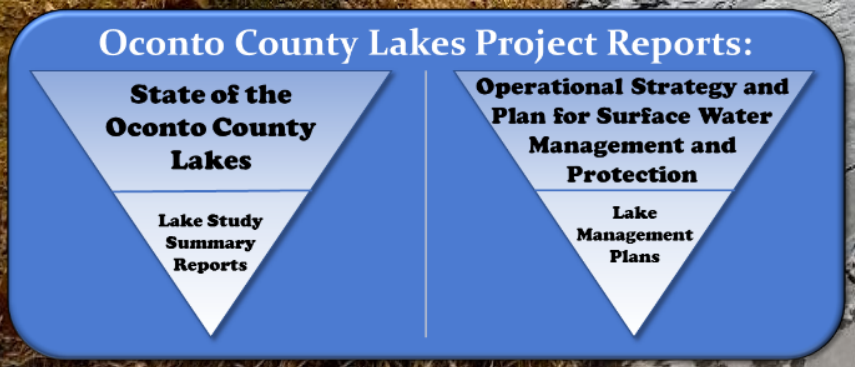
Oconto County Lakes Project

SHAY LAKE MANAGEMENT PLAN

2021



VISION

Shay Lake will remain a relaxing 'home away from home' with clean clear water, wildlife and great neighbors.

Shay Lake Management Plan

The authors would like to acknowledge the commitment and enthusiasm of 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 Shay 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.

Shay Lake Planning Participants

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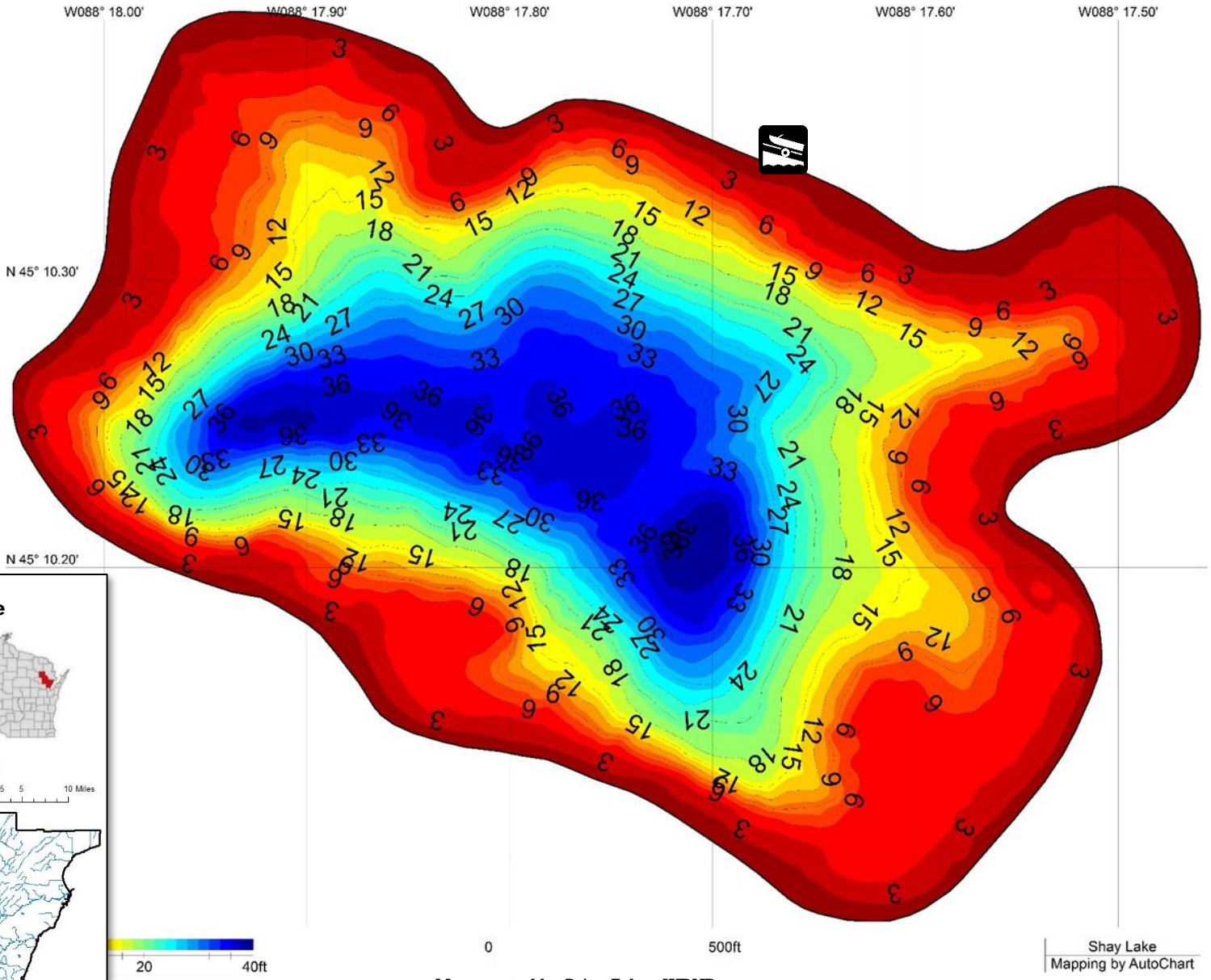
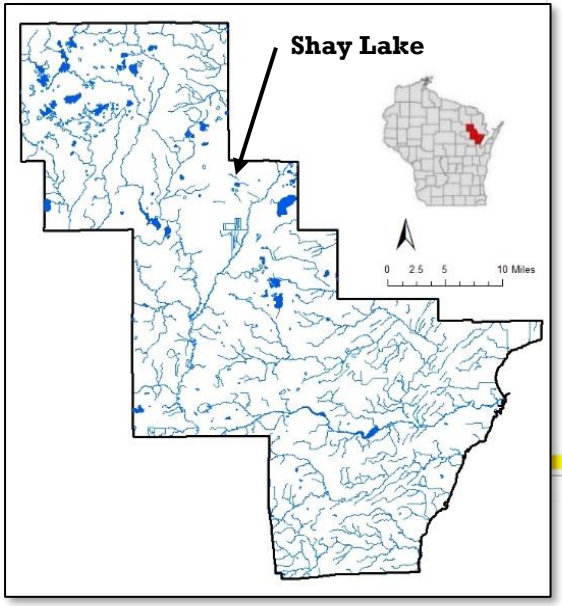
Resource	Acronym or Truncated Name
Citizen Lake Monitoring Network	CLMN
Clean Boats Clean Waters	CBCW
Lumberjack Resource Conservation & Development Council	LRCD
Oconto County Land & Water Conservation Dept.	OC LCD
Oconto County Board of Supervisors	OC Board
Oconto County Lakes and Waterways Association	OCLAWA
Town of Brazeau	TOB
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 SHAY LAKE

Shay Lake is located in the Town of Brazeau, in northeast Wisconsin. This 68-acre seepage lake has a maximum depth of 36 feet with clear water. Its bottom sediments are primarily sand with muck and some gravel. Visitors have access to the lake from one public boat landing on the lake's north side, which is owned and maintained by the Town of Brazeau. Water enters and leaves Shay Lake primarily from groundwater.





Map created by Brian Zalay, WDNR.

What Is A Lake Management Plan?

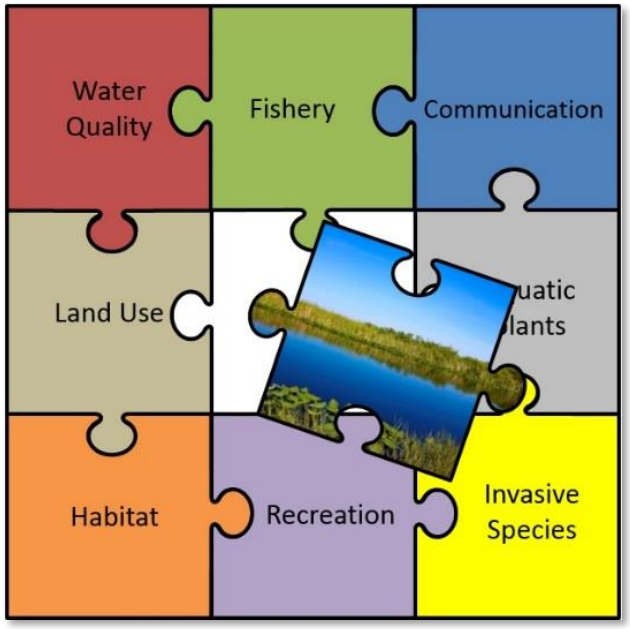
LAKE MANAGEMENT PLANS (LMP)

What is an LMP?

A management plan is a living document that changes over time to meet the current needs, challenges and desires of the lake and its community. Although each lake is different, the WDNR requires that each comprehensive lake management plan addresses 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.

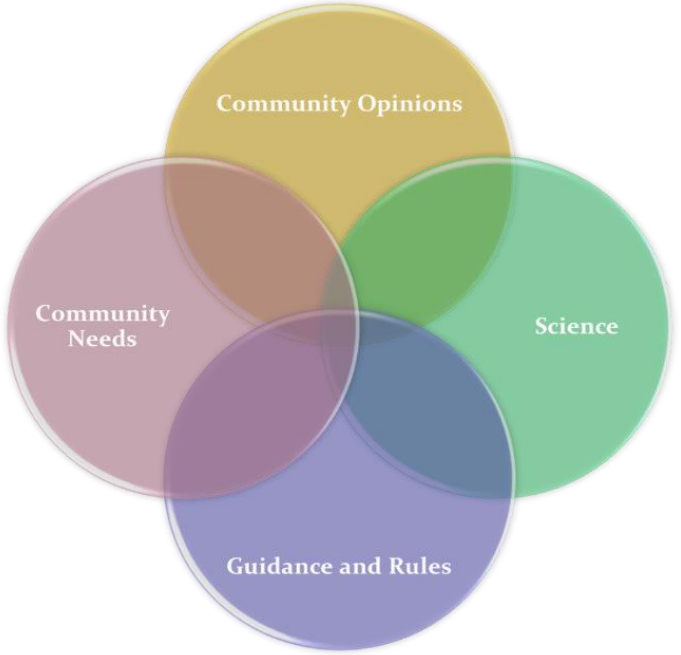
What is the purpose of this LMP?

This plan was created to ensure that Shay Lake is healthy now and for future generations. It was designed to learn about Shay Lake and identify features important to the Shay 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 Shay 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 2018-2019 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 Shay 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. Area residents, lake users, and representatives of local municipalities gathered at a public meeting held on June 23, 2018 at the Bagley Town Hall and January 20, 2021 via an online platform to learn from one another and make decisions about the fishery, water quality, habitat, and land management in the Shay 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 Shay 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 the lake can have the greatest influence on the lake by understanding and choosing lake-friendly options to manage their land and the lake.
- **A future lake association:** This plan provides an 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 Brazeau:** Municipalities can utilize the visions, objectives, and goals documented in this lake management plan when considering town-level planning or decisions within the watershed that may affect the lake.
- **Oconto County:** County professionals will better know how to identify needs, provide support, base decisions, and allocate resources to assist in lake-related efforts documented in this plan. This plan can also inform county board supervisors in decisions related to Oconto County lakes, streams, wetlands, and groundwater.
- **Wisconsin Department of Natural Resources (WDNR):** Professionals working with lakes in Oconto County can use this plan as guidance for management activities and decisions related to the management of the resource, including the fishery, and invasive species. LMPs help them to identify and prioritize needs, and where to apply resources. A well thought out lake management plan increases an application's competitiveness for funding from the State.

Who can help implement this plan?

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

Management Plan Structure

GOALS FOR SHAY 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 Shay 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

Shay Lake Management Plan Goals

Goals for Shay Lake

The following goals and actions were derived from the values and concerns of citizens interested in Shay Lake and members of the planning committee, as well as the known science about Shay 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	**Shay Lake will maintain a healthy, well-balanced fishery.**
Goal 2	**Shay Lake will have a healthy, well-balanced and diverse aquatic plant community that provides essential habitat and good water quality while not significantly impacting recreation and remaining free of invasive species.**
Goal 3	**Sensitive areas in Shay Lake, which provide essential habitat and/or water quality benefits, will be protected.**
Goal 4	**Property owners in the Shay Lake watershed will know about and utilize resources for healthy land management practices.**
Goal 5	**Shorelands around Shay Lake will be healthy and protective of water quality and habitat. Over the next 5 years, 1,000 feet of mowed shoreline (at least 10-15 properties) will be restored and at least 10 fish sticks will be installed.**
Goal 6	**Maintain or improve water quality in Shay Lake.**
Goal 7	**Lake users will informed about and care for the health of Shay Lake.**
Goal 8	**Increase participation in lake stewardship.**
Goal 9	**Review plan regularly and update as needed.**

Fish Community

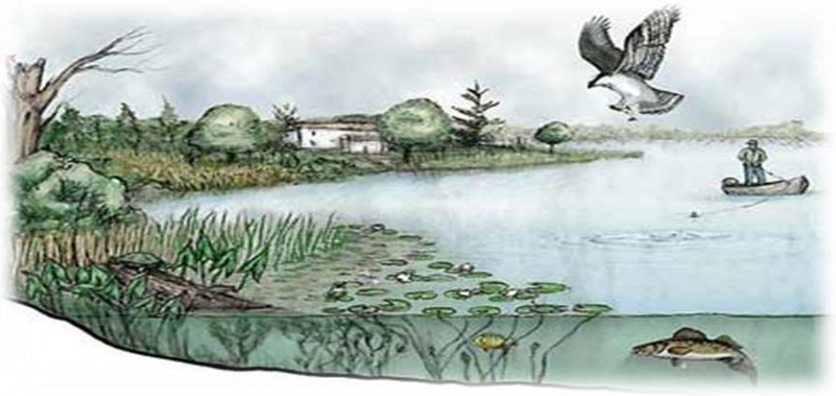
IN-LAKE HABITAT AND A HEALTHY LAKE

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 Shay 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 Shay Lake

The ability to relax with family and friends and 'get away from it all'
Ability to get away from home and work and enjoy the outdoors
Beauty, serenity and fond memories
Natural and peaceful
Place to relax

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

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.

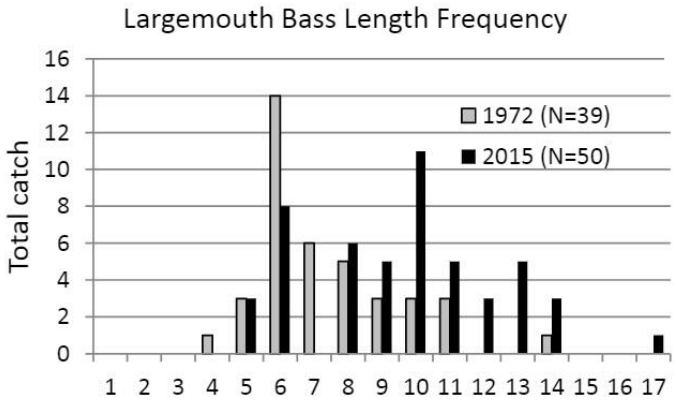
Species	Total Catch	Catch/ mi	Mean (in)	Min (in)	Max (in)
Bluegill	154	103	4.9	2.0	8.7
Largemouth Bass	50	33	10.1	5.4	17.5
Black Crappie	17	11	9.1	8.2	10.3
Yellow Perch	13	9	5.4	3.9	10.3
Yellow Bullhead	6	4	10.6	8.5	11.8
Pumpkinseed	6	4	5.4	4.1	6.9
Northern Pike	3	2	20.1	19.0	22.4
Green Sunfish	1	1	3.4	3.4	3.4

Shay Lake May 27, 2015 Fish Electrofishing Survey Summary

- ✓ Previous surveys conducted in 1965 and 1972 indicated a bass and bluegill fishery.
- ✓ Eight species observed in 2015 survey: bluegill, largemouth bass, black crappie, yellow perch, yellow bullhead, pumpkinseed, northern pike, green sunfish.
- ✓ 2015 survey results similar to previous surveys with addition of black crappie and northern pike.
- ✓ Bluegill most abundant species (103/mile) with average growth.
- ✓ Largemouth bass dominant predator (33/mile) with below average growth though numbers have improved.
- ✓ Next survey scheduled for 2025.

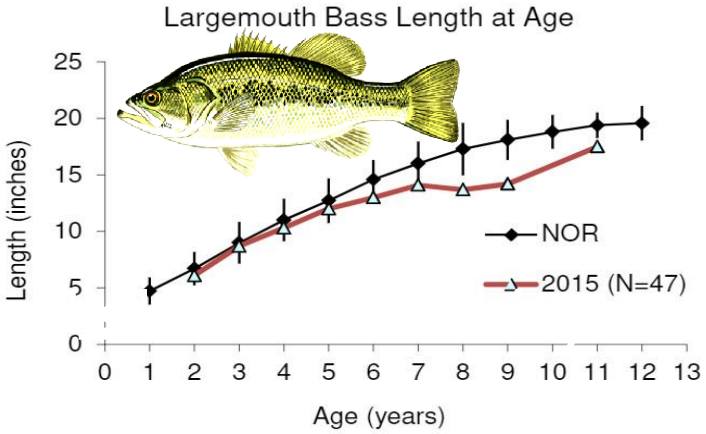
Fish Community

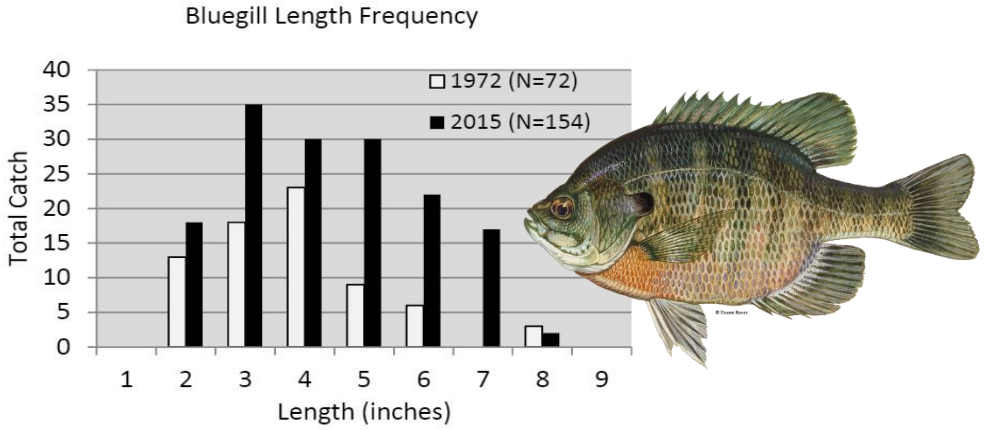
Fish cribs are good cover for small fish, but near shore habitat is essential for reproduction of most species.



Shay Lake Stocking History

- Stocked extensively from 1937 through 1952
- Largemouth bass from 1943 through 1952
- Species stocked to a lesser degree included bluegill, yellow perch, northern pike, walleye bullheads and rock bass
- Explored potential for two-story fishery with stocking of Brook trout from 1954 to 1964 (128,000 total)
- No stocking records after 1964





Goal 1. Shay Lake will maintain a healthy, well-balanced fishery.

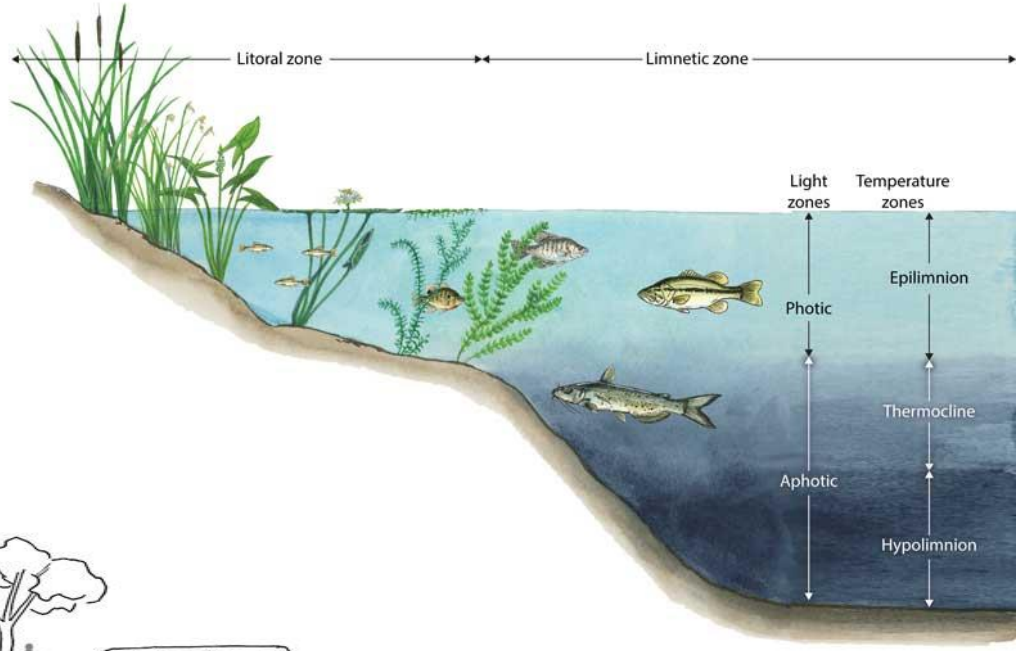
Objective 1.1 Continue to manage for a healthy balance of predator and panfish populations.

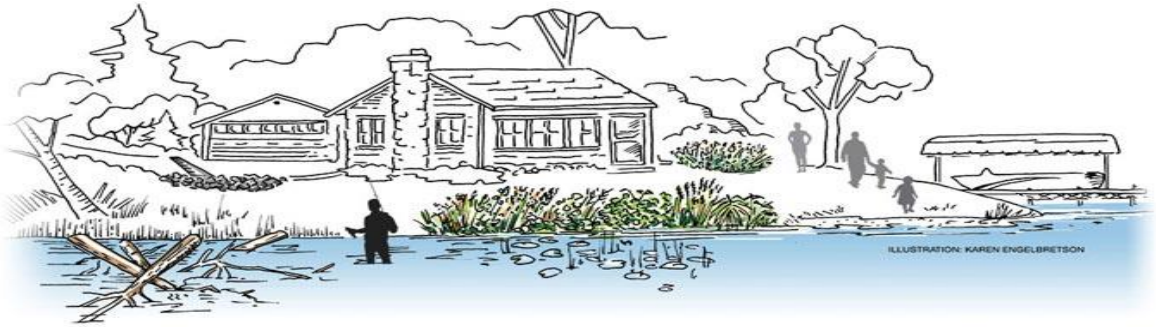
Actions	Lead person/group	Resources	Timeline
Request additional survey work to assess and evaluate panfish and northern pike populations.		WDNR-Chip Long	2021-2022
Explore regulation change to 10/day maximum for panfish.		WDNR-Chip Long	Based on additional survey results

Fish Community

Objective 1.2 Continue to enhance fish and wildlife habitat in and around the lake. At least 10 fish stick clusters will be installed over the next 5 years.

Actions	Lead person/group	Resources	Timeline
Identify willing landowners for fish stick installations (at least 10% of properties with fish sticks is recommended). Trees can be sourced by identifying other landowners who need a tree removed.		WDNR-Chip Long	Ongoing
Educate and encourage landowners to leave logs, tree branches and limbs in place in the water, whenever possible.		WDNR-Chip Long UWEX-Pat Goggin	Ongoing
Continue to protect and restore shoreland areas and avoid shoreland alterations to improve fish habitat (see **Shoreland** section).		Shoreland property owners	Ongoing





Aquatic Plant Community

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

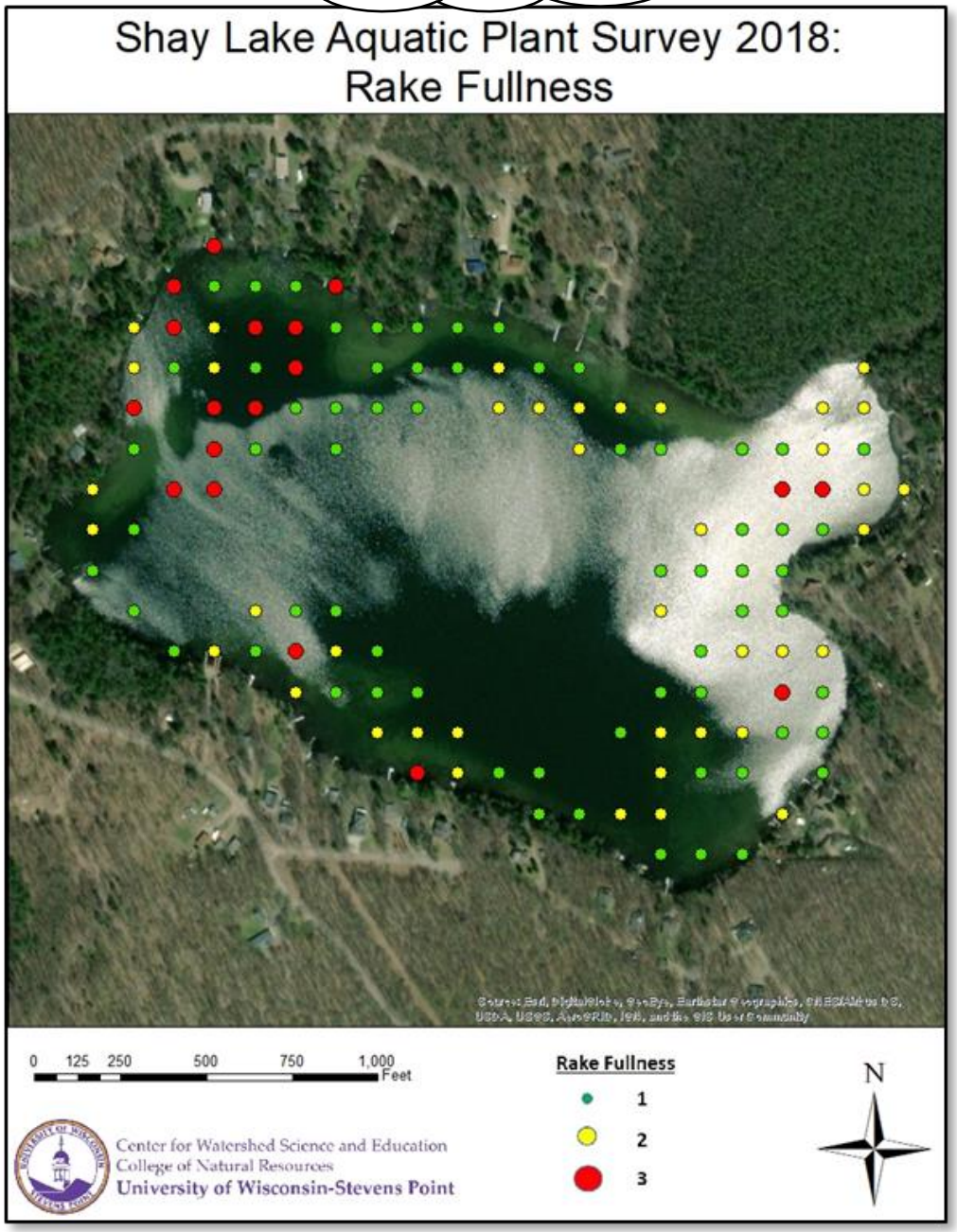
Aquatic Plants

Aquatic plants provide the forested landscape within Shay 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.

Shay Lake 2018 Aquatic Plant Survey Highlights

- ✓ 68% (122 of 216) of the sites visited had vegetative growth.
- ✓ The greatest depth aquatic plants were found was 19 feet.
- ✓ 19 species of aquatic plants were identified. This is above the North Central Hardwood average of 16.2.
- ✓ The three most dominate species were chara (84%), slender naiad (29%), wild celery (23%).
- ✓ The Floristic Quality Index (FQI) was 22.8. The northcentral hardwood average is 23.3.
- ✓ No invasive species were observed.

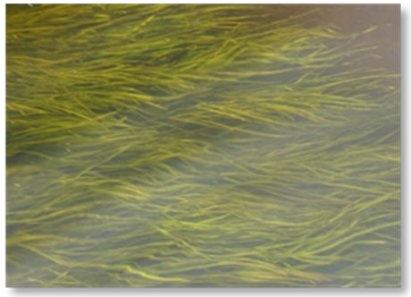


Aquatic Plant Community

Chara is a type of macro algae that grows attached to muddy lake bottoms and has a musky odor. Muskgrass, as it is known, filters the lake water and is helpful in preventing the establishment of invasive species.

Slender naiad, also called nodding water-nymph, is a primary food source for waterfowl and provides habitat for many invertebrates.

Wild celery has long, thin, ribbon-like leaves that are commonly up to four feet long. The seeds, roots and leaves are consumed by ducks and other waterfowl. Water celery provides excellent habitat for fish.



Aquatic Invasive Species (AIS)

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

No invasive species were observed during the 2018 survey.

However, **Chinese mystery snails** were documented in Shay Lake in 2013. Not a lot is known about the impacts of this species, but they have been shown to compete with native populations of snails and possibly serve as a vector for parasites and disease.

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

Aquatic Plant Management in Shay Lake

Management strategies in Shay 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 Shay 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 Shay 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. Shay Lake will have a healthy, well-balanced and diverse aquatic plant community that provides essential habitat and good water quality while not significantly impacting recreation and remaining free of invasive species.

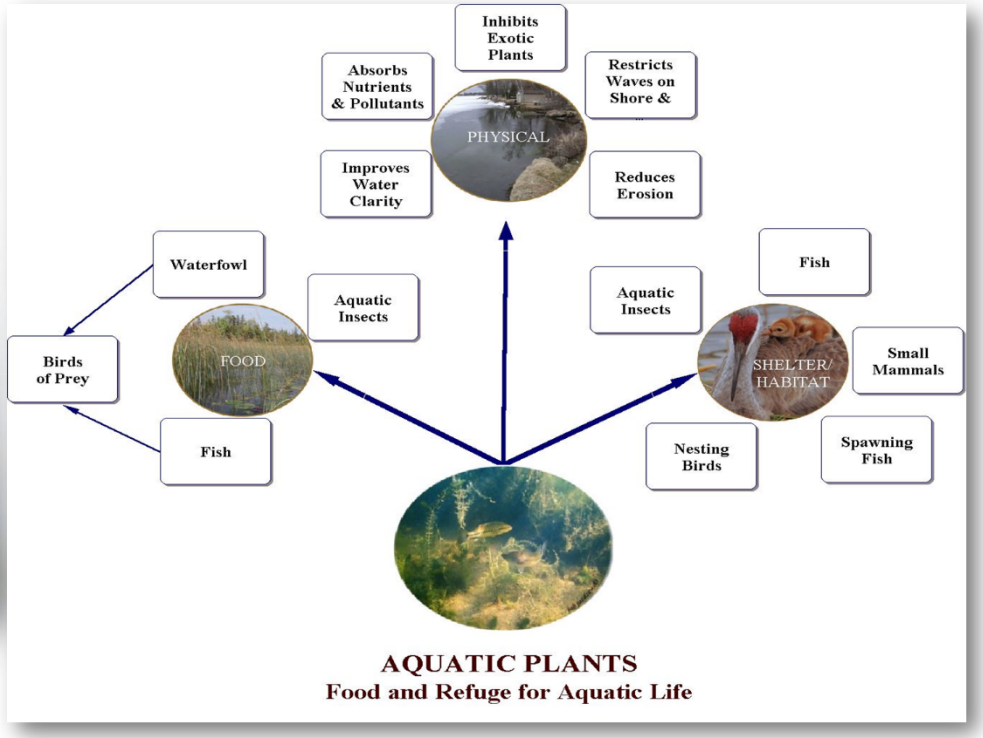
Objective 2.1 Minimize disturbance to native aquatic plants.

Actions	**Lead person/group**	**Resources**	**Timeline**
Inform property owners of the importance of native aquatic vegetation to impede the establishment of AIS, provide food and habitat for wildlife, and protect the shoreline by sending educational materials and/or newsletter.		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 access, 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.		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.		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 **Shoreands** section) and implementing BMPs in the watershed (see **Watershed** section).		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.		WDNR-Brenda Nordin LRCD	Summers
Identify Clean Boats Clean Waters volunteers or hire someone to staff boat launch on busy days. This can be paid for with a CBCW grant.		CBCW	Summers
Educate landowners on importance of native aquatic plants for preventing AIS. Host a speaker or mail literature to property owners.		WDNR-Brenda Nordin	Ongoing
If new AIS is suspected or observed, follow the guidance in **Appendix B**.		WDNR-Brenda Nordin	Ongoing



Critical Habitat

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

Critical Habitat

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

Although Shay Lake does not have an official critical habitat area designation, there are areas within Shay 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 Shay 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 Shay Lake.

Actions	Lead person/group	Resources	Timeline
Request a Critical Habitat Designation from WDNR.		WDNR-Brenda Nordin	2022
If critical habitat is identified, communicate to property owners, visitors, and Town Board as to why these areas are important. Look for opportunities to protect these areas.			TBD

Watershed

LANDSCAPES AND THE LAKE

Shay Lake Watershed

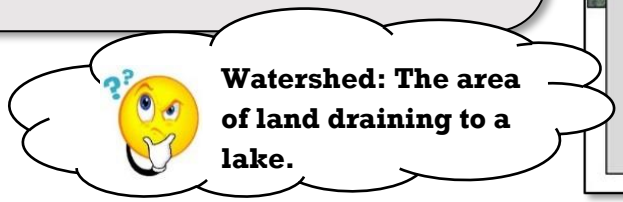
A Lake is a Reflection of its Watershed…

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

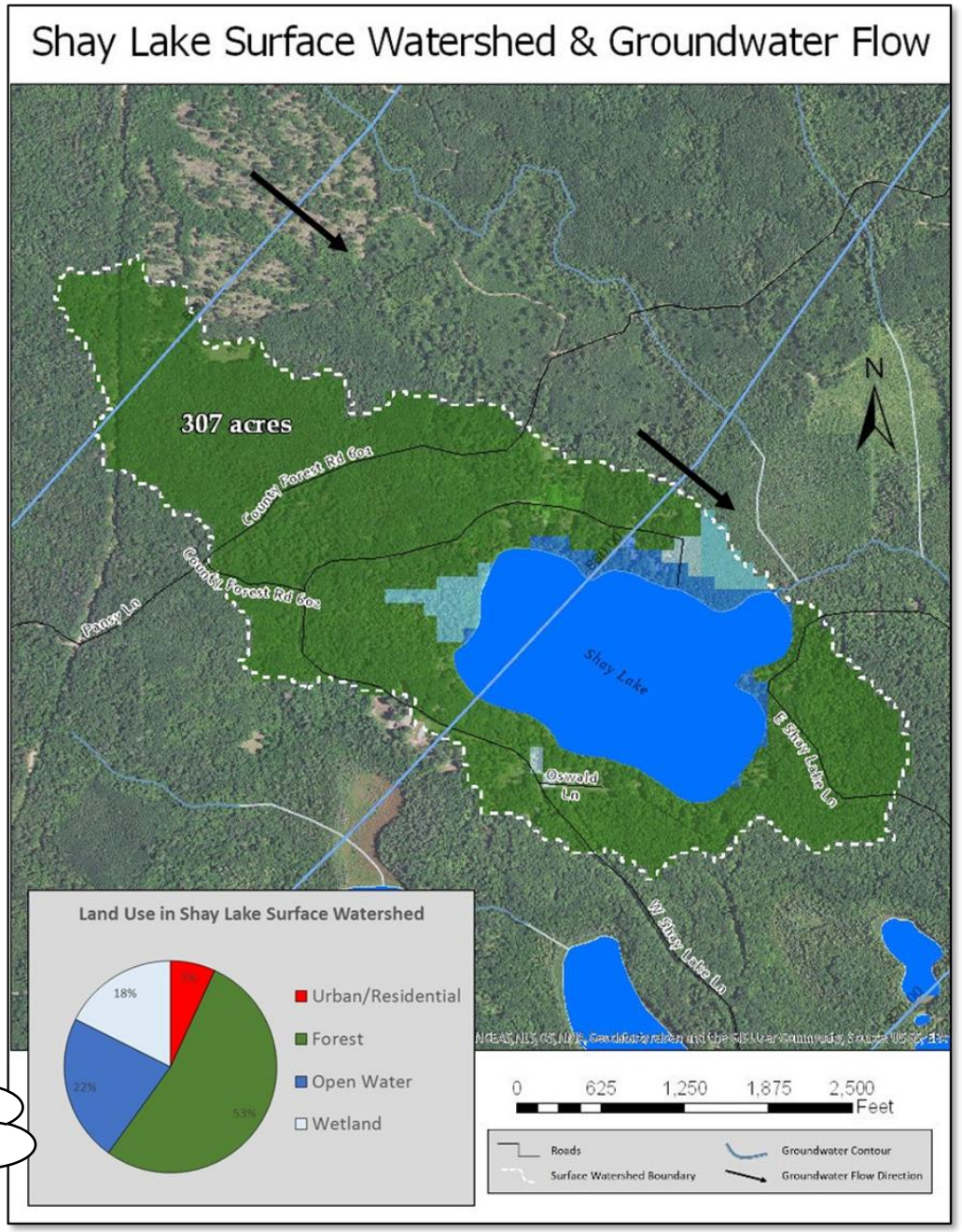
Less runoff is desirable because it allows more water to recharge the groundwater, which feeds the lake year-round - even during dry periods or when the lake is covered with ice. The capacity of the landscape to shed or hold water and contribute or filter particles determines the amount of erosion that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

Shay Lake's Watershed

The Shay Lake watershed is 307 acres. Primary land use is forested land. The lake's shoreland is surrounded primarily by developed residential lots and forest. 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:

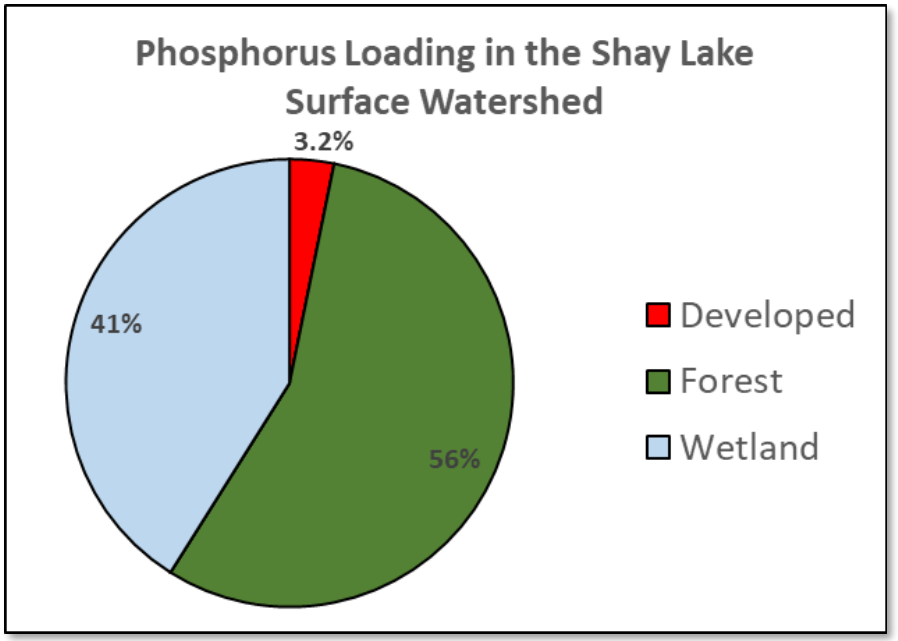
- eliminating/reducing the use of fertilizers,
- increasing the distance between the lake and a septic drainfield,
- protecting/restoring wetlands and native vegetation in the shoreland,
- controlling erosion,
- manure management and cropping practices.

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

Watershed

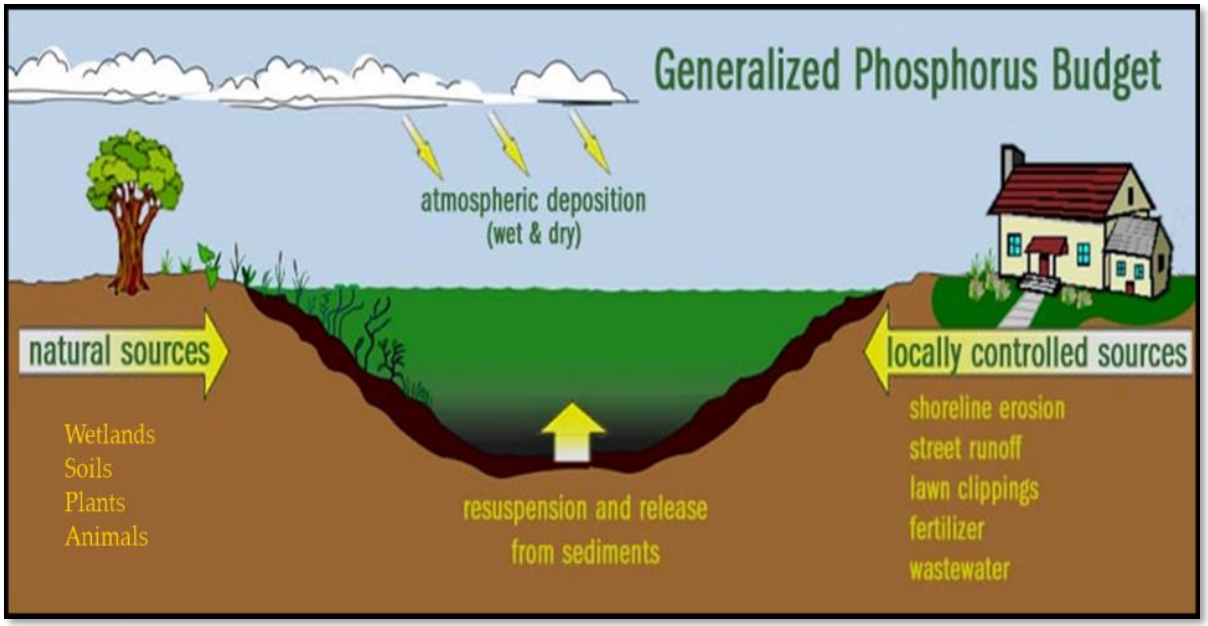
Phosphorus Modeling

Estimates of phosphorus from the landscape can help to understand the phosphorus sources to Shay 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 Shay Lake watershed, the vast majority of these sources are natural and cannot be changed.



Phosphorus Loading in Shay Lake Watershed

Based on modeling results, forested land 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 agriculture and developed areas.



Goal 4. Property owners in the Shay Lake watershed will know about and utilize resources for healthy land management practices.

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

Actions	Resources	Timeline
Encourage the County to support and follow-up with water quality-based best management practices (BMPs) within the lake's watershed. Include BMPs that reduce application of excess nitrogen and pesticides that leach to groundwater.	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.	WDNR Lake Protection Grant Knowles-Nelson Stewardship Fund NWLT	As needed
Encourage and new development to manage runoff on site and consider ways to minimize impacts from septic systems on Shay Lake.	Town of Brazeau Developers/builders	As needed
Encourage design of road and construction projects that will minimize impact to lakes.	Town of Brazeau OC Highway Dept./WDOT	As needed
Protect wetlands to maintain the water budget of Shay Lake. Any altered wetlands should be mitigated within the lake's watershed.	WDNR	As needed
Work with Town of Brazeau to maintain and make improvements to boat launch to reduce erosion and runoff.	Town of Brazeau WDNR	As needed

Shorelands

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

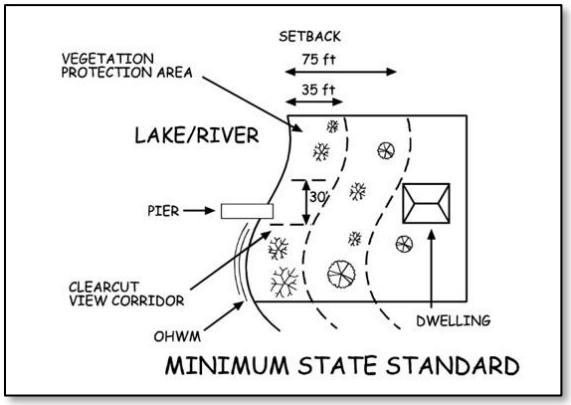
Shorelands

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

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

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

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



Be Part of the Solution!

Follow Healthy Shoreland Practices

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

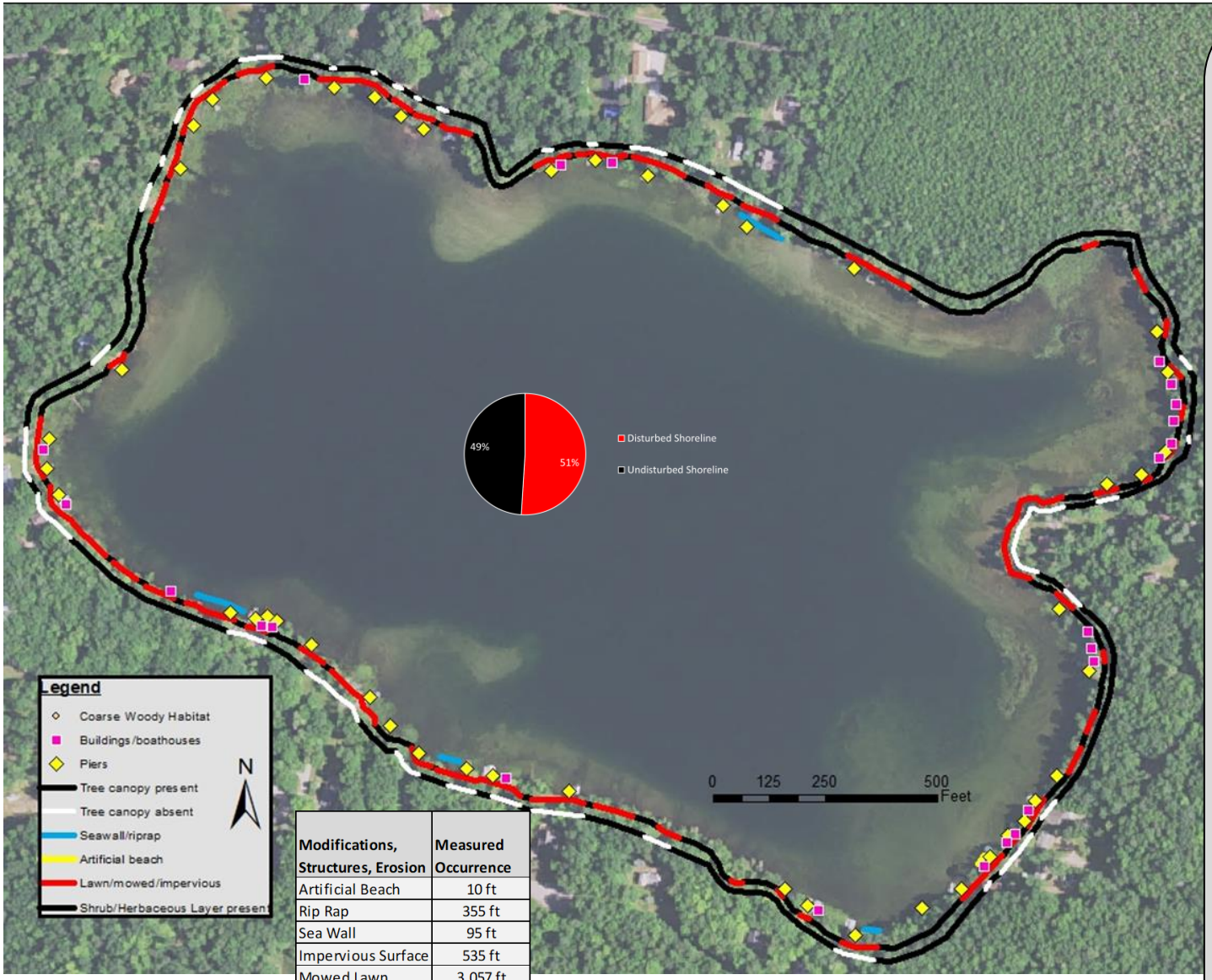
State Shoreland Zoning Ordinance

NR 115 Wisc. Adm. Code for Unincorporated Municipalities

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

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

Shorelands



Modifications, Structures, Erosion	Measured Occurrence
Artificial Beach	10 ft
Rip Rap	355 ft
Sea Wall	95 ft
Impervious Surface	535 ft
Mowed Lawn	3,057 ft
Erosion	160 ft
Nonconforming Buildings	2
Piers	46
Coarse Woody Habitat	56 logs/mile

Shay Lake's Shorelands

To better understand the health of Shay Lake, shorelands were evaluated. The survey inventoried shoreland vegetation, erosion, riprap, barren ground, seawalls, structures, and docks. About half of the 1.5 miles of shoreline is developed as homes and seasonal cottages. A total of 61 piers were counted during the survey (1 pier/127 feet of shoreline).

- With 38 lakefront lots, 1,830 feet (24%) of disturbed shoreland is permitted under NR115. Based on the 2018 shoreland inventory, 53% (4,052 feet) of Shay Lake's shoreland was disturbed. Coarse woody habitat was measured at 56 logs/mile (250 logs/mile recommended.)
- Shay Lake had slightly below average shoreland health compared to other lakes in the study. Some stretches are in good shape, but many portions have challenges that should be addressed.

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

Shay Lake 2018 Shoreland Survey Results			
Total lakefront footage	**# Riparian lots**	**Total allowable (NR115) disturbed shoreland**	**Measured disturbed shoreland**
7,716	61	1,830 feet (24%)	3,934 feet (51%)

Goal 5. Shorelands around Shay Lake will be healthy and protective of water quality and habitat. Over the next 5 years, 1,000 feet of mowed shoreline (at least 10-15 properties) will be restored and at least 10 fish sticks will be installed.

Objective 5.1 Shoreland property owners will be knowledgeable and make good decisions regarding shoreland practices.

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, native plants, coarse woody debris). Include information on cost share programs.		OCLWA UWEX Lakes WDNR 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.		UWEX Lakes OCLCD WDNR Healthy Lakes Grants	Ongoing
Encourage those interested in shoreland restorations to contact OCLCD for available resources.		OCLCD WDNR Healthy Lakes Grants	Ongoing
Consider restoring and showcasing a 'demonstration site' with a sign about shoreland protection.		WDNR	2022
Work with landowners of large undeveloped shoreline areas to develop protections for these areas such as conservation easement, purchase, or other strategies.		UWEX Lakes Knowles-Nelson Stewardship Fund	Ongoing
Identify willing property owners to install fish sticks to improve fish habitat (see **Fish Community** section).		WDNR-Chip Long OCLCD	2022
Work with Town to design and install a water diversion structure at the boat ramp to keep runoff from flowing directly into lake.		Town of Brazeau WDNR OCLCD	2022

Water Quality

Water Quality

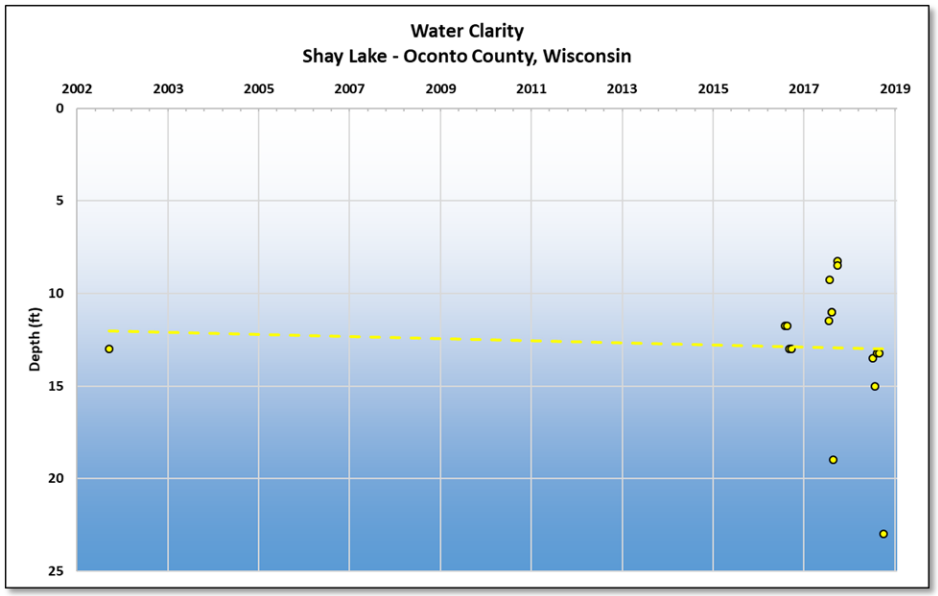
A variety of water chemistry measurements were used to characterize the water quality in Shay Lake. Water quality was assessed during the 2018-2019 lake study and involved a number of measures including temperature, dissolved oxygen, water chemistry, and nutrients (phosphorus and nitrogen). Nutrients 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 Shay Lake's water quality.

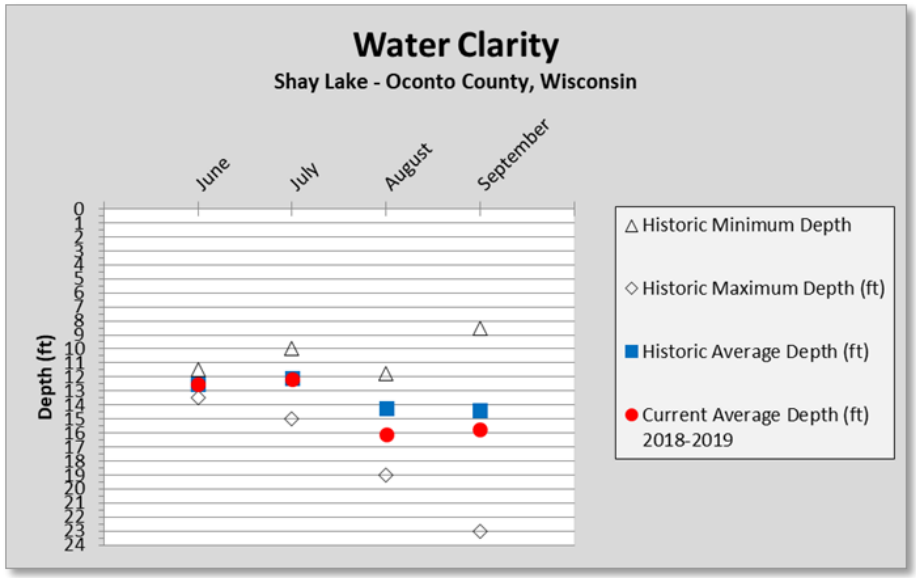
Water Clarity

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.

Shay Lake's Water Quality Summary

- ✓ **Water clarity** ranged from 8.5-23 feet (considered very good), which is slightly better than historic measurements and suggests a very slight improving trend.
- ✓ Sufficient **dissolved oxygen** was present in at least the upper 23 feet of water at all times during the study.
- ✓ Concentrations of **contaminants** were all low during the study. Atrazine was not detected.
- ✓ **Phosphorus** concentrations typically remained below the standard of 40 ug/L throughout the study, with one exception. Inorganic nitrogen remained below concentrations that spur algal blooms.
- ✓ Water in Shay Lake is **hard** (122 mg/L CaCO3), having an elevated level of dissolved minerals. This calcium-rich water helps buffer the impacts of phosphorus.

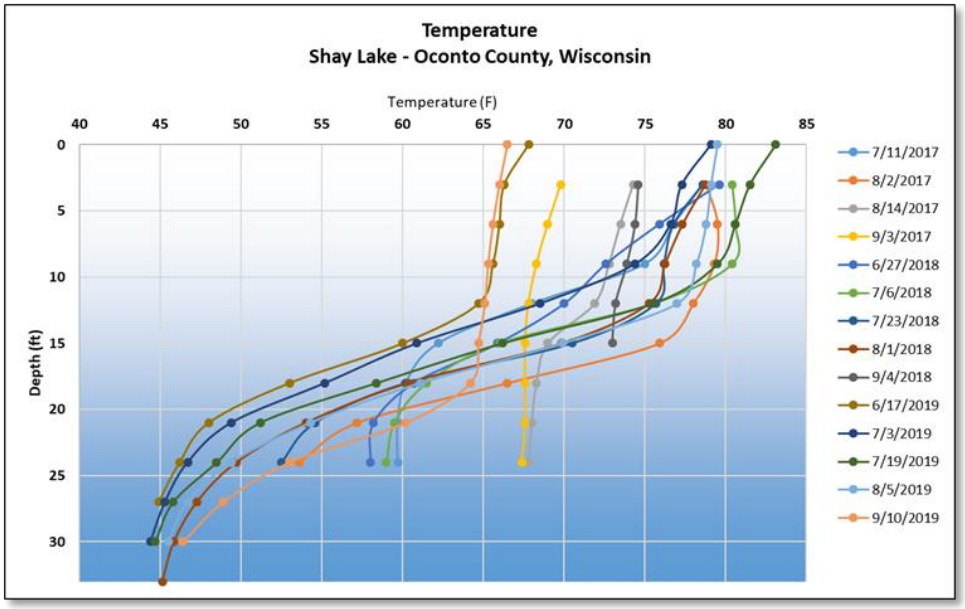




Water Quality

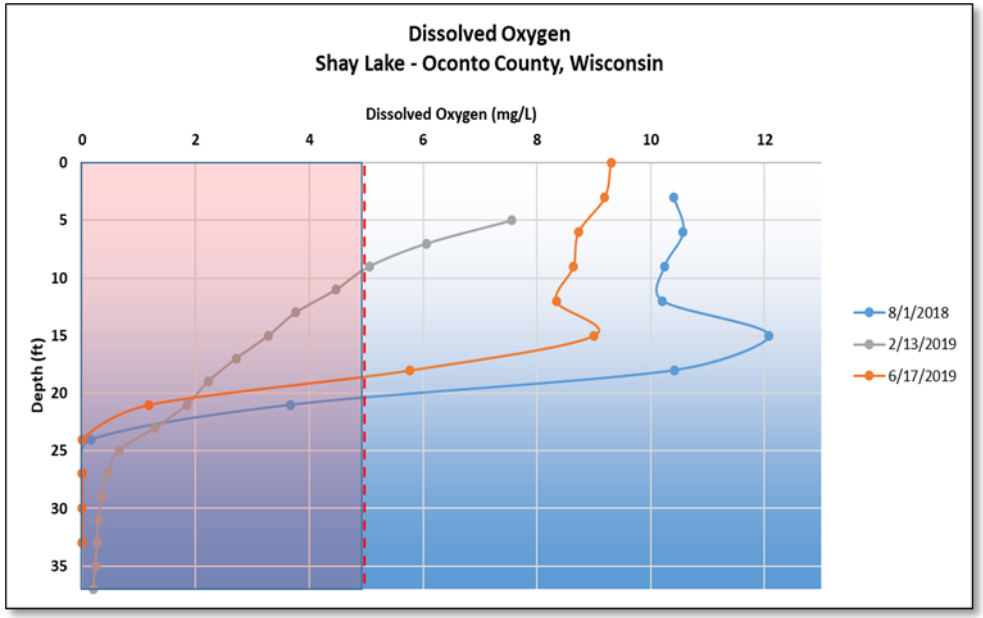
Temperature and Dissolved oxygen

Temperature profiles for Shay Lake show a thermocline at depth between 10 and 20 feet during most of the growing season. This phenomenon separates warmer water nearer the surface from



colder, groundwater-fed water at depth. In the spring and fall, temperatures at depth and near the surface become similar, allowing all the water within the lake to mix. Dissolved oxygen is an important measure in Shay 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.

Dissolved oxygen concentrations decline with depth as access to sources such as the atmosphere and growing plants is decreased. Oxygen levels in Shay Lake are typically sufficient to support fish through most of the year, but a late winter profile shows that



concentrations are very low and winter fish kills are possible Some bumps in concentrations at depth, around 15 feet, suggest some algal activity.

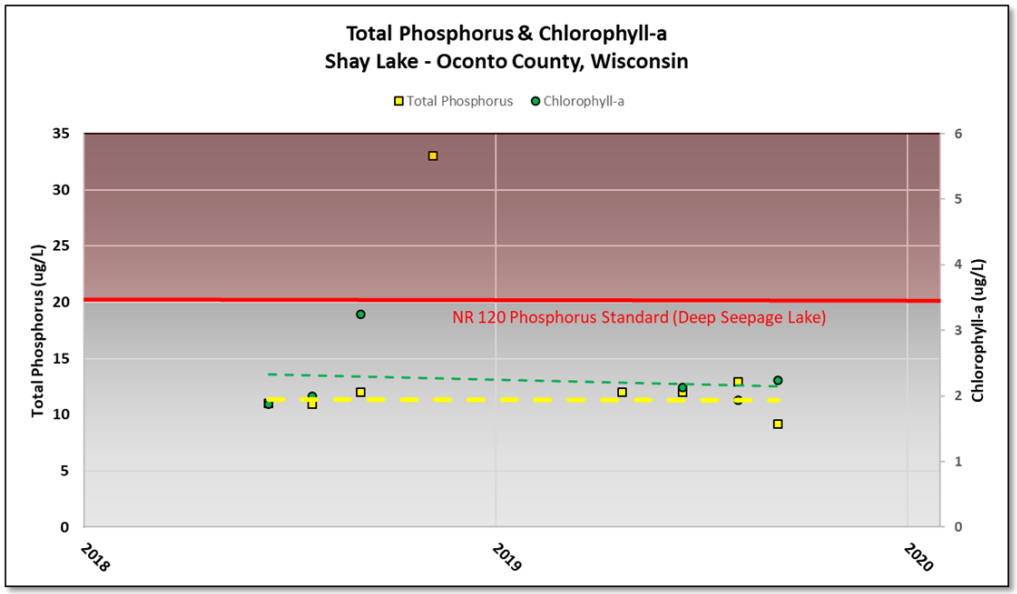
Contaminants

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 all low, suggesting minimal impacts from human activity.

Water Quality

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. Deep seepage lakes such as Shay have a standard of 20 ug/L they must remain stay to remain healthy. The very limited data available show concentrations in Shay 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 Shay Lake, phosphorus concentrations remained well below the threshold of 20 ug/L and chlorophyll-a remained below its threshold of 6 ug/L throughout the study. Based on limited data collected during the two-year study, a stable trend in concentrations is suggested. Continued monitoring is recommended.

Be part of the solution!

Managing nitrogen, phosphorus and soil erosion throughout the Shay 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 Shay Lake.

Objective 6.1 Maintain median summer total phosphorus concentrations below 20 ug/L and fall inorganic nitrogen concentrations below 0.3 mg/L.

Actions	Lead person/group	Resources	Timeline
Inform others around the lake about the impact of nutrients and land management on water quality through the distribution of a newsletter and/or hosting a guest speaker.		OCLWA WDNR UWEX Lakes	Ongoing
Refrain from the use of fertilizers. Encourage soil testing to determine if amendments are necessary.		OC UWEX	Ongoing
Encourage the restoration of unmowed vegetation to slow and absorb runoff and pollutants (see **Shorelands** section).		UWEX Lakes	Ongoing

Objective 6.2 Continue to develop an ongoing, robust water quality dataset for Shay Lake to monitor trends and declines or improvements over time.

Actions	Lead person/group	Resources	Timeline
Support volunteers collecting water quality data. Offer help or backup to those efforts. Continue participation in the Citizen Lake Monitoring Network.		CLMN WDNR-Brenda Nordin	3+ times annually in summer
Submit all collected data to WDNR for archival and use by scientists and resource managers.		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 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, and fishing. There is one public boat launch located on the north side of Shay Lake which is owned and maintained by the Town of Brazeau. No Wake is allowed from 6 pm until 10 am.

Goal 7. Lake users will informed about and care for the health of Shay Lake.

Objective 7.1 Promote an atmosphere of respect among 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. Inform residents and consider signage of "DNR Hotline" (1-800-TIP-WDNR) or sheriff's office to report unlawful behavior.		Town of Brazeau OCLWA OC UWEX	Ongoing
Work with Town to upkeep/repair boat ramp, as appropriate. Boat ramps in disrepair can be unhealthy to the lake if it results in spinning tires, power loading, etc.		Town of Brazeau WDNR	Ongoing
Update signage at boat launch with interpretive kiosk. Consider a map or some other reminder to lake users regarding NO WAKE zones (i.e., within 200 feet of shore).		UWEX Lakes	2022
Property owners can place a floating dock up to 200 feet out from their shoreland to help protect this area from boat traffic.		Shoreland property owners	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 Town of Brazeau, 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 Shay 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 Shay Lake.

Actions	Lead person/group	Resources	Timeline
Maintain a website or Facebook page to provide a common source of communication.		LakeKit.net OC UWEX	Ongoing
Maintain an email list of shoreland property owners and others interested in Shay Lake.		OC UWEX	Ongoing
Distribute welcome packet/mailing to all new shoreland property owners with basic lake stewardship information.		OCLWA UWEX Lakes	As needed
Communicate updates to lake management plan and management activities to residents and users of the lake via email list and/or newsletter.			As needed
Host gatherings to learn about topics identified in this plan. Invite speakers or conduct demonstrations.		UWEX Lakes WDNR	Ongoing

Objective 8.2. Organize stewards of Shay Lake to maximize and access resources. Communicate with municipalities, agencies and organizations to leverage resources and opportunities.

Actions	Lead person/group	Resources	Timeline
Explore creation of lake association or 'friends' group.	Interested citizens	UWEX Lakes	2022
Network with other lake groups by having Shay Lake represented at OCLWA.		OCLWA	
Attend Wisconsin Lakes Convention or Lake Leaders Institute.		UWEX Lakes	April

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 regularly and update as needed.

Objective 9.1 Communicate updates with lake community, Oconto County and WDNR.

Actions	Lead person/group	Resources	Timeline
Review plan regularly (annually) and discuss/document accomplishments and identification of goals/objectives for coming year.			Annually
Formally update this plan every 5 years.		OC UWEX UWEX Lakes WDNR	2026

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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: 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

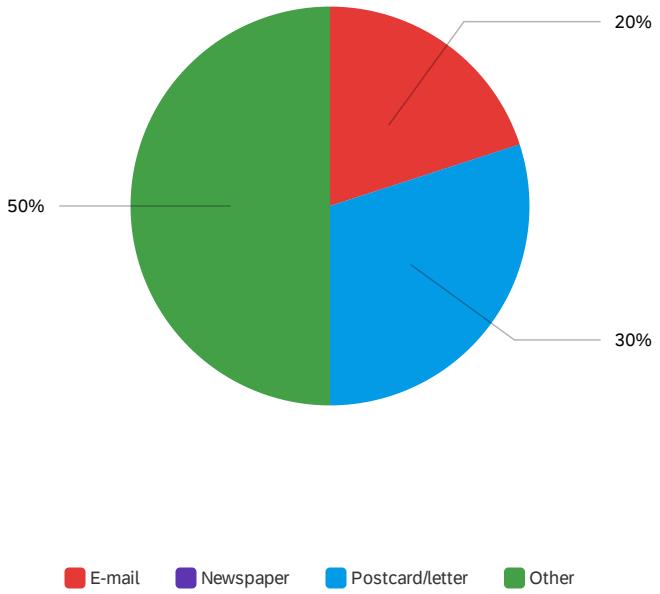
Appendix C. Lake User Survey Results

Default Report

Shay Lake Survey - Oconto County Lakes Project

March 25, 2021 11:48 AM MDT

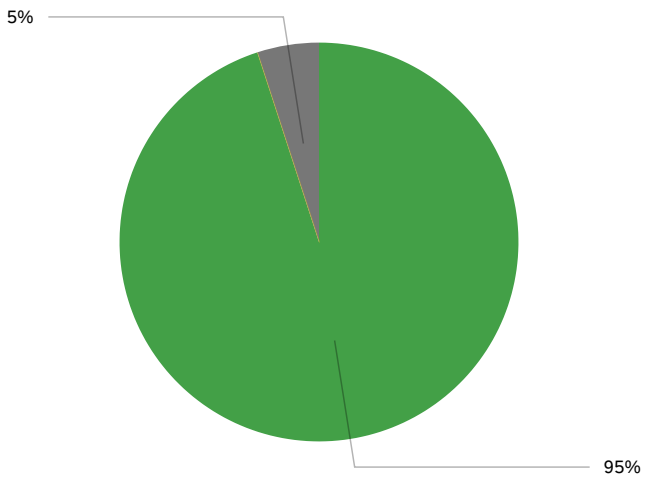
Q2 - How did you hear about this survey?



#	Field		Choice Count
1	E-mail	20%	4
2	Newspaper	0%	0
3	Postcard/letter	30%	6
4	Other	50%	10
			20

Showing rows 1 - 5 of 5

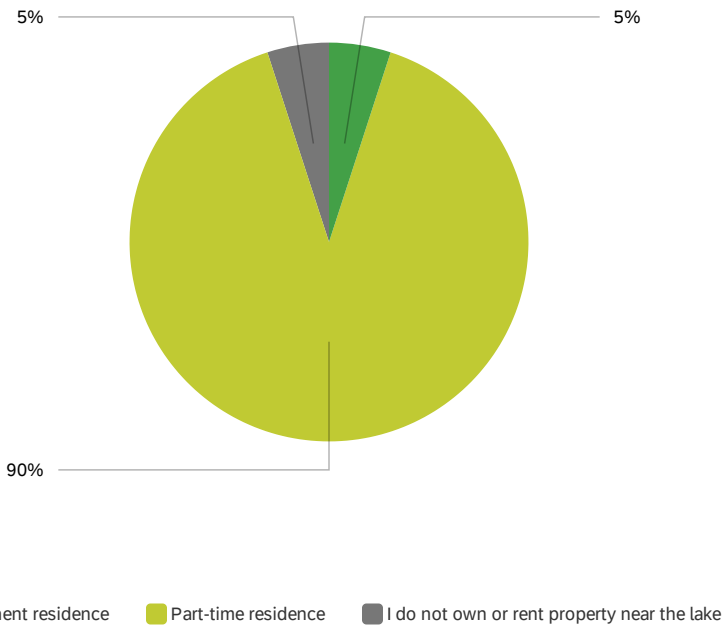
Q3 - Do you own or rent property...



#	Field	Choice Count	
3	Near the lake, but more than 1/2 mile away	0%	0
2	Less than 1/2 mile from the lake	0%	0
4	I do not own or rent property near the lake	5%	1
1	Around the lake	95%	19
			20

Showing rows 1 - 5 of 5

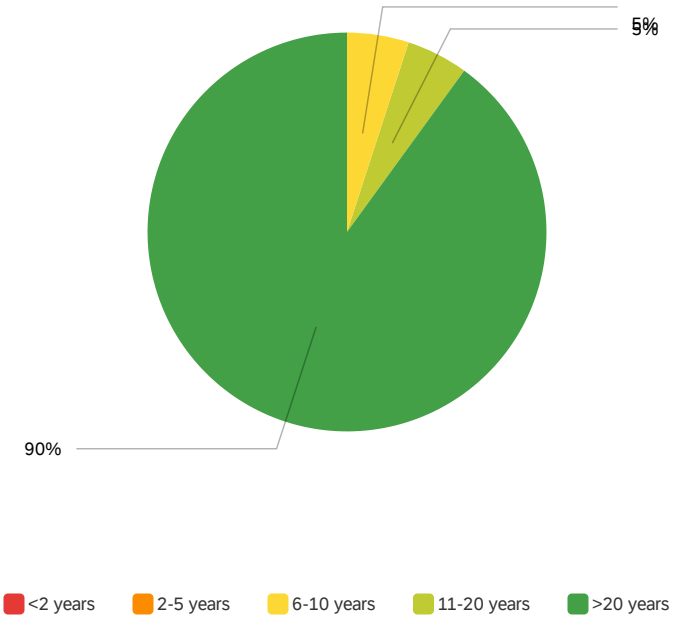
Q4 - If you own or rent property near the lake, is this property your...



#	Field		Choice Count
1	Permanent residence	5%	1
2	Part-time residence	90%	18
3	I do not own or rent property near the lake	5%	1
			20

Showing rows 1 - 4 of 4

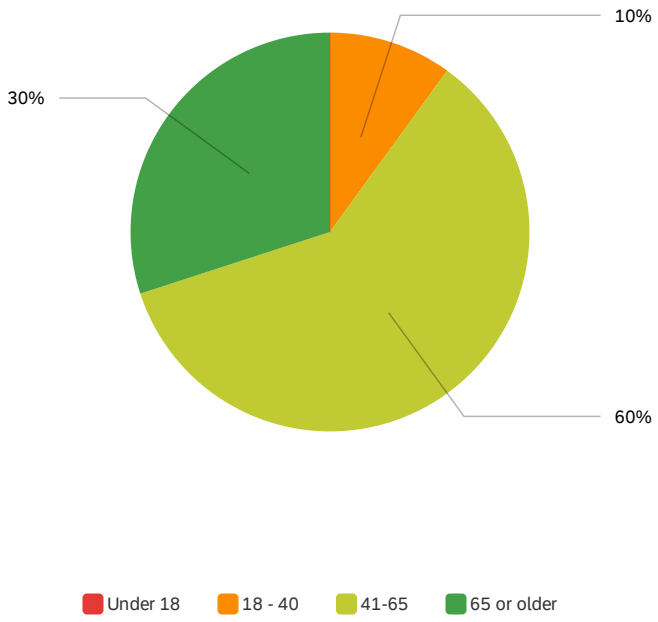
Q5 - How long have you lived on, visited or recreated on the lake?



#	Field	Choice Count
1	<2 years	0% 0
2	2-5 years	0% 0
3	6-10 years	5% 1
4	11-20 years	5% 1
5	>20 years	90% 18
		20

Showing rows 1 - 6 of 6

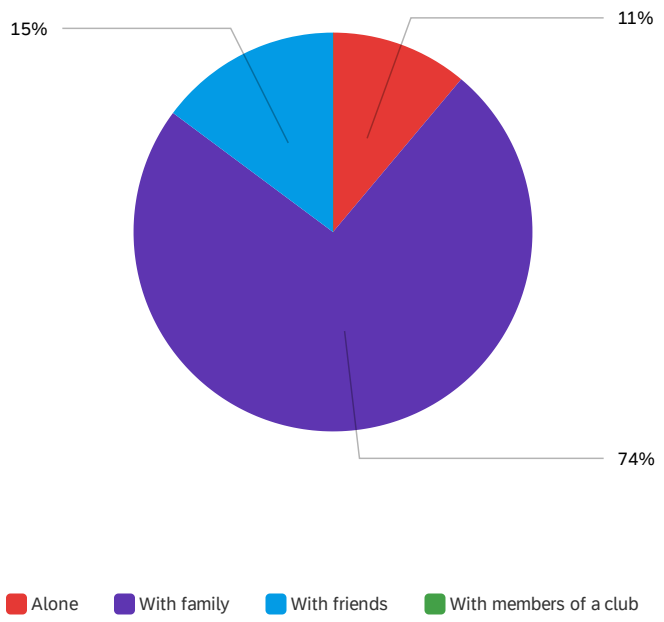
Q8 - Which category below includes your age?



#	Field	Choice Count	
1	Under 18	0%	0
2	18 - 40	10%	2
3	41-65	60%	12
4	65 or older	30%	6
			20

Showing rows 1 - 5 of 5

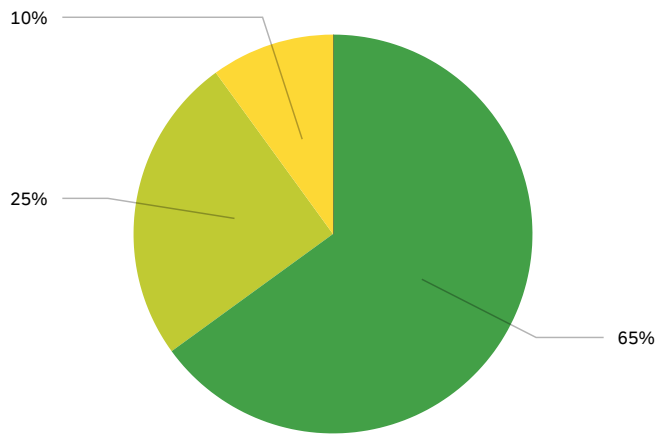
Q9 - When you visit Shay Lake, are you typically ...(check all that apply)



#	Field		Choice Count
1	Alone	11%	3
2	With family	74%	20
3	With friends	15%	4
4	With members of a club	0%	0
			27

Showing rows 1 - 5 of 5

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



Strongly Agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree | I do not live on or near the lake

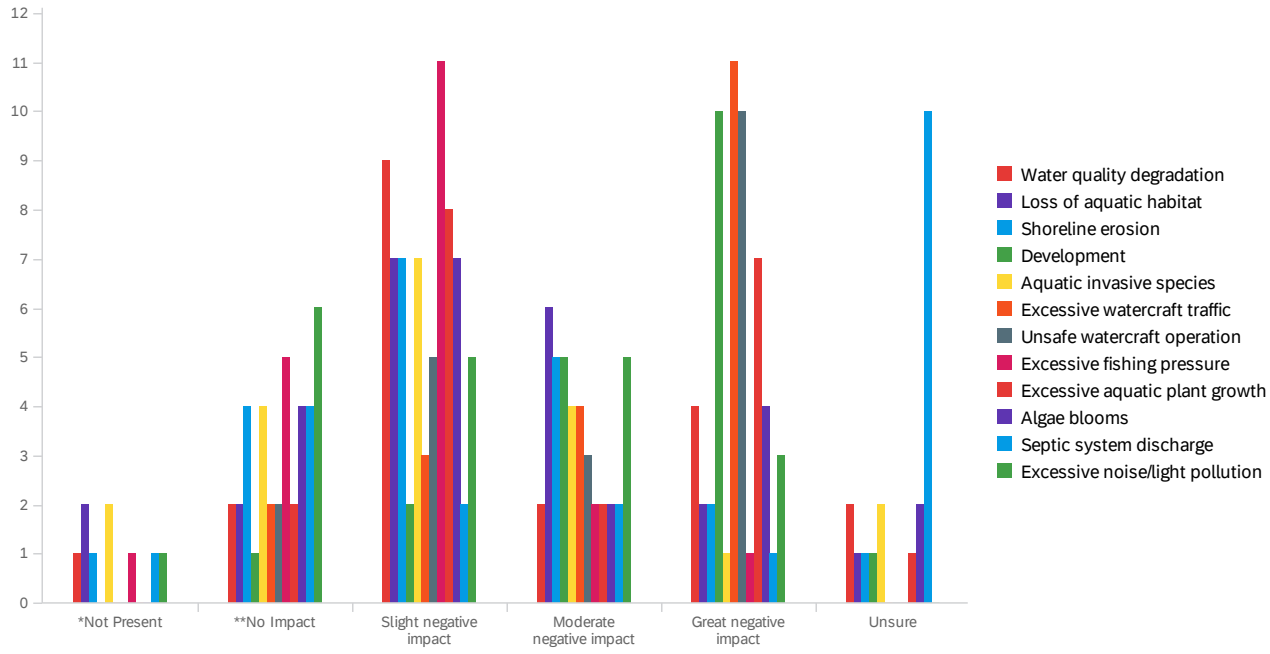
#	Field	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	I do not live on or near the lake	Total
1	To spend time with family or friends	65% 13	25% 5	10% 2	0% 0	0% 0	0% 0	20
2	For the peace and tranquility	75% 15	20% 4	5% 1	0% 0	0% 0	0% 0	20
3	Because I enjoy the view	75% 15	20% 4	5% 1	0% 0	0% 0	0% 0	20
4	Because its a good investment	25% 5	25% 5	50% 10	0% 0	0% 0	0% 0	20

Showing rows 1 - 4 of 4

Q11 - What do you value most about Shay Lake?

What do you value most about Shay Lake?
Family time to get away and disconnect. Time to relax and enjoy nature.
Being in nature and all the sights and sounds, and the memories of family spending time there growing up
That we have a getaway from home aprox 1 hr from GB. Been a family cabin since the 60's
being off the beaten path
Size of the lake where people are around but it’s not to busy of a lake.
beauty and serenity and fond memories
Place to relax
Natural and peaceful
The ability too relax with family and friends and "get away from it all"
The ability to get away from home and work and enjoy the outdoors.
smaller peacefull lake
A good mix of everything we like
Its located back off the beated track, peacefull place to spend time
We started out there right after we were married and raised our kids there and now our grandchildren come to visit,,my parents had a cottage there also,,they were one of the first 2 people to own property on the lake and now my brother has their place and he also is NOT happy with the no wake hours and boats etc on the lake and I am sure that he will fill out a form like this too
It use to be the tranquility, great fishing. The lake is just not large enough for the amount of excessive high speed watercraft that impales it waters all summer...
Water Recreation
It used to be a quiet, tranquil fishing and light recreation lake but recently has turned into a haven for big, fast boats which seem far too big for this size lake.
Nature

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

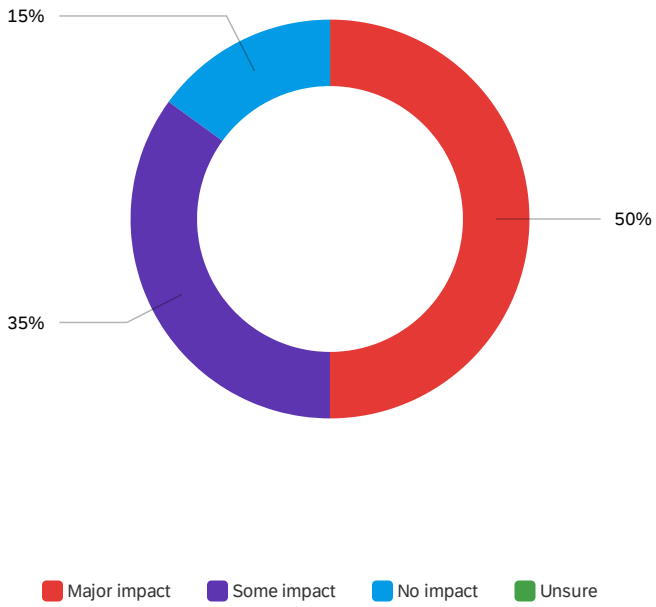


#	Field	*Not Present	**No Impact	Slight negative impact	Moderate negative impact	Great negative impact	Unsure	Total
1	Water quality degradation	5% 1	10% 2	45% 9	10% 2	20% 4	10% 2	20
2	Loss of aquatic habitat	10% 2	10% 2	35% 7	30% 6	10% 2	5% 1	20
3	Shoreline erosion	5% 1	20% 4	35% 7	25% 5	10% 2	5% 1	20
4	Development	0% 0	5% 1	11% 2	26% 5	53% 10	5% 1	19
5	Aquatic invasive species	10% 2	20% 4	35% 7	20% 4	5% 1	10% 2	20
6	Excessive watercraft traffic	0% 0	10% 2	15% 3	20% 4	55% 11	0% 0	20
7	Unsafe watercraft operation	0% 0	10% 2	25% 5	15% 3	50% 10	0% 0	20
8	Excessive fishing pressure	5% 1	25% 5	55% 11	10% 2	5% 1	0% 0	20

#	Field	*Not Present	**No Impact	Slight negative impact	Moderate negative impact	Great negative impact	Unsure	Total
9	Excessive aquatic plant growth	0% 0	10% 2	40% 8	10% 2	35% 7	5% 1	20
10	Algae blooms	0% 0	21% 4	37% 7	11% 2	21% 4	11% 2	19
11	Septic system discharge	5% 1	20% 4	10% 2	10% 2	5% 1	50% 10	20
12	Excessive noise/light pollution	5% 1	30% 6	25% 5	25% 5	15% 3	0% 0	20

Showing rows 1 - 12 of 12

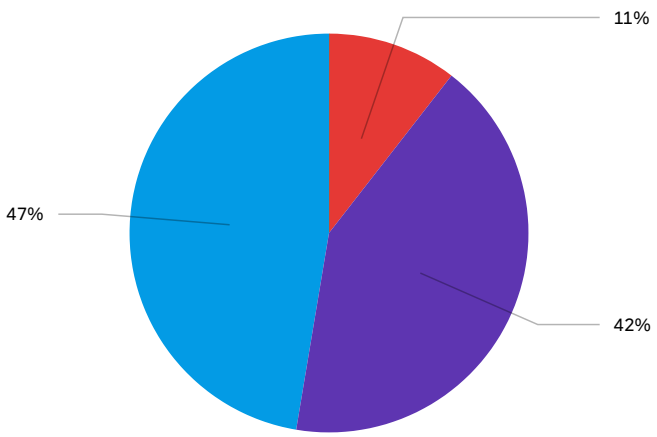
Q16 - How much impact does the water quality of Shay Lake have on the following?

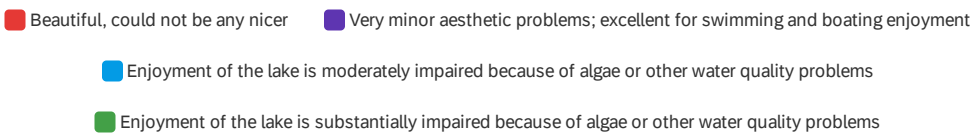


#	Field	Major impact	Some impact	No impact	Unsure	Total
1	Personal enjoyment value	50% 10	35% 7	15% 3	0% 0	20
2	Economic value	20% 4	45% 9	25% 5	10% 2	20

Showing rows 1 - 2 of 2

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

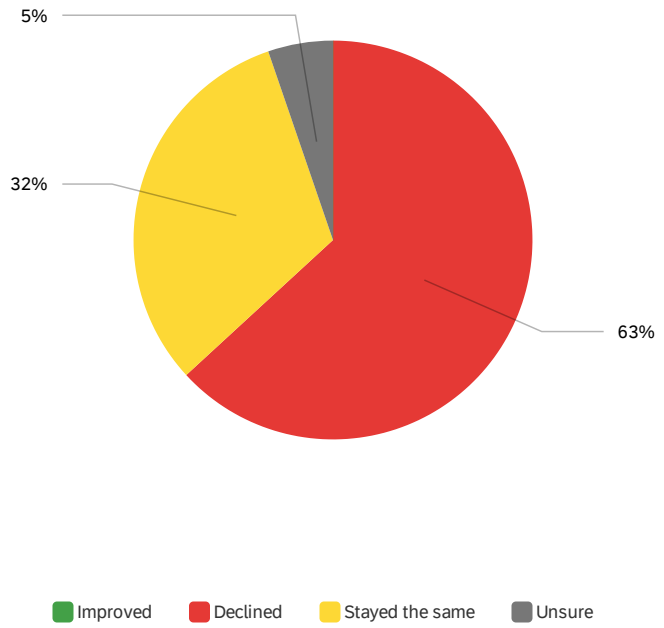




#	Field		Choice Count
1	Beautiful, could not be any nicer	11%	2
2	Very minor aesthetic problems; excellent for swimming and boating enjoyment	42%	8
3	Enjoyment of the lake is moderately impaired because of algae or other water quality problems	47%	9
4	Enjoyment of the lake is substantially impaired because of algae or other water quality problems	0%	0
			19

Showing rows 1 - 5 of 5

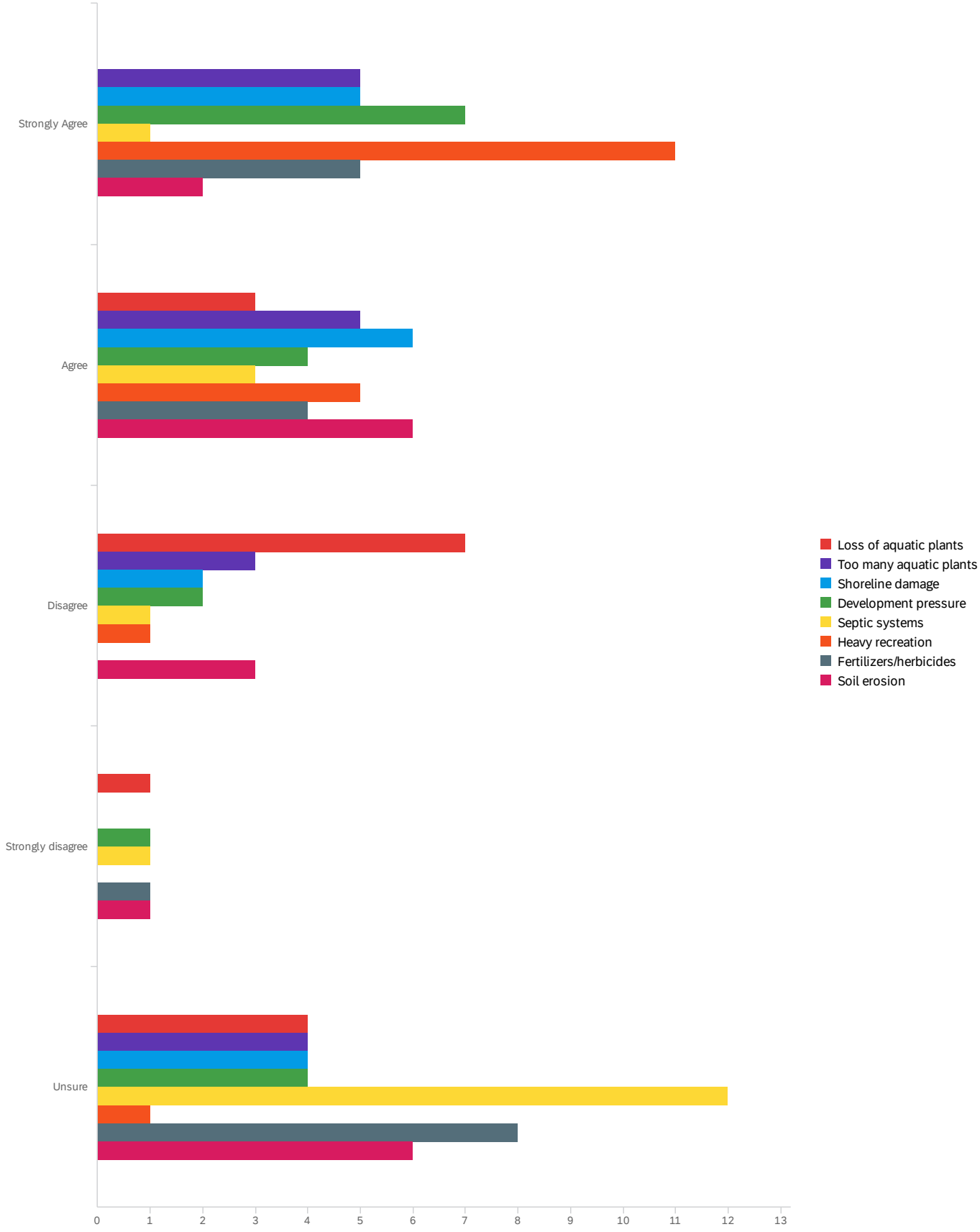
Q18 - During the time that you have lived on, visited or recreated on the lake, how would you say the water quality has changed?



#	Field	Choice Count	
1	Improved	0%	0
2	Declined	63%	12
3	Stayed the same	32%	6
4	Unsure	5%	1
			19

Showing rows 1 - 5 of 5

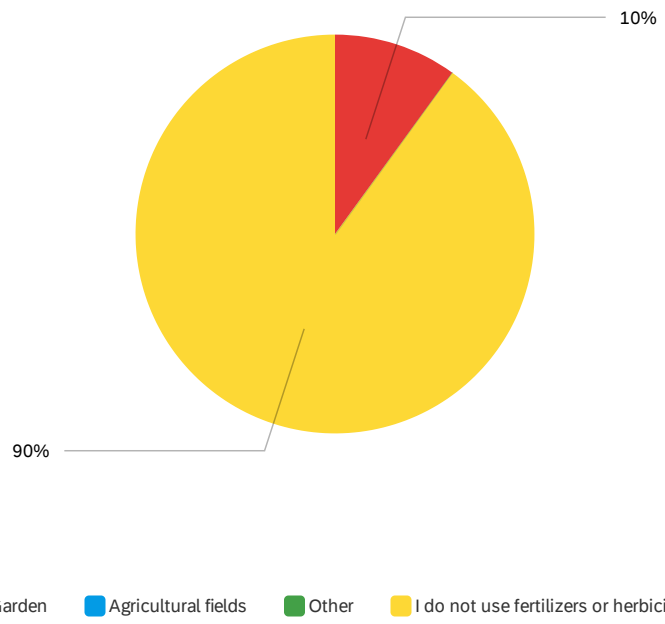
Q19 - If you think it has declined, what, in your opinion, are the primary causes?



#	Field	Strongly Agree		Agree		Disagree		Strongly disagree		Unsure		Total
1	Loss of aquatic plants	0%	0	20%	3	47%	7	7%	1	27%	4	15
2	Too many aquatic plants	29%	5	29%	5	18%	3	0%	0	24%	4	17
3	Shoreline damage	29%	5	35%	6	12%	2	0%	0	24%	4	17
4	Development pressure	39%	7	22%	4	11%	2	6%	1	22%	4	18
5	Septic systems	6%	1	17%	3	6%	1	6%	1	67%	12	18
6	Heavy recreation	61%	11	28%	5	6%	1	0%	0	6%	1	18
7	Fertilizers/herbicides	28%	5	22%	4	0%	0	6%	1	44%	8	18
8	Soil erosion	11%	2	33%	6	17%	3	6%	1	33%	6	18

Showing rows 1 - 8 of 8

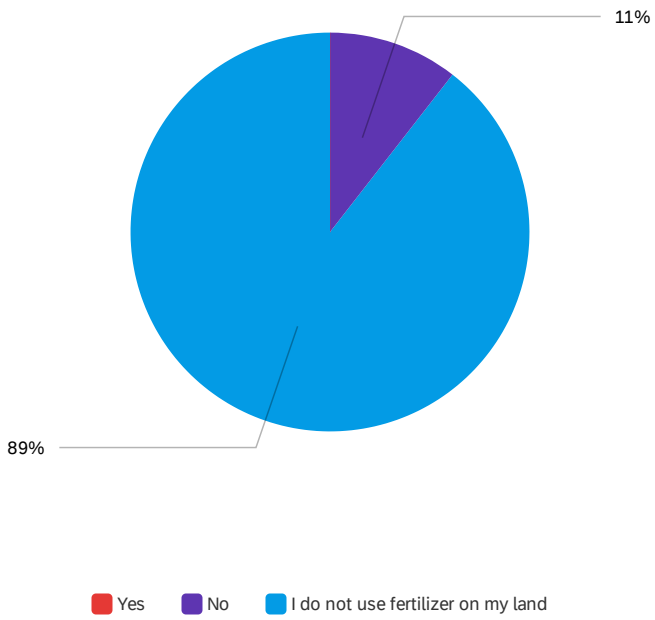
Q20 - If you use fertilizers or herbicides on your land, where are they applied?



#	Field	Choice Count
1	Lawn	10% 2
2	Garden	0% 0
3	Agricultural fields	0% 0
4	Other	0% 0
5	I do not use fertilizers or herbicides on my land	90% 18
		20

Showing rows 1 - 6 of 6

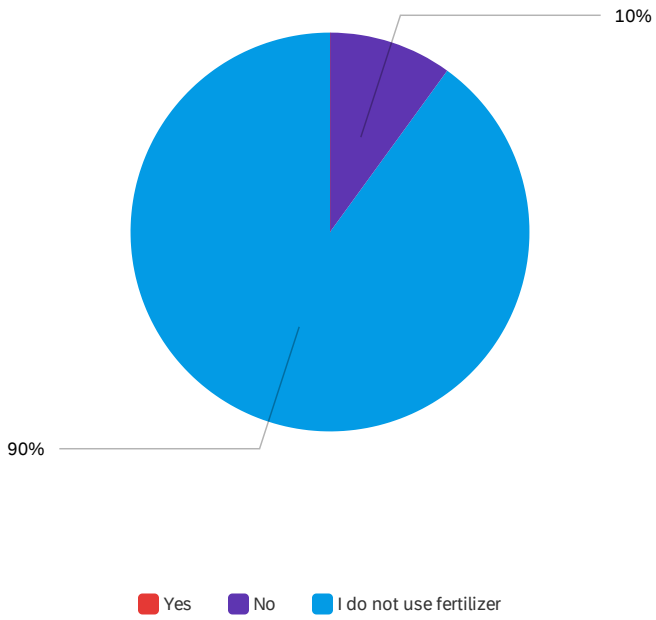
Q21 - Do you use fertilizer that contains phosphorus?



#	Field		Choice Count
1	Yes	0%	0
2	No	11%	2
4	I do not use fertilizer on my land	89%	17
			19

Showing rows 1 - 4 of 4

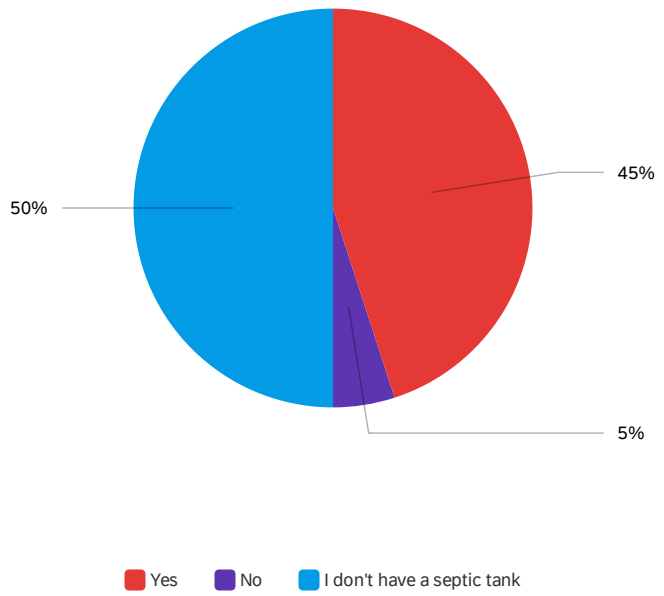
Q23 - Have you had your soil tested before using fertilizer?



#	Field	Choice Count
1	Yes	0% 0
2	No	10% 2
3	I do not use fertilizer	90% 18
		20

Showing rows 1 - 4 of 4

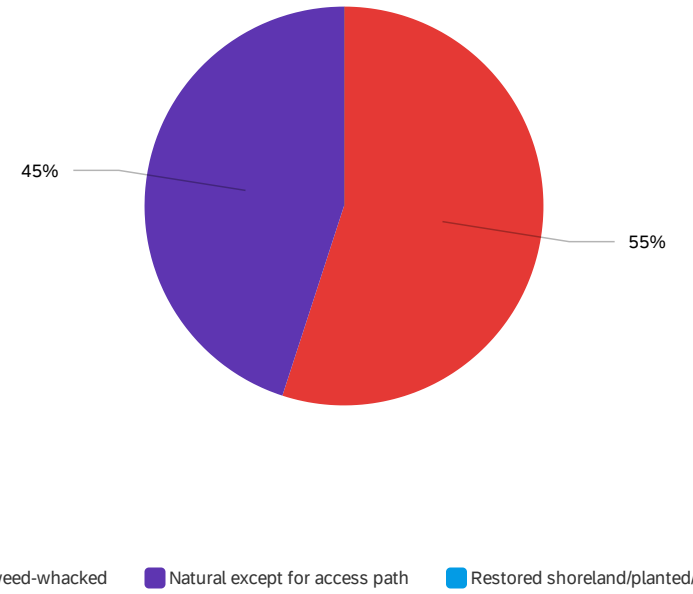
Q22 - Do you have your septic tank pumped regularly (at least every 3 years)?



#	Field		Choice Count
1	Yes	45%	9
2	No	5%	1
3	I don't have a septic tank	50%	10
			20

Showing rows 1 - 4 of 4

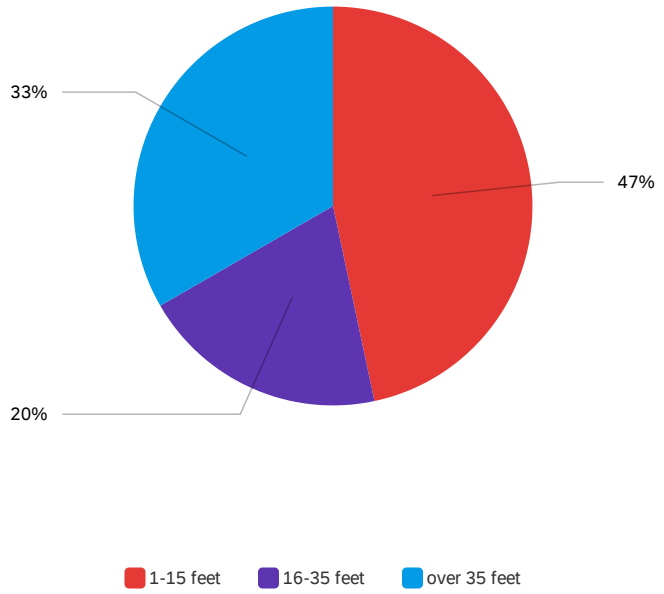
Q25 - How do you currently manage the majority of your property within 35 feet of the lake?



#	Field		Choice Count
1	Mowed or weed-whacked	55%	11
2	Natural except for access path	45%	9
3	Restored shoreland/planted/landscaped	0%	0
			20

Showing rows 1 - 4 of 4

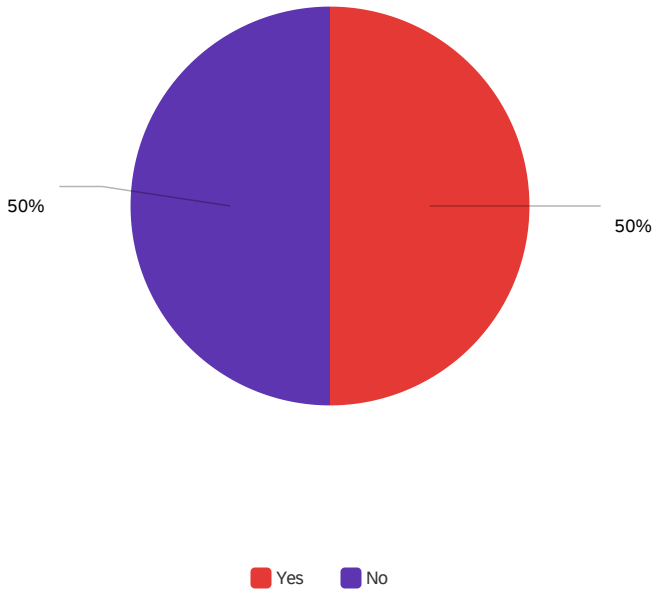
Q26 - If you have unmowed shoreland vegetation, how far inland from the water's edge does it extend?



#	Field		Choice Count
1	1-15 feet	47%	7
2	16-35 feet	20%	3
3	over 35 feet	33%	5
			15

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	50% 10
2	No	50% 10
		20

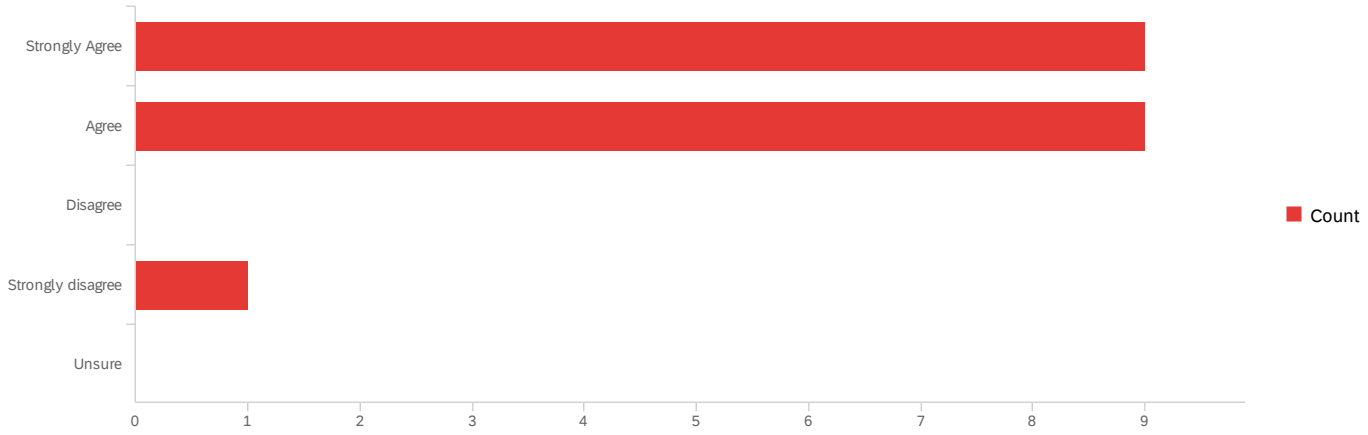
Showing rows 1 - 3 of 3

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

#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	enhance the beauty of the property	35% 7	35% 7	15% 3	5% 1	10% 2	20
2	increase the economic value of the property	20% 4	10% 2	25% 5	10% 2	35% 7	20

Showing rows 1 - 2 of 2

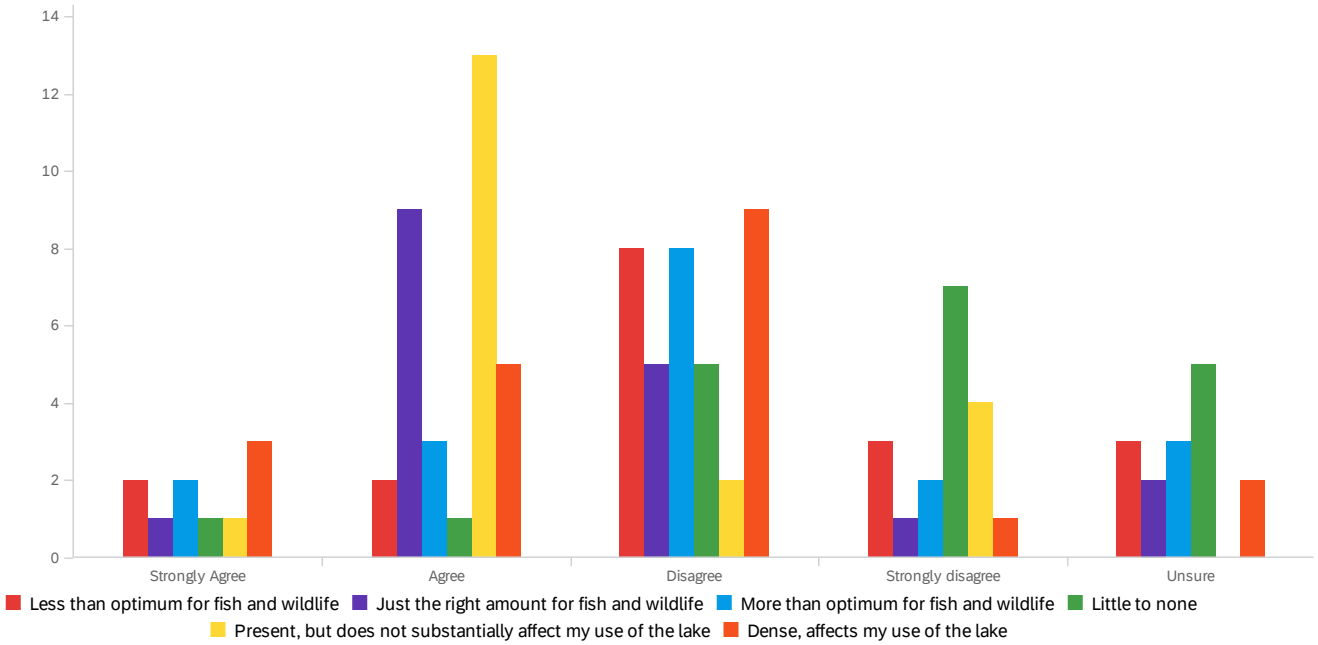
Q28 - What might motivate you to change how you manage your shoreland?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Improving water quality	32% 6	63% 12	0% 0	5% 1	0% 0	19
2	Providing better habitat for fish and wildlife	47% 9	47% 9	0% 0	5% 1	0% 0	19
3	Available financial/technical assistance	33% 6	39% 7	6% 1	6% 1	17% 3	18
4	Savings on landscaping/maintenance costs	12% 2	35% 6	29% 5	6% 1	18% 3	17
5	Increasing my privacy	22% 4	39% 7	28% 5	6% 1	6% 1	18
6	Increasing my property value	26% 5	53% 10	11% 2	5% 1	5% 1	19

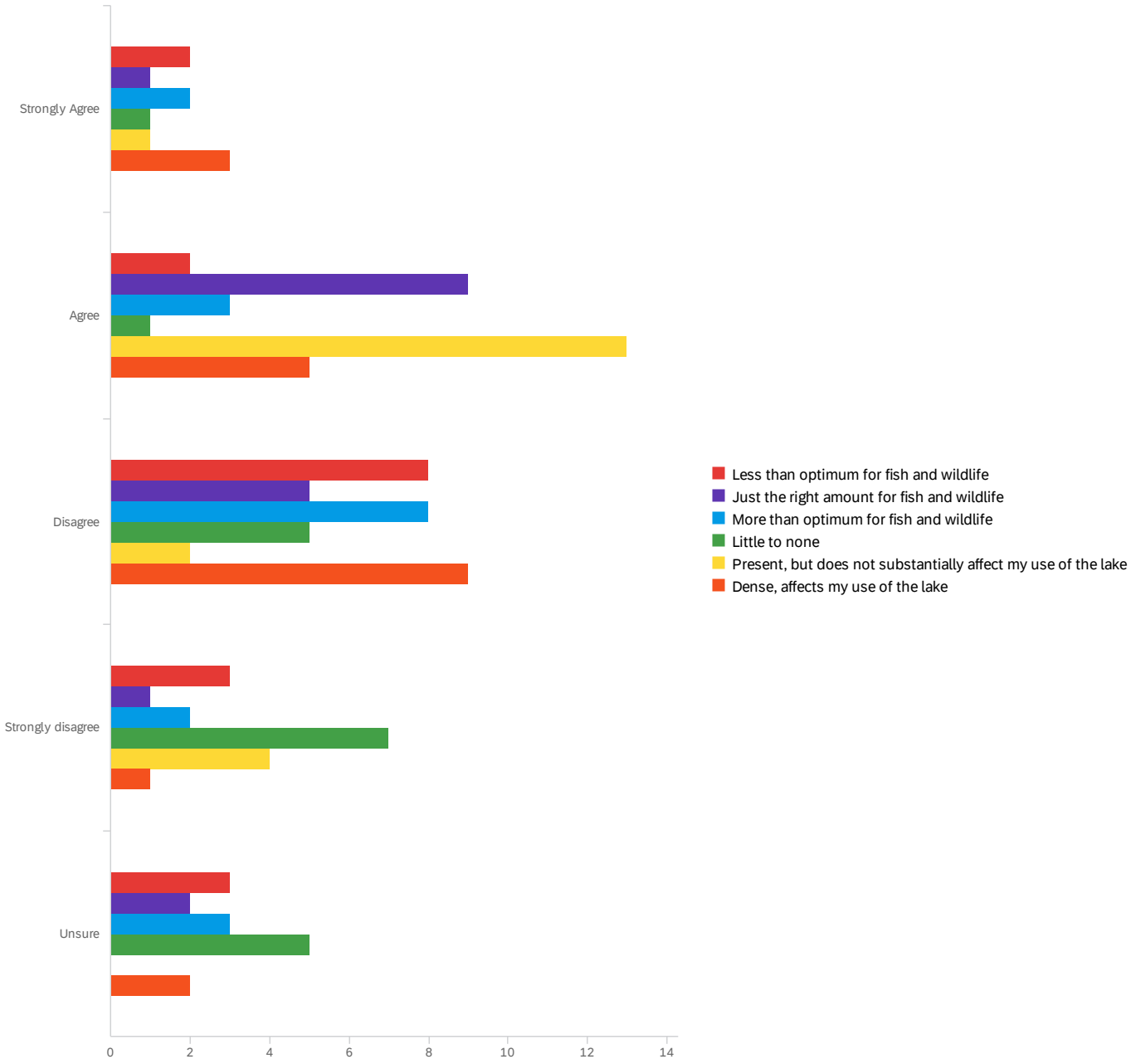
Showing rows 1 - 6 of 6

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

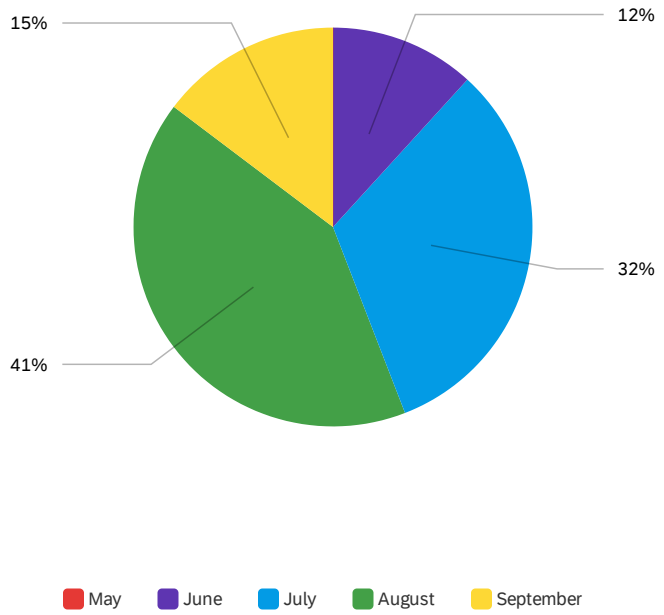


#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Less than optimum for fish and wildlife	11% 2	11% 2	44% 8	17% 3	17% 3	18
2	Just the right amount for fish and wildlife	6% 1	50% 9	28% 5	6% 1	11% 2	18
3	More than optimum for fish and wildlife	11% 2	17% 3	44% 8	11% 2	17% 3	18
4	Little to none	5% 1	5% 1	26% 5	37% 7	26% 5	19
5	Present, but does not substantially affect my use of the lake	5% 1	65% 13	10% 2	20% 4	0% 0	20
6	Dense, affects my use of the lake	15% 3	25% 5	45% 9	5% 1	10% 2	20

Showing rows 1 - 6 of 6


Strongly Agree
Agree
Disagree
Strongly disagree
Unsure
0
2
4
6
8
10
12
14
Less than optimum for fish and wildlife
Just the right amount for fish and wildlife
More than optimum for fish and wildlife
Little to none
Present, but does not substantially affect my use of the lake
Dense, affects my use of the lake

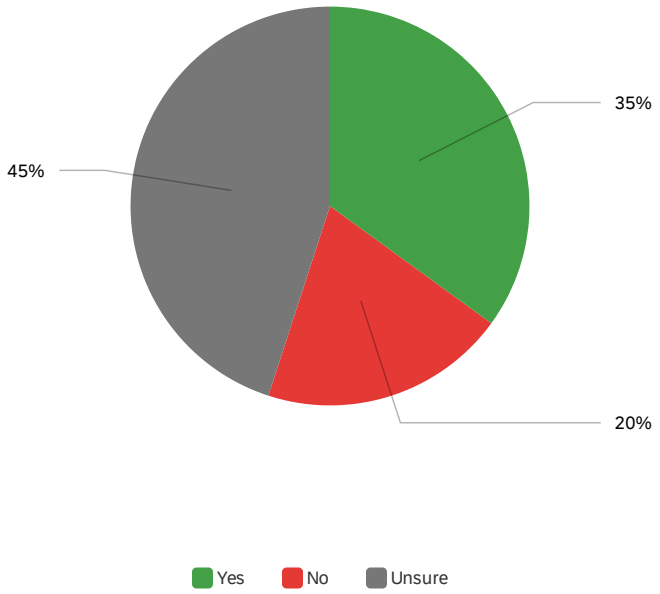
Q33 - If you think the plant growth in Shay Lake is dense, what month(s) do the problems occur? Check all that apply.



#	Field	Choice Count	
1	May	0%	0
2	June	12%	4
3	July	32%	11
4	August	41%	14
5	September	15%	5
			34

Showing rows 1 - 6 of 6

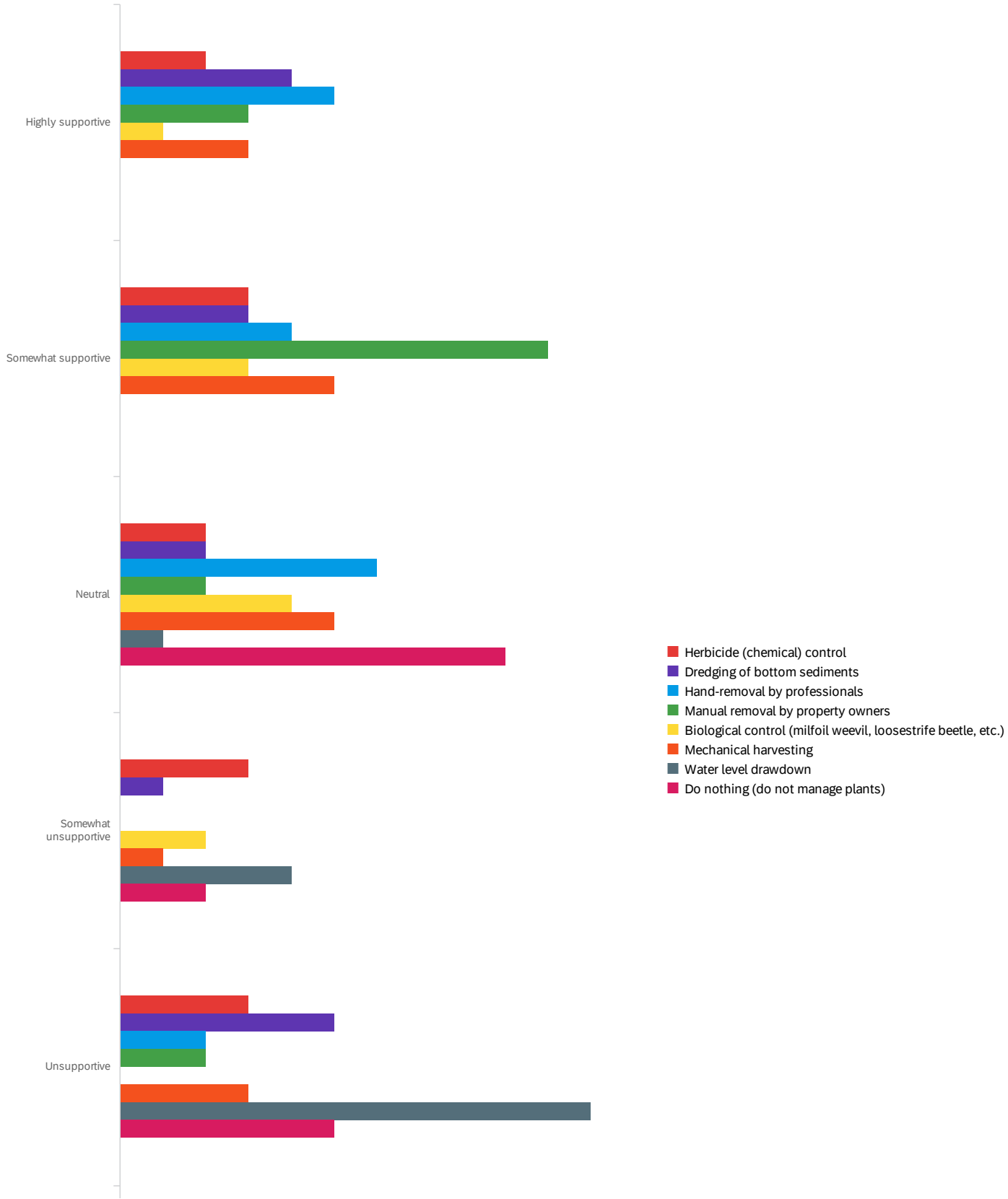
Q34 - Do you believe aquatic plant control is needed on Shay Lake?

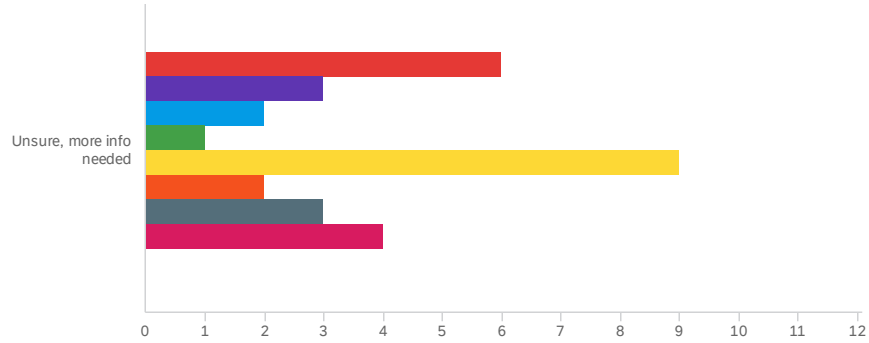


#	Field		Choice Count
1	Yes	35%	7
2	No	20%	4
3	Unsure	45%	9
			20

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 Shay Lake?

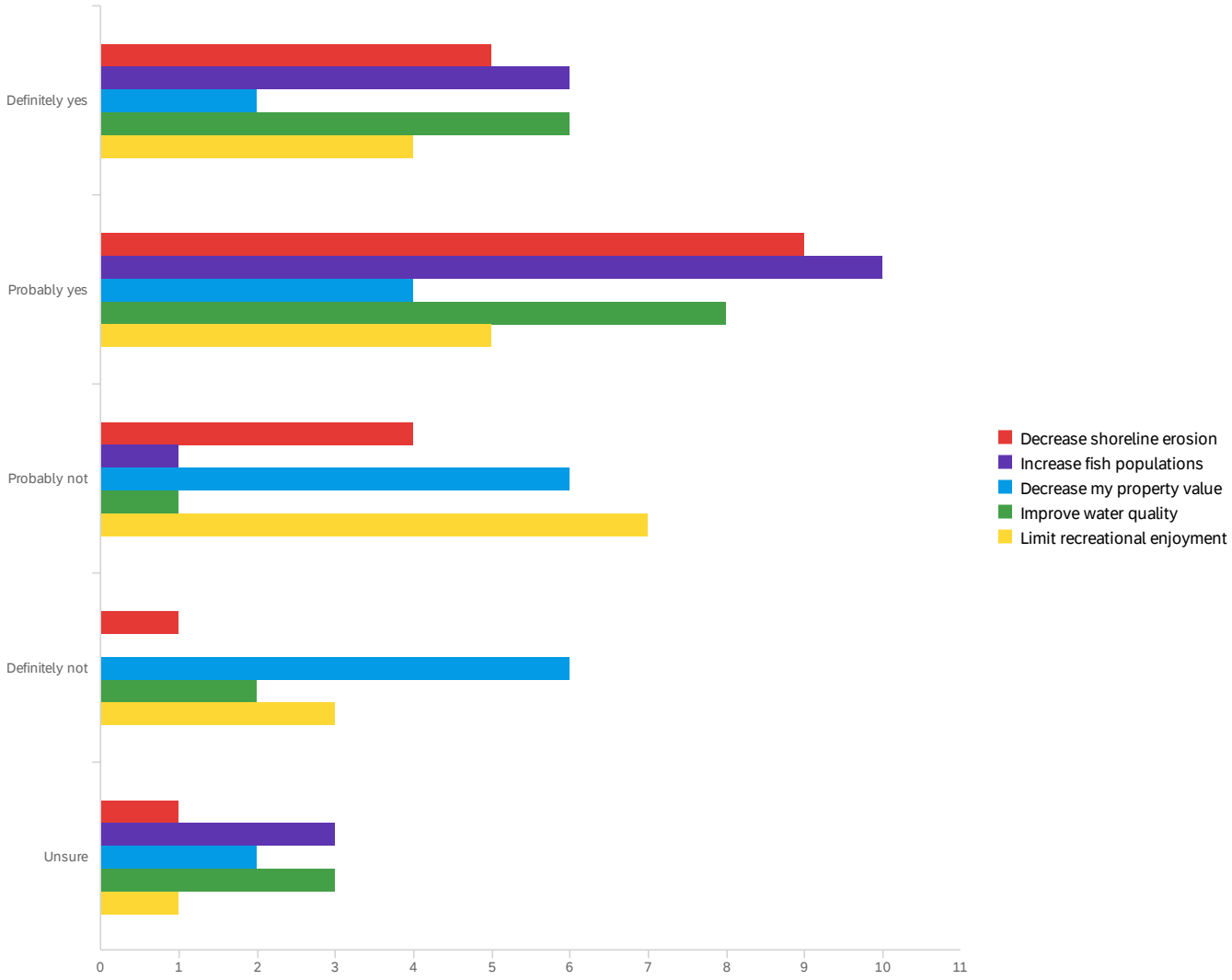




#	Field	Highly supportive	Somewhat supportive	Neutral	Somewhat unsupportive	Unsupportive	Unsure, more info needed	Total
1	Herbicide (chemical) control	11% 2	16% 3	11% 2	16% 3	16% 3	32% 6	19
2	Dredging of bottom sediments	22% 4	17% 3	11% 2	6% 1	28% 5	17% 3	18
3	Hand-removal by professionals	26% 5	21% 4	32% 6	0% 0	11% 2	11% 2	19
4	Manual removal by property owners	17% 3	56% 10	11% 2	0% 0	11% 2	6% 1	18
5	Biological control (milfoil weevil, loosestrife beetle, etc.)	5% 1	16% 3	21% 4	11% 2	0% 0	47% 9	19
6	Mechanical harvesting	16% 3	26% 5	26% 5	5% 1	16% 3	11% 2	19
7	Water level drawdown	0% 0	0% 0	5% 1	21% 4	58% 11	16% 3	19
8	Do nothing (do not manage plants)	0% 0	0% 0	45% 9	10% 2	25% 5	20% 4	20

Showing rows 1 - 8 of 8

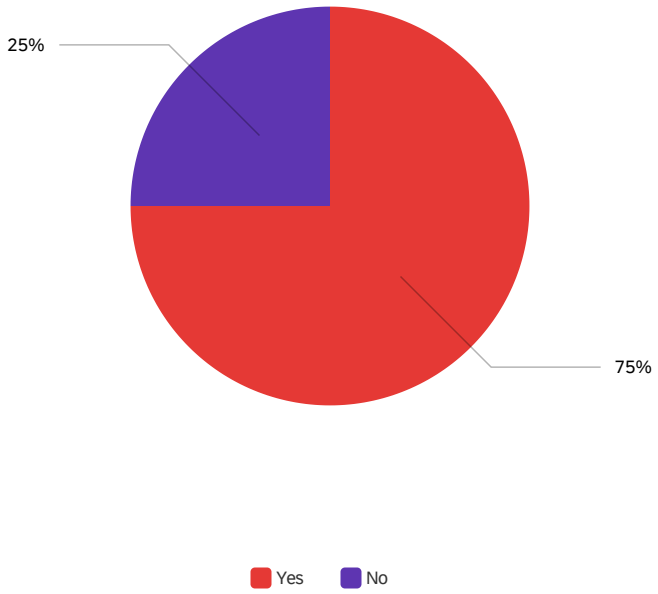
Q36 - In your opinion, does establishing or maintaining native vegetation in the water in the near-shore area...



#	Field	Definitely yes	Probably yes	Probably not	Definitely not	Unsure	Total
1	Decrease shoreline erosion	25% 5	45% 9	20% 4	5% 1	5% 1	20
2	Increase fish populations	30% 6	50% 10	5% 1	0% 0	15% 3	20
3	Decrease my property value	10% 2	20% 4	30% 6	30% 6	10% 2	20
4	Improve water quality	30% 6	40% 8	5% 1	10% 2	15% 3	20
5	Limit recreational enjoyment	20% 4	25% 5	35% 7	15% 3	5% 1	20

Showing rows 1 - 5 of 5

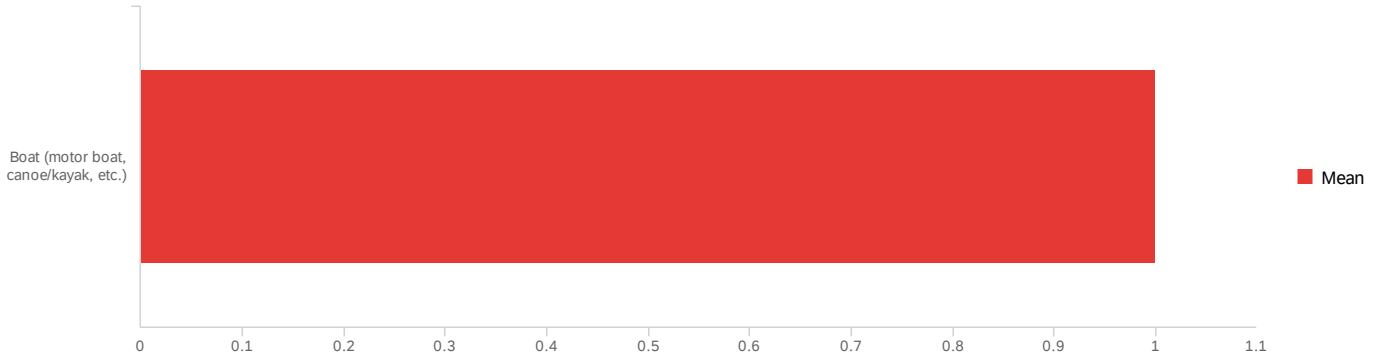
Q37 - Are you aware of invasive species (in general)?



#	Field		Choice Count
1	Yes	75%	15
2	No	25%	5
			20

Showing rows 1 - 3 of 3

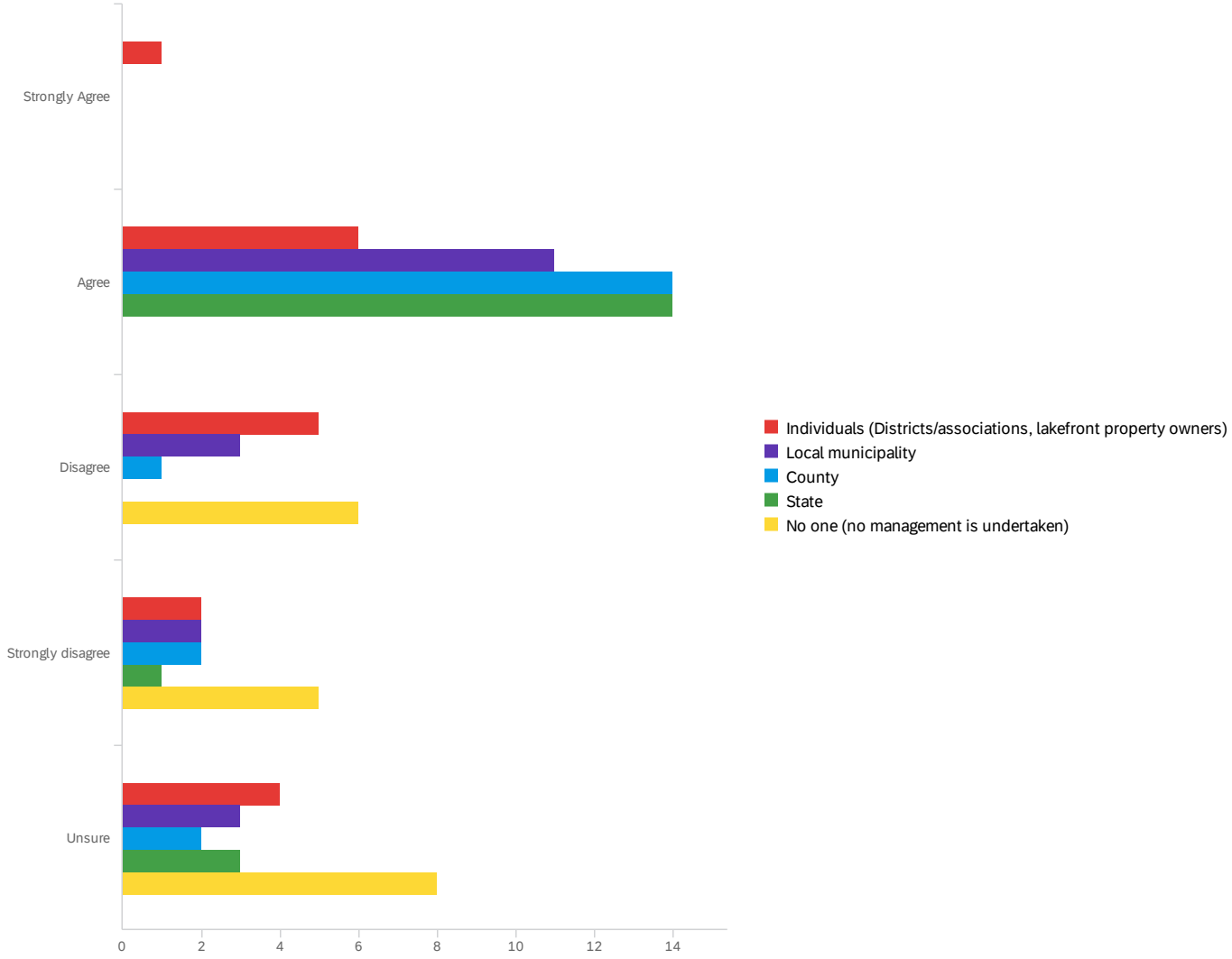
Q39 - After you have been to another lake, do you clean your.... before bringing it back to Shay Lake?



#	Field	Yes, always	Sometimes	Rarely	No, never	Total
1	Boat (motor boat, canoe/kayak, etc.)	67% 4	33% 2	0% 0	0% 0	6
2	Trailer	100% 4	0% 0	0% 0	0% 0	4
3	Fishing equipment	33% 4	42% 5	17% 2	8% 1	12
4	Live wells	33% 1	67% 2	0% 0	0% 0	3

Showing rows 1 - 4 of 4

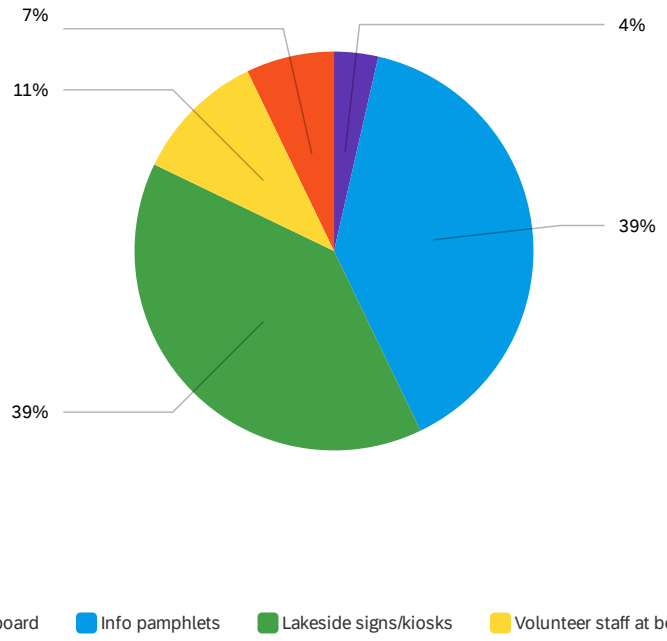
Q40 - Who should pay the cost of managing invasive aquatic plants?



#	Field	Strongly Agree	Agree	Disagree	Strongly disagree	Unsure	Total
1	Individuals (Districts/associations, lakefront property owners)	6% 1	33% 6	28% 5	11% 2	22% 4	18
2	Local municipality	0% 0	58% 11	16% 3	11% 2	16% 3	19
3	County	0% 0	74% 14	5% 1	11% 2	11% 2	19
4	State	0% 0	78% 14	0% 0	6% 1	17% 3	18
5	No one (no management is undertaken)	0% 0	0% 0	32% 6	26% 5	42% 8	19

Showing rows 1 - 5 of 5

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



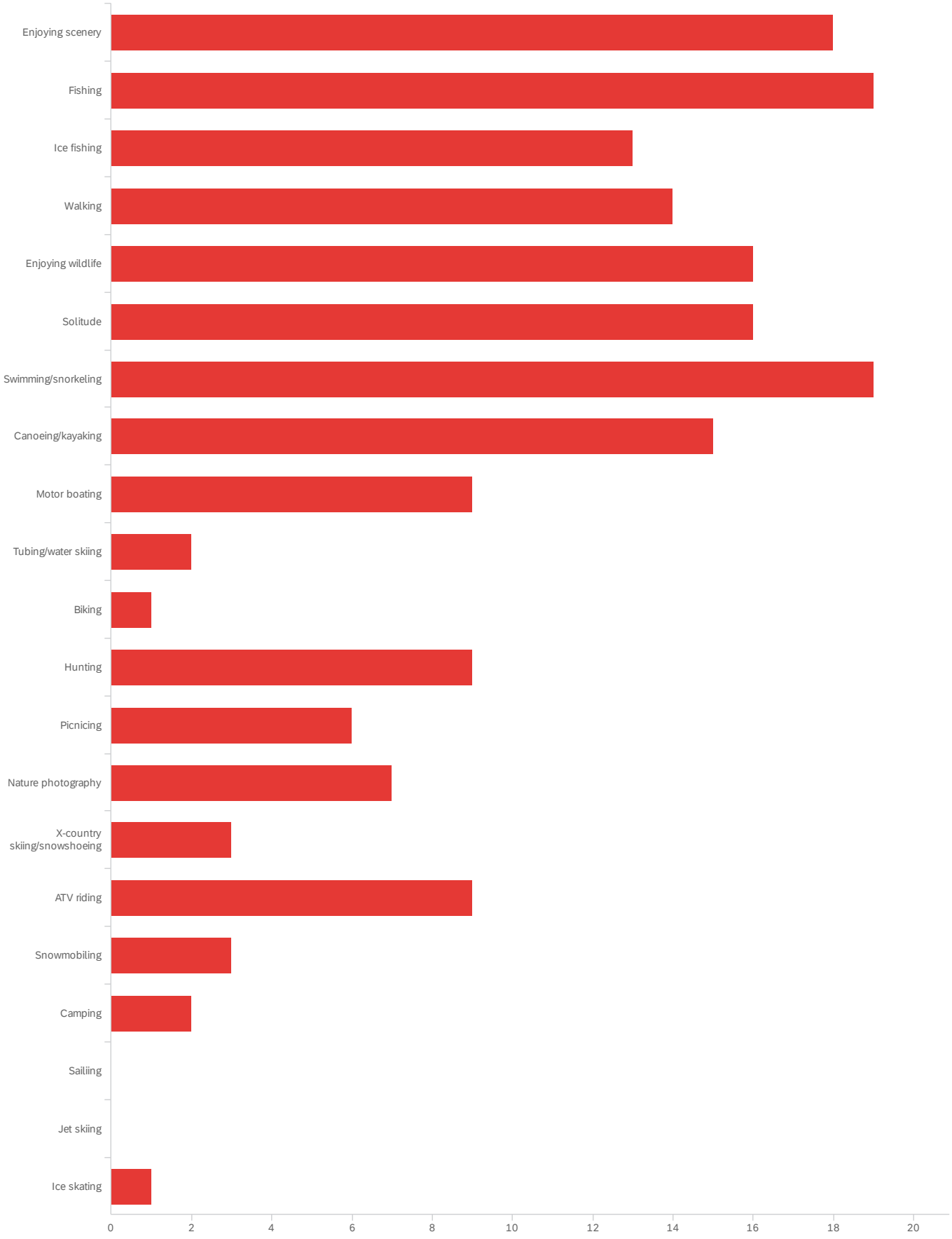
#	Field	Choice Count
1	Newspaper	0% 0
2	Billboard	4% 1
3	Info pamphlets	39% 11
4	Lakeside signs/kiosks	39% 11
5	Volunteer staff at boat launch	11% 3
6	Other	7% 2
		28

Showing rows 1 - 7 of 7

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

In your opinion, what should be done to restore, maintain or improve Shay L...
Jet skiis are out of control, limit the lake to smaller boats and motor sizes. Stop using fertilizer on lawns that runs into the lake
Unsure
Better education of property owners on proper shoreline vegetation and boating rules/regulations
less "large" powerboat traffic
No much. It is only busy with boat maybe 10-12 days a year. Otherwise not to many people are on the lake.
reduce the use of watercraft. much too small to have people tearing around. do not have quality fishing.
Limit large boat traffic and personal watercraft, including enforcement of boating regulations
Improved boat launch
limit to minimal motors on watercraft-trolling motor only?
lake owners association, continued guidance from county, state, university
Investigate some weed removal
Reduce wake hours, enforce required lake buffers, and dredge lake.
Improve and enforce enviroment laws
Limit the jet skis and high power boats as it is a small lake and on our side of the lake all of the weeds are so thick that soon we will be able to walk on them,,we have a dock but there is NO way that we could have a boat leave the dock or have someone come to the dock because of all the weeds that the jet skis tear up and bring to shore.
Minimal horse power rating on watercraft
Shoreline erosion/lawns to the lake edge
To many big boats People fertilizing and run off into lake

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



#	Field	Choice Count

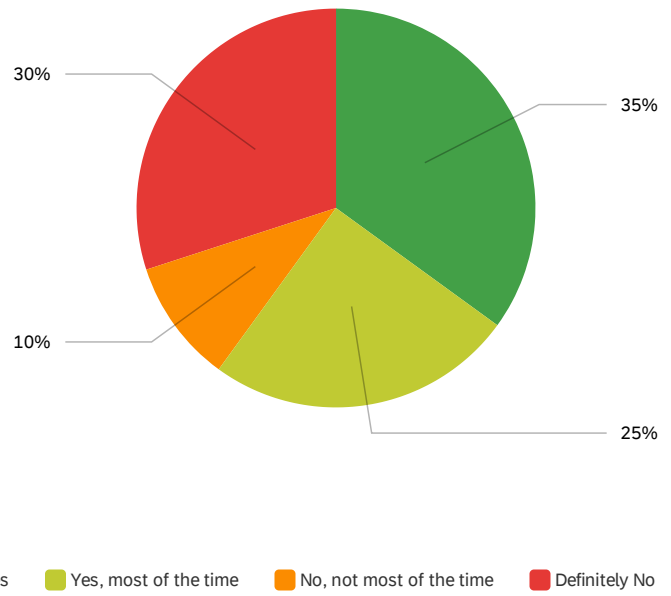
#	Field		Choice Count
1	Enjoying scenery	10%	18
2	Fishing	10%	19
3	Ice fishing	7%	13
4	Walking	8%	14
5	Enjoying wildlife	9%	16
6	Solitude	9%	16
7	Swimming/snorkeling	10%	19
8	Canoeing/kayaking	8%	15
9	Motor boating	5%	9
10	Tubing/water skiing	1%	2
11	Biking	1%	1
12	Hunting	5%	9
13	Picnicing	3%	6
14	Nature photography	4%	7
15	X-country skiing/snowshoeing	2%	3
16	ATV riding	5%	9
17	Snowmobiling	2%	3
18	Camping	1%	2
19	Sailiing	0%	0
20	Jet skiing	0%	0
21	Ice skating	1%	1
			182

Showing rows 1 - 22 of 22

Q46 - Other recreational activities not included above:

Other recreational activities not included above:
Pontooning
We used to love to fish but now the weed beds that we fished near are gone and at the shoreline, and the boats tear around that is is impossible to sit in a row boat to fish.

Q47 - "No Wake" is allowed on Shay Lake between 6pm and 10am. Do you like the current "No Wake" rules as they are?



#	Field		Choice Count
1	Definitely Yes	35%	7
2	Yes, most of the time	25%	5
3	No, not most of the time	10%	2
4	Definitely No	30%	6
5	Unsure	0%	0
			20

Showing rows 1 - 6 of 6

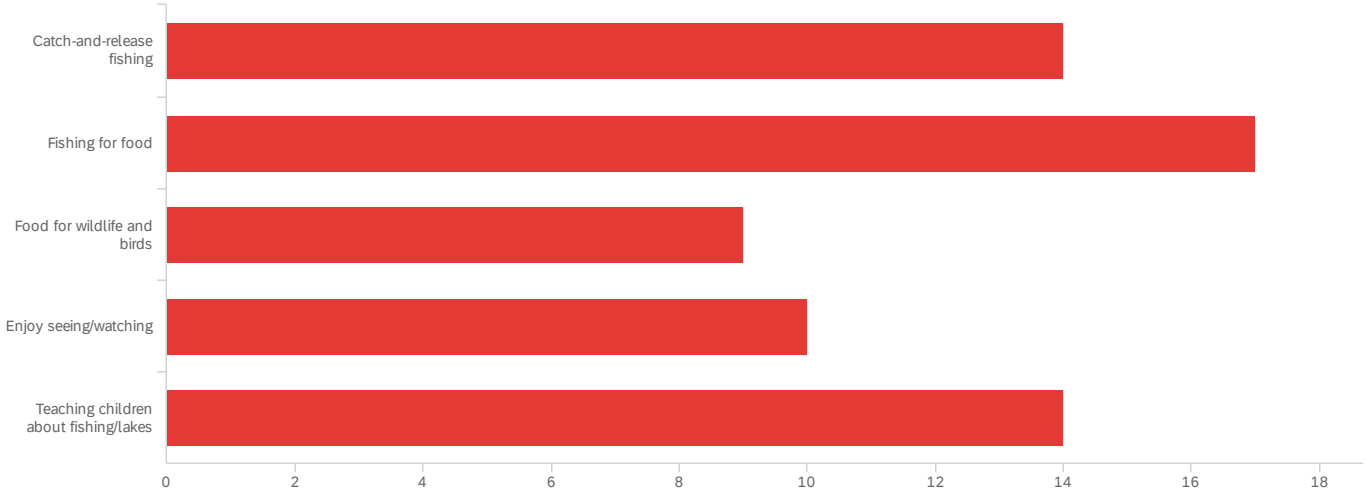
Q48 - If you think the "No Wake" rules should be adjusted...in what way?

If you think the "No Wake" rules should be adjusted...in what way?
People dont follow them so i am unsure how to fix that when they are out ripping around at 8 pm what can we do as cottage owners?
Overall a no wake in general. It is a small lake and in the summer on a lot of weekends, it is unusable unless you want to join the wake board board, jet skis, and people skiing
lengthened
4 pm to 11 am no wake
To all hours. The loons don't like motors and the lake is, in my opinion, too small for large motorboats.
longer 'no wake' hours during middle of day
5pm to 10am
Extended
l
Should only allow waterski, jet boats, and speed boats in the afternoons from noon to 5:00
We used to fish mid day for the best results , from 10-7 and now that is impossible because of the boats and even after 6, when the wake starts, the water is so riled up that the fish are scarce.
4 or 5 pm till 10am if at all
Rather than adjusted, enforced. I have seen numerous boats defy this rule after 6 PM. What is the proper way to report this behavior?
Some people on the lake do not follow the hours

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

What could be done to improve your recreation experience on Shay Lake?
Ban jet skiis and certain size boats and motors.
No wake. Often I go there to relax and fish and there are multiple boats skiing and jet skis. The water gets show churned up? It is unfishable
Educate on the no wake rules and boating regulations for ski doos. They come WAY to close to the shoreline and swimmers and go past 6 pm most weekends.
less large powerboat traffic. limit size of motors.
There are only a few days where I think it’s to busy on the lake but restricting wake times more would make those times to busy creating an opposite affect of trying to make to lake more peaceful.
greatly reduce noise polution and general lake disturbance by recreational watercraft.
Limit or eliminate large boats and personal watercraft
No Jet Sking
Keep it quiet and about family, not partying.
Ban PWC/Jet Ski's and the Large Wake Boat that shows up twice a year. Some boats are just to big for the lake.
Extend no wake times
loud boats to big for shay lake
Increase no wake times
Limit the size of boats and don't allow the jet skis. Sometimes there are 3-5 at a time..not safe for a small lake like Shay Lake
As stated before, the lake is not big enough or deep enough to support the constant high powered watercraft that have increasingly negatively impacted the water quality and fish habitat. I have recreated on this lake for more than 60 years and it's SHAMEFUL to see the destructions.
Educate the cottage owners as some do not care

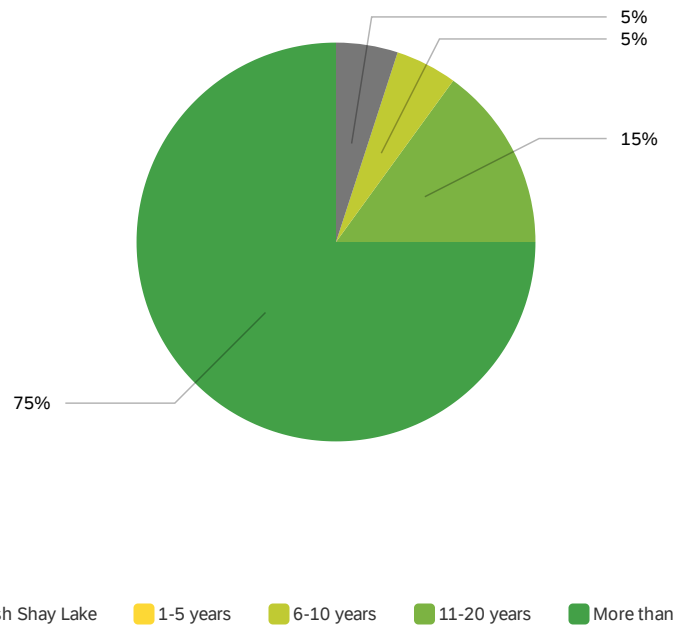
Q51 - For what purposes do you value the fishery in Shay Lake? (Check all that apply)



#	Field		Choice Count
1	Catch-and-release fishing	22%	14
2	Fishing for food	27%	17
3	Food for wildlife and birds	14%	9
4	Enjoy seeing/watching	16%	10
5	Teaching children about fishing/lakes	22%	14
			64

Showing rows 1 - 6 of 6

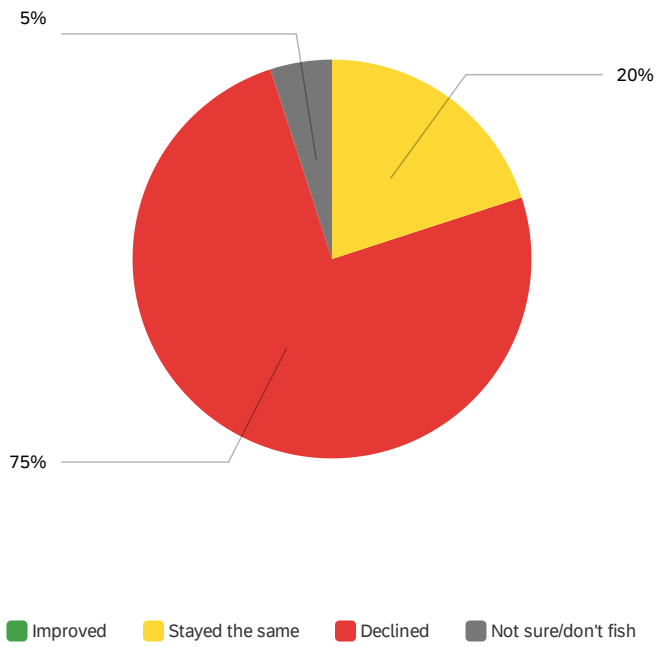
Q52 - How many years experience do you have fishing Shay Lake?



#	Field	Choice Count	
1	I don't fish Shay Lake	5%	1
2	1-5 years	0%	0
3	6-10 years	5%	1
4	11-20 years	15%	3
5	More than 20 years	75%	15
			20

Showing rows 1 - 6 of 6

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



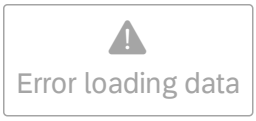
#	Field		Choice Count
1	Improved	0%	0
2	Stayed the same	20%	4
3	Declined	75%	15
4	Not sure/don't fish	5%	1
			20

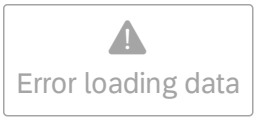
Showing rows 1 - 5 of 5

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

What do you think has contributed to the change in fishing?
There is some over fishing for sure - needs to be more catch and release of small fish. Put back the smaller fish to grow. Maybe set a limit on number of fish that can be caught. Used to be tons of perch in the lake in the 70's and 80's. Have not caught one in years.
Over harvesting of pan fish, increase in boating traffic
much greater recreation pressure resulting in difficulty fishing and destruction of aquatic plants
unsure
I understand that fish population can go in cycles but on average the population and size of Bluegills have gone way down. But Bass fishing has never been better.
Increased boat traffic
not sure
Incteased fishing pressure
Like I have said,,ever since the big boats and jet skis started we pretty much quit fishing
Watercraft and fertilizers
To small of lake for the amount of pressure
Big boats and fertilizer

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

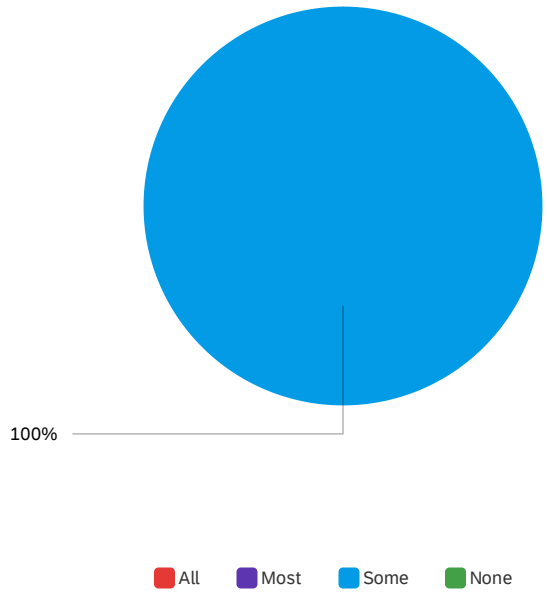




Q56 - What type of fish do you catch on Shay Lake?

What type of fish do you catch on Shay Lake?
Blue gill and crappie.
Crappies, blue gills, sun fish, largemouth bass, northern pike
pan fish, bluegill and crappie, seeing an increase in perch
all present
panfish and black bass
Panfish
Pan fish & Northern
bass, blue gill, northern, crappe, perch, sunfish
panfish, bass, pike
Bluegill, Bass, Northern, Perch, Some crappie
Pike, bass, panfish
bass bluegills perch northern
Northern Pike, Largemouth Bass, panfish
pan fisk, bass, northern
Blue gills perch crappies but they are pretty much gone now,,the shoreline doesn't have the good places for them to spawn in spring, so you could sit in a boat for hours and catch nothing
To many northern that were NOT native to the lake
bass and panfish
Bluegill
Bass crappie blue gills sun fish northern some times bullheads

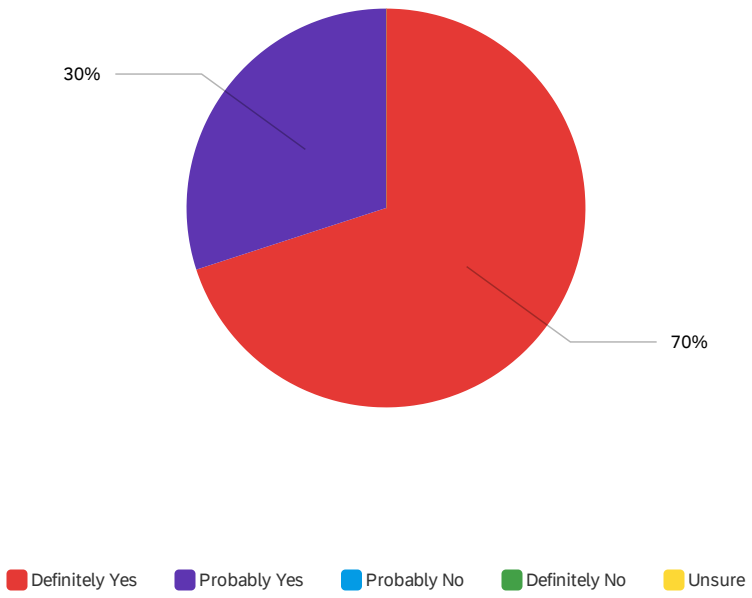
Q57 - In general, how many of the fish you catch are big enough to keep?



#	Field	Choice Count
1	All	0% 0
2	Most	0% 0
3	Some	100% 19
4	None	0% 0
		19

Showing rows 1 - 5 of 5

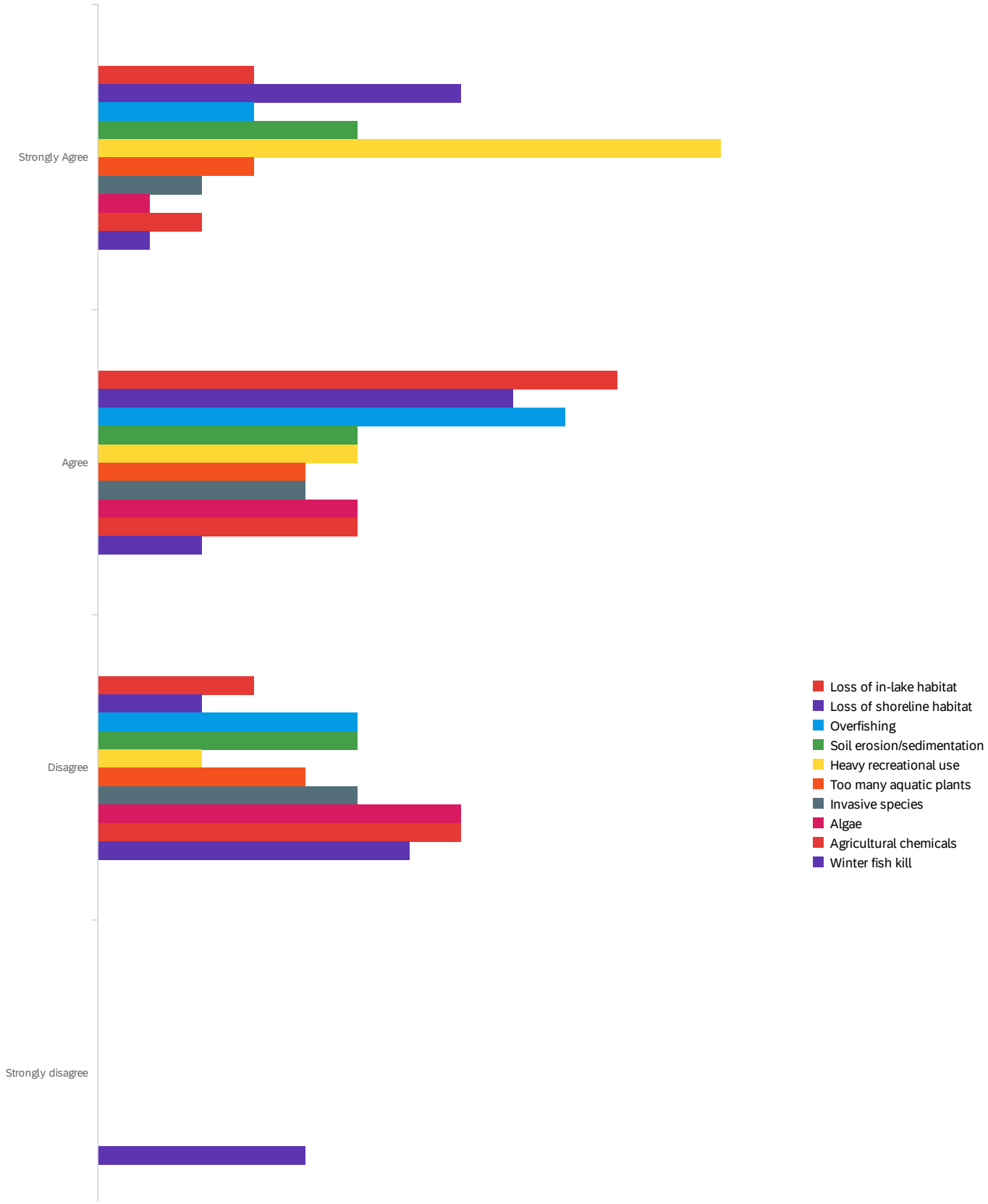
Q58 - Do you believe fish from Shay Lake are safe to eat?

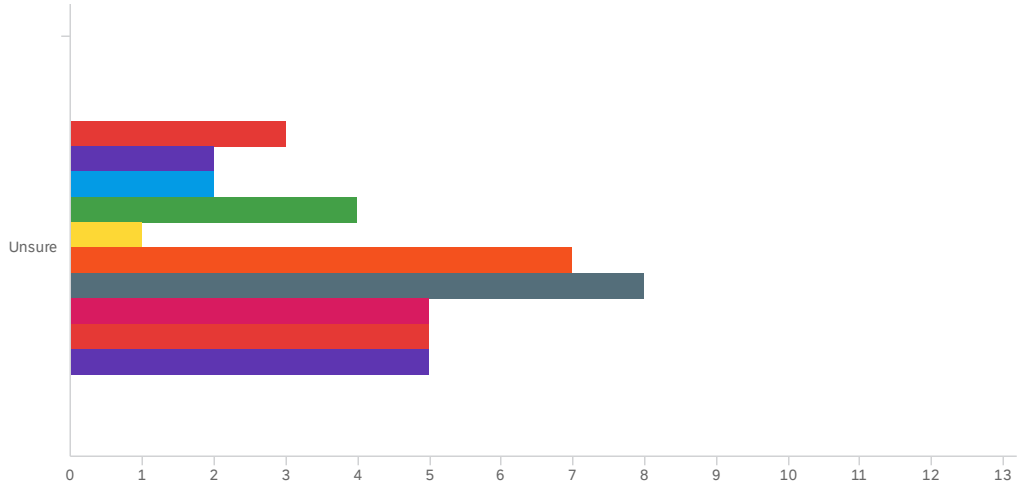


#	Field		Choice Count
1	Definitely Yes	70%	14
2	Probably Yes	30%	6
3	Probably No	0%	0
4	Definitely No	0%	0
5	Unsure	0%	0
			20

Showing rows 1 - 6 of 6

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





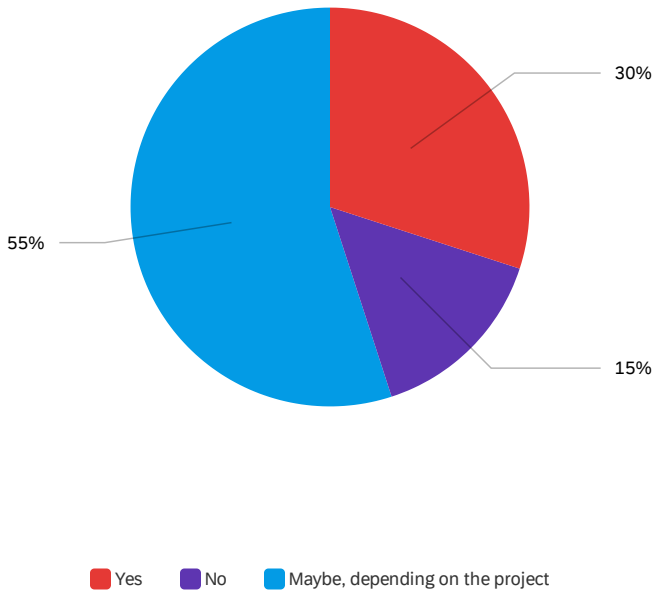
#	Field	Strongly Agree		Agree		Disagree		Strongly disagree		Unsure		Total
1	Loss of in-lake habitat	16%	3	53%	10	16%	3	0%	0	16%	3	19
2	Loss of shoreline habitat	37%	7	42%	8	11%	2	0%	0	11%	2	19
3	Overfishing	16%	3	47%	9	26%	5	0%	0	11%	2	19
4	Soil erosion/sedimentation	26%	5	26%	5	26%	5	0%	0	21%	4	19
5	Heavy recreational use	60%	12	25%	5	10%	2	0%	0	5%	1	20
6	Too many aquatic plants	17%	3	22%	4	22%	4	0%	0	39%	7	18
7	Invasive species	11%	2	21%	4	26%	5	0%	0	42%	8	19
8	Algae	6%	1	28%	5	39%	7	0%	0	28%	5	18
9	Agricultural chemicals	11%	2	26%	5	37%	7	0%	0	26%	5	19
10	Winter fish kill	6%	1	11%	2	33%	6	22%	4	28%	5	18

Showing rows 1 - 10 of 10

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

Do you have any additional comments regarding Shay Lake?
Thank you for doing this and for all your help trying to keep the lake healthy !
Overall something needs to be done about boat traffic. It is excessive on weekends
Biggest complaint I have is the increased boat traffic with large motors and ski doos. Our lake is not large enough to sustain this.
I have been a part of Shay Lake since 1962, I was two years old when our cottage was built, my wife and I now called it home. The lake has really gotten busy over the past few years and safety is sometimes a concern. Know most of this just happens on the weekends, during the week this lake is beautiful and I wouldn't change much. The real issue to me is the size and number of boats/PWC on the weekends. And mostly the problem boats are from outside the area.
love shay lake
We have had our cottage on Shay Lake for over 40 years and always enjoyed our weekends there but the past 5+ years it just isn't the same and it is mostly because of the activity on the lake,,loss of fishing and bringing our boats and visitors to our dock ..just not enjoyable anymore
Just hope something can be done to bring it back to what it use to be so my grand kids can enjoy it
Next question down am to old.

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



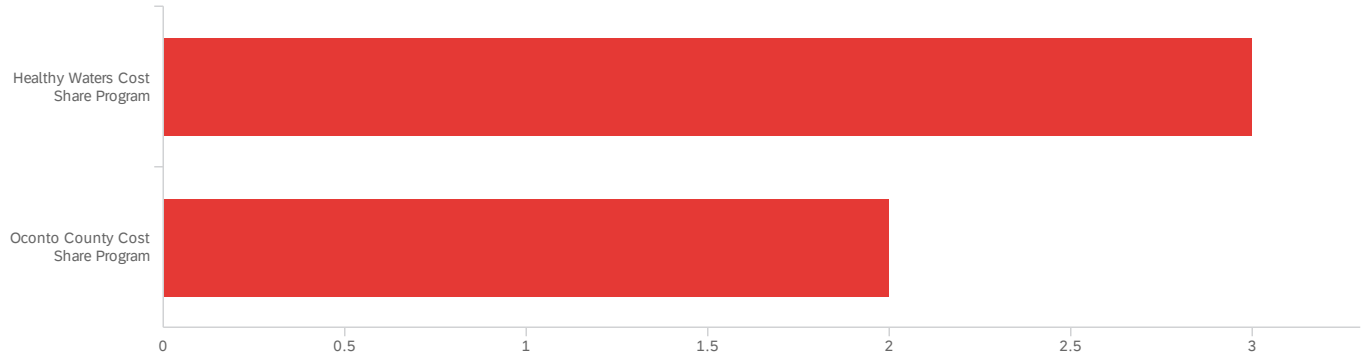
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Would you be interested in volunteering on a project on your lake (such as shoreland restoration planting, invasive species monitoring/removal, water quality monitoring, highway cleanup, etc.)?	1	3	2	1	1	20

#	Field		Choice Count
1	Yes	30%	6
2	No	15%	3
3	Maybe, depending on the project	55%	11
			20

Showing rows 1 - 4 of 4

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

(Check all that apply)



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

Showing rows 1 - 3 of 3

End of Report