A

APPENDIX A

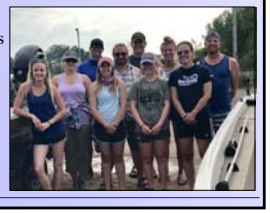
Public Participation Materials

Presentation Outline

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

Onterra, LLC

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



Why create a lake management plan?

- Preserve/restore ecological function to ensure cultural services
- 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.
- Snapshot of lake's current status or health.
- Foster realistic expectations and dispel any misconceptions.

Elements of an Effective Lake Management Planning Project

Data and Information Gathering

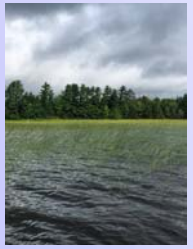
Environmental & Sociological

Planning Process

Brings it all together

Data and Information Gathering

- **Study Components**
  - Water Quality Analysis
  - Paleocore Collection & Analysis
  - Watershed Assessment
  - Shoreland Assessment
  - Aquatic Plant Surveys
  - Acoustic Survey
  - Fisheries data integration
  - Stakeholder Survey



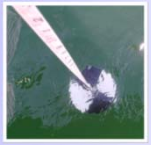
Water Quality Analysis

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

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

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

Secchi Disk



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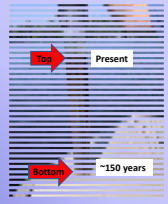
Paleocore Collection & Analysis



Sediment core

Diatoms

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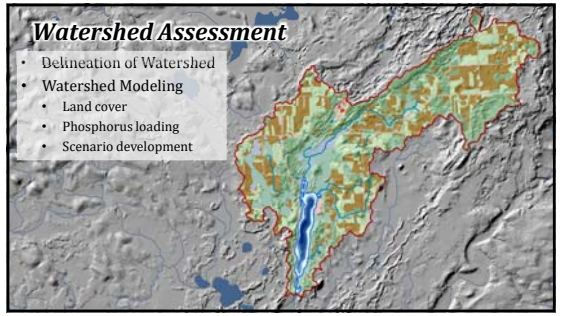
Watershed Assessment

- Delineation of Watershed
- Watershed Modeling
  - Land cover
  - Phosphorus loading
  - Scenario development



Shoreland Assessment

- Transition zone between land and water
- Important to maintain as much natural shoreline zone as possible

Completely Developed

Range

Completely Natural

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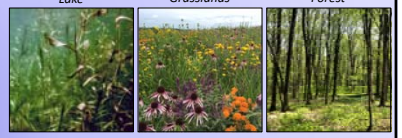
Native Aquatic Plants

- Foundation of the lake ecosystem
- Provide oxygen, food, and shelter
- Improve water quality
- Stabilize bottom and shoreline sediments

Lake *Grasslands* *Forest*



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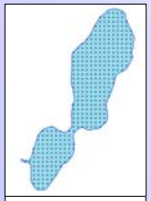
Point-Intercept Survey

- Grid-based survey
- Determine abundance of each species
- Compare to other lakes
- Compare the same lake over time



357 Sampling Locations
32-meter Resolution

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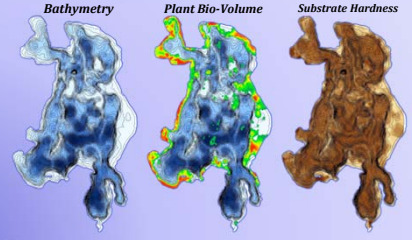
Bio-Acoustic Survey

Bathymetry | Plant Bio-Volume | Substrate Hardness



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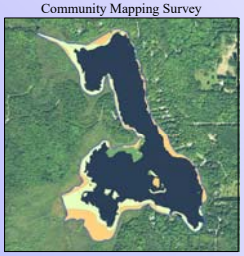
Emergent & Floating-leaf Plant Communities

- Important communities for habitat, water quality, and shoreland stabilization
- Often negatively impacted by shoreland development

Community Mapping Survey



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Non-Native Aquatic Plants

Eurasian Watermilfoil

Curly-leaf Pondweed

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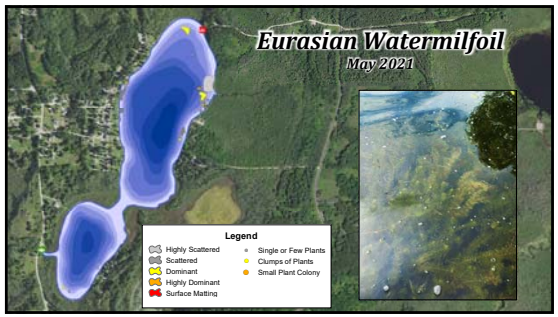
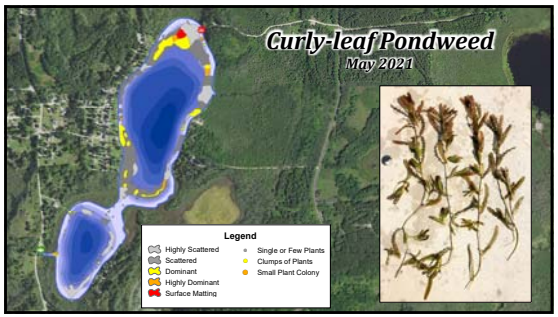
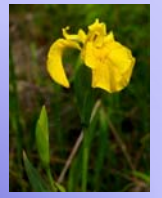




Non-Native Aquatic Plants

Pale-yellow Iris



Purple Loosestrife

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Fisheries Data Integration

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

Stakeholder Survey

- Survey includes ALHA members & riparian property owners
- 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

Planning Process

Planning Committee Meetings

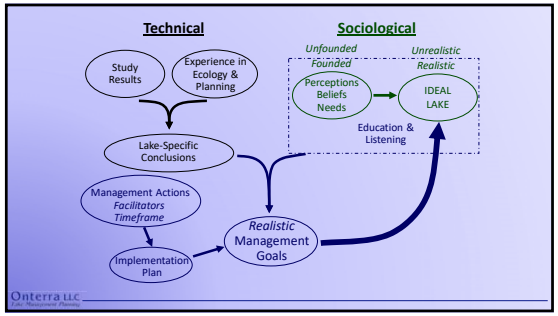
Study Results (including a stakeholder survey)
Conclusions & Initial Recommendations
Management Goals
Management Actions
Timeframe
Facilitator(s)

Implementation Plan

Project Timeline

The Planning Process

…it's not as easy as you may think.


Technical
Sociological
Unfounded
Founded
Unrealistic
Realistic
Study Results
Experience in Ecology & Planning
Perceptions Beliefs Needs
IDEAL LAKE
Education & Listening
Lake-Specific Conclusions
Management Actions
Facilitators
Timeframe
Realistic Management Goals
Implementation Plan
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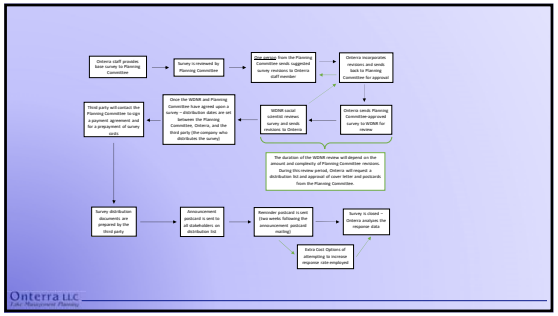
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Town of Auburn &
Auburn Lake Homeowners Association

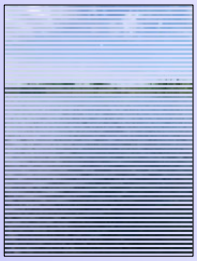
Auburn Lake
Management Planning Project
Planning Meeting I
April 21, 2022

Todd Hanke & Jo Barlament
Onterra LLC
Lake Management Planning

Planning I Meeting Agenda

- Management Planning Project Overview
- Study Results
  - Water Quality
  - Watershed
  - Paleoecology
  - Shoreland Condition
  - Aquatic Plants
  - Fisheries Data Integration
  - Conservation Opportunity Areas

  "Big Picture" Conclusions
- Planning Meeting II: Aquatic Plant Management & Goal Development



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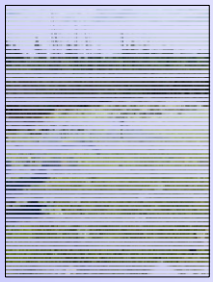
Management Planning Project Overview

- First management plan developed for Auburn Lake
- Current project designed to assess the overall status of the lake
- Collect & analyze data – completed
  - Technical & sociological
- Construct long-term & useable plan



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Management Plan Outline

Planning Meeting I

- 1.0 Introduction
- 2.0 Stakeholder Participation
- 3.0 Study Results
  - 3.1 Water Quality
  - 3.2 Watershed Assessment
  - 3.3 Paleoecology
  - 3.4 Shoreland Condition
  - 3.5 Aquatic Plants
  - 3.6 Aquatic Invasive Species
  - 3.7 Fisheries Data Integration
  - 3.8 Areas of Special Conservation Interest
- 4.0 Summary & Conclusions

Planning Meeting II

- 5.0 Implementation Plan
- 6.0 Methods
- 7.0 Literature Cited

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Summary of General Project Results

Water Quality

- Overall, water quality is *good* to *excellent* for a deep lowland drainage lake in Wisconsin
- Indicators from aquatic plant community that there has been an increase in nutrient input in recent years – likely the result of record-level precipitation
- Water clarity in 2019-2021 highest recorded – may be the result of zebra mussel population

Watershed & Immediate Shoreline

- Watershed overall is in good condition– ~70% comprised of intact forests & wetlands
- Some areas of concern including croplands and shoreland development

Aquatic Plant Community

- Aquatic plant community has seen some significant changes between 2008 and 2021
- Increase in the occurrence and biomass of certain species (e.g., coontail) that are indicative of increasing nutrient input; decrease in occurrence of some sensitive species
- High native species diversity compared to other lakes in the SWTP Ecoregion
- Lake supports moderate levels of invasive Eurasian watermilfoil and curly-leaf pondweed

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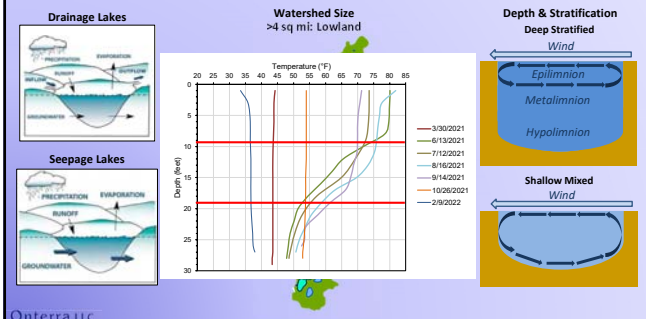
Wisconsin Lakes Natural Community Types



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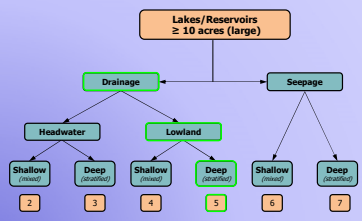
Natural Community Types

Categorization of lakes with similar features that influence water quality



Ecoregions

An area containing similar geology, physiography, hydrology, climate, and soils. As well as common terrestrial and aquatic fauna.

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Introduction to Lake Water Quality

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

N:P Ratio: 24:1 – Phosphorus

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

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

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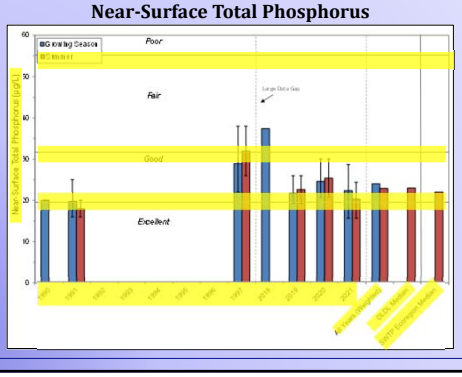
Near-Surface Total Phosphorus



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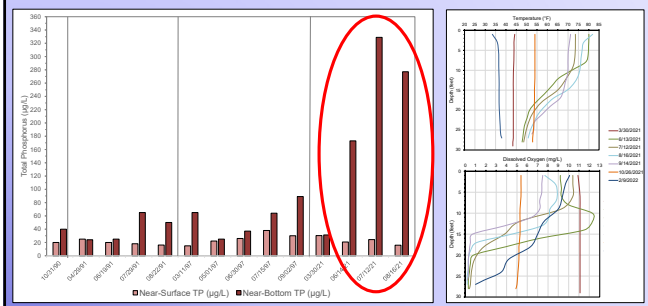
Near-Surface vs Near-Bottom Total Phosphorus



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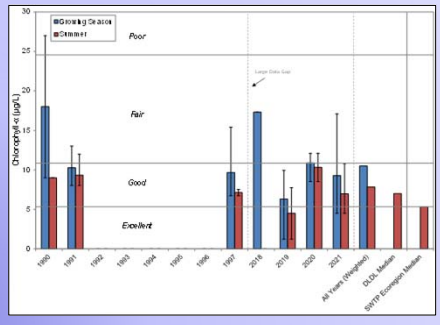
Chlorophyll-α



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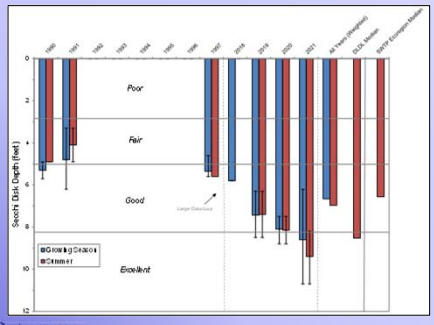
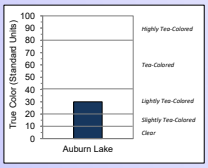
Secchi Disk Depth



True Color



Dissolved Organic Matter (DOM) is driven by precip & influences clarity.

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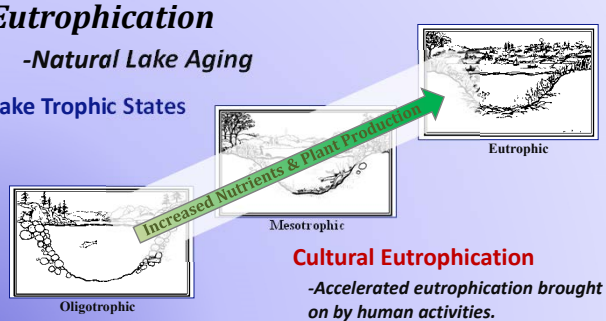
Eutrophication

-Natural Lake Aging

Lake Trophic States



Cultural Eutrophication

-Accelerated eutrophication brought on by human activities.

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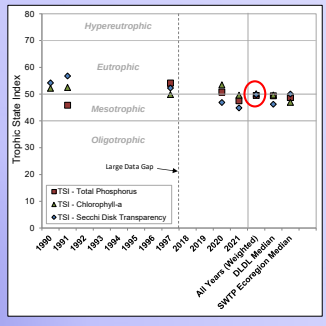
Trophic State Index



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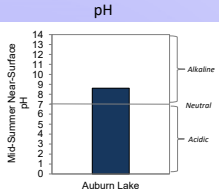
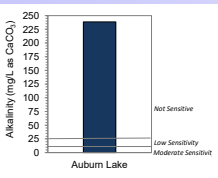
Additional Water Quality Parameters

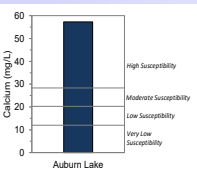
pH



Alkalinity



Calcium



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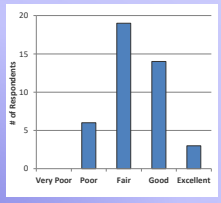
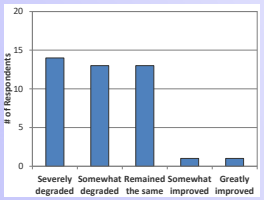
Stakeholder Perceptions of Water Quality

How would describe the overall current water quality of Auburn Lake?



How has the overall water quality changed in Auburn Lake since you first visited the lake?



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Zebra Mussels Influence on Water Quality

- **Filter water-increased water clarity**
- **Higher water clarity can increase plant growth, especially into deeper littoral areas**
- **Sunlight on bottom sediments can stimulate the growth of algae (Cladophora) which float to the waters surface.**

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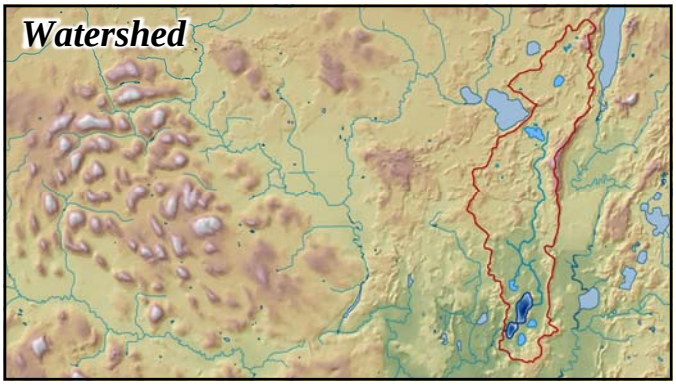
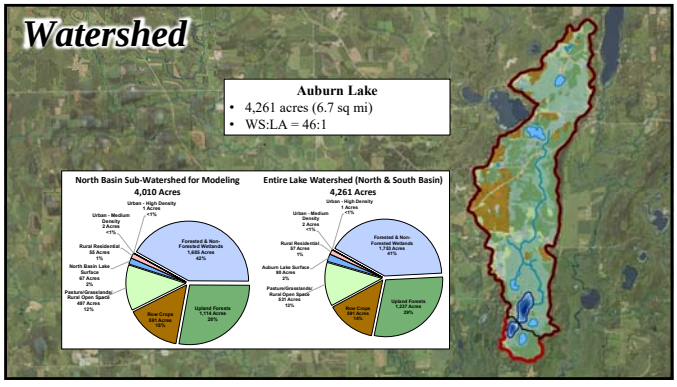
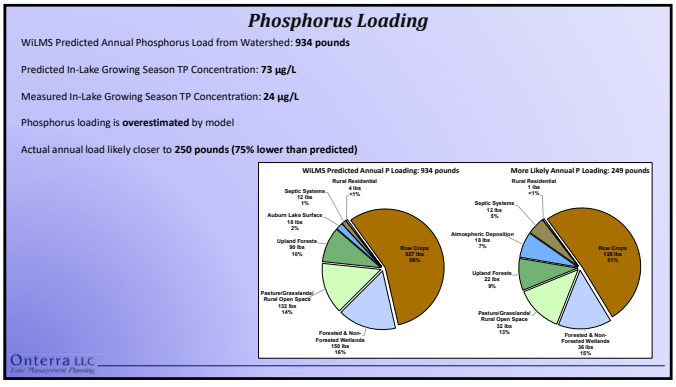
Watershed


Watershed


Watershed


Watershed
Auburn Lake
• 4,261 acres (6.7 sq mi)
• WS:LA = 46:1
North Basin Sub-Watershed for Modeling
4,010 Acres
Entire Lake Watershed (North & South Basin)
4,261 Acres


Phosphorus Loading
WiLMS Predicted Annual Phosphorus Load from Watershed: 934 pounds
Predicted In-Lake Growing Season TP Concentration: 73 µg/L
Measured In-Lake Growing Season TP Concentration: 24 µg/L
Phosphorus loading is overestimated by model
Actual annual load likely closer to 250 pounds (75% lower than predicted)
WiLMS Predicted Annual P Loading: 934 pounds
More Likely Annual P Loading: 249 pounds
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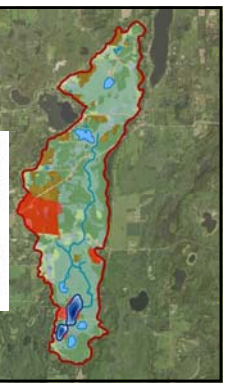
Watershed Areas of Concern

As part of Auburn Lake's watershed assessment, six *areas of concern* were delineated. These areas were identified based on their potential to degrade Auburn Lake's water quality. Three areas of row crop agriculture which are closest to Auburn Lake were identified (Map 4). The LiDAR (Light Detection and Ranging) data from Fond du Lac County, show that these fields have direct drainages into the wetlands immediately adjacent to Auburn Lake Creek. The wetland buffer between these drainages and the creek are relatively small, and these areas may contribute nutrients and sediments to Auburn Lake Creek and Auburn Lake.

Three other areas were identified, comprised of rural residential development immediately adjacent to Auburn Lake (Map 4). These areas are comprised of homes and manicured lawns on hillsides which slope towards the lake. These areas likely contribute nutrients and any other pollutants (lawn fertilizers, pesticides, etc.) directly to Auburn Lake. The subsequent Shoreland Condition Section (Section 3.3) discusses Auburn Lake's immediate shoreland zone and best management practices that riparians can implement to minimize pollution and improve habitat.

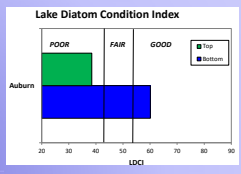


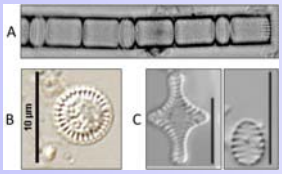
Watershed Areas of Concern

This modeling highlights the importance of maintaining the integrity of the wetland and upland forest complexes within the lake's watershed. These natural areas are essential for maintaining Auburn Lake's water quality. The model shows how Auburn Lake's water quality would degrade if these natural communities were not in place. Without these wetlands, the predicted in-lake phosphorus concentration of 73 µg/L would result in significant algal blooms, with a predicted summer chlorophyll-*a* concentration of over 40 µg/L and an average Secchi disk transparency of just 2.0 feet. Conservation of Auburn Lake's water quality depends on the conservation of natural areas beyond the immediate shoreland zone.

Paleoecology

- Fossils from a group of algae (diatoms) were analyzed in a sediment core
- Determine if and how water quality has changed over ~150 years
- Diatom communities in top and bottom samples indicate that phosphorus concentrations have increased from historical concentrations of 18-20 µg/L (currently 24 µg/L)





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Shoreline Development

Surveyed in 2021 using WDNR Shorelands and Shallows Habitat Monitoring Field Protocol

Collected Data Includes:
-Canopy Layers
-Impervious Surface
-Manicured Lawns
-Sea walls or riprap
-Human structures
-Aquatic Plants
-Bank erosion
-Coarse Woody Habitat

https://dnrmaps.wi.gov/H5/?viewer=Lakes_AIS_Viewer

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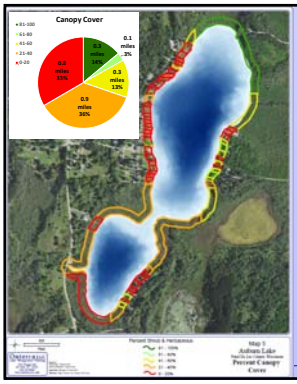
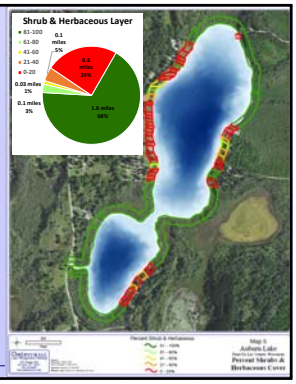
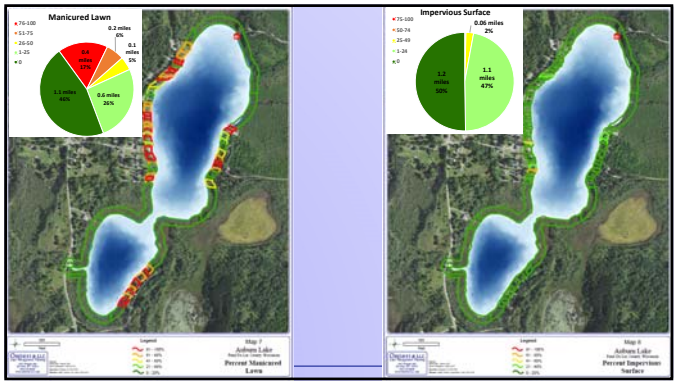
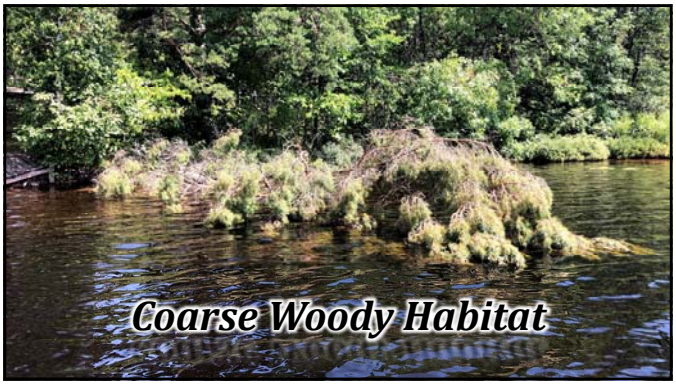
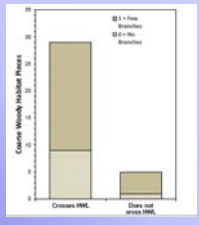








Coarse Woody Habitat



Wetland shoreline results in fewer CWH pieces

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Aquatic Plant Surveys

- Assess both non-native & native species
- Four surveys completed in 2021
  - Early-Season AIS Survey
  - Whole-lake Point-Intercept Survey
  - Emergent/Floating-leaf Community Mapping Survey
  - Late-Season AIS Survey

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Plant Data Overview

- 38 native plant species recorded from 2008, 2019, & 2021 surveys
- 36 located in 2021
- 4 non-native plant species recorded
  - Curly-leaf pondweed
  - Eurasian watermilfoil
  - Pale-yellow Iris
  - Narrow-leaved Cattail
- Max Rooting Depth in 2021: 18'

Growth Form	Scientific Name	Common Name	Status in Wisconsin	Coefficient of Conservatism	2008	2019	2021
Emergent	Iris pseudacorus	Pale-yellow iris	Non-Native - Invasive	NA			I
	Iris versicolor	Northern blue flag	Native	5			I
	Phragmites australis subsp. americanus	Common reed	Native	5			I
	Schoenoplectus acutus	Hardstem bulrush	Native	5	X	X	
	Sparganium eurycarpum	Common bur-reed	Native	5			I
	Typha angustifolia	Narrow-leaved cattail	Non-Native - Invasive	NA			I
	Typha latifolia	Broad-leaved cattail	Native	1			I
FL	Nuphar variegata	Spatterdock	Native	6	X	X	X
	Nymphaea odorata	White water lily	Native	6	X	X	X
FLOE	Sparganium emersum var. acaule	Short-stemmed bur-reed	Native	9			I
Submergent	Ceratophyllum demersum	Coontail	Native	3	X	X	X
	Chara spp.	Muskgrasses	Native	7	X	X	X
	Elodea canadensis	Common waterweed	Native	3	X	X	X
	Heteranthera dubia	Water stargrass	Native	6		X	X
	Myriophyllum heterophyllum	Various-leaved watermilfoil	Native	7	X	X	X
	Myriophyllum sibiricum	Northern watermilfoil	Native	7	X	X	X
	Myriophyllum spicatum	Eurasian watermilfoil	Non-Native - Invasive	NA	X	X	X
	Myriophyllum verticillatum	Whorled watermilfoil	Native	8		X	
	Najas flexilis	Slender naiad	Native	6	X		X
	Najas guadalupensis	Southern naiad	Native	7		X	
	Nitella spp.	Stonewarts	Native	7	X	X	X
	Potamogeton amplifolius	Large-leaf pondweed	Native	7	X	X	X
	Potamogeton crispus	Curly-leaf pondweed	Non-Native - Invasive	NA	X	X	X
	Potamogeton friesii	Fries' pondweed	Native	8			X
	Potamogeton gramineus	Variable-leaf pondweed	Native	7			X
	Potamogeton illinoensis	Illinois pondweed	Native	6	X	X	X
	Potamogeton natans	Floating-leaf pondweed	Native	5	X		X
	Potamogeton nodosus	Long-leaf pondweed	Native	5	X	X	X
	Potamogeton pusillus	Small pondweed	Native	7			X
	Potamogeton zosteriformis	Flat-stempondweed	Native	6	X	X	X
	Ranunculus aquatilis	White water crowfoot	Native	8			X
	Sagittaria sp. (rosette)	Arrow head sp. (rosette)	Native	NA			X
	Stuckenia pectinata	Sago pondweed	Native	3	X	X	X
	Utricularia vulgaris	Common bladderwort	Native	7	X	X	X
	Vallisneria americana	Wild celery	Native	6			X
ES	Schoenoplectus subterminalis	Water bulrush	Native	9	X	X	X
FF	Lemna minor	Lesser duckweed	Native	5			I
	Lemna trisulca	Forked duckweed	Native	6			X

X = Located on rake during point-intercept survey; I = Incidentally located; not located on rake during point-intercept survey

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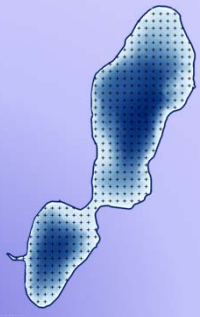
Whole-Lake Point-Intercept Surveys



Auburn Lake
32-meter resolution
357 total points

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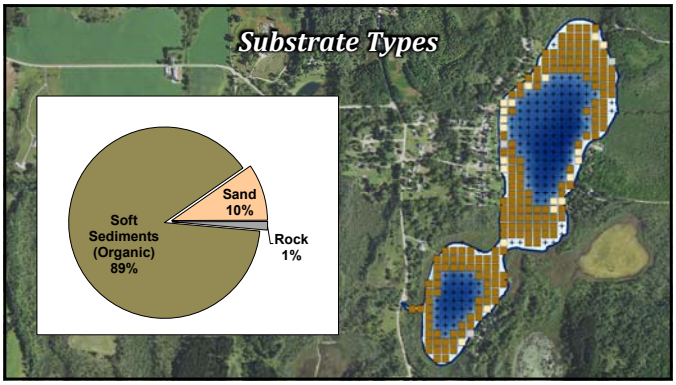
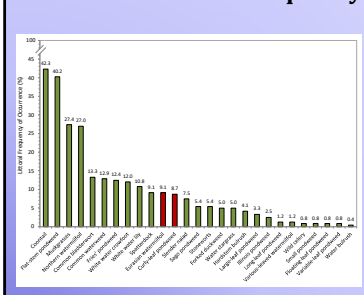
Substrate Types



Littoral Frequency of Occurrence



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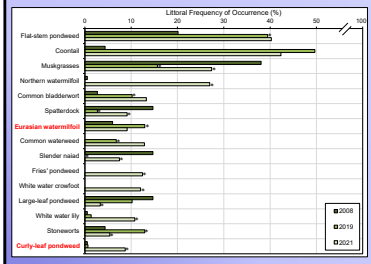
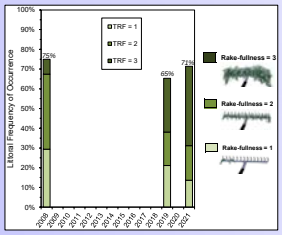
Littoral Frequency of Occurrence





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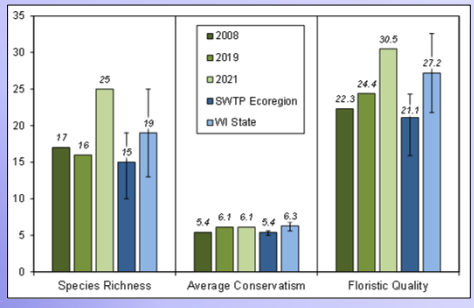
Floristic Quality Analysis



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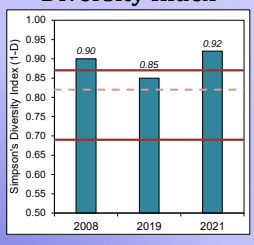
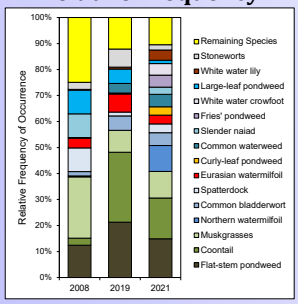
Simpson's Diversity Index



Relative Frequency



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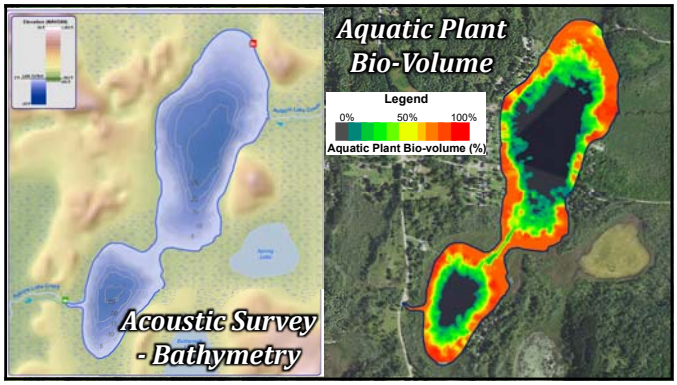
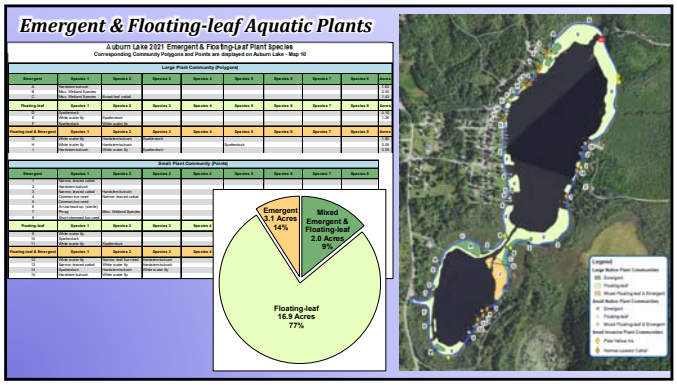
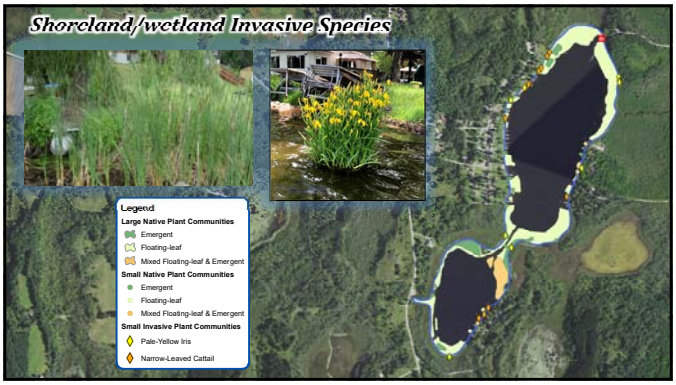
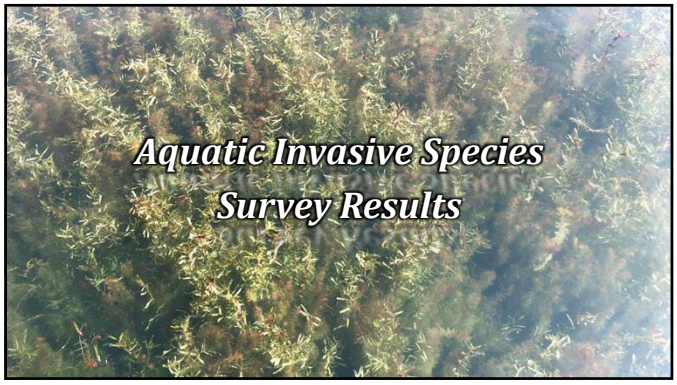
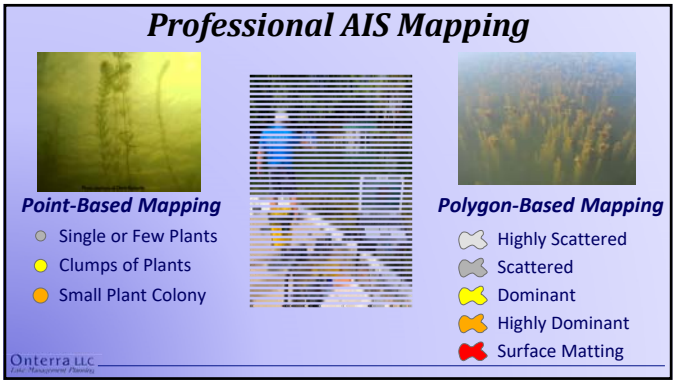

Aquatic Plant Bio-Volume
Legend
0%
50%
100%
Aquatic Plant Bio-volume (%)
Acoustic Survey - Bathymetry


Emergent & Floating-leaf Aquatic Plants


Emergent & Floating-leaf Aquatic Plants
Auburn Lake 2021 Emergent & Floating-Leaf Plant Species
Corresponding Community Polygons and Points are displayed on Auburn Lake - Map 10
Large Plant Community (Polygons)
Small Plant Community (Points)
Emergent 3.1 Acres 14%
Mixed Emergent & Floating-leaf 2.0 Acres 9%
Floating-leaf 16.9 Acres 77%


Shoreland/wetland Invasive Species
Legend
Large Native Plant Communities
Emergent
Floating-leaf
Mixed Floating-leaf & Emergent
Small Native Plant Communities
Emergent
Floating-leaf
Mixed Floating-leaf & Emergent
Small Invasive Plant Communities
Pale-Yellow Iris
Narrow-Leaved Cattail


Aquatic Invasive Species Survey Results


Professional AIS Mapping
Point-Based Mapping
Single or Few Plants
Clumps of Plants
Small Plant Colony
Polygon-Based Mapping
Highly Scattered
Scattered
Dominant
Highly Dominant
Surface Matting
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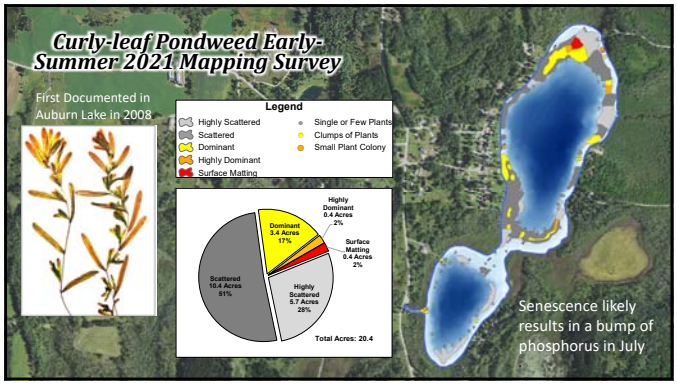

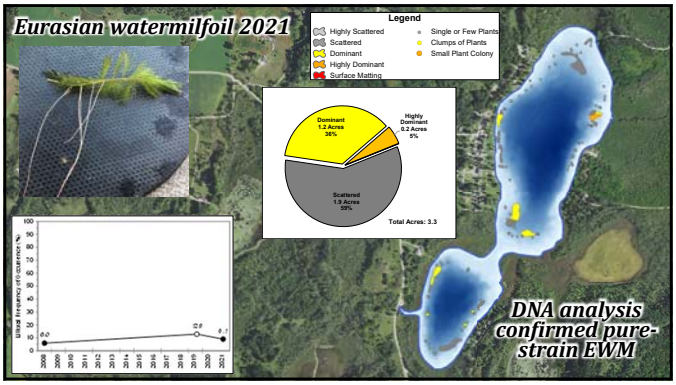

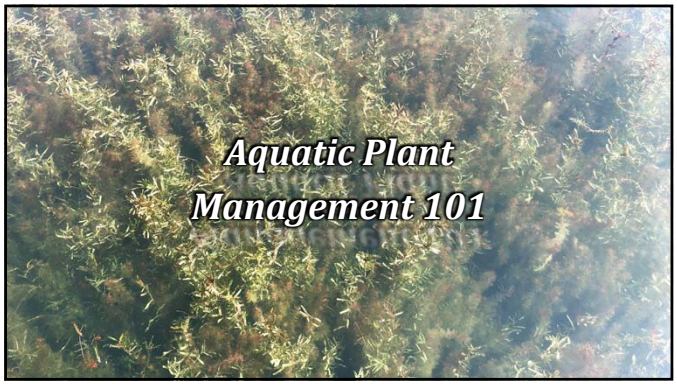

Stakeholder Survey – Aquatic Plant Management

24. Have aquatic plants ever had a negative impact on your enjoyment of Auburn Lake?

Answer Options	Yes	Unsure	No	Total
Swimming	34	0	4	38
Fishing - open water (from boat, shore or pier)	25	3	11	39
Ice fishing	6	8	21	35
Motor boating	29	3	6	38
Canoeing/kayaking/stand-up paddleboard	25	4	8	37
Nature viewing	14	6	17	37
Aesthetics	32	2	4	38
Other	2	5	2	9
			answered question	41
			skipped question	2

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Stakeholder Survey – Aquatic Plant Management

25. Do you believe the aquatic plants in Auburn Lake should be managed, or allow nature to take its course and do not manage?

Answer Options	Response Percent	Response Count
Manage	80.0%	32
Do not manage	10.0%	4
Unsure	10.0%	4

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Best Management Practices (BMPs)

- **A "placeholder" term to represent the management option that is currently supported by that latest science and policy**
- **Definition evolves over time**
  - Pre 2010 - small spot treatments with granular products
  - Early 2010s - larger spot treatments with liquid products
  - Mid 2010s – whole-lake treatments, spot treatments with herbicide combos, hand-harvesting/DASH
  - Current– whole-lake/basin approaches, nuisance maintenance vs population management, mechanical harvesting, increasing human tolerance, new herbicides

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Integrated Pest Management Strategies (IPM)

- **Using a combination of methods that are more effective when applied collectively as part of defined strategy than when conducted separately**

- Prevention
- Biological control
- Biomanipulation
- Nutrient management
- Habitat manipulation
- Substantial modification of cultural practices
- Pesticide application
- Water level manipulation
- Mechanical removal
- Feasibility planning
- Population monitoring

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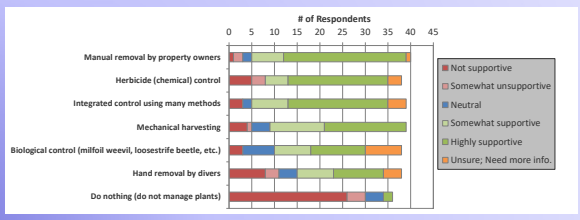
Stakeholder Survey – Aquatic Plant Management

26. Aquatic invasive plants can be controlled using many techniques. What is your level of support for the responsible use of the following aquatic invasive plant management techniques on Auburn Lake?



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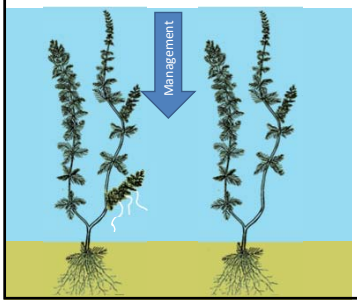
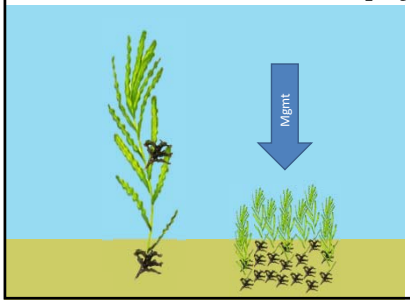
EWM Life-Cycle & Control Strategy Philosophy



- Herbicide needs to translocate to root crown (*hard to kill with herbicides*)
- Hand-harvesting that extracts roots is effective (*extremely time intensive*)
- Mechanical harvesting can minimize nuisance conditions (*spread to new areas not a concern for established populations)*
- Sometimes EWM does not cause nuisance conditions or ecological changes

CLP Life-Cycle & Control Strategy Philosophy



- Established populations typically have 5-10 years of viable turions in sediment
- Unless documented ecological impacts, established populations not targeted for lake-wide management
- Dies off around July 4th

Active Plant Management

- **Hand-Harvest/DASH**
- **Mechanical Harvesting**
- **Herbicide Treatment (Exotics only)**

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Hand-Harvesting

- **Removal of entire root material required for EWM/HWM**
- **Scale limitations, not for large or dense areas**
- **Diver-Assisted Suction Harvest (DASH) can increase efficiency**
- **Limitations**
  - –Density of EWM & native plants
  - –Clarity of water
  - –Sediment type
  - –Obstructions

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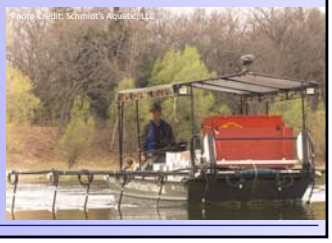
Herbicide Treatment

- **Introduces greater need for risk assessment discussion**
  - Known impacts of herbicides
  - Unknown impacts of herbicides
  - Public sentiment
- **How they work**
  - Concentration & Exposure Time (CET)
  - Herbicide dissipation
  - Spot vs whole-lake (whole-basin)
  - Herbicide formulation



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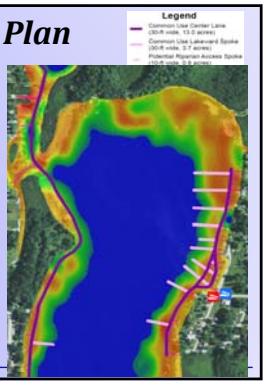
Mechanical Harvesting Plan

- Approved harvesting plan may allow multi-year permit
- Defined parameters of need
- Defined project design
  - Defined sites
  - Defined operations (cutting depth, off-loading location, disposal sites, decontamination procedures)
- WDNR tracking parameters
  - *An annual report of aquatic plant material removed by weight (unit) and volume (unit) and species, a detailed map of harvest areas, total acres harvested, a report detailing the non-target impacts and the species and number of fish encountered within 30 days of the last treatment*



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2020 Mechanical Harvesting Permit

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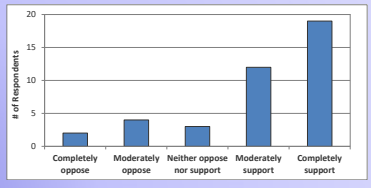
Stakeholder Survey – Aquatic Plant Management

29. What is your level of support or opposition for future mechanical harvesting to create navigation lanes in Auburn Lake?



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AIS Management Perspectives

1. **No Coordinated Active Management (Let Nature Take its Course)**
   - Lake group does not lead efforts
   - Encourage nuisance abatement through manual removal by property owners
2. **Minimize navigation and recreation impediment (Nuisance Mgmt)**
   - May be accomplished through mechanical harvesting or herbicide treatment
   - Prioritize areas based on human use & HWM density
3. **Reduce AIS Population on a lake-wide level (Population Management)**
   - Most applicable for new discoveries, whole-lake herbicide, water level drawdown
   - Not possible on some systems with current management "toolbox"
   - Will not eradicate AIS
   - Set triggers (thresholds) of implementation and tolerance

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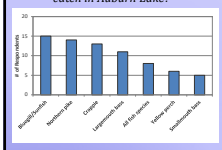
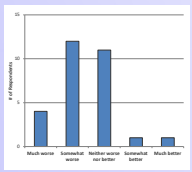
Fisheries – Stakeholder Survey

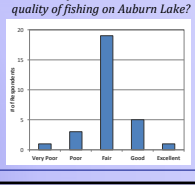
What species of fish do you like to catch in Auburn Lake?



How has the quality of fishing changed on Auburn Lake since you have started fishing the lake?



How would you describe the current quality of fishing on Auburn Lake?



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Fisheries – Population Trends

WDNR Fisheries Studies Completed in 2006 and 2018

Largemouth Bass
- Considered common
- Avg. length in 2018 11.7 inches

Northern Pike
- Considered common

Panfish
- Bluegill and pumpkinseed are common
- Yellow perch present, but not very abundant

Yellow Bass
- Uncommon in WI, but present in 2018 survey

WDNR Stocking events
- 1976 & 1978 – 900 northern pike fingerling
- 1986 & 1987 - 800,000 walleye Fry

WDNR Fishery Biologist Goals
- Survey bass and panfish populations to evaluate need for regulation changes
- 10 year sampling rotation

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Auburn Lake Areas of Special Conservation Interest (ASCIs)

- Three ASCIs delineated in Auburn Lake based on aquatic plant community & shoreland assessments
  - Intent is to encompass and highlight the full spectrum of native species and natural community diversity present in Auburn Lake
  - Capture areas of highest plant species richness and diversity
  - Proximity to natural shorelines and coarse woody habitat abundance

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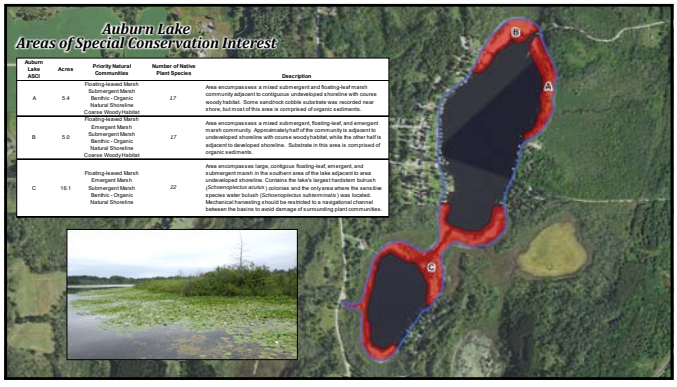
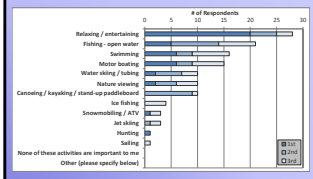
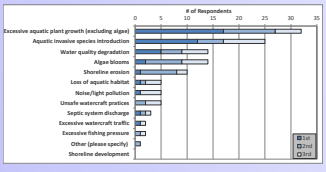


Stakeholder Survey Results

Rank up to three activities that are important reasons for owning property on or near Auburn Lake.



Please rank your top three concerns regarding Auburn Lake.



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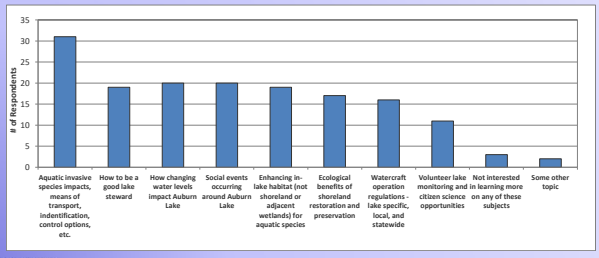
Stakeholder Survey Results

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



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Big Picture Conclusions

Water Quality

- Overall, water quality is *good* to *excellent* for a deep lowland drainage lake in Wisconsin
- Indicators from aquatic plant community that there has been an increase in nutrient input in recent years – likely the result of record-level precipitation
- Water clarity in 2019-2021 highest recorded – may be the result of zebra mussel population

Watershed & Immediate Shoreline

- Watershed overall is in good condition– ~70% comprised of intact forests & wetlands
- Some areas of concern including croplands and shoreland development

Aquatic Plant Community

- Aquatic plant community has seen some significant changes between 2008 and 2021
- Increase in the occurrence and biomass of certain species (e.g., coontail) that are indicative of increasing nutrient input; decrease in occurrence of some sensitive species
- High native species diversity compared to other lakes in the SWTP Ecoregion
- Lake supports moderate levels of invasive Eurasian watermilfoil and curly-leaf pondweed
- High amount of plant biomass likely contributes to some limitations to recreational uses

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Planning Meeting II

Primary Objective: Create implementation plan framework

Steps to Achieve Objective:

1. Discuss challenges facing the lake and the lake group
2. Convert challenges to management goals
3. Create management actions to meet management goals
4. Determine timeframes and facilitators to carry out actions

Assignment for Planning Meeting II

1. Create list of challenges facing lake and lake group – keep for meeting
2. Review stakeholder survey results
3. Send potential report section edits and questions

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B

APPENDIX B

Stakeholder Survey Response Charts and Comments

Auburn Lake - Anonymous Stakeholder Survey

Surveys Distributed: *82*
Surveys Returned: *43*
Response Rate: *52.4%*

Auburn Lake Property

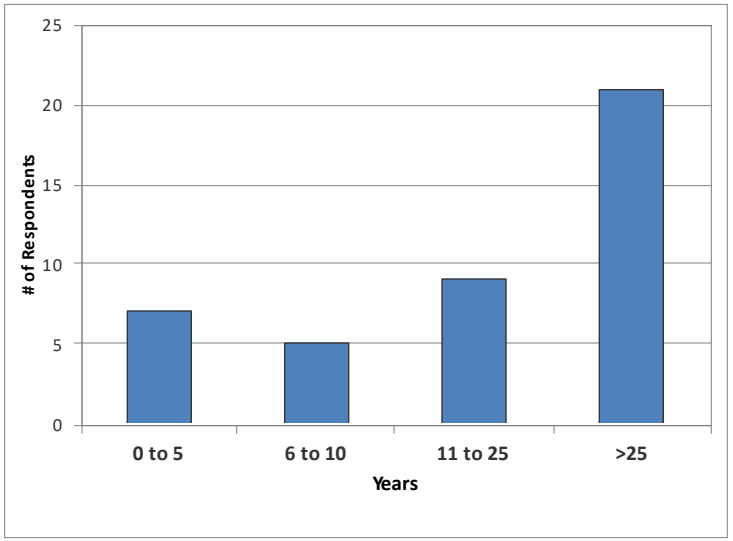
1. Is your property on the lake or off the lake? Please select one choice.

Answer Options	Response Percent	Response Count
On the lake	81.4%	35
Off the lake	18.6%	8
answered question		**43**
skipped question		**0**

2. How many years have you owned or rented your property on or near Auburn Lake?

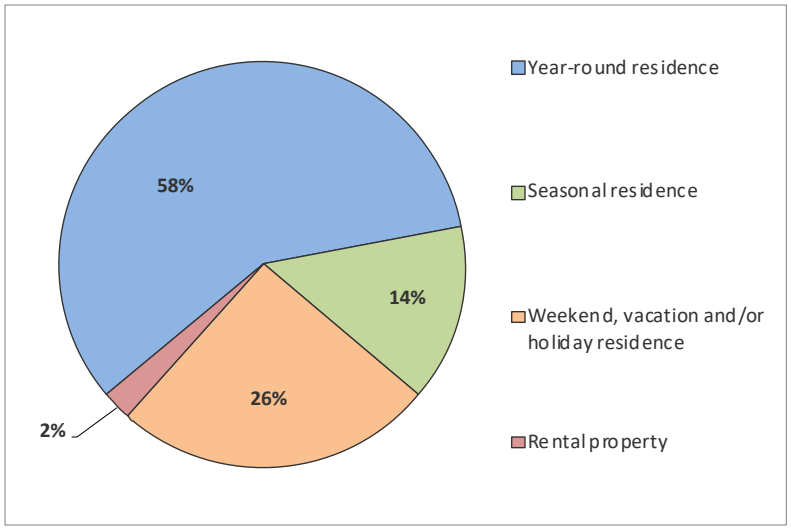
Answer Options	Response Count
	42
answered question	**42**
skipped question	**1**

Category (# of years)	Responses	% Response
0 to 5	**7**	**17%**
6 to 10	**5**	**12%**
11 to 25	**9**	**21%**
>25	**21**	**50%**



3. How is your property on or near Auburn Lake used?

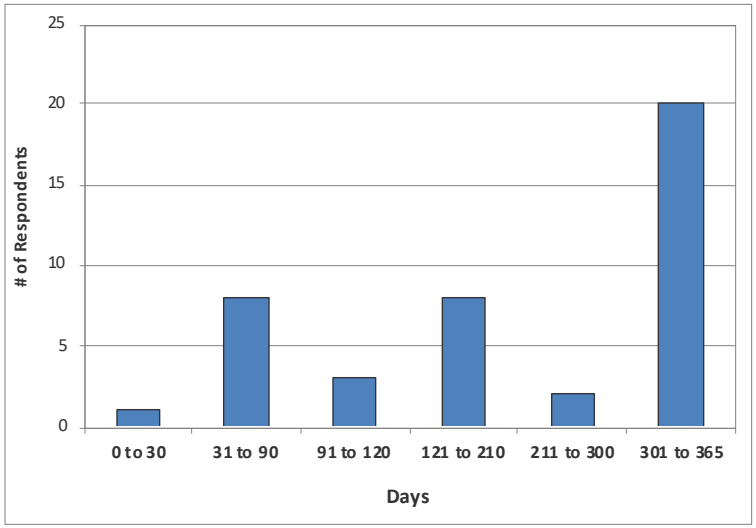
Answer Options	Response Percent	Response Count
Year-round residence	58.1%	25
Seasonal residence	14.0%	6
Weekend, vacation and/or holiday residence	25.6%	11
Rental property	2.3%	1
Other	0.0%	0
answered question		43
skipped question		0



4. Considering the past three years, how many days each year is your property used by you or others?

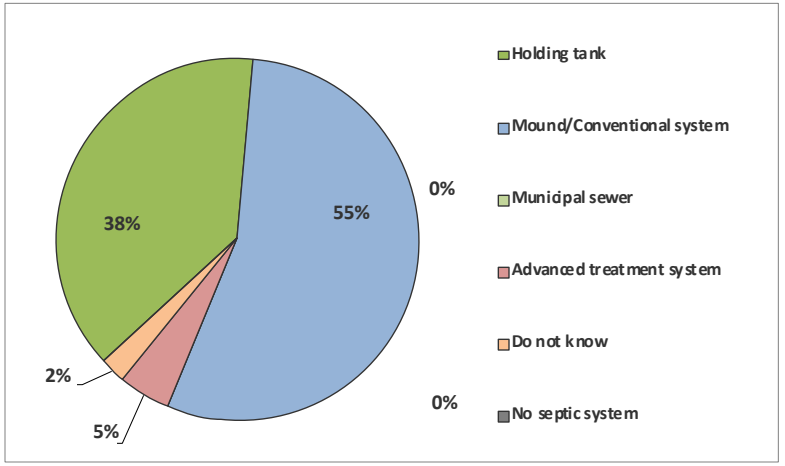
	Response Count
answered question	42
skipped question	1

Category (# of days)	Responses	%
0 to 30	1	2%
31 to 90	8	19%
91 to 120	3	7%
121 to 210	8	19%
211 to 300	2	5%
301 to 365	20	48%



5. What type of septic system does your property have?

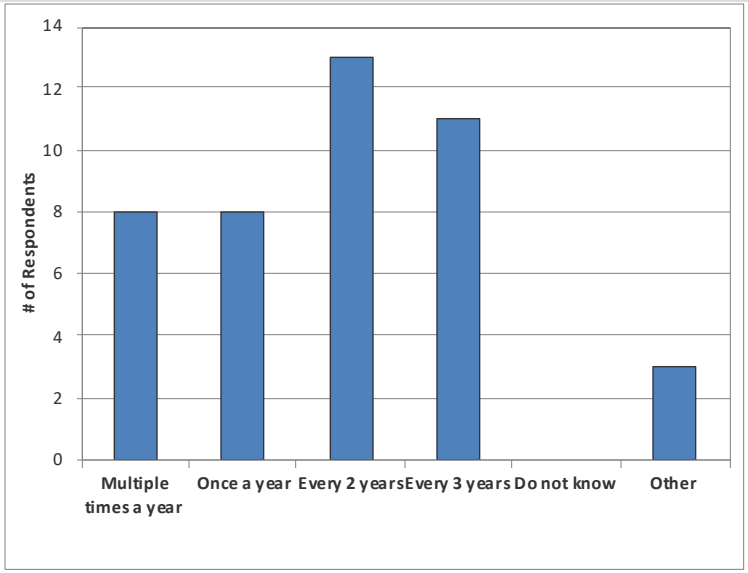
Answer Options	Response Percent	Response Count
Holding tank	38.1%	16
Mound/Conventional system	54.8%	23
Municipal sewer	0.0%	0
Advanced treatment system	4.8%	2
Do not know	2.4%	1
No septic system	0.0%	0
answered question		42
skipped question		1



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

Answer Options	Response Percent	Response Count
Multiple times a year	18.6%	8
Once a year	18.6%	8
Every 2 years	30.2%	13
Every 3 years	25.6%	11
Do not know	0.0%	0
Other (please specify)	7.0%	3
answered question		43
skipped question		0

Number	"Other" responses
1	Monthly- Holding tank
2	Every 2-3 years
3	Holding Tank 1x month

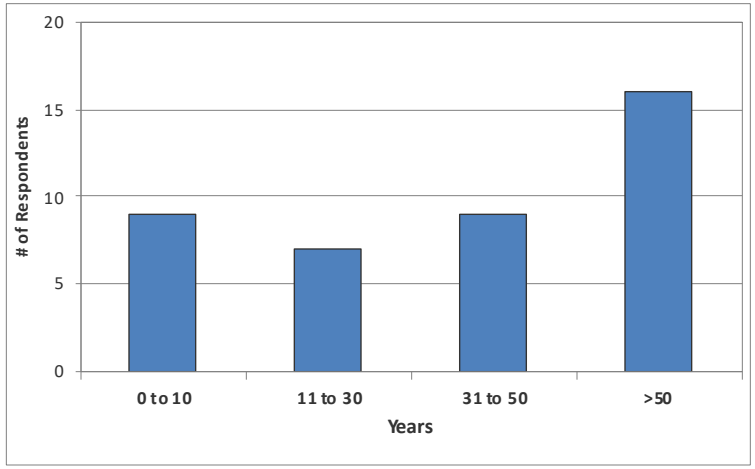


Recreational Activity on Auburn Lake

7. How many years ago did you first visit Auburn Lake?

Answer Options	Response Count
answered question	41
skipped question	2

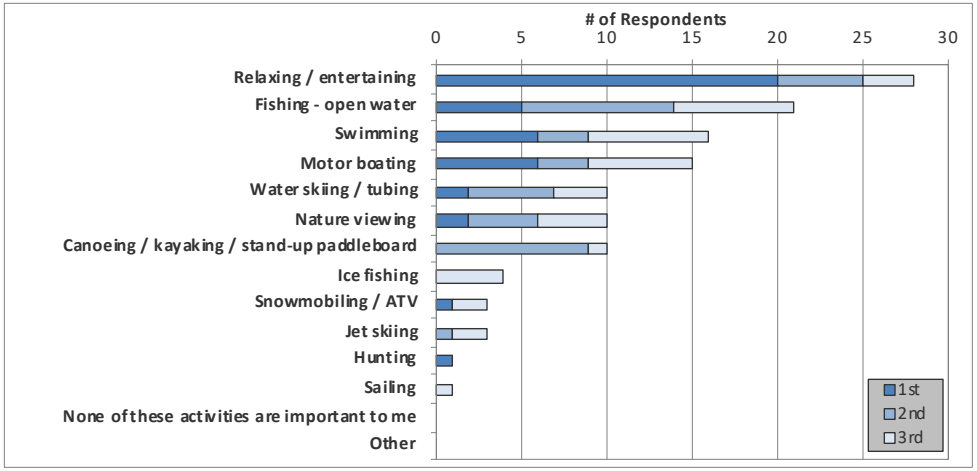
Category (# of years)	Response Percent	Response Count
0 to 10		9
11 to 30		7
31 to 50		9
>50		16



8. Please rank up to three activities that are important reasons for owning your property on or near Auburn Lake, with 1 being the most important.

Answer Options	1st	2nd	3rd	Weighted Average	Response Count
Relaxing / entertaining	20	5	3	1.39	28
Fishing - open water	5	9	7	2.1	21
Swimming	6	3	7	2.06	16
Motor boating	6	3	6	2	15
Water skiing / tubing	2	5	3	2.1	10
Nature viewing	2	4	4	2.2	10
Canoeing / kayaking / stand-up paddleboard	0	9	1	2.1	10
Ice fishing	0	0	4	3	4
Snowmobiling / ATV	1	0	2	2.33	3
Jet skiing	0	1	2	2.67	3
Hunting	1	0	0	1	1
Sailing	0	0	1	3	1
None of these activities are important to me	0	0	0	0	0
Other	0	0	0	0	0
				answered question	**43**
				skipped question	**0**

Number	"Other" responses
1	LAKE OPEN TO ALL BOATING/SKIING USES

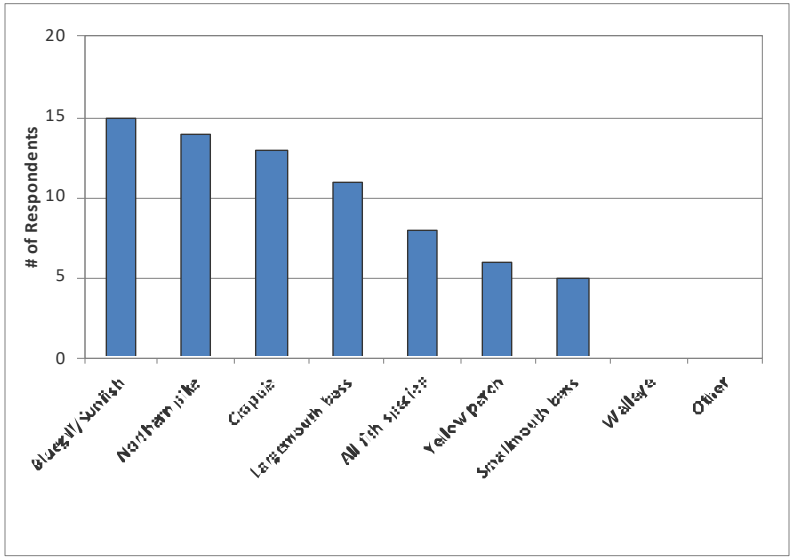


9. Have you personally fished on Auburn Lake in the past three years?

Answer Options	Response Percent	Response Count
Yes	67.4%	29
No	32.6%	14
answered question		**43**
skipped question		**0**

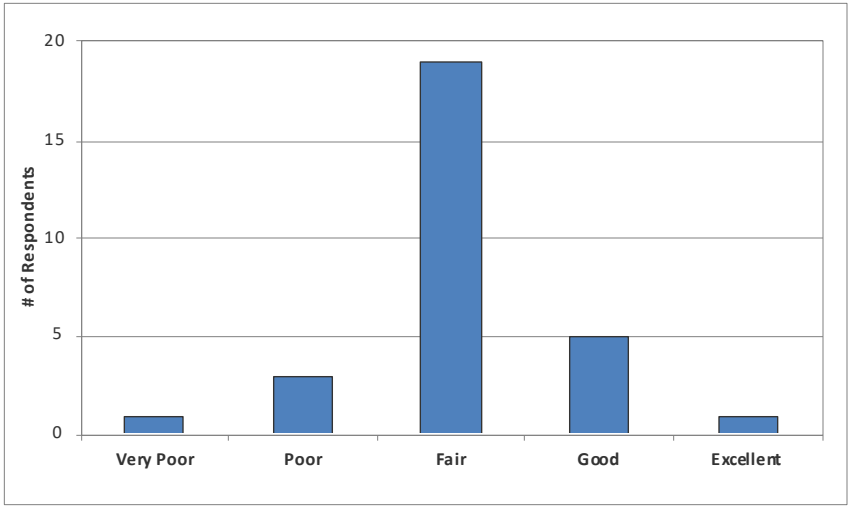
10. What species of fish do you try to catch on Auburn Lake?

Answer Options	Response Percent	Response Count
Bluegill/Sunfish	53.6%	15
Northern pike	50.0%	14
Crappie	46.4%	13
Largemouth bass	39.3%	11
All fish species	28.6%	8
Yellow perch	21.4%	6
Smallmouth bass	17.9%	5
Walleye	0.0%	0
Other	0.0%	0
answered question		**28**
skipped question		**15**



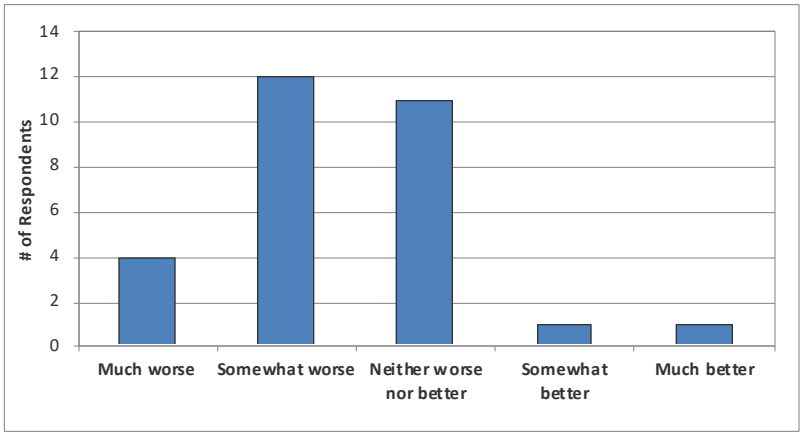
11. How would you describe the current quality of fishing on Auburn Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Response Count
	1	3	19	5	1	29
					answered question	**29**
					skipped question	**14**



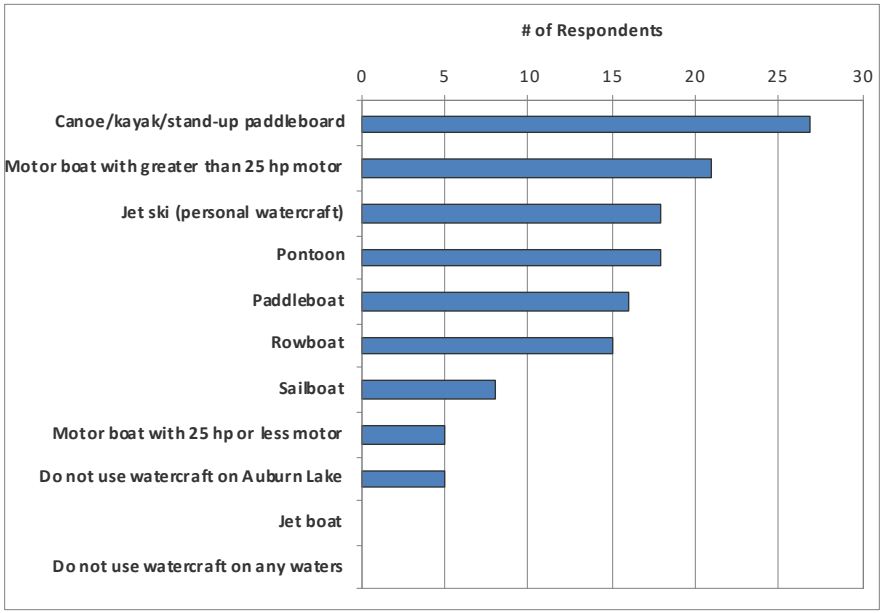
12. How has the quality of fishing changed on Auburn Lake since you have started fishing the lake?

Answer Options	Much worse	Somewhat worse	Neither worse nor better	Somewhat better	Much better	Response Count
	4	12	11	1	1	29
					answered question	**29**
					skipped question	**14**



13. What types of watercraft do you currently use on Auburn Lake?

Answer Options	Response Percent	Response Count
Canoe/kayak/stand-up paddleboard	62.8%	27
Motor boat with greater than 25 hp motor	48.8%	21
Jet ski (personal watercraft)	41.9%	18
Pontoon	41.9%	18
Paddleboat	37.2%	16
Rowboat	34.9%	15
Sailboat	18.6%	8
Motor boat with 25 hp or less motor	11.6%	5
Do not use watercraft on Auburn Lake	11.6%	5
Jet boat	0.0%	0
Do not use watercraft on any waters	0.0%	0
answered question		**43**
skipped question		**0**



14. Do you use your watercraft on waters other than Auburn Lake?

Answer Options	Response Percent	Response Count
Yes	18.6%	8
No	81.4%	35
answered question		**43**
skipped question		**0**

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

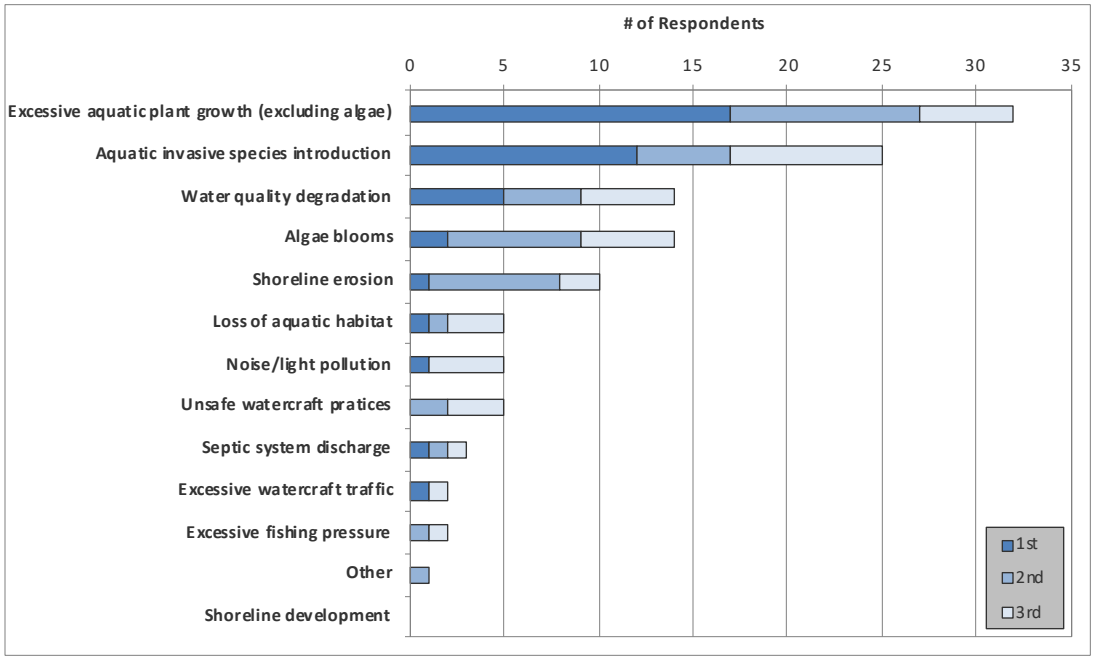
Answer Options	Response Percent	Response Count
Remove aquatic hitch-hikers (ex. - plant material, clams, mussels)	75.0%	6
Drain bilge	50.0%	4
Rinse boat	50.0%	4
Power wash boat	12.5%	1
Apply bleach	12.5%	1
Air dry boat for 5 or more days	50.0%	4
Do not clean boat	12.5%	1
Other		0
answered question		**8**
skipped question		**35**

Auburn Lake Current and Historic Condition, Health and Management

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

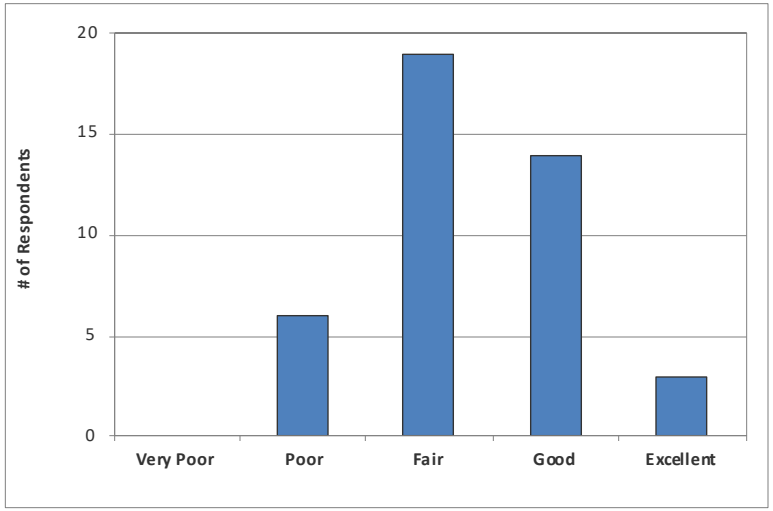
Answer Options	1st	2nd	3rd	Response Count
Excessive aquatic plant growth (excluding algae)	17	10	5	32
Aquatic invasive species introduction	12	5	8	25
Water quality degradation	5	4	5	14
Algae blooms	2	7	5	14
Shoreline erosion	1	7	2	10
Loss of aquatic habitat	1	1	3	5
Noise/light pollution	1	0	4	5
Unsafe watercraft pratices	0	2	3	5
Septic system discharge	1	1	1	3
Excessive watercraft traffic	1	0	1	2
Excessive fishing pressure	0	1	1	2
Other	0	1	0	1
Shoreline development	0	0	0	0
			answered question	**41**
			skipped question	**2**

Number	"Other" responses
1	DISRESPECT FOR LAKE FROM LAUNCH RAMP USERS
2	Authoritarian narcissist in YELLOW ski boat after wake hours.



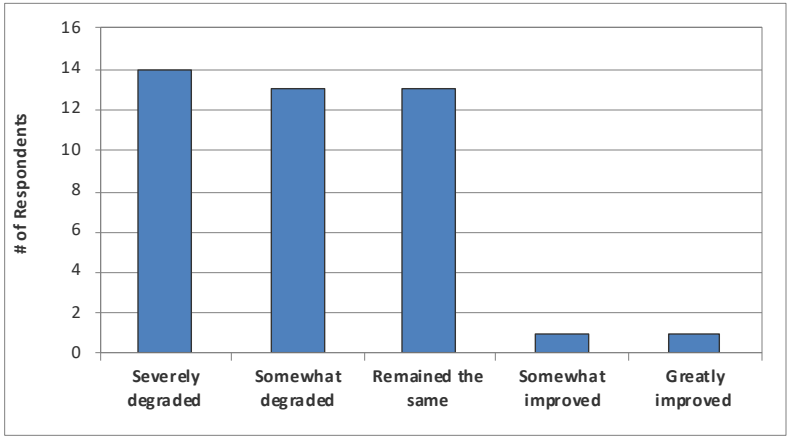
17. How would you describe the overall current water quality of Auburn Lake?

Answer Options	Very Poor	Poor	Fair	Good	Excellent	Response Count
	0	6	19	14	3	42
					answered question	**42**
					skipped question	**1**



18. How has the overall water quality changed in Auburn Lake since you first visited the lake?

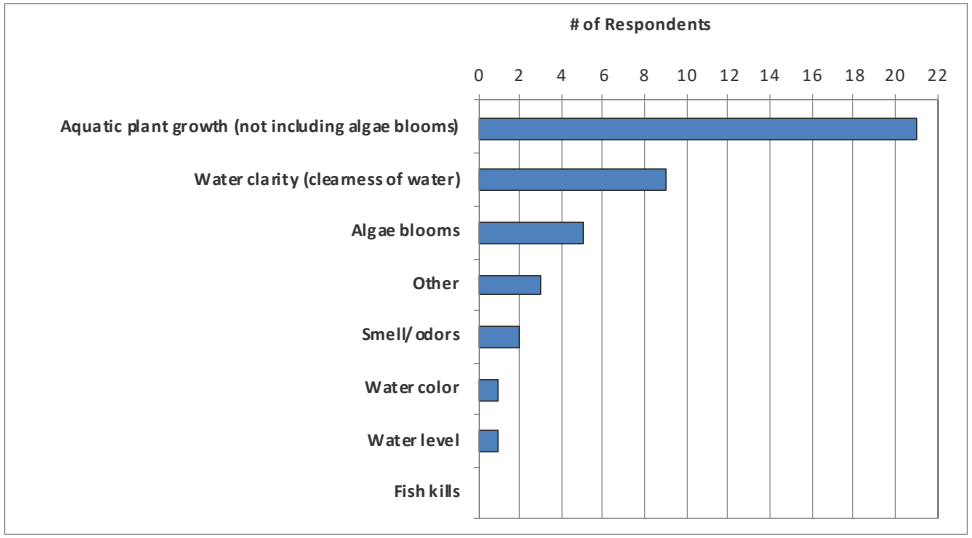
Answer Options	Severely degraded	Somewhat degraded	Remained the same	Somewhat improved	Greatly improved	Response Count
	14	13	13	1	1	42
					answered question	**42**
					skipped question	**1**



19. Which of the following would you say is the single most important aspect when considering water quality?

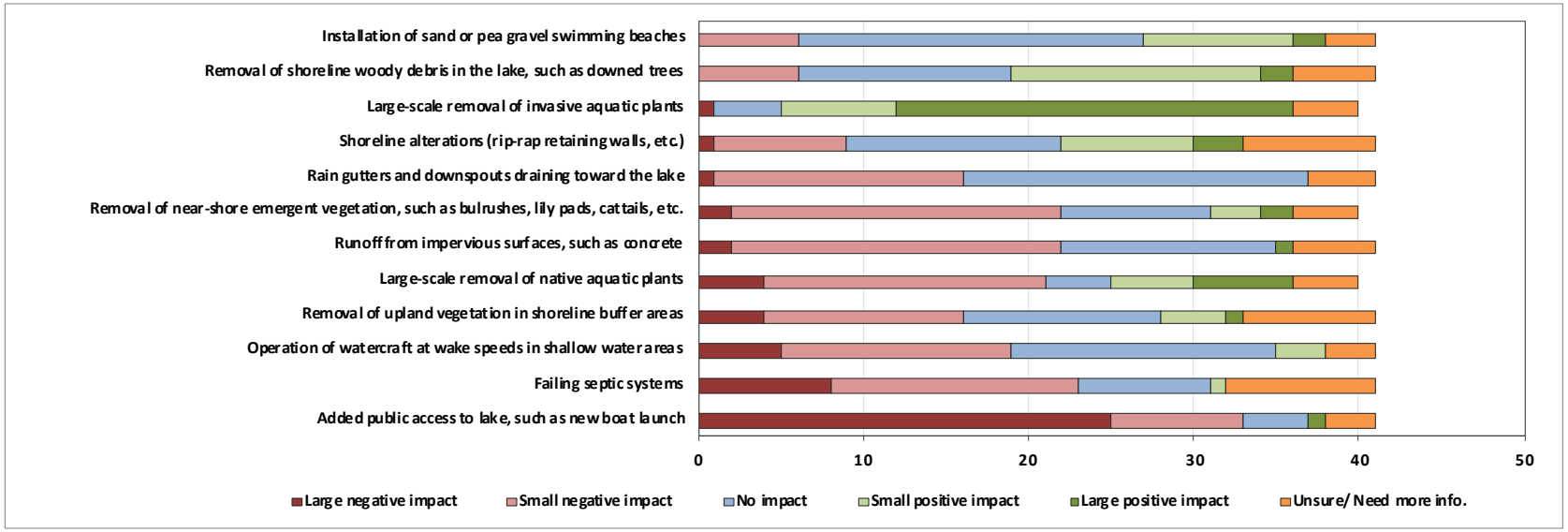
Answer Options	Response Percent	Response Count
Aquatic plant growth (not including algae blooms)	50.0%	21
Water clarity (clearness of water)	21.4%	9
Algae blooms	11.9%	5
Other	7.1%	3
Smell/odors	4.8%	2
Water color	2.4%	1
Water level	2.4%	1
Fish kills	0.0%	0
answered question		42
skipped question		1

Number	"Other" responses
1	INVASIVES EXCESS GROWTH
2	water color, aquatic plant growth, algae blooms, muck, zebra mussels
3	Water is clear but have not checked bacteria level



20. Using the following scale, what impact, if any, do you believe each of the following practices have on the water quality of Auburn Lake?

Answer Options	Large negative impact	Small negative impact	No impact	Small positive impact	Large positive impact	Unsure/ Need more info.	Response Count	Weighted Average
Added public access to lake, such as new boat launch	25	8	4	0	1	3	41	1.41
Failing septic systems	8	15	8	1	0	9	41	1.61
Operation of watercraft at wake speeds in shallow water areas	5	14	16	3	0	3	41	2.27
Removal of upland vegetation in shoreline buffer areas	4	12	12	4	1	8	41	2.07
Large-scale removal of native aquatic plants	4	17	4	5	6	4	40	2.5
Runoff from impervious surfaces, such as concrete	2	20	13	0	1	5	41	2.1
Removal of near-shore emergent vegetation, such as bulrushes, lily pads, cattails, etc.	2	20	9	3	2	4	40	2.28
Rain gutters and downspouts draining toward the lake	1	15	21	0	0	4	41	2.29
Shoreline alterations (rip-rap retaining walls, etc.)	1	8	13	8	3	8	41	2.51
Large-scale removal of invasive aquatic plants	1	0	4	7	24	4	40	4.03
Removal of shoreline woody debris in the lake, such as downed trees	0	6	13	15	2	5	41	2.95
Installation of sand or pea gravel swimming beaches	0	6	21	9	2	3	41	2.95
				answered question				**41**
				skipped question				**2**

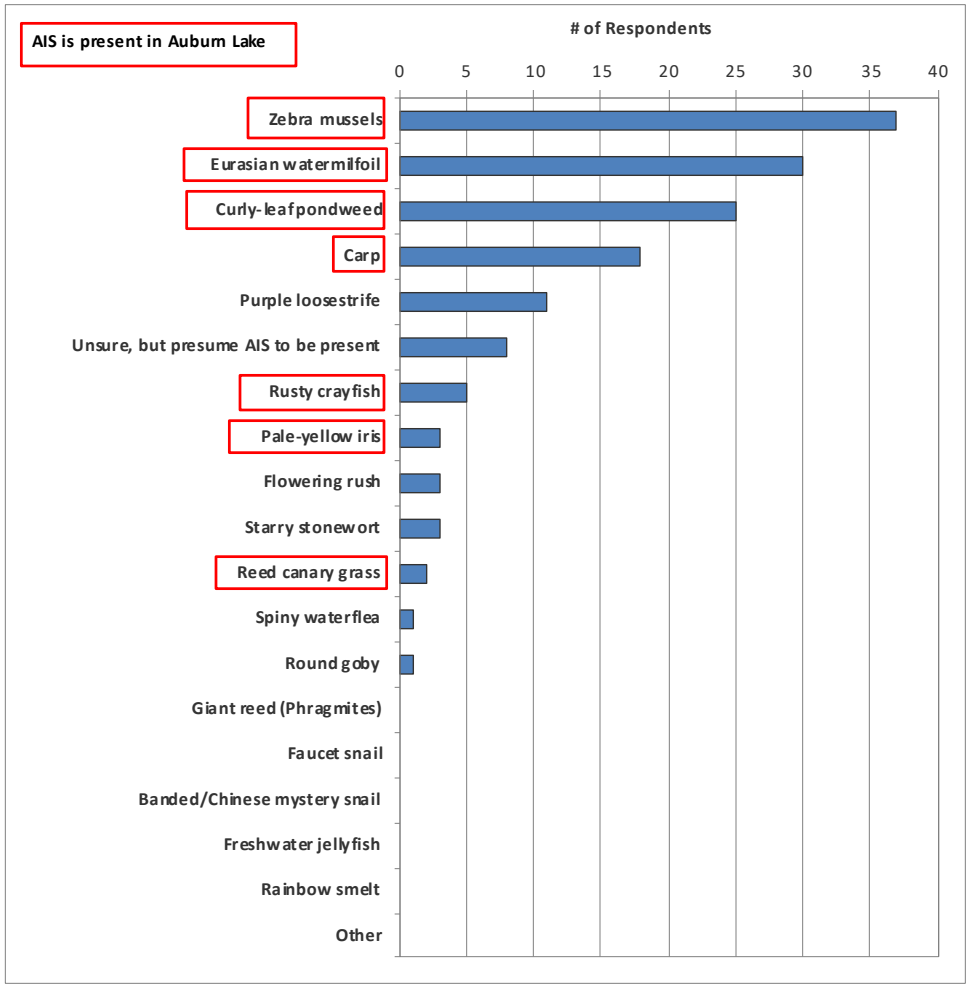

Installation of sand or pea gravel swimming beaches
Removal of shoreline woody debris in the lake, such as downed trees
Large-scale removal of invasive aquatic plants
Shoreline alterations (rip-rap retaining walls, etc.)
Rain gutters and downspouts draining toward the lake
Removal of near-shore emergent vegetation, such as bulrushes, lily pads, cattails, etc.
Runoff from impervious surfaces, such as concrete
Large-scale removal of native aquatic plants
Removal of upland vegetation in shoreline buffer areas
Operation of watercraft at wake speeds in shallow water areas
Failing septic systems
Added public access to lake, such as new boat launch
0
10
20
30
40
50
Large negative impact
Small negative impact
No impact
Small positive impact
Large positive impact
Unsure/ Need more info.

21. Before reading the statement above, had you ever heard of aquatic invasive species?		
Answer Options	**Response Percent**	**Response Count**
Yes	97.6%	40
No	2.4%	1
answered question		**41**
skipped question		**2**

22. Do you believe aquatic invasive species are present within Auburn Lake?		
Answer Options	**Response Percent**	**Response Count**
Yes	97.5%	39
I think so but am not certain	0.0%	0
No	2.5%	1
answered question		**40**
skipped question		**3**

23. Which aquatic invasive species do you believe are present in or immediately around Auburn Lake?

Answer Options	Response Percent	Response Count
Zebra mussels	94.9%	37
Eurasian watermilfoil	76.9%	30
Curly-leaf pondweed	64.1%	25
Carp	46.2%	18
Purple loosestrife	28.2%	11
Unsure, but presume AIS to be present	20.5%	8
Rusty crayfish	12.8%	5
Pale-yellow iris	7.7%	3
Flowering rush	7.7%	3
Starry stonewort	7.7%	3
Reed canary grass	5.1%	2
Spiny waterflea	2.6%	1
Round goby	2.6%	1
Giant reed (Phragmites)	0.0%	0
Faucet snail	0.0%	0
Banded/Chinese mystery snail	0.0%	0
Freshwater jellyfish	0.0%	0
Rainbow smelt	0.0%	0
Other	0.0%	0
answered question		**39**
skipped question		**4**



24. Have aquatic plants ever had a negative impact on your enjoyment of Auburn Lake?

Answer Options	Yes	Unsure	No	Total
Swimming	34	0	4	38
Fishing - open water (from boat, shore or pier)	25	3	11	39
Ice fishing	6	8	21	35
Motor boating	29	3	6	38
Canoeing/kayaking/stand-up paddleboard	25	4	8	37
Nature viewing	14	6	17	37
Aesthetics	32	2	4	38
Other	2	5	2	9
			answered question	**41**
			skipped question	**2**

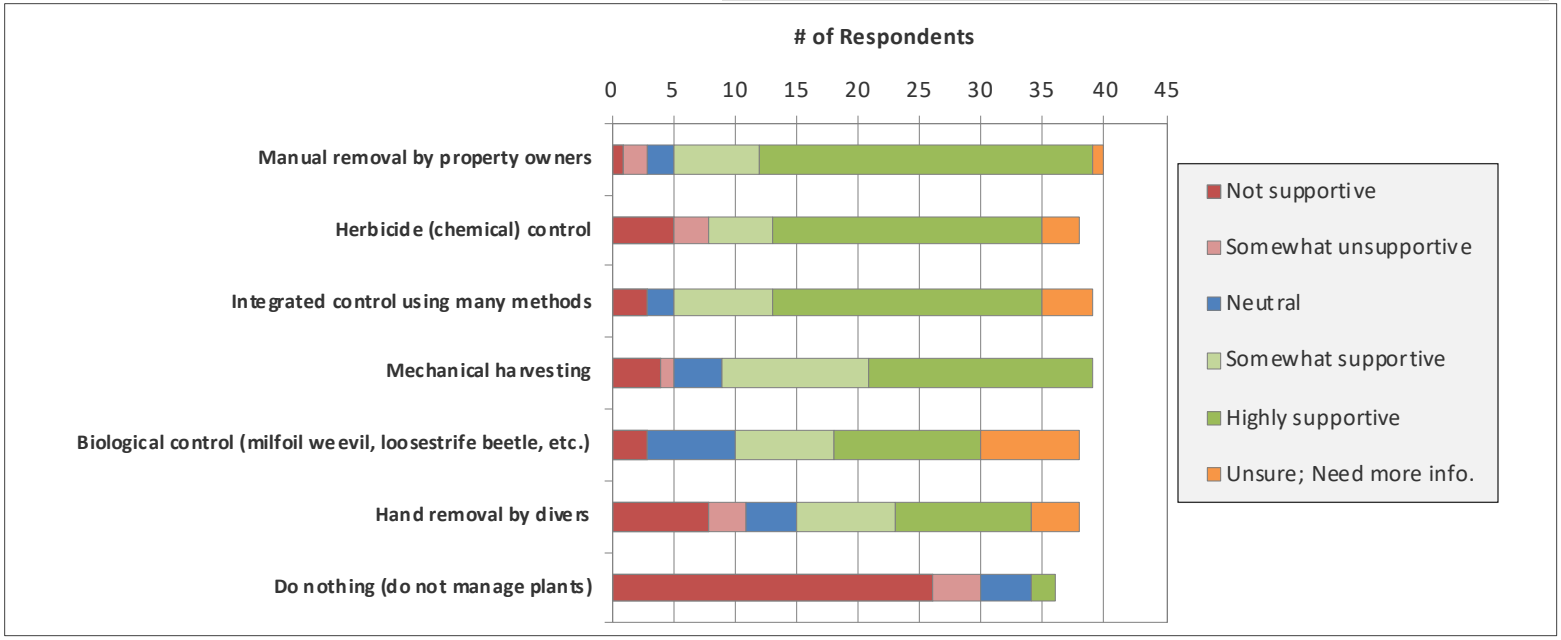
Number	"Other" responses
1	ZEBRA MUSSELS CUT FEET & WEEDS CHOKE SHORES
2	jetsking
3	PWC boating

25. Do you believe the aquatic plants in Auburn Lake should be managed, or allow nature to take its course and do not manage?

Answer Options	Response Percent	Response Count
Manage	80.0%	32
Do not manage	10.0%	4
Unsure	10.0%	4
	answered question	**40**
	skipped question	**3**

26. Aquatic invasive plants can be controlled using many techniques. What is your level of support for the responsible use of the following aquatic invasive plant management techniques on Auburn Lake?

Answer Options	Not supportive	Somewhat unsupportive	Neutral	Somewhat supportive	Highly supportive	Unsure; Need more info.	Response Count	Weighted Average
Manual removal by property owners	1	2	2	7	27	1	40	4.35
Herbicide (chemical) control	5	3	0	5	22	3	38	3.71
Integrated control using many methods	3	0	2	8	22	4	39	3.87
Mechanical harvesting	4	1	4	12	18	0	39	4
Biological control (milfoil weevil, loosestrife beetle, etc.)	3	0	7	8	12	8	38	3.05
Hand removal by divers	8	3	4	8	11	4	38	2.97
Do nothing (do not manage plants)	26	4	4	0	2	0	36	1.56
						answered question	40	
						skipped question	3	

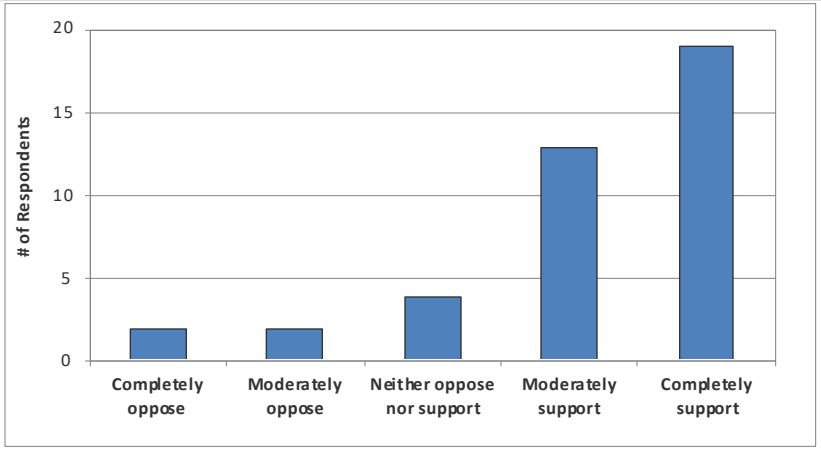


27. In 2020, mechanical harvesting was done to create navigation lanes in Auburn Lake. Prior to reading this information, did you know that mechanical harvesting was used in Auburn Lake?

Answer Options	Response Percent	Response Count
Yes	87.5%	35
I think so but can't say for certain	2.5%	1
No	10.0%	4
answered question		40
skipped question		3

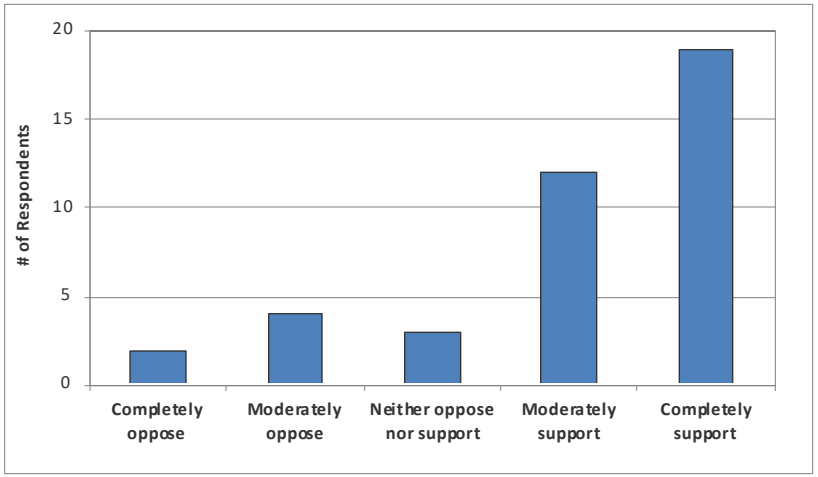
28. What is your level of support or opposition for the past use of mechanical harvesting to create navigation lanes in previous years?

Answer Options	Completely oppose	Moderately oppose	Neither oppose nor support	Moderately support	Completely support	Response Count
	2	2	4	13	19	40
answered question						40
skipped question						3



29. What is your level of support or opposition for future mechanical harvesting to create navigation lanes in Auburn Lake?

Answer Options	Completely oppose	Moderately oppose	Neither oppose nor support	Moderately support	Completely support		Response Count
	2	4	3	12	19		40
						answered question	40
						skipped question	3



30. If you selected "Moderately oppose" or "Completely oppose" for Question #29, what is the reason or reasons you oppose the future use of mechanical harvesting to create navigation lanes in Aub

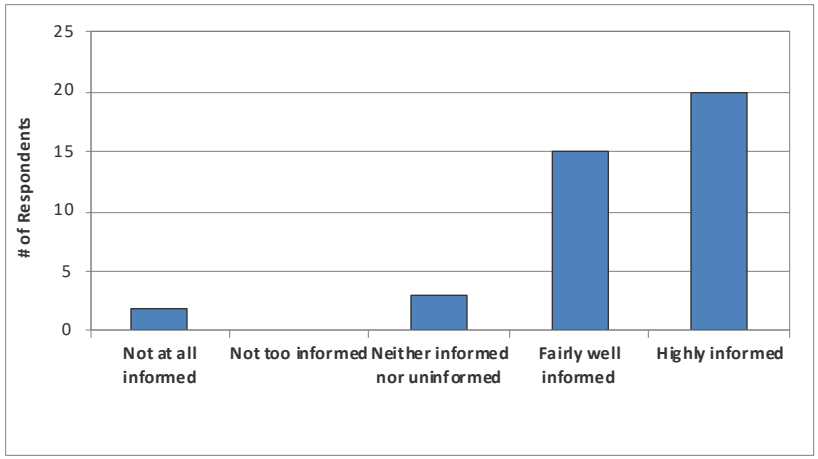
Answer Options	Response Percent	Response Count
Potential cost is too high	66.7%	4
Potential impacts to native aquatic plant species	33.3%	2
Potential impacts to native (non-plant) species (fish, insects, etc.)	33.3%	2
Future impacts are unknown	33.3%	2
Ineffectiveness of harvesting strategy	66.7%	4
Another reason	33.3%	2
	answered question	**6**
	skipped question	**37**

Number	"Other" responses
1	Short duration of weed control (weeds grew back quickly). May have created more weeds by leaving small debris in water.
2	seems to spead lake weeds

Auburn Lake (Homeowners') Association (ALA)

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

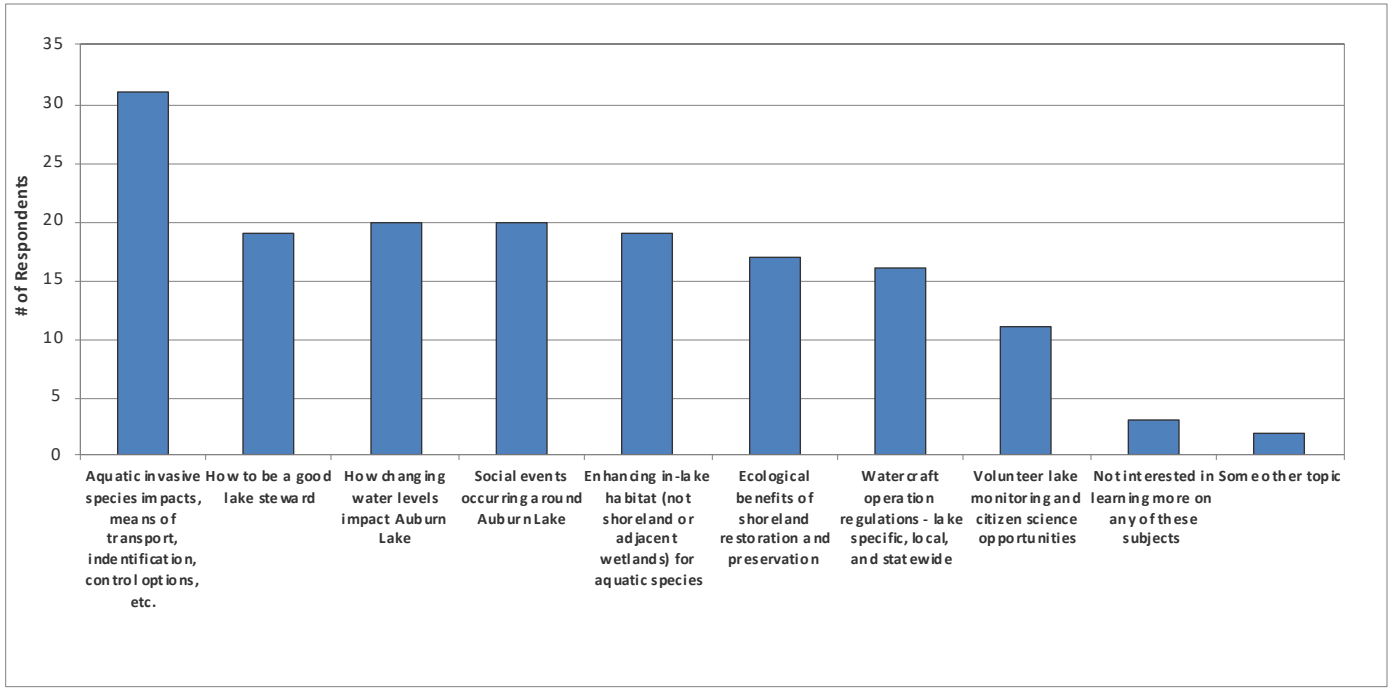
Answer Options	Not at all informed	Not too informed	Neither informed nor uninformed	Fairly well informed	Highly informed	Response Count
	2	0	3	15	20	40
					answered question	**40**
					skipped question	**3**



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

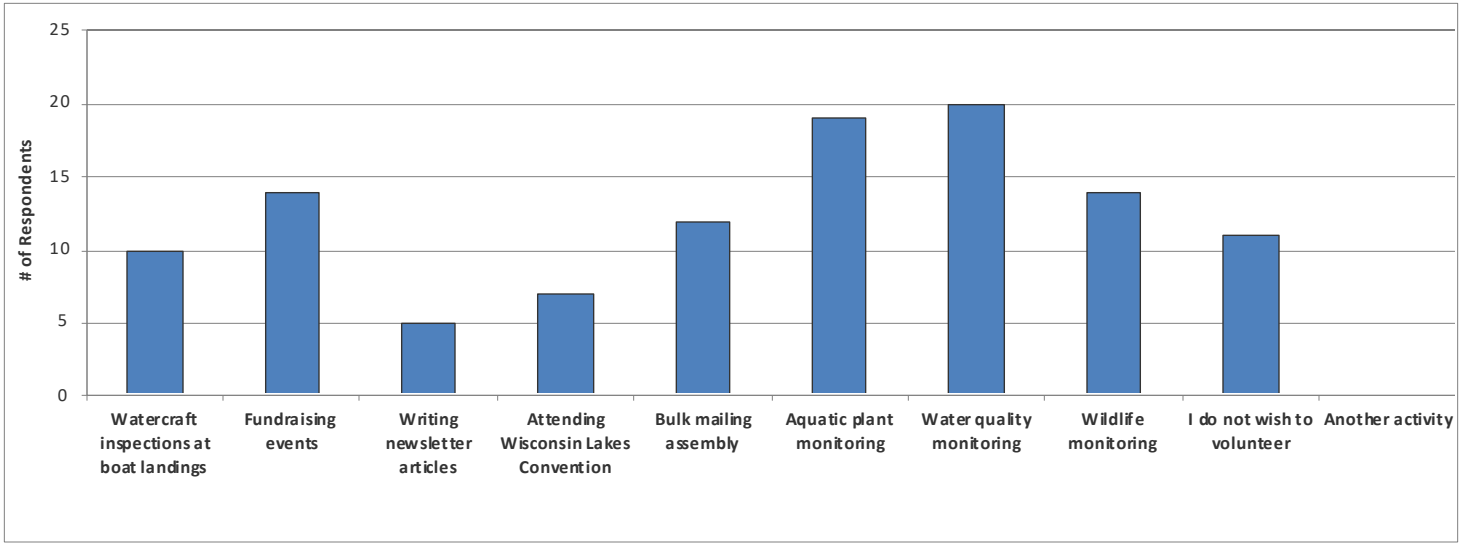
Answer Options	Response Percent	Response Count
Aquatic invasive species impacts, means of transport, indentification, control options, etc.	79.5%	31
How to be a good lake steward	48.7%	19
How changing water levels impact Auburn Lake	51.3%	20
Social events occurring around Auburn Lake	51.3%	20
Enhancing in-lake habitat (not shoreland or adjacent wetlands) for aquatic species	48.7%	19
Ecological benefits of shoreland restoration and preservation	43.6%	17
Watercraft operation regulations - lake specific, local, and statewide	41.0%	16
Volunteer lake monitoring and citizen science opportunities	28.2%	11
Not interested in learning more on any of these subjects	7.7%	3
Some other topic	5.1%	2
	answered question	**39**
	skipped question	**4**

Number	"Other" Responses
1	CONTROL OF LAW BREAKING LAUNCH RAMP USE.
2	Giving me access? I have no lake access


35
30
25
20
15
10
5
0
# of Respondents
Aquatic invasive species impacts, means of transport, indentification, control options, etc.
How to be a good lake steward
How changing water levels impact Auburn Lake
Social events occurring around Auburn Lake
Enhancing in-lake habitat (not shoreland or adjacent wetlands) for aquatic species
Ecological benefits of shoreland restoration and preservation
Watercraft operation regulations - lake specific, local, and statewide
Volunteer lake monitoring and citizen science opportunities
Not interested in learning more on any of these subjects
Some other topic

33. The effective management of Auburn Lake will require the cooperative efforts of numerous volunteers. Please select the activities you would be willing to participate in if the ALA requires additional assistance.

Answer Options	Response Percent	Response Count
Watercraft inspections at boat landings	25.0%	10
Fundraising events	35.0%	14
Writing newsletter articles	12.5%	5
Attending Wisconsin Lakes Convention	17.5%	7
Bulk mailing assembly	30.0%	12
Aquatic plant monitoring	47.5%	19
Water quality monitoring	50.0%	20
Wildlife monitoring	35.0%	14
I do not wish to volunteer	27.5%	11
Another activity	0.0%	0
answered question		**40**
skipped question		**3**



34. Please feel free to provide written comments concerning Auburn Lake, its current and/or historic condition and its management.

Answer Options	Response Count
	18
answered question	**18**
skipped question	**25**

Number	Response Text
1	I would have check marked "highly supportive" of Mechanical Harvesting of the weeds. However, I'd want to be sure that this is done at the "correct" time of the year. It's my understanding that if the mechanical removal isn't done at the correct time, can adversely promote further growth. That's why I'm quite supportive of RESPONSIBLE biological/chemical weed removal if it is proven and safe.
2	Conditions have deteriorated, weeds, blue greenalgae
3	I am extremely upset with the degradation of many of these activities and I believe the following are responsible for the serious problems our lake faces. 1). Unrestricted weed growth has seriously impacted many water related activities, particularly fishing, swimming, water skiing, boating to name a few. 2).The impact of higher lake water levels and aging septic systems which allows sewage to impact/infiltrate the lake. (Impacts point #1) 3). Changing use patterns from weekend use cottages or summer vacations to year round homes. (Impacts point #3 and therefore #1) 4) The introduction of zebra mussels has completely changed the recreational choices available to my family. I believe it is one of the major causes of the serious weed problems facing our lake.
4	LAKE LEVEL WILL VARY WITH PRECIPITATION BUT THE OUTLET MUST REMAIN THE SAME EVEN IF IT MEANS A SMALL CONTROLLED DAM.
5	We continue to harbor concern that the lake association will ultimately prove to be a net negative for our Auburn Lake experience once it proceeds beyond addressing the issues that prompted its creation and veers into issues of great importance to an activist minority of the membership, to say nothing of the potential for toxic "NextDoor-style" gossip and backbiting which is something of which we want no part.
6	Water regulation levels in the lake appears to fluctuate oddly and we would like to know more about why.
7	Be reasonable in you efforts and considerate of all of the property owners and their land values
8	The pristine grass and lawn management and the use of chemicals to obtain them is running into the lake causing the extravagant growth and presence of invasive species. Large boats are contributing to shore erosion. A better fish supply and management of fish habitus is needed along with stocking of fish species.
9	There were no questions about use of yard grass fertilizers and weed and feed products. The state DNA should manage public lake invasive species thus the association would not be needed.

10	Just enjoy the quiet and peaceful water not the muck or the sides. Water flowers are nice when in bloom.
11	I have been going to Auburn Lake for 60+ years owning a property for 10 year. When I purchased my property there were sand beaches with no weeds. Since then the conditions are worse every year with "no" sand beaches left and every area covered in weeds. The former resort beach is completely unusable several properties have lake access next to the resort. 4 or 5 years ago it had a large sand beach.
12	We would appreciate more assistance from DNR in active management of the lake and surrounding land.
13	I have had property on the lake for 65 years, The quality of the lake has deteriorated dramatically. the water quality used to be excellent along with the fishing This changed when the state installed the boat launch. this brought in zebra mussels along with invasive weed species the only weeds that are native to the lake are lilly pads, bull rushes and pickeral weeds. The state does not monitor the boat launch and outside boats are the cause of all the problems, the zebra mussels and new and evasive weed species Since the state caused the deterioration of the lake they should be responsible financially for eliminating the zebra mussels and non-native weed species
14	Over 50 years on the lake since the boat landing was changed from a walk in only to a drive in the water quality ,invasive weeds and lose of some fish strippers yellow base.
15	I have been coming and living on Auburn Lake for over 35 years. The zebra mussels change Auburn Lake water clarity and up came the weeds. It is tough to fish now and weeds are taking over the lake. The zebra mussels seemed to appear about 10 years ago. The color of the water is clearer now because of the zebra mussels but wish it was like it used to be.
16	I'm not certain why those with no lake access are part of a plan to put money into lake management. If we are to pay for it, we had better gain some sort of access point.
17	Changing our canoe launch to a motor boat launch with 7 parking spots added invasive species and fuel leakage. Loss of tamarack trees led to clearer water quality which has helped zebra mussels to grow. The water was made clearer by the zebra mussels which help weeds grow uncontrolled.
18	It is the worst weed invasion/problem I have seen in my many years living out here. Water appeared blue in color back in the 50's, 60's and mass weeds were in deeper water.

C

APPENDIX C

Water Quality Data

	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
1990	2	5.3	1	4.9	2	18.0	1	9.0	1	20.0	0.0	
1991	3	4.8	2	4.1	4	10.3	3	9.3	4	19.8	3.0	18.0
1992	0		0		0		0		0		0.0	
1993	0		0		0		0		0		0.0	
1994	0		0		0		0		0		0.0	
1995	0		0		0		0		0		0.0	
1996	0		0		0		0		0		0.0	
1997	4	5.4	2	5.6	4	9.7	2	7.1	4	29.0	2.0	32.0
2018	1	5.8	0		1	17.3	0		1	37.4	0.0	
2019	3	7.4	2	7.4	3	6.3	2	4.5	3	21.7	2.0	22.7
2020	3	8.1	2	8.2	3	10.9	2	10.3	3	24.6	2.0	25.4
2021	5	8.2	3	9.4	5	9.3	3	7.0	5	26.3	3.0	20.3
All Years (Weighted)		6.6		7.0		10.5		7.8		24.9		22.9
DLDL Median				8.5				7.0				23.0
SWTP Ecoregion Median				6.6				5.3				22.0

Scientific Name	Common Name	LFOO (%)			2008-2019		2019-2021	
		2008	2019	2021	% Change	Direction	% Change	Direction
Ceratophyllum demersum	Coontail	4.3	49.7	42.3	1042.2	▲	-14.8	▼
Myriophyllum sibiricum	Northern watermilfoil	0.5	0.0	27.0	-100.0	▼		▲
Utricularia vulgaris	Common bladderwort	2.7	10.2	13.3	275.5	▲	30.1	▲
Nuphar variegata	Spatterdock	14.7	2.7	9.1	-81.5	▼	235.5	▲
Myriophyllum spicatum	Eurasian watermilfoil	6.0	12.9	9.1	116.2	▲	-29.4	▼
Ranunculus aquatilis	White water crowfoot	0.0	0.0	12.0		-		▲
Nymphaea odorata	White water lily	0.5	1.4	10.8	150.3	▲	692.9	▲
Myriophyllum heterophyllum	Various-leaved watermilfoil	4.3	3.4	1.2	-21.8	▼	-63.4	▼
Myriophyllum verticillatum	Whorled watermilfoil	0.0	4.1	0.0		▲	-100.0	▼
Potamogeton zosteriformis	Flat-stem pondweed	20.1	39.5	40.2	96.2	▲	2.0	▲
Chara spp.	Muskgrasses	38.0	15.6	27.4	-58.9	▼	75.0	▲
Elodea canadensis	Common waterweed	0.0	6.8	12.9		▲	89.1	▲
Najas flexilis	Slender naiad	14.7	0.0	7.5	-100.0	▼		▲
Potamogeton friesii	Fries' pondweed	0.0	0.0	12.4		-		▲
Potamogeton amplifolius	Large-leaf pondweed	14.7	10.2	3.3	-30.5	▼	-67.5	▼
Nitella spp.	Stoneworts	4.3	12.9	5.4	197.3	▲	-58.3	▼
Potamogeton crispus	Curly-leaf pondweed	0.5	0.7	8.7	25.2	▲	1180.9	▲
Schoenoplectus acutus	Hardstem bulrush	9.2	0.0	4.1	-100.0	▼		▲
Stuckenia pectinata	Sago pondweed	3.3	2.0	5.4	-37.4	▼	164.3	▲
Schoenoplectus subterminalis	Water bulrush	13.0	0.7	0.4	-94.8	▼	-39.0	▼
Potamogeton illinoensis	Illinois pondweed	6.0	0.7	2.5	-88.6	▼	266.0	▲
Lemna trisulca	Forked duckweed	0.0	0.0	5.0		-		▲
Heteranthera dubia	Water stargrass	0.0	0.0	5.0		-		▲
Najas guadalupensis	Southern naiad	0.0	8.8	0.0		▲	-100.0	▼
Potamogeton nodosus	Long-leaf pondweed	1.1	2.7	1.2	150.3	▲	-54.3	▼
Najas sp.	Naiad sp.	2.7	0.0	0.0	-100.0	▼		-
Potamogeton natans	Floating-leaf pondweed	0.5	0.0	0.8	-100.0	▼		▲
Vallisneria americana	Wild celery	0.0	0.0	0.8		-		▲
Potamogeton pusillus	Small pondweed	0.0	0.0	0.8		-		▲
Potamogeton gramineus	Variable-leaf pondweed	0.0	0.0	0.8		-		▲

Comments to Auburn Lake (Fond du Lac Co.) Comprehensive Management Plan

WDNR Official Comments: Mary Gansberg (Water Resources Management Specialist) 5-10-2023

Comment Key:
Responses in blue by Todd Hanke (Onterra) (8-16-2023)

Thank you for the opportunity to review the draft plan. This is an amazing report with tons of great information and a realistic implementation strategy.

I offer the following comments:

1. Page 5 third paragraph. Add comma between coontail and flat-stem pondweed. Correction has been made.
2. Page 33 last sentence. Should say Little Spider Lake, not Little Auburn Lake. Correction made
3. Page 96. Was the Fisheries Biologists consulted really Travis Motl? I thought Travis moved on to new Counties quite a few years ago. Yes, Travis was the point of contact in early 2022 when the fisheries section was being written. Travis provided the stocking and fisheries survey information and then provided contact information for Ben Breaker for future communications.
4. Page 102, management goal 1. I fully support Auburn Lake joining the Citizen Lake Monitoring (CLMN) Program to collect water chemistry samples. However, the program is currently over-subscribed and it is not easy to get into the program. I could add the lake to the wish list if a spot opens up. One of the requirements to start collecting water chemistry samples is that the volunteer needs to start out by collecting at least one year of Secchi (water clarity) data first. I have been in communication with Greg Mueller who indicated plans to start secchi and water temperature on Auburn Lake in 2023. Updated text to reflect this comment. Added Greg as facilitator, and stated that Secchi and temperature data would be collected in 2023, and ALHA would ask to be placed on the waiting list to enroll in CLMN.
5. Page 112. ALHA already has a FaceBook page. Updated text to state that the ALHA has a private Facebook page as another means of communication with members.
6. Page 108 first paragraph. Says ALHA would "plant" to collect… Correction made
7. Page 81/82. Says as part of this project, a new mechanical harvesting plan may be created. And that the specifics of the mechanical harvesting plan would be determined through subsequent conversations between Onterra, the ALHA, WDNR, and other project partners. Also Goal 3 Page 107 provides some details of a harvesting operation. I wonder if you could expand on this section (or create an appendix or a stand-alone document) with all of the specifics of the harvesting operation. It could include additional information such as, when will harvesting occur, Harvesting will occur after June 1, and before September 31. Harvesting in 2020 took place in mid-July. The ALHA would contract for harvesting services with the exact dates being variable depending on the scheduling availability. The ALHA would solicit harvesting activities on an "as needed" basis, but anticipates that it would occur annually. what are the triggers to decide if harvesting is necessary Heavy aquatic plant growth occurs annually on the lake and harvesting will be planned on an annual basis assuming sufficient financial resources are available to the ALHA. , width of access lanes from the pierhead out to the common use lanes and how will those lanes be determined, a 60' common use access lane is placed out from the public access location, while other harvest areas are blocks located in front of riparian properties in 3-9'. type of harvesting equipment that will be used A conventional cutting head harvester would be used, how will ALHA assure that the

contracted harvester is clean of aquatic invasive species prior to coming into Auburn Lake (and leaving), A representative of the ALHA will communicate with the harvesting contractor to ensure the equipment is clear of AIS prior to launching on Auburn Lake. If available, an ALHA member may inspect the harvester for AIS upon arrival to the lake. how will the harvester minimize impacts to fish and fish habitat Harvester operators would minimize direct impact to fish by returning captured fish to the lake, or by temporarily suspending operations if many gamefish are encountered. The harvester would also follow any conditions on the WDNR permit specific to this topic. , map of disposal locations The primary disposal location is listed as the Dudee sand and gravel pit on HWY F, added an inset Figure to show this location. Individual properties that accept materials for fertilizer/composting may vary from year to year and are not displayed here, etc.? All these details need to be approved by the Department prior to receiving a 5-year harvesting permit as specified in Admin. code NR109

WDNR Official Comments: Mary Gansberg (Water Resources Management Specialist) 8-17-2023

I realize that further down in Section 3 of the draft plan you mention that DASH requires a WDNR permit, but does not really indicate if this is something that should be done for individual or multiple property owners and if so, how big of any area, for what species, how often, etc. What are your and ALHA thoughts on the use of DASH on Auburn Lake? Should it be allowed?

I've added some text within the Implementation Plan to address some of the questions you had relating to the use of DASH on the lake. The additional text would be added to second action under management goal 3 on page 110 of the document. Here is the full updated paragraph with the new text in red font.

"Each riparian owner can legally harvest any aquatic plants in a 30' wide area of one's frontage directly adjacent to one's pier without a permit. Simply wading into the lake and removing aquatic plant vegetation by hand or with the aid of a rake or other hand-held accessories can be helpful in managing aquatic plants on a small and individual property-based scale. Non-native species including CLP and EWM can be hand removed anywhere in the lake without a permit and therefore is not limited to the 30' corridor zone. A WDNR permit is required if an area larger than the 30' corridor is being harvested or if a mechanical assistance mechanism, like DASH (Diver Assisted Suction Harvesting), is being used. Individual property owners may seek a WDNR permit to utilize DASH to manage aquatic plants in their frontage zone. One or two days of harvesting each year would likely provide seasonal relief from dense aquatic plants in an area being used for recreational purposes. This technique may have utility on a small scale in Auburn Lake, such as within a riparian's 30' use corridor; however, DASH is not feasible for use on a lake-wide scale for creating navigation lanes or for EWM or CLP population management. Additional information about the use of DASH is included in section 3.5 of this report."

I believe this text would address the specifics regarding the use of DASH in the lake primarily as a tool for improving recreational use of an individual's frontage, rather than being used on a larger scale in the lake. We believe this management tool has its place in reaching the management goals for Auburn Lake with relatively limited scale of use.

Ben is no longer with the DNR, FYI.
Thanks for providing the additional text on DASH. While I understand this is a potential tool for individual properties, I guess I was kind of asking if this is a recommended action? I realize this text is tied to the management action: Determine and understand legal and permittable options… But if DASH is or is not a good strategy for Auburn Lake, maybe that could be specifically mentioned also?

I would say that DASH would be good strategy on Auburn Lake for individual properties to maintain navigability in their area of the lake. I will update the text to read as DASH being a recommended action that this Plan supports.
Do you have an updated contact for fisheries staff for Auburn Lake? I would update the contact info in the Plan if so.

The only information I have for Fisheries is the name of Ben's previous supervisor – laura.stremick@wisconsin.gov The fisheries biologist contact information has been changed within the table at the end of the Implementation Plan.
On that note, I plan to retire the beginning of next year. I wonder if instead of putting my name in the document, that you put my supervisor Andrew Hudak? Updated the contact information within the table at the end of the Implementation Plan.

Official Comments: Ben Breaker (Fisheries Biologist – WDNR) 5-22-2023

I apologize for the delay in getting back to you. Overall, this draft is very well put together and my minimal edits are below.

For the fisheries section:

1. Page 87, last paragraph. Change "appropriately sized" to "intermediate". Change made.
2. Page 89, Fishing Activity. Change "second" to "second most". Corrected
3. Page 91, Gamefish. Change "on" to "in". Corrected
4. Page 91, Largemouth bass. Change "weigh" to "weighed". Corrected
5. Page 93, add a space between "2021" and "survey". Corrected
6. Page 94, last sentence of the second paragraph. This could be split into two sentences or simplified for clarification. Possibly, "Additional information related to the construction, placement and maintenance of half-log structures is available online. " Change made