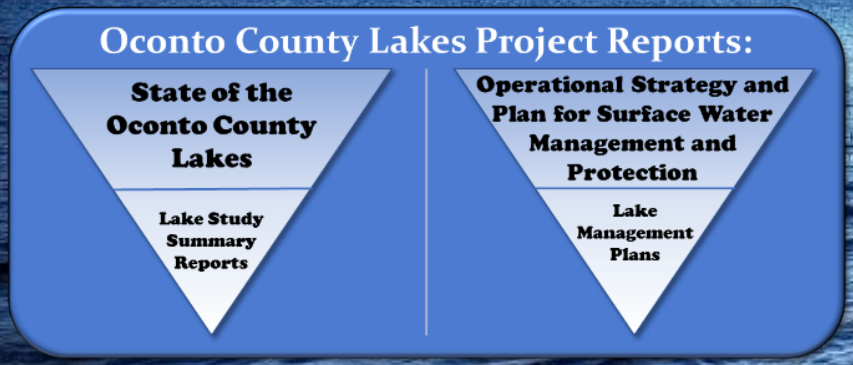
Oconto County Lakes Project

WAUBEE LAKE MANAGEMENT PLAN

2018



VISION

Waubee Lake will remain a relaxing tradition, where families gather to enjoy clean water, great fishing, and abundant wildlife on a classic Northwoods lake.

Waubee Lake Management Plan

The authors would like to acknowledge the commitment and enthusiasm of the Waubee Lake Association, Oconto County Lakes & Waterways Association, Oconto County Land and Water Conservation Department, UW Extension – Oconto County, Wisconsin Department of Natural Resources, UW-Stevens Point Water and Environmental Analysis Laboratory, landowners in the Waubee Lake watershed, and participants in the Oconto County Lakes Project.

This plan was prepared by the Center for Watershed Science and Education at University of Wisconsin – Stevens Point.

Along with the Oconto County Lakes Project participants, the following individuals and organizations contributed to the content of this plan.

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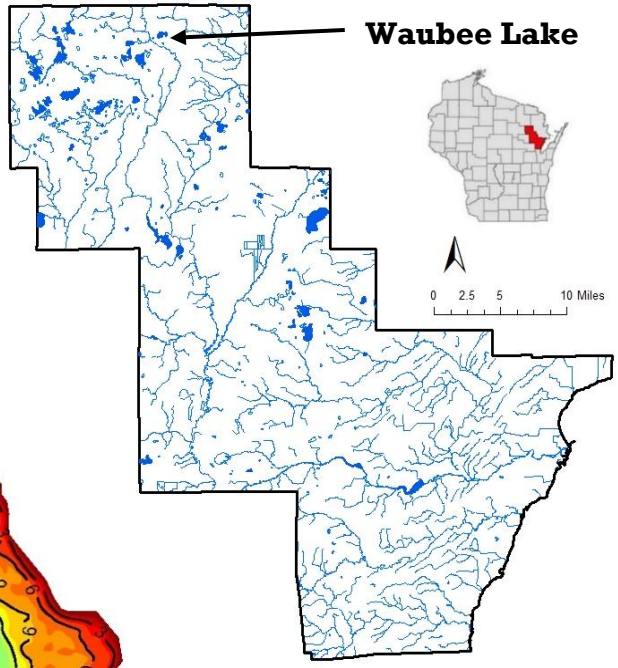
Resource	Acronym or Truncated Name
Citizen Lake Monitoring Network	CLMN
Clean Boats Clean Waters	CBCW
Lumberjack Resource Conservation & Development	LRCD
Oconto County Land Conservation Dept.	OC LCD
Oconto County Board of Supervisors	OC Board
Oconto County Lakes and Waterways Association	OCLAWA
Town of Lakewood	TOL
University of Wisconsin - Extension	UWEX
UWSP Water & Environmental Analysis Laboratory	WEAL
UWSP Center for Watershed Science and Education	CWSE
USDA Natural Resources Conservation Service	NRCS
Waubee Lake Association	WLA
Wisconsin Department of Natural Resources	WDNR
Wisconsin Department of Transportation	WDOT

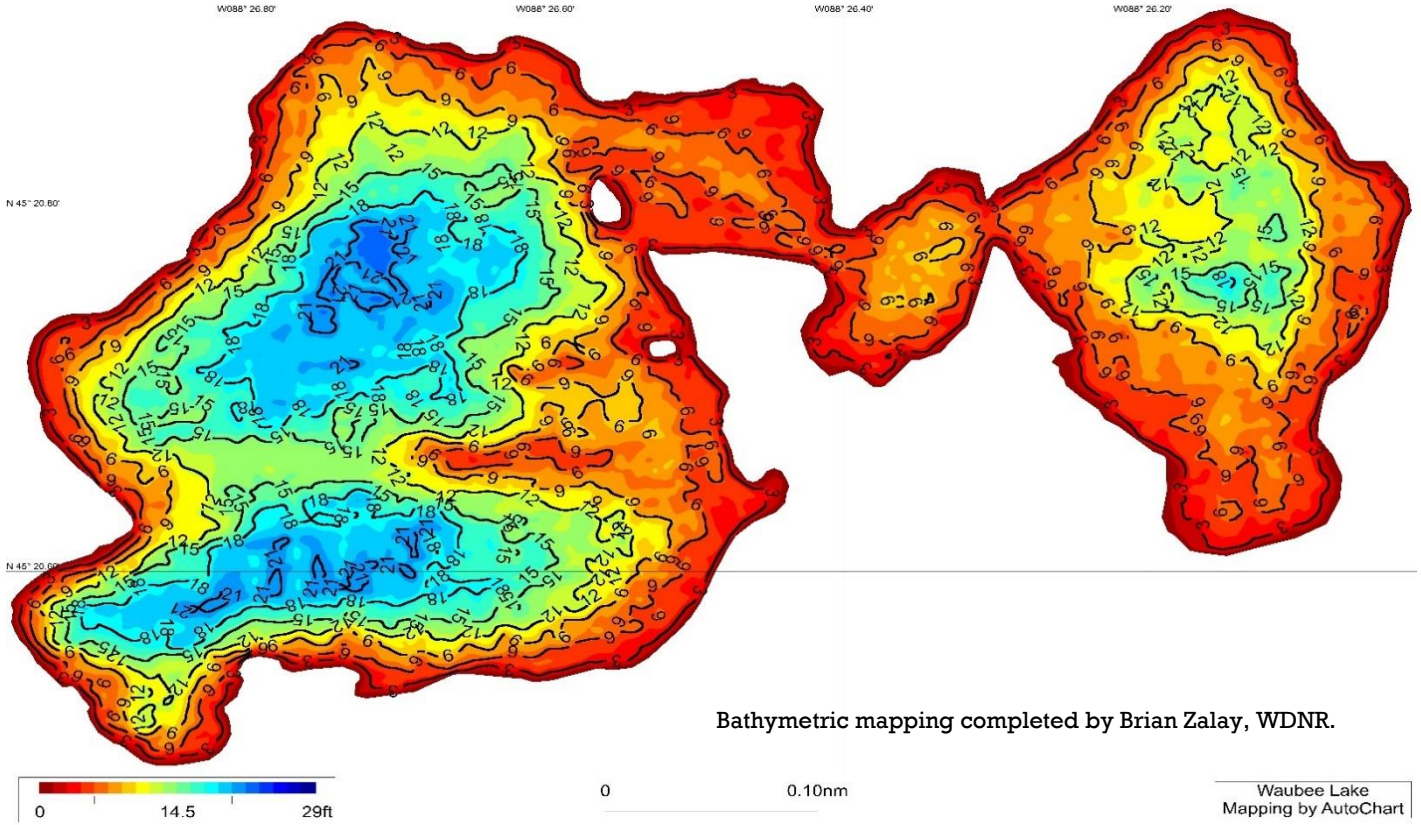
Background

ABOUT WAUBEE LAKE

Waubee Lake is located in the Town of Lakewood. This 116-acre seepage lake has a maximum depth of 23 feet with clear water. Its bottom sediments are primarily muck and sand. Visitors have access to the lake from one public boat landing located on the west side which is owned by the Town of Lakewood.

Most water enters Waubee Lake via groundwater. Surface water runoff, direct precipitation and groundwater also contribute water to lesser extents.





Bathymetric mapping completed by Brian Zalay, WDNR.

What Is A Lake Management Plan?

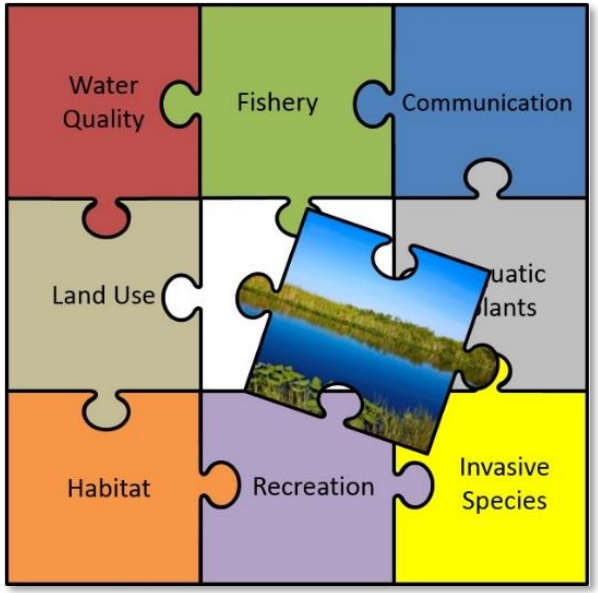
LAKE MANAGEMENT PLANS (LMP)

What is an LMP?

A management plan is a living document that changes over time to meet the current needs, challenges and desires of the lake and its community. Although each lake is different, the WDNR requires that each comprehensive lake management plan address a specific list of topics affecting the character of the lake, whether each topic has been identified as a priority, or as simply something to consider. In this way, every LMP considers the many aspects associated with lakes.

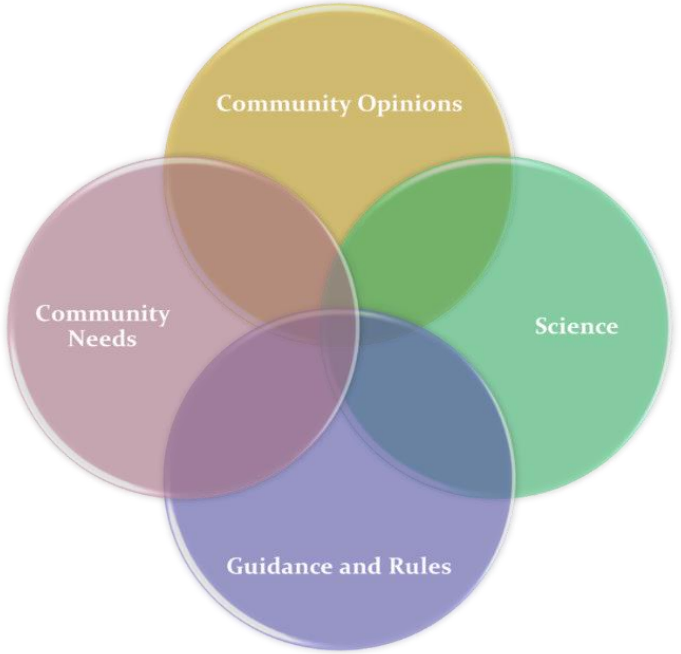
What is the purpose of this LMP?

This plan was created to ensure that Waubee Lake is a healthy now and for future generations. It was designed to learn about Waubee Lake and identify features important to the Waubee Lake community, in order to provide a framework for the protection and improvement of the lake.



Implementing the content of this LMP will enable citizens and others to work together to achieve the vision for Waubee Lake now and in the years to come. It is a dynamic document that identifies goals and action items for the purpose of maintaining, protecting and/or creating desired conditions in the lake and identifies steps to correct past problems, improve on current conditions, and provide guidance for future boards, lake users, and technical experts.

Because many entities are involved in lake and land management, it can be challenging to navigate the roles, partnerships and resources that are available. The planning process and content of this plan have been designed to identify where some key assistance exists. The actions identified in this LMP can serve as a gateway for obtaining grant funding and other resources to help implement activities outlined in the plan.



How Was This Plan Created?

ABOUT THIS PLAN

One of the first steps in creating this plan was to gather and compile data about the lake and its ecosystem to understand past and current conditions. This was done in 2016-2017 alongside 8 other lakes as part of the Oconto County Lakes Project. The project was initiated by citizens in the Oconto County Lakes and Waterways Association who encouraged Oconto County to prioritize lake interests. This effort led to funding from the WDNR Lake Protection Grant Program. There was insufficient data available for many of the lakes to evaluate current water quality, aquatic plant communities, invasive species, and shorelands. The data that were available had been collected at differing frequencies or periods of time, making it difficult to compare lake conditions. Professionals and students from UW-Stevens Point, Oconto County Land Conservation Department, UW Extension, Oconto County citizens and WDNR staff collected the data for use in the development of lake management plans. Sources of information used in the planning process are listed at the end of this document.

Reports from the Waubee Lake Study and the materials associated with the planning process and reports can be found on the Oconto County website: **www.co.oconto.wi.us** and navigating to Departments>Land Conservation>County Waterways>County-wide Lake Study.

THE PLANNING PROCESS

Who created the strategic plan?

This plan is the result of a stakeholder-driven effort which involved many partners combining insight, knowledge, and expertise throughout the process. Members of the lake association, area residents, lake users, and representatives of local municipalities gathered at a public meeting held on June 21, 2018 at the Lakewood Town Hall to learn from one another and make decisions about the fishery, water quality, habitat, and land management in the Waubee Lake watershed. Technical assistance during the planning process was provided by the Oconto County Conservationist, and staff from WDNR, UWEX, and the CWSE.

How were various opinions incorporated?

Participation in the planning process was open to everyone and was encouraged by letters mailed to Waubee Lake waterfront property owners and by press releases in local newspapers. In addition, those individuals and organizations who provided their information were provided with emails about upcoming meetings, which could be forwarded to additional contact lists. To involve and collect input from as many people as possible, including those who might not be able to attend the public meetings, an online survey was conducted. Property owners and interested lake users were notified about the survey and how to access it via direct mailings to waterfront property owners and associated lake organizations and press releases in local newspapers. The surveys could be filled out anonymously online, or paper copies were available upon request. Survey questions and responses were shared at the planning sessions and can be found in the Appendix.

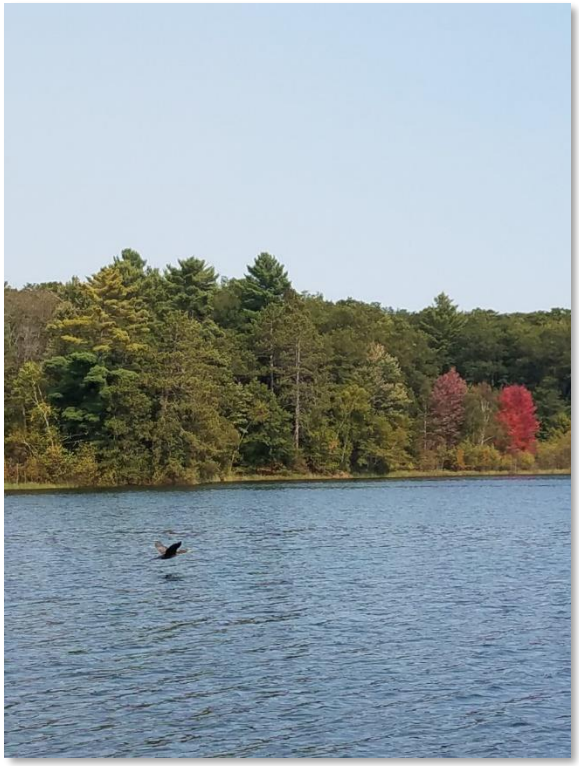
How Is This Management Plan Used?

Who will use this plan?

- **Individuals:** Individuals can use this plan to learn about the lake they love and their connection to it. People living near Waubee Lake can have the greatest influence on the lake by understanding and choosing lake-friendly options to manage their land and the lake.
- **Waubee Lake Association:** This plan provides the Association with guidance for the whole lake and lists options that can easily be prioritized. Resources and funding opportunities for lake management activities are made more available by placement of goals into the lake management plan, and the Association can identify partners to help achieve their goals for the lake.
- **Neighboring lake groups, sporting and conservation clubs:** Groups with similar goals for lake stewardship can combine their efforts and provide each other with support, improve competitiveness for funding opportunities, and make efforts more fun.
- **The Town of Lakewood:** Municipalities can utilize the visions, objectives, and goals documented in this lake management plan when considering town-level planning or decisions within the watershed that may affect the lake.
- **Oconto County:** County professionals will better know how to identify needs, provide support, base decisions, and allocate resources to assist in lake-related efforts documented in this plan. This plan can also inform county board supervisors in decisions related to Oconto County lakes, streams, wetlands, and groundwater.
- **Wisconsin Department of Natural Resources (WDNR):** Professionals working with lakes in Oconto County can use this plan as guidance for management activities and decisions related to the management of the resource, including the fishery, and invasive species. LMPs help them to identify and prioritize needs, and where to apply resources. A well thought out lake management plan increases an application's competitiveness for funding from the State.

Who can help implement this plan?

Lead persons and resources are identified under each action in this plan. These individuals and organizations are able to provide information, suggestions, or services to achieve goals. The following table lists organization names and their common acronyms used in this plan. This list should not be considered all-inclusive – assistance may also be provided by other entities, consultants, and organizations.



Management Plan Structure

GOALS FOR WAUBEE LAKE

The foundation of any effective strategic plan is clear identification of goals and the steps needed to achieve the goals. The selected goals should achieve the overall vision for Waubee Lake. This plan also identifies available resources within each objective.

The topics comprise the chapters in this plan and have been grouped as follows:

In-Lake Habitat and a Healthy Lake

Fish Community—fish species, abundance, size, important habitat and other needs

Aquatic Plant Community—habitat, food, health, native species, and invasive species

Critical Habitat—areas of special importance to the wildlife, fish, water quality, and aesthetics of the lake

Landscapes and the Lake

Water Quality—water chemistry, clarity, contaminants, lake levels

Shorelands—habitat, erosion, contaminant filtering, water quality, vegetation, access

Watershed—land use, management practices, conservation programs

People and the Lake

Recreation—access, sharing the lake, informing lake users, rules

Communication and Organization—maintaining connections for partnerships, implementation, community involvement

Updates & Revisions—plan for maintaining a living document

Waubee Lake Management Plan Goals

Goals for Waubee Lake

The following goals and actions were derived from the values and concerns of citizens interested in Waubee Lake and members of the planning committee, as well as the known science about Waubee Lake, its ecosystem and the landscape within its watershed.

Implementing and regularly updating the goals and actions in this plan will ensure that the vision is supported and that changes are incorporated into the plan.

List of Goals

Goal 1	**Waubee Lake will have a healthy and well-balanced fish community.**
Goal 2	**Waubee Lake will continue to have a healthy and diverse aquatic plant community free of invasive species that provides habitat and good water quality without major impacts to recreation.**
Goal 3	**Sensitive areas in Waubee Lake that provide essential habitat and/or water quality benefits will be protected.**
Goal 4	**Watershed and shoreland property owners will know about and utilize resources for healthy land management practices.**
Goal 5	**Waubee Lake's shorelands will become increasingly healthy over time. Over the next 5 years, 1,000 feet of mowed shoreland will be restored.**
Goal 6	**Maintain or improve water quality in Waubee Lake.**
Goal 7	**Create a robust dataset for Waubee Lake to monitor trends, declines and improvements over time.**
Goal 8	**Lake users will be informed and respectful of Waubee Lake.**
Goal 9	**Increase participation in lake stewardship.**
Goal 10	**Review plan annually and update as needed.**

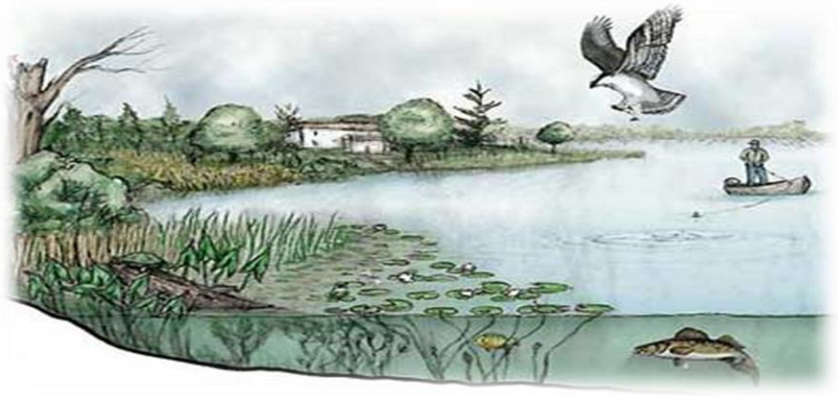
Fish Community

IN-LAKE HABITAT AND A HEALTHY LAKE

The health of one part of the lake system affects the health of the rest of the plant and animal community, the experiences of the people seeking pleasure at the lake, and the quality and quantity of water in the lake. Habitat is the structure for a healthy fishery and wildlife community. It can provide shelter for some animals and food for others. Many animals that live in and near the lake are only successful if their habitat needs are met.

What is lake-habitat?

Healthy lake-habitat in Waubee Lake includes native aquatic plants and shoreland vegetation, as well as tree branches/limbs above and below the water. Habitat exists within the lake, along the shoreland, and even extends into its watershed for some wildlife species. Native vegetation (including wetlands) along the shoreline and connected to the lake provides shelter and food for waterfowl, small mammals, turtles, frogs, and fish. Native plants in and near the lake can also improve water quality and balance water quantity. Aquatic plants infuse oxygen into the water, which is essential for the fish community. Some lake visitors such as birds, frogs, and turtles use limbs from trees that are sticking out



of the water for perches or to warm themselves in the sun. The types and abundance of plants and animals that comprise the lake community also vary based on the water quality, and the health and characteristics of the shoreland and watershed.

The Fish Community

A balanced fish community has a mix of predator and prey species, each with different food, habitat, nesting substrate, and water quality needs to flourish.

What can affect the fishery?

Activities in and around a lake that can affect a fishery include:

- disturbances to the native aquatic plant community or substrate,
- excessive additions of nutrients or harmful chemicals,
- removal of woody habitat,
- shoreline alterations,
- shoreland erosion can cause sediment to settle onto the substrate, causing the degradation of spawning habitat.

What People Value about Waubee Lake

Fishing, pontoon boating
Clean water for swimming, nature
Wildlife
Minimal traffic on lake, mix of ski and fish
Lake has a lot of character, enjoy the lodge, fun fishing.
Safe place for family
Relaxing
Area around the lake

Habitat provides shelter and food for fish and wildlife.

Fish Community

Can the fishery be improved?

Habitat can be improved by allowing shoreland vegetation to grow, minimizing the removal of aquatic plants, providing fallen trees or limbs in suitable areas, and protecting wetlands and other areas of critical habitat.

Managing a lake for a balanced fishery can result in fewer expenses to lake stewards and the public. While some efforts may be required to provide a more suitable environment to meet the needs of the fish, they usually do not have to be repeated on a frequent basis. Ideally, a lake contains the habitat, water quality, and food necessary to support the fish communities present within the lake and provide fishing opportunities for people without a lot of supplemental effort and associated expenses to maintain these conditions.

- Protecting existing habitat such as emergent, aquatic, and shoreland vegetation, and allowing trees that naturally fall into the lake to remain in the lake, are free of cost.
- Restoring habitat in and around a lake can have an up-front cost, but the effects will often continue for decades.
- Costs in time, travel, and other expenses are associated with routine efforts such as fish stocking and aeration.

Waubee Lake Fishery Summary

- Previous electrofishing surveys were conducted in 2014, 2010 and 2004.
- There is no evidence of natural reproduction of walleye.
- Bluegill abundance has increased; size structure is poor.
- Walleye and pike abundance is low.
- The next fish survey is scheduled for 2020 (electrofishing + fyke netting).

Stocking Date	Species	# Stocked	Avg. Length (in)
1974	Walleye	11,000	4
1977	Muskellunge	280	9
1978	Walleye	4,000	4
1992	Northern Pike	500	6
1992	Smallmouth Bass	500	5
1992	Walleye	500	5
1997	Largemouth Bass	500	6
1999	Northern Pike	500	9.5
1999	Smallmouth Bass	250	4
2001	Walleye	6,000	1.6
2003	Walleye	2,997	1.3
2005	Walleye	6,835	1.4
2008	Walleye	428	5
2009	Walleye	499	7.4
2010	Walleye	4,800	1.4
2010	Yellow Perch	400	7
2011	Walleye	300	6
2012	Walleye	2,997	1.6
2014	Walleye	1,743	7.6
2016	Walleye	1,745	7.4
2017	Yellow Perch	938	7
2018	Muskellunge	150	

Fish Community

Waubee Lake has a long history of active fish management going back to walleye and musky stocking in the 1970s and continuing through today. Largemouth bass are the predominant gamefish and, along with smallmouth bass, maintain a moderate density with fair size structure. Pike and walleye have remained in low abundance while bluegill are in high abundance with poor size structure. This likely indicates limitations in spawning habitat and/or forage for juveniles (this includes logs and trees in shallow water and zooplankton which are affected by nearshore and shoreland vegetation. A series of fish sticks were installed in 2008 and fish cribs in 2014, but much more is recommended from a fish management standpoint. A club in Shawano, Wisconsin is working with WDNR to stock muskellunge in Waubee Lake for the next 10 years.

Goal 1. Waubee Lake will have a healthy and well-balanced fish community.

Objective 1.1 Continue to enhance fish and wildlife habitat in and around Waubee Lake. Waubee Lake will have 250 logs/mile within the next 5 years (10 fish stick clusters/year).

Actions	Lead person/group	Resources	Timeline
Educate and encourage landowners to leave woody debris in place in the water and identify landowners for fish stick installations. ~250 logs/mile is recommended. Waubee currently has 37 logs/mile (see Shoreland Survey). Trees can be sourced by identifying other landowners who need a tree removed.	WLA	WDNR-Chip Long UWEX-Pat Goggin	Winter 2019-2024
Explore the design and installation of an informational kiosk at the boat landing, perhaps coupled with a shoreland restoration demonstration site, to illustrate the connection between good fishing and shoreland habitat.	WLA	UWEX-Lakes TOL	Ongoing
Continue to protect and restore shoreland areas (**see Shorelands section**) and avoid shoreland alterations to improve fish habitat.	WLA	Shoreland property owners	Ongoing
Continue stocking as recommended to maintain fishery and balance populations. Continue to work with musky club on 10-year stocking plan.	WLA	WDNR-Chip Long Figure 8 Musky Club	Ongoing

Aquatic Plant Community

Native plants provide essential food and habitat for fish and wildlife.

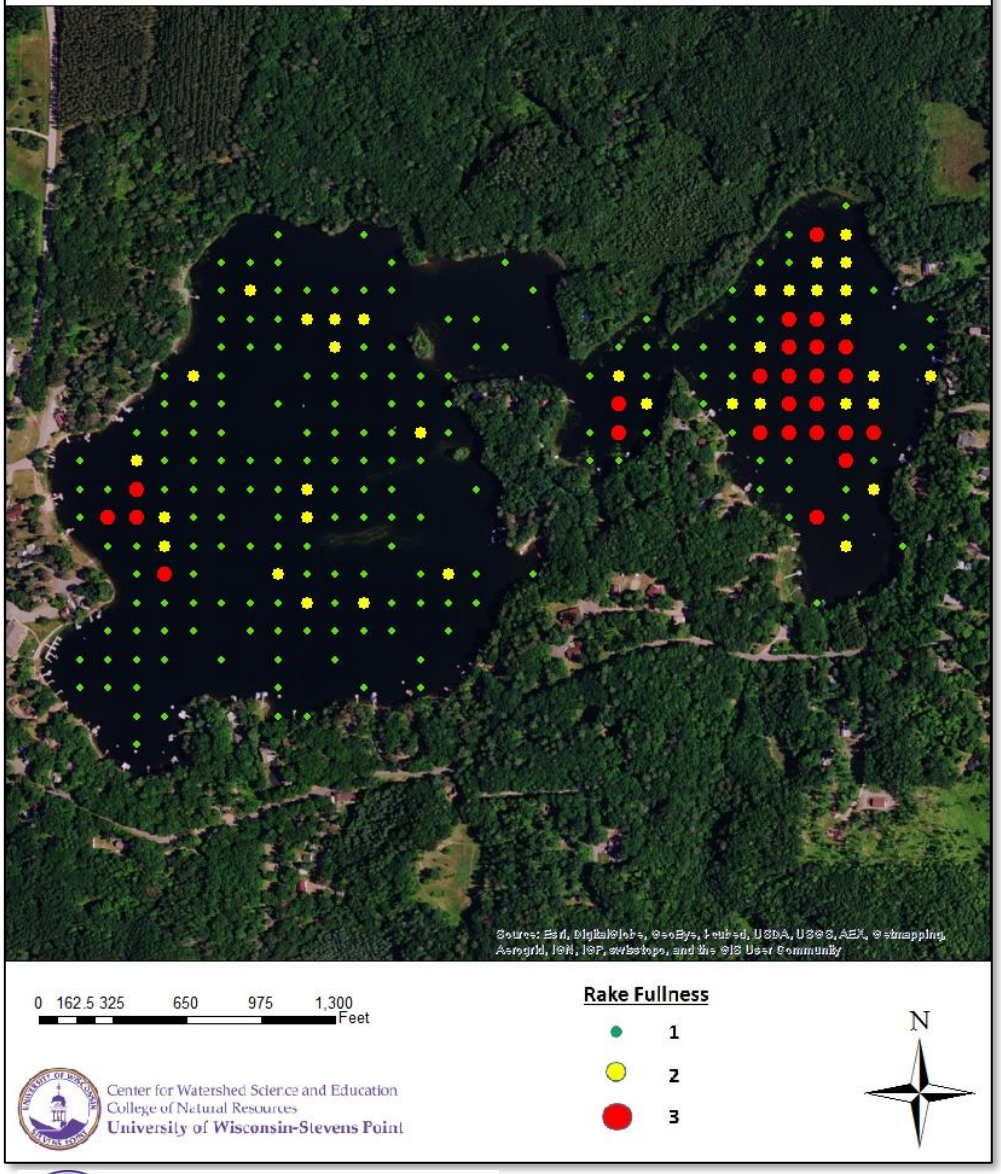
Aquatic Plants

Aquatic plants provide the forested landscape within Waubee Lake. They provide food and habitat for spawning, breeding, and survival for a wide range of inhabitants and lake visitors including fish, waterfowl, turtles, amphibians, as well as invertebrates and other animals. They improve water quality by releasing oxygen into the water and utilizing nutrients that would otherwise be used by algae. A healthy lake typically has a variety of aquatic plant species, which makes the aquatic plant community more resilient and can help to prevent the establishment of non-native aquatic species. Additionally, they stabilize the bottom sediment and help filter out the suspended sediment from the water column.

Aquatic plants near shore and in shallows provide food, shelter, and nesting material for shoreland mammals, shorebirds and waterfowl. It is not unusual for otters, beavers, muskrats, weasels, and deer to be seen along a shoreline in their search for food, water or nesting material. The aquatic plants that attract the animals to these areas contribute to the beauty of the shoreland and lake. Aquatic plants also serve as indicator species for environmental stressors that could be occurring in a lake or river, such as a runoff event.

Waubee Lake 2016 Aquatic Plant Survey Highlights

- ✓ 72% (232 of 323) of the sites visited had vegetative growth.
- ✓ Greatest depth aquatic plants were found was 21.5 feet.
- ✓ 16 species of aquatic plants were identified. This is just below the North Central Hardwood region average of 16.2.
- ✓ The three most dominant species were chara (76%), Illinois pondweed (32%), and variable pondweed (20%).
- ✓ The Floristic Quality Index (FQI) was 24.96. The North Central Hardwood region average is 23.3.



Aquatic Plant Community

Chara is a type of macro-algae that grows attached to muddy lake bottoms and has a musky odor. Muskgrass, as it is known, filters the lake water, helps prevent the establishment of invasive species, and provides excellent habitat for small fish and other organisms.

Illinois pondweed is important forage and cover for aquatic animals and an important food source for waterfowl.

Variable pondweed has both floating and submersed leaves which provide food and habitat for fish.

Aquatic Invasive Species (AIS)

Aquatic invasive species are non-native aquatic plants and animals that are most often unintentionally introduced into lakes by lake users. This commonly occurs on trailers, boats, equipment, and from the release of bait. In some lakes, aquatic invasive plant species can exist as a part of the plant community, while in other lakes populations explode, creating dense beds that can damage boat motors, make areas non-navigable, inhibit activities like swimming and fishing, and disrupt the lakes' ecosystems.

A small population of phragmites is located on the northwest side of the lake. Invading moist habitats, it alters hydrology and wildlife habitat, increases fire potential and shades native species.

Aquatic Plant Management in Waubee Lake

Management strategies in Waubee Lake were designed to achieve a balance between healthy aquatic habitat, good water quality, and recreation. A variety of management options were discussed during the development of this plan. No invasive species were observed during the 2016 aquatic plant survey.

Management Options for Excessive Native Aquatic Plants

Most planning session participants did not feel that active aquatic plant management was necessary on Waubee Lake. Management options that offer the most practical and effective approaches for managing native plants, while minimizing impacts to Waubee Lake as a whole, have been identified if necessary. Depending upon conditions, the following options may be used alone or in combination with others.

Hand-pulling. No permit required.

Lakefront property owners are allowed remove aquatic plants from an area no more than 30 feet wide without a permit for swimming and boat access. Any denuded lakebed is prime real estate for invasive species, however, and close monitoring is necessary to ensure no populations are established.

Mechanical Harvesting. Permit required.

While harvesting, operators should take care (by raising and lowering the harvesting bar) to minimize the impact on habitat and to reduce sediment disturbance. Harvesting in depths less than 3 feet should be avoided but may be done with care in accordance with WDNR guidance, keeping in mind sediment resuspension can lead to additional plant growth and algae blooms. A second pass should be made on harvested areas to remove plant fragments and floaters. **Areas with EWM, if present, should be avoided to prevent its fragmentation and spread.** Thus, updates to the aquatic plant point-intercept survey and thorough monitoring for invasive species is required.

Mechanical Harvesting Plan for Navigation: Harvesting of dense plant beds that are not comprised of EWM/HWM may be conducted as needed to provide navigation. Paths from piers to open water may be cut to improve navigation and the fishery. Lanes should be no wider than 15 yards. To minimize disturbances to sediment and important fish habitat, harvesting should be avoided or conducted carefully in water depths less than 3 feet. A depth finder on the cutter end of the harvester can aid in evaluating water depths.

Skimming, target: dense floating plant material, filamentous algae. Permit required.

This mechanical removal method would be applied when targeting uprooted aquatic plants that have accumulated in parts of Waubee Lake. Skimming of floating plant material can be conducted by mechanical or non-mechanical means in areas where sediment and emergent plants would not be disturbed by this activity.

Be part of the solution!

Practices designed to deter establishment of invasive species:

- ✓ Learn to identify invasive species and routinely look for them when on the lake.
- ✓ Do not remove native aquatic vegetation beyond what is necessary to access the lake. Any denuded areas should be monitored closely for invasive species.

The surface of the lake is skimmed to collect plant material for removal from the lake. When skimming with a harvester, aquatic plants are not cut.

Aquatic Plant Management Plan Review

A good aquatic plant management plan strategy should reduce the amount of management activity needed as time goes on. In Waubee Lake, a series of successful strategies should lead to a balance between healthy aquatic habitat, water quality, and recreation with minimal annual management. To evaluate if management strategies are succeeding, updates to aquatic plant point-intercept surveys should be conducted at least every five years. If chemical treatments are pursued, more frequent (pre- and post-treatment) surveys are necessary and it is important to separate the surveyor from the herbicide applicator or the firm who is doing the control work. This eliminates the "fox guarding the henhouse" factor. Assistance in updating surveys can be provided by the WDNR Aquatic Plant Specialist and/or consultants.

Aquatic Plant Community

Goal 2. Waubee Lake will continue to have a healthy and diverse aquatic plant community free of invasive species that provides habitat and good water quality without major impacts to recreation.

Objective 2.1 Minimize disturbance to native aquatic plant communities.

Actions	Lead person/group	Resources	Timeline
Inform property owners of the importance of native aquatic vegetation to impede the establishment of additional AIS, provide food and habitat for wildlife, and protect the shoreline via educational materials provided at the annual meeting and/or in a newsletter.	WLA	WDNR-Brenda Nordin	Ongoing
Encourage landowners to limit plant removal to invasive species or skimming off those that have become unrooted and free-floating. If plants severely impede recreation, consider hand-pulling small areas around private docks (within WDNR guidelines). Cleared lakebed is ideal habitat for AIS, so vigilance is necessary in these areas.	WLA	WDNR-Brenda Nordin	Ongoing
Regularly monitor aquatic plant community to detect any changes in lake conditions and ensure stable populations.	WLA	WDNR Consultants	Every 10 years if no active plant management.
Reduce nutrient and sediment (food source) loading to lake to limit abundance of plants in algae by improving shoreland buffers (see **Shorelands** section) and implementing BMPs in the watershed (see **Watershed** section).	WLA	WDNR-Brenda Nordin OCLCD	Ongoing

Objective 2.1 Protect against the establishment of invasive species.

Actions	Lead person/group	Resources	Timeline
Eradicate populations of phragmites around the lake.	WLA	WDNR-Brenda Nordin OCLCD	2019
Encourage or host training to identify and look for invasive species.	WLA	WDNR-Brenda Nordin LRCD	Summer 2019
Identify CBCW volunteers or hire someone to staff boat launch on busy days.	WLA	CBCW	Summers
Educate landowners on importance of native aquatic plants for preventing invasive species. Bring in speaker for annual meeting, mail literature to property owners, etc.	WLA	WDNR-Brenda Nordin	Ongoing
If new AIS is suspected or observed, follow the guidance in Appendix C.	WLA	WDNR-Brenda Nordin	Ongoing

Critical Habitat

Every waterbody has areas that are most important to the overall health of the lake.

Critical Habitat

Special areas harbor habitat that is essential to the health of a lake and its inhabitants. In Wisconsin, critical habitat areas are identified by biologists and other lake professionals from the WDNR in order to protect features that are important to the overall health and integrity of the lake, including aquatic plants and animals. While every lake contains important natural features, not all lakes have official critical habitat designations. Designating areas of the lake as critical habitat enables these areas to be located on maps and information about their importance to be shared. Having a critical habitat designation on a lake can help lake groups and landowners plan waterfront projects that will minimize impact to important habitat, ultimately helping to ensure the long-term health of the lake.

Although Waubee Lake does not have an official critical habitat area designation, there are areas within Waubee Lake that are important for fish and wildlife. Natural, minimally-impacted areas with woody habitat such as logs, branches, and stumps; areas with emergent and other forms of aquatic vegetation; areas with overhanging vegetation; and wetlands are elements of good quality habitat. Identifying other important areas around the lake that are important habitat and informing lake users of their value can help raise awareness for the protection of these areas.

Goal 3. Sensitive areas in Waubee Lake that provide essential habitat and/or water quality benefits will be protected.

Objective 3.1 Identify and protect quality habitat areas in and around Waubee Lake.

Actions	Lead person/group	Resources	Timeline
Request a Critical Habitat Designation from WDNR.	WLA	WDNR-Brenda Nordin	2019
If critical habitat is designated on Waubee Lake, communicate to property owners, visitors, and Town Board as to why these areas are important. Consider signage to make lake users aware.	WLA		TBD

LANDSCAPES AND THE LAKE

Waubee Lake Watershed

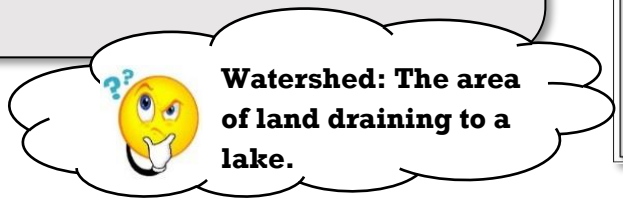
A Lake is a Reflection of its Watershed…

Understanding where Waubee Lake's water originates is important to understanding lake health. During snowmelt or rainstorms, water moves across the surface of the landscape (runoff) towards lower elevations such as lakes, streams, and wetlands. This area is called the watershed. Groundwater also feeds Waubee Lake; its land area may be slightly different than the surface watershed.

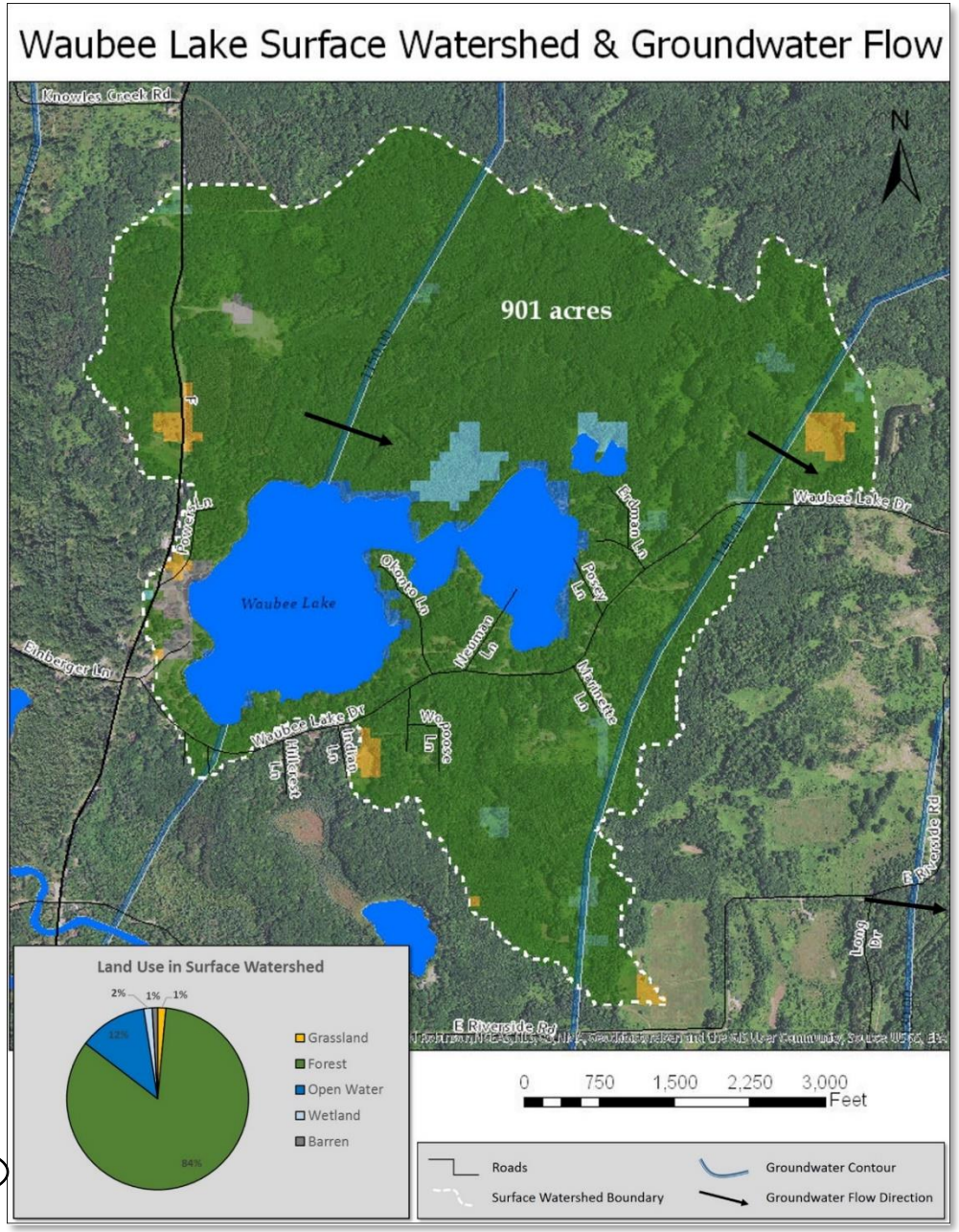
Less runoff is desirable because it allows more water to recharge the groundwater, which feeds the lake year-round - even during dry periods or when the lake is covered with ice. The capacity of the landscape to shed or hold water and contribute or filter particles determines the amount of erosion that may occur, the amount of groundwater feeding a lake, and the lake's water quality and quantity. Landscapes with greater capacities to hold water during rain events and snowmelt slow the delivery of the water to the lake.

Waubee Lake's Watershed

The Waubee Lake watershed is 901 acres. Primary land use is forest land. The lake's shoreland is surrounded primarily by developed residential lots. In general, the land closest to the lake has the greatest immediate impact on water quality.



Watershed: The area of land draining to a lake.



Watershed

Why does land matter?

Land use and land management practices within the watershed can affect both its water quantity and quality. While forests, grasslands, and wetlands allow a fair amount of precipitation to soak into the ground, resulting in more groundwater and good water quality, other types of land uses may result in increased runoff and less groundwater recharge, and may also be sources of pollutants that can impact the lake and its inhabitants.

Soil and Erosion

Areas of land with exposed soil can produce soil erosion. Soil entering the lake can make the water cloudy and cover fish spawning beds. Soil also contains nutrients that increase the growth of algae and aquatic plants.

Development

Development on the land may result in changes to natural drainage patterns, alterations to vegetation on the landscape, and may be a source of pollutants. Impervious (hard) surfaces such as roads, rooftops, and compacted soil prevent rainfall from soaking into the ground, which may result in more runoff that carries pollutants to the lake. Wastewater, animal waste, and fertilizers used on lawns, gardens and crops can contribute nutrients that enhance the growth of algae and aquatic plants in our lakes.

What can be done?

Land management practices can be put into place that mimic some of the natural processes, and reduction or elimination of nutrients added to the landscape will help prevent the nutrients from reaching the water. In general, the land nearest the lake has the greatest impact on the lake water quality and habitat.

Be Part of the Solution!

Practices designed to reduce runoff include:

- protecting/restoring wetlands,
- installing rain gardens, swales, rain barrels, and other practices that increase infiltration
- routing drainage from pavement and roofs away from the lake
- meandering lake access paths to minimize direct flow to the lake.

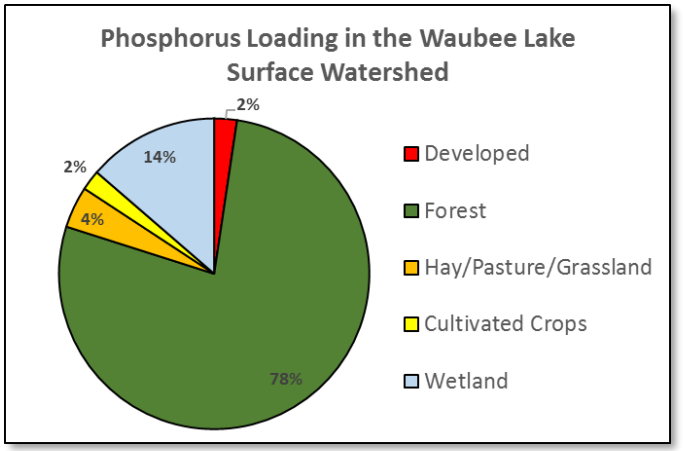
Practices used to help reduce nutrients from moving across the landscape towards the lake include:

- eliminating/reducing the use of fertilizers,
- increasing the distance between the lake and a septic drainfield,
- protecting/restoring wetlands and native vegetation in the shoreland,
- controlling erosion,
- manure management and cropping practices.

Most of these activities are eligible for cost share and grant assistance!

Phosphorus Modeling

Estimates of phosphorus from the landscape can help to understand the phosphorus sources to Waubee Lake. Land use in the surface watershed was evaluated and used to populate the Wisconsin Lakes Modeling Suite (WILMS) model. In general, each type of land use contributes different amounts of phosphorus in runoff and groundwater. The types of land management practices that are used and their distances from the lake also affect the contributions to the lake from a parcel of land. Based on modeling results, wetland had the greatest percentage of phosphorus contributions from the watershed. The phosphorus contributions by land use category, called phosphorus export coefficients, have been obtained from studies throughout Wisconsin (Panuska and Lillie, 1995).



Goal 4. Watershed and shoreland property owners will know about and utilize resources for healthy land management practices.

Objective 4.1 Support healthy land management activities in the Waubee Lake watershed to reduce sediment/nutrient loading.

Actions	Lead person/group	Resources	Timeline
Encourage the County to support and follow-up with water quality-based best management practices (BMPs) within the watershed. Include BMPs that reduce application of excess nitrogen and pesticides that leach to groundwater.	WLA	NRCS DATCP County Board Supervisors	Ongoing
Support landowners interested in the protection of their land via a land conservation program (i.e. Conservation Easement, Purchase of Development Rights, or sale of land for protection).	WLA	WDNR Lake Protection Grants Knowles-Nelson Stewardship Fund NWLT	As needed
Encourage new developments to manage storm water on site and consider ways to minimize impacts from septic systems on Porters Lake.	WLA	Town of Lakewood Developers/Builders	As needed
Protect wetlands to maintain the water budget of Munger and Bear Lakes. Any altered wetlands should be mitigated within the lake's watershed.	WLA	WDNR	As needed
Encourage design of road and construction projects that will minimize impacts to Porters Lake.	WLA	Town of Lakewood OC Highway Department/WDOT	As needed

Shorelands

90% of lake life spends all or part of their life in the near shore zone.

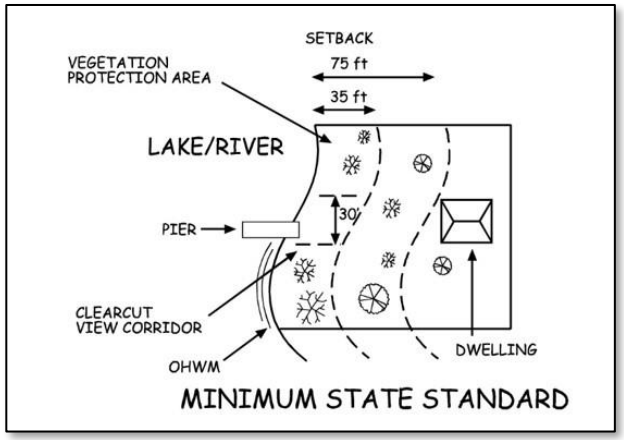
Shorelands

Shoreland vegetation is critical to a healthy lake ecosystem. It provides habitat for many aquatic and terrestrial animals including birds, frogs, turtles, and small and large mammals. It also helps to improve the quality of the runoff that is flowing across the landscape towards the lake.

Healthy shoreland vegetation includes a mix of unmowed grasses/flowers, shrubs, trees, and wetlands which extends at least 35 feet landward from the water's edge.

Shoreland ordinances have been in place since 1964 to improve water quality and habitat, and to protect our lakes. To protect our lakes, county and state (NR 115) shoreland ordinances state that vegetation should extend at least 35 feet inland from the water's edge, with the exception of an optional 30-foot wide view corridor for each shoreland lot. Although some properties were grandfathered in when the ordinance was initiated in 1966, following this guidance will benefit the health of the lake and its inhabitants.

Disturbed shoreland is measured as any shoreline without a shrub or herbaceous layer at the water's edge, regardless of buffer thickness. This may be a result of mowed lawn, artificial beach, etc.



Be Part of the Solution!

Follow Healthy Shoreland Practices

- Mow Less: The simplest, most affordable way to improve your shoreland is to reduce mowing near shore. Native vegetation will re-establish itself over time.
- Leave natural shoreland vegetation in place.
- Restore native shoreland vegetation where it is lacking.
- Plant attractive native species of grasses/flowers, shrubs and trees that will add interest and beauty to your property.
- Don't use fertilizers or herbicides, they may run into the lake. Test your soil to determine if fertilizer is warranted.
- Add or leave woody habitat near the shore. Turtles, birds, and fish love it!
- Never transplant water garden plants or aquarium plants into lakes, streams, or wetlands.
- Visit **www.healthylakeswi.com** for additional resources.

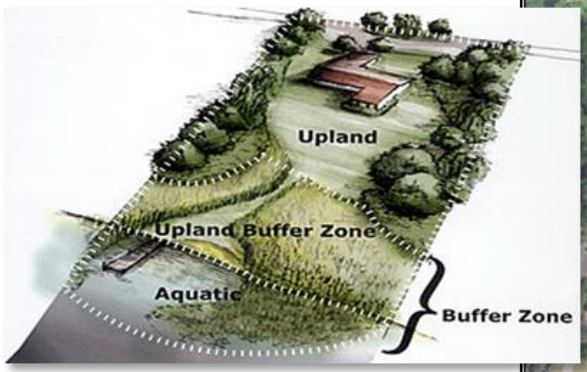
State Shoreland Zoning Ordinance

NR 115 Wisc. Adm. Code for Unincorporated Municipalities

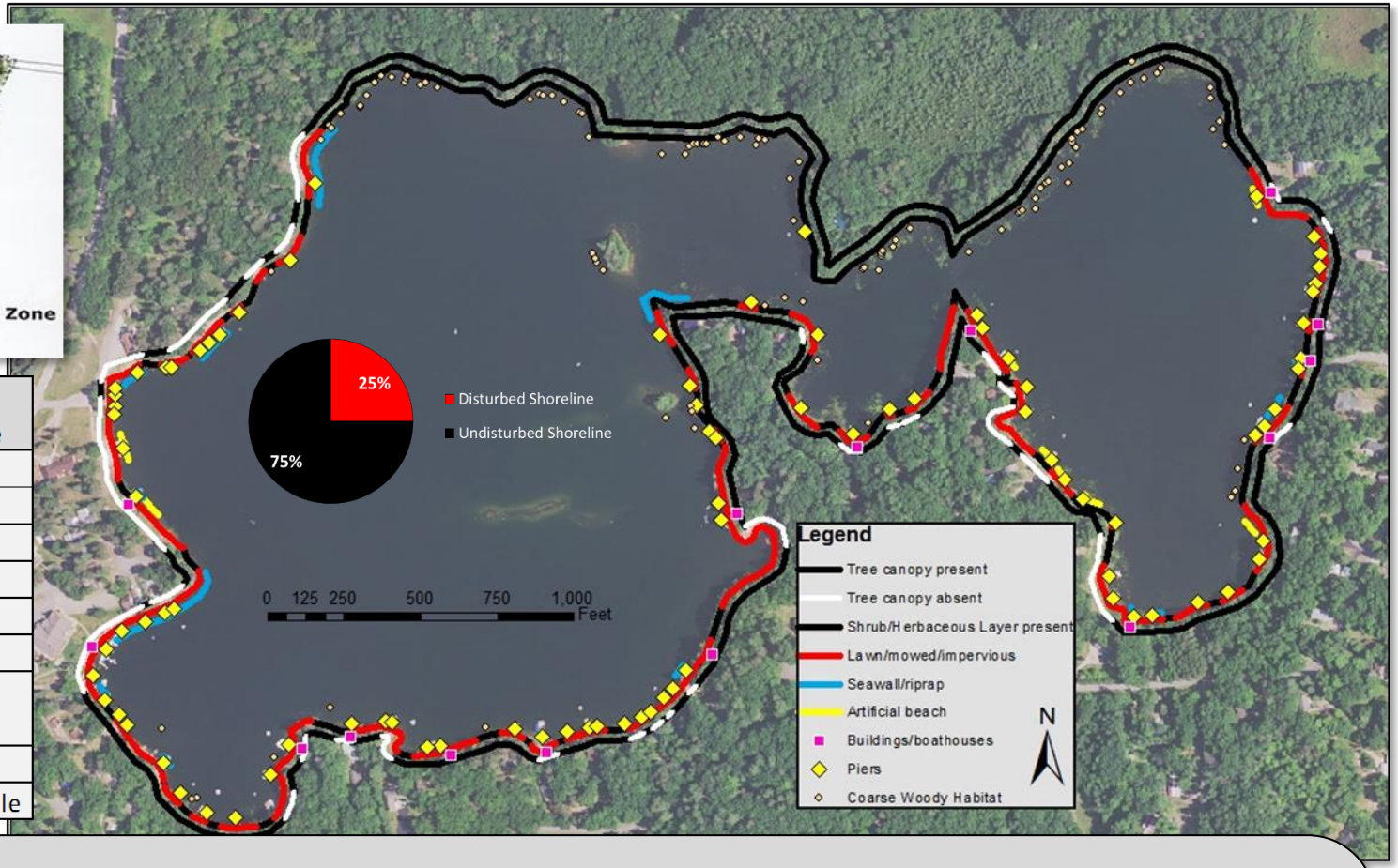
No vegetation within 35 feet of the lake's edge shall be removed except for:

- Up to 30% of shoreline may be removed of shrubs and trees for a view corridor
- A mowed or constructed pedestrian path up to 5 feet wide to access lake

Shorelands



Modifications, Structures, Erosion	Measured Occurrence
Artificial Beach	255 ft
Rip Rap	1,115 ft
Sea Wall	65 ft
Impervious Surface	612 ft
Mowed Lawn	3,191 ft
Erosion	90 ft
Nonconforming Buildings	16
Piers	91
Coarse Woody Habitat	37 logs/mile



Waubee Lake's Shorelands

To better understand the health of Waubee Lake, shorelands were evaluated. The survey inventoried shoreland vegetation, erosion, riprap, barren ground, seawalls, structures, and docks. The majority of the 2.8 miles of shoreline is developed as homes and seasonal cottages, but some undeveloped wetland shoreline exists on the north and south ends. A total of 91 piers were counted during the survey (1/164 ft).

- With 89 lakefront lots, 2,670 feet (18%) of disturbed shoreland is permitted. Based on the 2017 shoreland inventory, 25% (3,794 feet) of Waubee Lake's shoreland was disturbed. Coarse woody habitat was measured at 37 logs/mile (250 logs/mile is recommended).
- As a whole, Waubee Lake had average shoreland health compared to other lakes in the study. Some stretches of Waubee Lake's shorelands are in good shape, but many portions have challenges that should be addressed.

Shorelands

Waubee Lake 2017 Shoreland Survey Results			
Total lakefront footage	**# Riparian lots**	**Total allowable (NR115) disturbed shoreland**	**Measured disturbed shoreland**
14,936 feet	89	2,670 feet or 18%	3,795 feet or 25%

Goal 5. Waubee Lake's shorelands will become increasingly healthy over time.

Objective 5.1 Shoreland property owners will be knowledgeable about and make good decisions regarding shoreland practices that result in good water quality and habitat. Over the next 5 years, 1,000 feet of mowed shoreland will be restored.

Actions	Lead person/group	Resources	Timeline
Provide informational materials to all shoreland property owners about basic lake stewardship including healthy shorelands and their composition (wildflowers, shrubs, trees, etc.). Include information on cost share programs.	WLA	OCLAWA UWEX Lakes Healthy Lakes grants	Ongoing
Encourage and support shoreland owners interested in shoreland restoration (including rain gardens, diversion practices, infiltration practices, native plantings, no mow, or fish sticks). Include information on how and why to create healthy shorelands in a welcome packet to new property owners.	WLA	UWEX Lakes OCLCD WDNR Healthy Lakes Grants	Ongoing
Encourage those interested in shoreland restorations to contact the OCLCD for available resources.	WLA	OCLCD WDNR Healthy Lakes Grants	Ongoing
Host a speaker/demonstration: "How to restore your shoreline."	WLA	UWEX Lakes-Pat Goggin	2019
Consider restoring and showcasing a "demonstration site" with a sign at the water's edge about shoreland restoration (perhaps at the boat launch or Waubee Lodge).	WLA	OCLCD UWEX Lakes-Pat Goggin WDNR Healthy Lakes Grants	2019
Explore purchase of undeveloped shoreland property.	WLA	UWEX Lakes Knowles-Nelson Stewardship Fund	As available

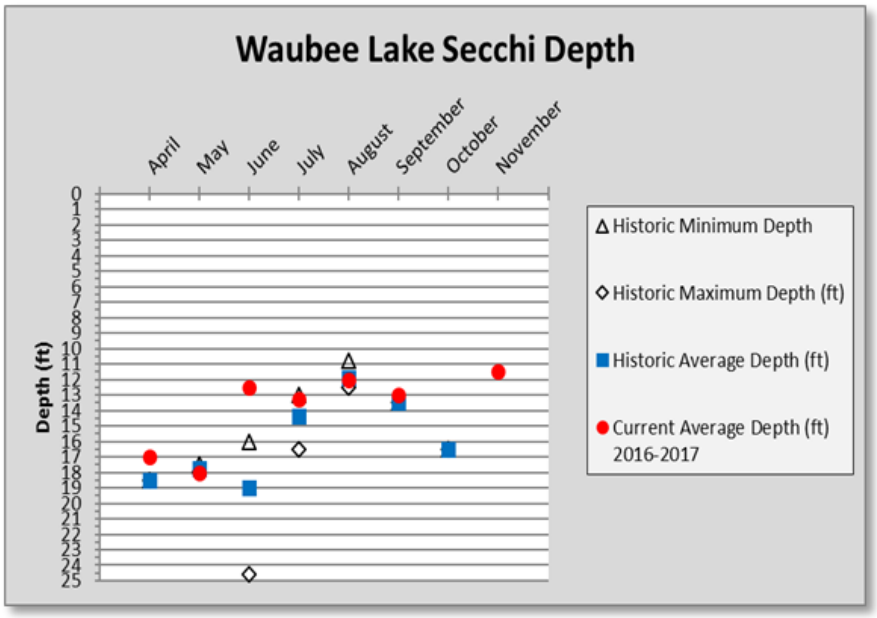
Water Quality

Water Quality

A variety of water chemistry measurements were used to characterize the water quality in Waubee Lake. Water quality was assessed during the 2016-2017 lake study and involved a number of measures including temperature, dissolved oxygen, water chemistry, and nutrients (phosphorus and nitrogen). Nutrients are important measures of water quality in lakes because they contribute to algae and aquatic plant growth. Each of these interrelated measures plays a part in the lake's overall water quality. In addition, water quality data collected in past years was also reviewed to determine trends in Waubee Lake's water quality.

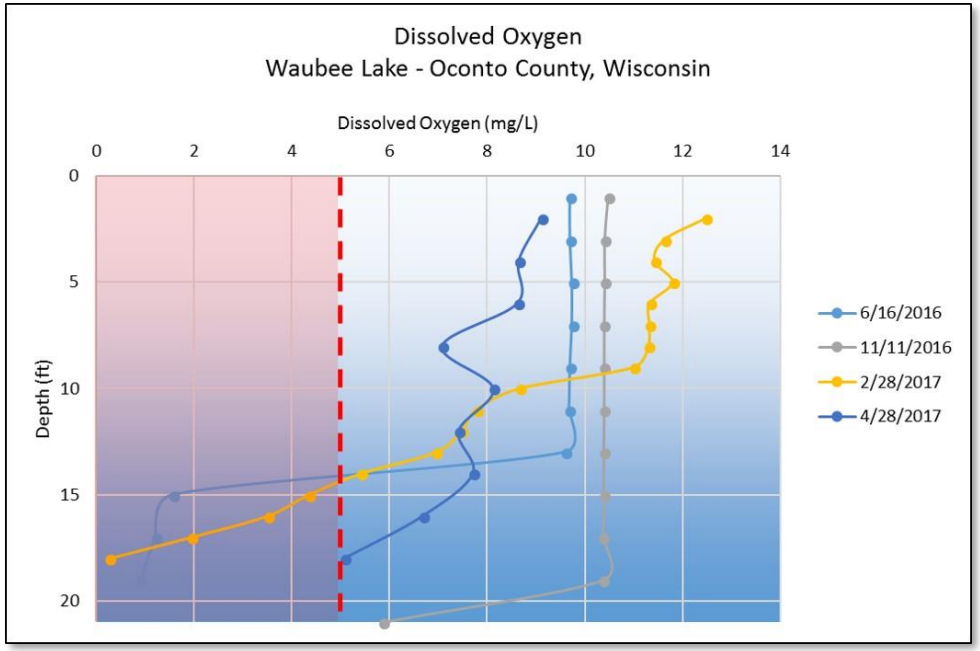
Water Clarity

Water clarity is a measure of how deep light can penetrate (Secchi depth). Clarity is affected by water color, turbidity, and algae and helps determine where rooted aquatic plants grow.



Dissolved oxygen

Dissolved oxygen is an important measure in Waubee Lake because a majority of organisms in the water depend on oxygen to survive. Oxygen is dissolved into the water from contact with air, which is increased by wind and wave action. Algae and aquatic plants also produce oxygen when sunlight enters the water, but the decomposition of dead plants and algae reduces oxygen in the lake.



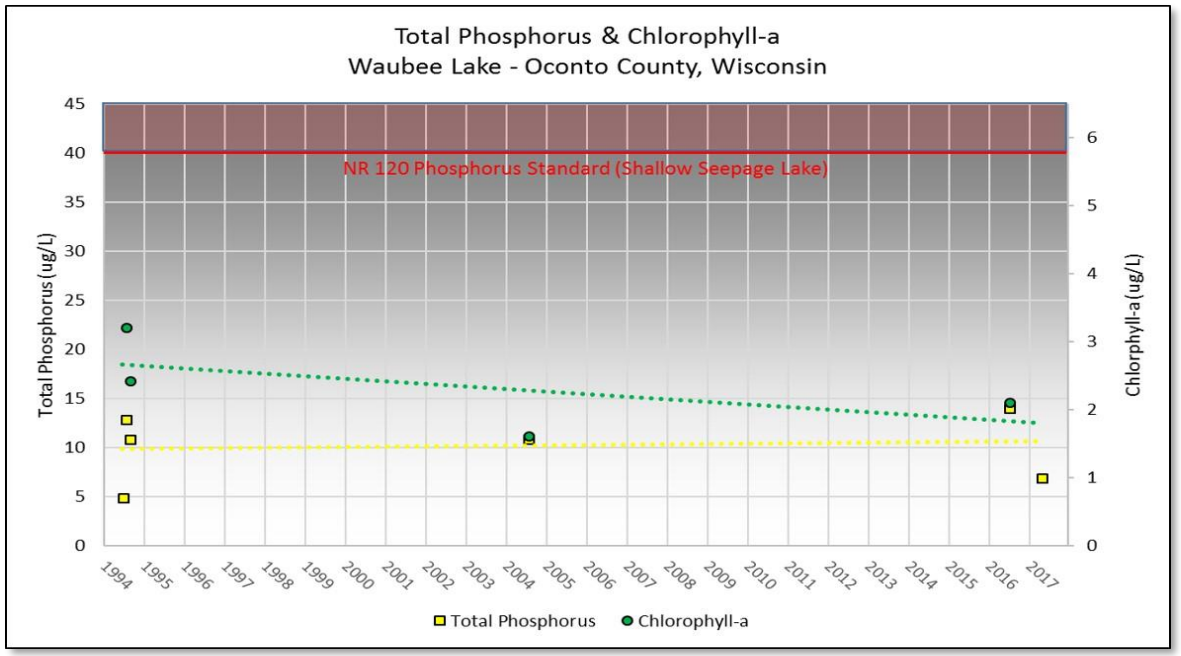
Contaminants

Chloride, sodium and potassium concentrations are commonly used as indicators of how a lake is being impacted by human activity. The presence of these compounds where they do not naturally occur indicates sources of water contaminants. Although these elements are not detrimental to the aquatic ecosystem, they indicate that sources of contaminants such as road salt, fertilizer,

animal waste and/or septic system effluent may be entering the lake from either surface runoff or via groundwater. Measurements of contaminants were low.

Nutrients

Phosphorus is an element that is essential in trace amounts to most living organisms, including aquatic plants and algae. Naturally-occurring sources of phosphorus include soils and wetlands, and groundwater. Common sources from human activities include soil erosion, animal waste, fertilizers, and septic systems. Although a variety of compounds are important to biological growth, phosphorus receives so much attention because it is commonly the "limiting nutrient" in many Wisconsin lakes. Due to its relatively short supply compared to other substances necessary for growth, relatively small increases in phosphorus result in significant increases in aquatic plants and algae. NR 120, Wisconsin Administrative Code lists phosphorus limits for different lake types. Shallow seepage lakes such as Waubee have a standard of 40 ug/L they must remain stay to remain healthy. The very limited data available show concentrations in Waubee to be well below this standard. Continued monitoring is necessary to verify this and establish and trends. Concentrations of 0.3 mg/L inorganic nitrogen in spring are sufficient to fuel algal blooms throughout the summer. Sources of inorganic nitrogen include animal waste, septic systems/waste treatment effluent, and fertilizers.



Waubee Lake's Water Quality Summary

- ✓ Sufficient **dissolved oxygen** was present in at least the upper 14 feet of water at all times during the study.
- ✓ **Water clarity** ranged from 13-19.25 feet (considered very good), which is consistent with historic measurements.
- ✓ Slightly elevated concentrations of **contaminants** were measured during the study. Atrazine was not detected.
- ✓ **Phosphorus** concentrations remained below the Wisconsin state standard of 30 ug/L throughout the study. Inorganic nitrogen periodically reached concentrations that spur algal blooms.

Water Quality

Be part of the solution!

Managing nitrogen, phosphorus and soil erosion throughout the Waubee Lake watershed is one of the keys to protecting the lake itself. Near shore activities that may increase the input of phosphorus to the lake include applying fertilizer, removing native vegetation (trees, bushes and grasses), mowing vegetation, and increasing the amount of exposed soil. Nitrogen inputs to a lake can be controlled by using lake-friendly land management decisions, such as the restoration of shoreland vegetation, elimination/reduction of fertilizers, proper management of animal waste and septic systems, and the use of water quality-based management practices.

Goal 6. Maintain or improve water quality in Waubee Lake.

Objective 6.1 Maintain median summer phosphorus concentrations below 40 ug/L and spring inorganic nitrogen concentrations below 0.3 mg/L. Association members will be knowledgeable about their role in the water quality of Waubee Lake.

Actions	Lead person/group	Resources	Timeline
Inform others around the lake about the impact of nutrients and land management on water quality through the distribution of a District newsletter and/or hosting a guest speaker at the annual meeting.	WLA	OCLAWA WDNR UWEX Lakes	Ongoing, 2019
Refrain from the use of fertilizers. Encourage soil testing to determine if fertilizer is necessary.	WLA	OC UWEX	Ongoing
Encourage the restoration of unmowed vegetation to slow and absorb runoff and pollutants.	WLA	UWEX Lakes	Ongoing

Goal 7. Create a robust dataset for Waubee Lake to monitor trends, declines and improvements over time.

Objective 7.1 Lake water quality monitoring will become a standard lake management activity covered each year by a volunteer lake resident and/or the WLA.

Actions	Lead person/group	Resources	Timeline
Continue to monitor water clarity and chemistry (TP & Chlorophyll-a).	Trained volunteer	CLMN	Ongoing-summer
Submit all collected data to WDNR for storage and use.	Trained volunteer	CLMN/WDNR	Ongoing

Wisconsin has more than 500,000 registered boats-one for every 10 residents.

PEOPLE AND THE LAKE

The people who interact with the lake are a key component of the lake and its management. In essence a lake management plan is a venue by which people decide how they would like people to positively impact the lake. The plan summarizes the decisions of the people to take proactive steps to improve their lake and their community. Individual decisions by lake residents and visitors can have positive impacts on the lake and on those who enjoy this common resource. Collaborative efforts may have bigger positive impacts; therefore, communication and cooperation between the lake district, community, and suite of lake users are essential to maximize the effects of plan implementation.

Boating hours, regulations, and fishing limits are examples of principles that are put into place to minimize conflicts between lake users and balance human activities with environmental considerations for the lake.

Recreation

According to survey responses, the lake is enjoyed for its scenery, wildlife, boating and fishing. There is one public boat launch located on the west side which is owned by the Town of Lakewood. No Wake is allowed between 6pm and 11am.

Goal 8. Lake users will be informed and respectful of Waubee Lake.

Objective 8.1 Foster and environment of compliance amongst lake users.

Actions	Lead person/group	Resources	Timeline
Work with other lake groups and towns to support/establish a recreational officer and municipal court for enforcement of regulations, including 'No Wake' and safe boat operation.	WLA	Town of Lakewood OCLAWA OC UWEX	Ongoing
Create and install signage at boat landing regarding 'No Wake' zones (all areas within 100 feet of shore, especially the narrows between the east and west lobes). Landowners can install a swim dock up to 200 feet from shore to protect this zone.	WLA	Town of Lakewood WDNR	2019
Work with township to explore limitations on speed limits and use of jet skis.	WLA	Town of Lakewood UWEX Lakes	2019

Communication & Organization

Communication and Organization

Working together on common values will help to achieve the goals outlined in this plan. This will involve communication between individuals, the Association, the Town of Lakewood, Oconto County, resource managers, and elected officials. In addition, staying informed about lake- and groundwater-related topics will be essential to achieving the goals laid out in this plan. See the Oconto County Lake Information Directory in the Appendices for contact information.

Many of the goals outlined in this plan focus on distributing information to lake and watershed residents and lake users in order to help them make informed decisions that will result in a healthy Waubee Lake ecosystem that is enjoyed by many people. Working together on common values will help to achieve the goals that are outlined in this plan.

Goal 9. Increase participation in lake stewardship.

Objective 9.1 Develop opportunities for education and outreach among full and part-time residents.

Actions	Lead person/group	Resources	Timeline
Maintain a WLA website to provide a common source of communication.	WLA	LakeKit.net OC UWEX	Ongoing
Maintain an email list of shoreland property owners and others interested in Waubee Lake.	WLA	OC UWEX	Ongoing
Share minutes (or meeting notes) from annual meeting on website and/or newsletter.	WLA		As needed
Distribute a welcome packet/mailing to all new shoreland property owners with basic lake stewardship information/brochures.	WLA	OC UWEX UWEX Lakes OCLCD	Ongoing
Communicate updates to lake management plan and management activities to residents and users of the lake via email list and/or newsletter.	WLA		Ongoing
Host an annual meeting to discuss lake management and opportunities for shoreland property owners.	WLA		Annually
Host gatherings to learn about topics identified in this plan. Invite speakers or conduct demonstrations.	WLA	UWEX Lakes WDNR OCLCD	As needed

Objective 9.2 Establish relationships with other lake groups, individuals and agencies working in lake management.

Actions	Lead person/group	Resources	Timeline
Network with other lake groups in Oconto County by having Munger and Bear Lakes represented at OCLAWA.	WLA	OC UWEX	Quarterly
Network with other lakes in the state to learn lake management strategies, etc. by having a representative attend the Wisconsin Lake Convention.	WLA	UWEX Lakes	Annually
Consider nominating an individual from Munger or Bear Lakes for the Lake Leaders Institute.	WLA	UWEX Lakes	

Updates and Revisions

Updates and Revisions

A management plan is a living document that changes over time to meet the current needs, challenges and desires of the lake and its community. The goals, objectives and actions listed in this plan should be reviewed annually and updated with any necessary changes. Partners listed in the plan should be contacted annually, and updated information complied. A list of changes/updates to the plan should be documented. To ensure that everyone is informed about changes, appropriate approval for changes should be acquired by all partners signing on to this plan.

Goal 10. Review plan annually and update as needed.

Objective 10.1

Actions	Lead person/group	Resources	Timeline
Organize a LMP committee responsible for reviewing and updating the plan annually.	WLA	UWEX Lakes	Annually
Review plan at annual meeting and discuss accomplishments and identification of goals/objectives/actions for coming year.	WLA		Annually
Formally update this LMP every 5 years.	WLA	OC UWEX UWEX Lakes WDNR	2023
Work with WDNR fishery biologist to develop the Fish Community portion of this plan and include this in a future plan update.	WLA	WDNR-Chip Long	2019

REFERENCES

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APPENDICES

Appendix A

Appendix A. Oconto County Lake Information Directory

Algae - Blue-Green

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Website: http://dnr.wi.gov/lakes/bluegreenalgae

Contact: Wisconsin Department of Health Services
1 West Wilson Street, Madison, WI 53703
Phone: 608-267-3242

Website:
www.dhs.wisconsin.gov/eh/bluegreenalgae/contactus.htm

Aquatic Invasive Species/Clean Boats Clean Water

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Website: http://dnr.wi.gov/topic/Invasives/

Aquatic Plant Management

(Native and Invasive)

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Website: http://dnr.wi.gov/lakes/plants/

Aquatic Plant Identification

Contact: Dr. Emmet Judziewicz
UWSP Freckmann Herbarium
TNR 301, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-4248
E-mail: ejudziew@uwsp.edu

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Aquatic Plant Surveys/Management

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Website: http://dnr.wi.gov/lakes/plants/

Best Management Practices (rain gardens, shoreland buffers, agricultural practices, runoff controls)

Contact: Ken Dolata
Oconto County Land Conservation Department
410 ½ East Main Street, Lena, WI 54139
Phone: 920-834-7152
E-mail: ken.dolata@co.oconto.wi.us

Website: http://www.co.oconto.wi.us/departments/

Boat Landings, Signage, Permissions (County)

Contact: Monty Brink
Oconto County Forestry/Park/Recreation
301 Washington Street, Oconto, WI 54153
Phone: 920-834-6995
E-mail: monty.brink@co.oconto.wi.us

Website: http://www.co.oconto.wi.us/departments/

Appendix A

Boat Landings (State)

Contact: Chip Long
Wisconsin Department of Natural Resources
101 N. Ogden Road, Peshtigo, WI 54157
Phone: 715-582-5017
E-mail: Christopher.Long@wisconsin.gov

Website: http://dnr.wi.gov/org/land/facilities/boataccess/

Boat Landings (Town)

Contact the clerk for the specific town/village in which the boat landing is located.

Conservation Easements

Contact: Gathering Waters Conservancy
211 S. Paterson St., Suite 270, Madison, WI 53703
Phone: 608-251-9131
E-mail: info@gatheringwaters.org

Website: http://gatheringwaters.org/

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Contact: Patrick Sorge
Wisconsin Department of Natural Resources
PO Box 4001, Eau Claire, WI 54702
Phone: 715-839-3794
E-mail: Patrick.Sorge@wisconsin.gov

Contact: Northeast Wisconsin Land Trust
14 Tri-Park Way, Suite 1, Appleton, WI 54914
Phone: 920-738-7265
E-mail: newlt@newlt.org

Website: www.newlt.org

Contact: NRCS Lena Service Center
410 ½ East Main Street, Lena, WI 54139
Phone: 920-829-5406

Critical Habitat and Sensitive Areas

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Website: http://dnr.wi.gov/lakes/criticalhabitat/

Dams

Contact: Meg Galloway
Wisconsin Department of Natural Resources
PO Box 7921, Madison, WI 53707
Phone: 608-266-7014
E-mail: meg.galloway@wisconsin.gov

Website: http://dnr.wi.gov/org/water/wm/dsfm/dams/

Fertilizers/Soil Testing

Contact: Dale Mohr
Oconto County UW- Extension
301 Washington Street, Oconto, WI 54153
Phone: 920-835-6845
E-mail: dale.mohr@co.oconto.wi.us

Website: http://oconto.uwex.edu

Fisheries Biologist (management, habitat)

Contact: Chip Long
Wisconsin Department of Natural Resources
101 N. Ogden Road, Peshtigo, WI 54157
Phone: 715-582-5017
E-mail: Christopher.Long@wisconsin.gov

Website: http://dnr.wi.gov/fish/

Appendix A

Frog Monitoring—Citizen Based

Contact: Andrew Badje
Wisconsin Department of Natural Resources
Phone: 608-785-9472
E-mail: Andrew.badje@wisconsin.gov

Website: WFTS@wisconsin.gov

Grants

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Website: http://dnr.wi.gov/Aid/Grants.html

Contact: Ken Dolata
Oconto County Land Conservation Department
410 ½ East Main Street, Lena, WI 54139
Phone: 920-834-7152
E-mail: ken.dolata@co.oconto.wi.us

Website: http://www.co.oconto.wi.us/departments/

Groundwater Quality

Contact: Kevin Masarik
UWSP Center for Watershed Science & Education
TNR 224, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-4276
E-mail: kmasarik@uwsp.edu

Website: http://www.uwsp.edu/cnr/watersheds/

Groundwater Levels/Quantity

Contact: Ken Dolata
Oconto County Land Conservation Department
410 ½ East Main Street, Lena, WI 54139
Phone: 920-834-7152
E-mail: ken.dolata@co.oconto.wi.us

Website: http://www.co.oconto.wi.us/departments/

Contact: George Kraft
UWSP Center for Watershed Science & Education
TNR 224, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-2984
E-mail: george.kraft@uwsp.edu

Informational Packets

Contact: UW Extension - Lakes
TNR 224, 800 Reserve St. Stevens Point, WI 54481
Phone: 715-346-2116
E-mail: uwexlakes@uwsp.edu

Lake Groups – Friends, Associations, Districts

Contact: Dale Mohr
Oconto County UW- Extension
301 Washington Street, Oconto, WI 54153
Phone: 920-835-6845
E-mail: dale.mohr@co.oconto.wi.us

Website: http://oconto.uwex.edu

Contact: Patrick Goggin
UWEX Lakes
TNR 203, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-365-8943
E-mail: pgoggin@uwsp.edu

Website: http://www.uwsp.edu/cnr/uwexlakes/organizations/

Contact: Eric Olson
UWEX Lakes
TNR 206, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-2192
E-mail: eolson@uwsp.edu

Website: http://www.uwsp.edu/cnr/uwexlakes/organizations/

Contact: Susan Tesarik
Wisconsin Lakes
4513 Vernon Blvd., Suite 101, Madison, WI 53705

Phone: 1-800-542-5253
E-mail: lakeinfo@wisconsinlakes.org

Website: http://wisconsinlakes.org/

Lake Levels

See: Groundwater

Lake-Related Law Enforcement (no-wake, transporting invasives, etc.)

Contact: Ben Mott
State Conservation Warden
Wisconsin Department of Natural Resources
427 E. Tower Drive, Suite 100, Wautoma, WI 54982
Phone: 920-896-3383

Website: http://www.wigamewarden.com/

Land Use Plans and Zoning Ordinances

Contact: Patrick Virtues
Oconto County Planning/Zoning/Solid Waste
301 Washington Street, Oconto, WI 54153
Phone: 920-834-6827
E-mail: Patrick.virtues@co.oconto.wi.us

Website: http://www.co.waushara.wi.us/zoning.htm

Contact: UWSP Center for Land Use Education
TNR 208, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-3783
E-mail: Center.for.Land.Use.Education@uwsp.edu

Website: http://www.uwsp.edu/cnr/landcenter/

Nutrient Management Plans

Contact: Ken Dolata
Oconto County Land Conservation Department
410 ½ East Main Street, Lena, WI 54139
Phone: 920-834-7152
E-mail: ken.dolata@co.oconto.wi.us

Website: http://www.co.oconto.wi.us/departments/

Contact: NRCS Lena Service Center
410 ½ East Main Street, Lena, WI 54139
Phone: 920-829-5406

Parks (County)

Contact: Monty Brink
Oconto County Forestry/Park/Recreation
301 Washington Street, Oconto, WI 54153
Phone: 920-834-6995
E-mail: monty.brink@co.oconto.wi.us

Website: http://www.co.oconto.wi.us/departments/

Purchase of Development Rights

Contact: Northeast Wisconsin Land Trust
14 Tri-Park Way, Suite 1, Appleton, WI 54914
Phone: 920-738-7265
E-mail: newlt@newlt.org

Website: www.newlt.org

Purchase of Land

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Website: http://dnr.wi.gov/topic/stewardship/

Rain Gardens and Stormwater Runoff

Contact: Ken Dolata
Oconto County Land Conservation Department
410 ½ East Main Street, Lena, WI 54139
Phone: 920-834-7152
E-mail: ken.dolata@co.oconto.wi.us

Website: http://www.co.oconto.wi.us/departments/

Appendix A

Septic Systems/Onsite Waste

Contact: Patrick Virtues
Oconto County Planning/Zoning/Solid Waste
301 Washington Street, Oconto, WI 54153
Phone: 920-834-6827
E-mail: Patrick.virtues@co.oconto.wi.us
Website: http://www.co.waushara.wi.us/zoning.htm

Shoreland Management

Contact: Ken Dolata
Oconto County Land Conservation Department
410 ½ East Main Street, Lena, WI 54139
Phone: 920-834-7152
E-mail: ken.dolata@co.oconto.wi.us
Website: http://www.co.oconto.wi.us/departments/

Shoreland Vegetation

http://dnr.wi.gov/topic/ShorelandZoning/

Shoreland Zoning Ordinances

See: Land Use Plans and Zoning Ordinances

Soil Fertility Testing

Contact: Dale Mohr
Oconto County UW- Extension
301 Washington Street, Oconto, WI 54153
Phone: 920-835-6845
E-mail: dale.mohr@co.oconto.wi.us
Website: http://oconto.uwex.edu

Water Quality Monitoring

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Water Quality Problems

Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-360-3167
E-mail: brenda.nordin@wisconsin.gov

Wetlands

Contact: Jason Fleener
Wisconsin Department of Natural Resources
GEF2 DNR Central Office, Madison, WI 53707
Phone: 608-266-7408
E-mail: Jason.fleener@wisconsin.gov
Website: http://dnr.wi.gov/wetlands/

Contact: Wisconsin Wetlands Association
214 N. Hamilton Street, #201, Madison, WI 53703
Phone: 608-250-9971
Email: info@wisconsinwetlands.org

Wetland Inventory

Contact: Dr. Emmet Judziewicz
UWSP Freckmann Herbarium
TNR 301, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-4248
E-mail: ejudziew@uwsp.edu

Woody Habitat

Contact: Chip Long
Wisconsin Department of Natural Resources
101 N. Ogden Road, Peshtigo, WI 54157
Phone: 715-582-5017
E-mail: Christopher.Long@wisconsin.gov

Appendix B. Rapid Response Plan

REPORTING A SUSPECTED INVASIVE SPECIES

1. Collect specimens or take photos.

Regardless of the method used, provide as much information as possible. Try to include flowers, seeds or fruit, buds, full leaves, stems, roots and other distinctive features. In photos, place a coin, pencil or ruler for scale. Deliver or send specimen ASAP.

Collect, press and dry a complete sample. This method is best because a plant expert can then examine the specimen.

-OR-

Collect a fresh sample. Enclose in a plastic bag with a moist paper towel and refrigerate.

-OR-

Take detailed photos (digital or film).

2. Note the location where the specimen was found.

If possible, give the exact geographic location using a GPS (global positioning system) unit, topographic map, or the Wisconsin Gazetteer map book. If using a map, include a photocopy with a dot showing the plant's location.

Provide one or more of the following:

- Latitude & Longitude
- UTM (Universal Transverse Mercator) coordinates
- County, Township, Range, Section, Part-section
- Precise written site description, noting nearest city & road names, landmarks, local topography

3. Gather information to aid in positive species identification.

- Collection date and county
- Your name, address, phone, email
- Exact location (lat/long or UTM, Township/Range)
- Plant name
- Land ownership (if known/applicable)
- Population description (estimated # plants, area covered)
- Habitat type where found (forest, field, prairie, wetland, open water)

4. **Mail or bring specimens and information to any of the following locations (digital photos may be emailed):**

Wisconsin Dept. Natural Resources
2984 Shawano Avenue,
Green Bay, WI 54313
Phone: (920) 662-5100

UW-Stevens Point Herbarium
301 Trainer Natural Resources Building
800 Reserve Street
Stevens Point, WI 54481
Phone: 715-346-4248
E-Mail: ejudziew@uwsp.edu

Wisconsin Invasive Plants Reporting & Prevention Project
Herbarium-UW-Madison
430 Lincoln Drive
Madison, WI 53706
Phone: (608) 267-7612
E-Mail: invasiveplants@mailplus.wisc.edu

Appendix C

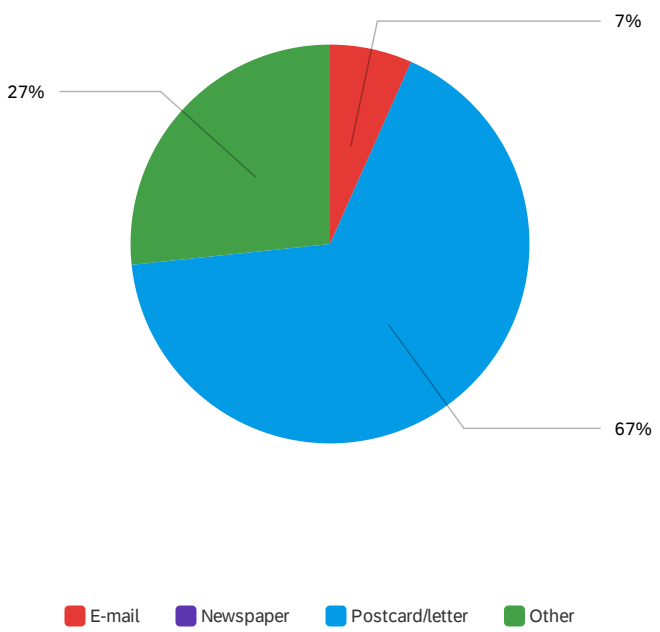
Appendix C. Lake User Survey Results

Default Report

Waubee Lake Survey - Oconto County Lakes Project

February 14, 2023 1:07 PM MST

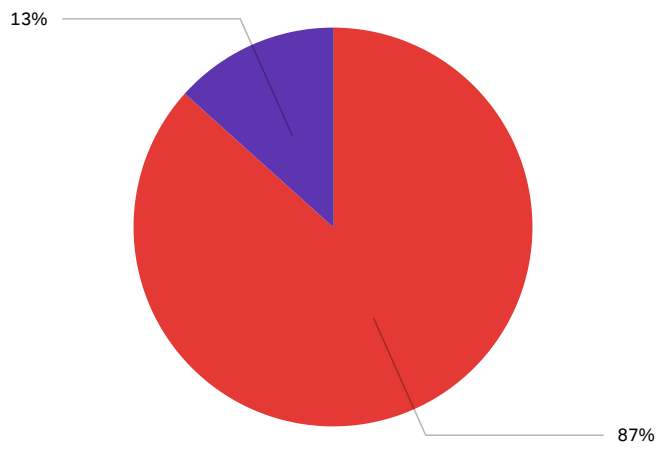
Q2 - How did you hear about this survey?



#	Field		Choice Count
1	E-mail	7%	1
2	Newspaper	0%	0
3	Postcard/letter	67%	10
4	Other	27%	4
			15

Showing rows 1 - 5 of 5

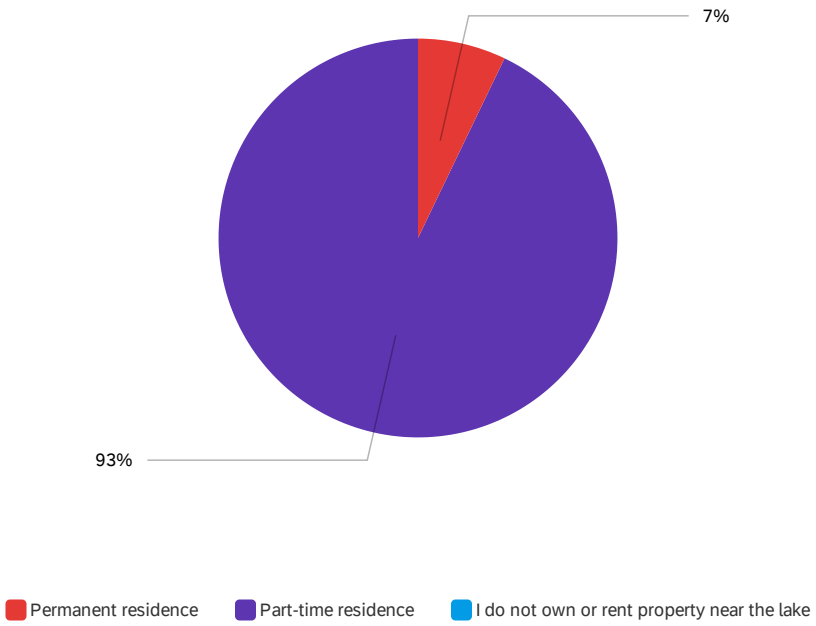
Q3 - Do you own or rent property...



#	Field	Choice Count	
1	Around the lake	87%	13
2	Less than 1/2 mile from the lake	13%	2
3	Near the lake, but more than 1/2 mile away	0%	0
4	I do not own or rent property near the lake	0%	0
			15

Showing rows 1 - 5 of 5

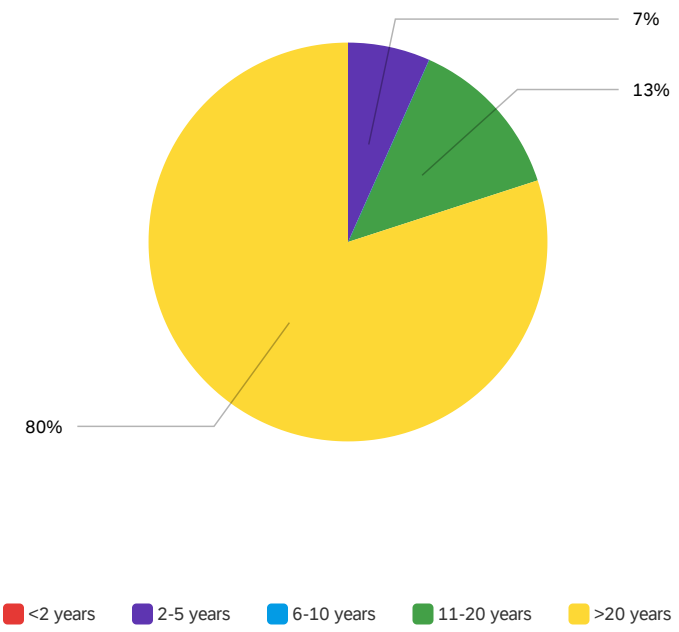
Q4 - If you own or rent property near the lake, is this property your...



#	Field		Choice Count
1	Permanent residence	7%	1
2	Part-time residence	93%	13
3	I do not own or rent property near the lake	0%	0
			14

Showing rows 1 - 4 of 4

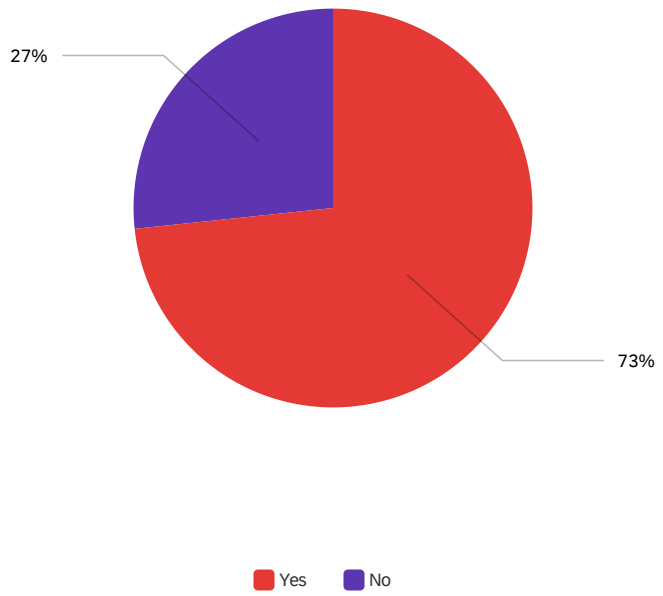
Q5 - How long have you lived on, visited or recreated on the lake?



#	Field	Choice Count
1	<2 years	0% 0
2	2-5 years	7% 1
3	6-10 years	0% 0
4	11-20 years	13% 2
5	>20 years	80% 12
		15

Showing rows 1 - 6 of 6

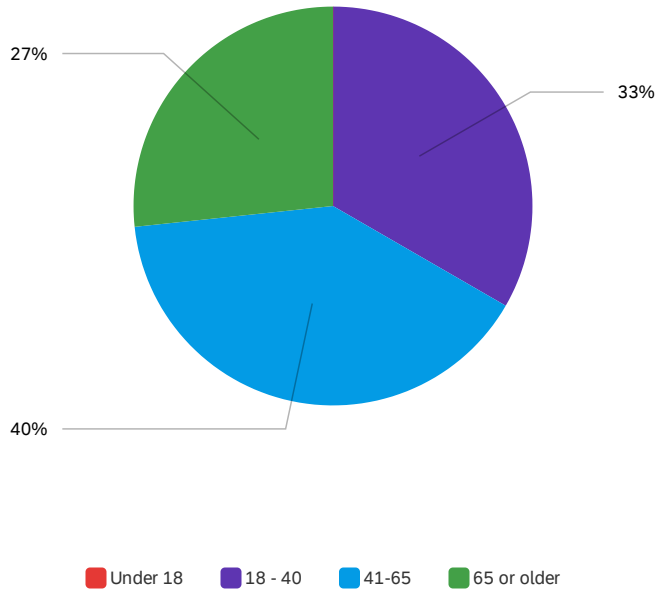
Q6 - Are you a member of the Waubee Lake Association?



#	Field		Choice Count
1	Yes	73%	11
2	No	27%	4
			15

Showing rows 1 - 3 of 3

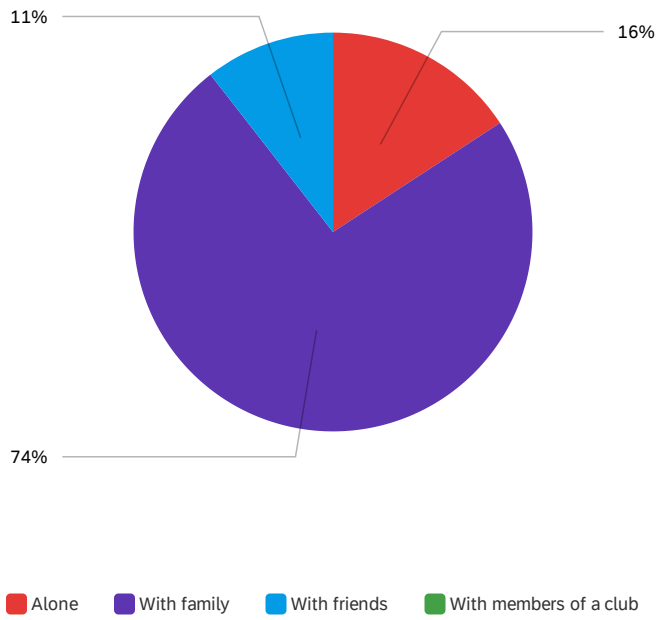
Q8 - Which category below includes your age?



#	Field	Choice Count
1	Under 18	0% 0
2	18 - 40	33% 5
3	41-65	40% 6
4	65 or older	27% 4
		15

Showing rows 1 - 5 of 5

Q9 - When you visit Waubee Lake, are you typically ...(check all that apply)

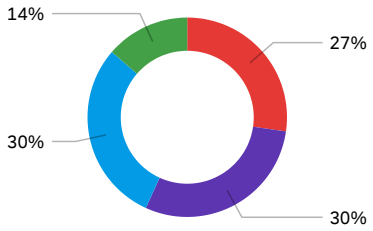


#	Field	Choice Count	
1	Alone	16%	3
2	With family	74%	14
3	With friends	11%	2
4	With members of a club	0%	0
			19

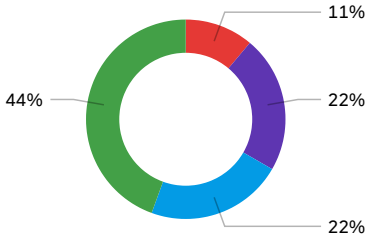
Showing rows 1 - 5 of 5

Q10 - I live on or near the lake...

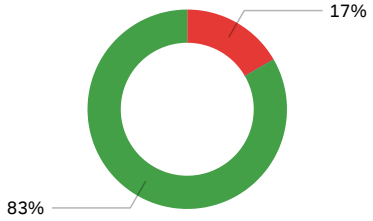
Strongly Agree



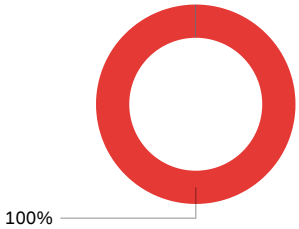
Agree



Neither agree nor disagree



Disagree



Strongly disagree

NO DATA

I do not live on or near the lake

NO DATA

To spend time with family or friends | For the peace and tranquility | Because I enjoy the view | Because its a good investment

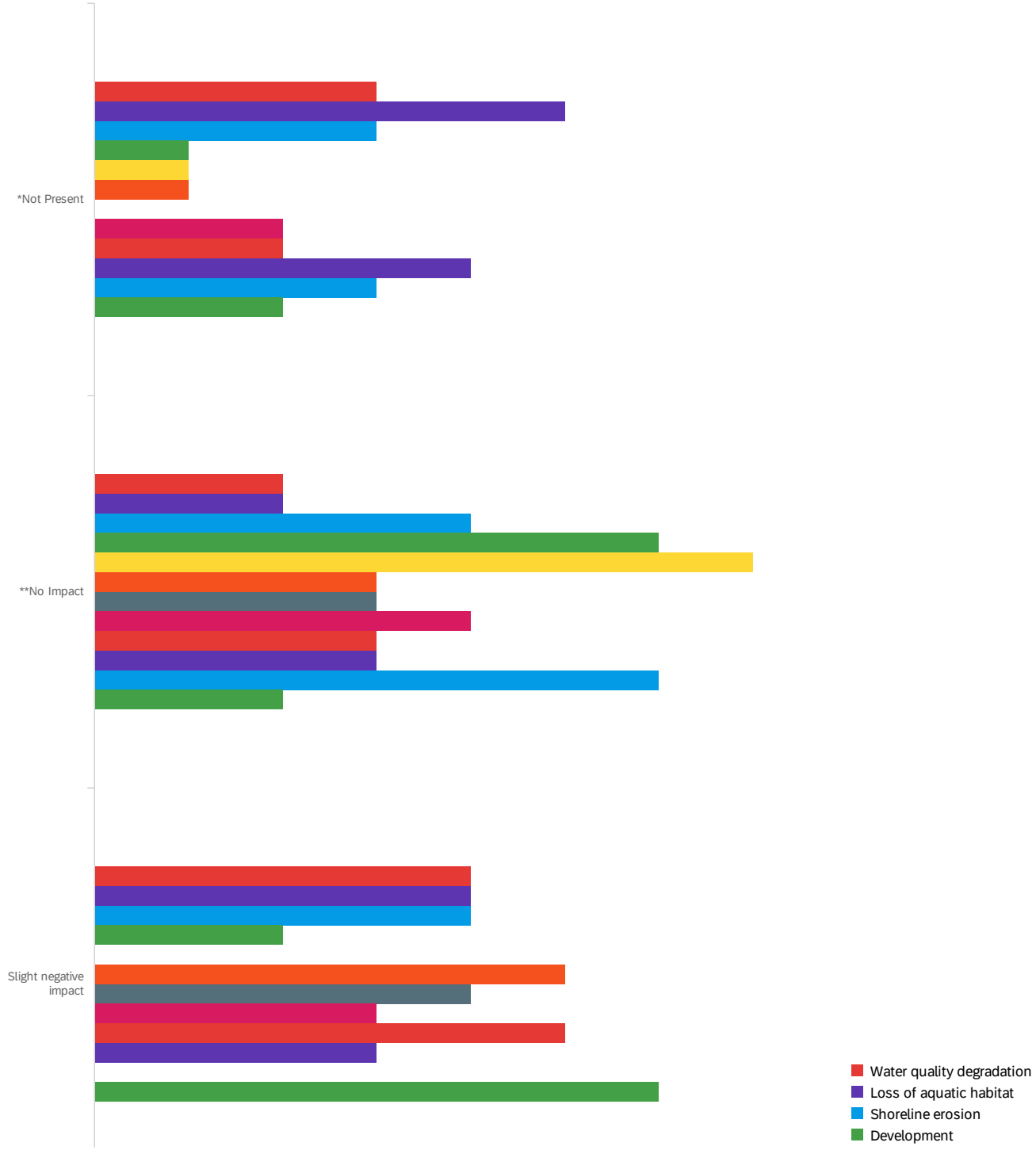
#	Field	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	I do not live on or near the lake	Total
1	To spend time with family or friends	80% 12	7% 1	7% 1	7% 1	0% 0	0% 0	15
2	For the peace and tranquility	87% 13	13% 2	0% 0	0% 0	0% 0	0% 0	15
3	Because I enjoy the view	87% 13	13% 2	0% 0	0% 0	0% 0	0% 0	15
4	Because its a good investment	40% 6	27% 4	33% 5	0% 0	0% 0	0% 0	15

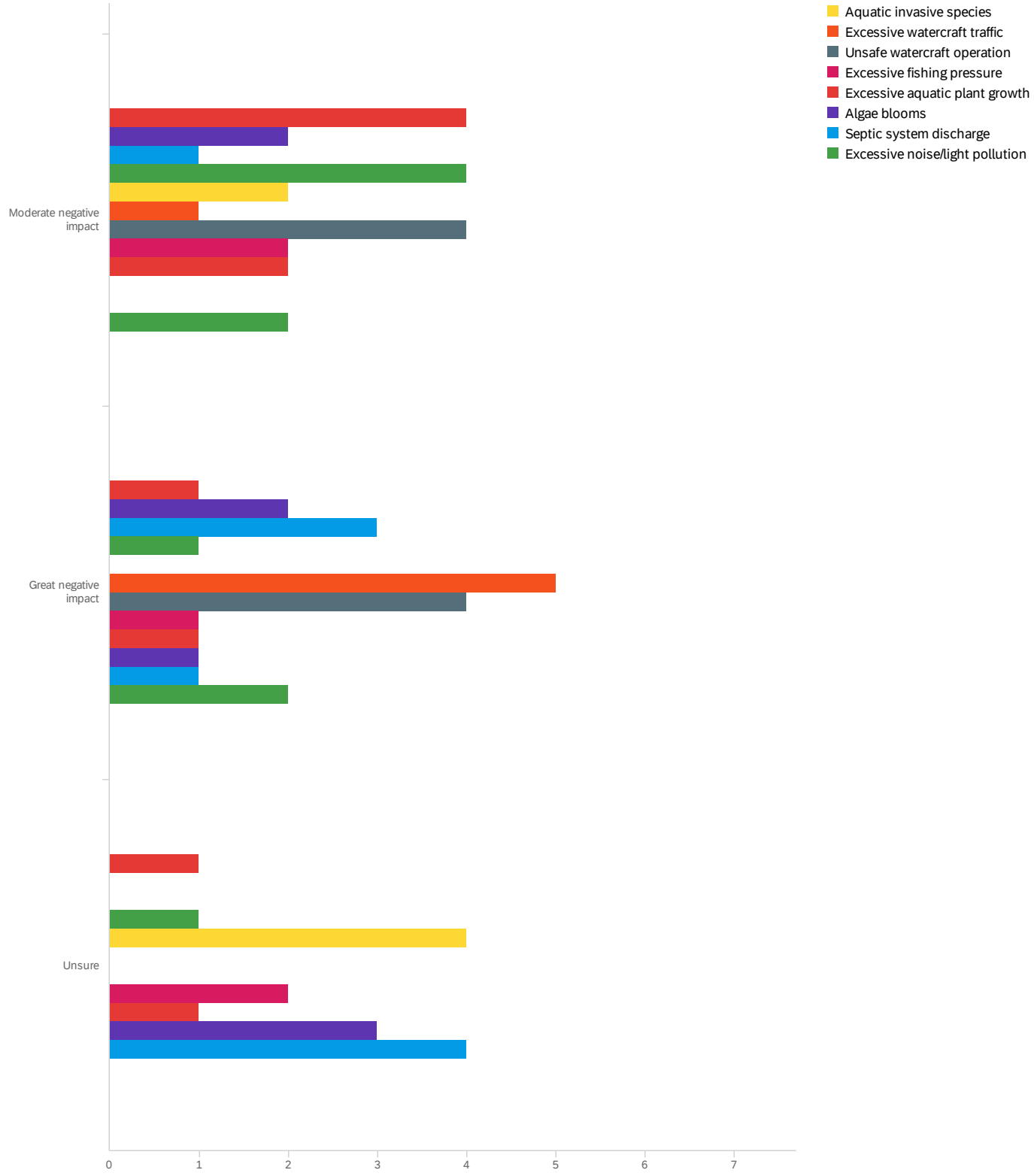
Showing rows 1 - 4 of 4

Q11 - What do you value most about Waubee Lake?

What do you value most about Waubee Lake?
Just a nice lake with nice people
that it is clean, free of major invasives and has the national forest as a main shoreline
Growing up on the lake and a life time of memories. Fishing and enjoying time with my family on the lake.
The fact that it is not super crowded and that people are friendly.
Fishing, pontooning
clean water for swimming, nature,
Wildlife
minimal traffic on lake... mix of ski and fish
It has a lot of character for a small lake. I enjoy the lodge as well. Beautiful lake, fun fishing.
Safe place for family
Clean water
relaxing
The area around it

Q42 - Below is a list of negative impacts commonly found in Wisconsin lakes. To what level do you believe each of the following factors may be impacting Waubee Lake? *Not Present means that you believe the issue does not exist on Waubee Lake**No Impact means that the issue may exist, but is not negatively impacting Waubee Lake



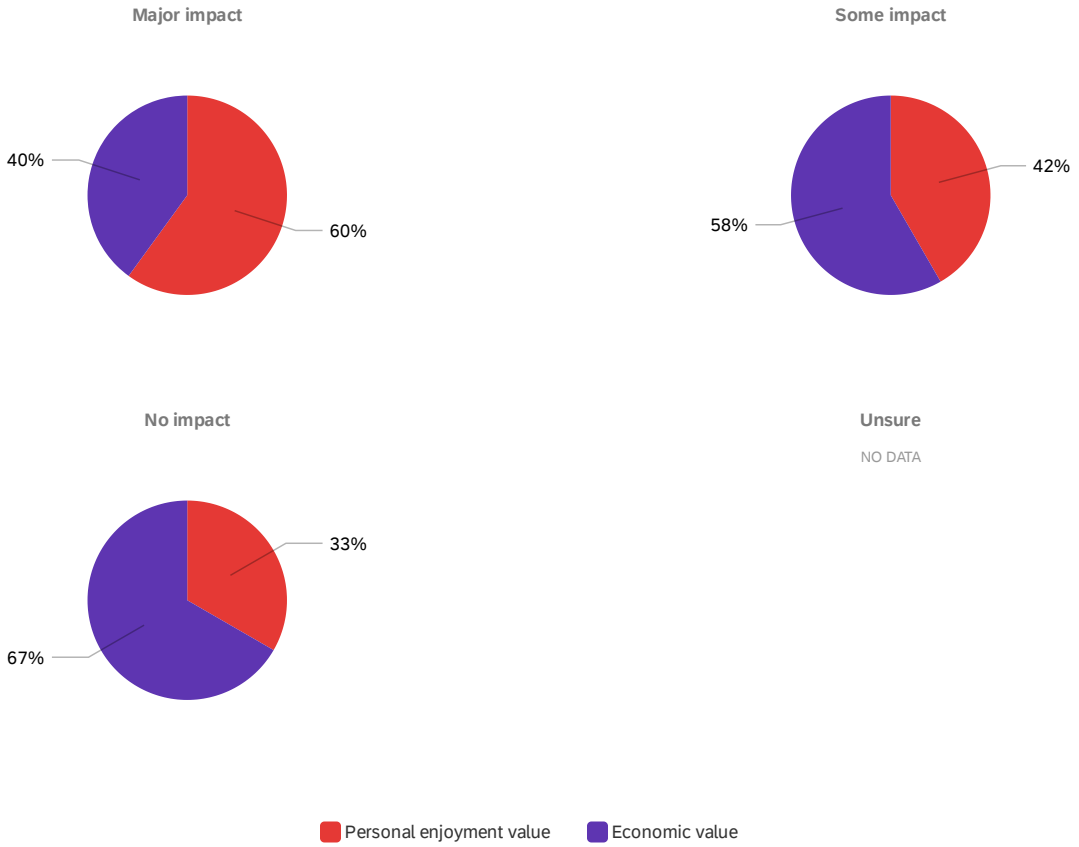


#	Field	*Not Present	**No Impact	Slight negative impact	Moderate negative impact	Great negative impact	Unsure	Total
1	Water quality degradation	20% 3	13% 2	27% 4	27% 4	7% 1	7% 1	15
2	Loss of aquatic habitat	33% 5	13% 2	27% 4	13% 2	13% 2	0% 0	15
3	Shoreline erosion	20% 3	27% 4	27% 4	7% 1	20% 3	0% 0	15

#	Field	*Not Present	**No Impact	Slight negative impact	Moderate negative impact	Great negative impact	Unsure	Total
4	Development	7% 1	40% 6	13% 2	27% 4	7% 1	7% 1	15
5	Aquatic invasive species	7% 1	50% 7	0% 0	14% 2	0% 0	29% 4	14
6	Excessive watercraft traffic	7% 1	20% 3	33% 5	7% 1	33% 5	0% 0	15
7	Unsafe watercraft operation	0% 0	20% 3	27% 4	27% 4	27% 4	0% 0	15
8	Excessive fishing pressure	14% 2	29% 4	21% 3	14% 2	7% 1	14% 2	14
9	Excessive aquatic plant growth	14% 2	21% 3	36% 5	14% 2	7% 1	7% 1	14
10	Algae blooms	29% 4	21% 3	21% 3	0% 0	7% 1	21% 3	14
11	Septic system discharge	21% 3	43% 6	0% 0	0% 0	7% 1	29% 4	14
12	Excessive noise/light pollution	14% 2	14% 2	43% 6	14% 2	14% 2	0% 0	14

Showing rows 1 - 12 of 12

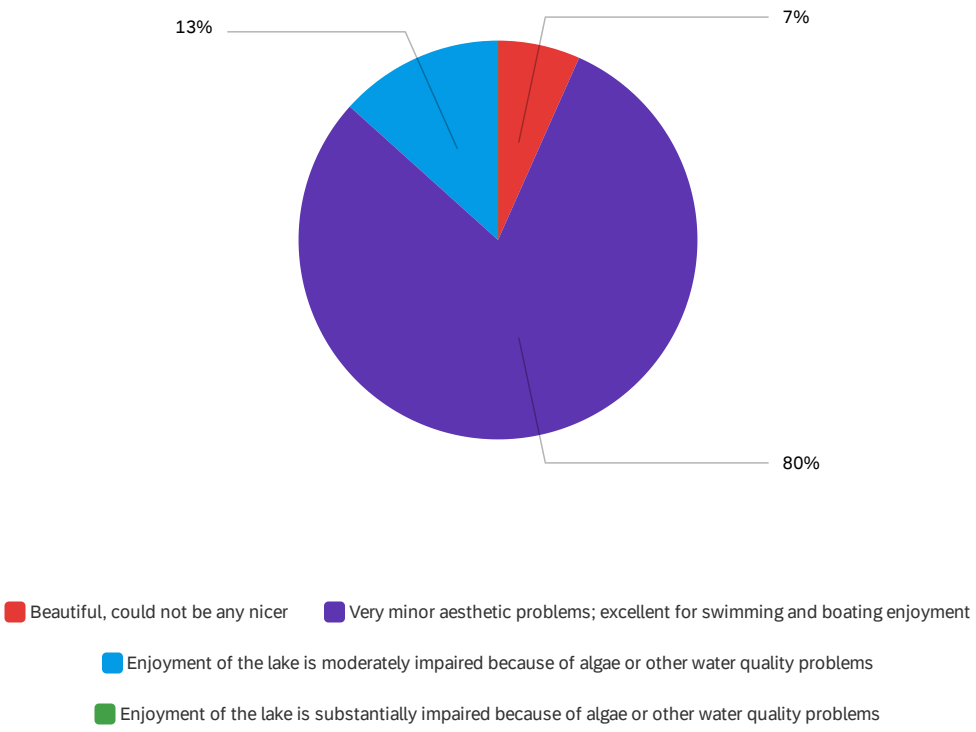
Q16 - How much impact does the water quality of Waubee Lake have on the following?



#	Field	Major impact	Some impact	No impact	Unsure	Total
1	Personal enjoyment value	60% 9	33% 5	7% 1	0% 0	15
2	Economic value	40% 6	47% 7	13% 2	0% 0	15

Showing rows 1 - 2 of 2

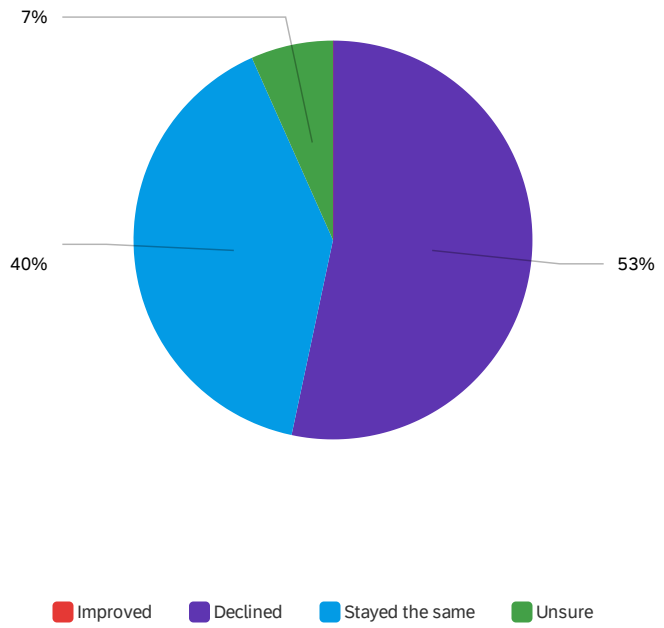
Q17 - Which statement best describes water clarity during the times you spend most on the lake?



#	Field	Choice Count	
1	Beautiful, could not be any nicer	7%	1
2	Very minor aesthetic problems; excellent for swimming and boating enjoyment	80%	12
3	Enjoyment of the lake is moderately impaired because of algae or other water quality problems	13%	2
4	Enjoyment of the lake is substantially impaired because of algae or other water quality problems	0%	0
			15

Showing rows 1 - 5 of 5

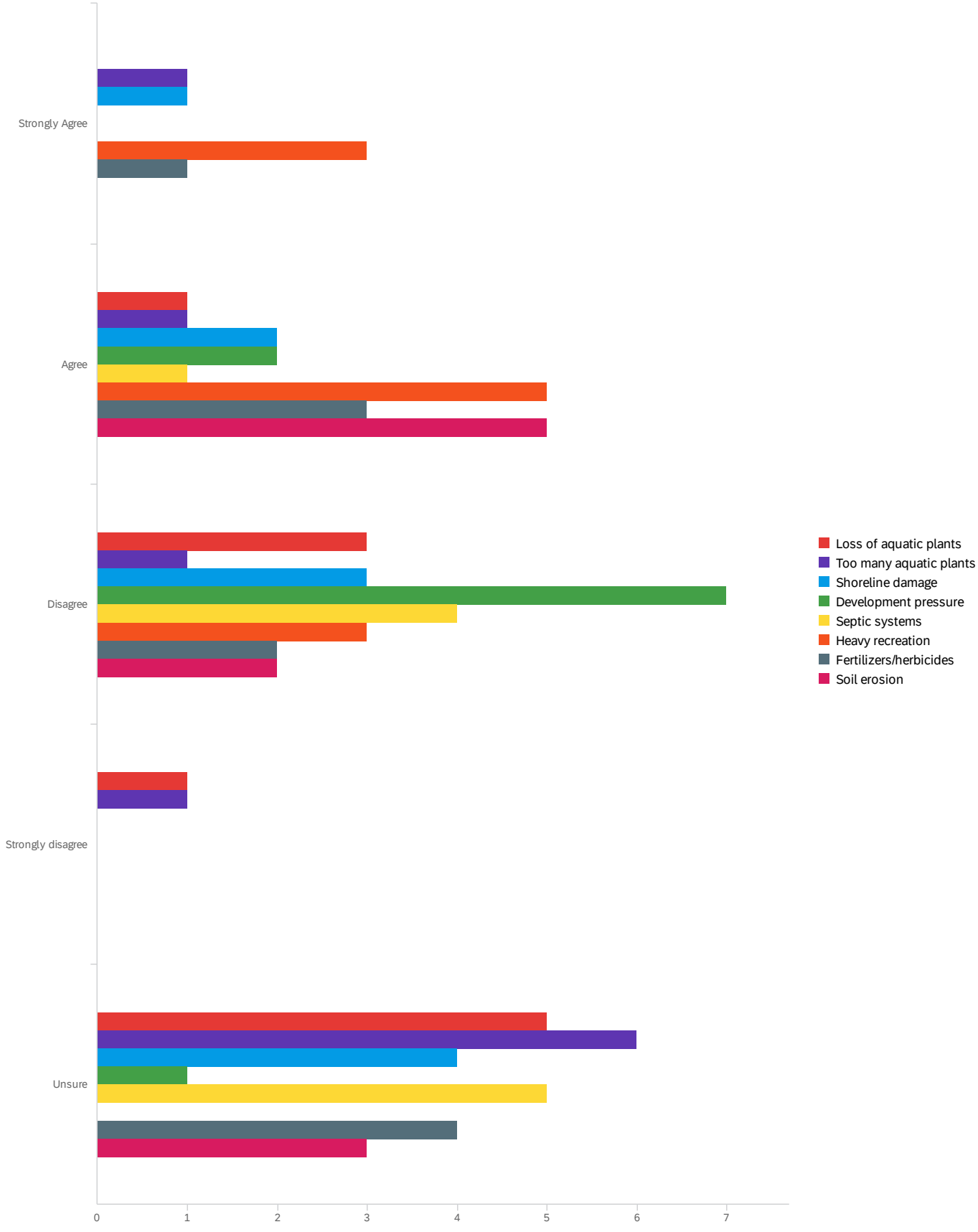
Q18 - During the time that you have lived on, visited or recreated on the lake, how would you say the water quality has changed?



#	Field	Choice Count	
1	Improved	0%	0
2	Declined	53%	8
3	Stayed the same	40%	6
4	Unsure	7%	1
			15

Showing rows 1 - 5 of 5

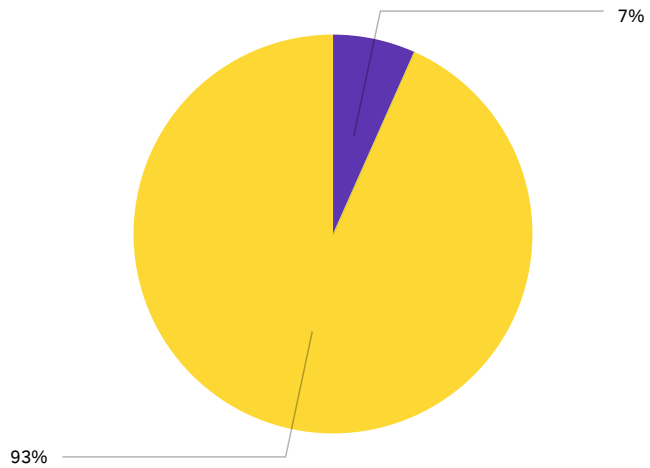
Q19 - If you think it has declined, what, in your opinion, are the primary causes?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Loss of aquatic plants	0% 0	10% 1	30% 3	10% 1	50% 5	10
2	Too many aquatic plants	10% 1	10% 1	10% 1	10% 1	60% 6	10
3	Shoreline damage	10% 1	20% 2	30% 3	0% 0	40% 4	10
4	Development pressure	0% 0	20% 2	70% 7	0% 0	10% 1	10
5	Septic systems	0% 0	10% 1	40% 4	0% 0	50% 5	10
6	Heavy recreation	27% 3	45% 5	27% 3	0% 0	0% 0	11
7	Fertilizers/herbicides	10% 1	30% 3	20% 2	0% 0	40% 4	10
8	Soil erosion	0% 0	50% 5	20% 2	0% 0	30% 3	10

Showing rows 1 - 8 of 8

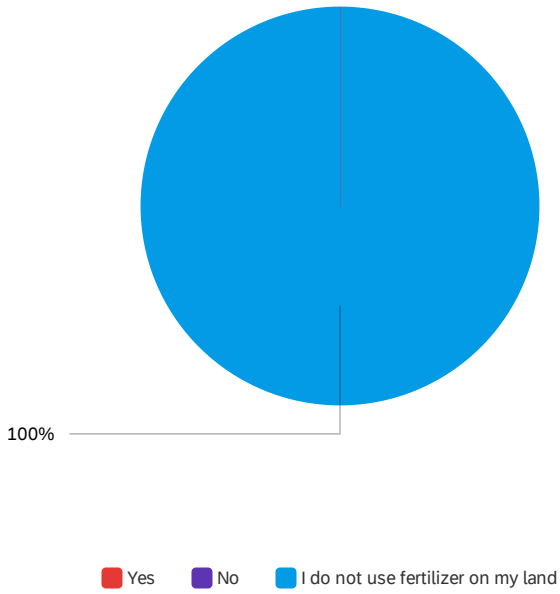
Q20 - If you use fertilizers or herbicides on your land, where are they applied?



#	Field	Choice Count
1	Lawn	0% 0
2	Garden	7% 1
3	Agricultural fields	0% 0
4	Other	0% 0
5	I do not use fertilizers or herbicides on my land	93% 14
		15

Showing rows 1 - 6 of 6

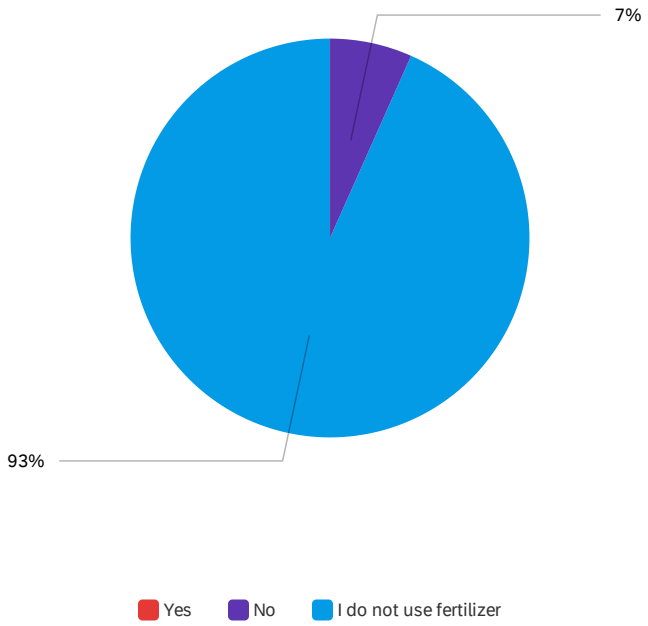
Q21 - Do you use fertilizer that contains phosphorus?



#	Field	Choice Count
1	Yes	0% 0
2	No	0% 0
4	I do not use fertilizer on my land	100% 14
		14

Showing rows 1 - 4 of 4

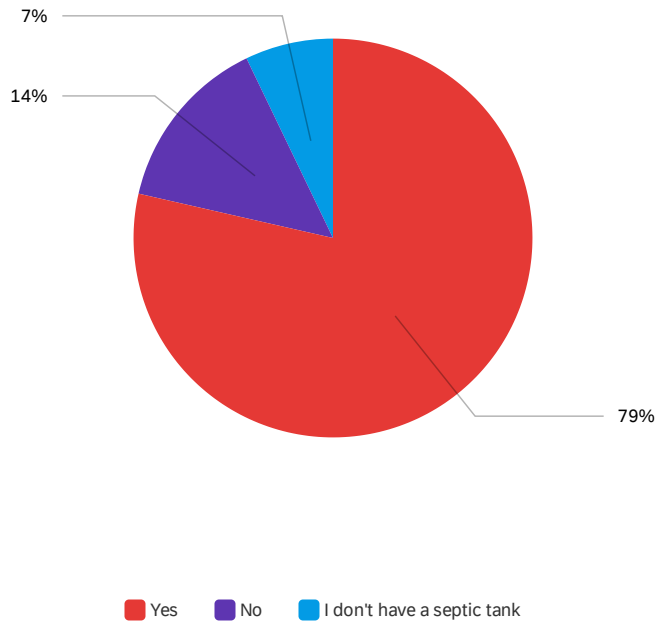
Q23 - Have you had your soil tested before using fertilizer?



#	Field	Choice Count
1	Yes	0% 0
2	No	7% 1
3	I do not use fertilizer	93% 14
		15

Showing rows 1 - 4 of 4

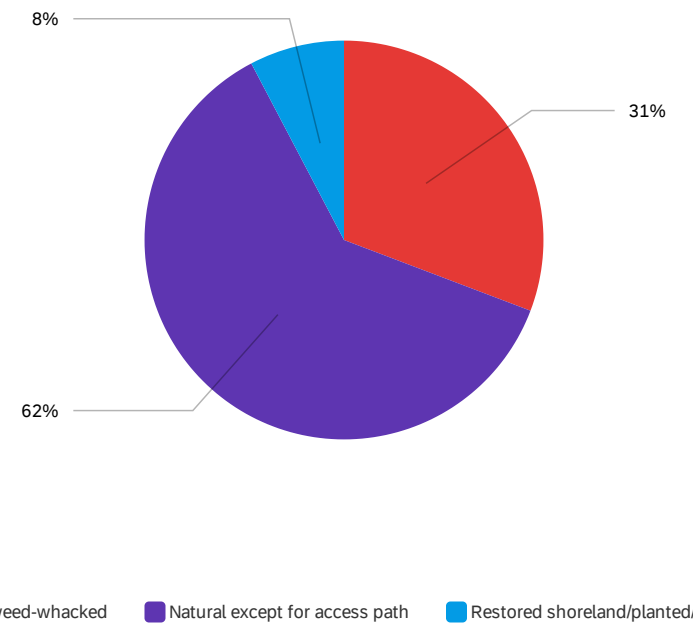
Q22 - Do you have your septic tank pumped regularly (at least every 3 years)?



#	Field		Choice Count
1	Yes	79%	11
2	No	14%	2
3	I don't have a septic tank	7%	1
			14

Showing rows 1 - 4 of 4

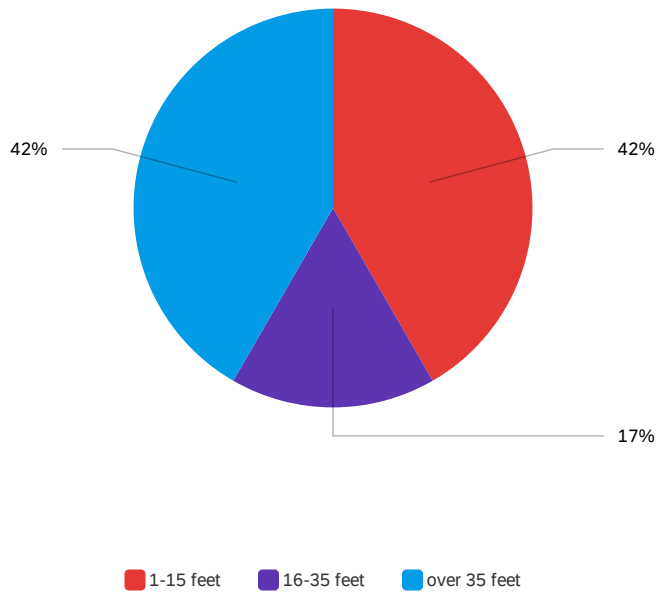
Q25 - How do you currently manage the majority of your property within 35 feet of the lake?



#	Field		Choice Count
1	Mowed or weed-whacked	31%	4
2	Natural except for access path	62%	8
3	Restored shoreland/planted/landscaped	8%	1
			13

Showing rows 1 - 4 of 4

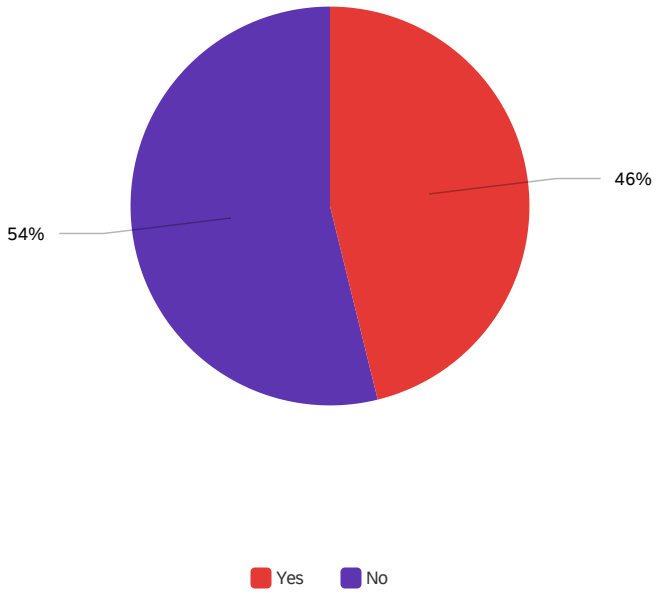
Q26 - If you have unmowed shoreland vegetation, how far inland from the water's edge does it extend?



#	Field		Choice Count
1	1-15 feet	42%	5
2	16-35 feet	17%	2
3	over 35 feet	42%	5
			12

Showing rows 1 - 4 of 4

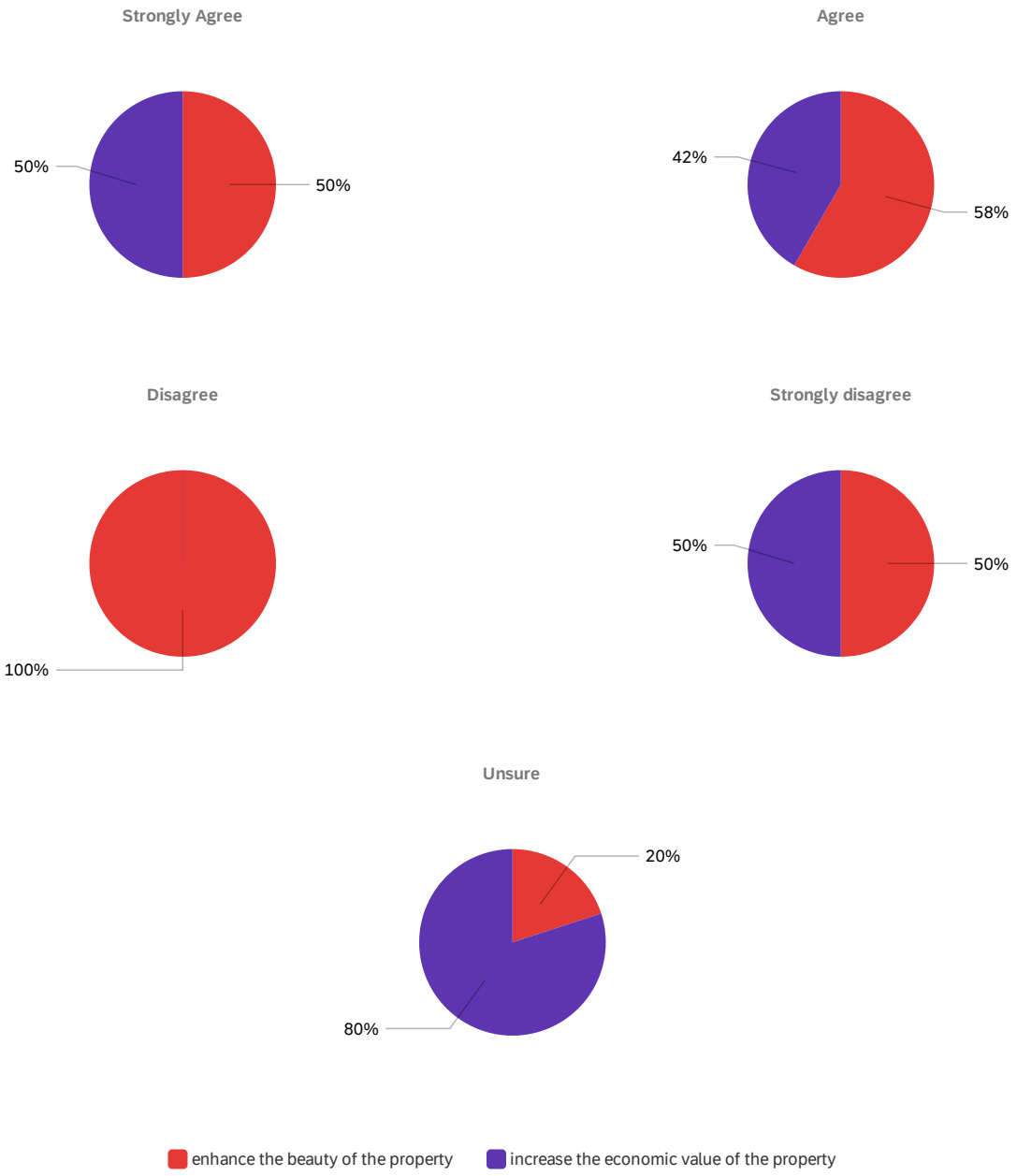
Q31 - Do you have woody structure such as fallen trees or large branches in the shallow water along your property?



#	Field		Choice Count
1	Yes	46%	6
2	No	54%	7
			13

Showing rows 1 - 3 of 3

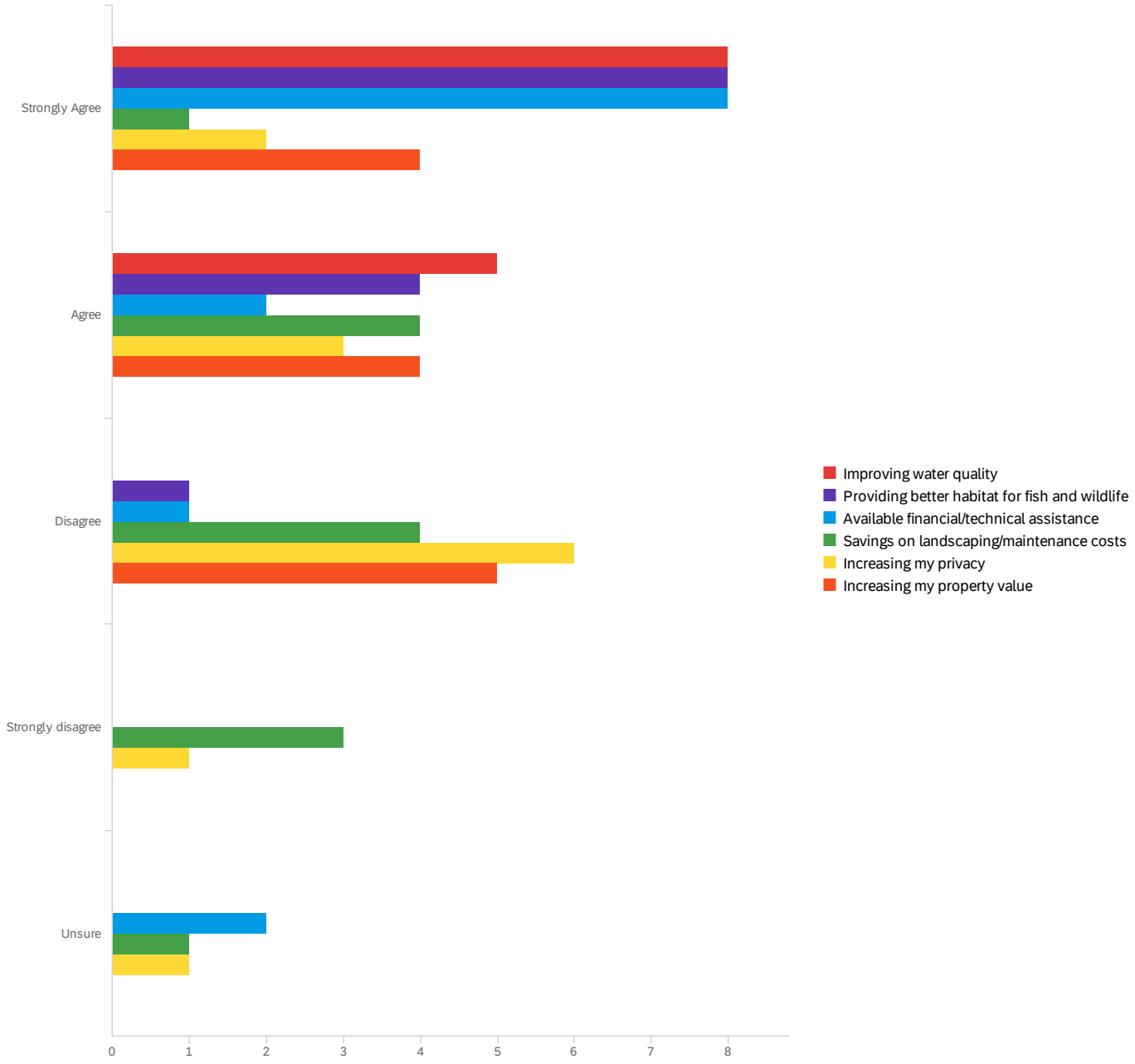
Q27 - In your opinion, does shoreland vegetation...



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	enhance the beauty of the property	27% 4	47% 7	7% 1	13% 2	7% 1	15
2	increase the economic value of the property	27% 4	33% 5	0% 0	13% 2	27% 4	15

Showing rows 1 - 2 of 2

Q28 - What might motivate you to change how you manage your shoreland?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Improving water quality	62% 8	38% 5	0% 0	0% 0	0% 0	13
2	Providing better habitat for fish and wildlife	62% 8	31% 4	8% 1	0% 0	0% 0	13
3	Available financial/technical assistance	62% 8	15% 2	8% 1	0% 0	15% 2	13
4	Savings on landscaping/maintenance costs	8% 1	31% 4	31% 4	23% 3	8% 1	13
5	Increasing my privacy	15% 2	23% 3	46% 6	8% 1	8% 1	13

#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
6	Increasing my property value	31% 4	31% 4	38% 5	0% 0	0% 0	13

Showing rows 1 - 6 of 6

Q32 - In your opinion, which statement best describes the amount of aquatic plant growth in Waubee Lake?

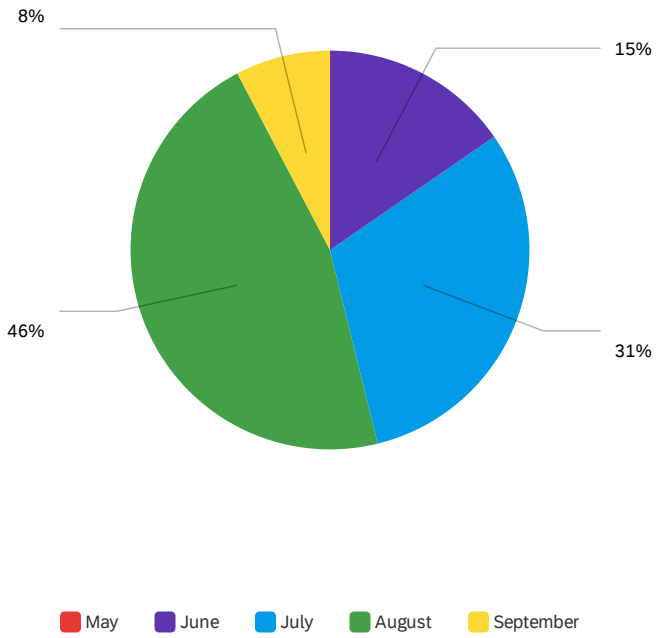
#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Less than optimum for fish and wildlife	0% 0	13% 2	47% 7	7% 1	33% 5	15
2	Just the right amount for fish and wildlife	7% 1	47% 7	7% 1	0% 0	40% 6	15
3	More than optimum for fish and wildlife	0% 0	40% 6	27% 4	7% 1	27% 4	15
4	Little to none	0% 0	7% 1	40% 6	40% 6	13% 2	15
5	Present, but does not substantially affect my use of the lake	7% 1	60% 9	13% 2	7% 1	13% 2	15
6	Dense, affects my use of the lake	0% 0	13% 2	53% 8	20% 3	13% 2	15

Showing rows 1 - 6 of 6

#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Less than optimum for fish and wildlife	0% 0	13% 2	47% 7	7% 1	33% 5	15
2	Just the right amount for fish and wildlife	7% 1	47% 7	7% 1	0% 0	40% 6	15
3	More than optimum for fish and wildlife	0% 0	40% 6	27% 4	7% 1	27% 4	15
4	Little to none	0% 0	7% 1	40% 6	40% 6	13% 2	15
5	Present, but does not substantially affect my use of the lake	7% 1	60% 9	13% 2	7% 1	13% 2	15
6	Dense, affects my use of the lake	0% 0	13% 2	53% 8	20% 3	13% 2	15

Showing rows 1 - 6 of 6

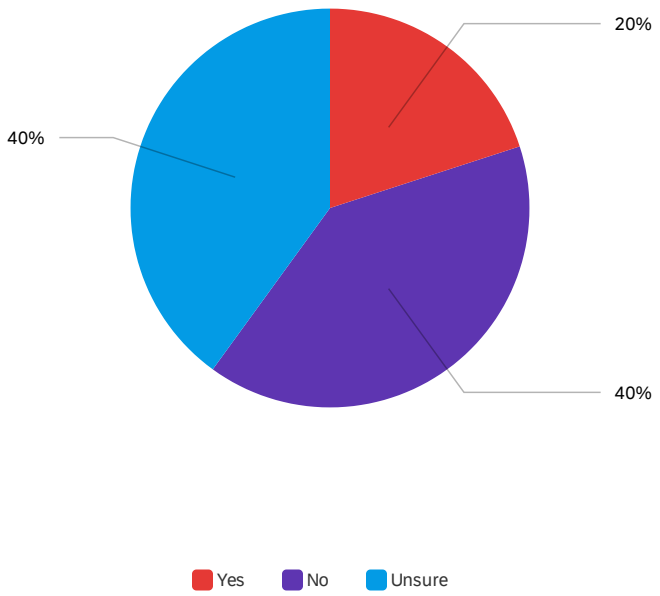
Q33 - If you think the plant growth in Waubee Lake is dense, what month(s) do the problems occur? Check all that apply.



#	Field	Choice Count
1	May	0% 0
2	June	15% 2
3	July	31% 4
4	August	46% 6
5	September	8% 1
		13

Showing rows 1 - 6 of 6

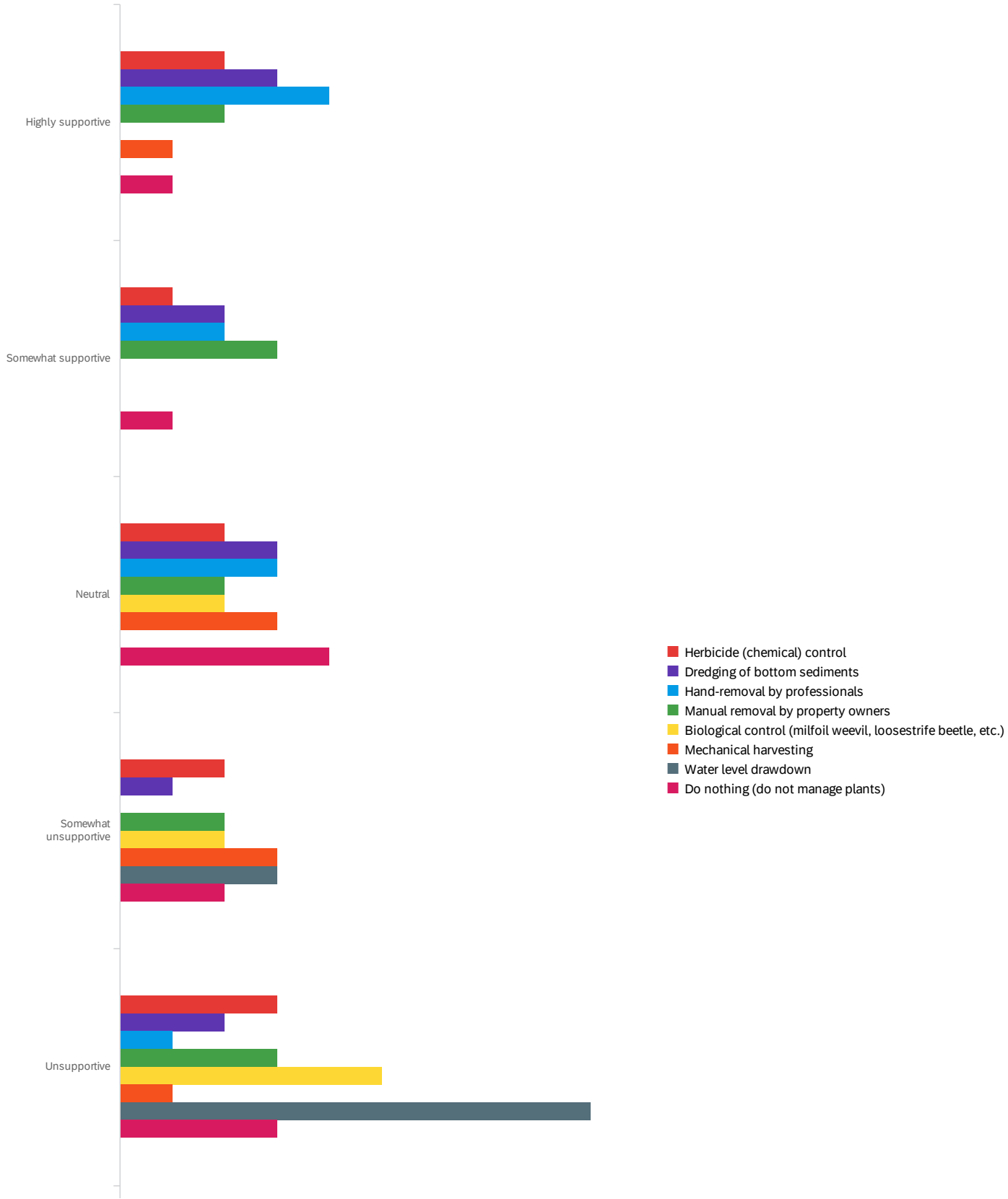
Q34 - Do you believe aquatic plant control is needed on Waubee Lake?

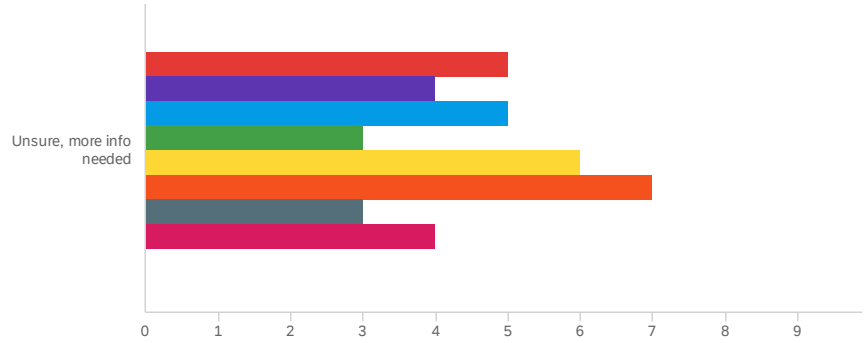


#	Field	Choice Count	
1	Yes	20%	3
2	No	40%	6
3	Unsure	40%	6
			15

Showing rows 1 - 4 of 4

Q35 - What is your level of support for the responsible use of the following techniques to manage aquatic plants on Waubee Lake?

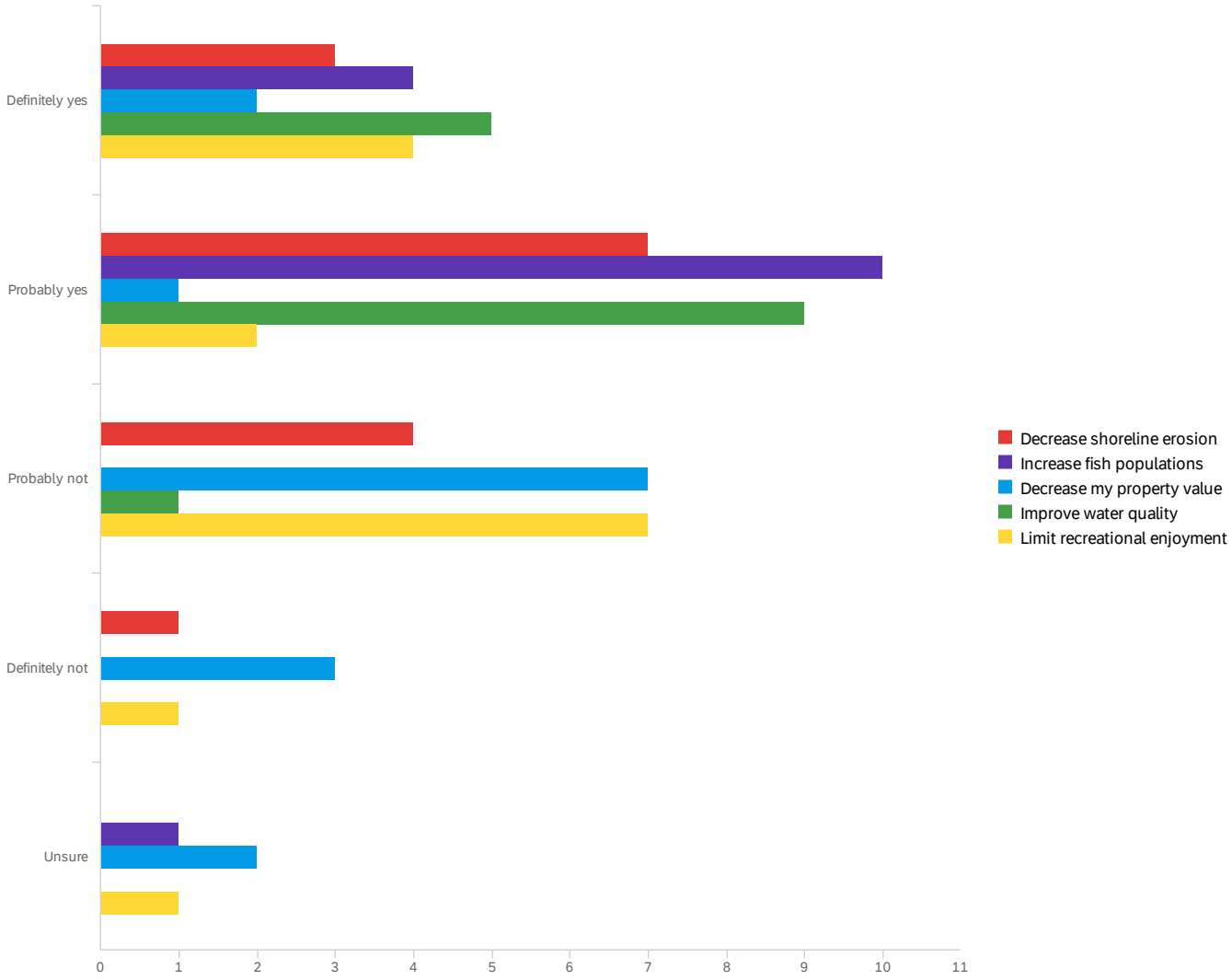




#	Field	Highly supportive	Somewhat supportive	Neutral	Somewhat unsupportive	Unsupportive	Unsure, more info needed	Total
1	Herbicide (chemical) control	13% 2	7% 1	13% 2	13% 2	20% 3	33% 5	15
2	Dredging of bottom sediments	20% 3	13% 2	20% 3	7% 1	13% 2	27% 4	15
3	Hand-removal by professionals	27% 4	13% 2	20% 3	0% 0	7% 1	33% 5	15
4	Manual removal by property owners	13% 2	20% 3	13% 2	13% 2	20% 3	20% 3	15
5	Biological control (milfoil weevil, loosestrife beetle, etc.)	0% 0	0% 0	13% 2	13% 2	33% 5	40% 6	15
6	Mechanical harvesting	7% 1	0% 0	20% 3	20% 3	7% 1	47% 7	15
7	Water level drawdown	0% 0	0% 0	0% 0	20% 3	60% 9	20% 3	15
8	Do nothing (do not manage plants)	7% 1	7% 1	27% 4	13% 2	20% 3	27% 4	15

Showing rows 1 - 8 of 8

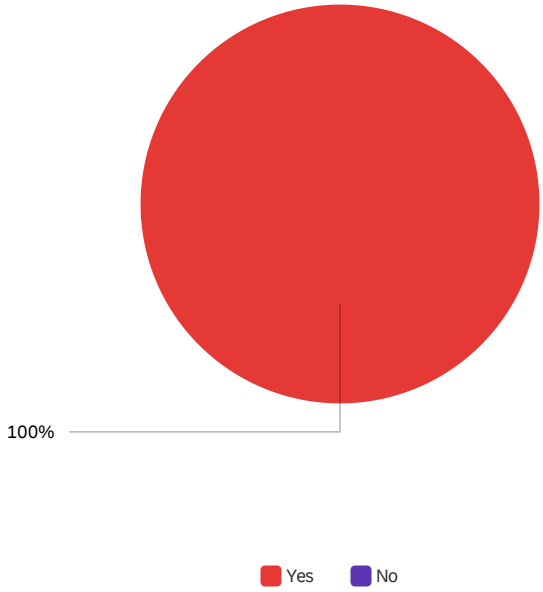
Q36 - In your opinion, does establishing or maintaining native vegetation in the water in the near-shore area...



#	Field	Definitely yes	Probably yes	Probably not	Definitely not	Unsure	Total
1	Decrease shoreline erosion	20% 3	47% 7	27% 4	7% 1	0% 0	15
2	Increase fish populations	27% 4	67% 10	0% 0	0% 0	7% 1	15
3	Decrease my property value	13% 2	7% 1	47% 7	20% 3	13% 2	15
4	Improve water quality	33% 5	60% 9	7% 1	0% 0	0% 0	15
5	Limit recreational enjoyment	27% 4	13% 2	47% 7	7% 1	7% 1	15

Showing rows 1 - 5 of 5

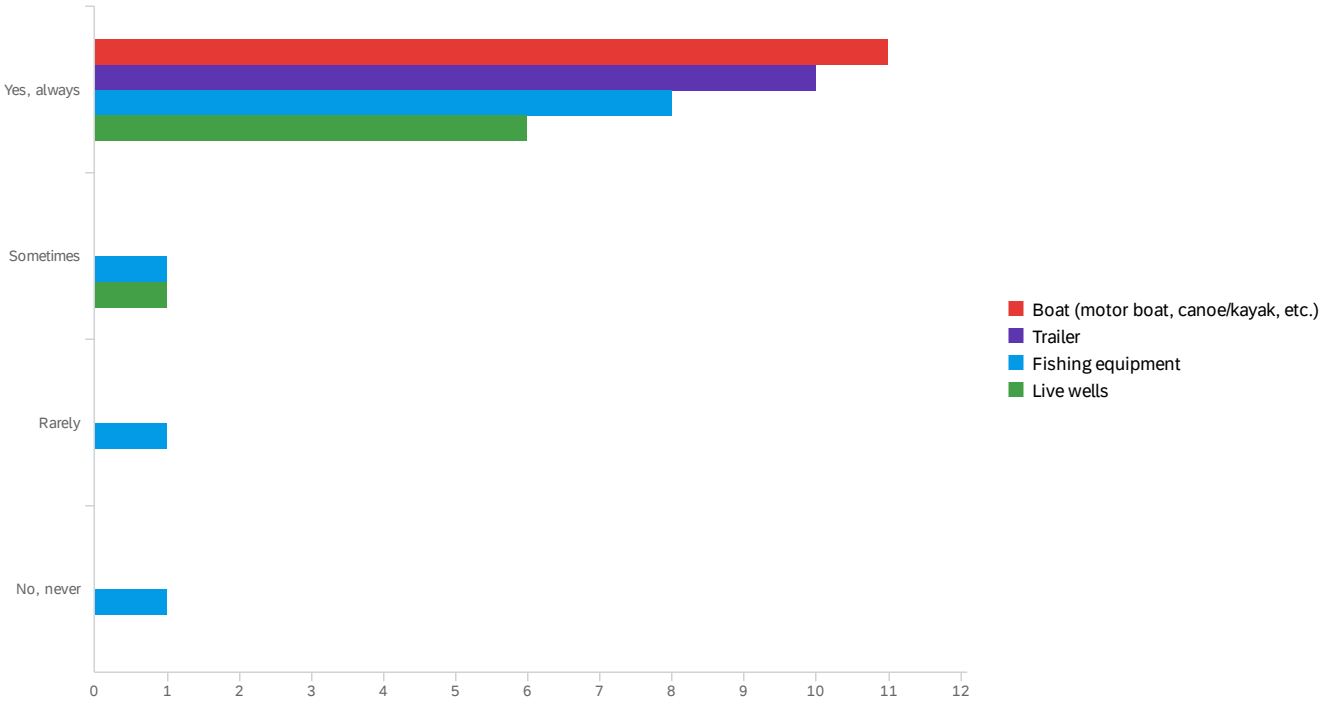
Q37 - Are you aware of invasive species (in general)?



#	Field	Choice Count	
1	Yes	100%	15
2	No	0%	0
			15

Showing rows 1 - 3 of 3

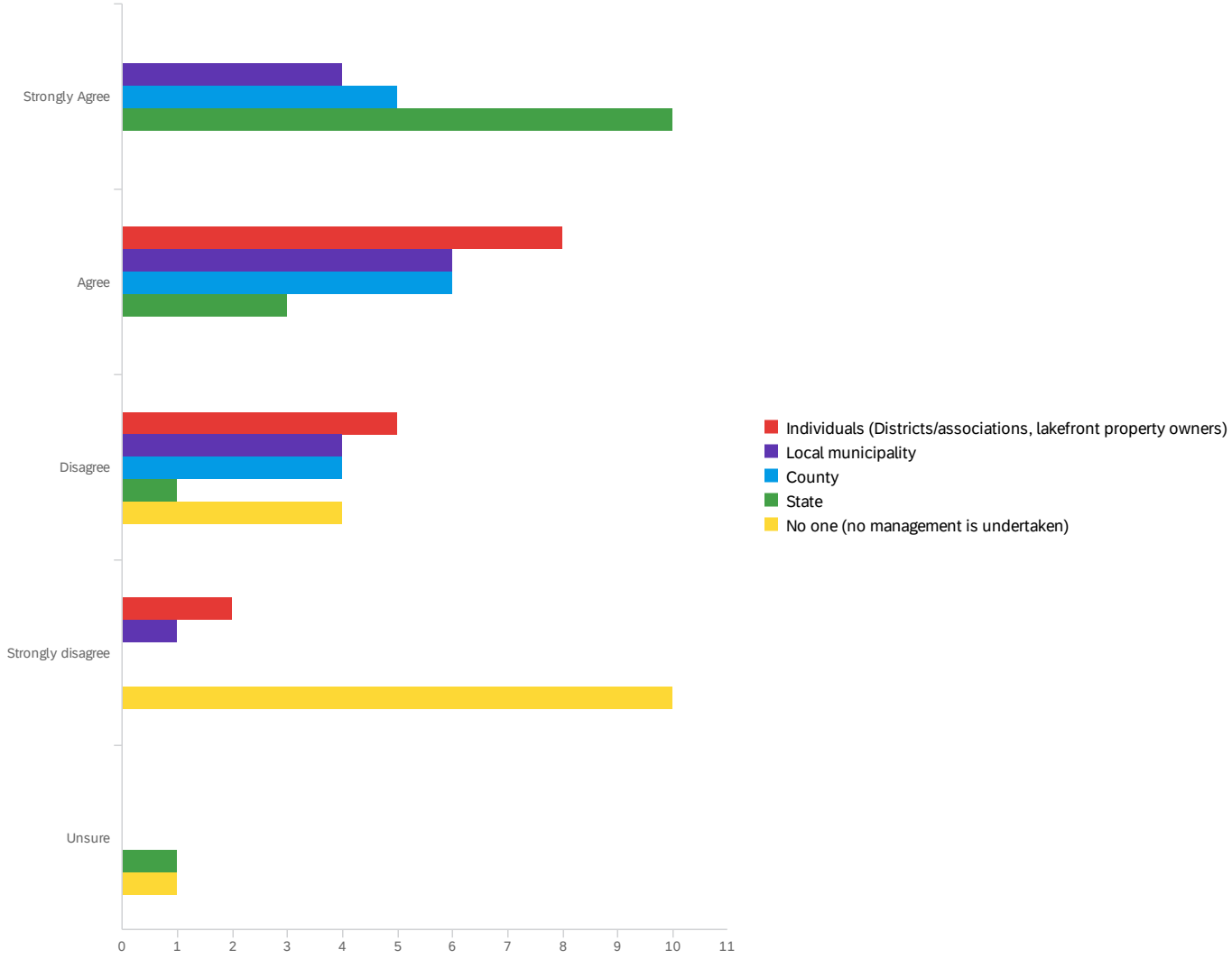
Q39 - After you have been to another lake, do you clean your.... before bringing it back to Waubee Lake?



#	Field	Yes, always	Sometimes	Rarely	No, never	Total
1	Boat (motor boat, canoe/kayak, etc.)	100% 11	0% 0	0% 0	0% 0	11
2	Trailer	100% 10	0% 0	0% 0	0% 0	10
3	Fishing equipment	73% 8	9% 1	9% 1	9% 1	11
4	Live wells	86% 6	14% 1	0% 0	0% 0	7

Showing rows 1 - 4 of 4

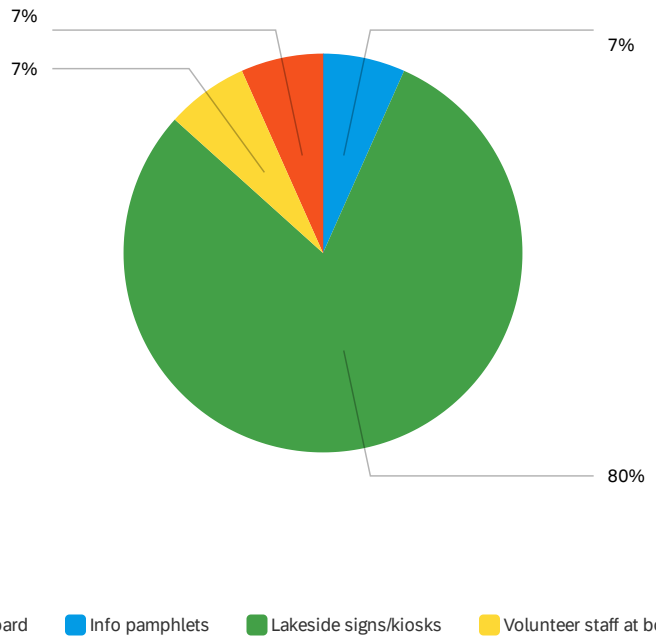
Q40 - Who should pay the cost of managing invasive aquatic plants?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Individuals (Districts/associations, lakefront property owners)	0% 0	53% 8	33% 5	13% 2	0% 0	15
2	Local municipality	27% 4	40% 6	27% 4	7% 1	0% 0	15
3	County	33% 5	40% 6	27% 4	0% 0	0% 0	15
4	State	67% 10	20% 3	7% 1	0% 0	7% 1	15
5	No one (no management is undertaken)	0% 0	0% 0	27% 4	67% 10	7% 1	15

Showing rows 1 - 5 of 5

Q41 - What is the most effective way to inform others about aquatic invasive species?



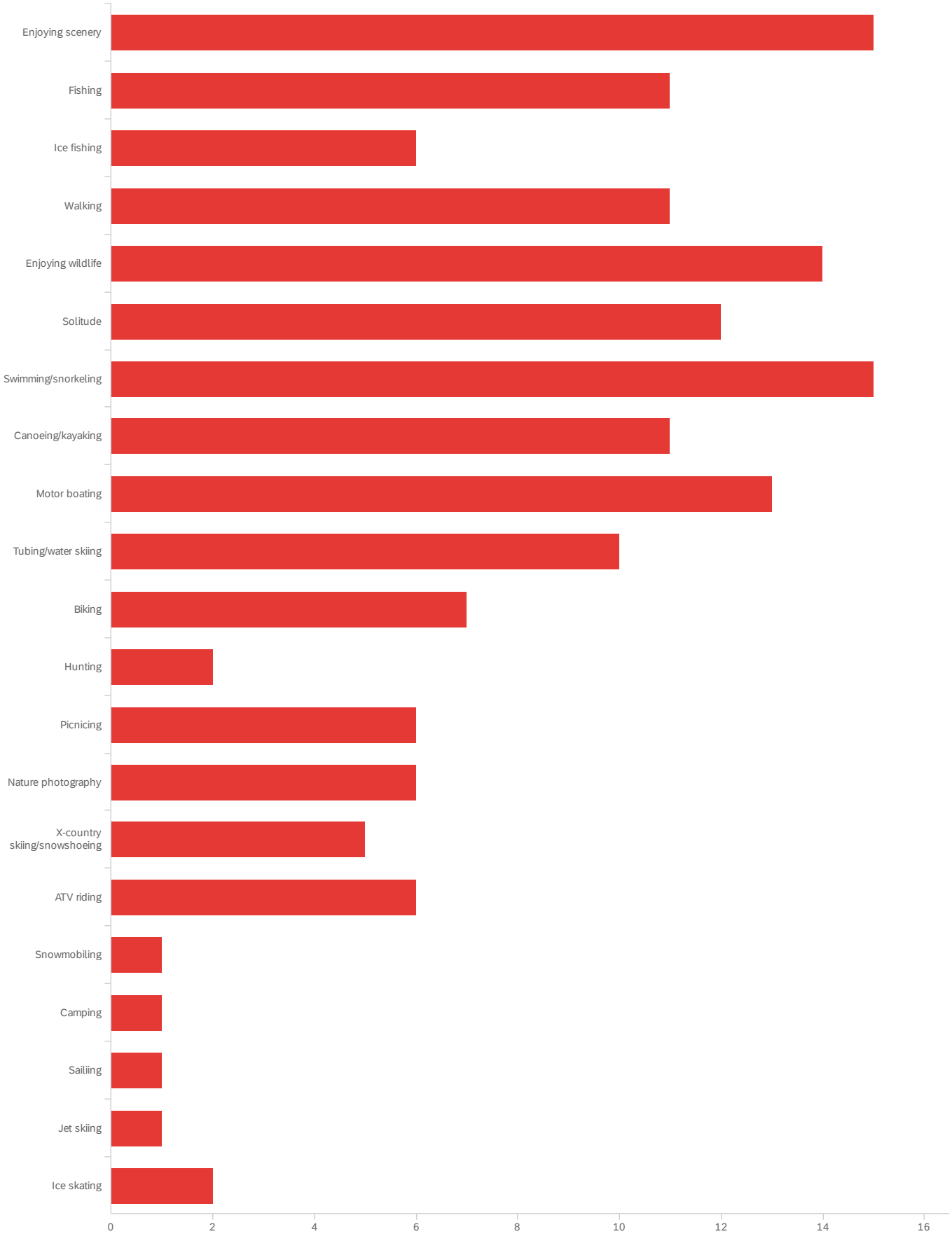
#	Field	Choice Count
1	Newspaper	0% 0
2	Billboard	0% 0
3	Info pamphlets	7% 1
4	Lakeside signs/kiosks	80% 12
5	Volunteer staff at boat launch	7% 1
6	Other	7% 1
		15

Showing rows 1 - 7 of 7

Q12 - In your opinion, what should be done to restore, maintain or improve Waubee Lake?

In your opinion, what should be done to restore, maintain or improve Waubee...
not sure
Stop investing money in stocking fish and focus on keeping out invasives.
Keep invasive plants and fish out and improve fish management
Continued study and action plan
middle bay should become a no wake zone
limit size of motors on lake, enforce rules of the lake, continue to develop the fish habitats and continue to educate on lake/water management
Establish no wake rule in east bay
too many downed trees in lake..
I strongly believe the lake needs to be dredged. The muck/sediment is out of control.
Have a plan for silt/muck accumulation.
No wake zone in the two smaller bays
Maintain the public beach area better, along with the boat landing.
Keep an eye on Waubee Lake Association. They've been trying for years to ruin Mary Park by trying to Make it go "natural". That way no one can enjoy the Lake except for the waterfront owners. The township owns the park. Not the association.

Q45 - What recreational activities do you partake in on Waubee Lake (check all that apply)?



#	Field	Choice Count

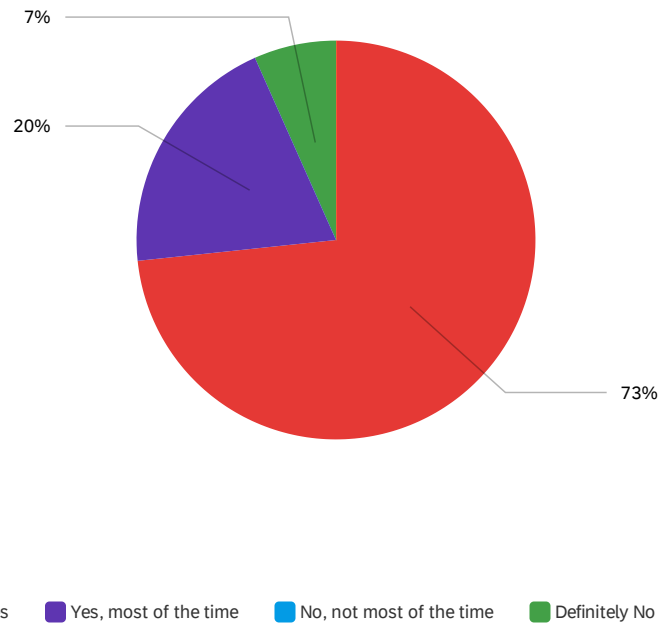
#	Field		Choice Count
1	Enjoying scenery	10%	15
2	Fishing	7%	11
3	Ice fishing	4%	6
4	Walking	7%	11
5	Enjoying wildlife	9%	14
6	Solitude	8%	12
7	Swimming/snorkeling	10%	15
8	Canoeing/kayaking	7%	11
9	Motor boating	8%	13
10	Tubing/water skiing	6%	10
11	Biking	4%	7
12	Hunting	1%	2
13	Picnicing	4%	6
14	Nature photography	4%	6
15	X-country skiing/snowshoeing	3%	5
16	ATV riding	4%	6
17	Snowmobiling	1%	1
18	Camping	1%	1
19	Sailiing	1%	1
20	Jet skiing	1%	1
21	Ice skating	1%	2
			156

Showing rows 1 - 22 of 22

Q46 - Other recreational activities not included above:

Other recreational activities not included above:
utv

Q47 - "No Wake" is allowed on Waubee Lake between 6pm and 11am. Do you like the current "No Wake" rules as they are?



#	Field		Choice Count
1	Definitely Yes	73%	11
2	Yes, most of the time	20%	3
3	No, not most of the time	0%	0
4	Definitely No	7%	1
5	Unsure	0%	0
			15

Showing rows 1 - 6 of 6

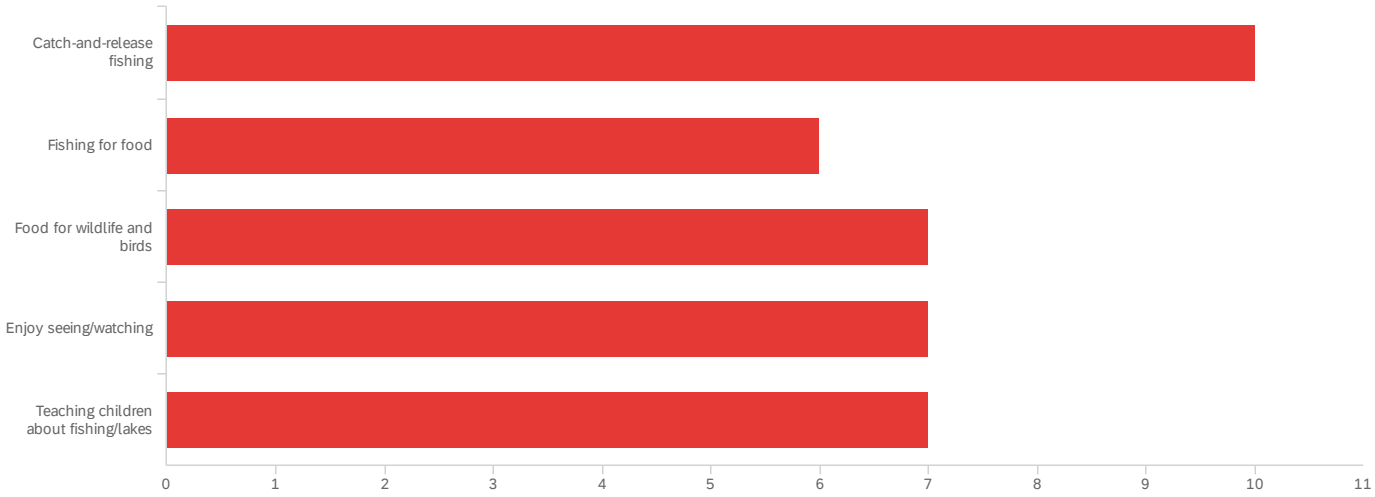
Q48 - If you think the "No Wake" rules should be adjusted...in what way?

If you think the "No Wake" rules should be adjusted...in what way?
I would like to see them start at 10 a.m. instead of 11
I'd like it to start at 10am. Ending at 6 pm is fine.
No
no, they should be enforced,though.
Make east bay no wake at all times
No wake zone in the two smaller bays
Should be enforced better.

Q49 - What could be done to improve your recreation experience on Waubee Lake?

What could be done to improve your recreation experience on Waubee Lake?
Do something about the park. People that use it don't pick up after themselves and don't understand the rules of the lake
Stocking more fish
Ban jet skis
middle bay should become a no wake area as you are heading East into the next little bay, people do not obey the 200 foot across rule (100 feet on each side of shorelines in neckdown)
enforce current rules
Longer no wake hours
Have a plan for sustainability
More no wake zones with enforcement
A Pier by the pool landing ..
Ban jet skis on the lake. As small as Waubee Lake is, it's vertually imposible to legally run one with the legal distance from shore, people, boaters/tubers/skiers, fisherman, swimmers, etc. Loud and very unsafe.

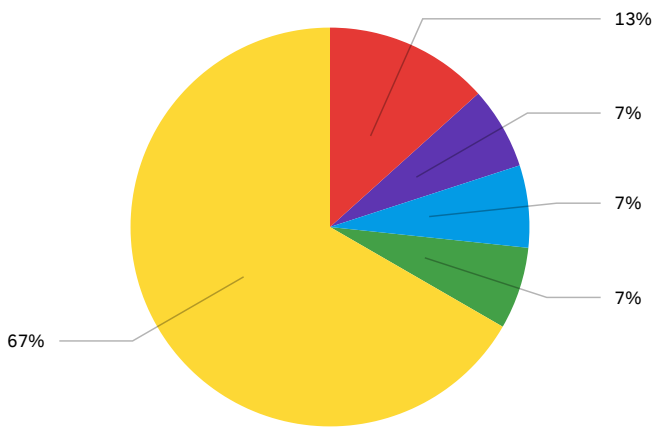
Q51 - For what purposes do you value the fishery in Waubee Lake? (Check all that apply)



#	Field		Choice Count
1	Catch-and-release fishing	27%	10
2	Fishing for food	16%	6
3	Food for wildlife and birds	19%	7
4	Enjoy seeing/watching	19%	7
5	Teaching children about fishing/lakes	19%	7
			37

Showing rows 1 - 6 of 6

Q52 - How many years experience do you have fishing Waubee Lake?

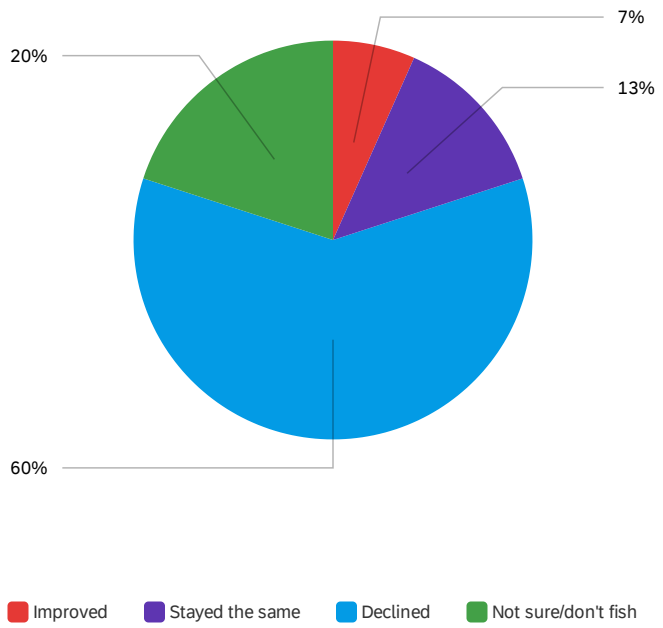


I don't fish Waubee Lake 1-5 years 6-10 years 11-20 years More than 20 years

#	Field	Choice Count	
1	I don't fish Waubee Lake	13%	2
2	1-5 years	7%	1
3	6-10 years	7%	1
4	11-20 years	7%	1
5	More than 20 years	67%	10
			15

Showing rows 1 - 6 of 6

Q53 - In the time you have been fishing Waubee Lake, would you say the quality of fishing has...



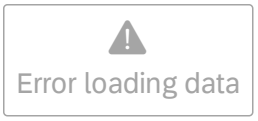
#	Field		Choice Count
1	Improved	7%	1
2	Stayed the same	13%	2
3	Declined	60%	9
4	Not sure/don't fish	20%	3
			15

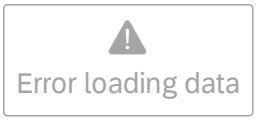
Showing rows 1 - 5 of 5

Q54 - What do you think has contributed to the change in fishing?

What do you think has contributed to the change in fishing?
not sure
Maybe over fishing years ago.
Not sure
lower lake levels in previous 10 years... last two years it has improved
Water level drop
Over fishing. Irresponsible stocking
Over fishing pan fish
Northern pike eating the smaller fish..Boat traffic.
The planting of Perch is showing to be sucsessful.

Q55 - When and how often do you fish Waubee Lake?

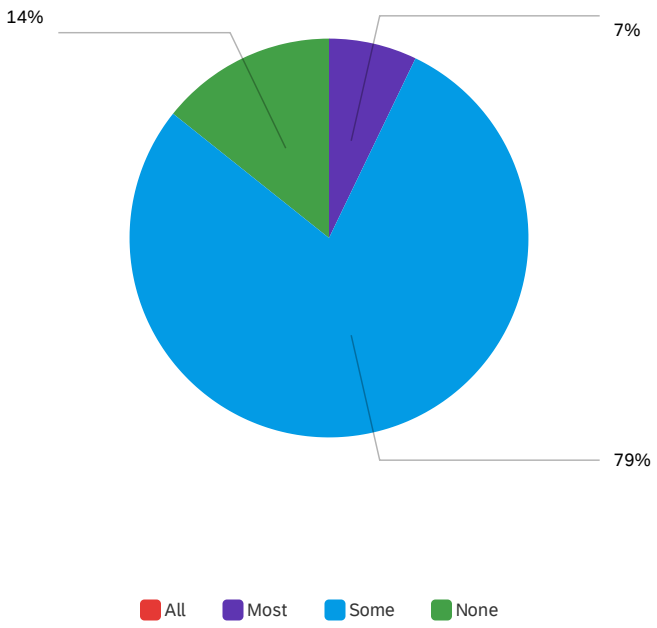




Q56 - What type of fish do you catch on Waubee Lake?

What type of fish do you catch on Waubee Lake?
bass
panfish and bass
Pan fish mostly. Some large mouth bass and walleye.
Perch, bass
Large mouth bass , northern pike
walleye, northern pike, bluegills
large mouth bass, pan fish
large mouth... but loved it when it had perch and blue gill
Large mouth bass, crappie, Blue gills, perch, rock bass, northern pike
Pan fish
Bass
bluegill
Large mouth bass, and small mouth bass.
Lg. and Sm. Mouth Bass, Northern, Bluegill, Sunfish, Perch,

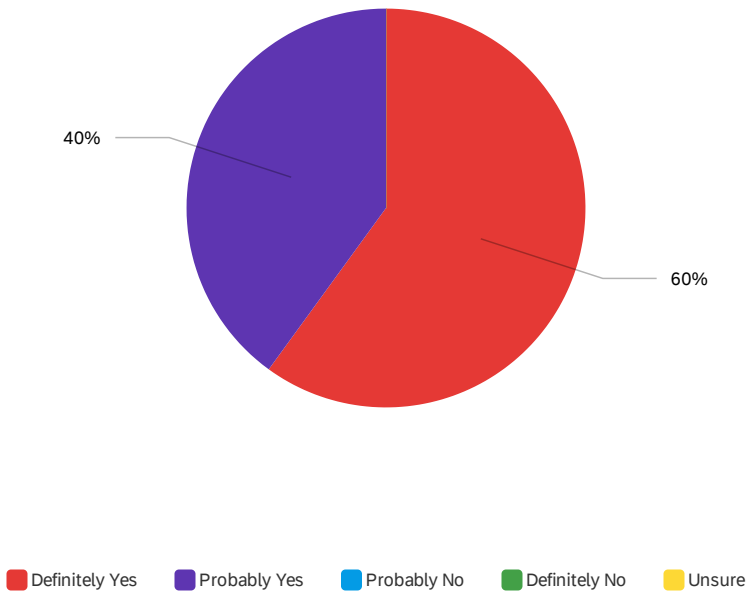
Q57 - In general, how many of the fish you catch are big enough to keep?



#	Field	Choice Count
1	All	0% 0
2	Most	7% 1
3	Some	79% 11
4	None	14% 2
		14

Showing rows 1 - 5 of 5

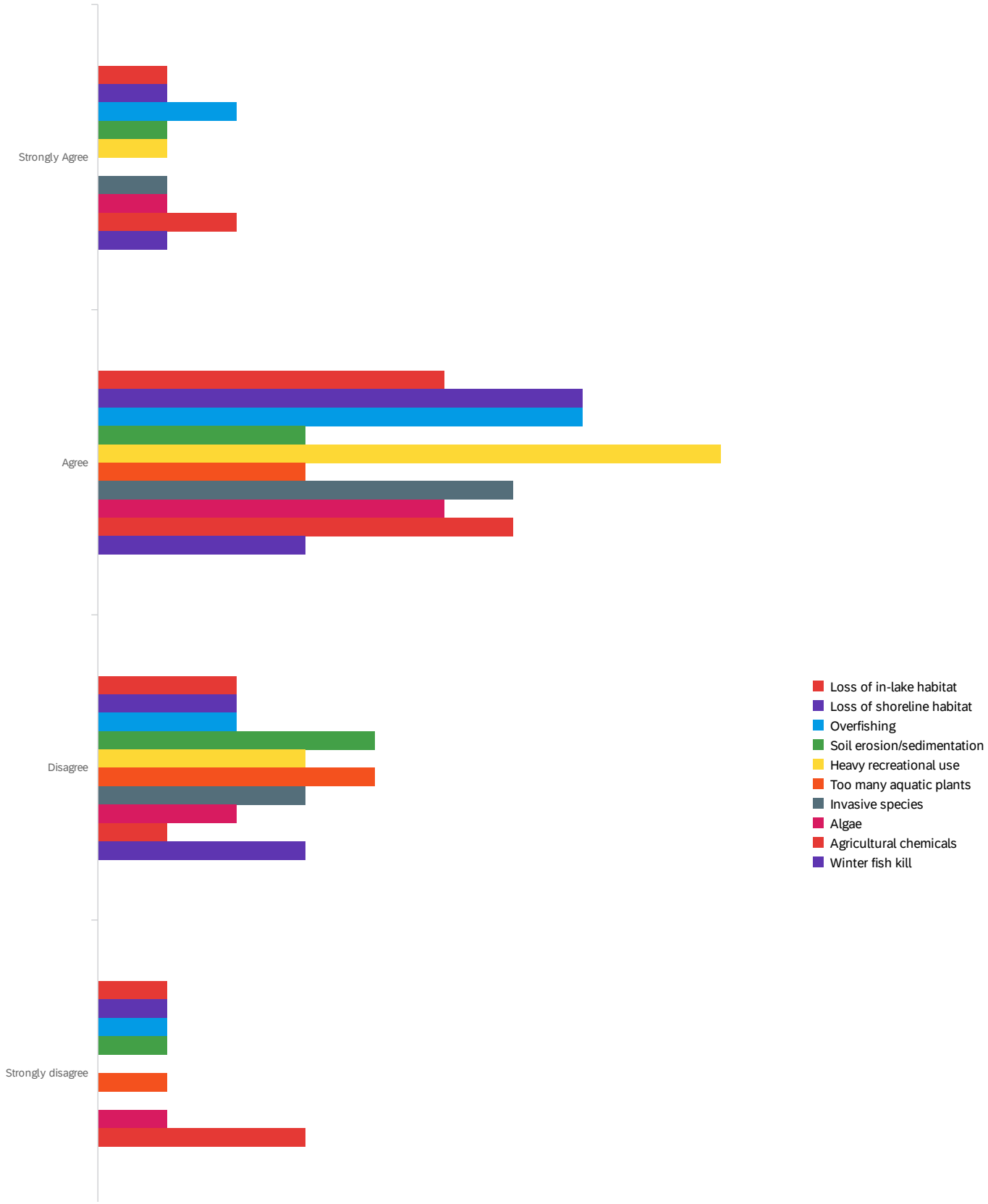
Q58 - Do you believe fish from Waubee Lake are safe to eat?

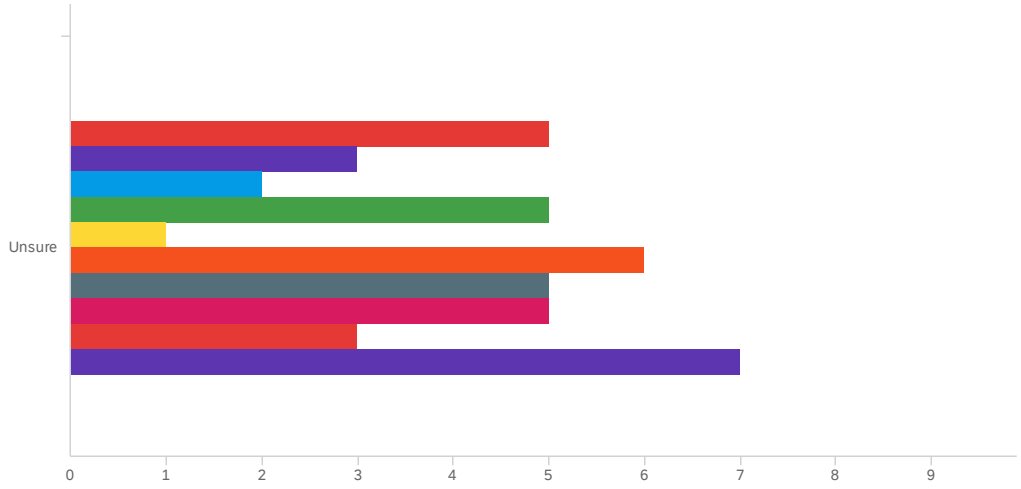


#	Field	Choice Count
1	Definitely Yes	60% 9
2	Probably Yes	40% 6
3	Probably No	0% 0
4	Definitely No	0% 0
5	Unsure	0% 0
		15

Showing rows 1 - 6 of 6

Q59 - What do you think is the greatest threat to the fishery in Waubee Lake in the next 10 years?





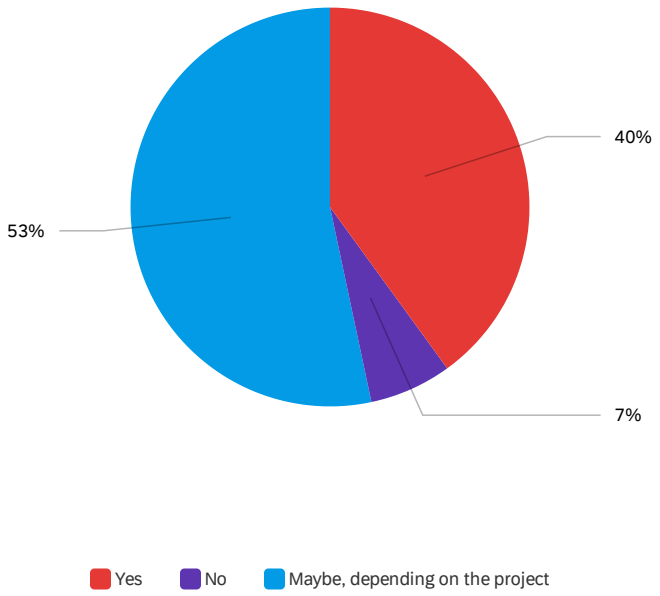
#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Loss of in-lake habitat	7% 1	36% 5	14% 2	7% 1	36% 5	14
2	Loss of shoreline habitat	7% 1	50% 7	14% 2	7% 1	21% 3	14
3	Overfishing	14% 2	50% 7	14% 2	7% 1	14% 2	14
4	Soil erosion/sedimentation	7% 1	21% 3	29% 4	7% 1	36% 5	14
5	Heavy recreational use	7% 1	64% 9	21% 3	0% 0	7% 1	14
6	Too many aquatic plants	0% 0	21% 3	29% 4	7% 1	43% 6	14
7	Invasive species	7% 1	40% 6	20% 3	0% 0	33% 5	15
8	Algae	7% 1	36% 5	14% 2	7% 1	36% 5	14
9	Agricultural chemicals	13% 2	40% 6	7% 1	20% 3	20% 3	15
10	Winter fish kill	7% 1	21% 3	21% 3	0% 0	50% 7	14

Showing rows 1 - 10 of 10

Q61 - Do you have any additional comments regarding Waubee Lake?

Do you have any additional comments regarding Waubee Lake?
Enforce the no wake in the second bay/channel. It’s dangerous, especially with a tube or skier behind the boat. Also, NO leaving a personal buoy on the lake when your boat isn’t tied up to it.
Enforcement of boats at high speeds near the shorelines
Need to plant Walleyes , and Crappies..Very few of them left.
I've been up there for over 20+ years. It's a nice little lake that doesn't need much attention. The lake does much better when the water is higher, like we have now. It's been down for lots of years. So any recent study of water quality with low water doesn't accurately tell of the lakes health. I also think that the notion of water run off impurities is very minimal. That also includes impurities from winter run off. The soil around the lake is coarse sand which drains water rapidly.

Q63 - Would you be interested in volunteering on a project on your lake (such as shoreland restoration planting, invasive species monitoring/removal, water quality monitoring, highway cleanup, etc.)?



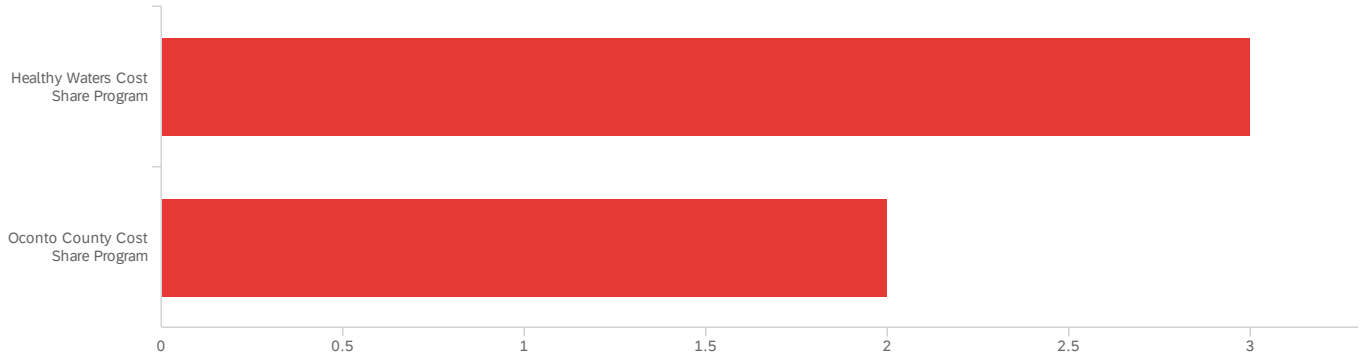
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Would you be interested in volunteering on a project on your lake (such as shoreland restoration planting, invasive species monitoring/removal, water quality monitoring, highway cleanup, etc.)?	1	3	2	1	1	15

#	Field		Choice Count
1	Yes	40%	6
2	No	7%	1
3	Maybe, depending on the project	53%	8
			15

Showing rows 1 - 4 of 4

Q64 - Are you aware of the following programs available to you from Oconto County?

(Check all that apply)



#	Field		Choice Count
1	Healthy Waters Cost Share Program	60%	3
2	Oconto County Cost Share Program	40%	2
			5

Showing rows 1 - 3 of 3

End of Report