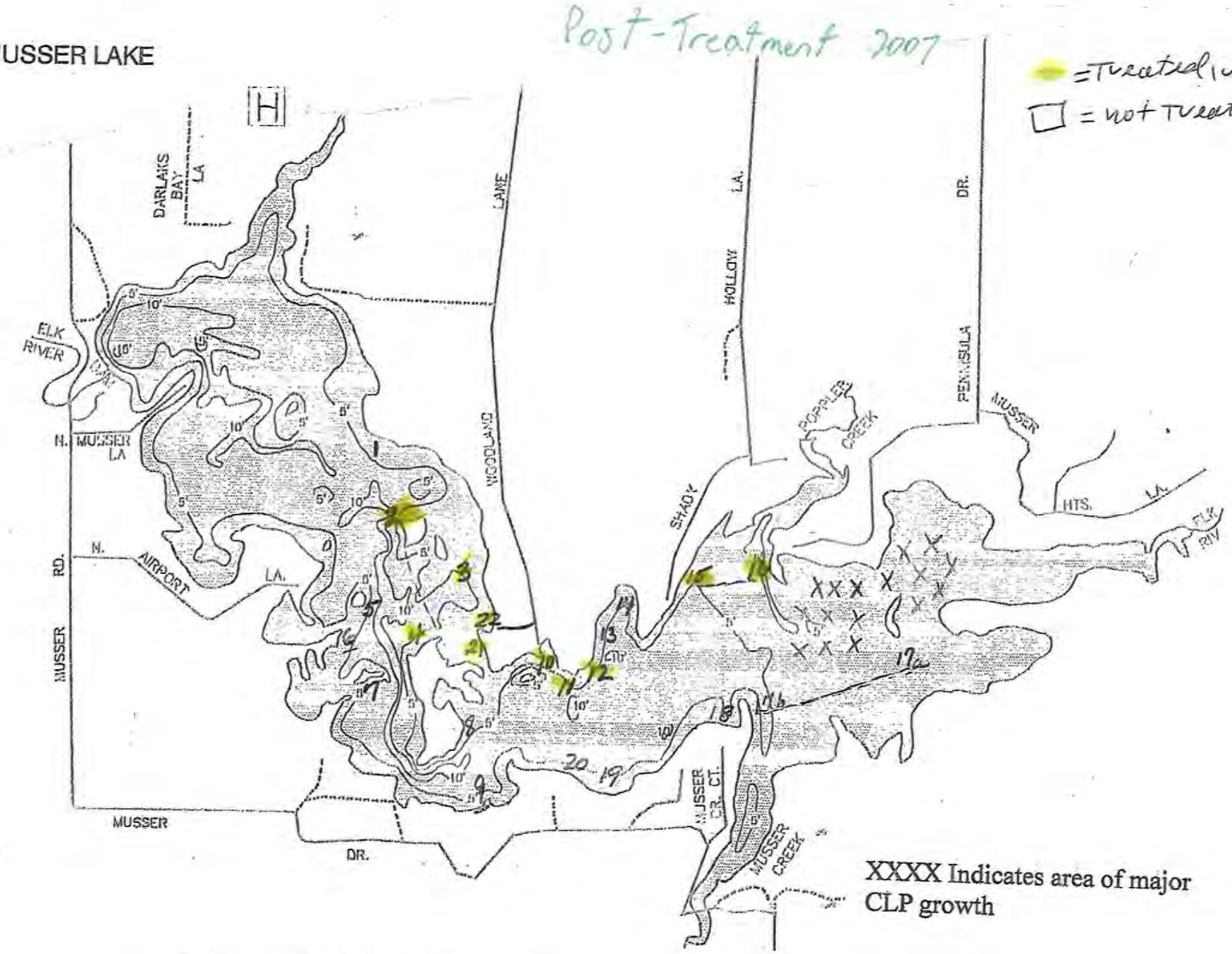
Musser Lake Plant Survey August 2007 - 90 days Post Aquathol Super-K Treatment

This survey looks for CLP anywhere it was found in the lake, at both treated and non-treated sites.

Site #	Coordinates	Treated 2007	Current Status
1	N4544375 W9016647	no	small area off Birch Island western most pier
2	N4544375 W9016647	yes	none present on west side of Eagle Island or east side of sand bar
3	N4544374 W9016645	yes	small area off south side of small Eagle Island -area greatly reduced
4	N4543980 W9016404	yes	small area off large island - area greatly reduced
5	N4543982 W9016562	no	none present at this time - several plants seen here in early July
6	N4543943 W9016543	no	several plants present at this time
7	N4543876 W9016540	no	several plants present at this time
8	N4543838 W9016262	no	large area (est. 300-400 sq. ft.) off large island
9	N4543676 W9016287	no	small area off and to the right of Allington's pier
10	N4543928 W9016287	yes	several plants off Resort - area greatly reduced
11	N4543906 W9016053	yes	none present off point or in small bay
12	N4543910 W9015968	yes	none present off east side of point
13	N4543983 W9015940	no	several plants on east side of bay
14	N4543983 W9015940	no	small area in back of bay
15	N4544109 W9015678	yes	scattered plants along line from this point to #16 - greatly reduced in number
16	N4544125 W9015521	yes	scattered plants along line from this point to #15 - greatly reduced in number - this is next to boat ramp
17a	N4543953 W9015239	yes	some plants along transect line - greatly reduced
17b	N4543866 W9015577	yes	some plants along transect line - greatly reduced
18	N4543847 W9015615	see status	none present - this small isolated area was hand cut & raked as a test area rather than chemically treated
19	N4543722 W9015929	no	several plants present is back of bay
20	N4543752 W9016063	no	several plants along shoreline
21	N4543943 W9016259	yes	several plants along shoreline
22	N4543986 W9016228	yes	scattered areas along boat landing and adjacent piers - greatly reduced

Note: Major area of many acres on the northeast end of the lake still has Curly Leaf Pondweed growth.

MUSSER LAKE



Musser Lake Curly Leaf Pondweed Treatment - August 2007 Evaluation Sites