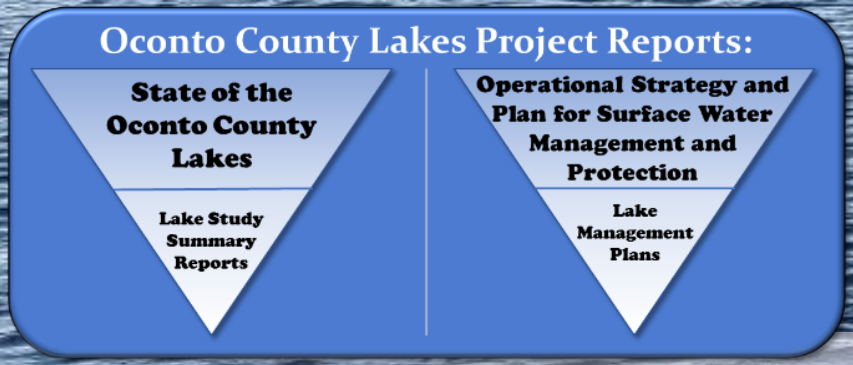
Oconto County Lakes Project

GRINDLE LAKE MANAGEMENT PLAN

2019



VISION

Grindle Lake will always be a quiet Northwoods retreat with good neighbors, an active lake association, and excellent recreation opportunities.

Grindle Lake Management Plan

The authors would like to acknowledge the commitment and enthusiasm of the Grindle Lake Area Landowners 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 Grindle 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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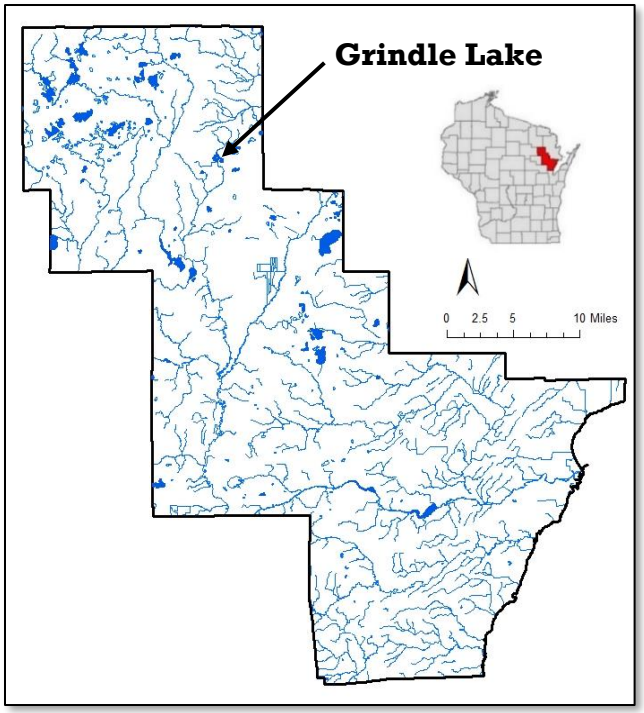
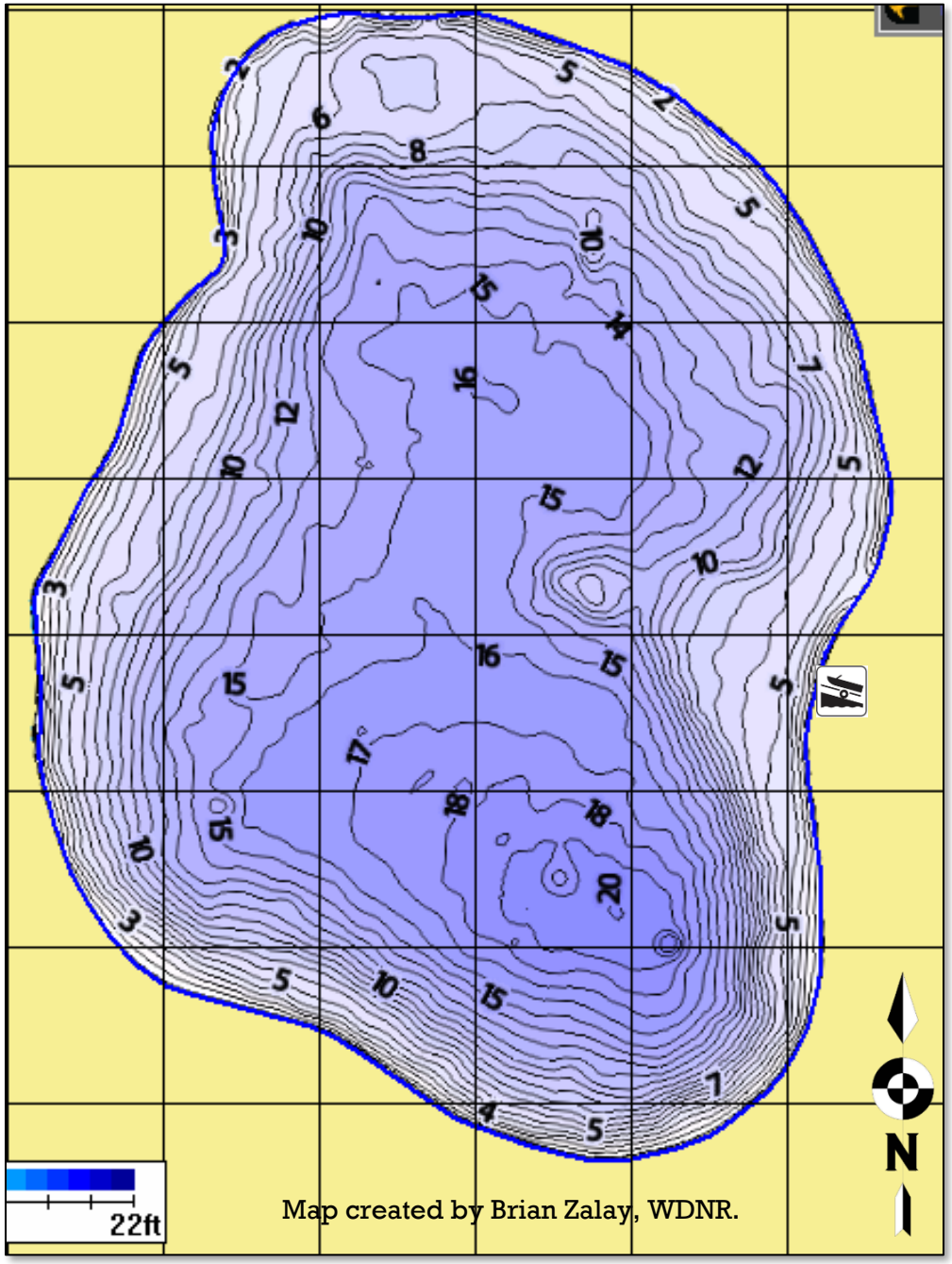
Resource	Acronym or Truncated Name
Citizen Lake Monitoring Network	CLMN
Clean Boats Clean Waters	CBCW
Grindle Lake Area Landowners Association	GLALA
Lumberjack Resource Conservation & Development Council	LRCD
Oconto County Land Conservation Dept.	OC LCD
Oconto County Board of Supervisors	OC Board
Oconto County Lakes and Waterways Association	OCLAWA
Town of Riverview	TOR
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
Wisconsin Department of Natural Resources	WDNR
Wisconsin Department of Transportation	WDOT

Background

ABOUT GRINDLE LAKE

Grindle Lake is located in the Town of Riverview, in northeast Wisconsin. This 40-acre seepage lake has a maximum depth of 23 feet with moderately clear water. Its bottom sediments are primarily sand and rock with some gravel. Visitors have access to the lake from one public boat landing on the lake's east side which is owned and maintained by the Town of Riverview. Water enters and leaves Grindle Lake primarily from groundwater.





What Is A Lake Management Plan?

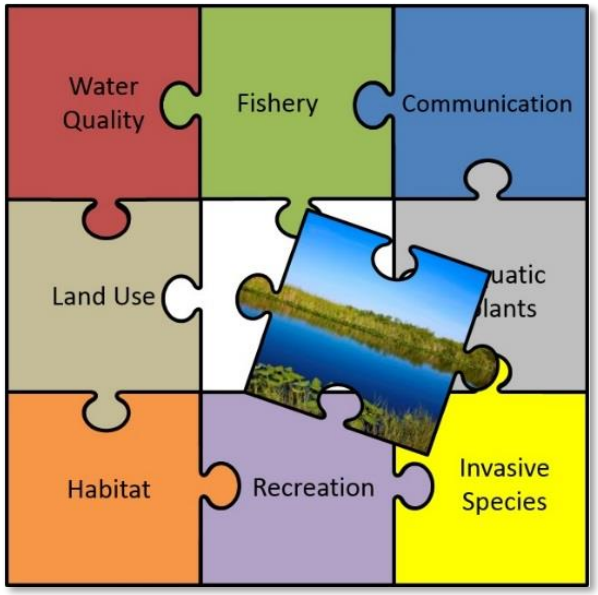
LAKE MANAGEMENT PLANS (LMP)

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.

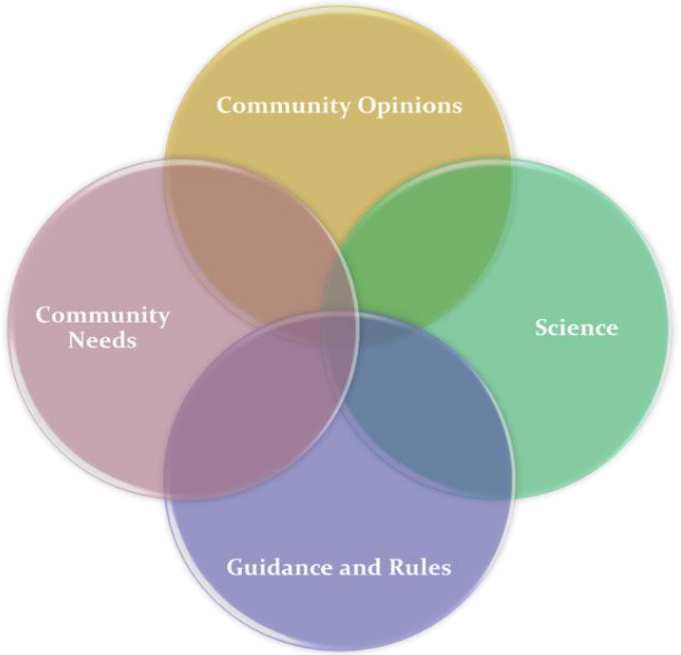
What is the purpose of this LMP?

This plan was created to ensure that Grindle Lake is healthy now and for future generations. It was designed to learn about Grindle Lake and identify features important to the Grindle 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 Grindle 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 2017-2018 alongside 5 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 Grindle 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 August 23, 2019 at the Mountain Community Center to learn from one another and make decisions about the fishery, water quality, habitat, and land management in the Grindle Lake watershed. Technical assistance during the planning process was provided by staff from OCLCD, UWEX, WDNR, and the CWSE.

How were various opinions incorporated?

Participation in the planning process was open to everyone and was encouraged by letters mailed to Grindle 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 Grindle Lake can have the greatest influence on the lake by understanding and choosing lake-friendly options to manage their land and the lake.
- **Grindle Lake Area Landowners 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 Riverview:** 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 table on page 2 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 GRINDLE 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 Grindle 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

Grindle Lake Management Plan Goals

Goals for Grindle Lake

The following goals and actions were derived from the values and concerns of citizens interested in Grindle Lake and members of the planning committee, as well as the known science about Grindle 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	**The fishery in Grindle Lake will remain healthy, well-balanced and self-sustaining.**
Goal 2	**Grindle Lake will continue to have a healthy and diverse aquatic plant community that provides habitat and good water quality, while minimizing recreational impediments and remaining free of invasive species.**
Goal 3	**Sensitive areas in Grindle Lake, which 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	**Grindle Lake's shorelands will become increasingly healthy over time. Over the next 5 years, 1,300 feet of mowed shoreland on Grindle Lake will be restored.**
Goal 6	**Maintain or improve water quality in Grindle Lake.**
Goal 7	**Lake users will be informed about and respectful of Grindle Lake.**
Goal 8	**Increase participation in lake stewardship.**
Goal 9	**Review plan annually and update as needed.**

Fish Community

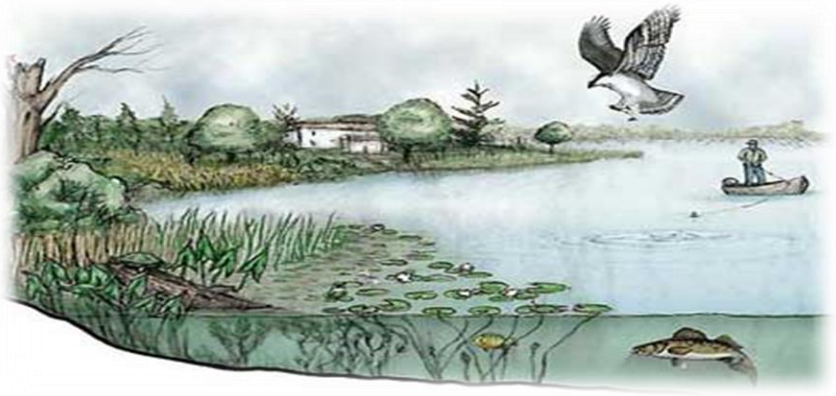
IN-LAKE HABITAT AND A HEALTHY LAKE

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 Grindle 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.

What People Value about Grindle Lake

The beauty of nature, which seems to be dwindling.

Quiet, peaceful, clean.

Serenity and wildlife.

No Wake.

Habitat provides shelter and food for fish and wildlife.

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.

Fish Community

Fish cribs are good cover for small fish, but near shore habitat is essential for reproduction of most species.

Can the fishery be improved?

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.

Grindle Lake Fishing Regulations

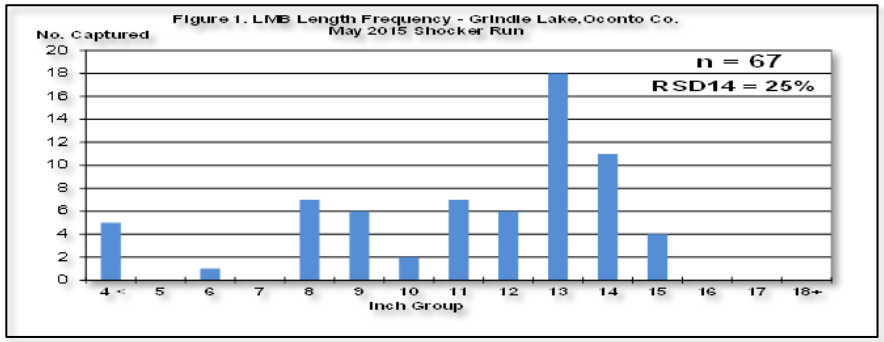
Type	Season	Min. Length	Bag Limit
Catfish	Open All Year	None	10/day
Largemouth Bass	5/4/19-3/1/20	14”	5/day
Smallmouth Bass	6/15/19-3/1/20	14”	5/day
Musky & Hybrids	5/25/19-11/30/19	40”	1/day
Northern Pike	5/4/19-3/1/20	None	5/day
Panfish	Open All Year	None	25/day
Walleye, Sauger & Hybrids	5/4/19-3/1/20	15” 20”-24” Slot	3/day Only 1>24”

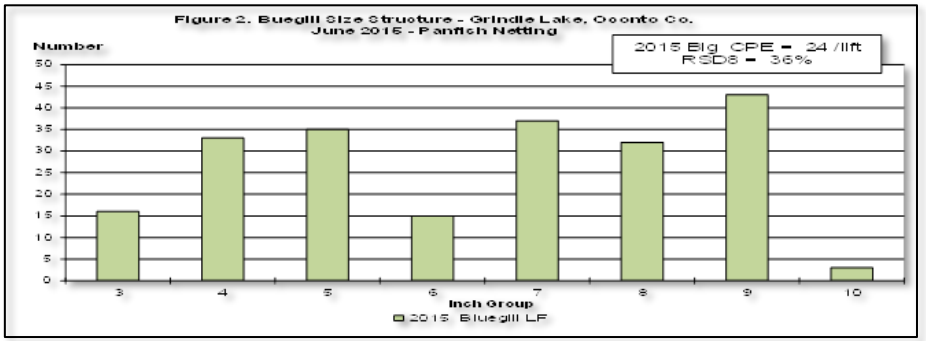
Grindle Lake is considered heavily developed with only a small portion of continuous natural shoreline (mainly on the north shore). Tree drops were installed by the USFS in 2007. Very little historical fisheries information is available, with the first known spring shocker run conducted in 2013. The lake has been known to contain largemouth bass, northern pike, bluegill and crappie.

Fish Community

Grindle Lake 2015 Fish Survey Summary

- The 2015 survey found that Grindle Lake contained a good-quality fishery of largemouth bass and bluegill, with lower abundances of northern pike, yellow perch and black crappie.
- The largemouth bass population was considered high in abundance and they were maintaining a good-quality size structure (though bass greater than 17" were not documented).
- Northern pike were present at a low abundance, and fish were generally small and in poor condition (though residents claim pike > 30" have been caught in the past).
- Bass and pike populations are self-sustaining and no supplemental stocking is needed.
- Bluegill were the primary panfish, considered moderate in abundance and were maintaining a high-quality size structure. Perch and black crappie were present in low abundances but can be cyclic spawners. As a result, reproduction can be very inconsistent and variable. Minimal return on stocking investment would be likely.
- Tree drops installed along the north and northeast shore have functioned well and provided valuable cover for all species in the lake.





Fish Community

Goal 1. The fishery in Grindle Lake will remain healthy, well-balanced and self-sustaining.

Objective 1.1 Manage Grindle Lake primarily for largemouth bass and panfish, with a secondary emphasis on northern pike.

Actions	Lead person/group	Resources	Timeline
No supplemental stocking is currently needed.	GLALA		As appropriate
Maintain current harvest regulation for largemouth bass of 14" minimum and 5 bag. Should largemouth bass become more abundant and a growth bottleneck develops below 14", a length limit exception should be evaluated.	GLALA	WDNR-Chip Long	As appropriate
Follow up with WDNR fisheries biologist after next survey (possibly in 2020).	GLALA	WDNR-Chip Long	2021

Objective 1.2 Continue to enhance fish habitat in Grindle Lake. 12 fish stick clusters will be installed over the next 4 years.

Actions	Lead person/group	Resources	Timeline
Continue to identify willing property owners for fish stick installations. Track and map these installations as they occur. 10% of properties with fish stick clusters (or at least 250 logs/mile) is recommended. Also identify properties seeking tree removal (>35 feet from water's edge) and/or work with USFS for a source of material.	GLALA	WDNR-Chip Long	2020-2025
Explore installation of fish cribs to add woody structure to lake.	GLALA	WDNR-Chip Long	2020
Educate property owners about healthy shoreland habitat and its importance to having a healthy fishery. See **Shorelands** section.	GLALA		Ongoing

Aquatic Plant Community

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

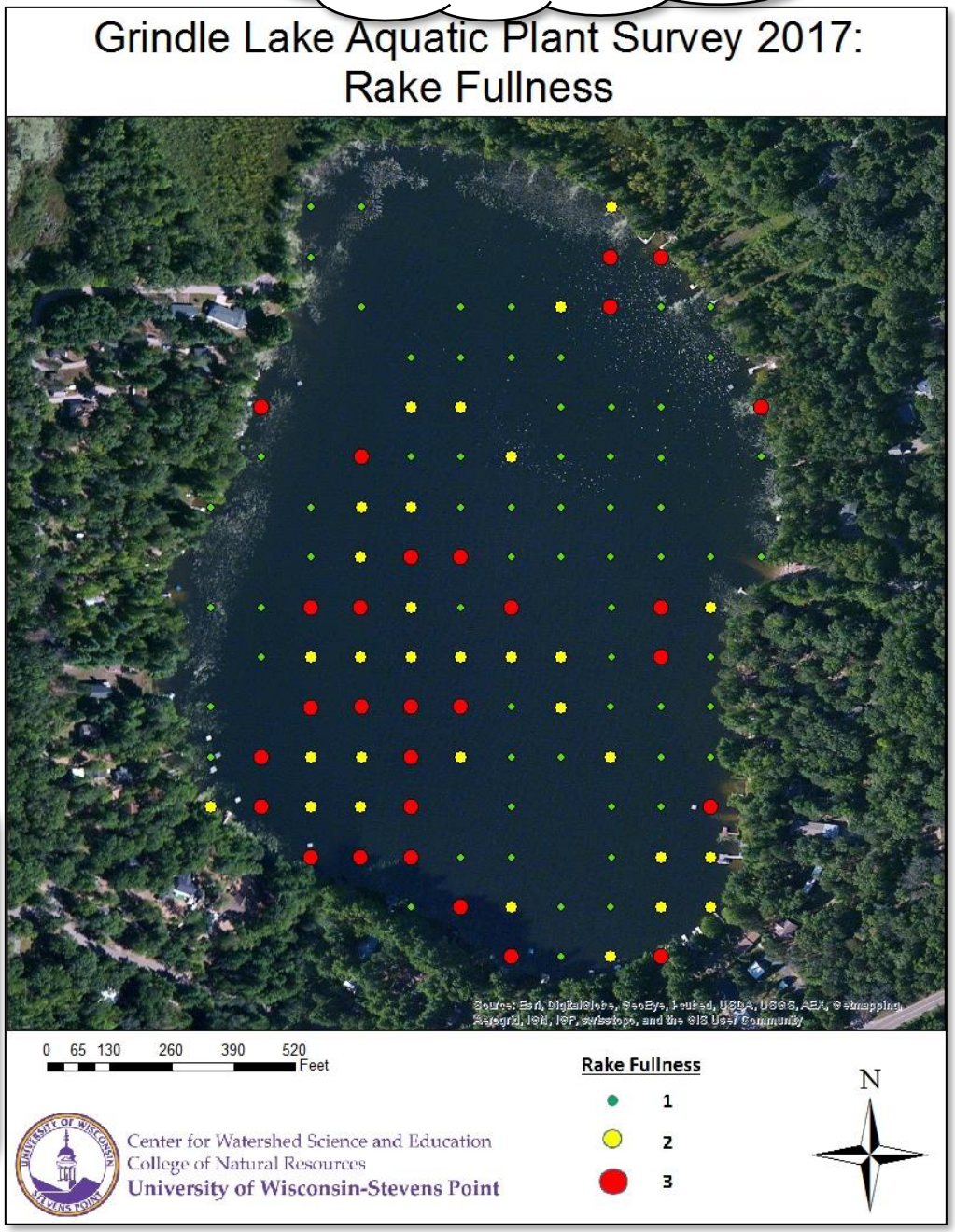
Aquatic Plants

Aquatic plants provide the forested landscape within Grindle 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. Aquatic plants also serve as indicator species for environmental stressors that could be occurring in a lake or river, such as a runoff event.

Grindle Lake 2017 Aquatic Plant Survey Highlights

- ✓ 77% (119 of 154) of the sites visited had vegetative growth.
- ✓ The greatest depth aquatic plants were found was 19 feet.
- ✓ 15 species of aquatic plants were identified. This is well above the North Central Hardwood average of 16.2.
- ✓ The three most dominate species were nitella (40%), chara (35%), and dwarf watermilfoil (21%).
- ✓ The Floristic Quality Index (FQI) was 24.4. The northcentral hardwood average is 23.3.
- ✓ No invasive species were observed.



Aquatic Plant Community

Nitella is a macroalgae that similarly grows along lake bottoms and can benefit a lake by filtering nutrients from water and preventing establishment of invasive species.

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.

Dwarf water-milfoil 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.

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.

Chinese Mystery Snail

Chinese mystery snails were documented in Grindle Lake in 2008. These snails compete with native snails for food and habitat, can serve as hosts for parasites and invade largemouth bass nests. Like other invasives, they are primarily spread by recreational boaters and can survive up to a month out of water, making their transport between waterbodies easy.

A point-intercept survey per the DNR protocol is recommended every 5 years to detect changes in the plant community and detect any additional AIS.

Aquatic Plant Management in Grindle Lake

Management strategies in Grindle Lake were designed to achieve a balance between healthy aquatic habitat, good water quality, and eradication of invasive species.

Management Options for Invasive Species or Nuisance Native Aquatic Plants

Management options that offer the most practical and effective approaches for managing invasive species or nuisance native plants, while minimizing impacts to Grindle Lake as a whole, have

been identified. Depending upon conditions, the following options may be used alone or in combination with others.

Hand-pulling. No permit required.

Hand-pulling is the preferred method for removing invasive species. Additionally, lakefront property owners are allowed to manually remove native aquatic plants from an area up to 30 feet wide without a permit for swimming and boat access (this does not include the excavation or removal of any bottom sediments). Any denuded lakebed is prime real estate for invasive species, however, and close monitoring is necessary to ensure no populations are established.

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 Grindle Lake, a series of successful strategies (integrated plant management) should lead to a balance between healthy aquatic habitat, water quality, and recreation with minimal annual management.

Goal 2. Grindle Lake will continue to have a healthy and diverse aquatic plant community that provides habitat and good water quality, while minimizing recreational impediments and remaining free of invasive species.

Objective 2.1 Minimize disturbance to native aquatic plants while also reducing impacts to recreation.

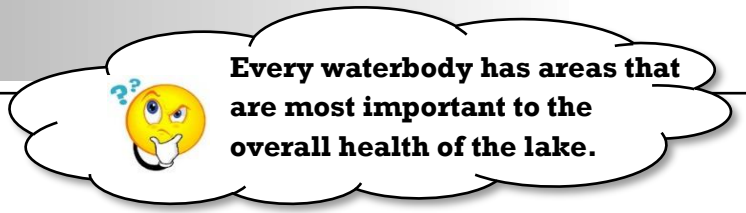
Actions	Lead person/group	Resources	Timeline
Inform property owners of the importance of native aquatic vegetation to impede the establishment of additional AIS, provide food and habitat for wildlife, and protect the shoreline via educational materials provided at the annual meeting and in a newsletter.	GLALA	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 to become established, so be vigilant about watching for AIS in these areas.	GLALA	WDNR-Brenda Nordin	Ongoing
Regularly monitor aquatic plant community to detect any changes in lake conditions and ensure stable populations. A point-intercept survey is recommended.	GLALA	WDNR-Brenda Nordin Consultants	Every 10 years if no active plant management taking place.
Reduce nutrient and sediment loading to lake (to limit abundance of plants and algae) by improving shoreland buffers (see **Shorelands** section) and implementing BMPs in the watershed (see **Watershed** section).	GLALA	WDNR-Brenda Nordin OCLCD	Ongoing

Aquatic Plant Community

Objective 2.2 Protect against establishment of AIS.

Actions	**Lead person/group**	**Resources**	**Timeline**
Encourage or host training to identify and look for invasive species, particularly EWM.	GLALA	WDNR-Brenda Nordin LRCD	Summer 2020
Identify Clean Boats Clean Waters volunteers or hire someone to staff boat launch on busy days.	GLALA	CBCW	Summers
Educate landowners on importance of native aquatic plants for preventing AIS. Bring in speaker for annual meeting, mail literature to property owners, etc.	GLALA	WDNR-Brenda Nordin	Ongoing
If new AIS is suspected or observed, follow the guidance in **Appendix B**.	GLALA	WDNR-Brenda Nordin	Ongoing

Critical Habitat



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 Grindle Lake does not have an official critical habitat area designation, there are areas within Grindle 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 Grindle Lake, which provide essential habitat and/or water quality benefits, will be protected.

Objective 3.1 Identify and inform others of quality habitat areas in and around Grindle Lake.

Actions	Lead person/group	Resources	Timeline
Request a Critical Habitat Designation from WDNR.	GLALA	WDNR-Brenda Nordin	2020
If critical habitat is designated on Bass Lake, communicate to property owners, visitors, and Town Board as to why these areas are important.	GLALA		TBD

Watershed

LANDSCAPES AND THE LAKE

Grindle Lake Watershed

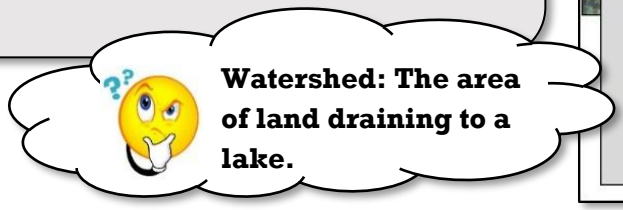
A Lake is a Reflection of its Watershed…

Understanding where Grindle 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 Grindle Lake; its land area may be slightly different than the surface watershed.

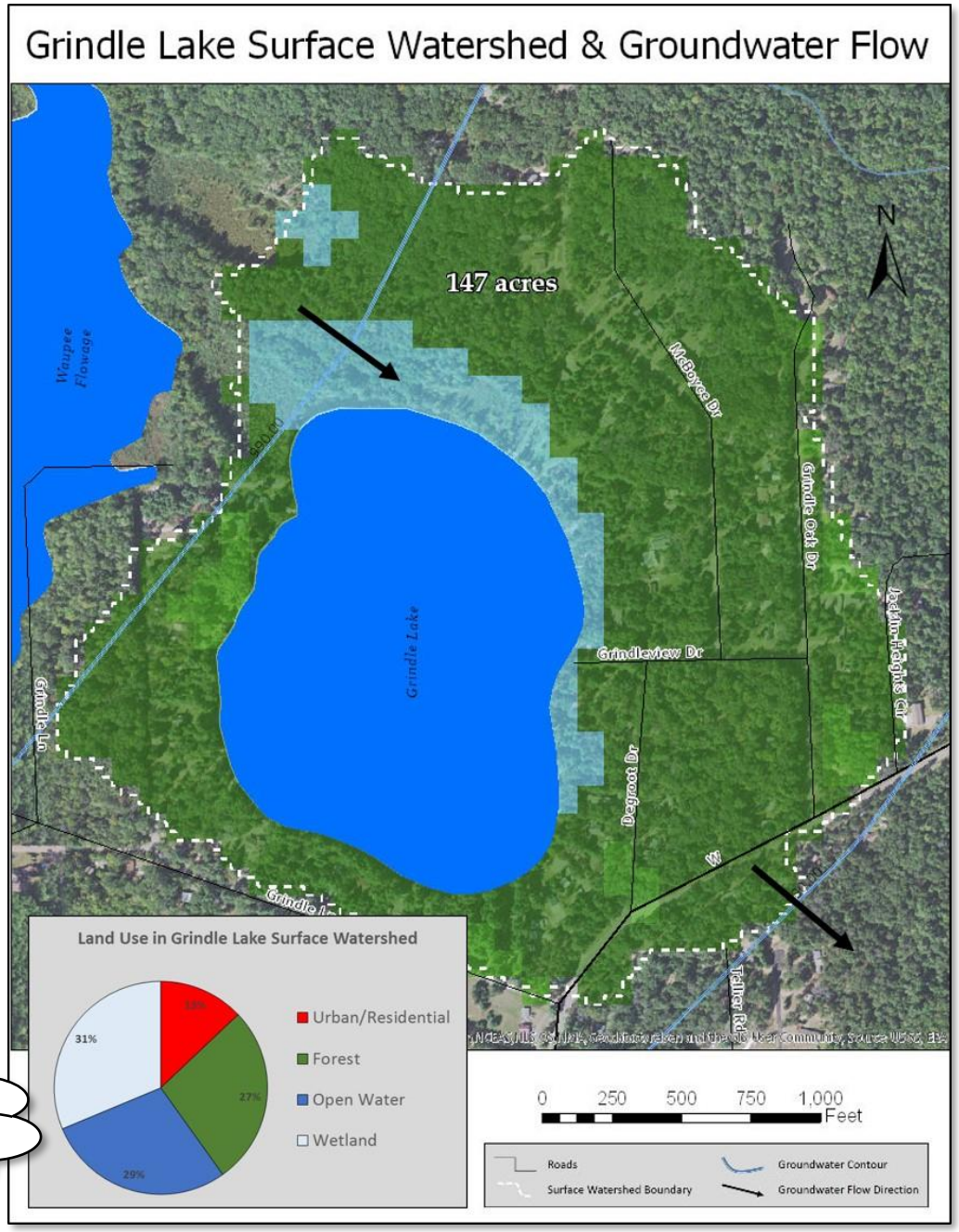
Less runoff is desirable because it allows more water to recharge the groundwater, which feeds the lake year-round - even during dry periods or when the lake is covered with ice. The capacity of the landscape to shed or hold water and contribute or filter particles determines the amount of erosion that 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.

Grindle Lake's Watershed

The Grindle Lake watershed is 147 acres. Primary land use is forest and wetland. 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 and is often the easiest to manage (own property, no politics, etc.).

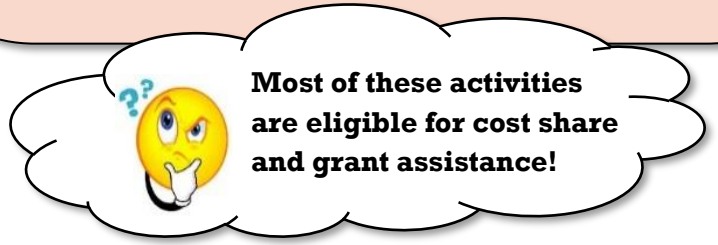
Be Part of the Solution!

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.

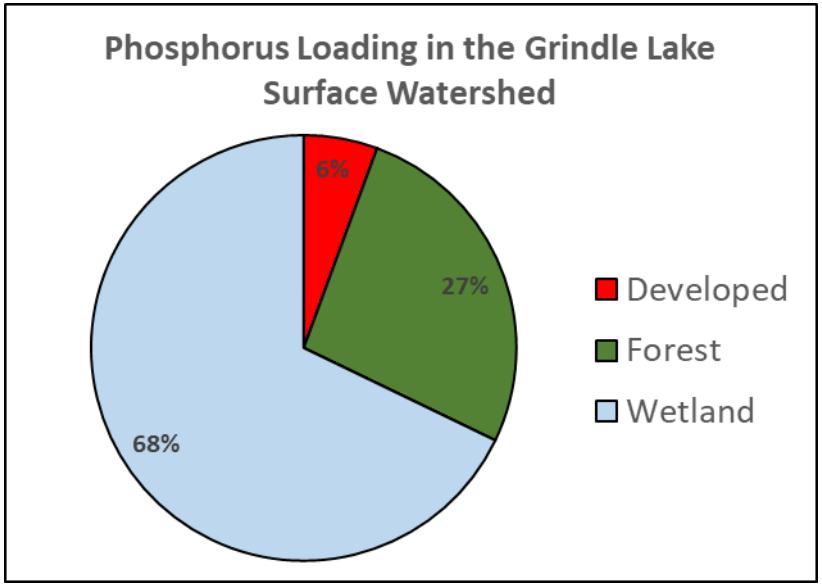


Most of these activities are eligible for cost share and grant assistance!

Watershed

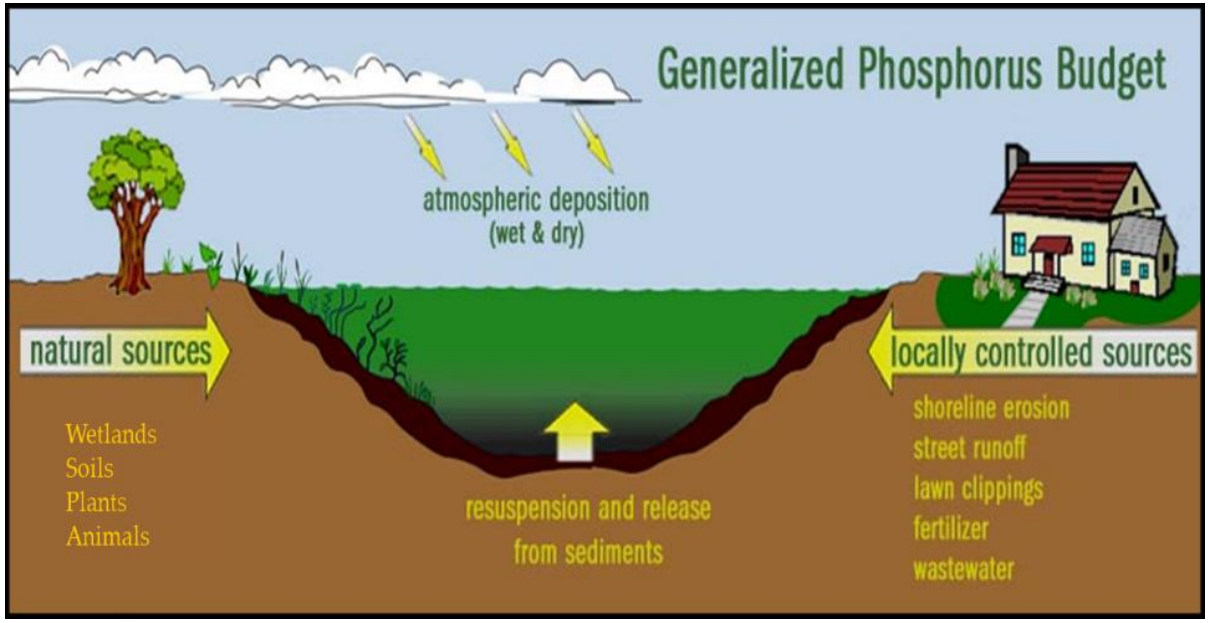
Phosphorus Modeling

Estimates of phosphorus from the landscape can help to understand the phosphorus sources to Grindle 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. The phosphorus contributions by land use category, called phosphorus export coefficients, have been obtained from studies throughout Wisconsin (Panuska and Lillie, 1995). In the Grindle Lake watershed, the vast majority of these sources are natural and cannot be changed.



Phosphorus Loading in Grindle Lake Watershed

Based on modeling results, wetland and forest had the greatest percentage of phosphorus contributions from the watershed. Though a smaller piece of the pie, efforts to reduce nutrient inputs to the lake must be focused on land uses that we have some control over such as developed areas.



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 Grindle 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.	GLALA	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).	GLALA	WDNR Lake Protection Grants Knowles-Nelson Stewardship Fund NWLT	As needed
Encourage any new developments to manage runoff on site and consider ways to minimize impacts from septic systems on Grindle Lake.	GLALA	Town of Riverview Developers/Builders	As needed
Protect wetlands to maintain the water budget of Grindle Lake. Any altered wetlands should be mitigated within the lake's watershed.	GLALA	WDNR	As needed
Encourage design of road and construction projects that will minimize impacts to the lake.	GLALA	Town of Riverview OC Highway Department/WDOT	As needed

Shorelands

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

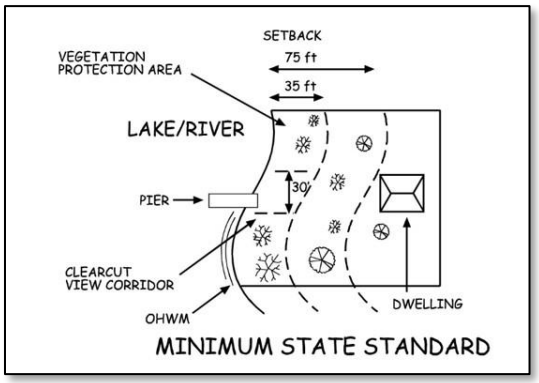
Shorelands

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:

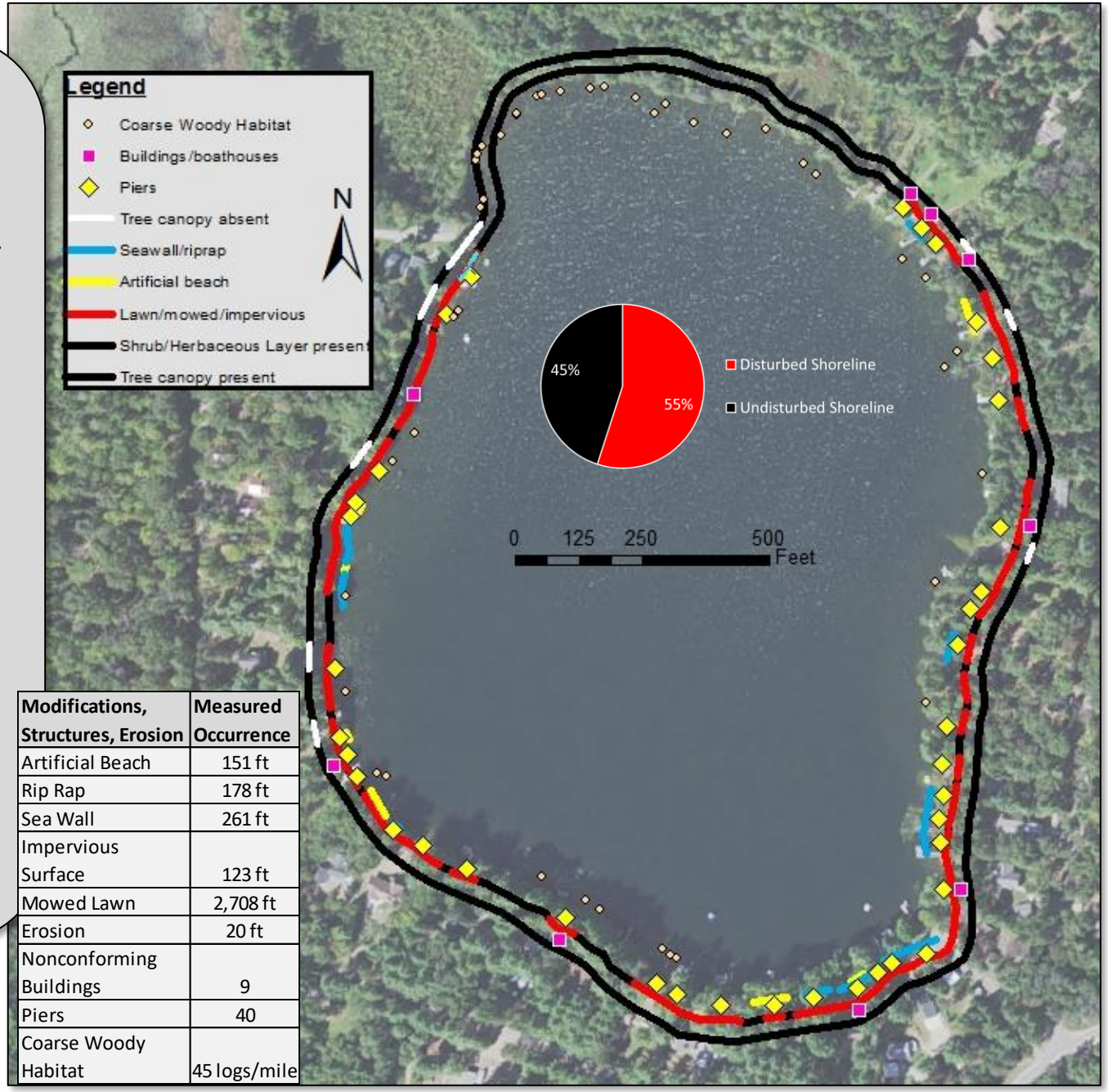
- Up to 30% of shoreline may be removed of shrubs and trees for a view corridor
- A mowed or constructed pedestrian path up to 5 feet wide to access lake

Shorelands

Grindle Lake's Shorelands

To better understand the health of Grindle Lake, shorelands were evaluated. The survey inventoried shoreland vegetation, erosion, riprap, barren ground, seawalls, structures, and docks. The majority of the 1-mile shoreline is developed as homes and seasonal cottages. A total of 40 piers were counted during the survey (1/130 ft).

- With 50 lakefront lots, 1,500 feet (29%) of disturbed shoreland is permitted. Based on the 2017 shoreland inventory, 55% (2,870 feet) of Grindle Lake's shoreland was disturbed. Coarse woody habitat was measured at 45 logs/mile (250 logs/mile recommended.)
- As a whole, Grindle Lake had average shoreland health compared to other lakes in the study. Many stretches of Grindle Lake's shorelands are developed, and it would be beneficial to incorporate native plantings or similar shoreline habitat improvement practices.



Modifications, Structures, Erosion	Measured Occurrence
Artificial Beach	151 ft
Rip Rap	178 ft
Sea Wall	261 ft
Impervious Surface	123 ft
Mowed Lawn	2,708 ft
Erosion	20 ft
Nonconforming Buildings	9
Piers	40
Coarse Woody Habitat	45 logs/mile

Coarse Woody Habitat (CWH)

Woody debris (i.e., branches, limbs, trees) that falls into the lake forms critical habitat for tiny aquatic organisms that feed bluegills, turtles, crayfish and other critters. Water insects such as mayflies graze on the algae that grow on decomposing wood. Dragonfly nymphs hunt for prey among the stems and branches. Largemouth and smallmouth bass often find food, shelter, or nesting habitat among these fallen trees.

Above water, a fallen tree is like a dock for wildlife. Ducks and turtles sun themselves on the trunk, muskrats use the tree as a feeding platform, predators such as mink and otter hunt for prey in the vicinity of fallen wood, and dead trees that remain along the shoreline are used as perches by belted kingfishers, ospreys and songbirds.

Undeveloped lakes typically contain hundreds of 'logs per mile' while they may completely disappear on developed lakes. Unless it is a hazard to navigation or swimming, consider leaving woody debris in the water.

Shorelands

Grindle Lake 2017 Shoreland Survey Results			
Total lakefront footage	**# Riparian lots**	**Total allowable (NR115) disturbed shoreland**	**Measured disturbed shoreland**
5,197	50	1,500 feet (29%)	2,870 feet (55%)

Goal 5. Grindle Lake's shorelands will become increasingly healthy over time. Over the next 5 years, 1,300 feet of mowed shoreland (or approximately 8 properties) on Grindle Lake will be restored.

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.

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.	GLALA	OCLAWA UWEX Lakes Healthy Lakes grants	Ongoing
Encourage and support shoreland owners interested in shoreland restoration. Include information on how and why to create healthy shorelands in a welcome packet to new property owners.	GLALA	UWEX Lakes OCLCD WDNR Healthy Lakes Grants	Ongoing
Encourage those interested in shoreland restorations to contact the OCLCD for available resources.	GLALA	OCLCD WDNR Healthy Lakes Grants	Ongoing
Host a speaker/demonstration: "How to restore your shoreline."	GLALA	UWEX Lakes-Pat Goggin	2020
Consider restoring and showcasing a "demonstration site" with a sign at the water's edge about shoreland restoration and/or hosting a "shoreland tour".	GLALA	OCLCD UWEX Lakes-Pat Goggin WDNR Healthy Lakes Grants	2020
Explore purchase of undeveloped shoreland property.	GLALA	UWEX Lakes Knowles-Nelson Stewardship Fund	As available

Water Quality

Water Quality

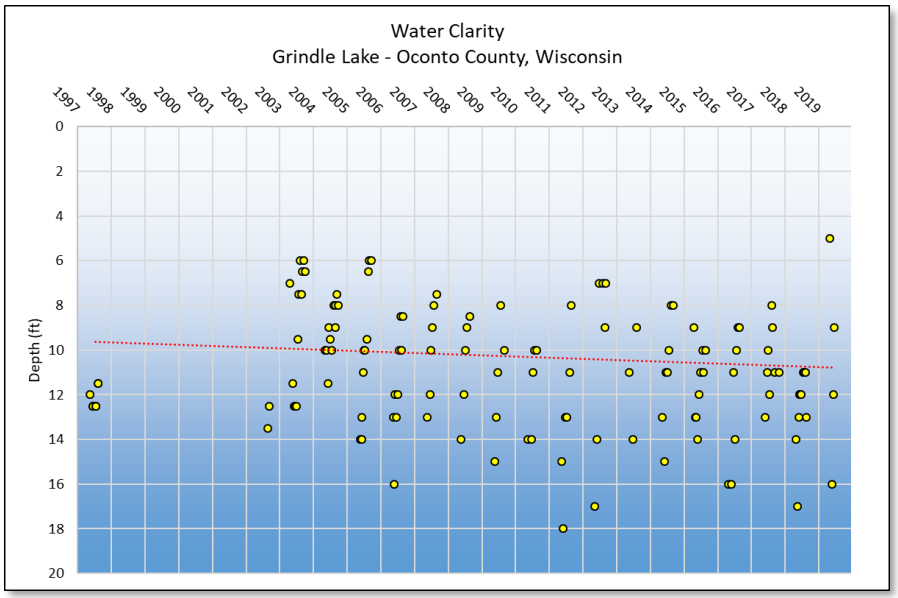
A variety of water chemistry measurements were used to characterize the water quality in Grindle Lake. Water quality was assessed during the 2017-2018 lake study and involved a number of measures including temperature, dissolved oxygen, water chemistry, and nutrients (phosphorus and nitrogen). Nutrients 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 Grindle Lake's water quality.

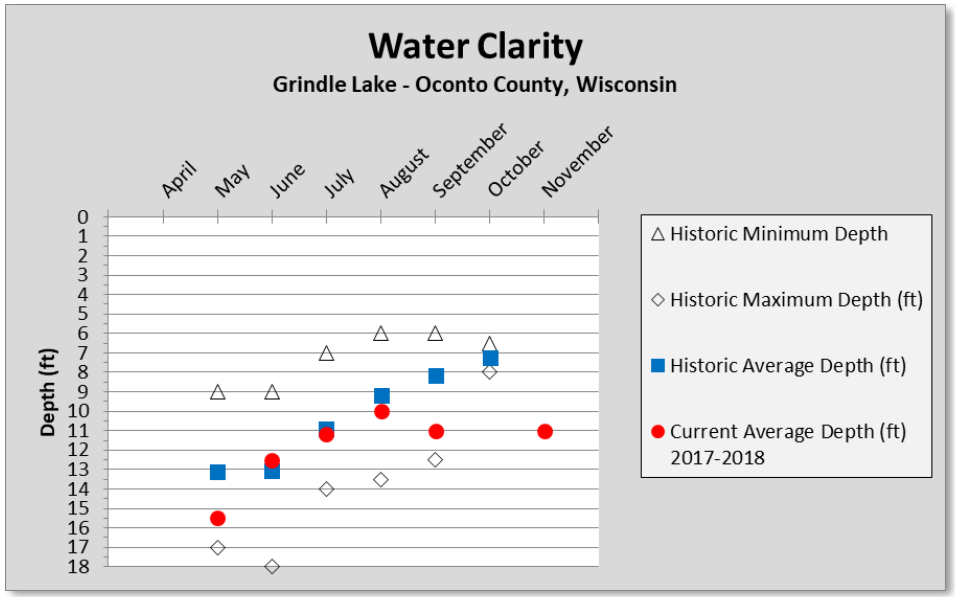
Water Clarity

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.

Grindle Lake's Water Quality Summary

- ✓ **Water clarity** ranged from 8-17 feet (considered very good), which is consistent with historic measurements.
- ✓ Sufficient **dissolved oxygen** was present in at least the upper 10-12 feet of water at all times during the study.
- ✓ Concentrations of **contaminants** were all low during the study. Atrazine was not detected.
- ✓ **Phosphorus** concentrations remained below the standard of 30 ug/L throughout the study. Inorganic nitrogen remained well below concentrations that spur algal blooms.
- ✓ Water in Grindle Lake is soft (14 mg/L CaCO3), having a low level of dissolved minerals. Soft water lakes tend to have a higher pH and are limited in their ability to buffer the effects of acid rain and results in reduced productivity and plays a role in the type of aquatic plants that are found.

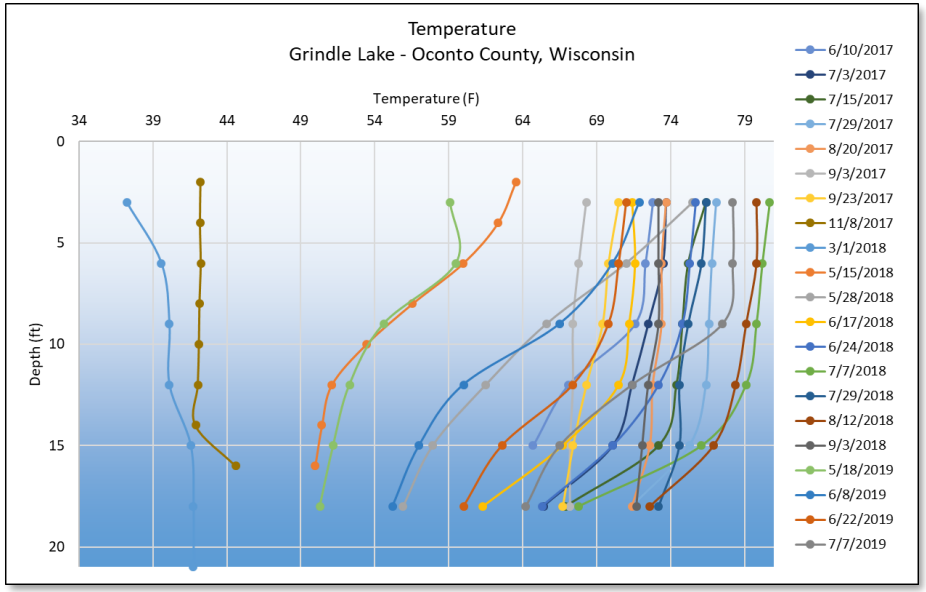




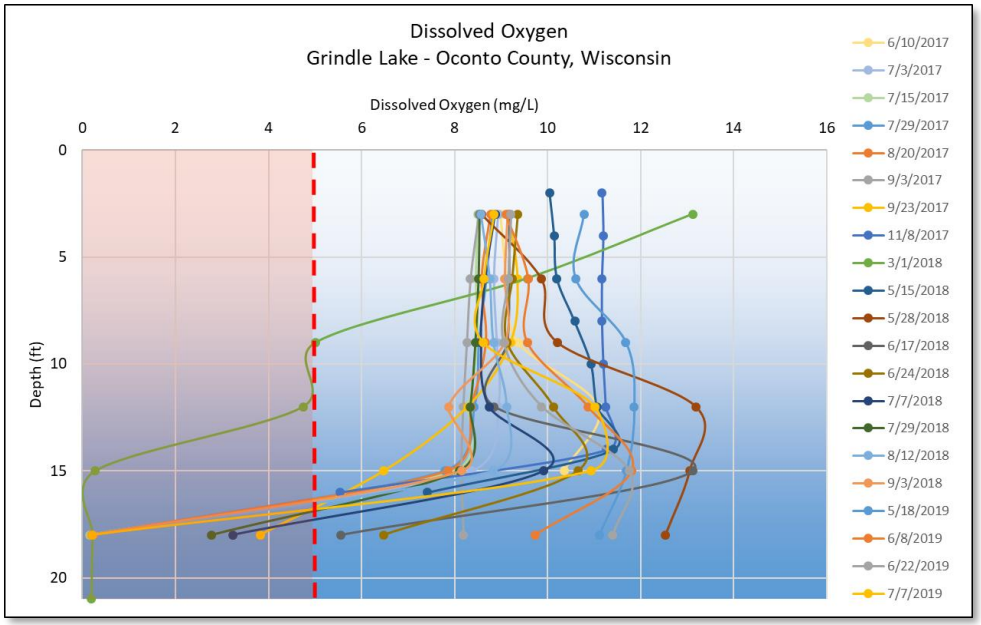
Water Quality

Temperature and Dissolved oxygen

Dissolved oxygen is an important measure in Grindle 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.



As a shallow, mixed lake (as evidenced by relatively straight temperature profiles above), dissolved oxygen concentrations remain uniform from the surface to depth most of the year. During winter, however, sources of oxygen (such as the atmosphere or growing plants) are cut off resulting in declining concentrations until ice melts and/or plants start growing again. This is illustrated in the dissolved oxygen chart by the late winter profile (3/1/2018), where only the top 10 feet of water column maintains concentrations sufficient to support fish (>5mg/L).



Contaminants

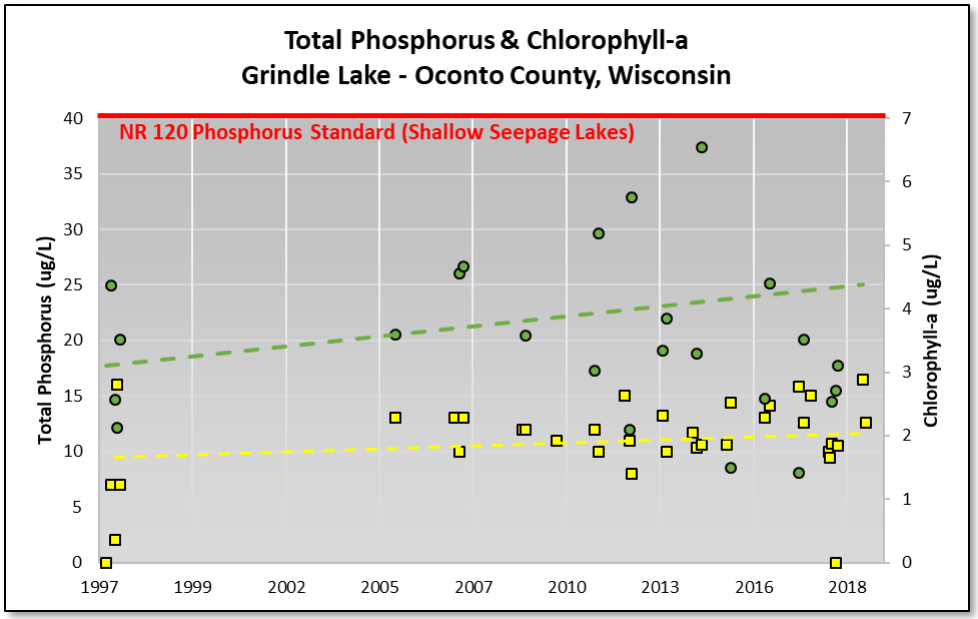
Chloride, sodium and potassium concentrations are commonly used as indicators of how a lake is being impacted by human activity. The presence of these compounds where they do not naturally occur indicates sources of water contaminants. Although these elements are not detrimental to the aquatic ecosystem, 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 Grindle have a standard of 40 ug/L they must remain stay to remain healthy. The very limited data available show concentrations in Grindle 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.

In Grindle Lake, phosphorus concentrations remained well below the threshold of 40 ug/L throughout the study. The last 10 years of available data suggests a slight increasing trend in concentrations. Continued monitoring is recommended.



Be part of the solution!

Managing nitrogen, phosphorus and soil erosion throughout the Grindle 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.

Water Quality

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

Objective 6.1 Maintain median summer phosphorus concentrations below 20 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 Grindle 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 an Association newsletter and/or hosting a guest speaker at the annual meeting.	GLALA	OCLAWA WDNR UWEX Lakes	Ongoing, 2020
Refrain from the use of fertilizers. Encourage soil testing to determine if fertilizer is necessary.	GLALA	OC UWEX	Ongoing
Encourage the restoration of unmowed vegetation along the shoreline to slow and absorb runoff and pollutants.	GLALA	UWEX Lakes	Ongoing

Objective 6.2 Continue to create a robust dataset for Grindle Lake to monitor trends, declines and improvements over time.

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

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 association, 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 east side of Grindle Lake which is owned and maintained by the Town of Riverview. Because the lake is less than 50 acres, no wake is allowed at any time.

Goal 7. Lake users will be informed about and respectful of Grindle Lake.

Objective 7.1 Cultivate an environment of compliance amongst lake users.

Actions	Lead person/group	Resources	Timeline
Work with other lake groups and towns to support a recreational officer and municipal court for enforcement of regulations, including 'No Wake' and safe boat operation.	GLALA	TOR OCLWA OC UWEX	Ongoing
Inform residents and consider posting signage of "DNR Hotline" to report unlawful behavior. (1-800-TIP-WDNR)	GLALA	WDNR	Ongoing
Ensure signage is up-to-date and clear. Consider updating sign board/kiosk with basic information on regulations and expectations. This can convey to lake users that there is an active and watchful group on the lake.	GLALA	USFS UWEX Lakes	Ongoing

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 Riverview, 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 Grindle 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 8. Increase participation in lake stewardship.

Objective 8.1 Develop opportunities and incentives for active participation in the management of Grindle Lake.

Actions	Lead person/group	Resources	Timeline
Maintain an Association website	GLALA		Ongoing
Maintain an email list of shoreland property owners and others interested in Grindle Lake.	GLALA	OC UWEX	Ongoing
Share minutes (or meeting notes) from annual meeting on website and/or newsletter.	GLALA		As needed
Distribute a welcome packet/mailing to all new shoreland property owners with basic lake stewardship information/brochures. WDNR small-scale planning grants can pay for this.	GLALA	OC UWEX OC Zoning Dept. OCLCD	Ongoing
Communicate updates to lake management plan and management activities to residents and users of the lake via email list and/or newsletter (and to WDNR).	GLALA		Ongoing
Host an annual meeting to discuss lake management and opportunities for shoreland property owners.	GLALA		Annually
Host gatherings to learn about topics identified in this plan. Invite speakers or conduct demonstrations.	GLALA	UWEX Lakes WDNR OCLCD	As needed
Identify ways to recruit 'next generation' of water quality monitors and AIS removers. Support interested persons in Lake Leaders Institute and/or Wisconsin Lakes Convention.	GLALA	UWEX Lakes Lake Leaders	Ongoing

Communication & Organization

Objective 8.2 Maintain good, clear communication between GLALA, its residents, clubs, municipalities, agency staff, elected officials and organizations interested in Grindle Lake.

Actions	Lead person/group	Resources	Timeline
Network with other lake groups in Oconto County by having Grindle Lake represented at OCLWA.	GLALA	OC UWEX	Quarterly
Network with other lakes in the state to learn lake management strategies, etc. by having a representative attend the Wisconsin Lakes Convention.	GLALA	UWEX Lakes	Annually in April
Consider nominating an individual from Grindle Lake for the Lake Leaders Institute. Encourage members of OCLWA to attend Lake Leaders Institute.	GLALA	UWEX Lakes	2020

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 9. Review plan annually and update as needed.

Objective 9.1 Maintain an up-to-date and relevant lake management plan and communicate updates to the lake community, Oconto County and WDNR.

Actions	Lead person/group	Resources	Timeline
Review plan at annual meeting and discuss accomplishments and identification of goals/objectives/actions for coming year.	GLALA		Annually
Formally update this plan every 5 years.	GLALA	OC UWEX UWEX Lakes WDNR	2024

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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/

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/

Appendix A

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/

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

Appendix A

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/

Appendix A

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/

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

Appendix A

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

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

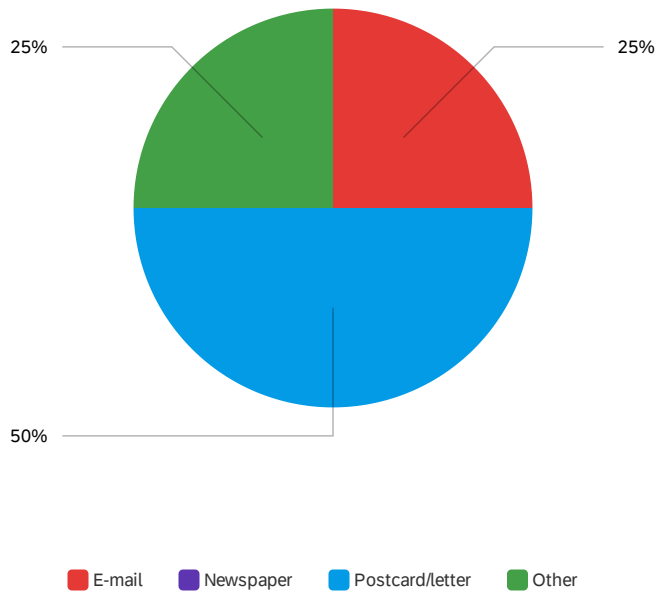
Appendix C. Lake User Survey Results

Default Report

Grindle Lake Survey - Oconto County Lakes Project

February 14, 2023 11:59 AM MST

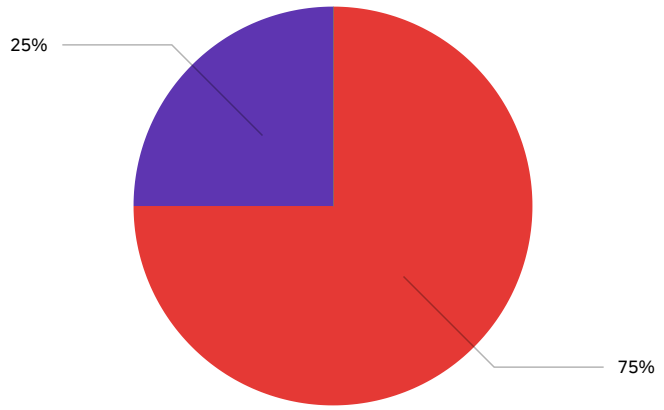
Q2 - How did you hear about this survey?



#	Field		Choice Count
1	E-mail	25%	1
2	Newspaper	0%	0
3	Postcard/letter	50%	2
4	Other	25%	1
			4

Showing rows 1 - 5 of 5

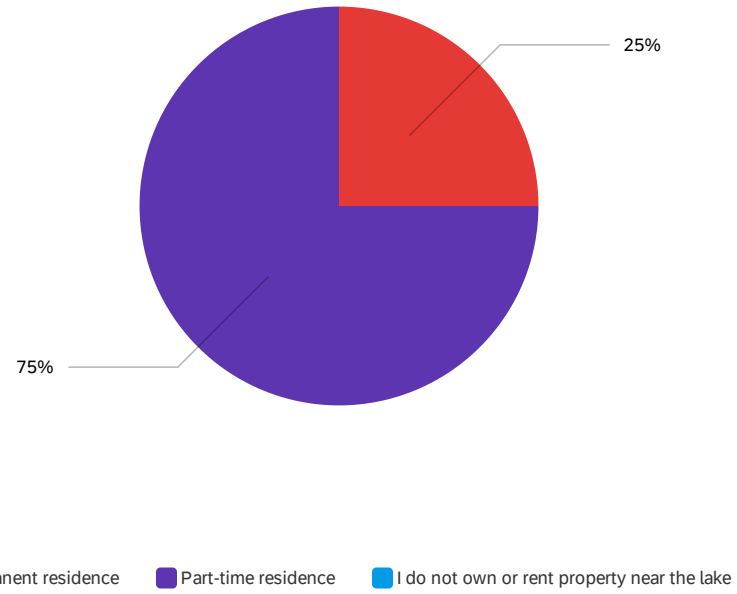
Q3 - Do you own or rent property...



#	Field	Choice Count	
1	Around the lake	75%	3
2	Less than 1/2 mile from the lake	25%	1
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
			4

Showing rows 1 - 5 of 5

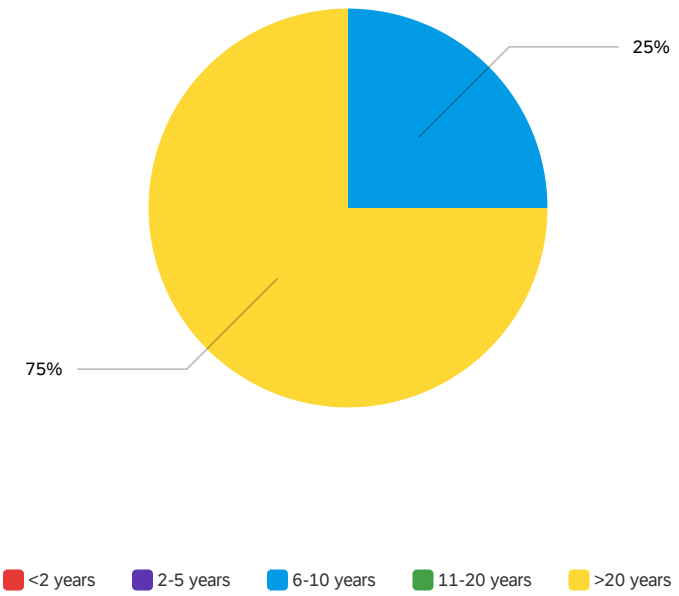
Q4 - If you own or rent property near the lake, is this property your...



#	Field		Choice Count
1	Permanent residence	25%	1
2	Part-time residence	75%	3
3	I do not own or rent property near the lake	0%	0
			4

Showing rows 1 - 4 of 4

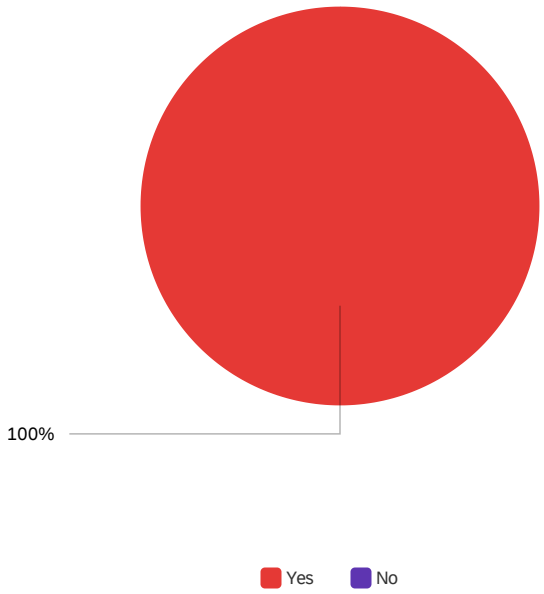
Q5 - How long have you lived on, visited or recreated on the lake?



#	Field	Choice Count
1	<2 years	0% 0
2	2-5 years	0% 0
3	6-10 years	25% 1
4	11-20 years	0% 0
5	>20 years	75% 3
		4

Showing rows 1 - 6 of 6

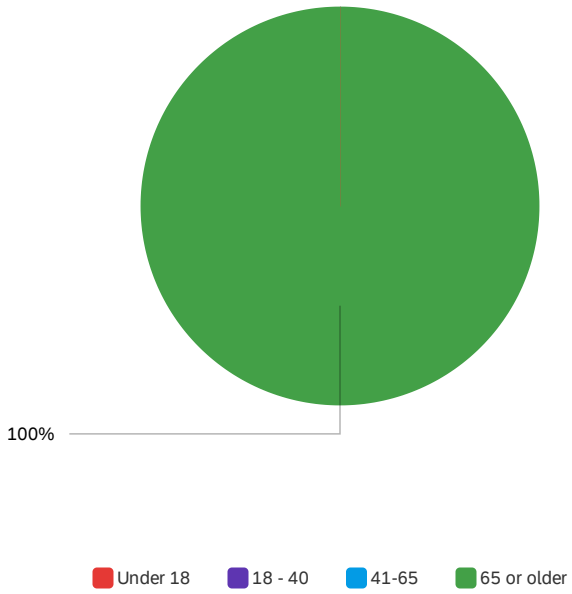
Q6 - Are you a member of the Grindle Lake Area Landowners Association?



#	Field	Choice Count
1	Yes	100% 4
2	No	0% 0
		4

Showing rows 1 - 3 of 3

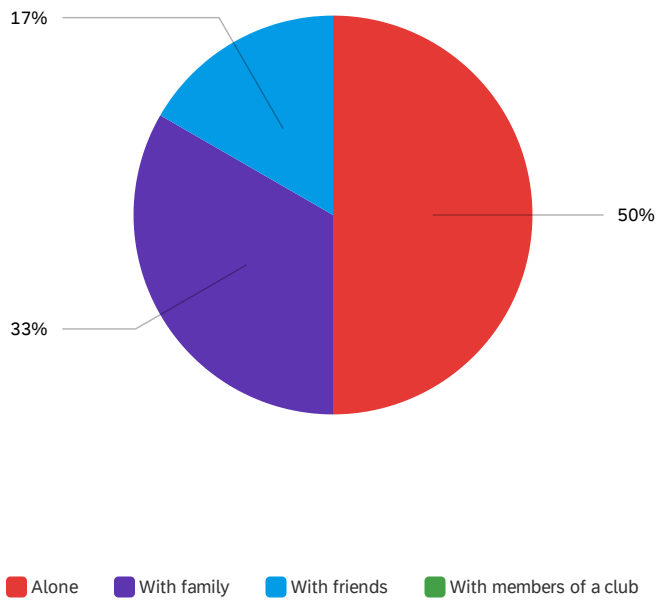
Q8 - Which category below includes your age?



#	Field	Choice Count
1	Under 18	0% 0
2	18 - 40	0% 0
3	41-65	0% 0
4	65 or older	100% 4
		4

Showing rows 1 - 5 of 5

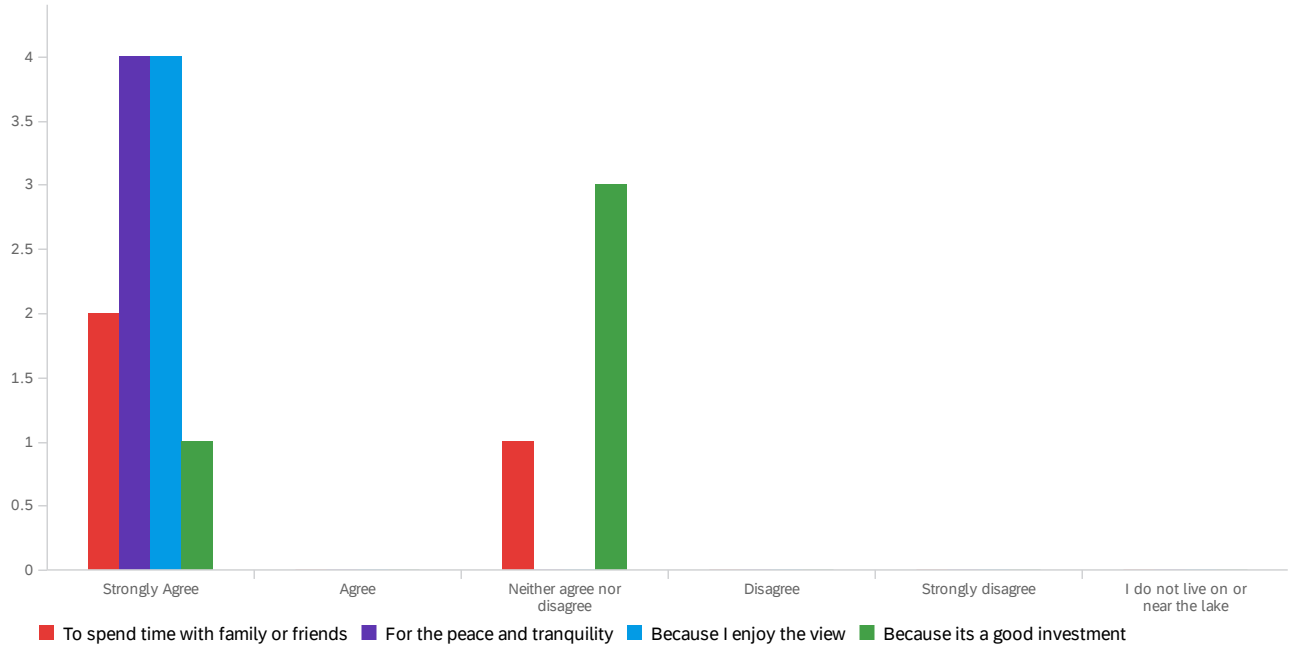
Q9 - When you visit Grindle Lake, are you typically ...(check all that apply)



#	Field	Choice Count
1	Alone	50% 3
2	With family	33% 2
3	With friends	17% 1
4	With members of a club	0% 0
		6

Showing rows 1 - 5 of 5

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



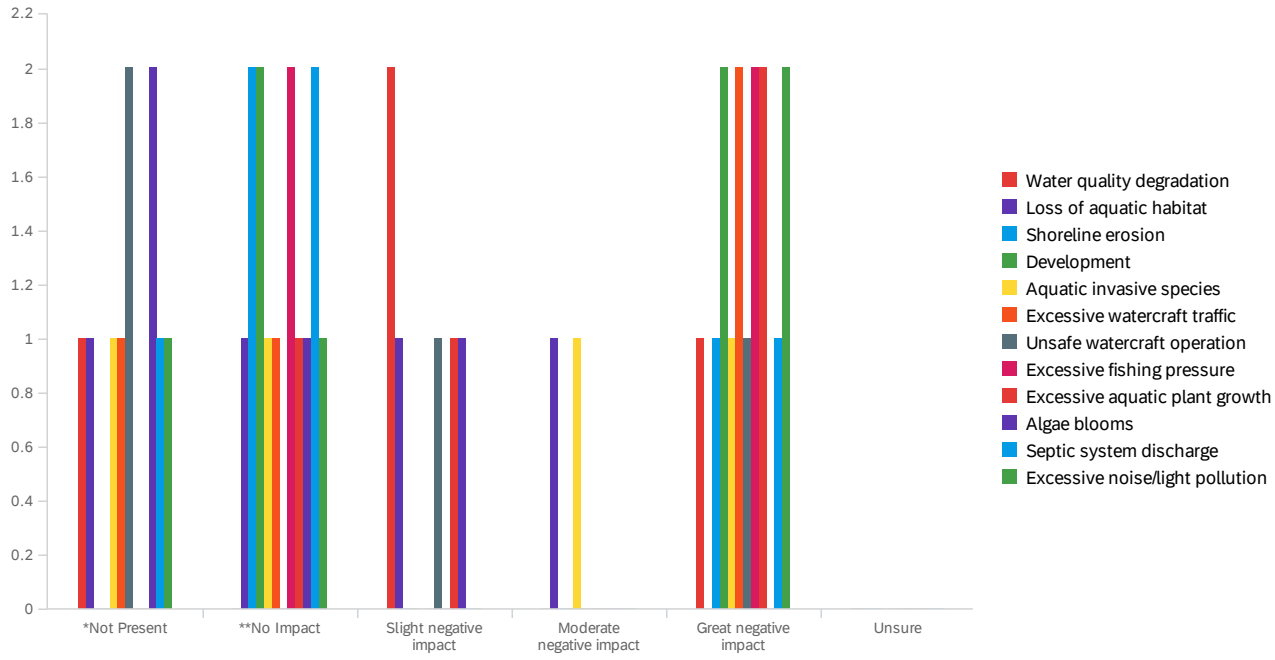
#	Field	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	I do not live on or near the lake	Total
1	To spend time with family or friends	67% 2	0% 0	33% 1	0% 0	0% 0	0% 0	3
2	For the peace and tranquility	100% 4	0% 0	0% 0	0% 0	0% 0	0% 0	4
3	Because I enjoy the view	100% 4	0% 0	0% 0	0% 0	0% 0	0% 0	4
4	Because its a good investment	25% 1	0% 0	75% 3	0% 0	0% 0	0% 0	4

Showing rows 1 - 4 of 4

Q11 - What do you value most about Grindle Lake?

What do you value most about Grindle Lake?
The serenity and wildlife
quiet,peaceful, clean lake
No Wake
The beauty of nature, which seems to be dwindling

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 Grindle Lake? *Not Present means that you believe the issue does not exist on Grindle Lake**No Impact means that the issue may exist, but is not negatively impacting Grindle Lake

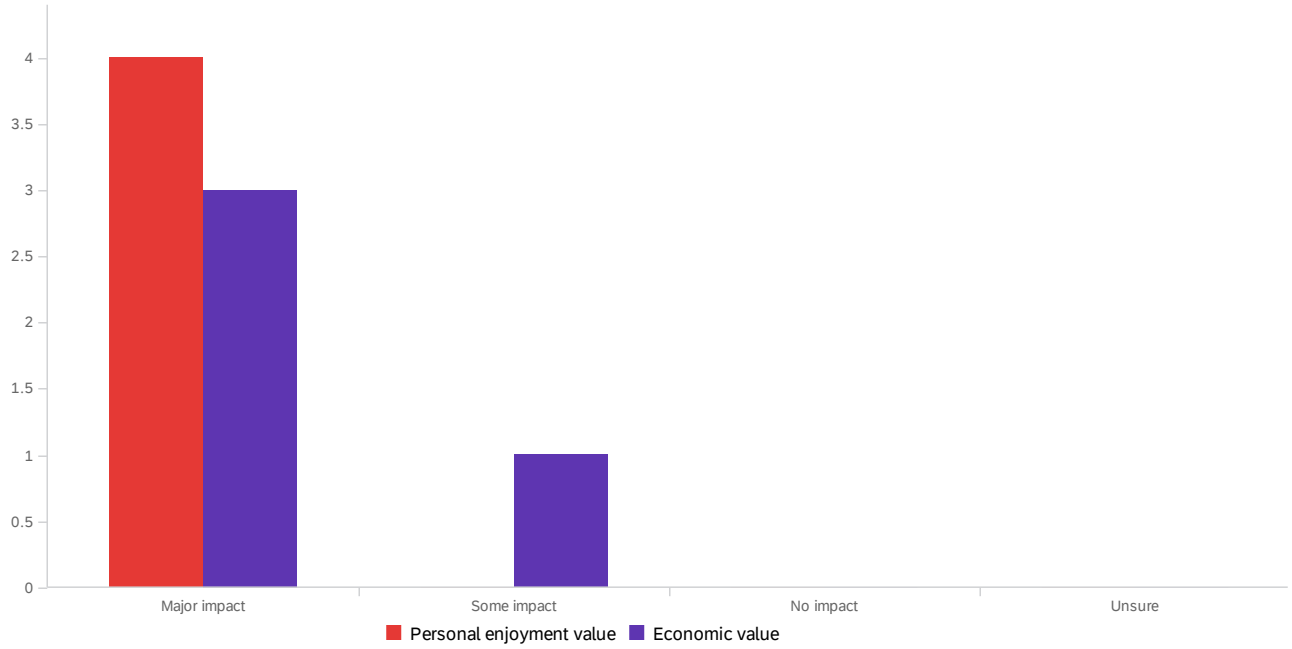


#	Field	*Not Present	**No Impact	Slight negative impact	Moderate negative impact	Great negative impact	Unsure	Total
1	Water quality degradation	25% 1	0% 0	50% 2	0% 0	25% 1	0% 0	4
2	Loss of aquatic habitat	25% 1	25% 1	25% 1	25% 1	0% 0	0% 0	4
3	Shoreline erosion	0% 0	67% 2	0% 0	0% 0	33% 1	0% 0	3
4	Development	0% 0	50% 2	0% 0	0% 0	50% 2	0% 0	4
5	Aquatic invasive species	25% 1	25% 1	0% 0	25% 1	25% 1	0% 0	4
6	Excessive watercraft traffic	25% 1	25% 1	0% 0	0% 0	50% 2	0% 0	4
7	Unsafe watercraft operation	50% 2	0% 0	25% 1	0% 0	25% 1	0% 0	4
8	Excessive fishing pressure	0% 0	50% 2	0% 0	0% 0	50% 2	0% 0	4

#	Field	*Not Present	**No Impact	Slight negative impact	Moderate negative impact	Great negative impact	Unsure	Total
9	Excessive aquatic plant growth	0% 0	25% 1	25% 1	0% 0	50% 2	0% 0	4
10	Algae blooms	50% 2	25% 1	25% 1	0% 0	0% 0	0% 0	4
11	Septic system discharge	25% 1	50% 2	0% 0	0% 0	25% 1	0% 0	4
12	Excessive noise/light pollution	25% 1	25% 1	0% 0	0% 0	50% 2	0% 0	4

Showing rows 1 - 12 of 12

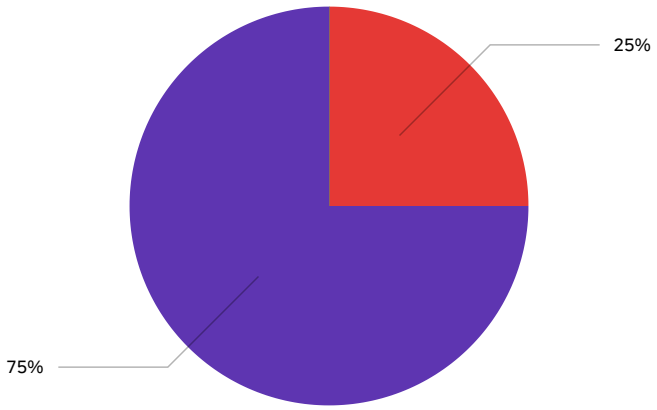
Q16 - How much impact does the water quality of Grindle Lake have on the following?



#	Field	Major impact	Some impact	No impact	Unsure	Total
1	Personal enjoyment value	100% 4	0% 0	0% 0	0% 0	4
2	Economic value	75% 3	25% 1	0% 0	0% 0	4

Showing rows 1 - 2 of 2

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



Beautiful, could not be any nicer
Very minor aesthetic problems; excellent for swimming and boating enjoyment
Enjoyment of the lake is moderately impaired because of algae or other water quality problems
Enjoyment of the lake is substantially impaired because of algae or other water quality problems

#	Field	Choice Count	
1	Beautiful, could not be any nicer	25%	1
2	Very minor aesthetic problems; excellent for swimming and boating enjoyment	75%	3
3	Enjoyment of the lake is moderately impaired because of algae or other water quality problems	0%	0
4	Enjoyment of the lake is substantially impaired because of algae or other water quality problems	0%	0
			4

Showing rows 1 - 5 of 5

Internal System Error

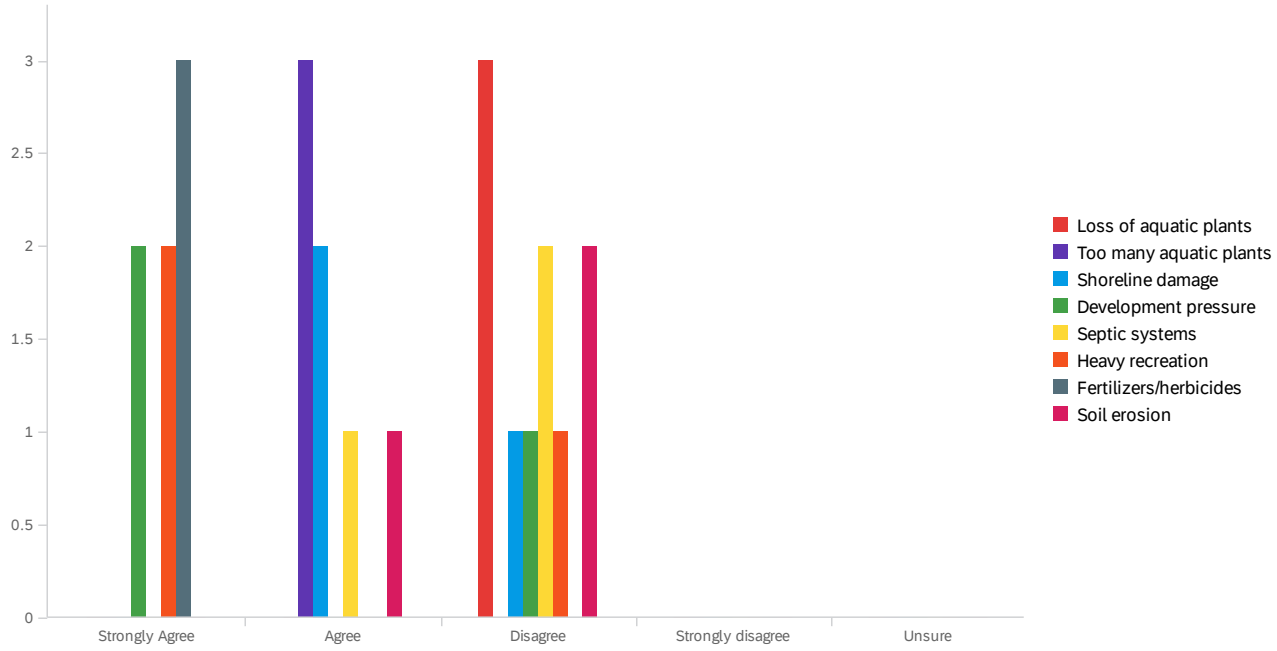
We’re sorry!

There seems to be a problem with our system – please try refreshing your browser.

If you still can’t reach the page you were looking for, please contact our support team.

Reference Error:

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	0% 0	100% 3	0% 0	0% 0	3
2	Too many aquatic plants	0% 0	100% 3	0% 0	0% 0	0% 0	3
3	Shoreline damage	0% 0	67% 2	33% 1	0% 0	0% 0	3
4	Development pressure	67% 2	0% 0	33% 1	0% 0	0% 0	3
5	Septic systems	0% 0	33% 1	67% 2	0% 0	0% 0	3
6	Heavy recreation	67% 2	0% 0	33% 1	0% 0	0% 0	3
7	Fertilizers/herbicides	100% 3	0% 0	0% 0	0% 0	0% 0	3
8	Soil erosion	0% 0	33% 1	67% 2	0% 0	0% 0	3

Showing rows 1 - 8 of 8

Internal System Error

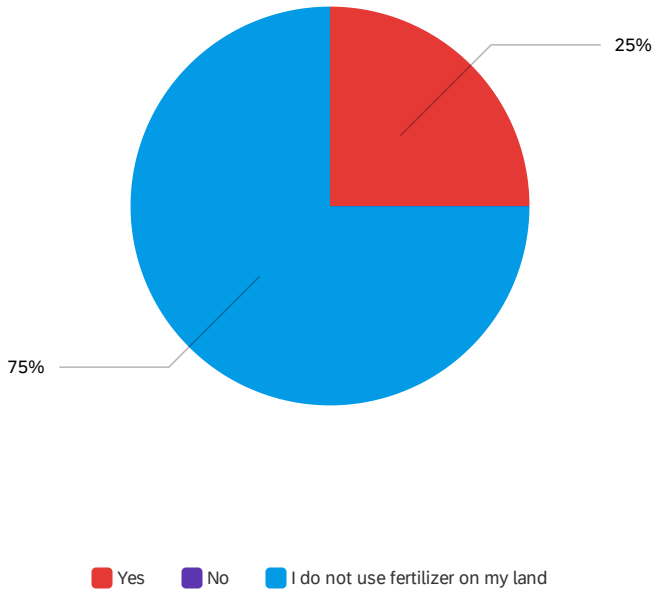
We’re sorry!

There seems to be a problem with our system – please try refreshing your browser.

If you still can’t reach the page you were looking for, please contact our support team.

Reference Error:

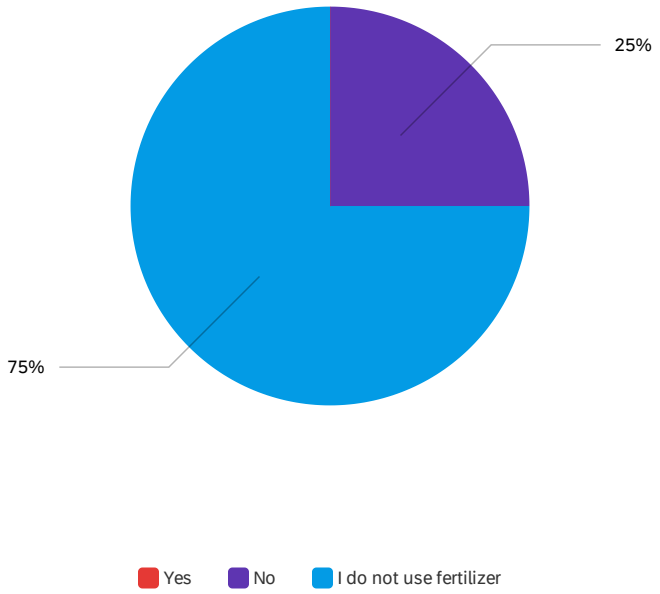
Q21 - Do you use fertilizer that contains phosphorus?



#	Field		Choice Count
1	Yes	25%	1
2	No	0%	0
4	I do not use fertilizer on my land	75%	3
			4

Showing rows 1 - 4 of 4

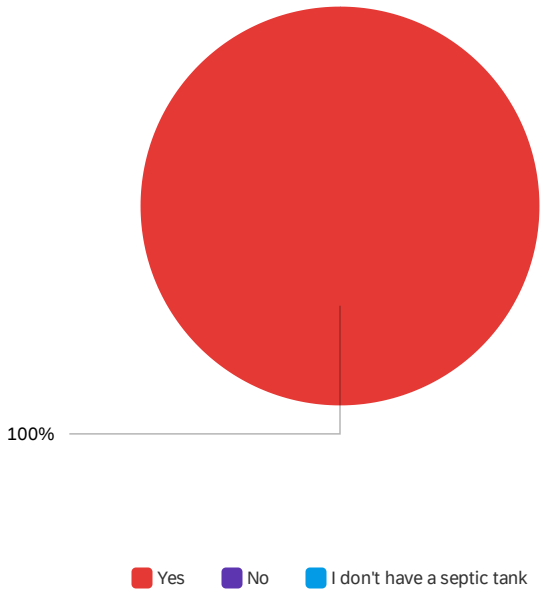
Q23 - Have you had your soil tested before using fertilizer?



#	Field	Choice Count
1	Yes	0% 0
2	No	25% 1
3	I do not use fertilizer	75% 3
		4

Showing rows 1 - 4 of 4

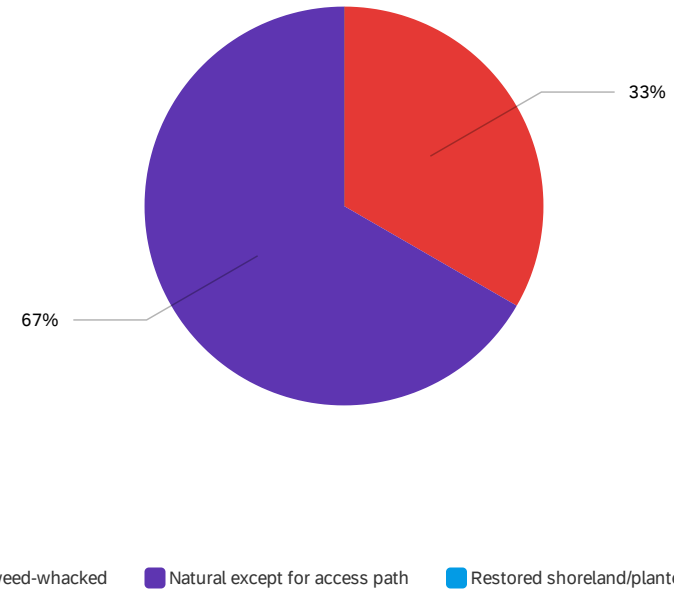
Q22 - Do you have your septic tank pumped regularly (at least every 3 years)?



#	Field	Choice Count
1	Yes	100% 4
2	No	0% 0
3	I don't have a septic tank	0% 0
		4

Showing rows 1 - 4 of 4

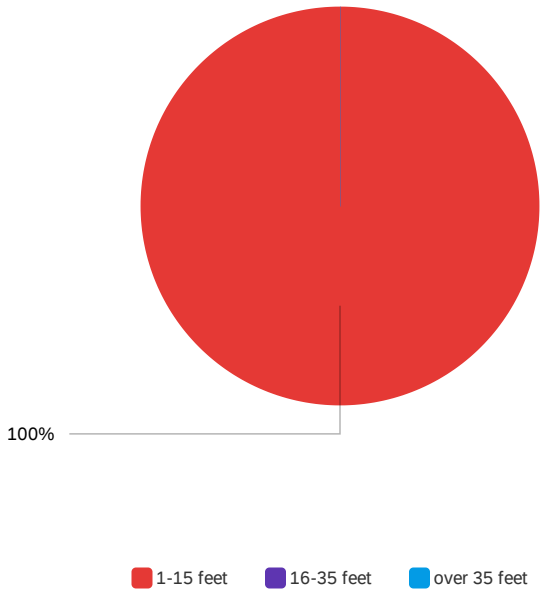
Q25 - How do you currently manage the majority of your property within 35 feet of the lake?



#	Field	Choice Count
1	Mowed or weed-whacked	33% 1
2	Natural except for access path	67% 2
3	Restored shoreland/planted/landscaped	0% 0
		3

Showing rows 1 - 4 of 4

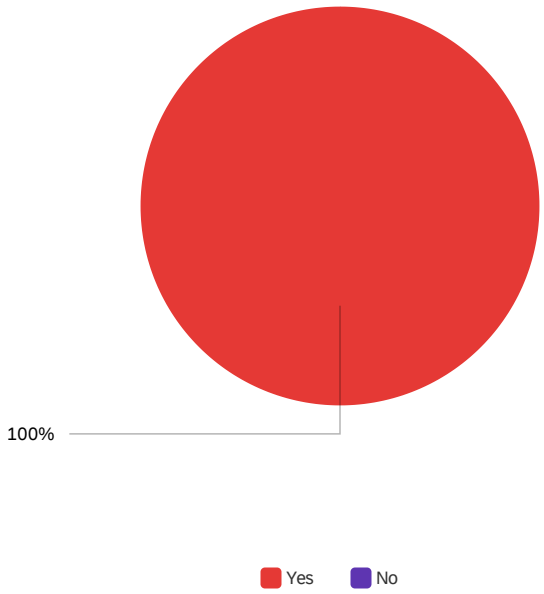
Q26 - If you have unmowed shoreland vegetation, how far inland from the water's edge does it extend?



#	Field	Choice Count
1	1-15 feet	100% 3
2	16-35 feet	0% 0
3	over 35 feet	0% 0
		3

Showing rows 1 - 4 of 4

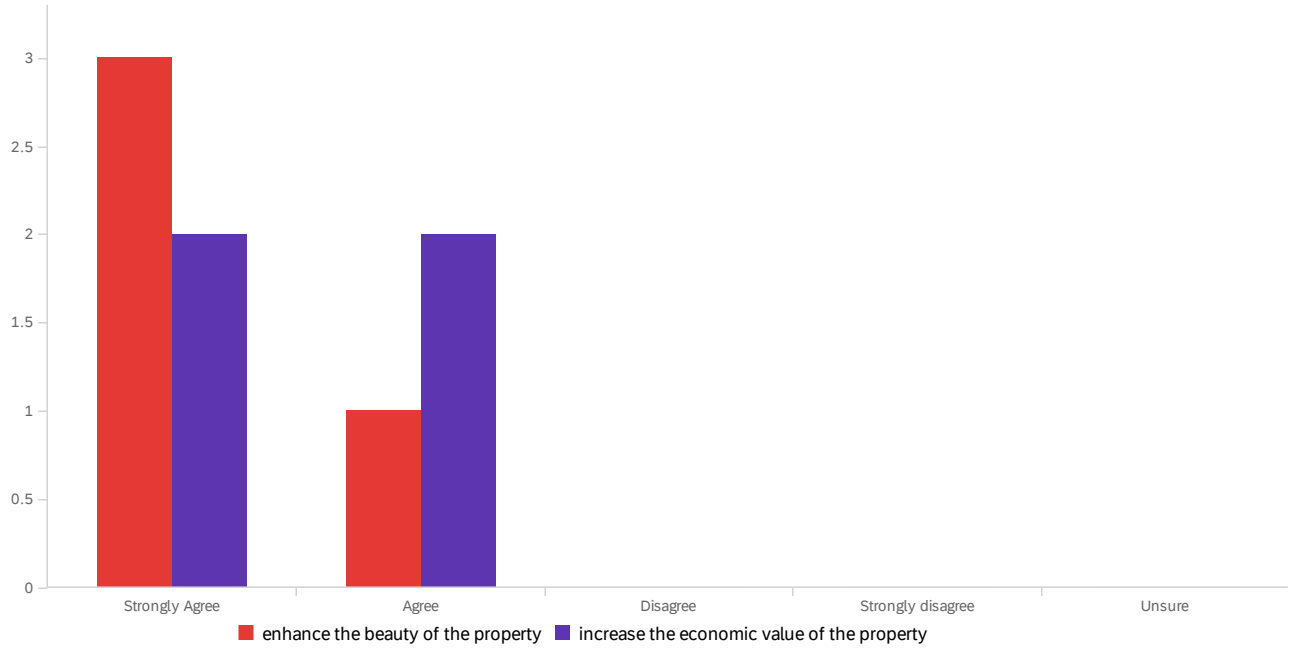
Q31 - Do you have woody structure such as fallen trees or large branches in the shallow water along your property?



#	Field	Choice Count
1	Yes	100% 3
2	No	0% 0
		3

Showing rows 1 - 3 of 3

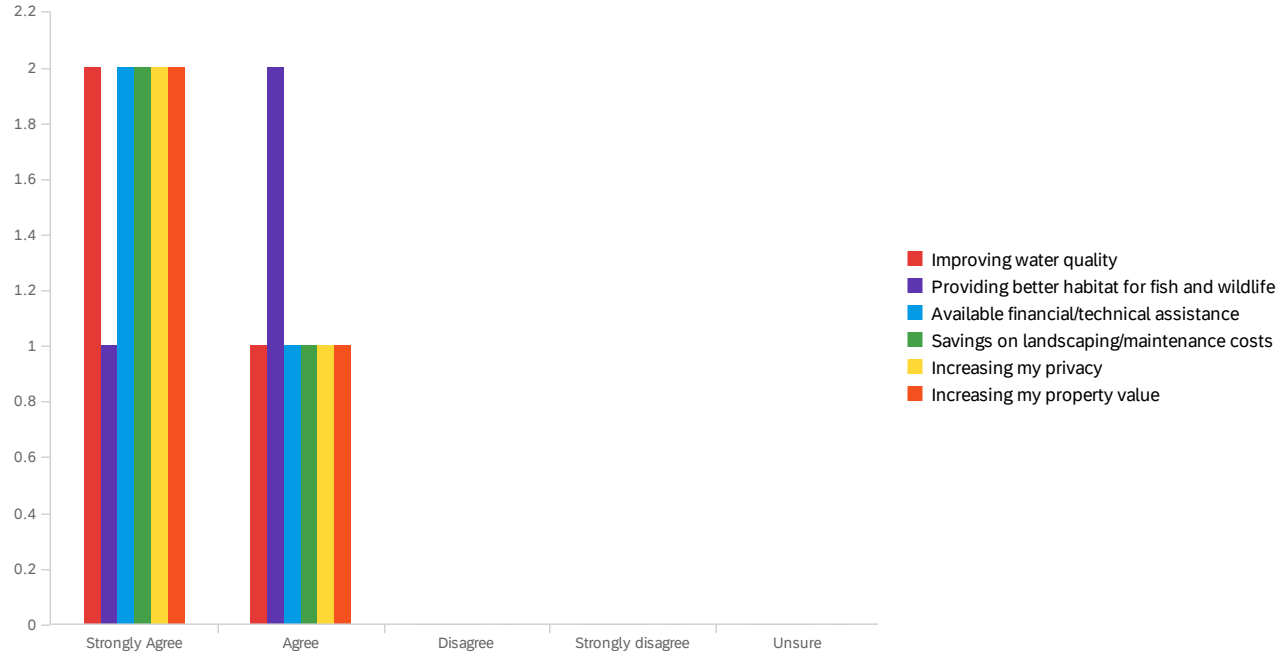
Q27 - In your opinion, does shoreland vegetation...



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	enhance the beauty of the property	75% 3	25% 1	0% 0	0% 0	0% 0	4
2	increase the economic value of the property	50% 2	50% 2	0% 0	0% 0	0% 0	4

Showing rows 1 - 2 of 2

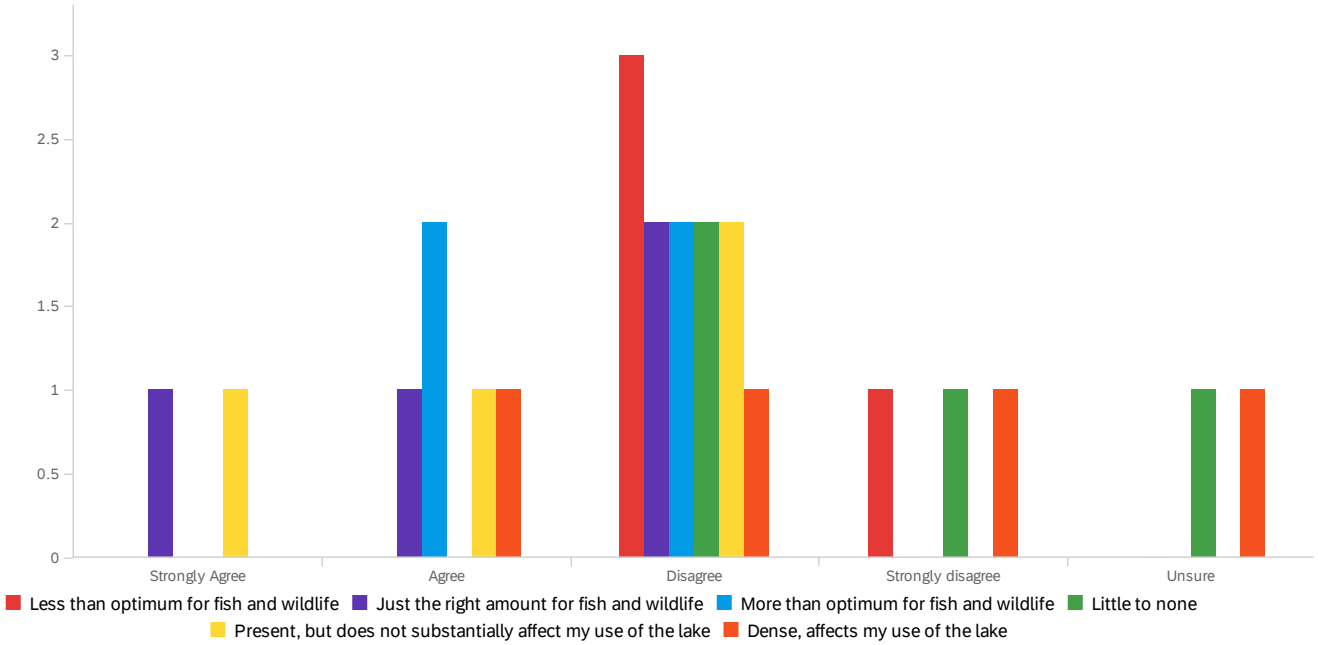
Q28 - What might motivate you to change how you manage your shoreland?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Improving water quality	67% 2	33% 1	0% 0	0% 0	0% 0	3
2	Providing better habitat for fish and wildlife	33% 1	67% 2	0% 0	0% 0	0% 0	3
3	Available financial/technical assistance	67% 2	33% 1	0% 0	0% 0	0% 0	3
4	Savings on landscaping/maintenance costs	67% 2	33% 1	0% 0	0% 0	0% 0	3
5	Increasing my privacy	67% 2	33% 1	0% 0	0% 0	0% 0	3
6	Increasing my property value	67% 2	33% 1	0% 0	0% 0	0% 0	3

Showing rows 1 - 6 of 6

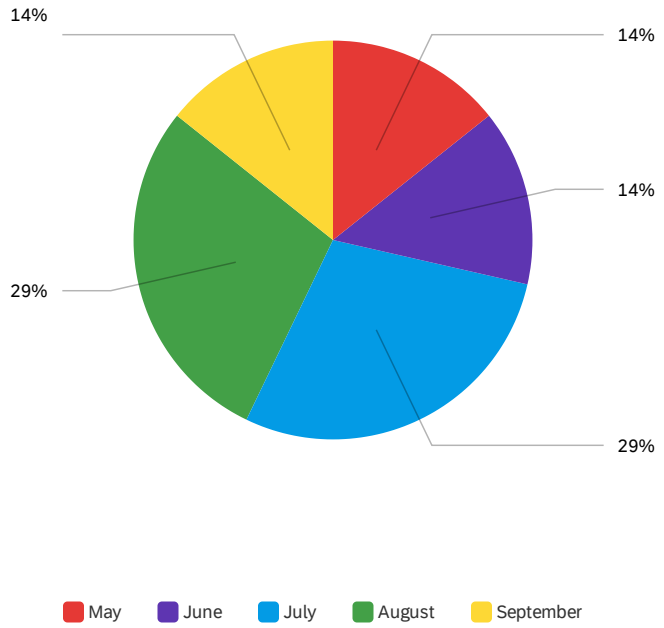
Q32 - In your opinion, which statement best describes the amount of aquatic plant growth in Grindle Lake?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Less than optimum for fish and wildlife	0% 0	0% 0	75% 3	25% 1	0% 0	4
2	Just the right amount for fish and wildlife	25% 1	25% 1	50% 2	0% 0	0% 0	4
3	More than optimum for fish and wildlife	0% 0	50% 2	50% 2	0% 0	0% 0	4
4	Little to none	0% 0	0% 0	50% 2	25% 1	25% 1	4
5	Present, but does not substantially affect my use of the lake	25% 1	25% 1	50% 2	0% 0	0% 0	4
6	Dense, affects my use of the lake	0% 0	25% 1	25% 1	25% 1	25% 1	4

Showing rows 1 - 6 of 6

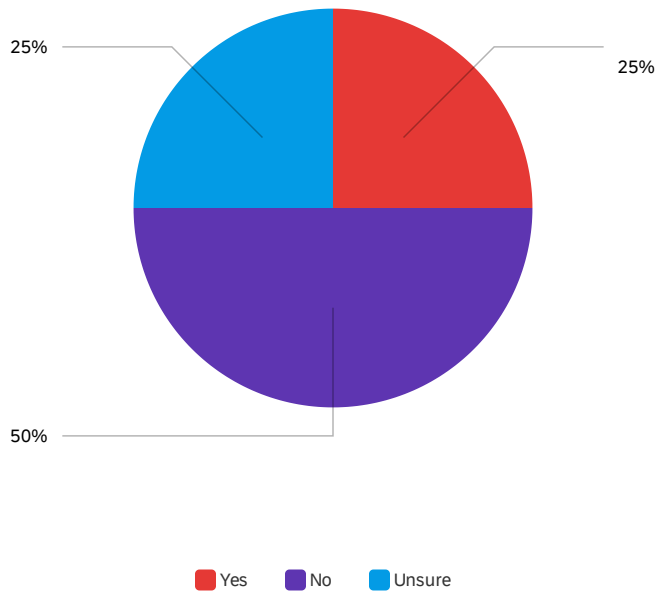
Q33 - If you think the plant growth in Grindle Lake is dense, what month(s) do the problems occur? Check all that apply.



#	Field	Choice Count
1	May	14% 1
2	June	14% 1
3	July	29% 2
4	August	29% 2
5	September	14% 1
		7

Showing rows 1 - 6 of 6

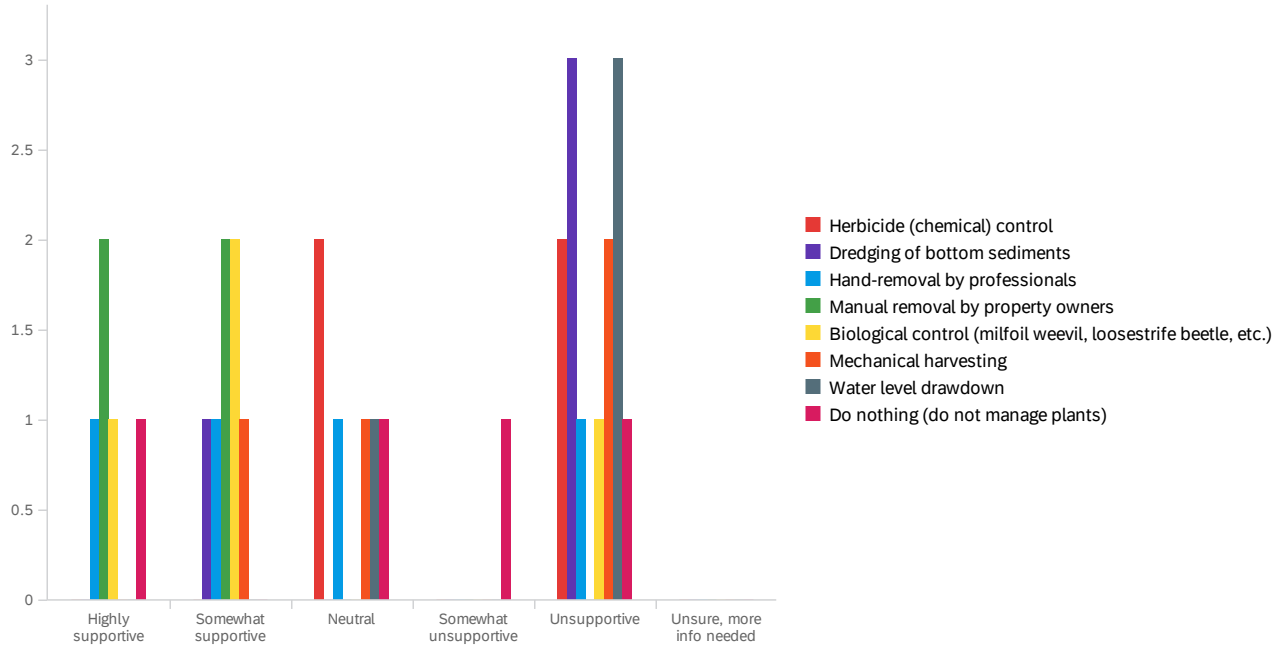
Q34 - Do you believe aquatic plant control is needed on Grindle Lake?



#	Field	Choice Count
1	Yes	25% 1
2	No	50% 2
3	Unsure	25% 1
		4

Showing rows 1 - 4 of 4

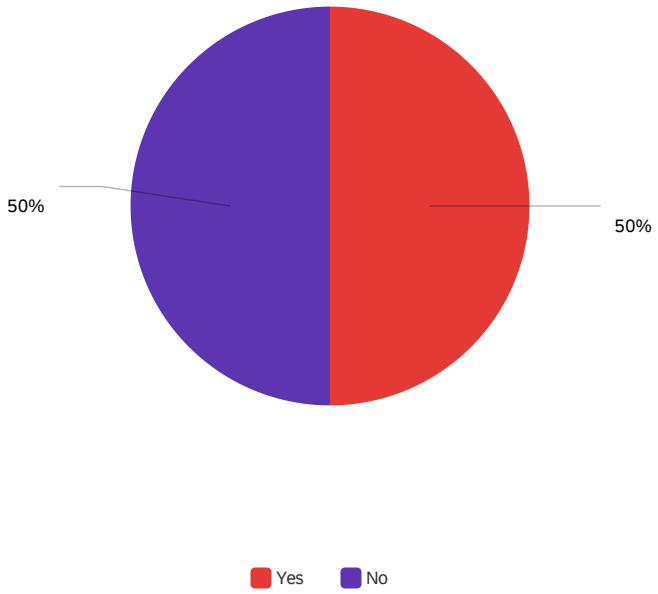
Q35 - What is your level of support for the responsible use of the following techniques to manage aquatic plants on Grindle Lake?



#	Field	Highly supportive	Somewhat supportive	Neutral	Somewhat unsupportive	Unsupportive	Unsure, more info needed	Total
1	Herbicide (chemical) control	0% 0	0% 0	50% 2	0% 0	50% 2	0% 0	4
2	Dredging of bottom sediments	0% 0	25% 1	0% 0	0% 0	75% 3	0% 0	4
3	Hand-removal by professionals	25% 1	25% 1	25% 1	0% 0	25% 1	0% 0	4
4	Manual removal by property owners	50% 2	50% 2	0% 0	0% 0	0% 0	0% 0	4
5	Biological control (milfoil weevil, loosestrife beetle, etc.)	25% 1	50% 2	0% 0	0% 0	25% 1	0% 0	4
6	Mechanical harvesting	0% 0	25% 1	25% 1	0% 0	50% 2	0% 0	4
7	Water level drawdown	0% 0	0% 0	25% 1	0% 0	75% 3	0% 0	4
8	Do nothing (do not manage plants)	25% 1	0% 0	25% 1	25% 1	25% 1	0% 0	4

Showing rows 1 - 8 of 8

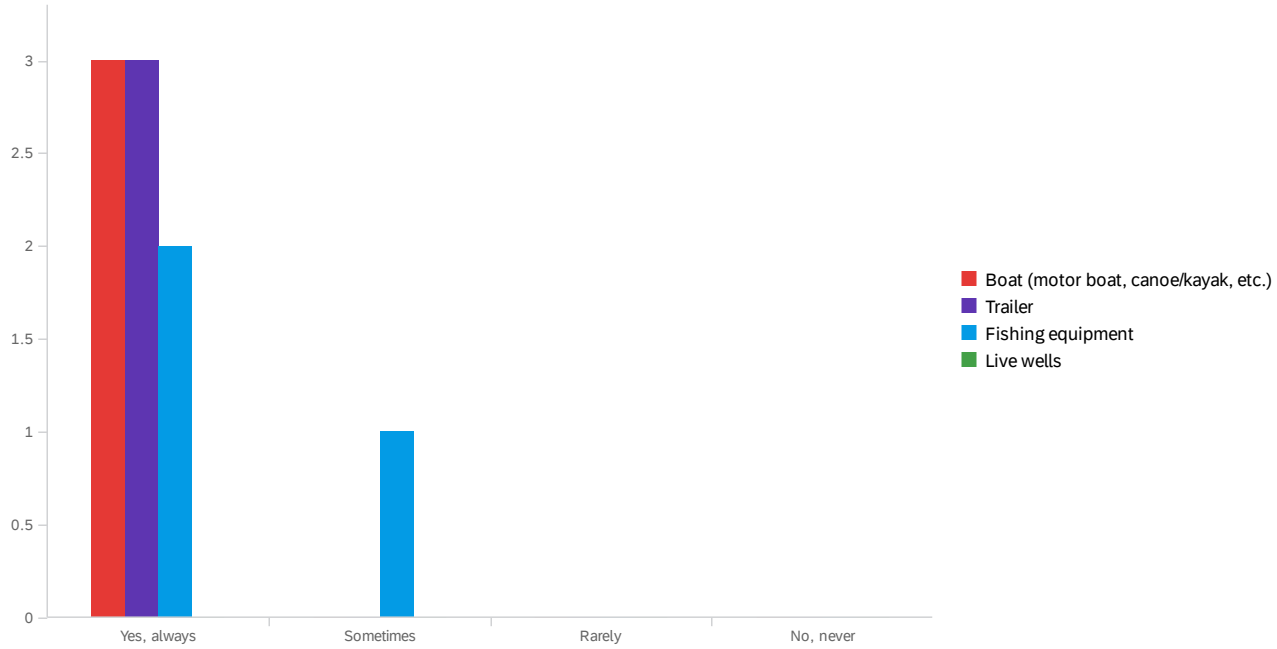
Q37 - Are you aware of invasive species (in general)?



#	Field	Choice Count
1	Yes	50% 2
2	No	50% 2
		4

Showing rows 1 - 3 of 3

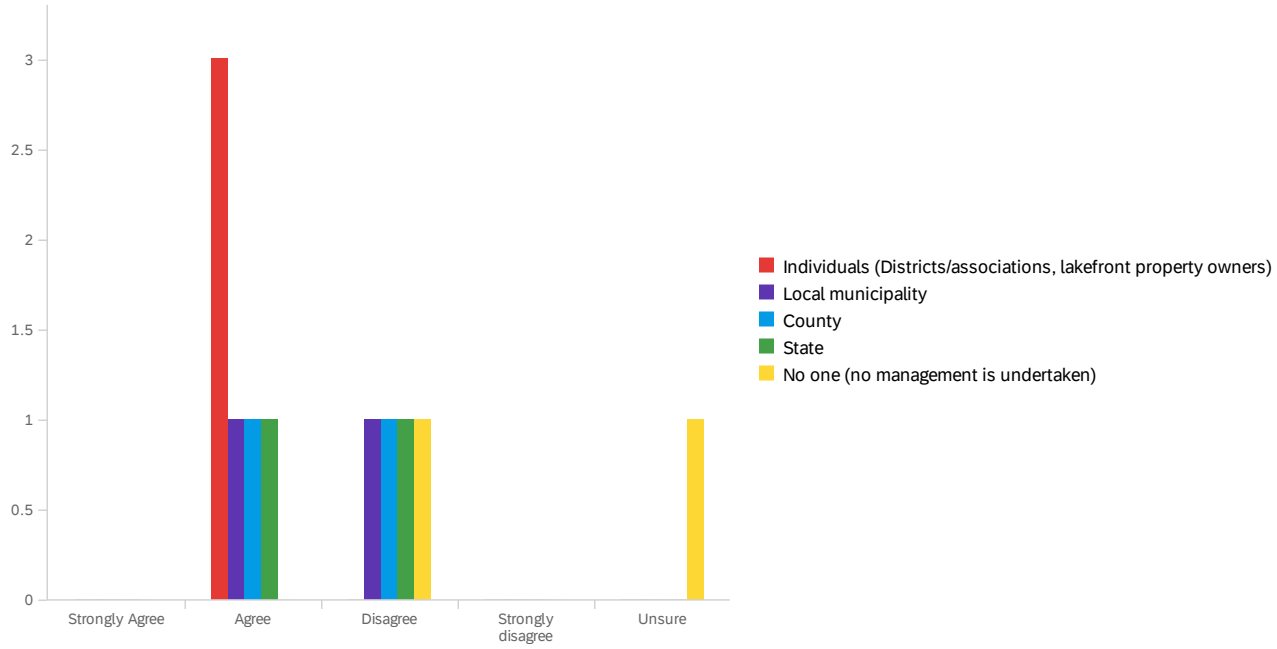
Q39 - After you have been to another lake, do you clean your.... before bringing it back to Grindle Lake?



#	Field	Yes, always	Sometimes	Rarely	No, never	Total
1	Boat (motor boat, canoe/kayak, etc.)	100% 3	0% 0	0% 0	0% 0	3
2	Trailer	100% 3	0% 0	0% 0	0% 0	3
3	Fishing equipment	67% 2	33% 1	0% 0	0% 0	3
4	Live wells	0% 0	0% 0	0% 0	0% 0	0

Showing rows 1 - 4 of 4

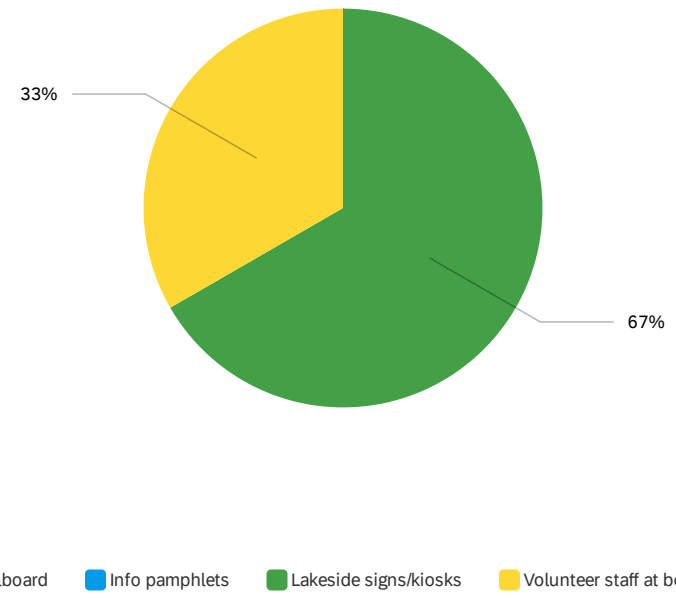
Q40 - Who should pay the cost of managing invasive aquatic plants?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Individuals (Districts/associations, lakefront property owners)	0% 0	100% 3	0% 0	0% 0	0% 0	3
2	Local municipality	0% 0	50% 1	50% 1	0% 0	0% 0	2
3	County	0% 0	50% 1	50% 1	0% 0	0% 0	2
4	State	0% 0	50% 1	50% 1	0% 0	0% 0	2
5	No one (no management is undertaken)	0% 0	0% 0	50% 1	0% 0	50% 1	2

Showing rows 1 - 5 of 5

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



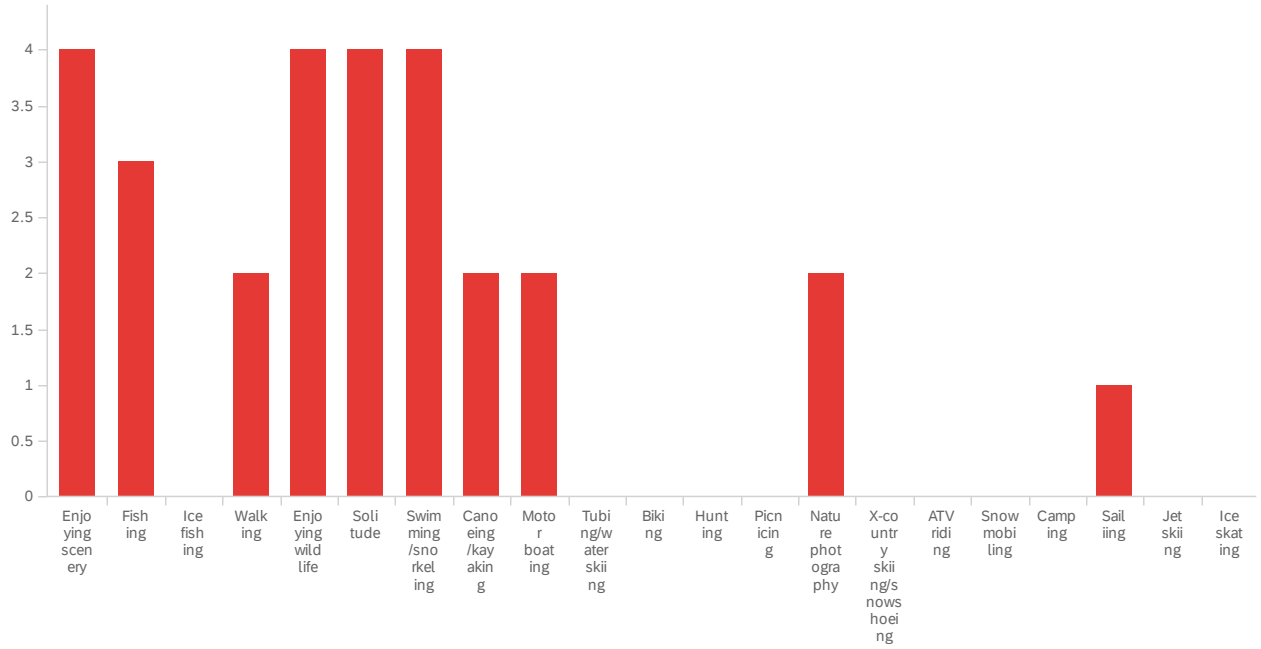
#	Field	Choice Count
1	Newspaper	0% 0
2	Billboard	0% 0
3	Info pamphlets	0% 0
4	Lakeside signs/kiosks	67% 2
5	Volunteer staff at boat launch	33% 1
6	Other	0% 0
		3

Showing rows 1 - 7 of 7

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

In your opinion, what should be done to restore, maintain or improve Grindl...
cut down on fishing pressure, less access from public sites, Less fireworks all year round, reduce the milfoil; and decrease noise pollution foil and decrease noise pollution
not much, some shoreline planting
Limit firework into the lake.
Less fishing pressure; and public landings

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



#	Field	Choice Count	
1	Enjoying scenery	14%	4
2	Fishing	11%	3
3	Ice fishing	0%	0
4	Walking	7%	2
5	Enjoying wildlife	14%	4
6	Solitude	14%	4
7	Swimming/snorkeling	14%	4
8	Canoeing/kayaking	7%	2
9	Motor boating	7%	2
10	Tubing/water skiing	0%	0
11	Biking	0%	0
12	Hunting	0%	0
13	Picnicing	0%	0

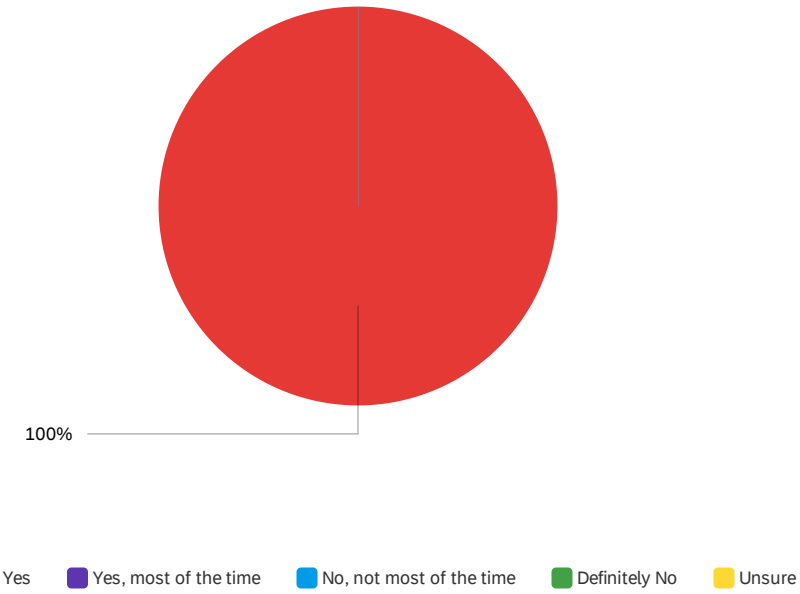
#	Field		Choice Count
14	Nature photography	7%	2
15	X-country skiing/snowshoeing	0%	0
16	ATV riding	0%	0
17	Snowmobiling	0%	0
18	Camping	0%	0
19	Sailiing	4%	1
20	Jet skiing	0%	0
21	Ice skating	0%	0
			28

Showing rows 1 - 22 of 22

Q46 - Other recreational activities not included above:

Other recreational activities not included above:
Paddle boarding

Q47 - "No Wake" is allowed on Grindle Lake at any time. Do you like the current "No Wake" rules as they are?



#	Field	Choice Count
1	Definitely Yes	100% 4
2	Yes, most of the time	0% 0
3	No, not most of the time	0% 0
4	Definitely No	0% 0
5	Unsure	0% 0
		4

Showing rows 1 - 6 of 6

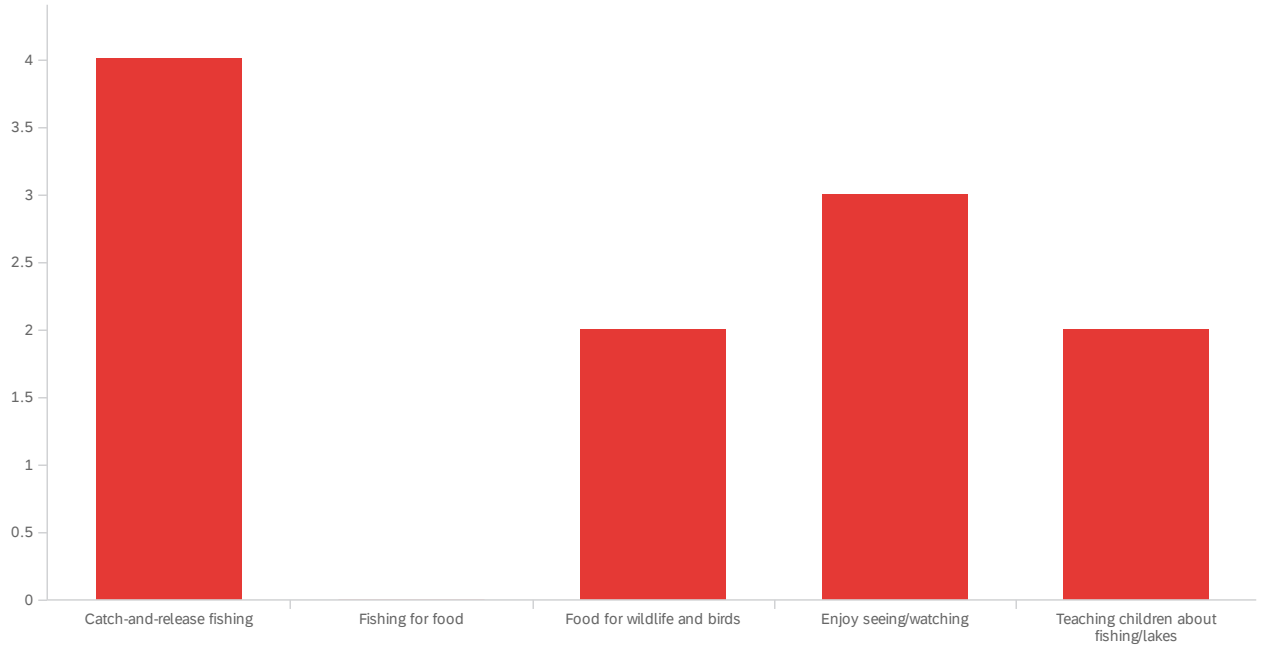
Q48 - If you think the "No Wake" rules should be adjusted...in what way?

If you think the "No Wake" rules should be adjusted...in what way?
N/A
I think they should be enforced

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

What could be done to improve your recreation experience on Grindle Lake?
less noise and people trying to turn their property into the city instead of leaving it wild
Nothing
enforce the rules; and stop people from turning it into the city with fertilized green lawns

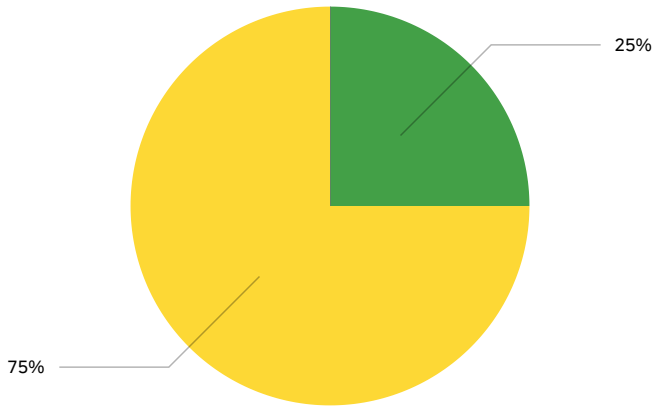
Q51 - For what purposes do you value the fishery in Grindle Lake? (Check all that apply)



#	Field		Choice Count
1	Catch-and-release fishing	36%	4
2	Fishing for food	0%	0
3	Food for wildlife and birds	18%	2
4	Enjoy seeing/watching	27%	3
5	Teaching children about fishing/lakes	18%	2
			11

Showing rows 1 - 6 of 6

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

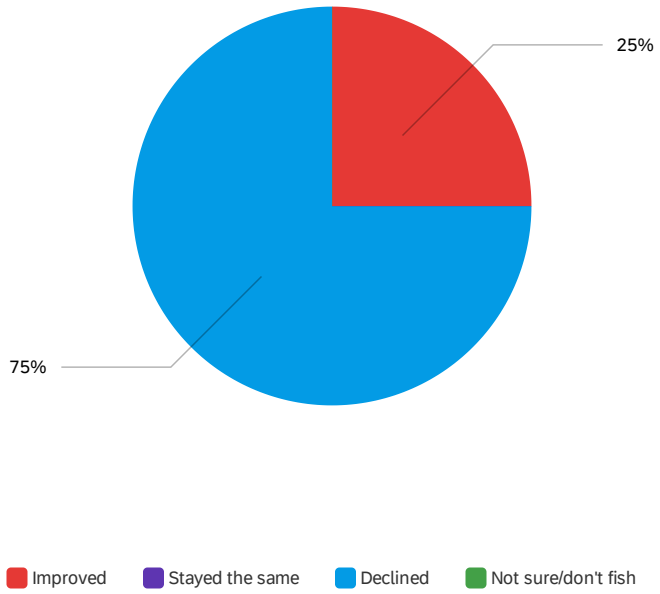


I don't fish Grindle Lake 1-5 years 6-10 years 11-20 years More than 20 years

#	Field	Choice Count
1	I don't fish Grindle Lake	0% 0
2	1-5 years	0% 0
3	6-10 years	0% 0
4	11-20 years	25% 1
5	More than 20 years	75% 3
		4

Showing rows 1 - 6 of 6

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



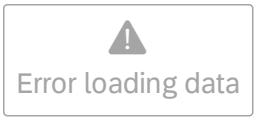
#	Field	Choice Count	
1	Improved	25%	1
2	Stayed the same	0%	0
3	Declined	75%	3
4	Not sure/don't fish	0%	0
			4

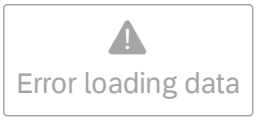
Showing rows 1 - 5 of 5

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

What do you think has contributed to the change in fishing?
pressure from over fishing
adding fallen trees to the shoreline. tree drop
Maybe over fished for food!
pressure from over fishing; and water quality. There use to be tons of minnows ie shiners. Haven't seen any in years

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

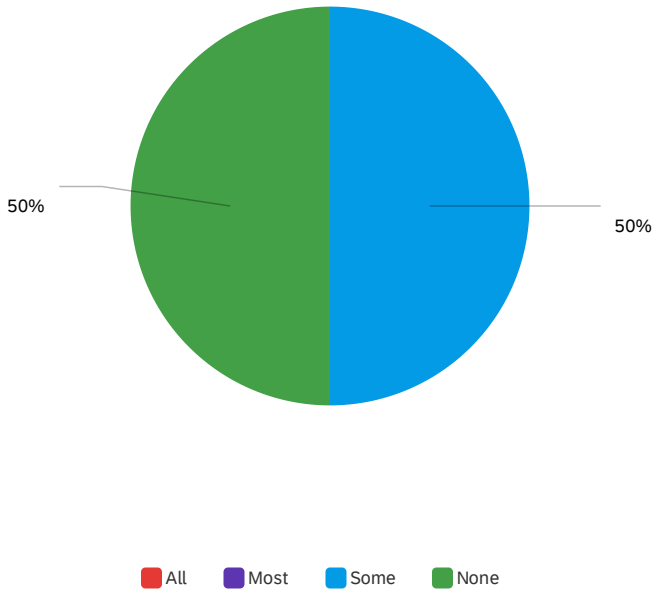




Q56 - What type of fish do you catch on Grindle Lake?

What type of fish do you catch on Grindle Lake?
large mouth bass, bluegill, use to be a very productive crappie lake; but not anymore. A few northerns; but they have been fished to death also
sun fish
Bass
bluegill, large mouth bass, there use to be northern and crappies, haven't seen any in the last 5 to 10 years

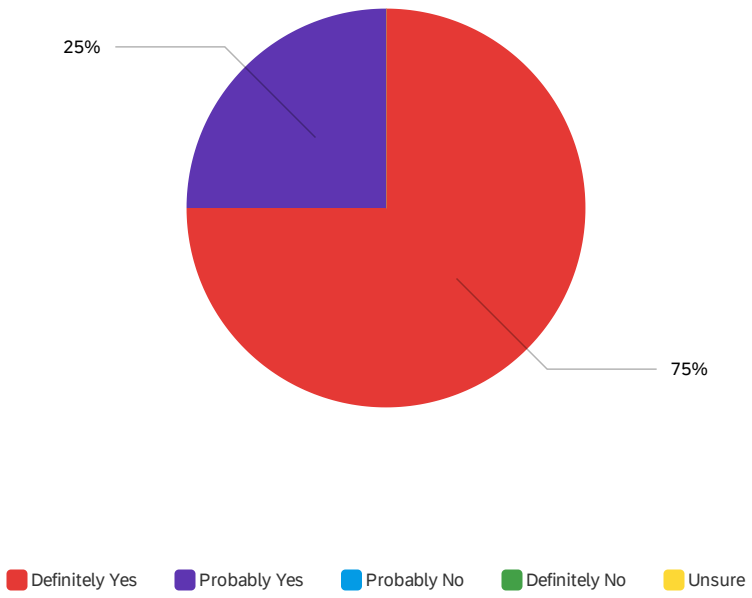
Q57 - In general, how many of the fish you catch are big enough to keep?



#	Field	Choice Count
1	All	0% 0
2	Most	0% 0
3	Some	50% 2
4	None	50% 2
		4

Showing rows 1 - 5 of 5

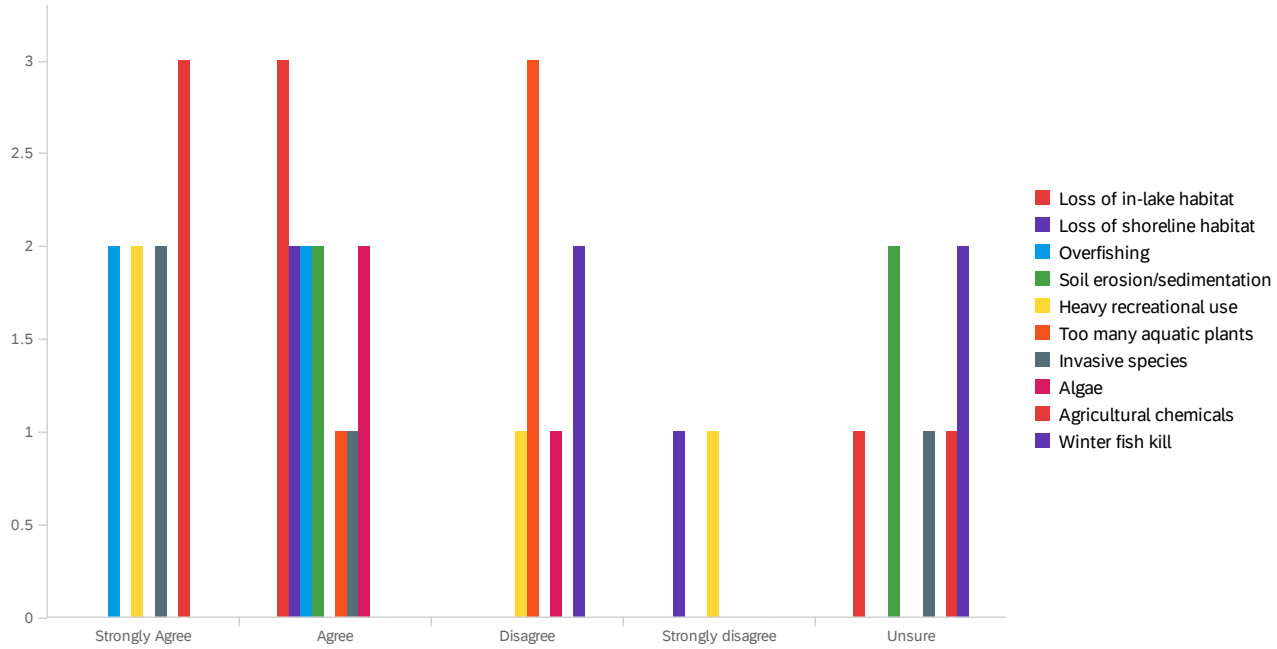
Q58 - Do you believe fish from Grindle Lake are safe to eat?



#	Field	Choice Count
1	Definitely Yes	75% 3
2	Probably Yes	25% 1
3	Probably No	0% 0
4	Definitely No	0% 0
5	Unsure	0% 0
		4

Showing rows 1 - 6 of 6

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



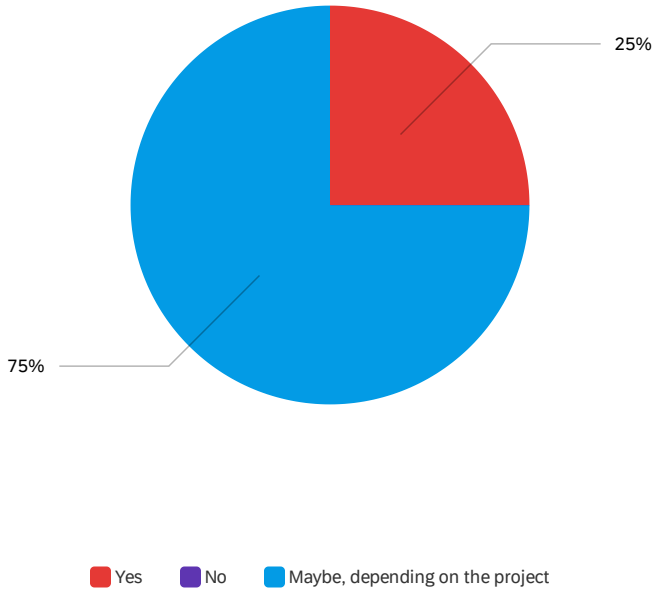
#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Loss of in-lake habitat	0% 0	75% 3	0% 0	0% 0	25% 1	4
2	Loss of shoreline habitat	0% 0	67% 2	0% 0	33% 1	0% 0	3
3	Overfishing	50% 2	50% 2	0% 0	0% 0	0% 0	4
4	Soil erosion/sedimentation	0% 0	50% 2	0% 0	0% 0	50% 2	4
5	Heavy recreational use	50% 2	0% 0	25% 1	25% 1	0% 0	4
6	Too many aquatic plants	0% 0	25% 1	75% 3	0% 0	0% 0	4
7	Invasive species	50% 2	25% 1	0% 0	0% 0	25% 1	4
8	Algae	0% 0	67% 2	33% 1	0% 0	0% 0	3
9	Agricultural chemicals	75% 3	0% 0	0% 0	0% 0	25% 1	4
10	Winter fish kill	0% 0	0% 0	50% 2	0% 0	50% 2	4

Showing rows 1 - 10 of 10

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

Do you have any additional comments regarding Grindle Lake?
No

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.)?



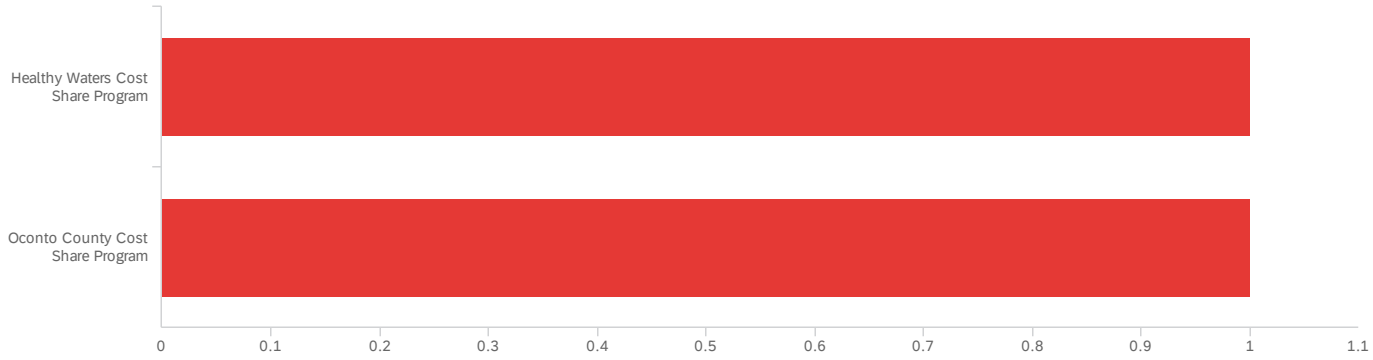
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Would you be interested in volunteering on a project on your lake (such as shoreland restoration planting, invasive species monitoring/removal, water quality monitoring, highway cleanup, etc.)?	1	3	3	1	1	4

#	Field		Choice Count
1	Yes	25%	1
2	No	0%	0
3	Maybe, depending on the project	75%	3
			4

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	50%	1
2	Oconto County Cost Share Program	50%	1
			2

Showing rows 1 - 3 of 3

End of Report