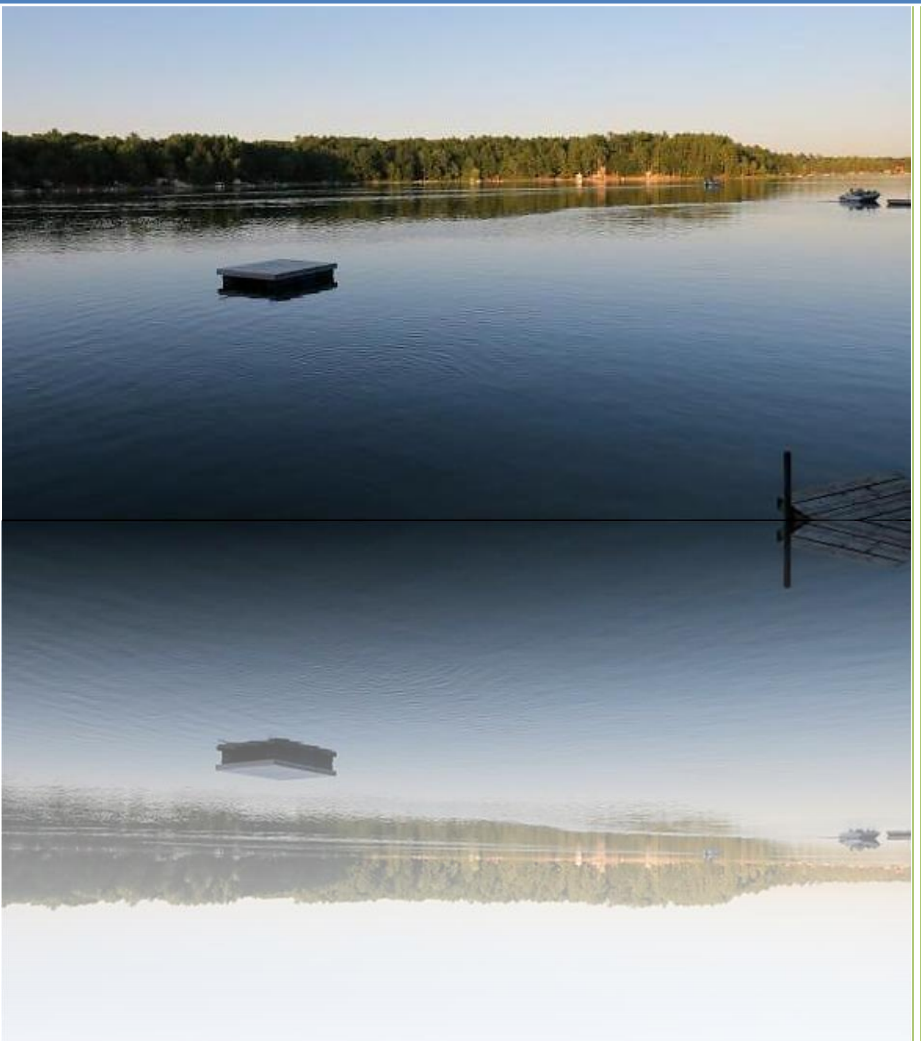
2016

Pearl Lake, Waushara County, Wisconsin
Lake Management Plan



Prepared by staff from the Center for Watershed Science and Education
University of Wisconsin-Stevens Point

Center for Watershed Science and Education
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Pearl Lake Management Plan

The Pearl Lake Management Plan was developed with input from residents and lake users at a series of four public planning sessions held at the Wild Rose Community Center in Wild Rose, Wisconsin and the Leon Town Hall in Pine River, Wisconsin in August-November, 2015. The inclusive community sessions were designed to learn about and identify key community opportunities, assets, concerns, and priorities. Representatives of state and local agencies, as well as nonprofit organizations, also attended the planning sessions to offer their assistance to the group in developing a strategic lake management plan (LMP).

The plan was adopted by the Pearl Lake Protection and Rehabilitation District on March 13, 2016.

The plan was accepted by the Town of Leon on .

The plan was accepted by Waushara County on June 1, 2016.

The plan was approved by the Wisconsin Department of Natural Resources on October 11, 2016.

A special thanks to all who helped to create the Pearl Lake Management Plan and provided guidance during the plan's development.

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We are grateful to many for providing funding, support, and insight:
Waushara County Watershed Lakes Council
Waushara County Staff and Citizens
Wisconsin Department of Natural Resources Professionals, Ted Johnson
Wisconsin Department of Natural Resources Lake Protection Grant Program

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Overarching Vision for Pearl Lake

Maintain good clean lake, free as possible of aquatic invasive species, while maintaining a balance between great recreation and fishing on Pearl Lake.

Introduction

Pearl Lake is located in the township of Leon, east of Wautoma, north of Highway 21, and west of County Highway EE. It has one public boat launch located on its southern side which is managed by the Town of Leon. Pearl Lake is a 101-acre seepage lake with groundwater and surface runoff contributing most of its water. Its maximum depth is 50 feet and is located in the western lobe. The lakebed has a steep slope with bottom sediments that are comprised of sand with rock along the perimeter and mostly muck in deeper sections of the lake. Land use near the lake is predominantly forested and residential. In 2015, community members around Pearl Lake came together in partnership with local professionals to learn about and discuss Pearl Lake which lead to the creation of a lake management plan which was designed to protect and improve their lake for generations to come. This document provides information about Pearl Lake while laying out a framework for the protection and improvement of lake-related features identified as important to the community. This framework, or lake management plan, provides the guidance needed for citizens and others involved in lake or land management to achieve the vision of the Pearl Lake community.

This lake management plan (LMP) and the process used to create and update it allows the community to guide the health and future of its lake. 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 over the next 20 years. It provides guidance for future boards, lake users, and technical experts by identifying which issues have been addressed and how successful previous efforts were. Because many entities are involved in lake and land management, it can be challenging to navigate the roles, partnerships, and the resources that are available. From the beginning of this plan's development, efforts have been made to identify where key assistance exists and identify opportunities for ensuring that the lake's ecological, aesthetic, and recreational opportunities are plentiful into the future. The actions identified in this LMP can serve as a gateway for obtaining resources, including grant funding, to help implement activities outlined in the plan.

Implementing the content within this lake management plan will enable citizens and other supporters to achieve the vision for Pearl Lake now and in the years to come.

The planning process included a series of four public planning sessions held between August and November 2015 at the Wild Rose Community Center and the Leon Town Hall in Pine River. Public participation in these sessions was achieved via letters mailed to Pearl Lake waterfront property owners and by press releases in local newspapers. In addition, participants were sent emails about upcoming meetings which could be forwarded to others. In order to involve and collect input from as many

people as possible, a survey was conducted prior to each planning session which sought feedback on the upcoming planning session's topic(s). The public was informed about the surveys via postcards (waterfront property owners) and press releases in local newspapers. The surveys could be completed anonymously online or on paper upon request. Survey questions and responses were shared at the planning sessions and can be found in the Appendix.

Guest experts and professionals were invited to attend the planning sessions to assist area residents, Pearl Lake Association members, lake users, and representatives of local municipalities with the development of the lake management plan. They presented information and participated in discussions with participants to provide context, insight and recommendations for the lake management plan, including environmental and regulatory considerations. Information provided by the professionals was organized into the same discussion topics as the surveys: the fishery and recreation, the aquatic plant community, water quality and land use, shoreland health, and communication. After learning about the current conditions of each topic, participants identified goals, objectives, and actions for the lake management plan that were then recorded by professionals from UW-Stevens Point. Planning session notes and presentations were posted to the Waushara County website.

The Pearl Lake Planning Management Committee consisted of property owners and recreational users. Technical assistance during the planning process was provided by the Waushara County Conservationist, the Waushara County Community, Natural Resources and Economic Development Extension Agent, and professionals from the Wisconsin Department of Natural Resources (WDNR), Golden Sands Resource Conservation and Development, Inc. (RC&D), University of Wisconsin-Extension (UWEX), and the University of Wisconsin-Stevens Point Center for Watershed Science and Education (CWSE).

Who can use the Pearl Lake Management Plan, and how can it be used?

- **Individuals**: Individuals can use this plan to learn about the lake they love and their connection to it. People living near Pearl Lake can have the greatest influence on the lake by understanding and choosing lake-friendly options to manage their land and the lake.
- **Pearl Lake Protection and Rehabilitation District:** This plan provides the Association with a well thought out plan for the whole lake and lists options that can easily be prioritized. Annual review of the plan will also help the Association to realize its accomplishments. Resources and funding opportunities for Association 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 Pearl Lake. http://www.mypearllake.com/PRD.php
- **Neighboring lake groups, sporting and conservation clubs**: Neighboring 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 Leon**: The Town can utilize the visions, wishes, and goals documented in this lake management plan when considering town-level management planning or decisions within the watershed that may affect the lake.
- **Waushara 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 Waushara County lakes, streams, wetlands, and groundwater.

- **Wisconsin Department of Natural Resources**: Professionals working with lakes in Waushara 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. Lake management plans help the Wisconsin Department of Natural Resources to identify and prioritize needs within Wisconsin's lake community, and decide where to apply resources and funding. A well thought out lake management plan increases an application's competitiveness for funding from the State – if multiple Waushara County lakes have similar goals in their lake management plans, they can join together when seeking grant support to increase competitiveness for statewide resources.

Background

Pearl Lake has a history of proactive management including several studies and plans prepared in the past. This plan is intended to be an update to previous plans and a continuation of the successful stewardship taking place at Pearl Lake. This plan was created as part of the Waushara County Lakes Project was initiated by citizens in the Waushara County Watershed Lakes Council who encouraged the Waushara County to work in partnership with personnel from UW-Stevens Point to assess 33 lakes in the county. This effort received funding from the Wisconsin Department of Natural Resources' Lake Protection Grant Program. Many of the lakes had insufficient data available to help evaluate current water quality, aquatic plant communities, invasive species, and shorelands, or had data obtained at differing frequencies or periods of time, making it difficult to compare lake conditions. Professionals and students from UW-Stevens Point and the Waushara County Land Conservation Department conducted the Waushara County Lakes Study and interpreted data for use in the development of lake management plans. Data collected by citizens, consultants, and professionals at the Wisconsin Department of Natural Resources were also incorporated into the planning process to provide a robust set of information from which informed decisions could be made. Sources of information used in the planning process are listed at the end of this document for future reference. The results of this project, including this plan, will assist citizens, municipalities, Waushara County, and State staff to efficiently manage water resources and help make informed decisions and policies that will affect their lakes now and for future generations.

Several reports from the Pearl Lake Study and the materials associated with the planning process and reports can be found on the Waushara County website: http://www.co.waushara.wi.us/. Hover over the Departments tab, then Zoning and Land Conservation, Land Conservation, and finally click on Lake Management Planning. Unless otherwise noted, the data used in the development of this plan were detailed in the report *Waushara County Lake Study – Pearl Lake 2010-2012*, University of Wisconsin-Stevens Point.

Goals, Objectives and Actions

The following goals, objectives, and associated actions were derived from the values and concerns of citizens and members of the Pearl Lake Management Planning Committee, and the known science about Pearl Lake, its ecosystem and the landscape within its watershed. Implementing and regularly updating the goals and actions in the Pearl Lake Management Plan will ensure that the vision is supported and that changes or new challenges are incorporated into the plan. 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.**

Although each lake is different, to ensure a lake management plan considers the many aspects associated with a lake, the Wisconsin Department of Natural Resources requires that a comprehensive lake management plan address, at a minimum, a list of topics that affect the character of a lake, whether each topic has been identified as a priority or as simply something to preserve. These topics comprise the chapters in this plan. For the purposes of this plan, the chapters 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 and Quantity—water chemistry, clarity, contaminants, lake levels
Shorelands—habitat, erosion, contaminant filtering, water quality, vegetation, access
Watershed Land Use—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 and Revisions—continuing the process
Governance—protection of the lake, constitution, state, county, local municipalities, Pearl Lake Protection and Rehabilitation District

Lead organizations and resources are identified under each objective of this plan. These individuals and organizations are able to provide information, suggestions, or services to accomplish objectives and 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.

Resource	Acronym
Center for Watershed Science and Education	CWSE
Citizen Lake Monitoring Network	CLMN
Department of Agriculture, Trade and Consumer Protection	DATCP
North Central Conservancy Trust	NCCT
Natural Resource Conservation Service	NRCS
Pearl Lake Protection and Rehabilitation District	PLPRD
Golden Sands Resource Conservation and Development	RC&D
University of Wisconsin-Stevens Point	UWSP
University of Wisconsin Extension	UWEX
Waushara County Watershed Lakes Council	WCWLC
Wisconsin Department of Natural Resources	WDNR
Wisconsin Department of Transportation	WDOT
Wisconsin Environmental Analysis Laboratory	WEAL

Contact information for organizations and individuals who support lake management in Waushara County can be found in Appendix A.

List of Goals

Goal 1. Enhance the fish community in Pearl Lake.
Goal 2. Protect native plants in and around Pearl Lake.
Goal 3. Eliminate aquatic invasive species from Pearl Lake.
Goal 4. Protect sensitive areas in and around Pearl Lake.
Goal 5. Minimize nutrient and sediment loading to Pearl Lake by improving land management practices near the lake and in its watershed.
Goal 6. Pearl Lake shorelands will become increasingly healthy over time through the efforts of shoreland property owners.
Goal 7. Explore and utilize resources for healthy lake management.
Goal 8. Foster an environment of compliance and consideration amongst lake users.
Goal 9. Increase participation in lake stewardship.
Goal 10. Review plan annually and update as needed.

Primary short-term goals

Continue AIS management program using best management practices.

Goal 3. Eliminate aquatic invasive species from Pearl Lake.
Objective 3.1. Reduce or eliminate populations of EWM and CLP in Pearl Lake.

Promote healthy shoreland environment through education and by example.

Goal 6. Pearl Lake shorelands will become increasingly healthy over time through the efforts of shoreland property owners.
Objective 6.1. Pearl Lake shoreland property owners will be knowledgeable about and make good decisions about shoreland practices that result in good water quality and habitat.

Invite properties not currently in the District to have an active role in the protection of Pearl Lake.

In-Lake Habitat and a Healthy Lake

Many lake users value Pearl Lake for its good water quality, wildlife and fishing. These attributes are all interrelated; 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.

Lake habitat occurs within the lake, along all of its shorelands, and even extends into its watershed for some species. Many animals that live in and near the lake are only successful if their needs – food, a healthy environment, and shelter – are met. Native vegetation including wetlands along the shoreline and adjacent to the lake provides habitat for safety, reproduction, and food, and can improve water quality and balance water quantity. 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. Aquatic plants infuse oxygen into the water and provide food and shelter for waterfowl, small mammals, and people. 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. Healthy habitat in Pearl Lake includes the aquatic plants, branches, and tree limbs above and below the water.

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 in order to flourish. Activities in and around a lake that can affect a fishery may involve disturbances to the native aquatic plant community or substrate, excessive additions of nutrients or harmful chemicals, removal of woody habitat, shoreline alterations, and/or an imbalance in the fishery. Shoreland erosion can cause sediment to settle onto the substrate, causing the deterioration of spawning habitat. Habitat can be improved by allowing shoreland vegetation to grow, minimizing the removal of aquatic plants, providing fallen trees or limbs in suitable areas, and protecting wetlands and other areas of critical habitat.

People are an important part of a sustainable fish community; their actions on the landscape and the numbers and sizes of fish taken out of the lake can influence the entire lake ecosystem. Putting appropriate fishing regulations in place and adhering to them can help to balance the fishery with healthy prey and predatory species, can be adjusted as the fish community changes, and can provide for excellent fishing.

Managing a lake for a balanced fishery can result in fewer expenses to lake stewards and the public. While some efforts may be needed to provide a more suitable environment to meet the needs of the fish, they usually do not have to be repeated on a frequently reoccurring basis. 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.

Alternatively, 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. Ideally, a lake contains the habitat, water quality, and food necessary to support the fish communities that are present within the lake and provide fishing opportunities for people without a lot of supplemental effort and associated expenses to maintain these conditions.

The fishery in Pearl lake is chiefly composed of largemouth bass, northern pike and panfish. Despite an extensive history of stocking, from 1933 to present. Because of its depth and cool temperatures, Pearl Lake is capable of supporting a two-story fishery through stocking; however, thousands of fish have been stocked without any reproduction of walleyes, smallmouth bass and trout. In the past, Fishery Biologists from the WDNR stocked trout 1951 to 1970. Trout stocking ceased due to very low survivability from one year to the next.

The most recent fish survey was conducted in the spring of 2012 by Fishery Biologists with the WDNR. Largemouth bass were reported in good abundance with a catch rate of 108/hr for fish greater than 8 inches but size structure was below average with a mean length of 10.5". Bluegill were in good abundance with a catch rate of 326/hr for fish greater than 3inches and good size structure (PSD6 = 73%, RSD8 = 16%). According to Dave Bartz, WDNR fisheries biologist, fisheries habitat, particularly near shore, scored low compared with other lakes in the Waushara Lakes Study. His recommendation for the enhancement of the fishery in Pearl Lake is the restoration of shoreland habitat and large woody habitat.

Guiding Vision for the Fish Community

The Pearl Lake fishery will be healthy, robust and well-balanced.

Goal 1. Enhance the fish community in Pearl Lake.

Objective 1.1. Protect and improve near-shore fish habitat in Pearl Lake.

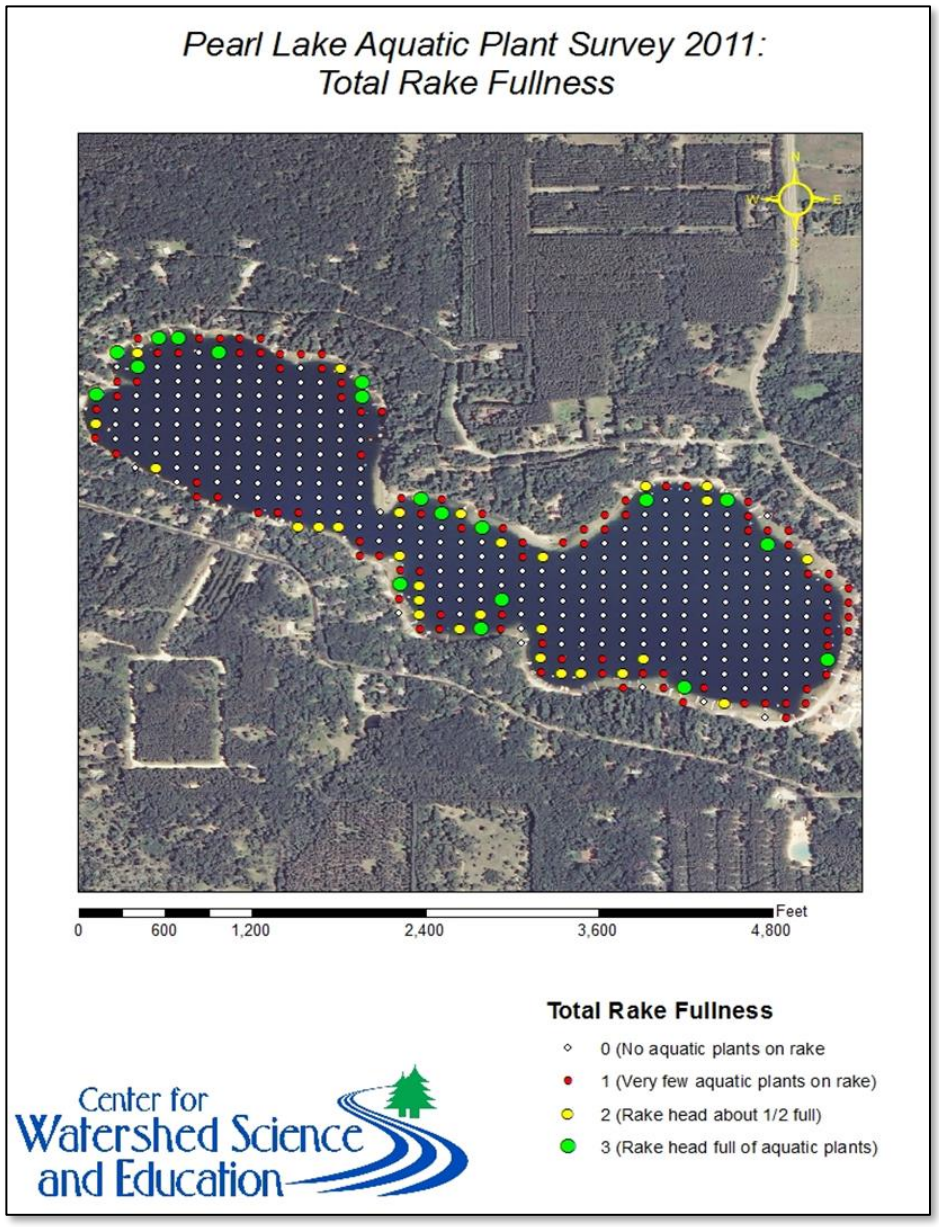
Actions	Lead person/group	Resources	Timeline
Protect existing natural habitat including downed trees and woody features around Pearl Lake by informing landowners about their importance.	PLPRD	UWEX info materials WDNR Fisheries Biologist	Ongoing
Identify landowners interested in tree drops or fish sticks.	PLPRD	WDNR Fisheries Biologist	Ongoing
Work with WDNR for assistance and permitting of tree drops and "fish sticks".	PLPRD Interested citizens	Fisheries Biologists – WDNR WDNR Healthy Lakes Grants	Ongoing
Explore the installation of woody habitat under and around docks.	PLPRD Shoreland property owners	Fisheries Biologists - WDNR	Ongoing

Aquatic Plants

Aquatic plants provide the forested landscape within Pearl 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 creates diversity that makes the aquatic plant community more resilient and can help to prevent the establishment of non-native aquatic species.

Aquatic plants near shore and in shallows provide food, shelter and nesting material for shoreland mammals, shorebirds and waterfowl. It is not unusual for otters, beavers, muskrats, weasels, and deer to be seen along a shoreline in their search for food, water, or nesting material. The aquatic plants that attract the animals to these areas contribute to the beauty of the shoreland and lake.

An aquatic plant survey was conducted in Pearl Lake by staff from the CWSE in 2011. Sixteen species of aquatic plants were observed, which is average when compared with other Waushara County lakes in the study. The greatest diversity occurred sporadically around the lake in shallow areas. 83 percent (141 of 169) of the sites sampled had vegetative growth with the average depth of plants located at 15 feet and the deepest plants found at 35 feet. The dominant plant species in the survey was muskgrass (chara), followed by variable pondweed and slender naiad. Of the aquatic plant species within Pearl Lake, three were high quality with a C-value of 8: yellow pond lily (*Nuphar advena*), slender naiad (*Najas flexilis*), and Illinois pondweed (*Potamogeton illinoensis*). The survey documented no species of special concern in Wisconsin. More detailed information can be found in the Pearl Lake Aquatic Plant Report or the Pearl Lake 2010-2012 Lake Study Report.



Guiding Vision for Aquatic Plants in Pearl Lake

Pearl Lake will have a healthy and diverse native aquatic plant community that supports a balanced fishery and promotes good water quality while allowing for recreation.

Goal 2. Protect native plants in and around Pearl Lake.

Objective 2.1. Maintain the native aquatic plant community within Pearl Lake while allowing for recreational use that has minimal disturbance from excessive aquatic plant growth.

Actions	Lead person/group	Resources	Timeline
Minimize the removal and disturbance of native vegetation to impede establishment of additional AIS. Members will be informed about the importance of native vegetation via educational materials provided in annual mailing, website re: mitigation methods available.	PLPRD	UWEX Lakes WCLWC	Ongoing
Keep disturbance to the native aquatic plant community to a minimum by informing District members of their importance.	PLPRD	Handouts District website	Ongoing
If plants severely impede recreation, consider reducing the growth by hand pulling small areas around personal docks.	Shoreland property owners	RC&D WDNR	Ongoing

Objective 2.2. Enhance shoreland vegetation and encourage best management practices within the watershed.

Actions	Lead person/group	Resources	Timeline
See **Shorelands** and **Watersheds** sections.			

Aquatic Invasive Species (AIS)

Aquatic invasives species are non-native aquatic plants and animals that are most often unintentionally introduced into a lake by lake users. This most 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.

One aquatic invasive species was observed during the 2011 survey, curly-leaf pondweed (CLP), so a special survey was conducted in June 2012 to look specifically for this species. During the June 2012 survey, CLP was found in a single location in Pearl Lake, but not in dense patches. In some lakes, CLP behaves as another member of the aquatic plant community, but in others it can become more aggressive, colonizing large areas. CLP has a unique life cycle. It begins growing under the ice in winter and by early spring has a competitive advantage over still-dormant native species. CLP typically dies off in late June/early July, and its decomposing tissue releases phosphorus into the warm water. The timing of this phosphorus release can help to enhance algal blooms. In Pearl Lake, CLP appears to be functioning as a member of the aquatic plant community and does not currently show any invasive tendencies; however, it should continue to be monitored to evaluate its aggressiveness.

Although not observed during the 2011 survey, Eurasian watermilfoil (EWM) was first documented in Pearl Lake in 1994 and has persisted in isolated populations since, despite almost annual herbicide treatments that began with 7 acres in 2000 (Cason 2010). All chemical treatments have been with granular 2,4-D. Until approximately 2005, the application rate was 100lbs/acre, since then, application rates have been increased to 150lbs/acre.

EWM and CLP in Pearl Lake, 2013.

Extent of EWM beds in Pearl Lake (Cason 2010).

Date	Acreage
June, 2000	7.0
July, 2000	4.0
August, 2000	1.7
May, 2002	2.0
August, 2002	2.3
June, 2003	0.4
June, 2004	1.7
June, 2005	1.7
June, 2006	2.0
June, 2007	1.9
October, 2007	5.8
June, 2008	2.0
May, 2009	1.6
May, 2010	1.0

Aquatic Plant Management Options for Pearl Lake (based on the October 2, 2015 discussion)

Management options will change depending upon the amount of EWM or CLP in Pearl Lake; therefore, routine monitoring of these species is essential. The presence of AIS will also define the type of aquatic plant management that could be conducted to address recreational impediments. Often multiple approaches and adaptive year-to-year changes in approach are most successful. It is essential that management methods be carefully evaluated before a treatment approach is selected each year. At a minimum, the population of EWM should be evaluated using a 'point-intercept' method every 5 years. Annually a visual survey of the littoral zone should be conducted before and after treatments (or at the end of summer in years that treatments are not conducted) to determine the effectiveness of an approach in a given year. Strategies for the subsequent year should be adjusted accordingly. EWM management involves evolving scientific knowledge; therefore, the strategies for the management of EWM in Pearl Lake should be adapted as EWM populations in the lake change and as new information becomes available.

Hybrid watermilfoil (HWM) results from a hybridization of native watermilfoil with EWM. There is some evidence that suggests HWM can be more tolerant to certain herbicides such as 2,4-D products; therefore, it is important to know if HWM is present in Pearl Lake. HWM may be suspected in a lake if any of the following occur, 1. the plants appearance is different than EWM; 2. management with chemicals becomes difficult or ineffective; and 3. the lake is near other lakes with HWM. If these criteria are met, plant samples should be submitted to a lab for confirmation. Once HWM is confirmed, a review of past herbicide use in the lake and surrounding lakes, may be necessary to assess the likelihood of herbicide tolerance. There are many combinations of herbicides and concentrations that can potentially be used to treat HWM; the only way to know the appropriate combination is by sending samples to be challenge tested. A "challenge test" may be appropriate if tolerance to herbicides is suspected. This entails obtaining live specimens from Pearl Lake and them having them grown in a controlled setting where a combination of herbicides at different rates will be applied to evaluate the effectiveness in controlling that particular strain of HWM. Treating HWM without knowing the appropriate combination of chemicals can result in an even more resilient strain in the lake, damage to the native aquatic plant population, and a waste of money.

The following aquatic plant management options were determined to be the most practical and effective options that would minimize impacts to Pearl Lake as a whole. Depending upon circumstances, multiple options may be employed in a given year or in different parts of the lake.

Manual removal (All AIS) – No Permit required.

Those trained to properly identify and remove EWM/HWM and other AIS can remove those plants manually any time, without a permit. Trained divers (DASH) can be hired to manually remove AIS in deeper parts of the lake. Given the small populations of invasives in Pearl Lake, aggressive manual removal is likely the most effective option.

Chemical spot treatment (EWM/HWM) – Annual Permit Required

Results of recent studies of the effectiveness of chemical spot treatment suggest the treatment is less effective than previously thought and may actually promote chemically resistant forms of EWM. However, chemical spot treatments may still be appropriate in certain conditions to control EWM/HWM in the future.

Chemical control of EWM beds that are less than 5 acres should be done using a contact herbicide (examples: endothall or diquat). However, systemic herbicides should be avoided if dilution rates exceed the necessary contact exposure time needed for that particular herbicide. Treatment should occur early in the season, prior to emergence of native plants. Early spring treatments take advantage of the seasonally stressed EWM/HWM plants and reduce damage to native plants, which helps to protect against the spread of EWM/HWM. To reduce the chance of developing resilient strains of EWM, integrated pest management (IPM) techniques should be employed. IPM utilizes different methods of management to prevent target species from becoming tolerant to a redundant control method (e.g. continual herbicide treatment using the same product and dose rate). Different methods should be used each year. This may even subscribe to other control methods such as manual or biological control.

Milfoil weevils. (EWM/HWM) – No Permit Required

This option could be considered in areas of the lake with native or restored shorelines. Milfoil weevils (*Euhrychiopsis lecontei*) are not commercially available but starter populations can be obtained and reared in predator-free conditions. Professional assistance should be sought if stocking or rearing is pursued. Milfoil weevils cannot be used in conjunction with herbicide treatments.

Do nothing

Doing no active management is an option to see how the invasives may respond. Though EWM typically behaves very aggressively, there have also been cases in other lakes where the population stabilized and did not present a significant issue to the lakes' users.

Guiding Vision for Aquatic Invasive Species

Pearl Lake will be free of aquatic invasive species.

Goal 3. Eliminate aquatic invasive species from Pearl Lake.

Objective 3.1. Reduce or eliminate populations of EWM and CLP in Pearl Lake.

Actions	Lead person/group	Resources	Timeline
Inform property owners about refraining from removing native aquatic vegetation to diminish the possibility colonization by AIS.	PLPRD	RC&D UWEX Lakes – info materials WCLWC	Ongoing:-spring- fall
Inform shoreland property owners that they should be trained in proper hand-pulling techniques for EWM.	PLPRD	RC&D	Annually or as needed
Re-evaluate the aquatic plant community routinely to determine the next steps (or no action) in management of EWM and CLP.	PLPRD	WDNR Lake Manager RC&D Consultant	Annually CLP survey – early June
Consider the possibility of no action if EWM or CLP population is not expanding, causing a nuisance, or disrupting the native plant community.	PLPRD	WDNR Lake Manager	Ongoing
Work with other area lake groups to apply jointly for a grant to hire divers (DASH) to hand pull EWM in deeper parts of the lake.	PLPRD	WDNR Lake Manager RC&D	As needed
If EWM populations exceed what is manageable by hand pulling, consider using herbicides in areas of denser infestation.	PLPRD	WDNR Lake Manager Consultant	As needed
Continue to monitor for EWM hybridization (HWM) and periodically submit samples for analysis.	PLPRD	WDNR Lake Manager Consultant	Ongoing
If HWM is determined to be present, conduct challenge tests on HWM to determine the correct combinations of chemicals for successful treatment.	PLPRD	RC&D	If appropriate.

Objective 3.2. Prevent the establishment of new species of AIS in Pearl Lake.

Actions	Lead person/group	Resources	Timeline
Use signs, newsletters, and other methods to inform lake visitors about AIS and removing aquatic hitchhikers.	PLPRD Town of Leon	UWEX Lakes – info materials	Ongoing
Inform property owners of the importance of aquatic vegetation and to refrain from removing native aquatic vegetation from the lakebed	PLPRD	UWEX Lakes – info materials	Ongoing

to diminish the possibility of AIS colonization.			
Learn to identify AIS and routinely look for it.	Shoreland property owners, lake users	RC&D	Ongoing
Routinely monitor for AIS in Pearl Lake. Report any suspected AIS to RC&D or WDNR Lake Specialist (see Appendix C: Rapid Response Plan).	Shoreland property owners, lake users	WDNR Lake Specialist RC&D	Ongoing
If a new infestation is found, follow steps in the Appendix C: Rapid Response Plan			
Coordinate volunteers or interns to staff the boat launch on busy days/weekends for boat inspections and information (Clean Boats Clean Waters).	Interested citizens	CBCW Coordinator, UWEX Lakes	2016, Ongoing

Critical Habitat

Special areas harbor habitat that is essential to the health of a lake and its inhabitants. In Wisconsin, critical habitat areas (CHA) are identified by biologists and other lake professionals from the Wisconsin Department of Natural Resources 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.

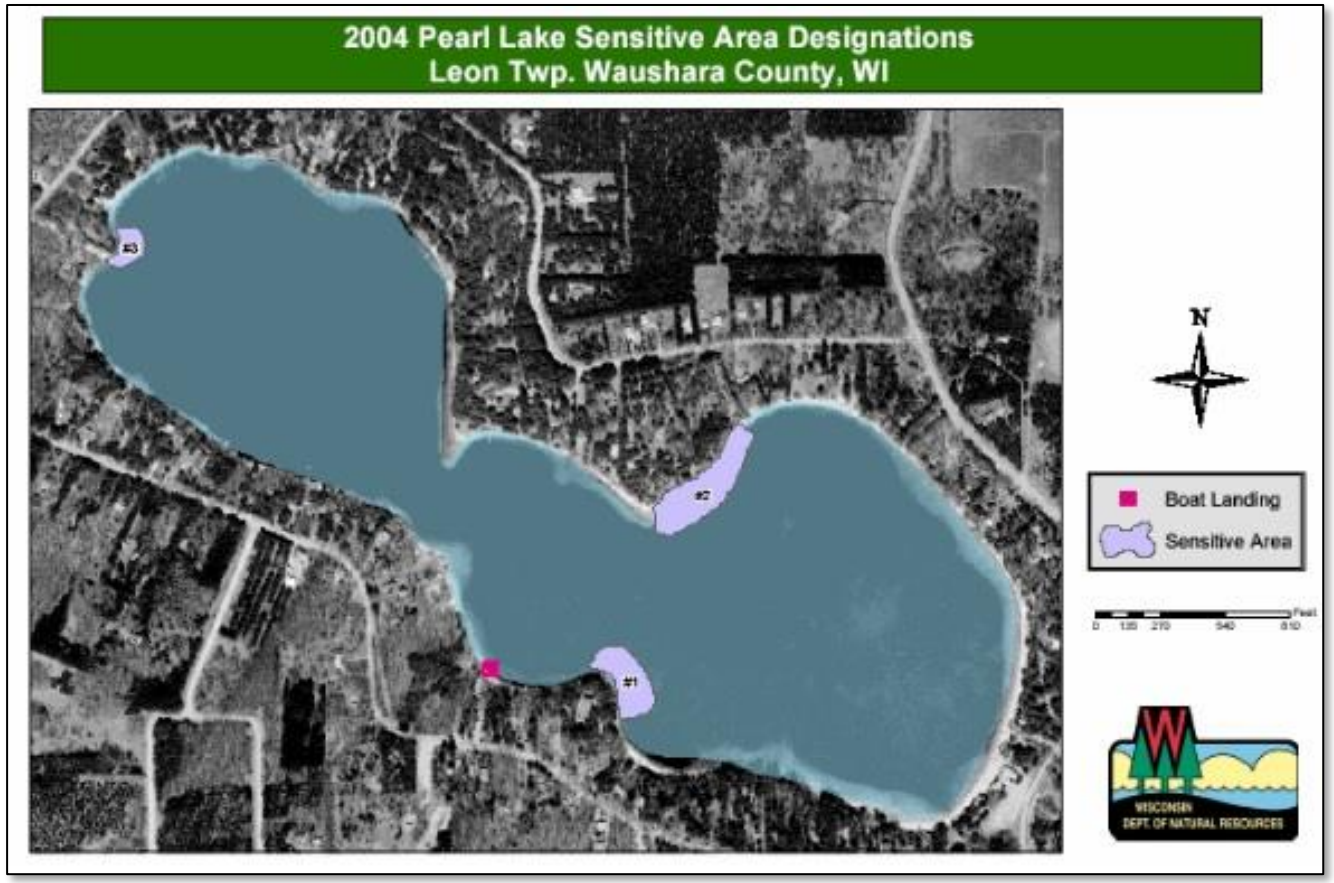
In 2004, biologists from the WDNR designated three sites at Pearl Lake as sensitive areas (now termed *Critical Habitat Areas*) because they contain critical or unique habitat. Because these areas have significant benefits to Pearl Lake, no removal of native rooted aquatic vegetation or shoreline alterations should take place unless the appropriate staff from the WDNR have been contacted. The following descriptions of the CHA sites in Pearl Lake originate from the WDNR's *Pearl Lake Sensitive Area Designation Report*, Provost, 2004.

Resource Value of Site 1:

This site is located in the south eastern side of the lake. Its upper bound is on north side of the point that is located east of the landing. The littoral zone has fair diversity within an abundant aquatic plant community, offering habitat for fish and wildlife. The submergent vegetation comprised of coontail (*Ceratophyllum demersum*), floating leaf pondweed (*Potamogeton natans*), chara (*Chara spp*.) and slender naiad (*Najas flexilis*). The aquatic plant community is healthy and likely a result of a lack of wind derived waves. The point on the northern boundary of the SAD provides protection from the prevailing winds. EWM is found in isolated cases; care should be taken to retard spreading. Despite the moderately developed shoreline, shrubs and trees dominate the sloping landscape to the sand and gravel shore.

The primary reasons for site selection were values to the fishery and wildlife, water quality protection, and aesthetic qualities. Many of the plants found in this area provide essential habitat needs for fish and wildlife. They are also important to the production of macro-invertebrates (aquatic insects) that benefit the fishery and wildlife utilizing the area. Like most of the lake, this area has decreased habitat value in the shallow areas. Although establishment of more plants would enhance all of the aforementioned values, this area has more aquatic plants than the other near shore areas around the lake. This area is expected to serve as a nursery area for the nearby spawning areas of centrarchids (sunfish family). Mini-fyke netting in this area in July 2003 showed forage species and young-of-the-year panfish using this area. Forage species consisted of golden and blacknose shiners and young-of-the-year panfish were, green sunfish, bluegill, yellow perch and bullhead.

Larger trees and overhanging vegetation along the shore provides roosting and feeding areas for birds, such as kingfishers and herons. However, there is a lack of fallen woody habitat along the shore, which could be improved by allowing fallen trees to remain in place, provided they are not a hazard to navigation. The near shore plants, including the trees, serve as a physical buffer that protects water quality by anchoring sediments and protecting the shoreline from wave erosion. Due to the presence of the point, a protected bay offers quiescent waters for birds and animals to retreat to during inclement weather. The entire SAD also adds a pleasing area to relax which is used by boaters who can anchor nearby to enjoy the peace and aesthetics this SAD offers.



Management Recommendations for Site 1:

- Exotic species should be monitored and removed.
- No removal of native plant species unless they are prohibiting navigation of boats from the shore.
- No bank armament such as rip rap should be permitted. If needed, bank stabilization should be bio-engineered as much as possible.
- Enhance natural woody habitat along the shore, where possible.
- Pursue grant options for shoreline restoration(s) and addition of woody habitat when applicable.

Resource Value of Site 2:


Photo: Scott

Site 2 is located on the north shore across from SAD Site 1. The shoreline is mainly undeveloped (see figure 2.). Threesquare bulrush (*Scirpus americanus*) common to abundant along the sandy shore. The spreading of bulrushes along the shore typify how bulrushes will colonize beaches during low water. As the water levels increase the flooded area will provide excellent habitat for fish and wildlife, especially during spawning and mating seasons. Bulrushes have more mass than submergent species, which can help control wave energy from eroding the banks, while absorbing unwanted nutrients to the lake. This is exactly the kind of spawning habitat pike and perch need. Even flooding one year out of 5 – 10 can produce a good age class of fish. This area has other benefits as well. Herps and other animals will you use this area as water levels decrease especially salamanders and frogs. Herps will use this area for breeding and shelter also. During low water years when the shore seems to be dry, emergent and wetland plants will begin to grow and reclaim the area, offering habitat for different species. As plant species change, diversity will increase especially during the transitional years. This is another benefit to the lake. Diversity of plant species will equate to a diverse fish and wildlife community.

Some woody debris is present along the shore. During the survey it was estimated that there were 1-2 pieces per 30 meters. This is not considered common but nonetheless it still serves many needs (see woody debris discussion). Wildflowers were also present. Blue Flag (*Iris versicolor*) and Blue Vervain (*Verbena hastata*) were growing along the shore. This area is an oasis for reptiles and birds.

Not only is this SAD important for reptiles and birds, it is very important to forage fish and young-of-the-year panfish. A mini-fyke net set in 2004 had the highest recordings of

forage fish than any other area on the lake. Forage species consisted of Golden Shiners, Bluntnose Shiners, Blacknose Shiners and Banded Killifish. The Banded Killifish is considered a species of special concern by the Bureau of Endangered Resources and is also listed as a “Species of Greatest Conservation Need”. The presence of this fish shows the importance of near shore vegetation found on this shoreline. This particular minnow spawns on vegetation when water temperatures reach the mid-70’s. The Banded Killifish was found only at this location on Pearl Lake, which can be attributed to the presence of near shore vegetation.

Management Recommendations for Site 2:

- Protect the natural growth of plants - do not mow during dry periods.
- Do not armor the shoreline; consult with a resource professional before commencing on any disturbances
- Protect the area from any upland erosion.
- Leave the shoreline in a natural state.
- Enhance fallen woody habitat at the shoreline.

Resource Value of Site 3:

Site 3 is located on the west end of the lake. The site has a large amount of gravel, cobble and boulders ideal for spawning and fish cover (see figure 3.). The site is also unique on an aesthetics standpoint. The clear water over this glacial deposition plunges into depths beyond the littoral zone, offering a wide range of diverse cover types. This is a rarity in Waushara County Lakes. Typically, lakes in the area were formed in pitted sandy outwash, with few cobbles and boulders. Pearl Lake has been fortunate to acquire this deposit in the littoral zone of the lake. The presence of the cobble and boulders coupled with the submergent vegetation adds diversity to the aquatic habitat of the lake. The "rocky point" is well known to anglers – both human and animals. Eurasian Watermilfoil was encountered in the area, not at nuisance levels but the presence in this area should be dealt with appropriately.

Management Recommendations for Site 3:

- Exotic species should be monitored and removed.
- No removal of native plant species unless navigation from shore is prohibited.
- No bank armament such as rip rap should be permitted, bio-engineer as much as possible.
- Enhance natural woody debris along the shore, where possible.
- Pursue grant options for shoreline restoration(s).
- Maintain wildlife corridors.
- Protect natural rock deposition that occurs.

Guiding Vision Pearl Lake's Critical Habitat

Pearl Lake's sensitive areas will be protected from degradation and enhanced.

Goal 4. Protect sensitive areas in and around Pearl Lake.

Objective 4.1. Protect and enhance critical habitat areas (CHA) in Pearl Lake.

Actions	Lead person/group	Resources	Timeline
Inform shoreland property owners and lake users about these important areas by publishing brochures to distribute to rental properties, include in newcomer packets, and for use at boat landing.	PLPRD	WCLCD WDNR Biologists UWEX Lakes	Ongoing
Protect areas surrounding off-lake critical habitat areas by supporting enrollment in conservation programs and incorporating into town decisions.	PLPRD	WCLCD NCCT Town Plan Commission	Ongoing

Landscapes and the Lake

Land use and land management practices within a lake's 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. 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 on the land may result in changes to natural drainage patterns and 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. Land management practices can be put into place that better 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.

Shoreland vegetation is critical to a healthy lake's ecosystem. It helps improve the quality of the runoff that is flowing across the landscape towards the lake. It also provides habitat for many aquatic and terrestrial animals including birds, frogs, turtles, and many small and large mammals. Healthy shoreland vegetation includes a mix of tall grasses/flowers, shrubs, and trees which extend at least 35 feet landward from the water's edge. Shorelands include adjacent wetlands, which also serve the lake by allowing contaminants to settle out, providing shelter for fish and wildlife, and decreasing the hazard of shoreline erosion by providing a shoreland barrier from waves and wind.

The water quality in Pearl Lake is the result of many factors, including the underlying geology, the climate, and land management practices. Since we have little control over the climate and cannot change the geology, changes to land management practices are the primary actions that can have positive impacts on the lake's water quality. The water quality in Pearl Lake was assessed by measuring different characteristics including temperature, dissolved oxygen, water clarity, and water chemistry. All of these factors were taken into consideration when management planning decisions were made.

Water Quality

Survey respondents feel there is a direct correlation between water quality in Pearl Lake and both personal enjoyment value of the lake and the economic value of their waterfront property. Half of the respondents felt that water quality had declined during their time at the lake and most attributed this to heavy recreation.

A variety of water chemistry measurements were used to characterize the water quality in Pearl Lake. Water quality was assessed during the 2010-2012 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 are used for growth by algae and aquatic plants. 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 Pearl Lake's water quality.

One pound of phosphorus entering a lake can result in up to 500 pounds of algal growth! (Vallentyne, 1974)

Dissolved oxygen is an important measure in Pearl 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 change throughout the year and vary with depth. Concentrations below 5 mg/L can stress some species of cold water fish and other aquatic organisms. In winter, spring and fall, the dissolved oxygen concentrations in Pearl Lake were nearly uniform through the water column. In Pearl Lake, low dissolved oxygen concentrations (below 5 mg/L)were observed in November 2010 and February 2012. The low concentrations observed in the fall may have been the result of the lake having just mixed. This is a temporary situation where the low oxygen bottom water mixes throughout the water column. Fall mixing events are typically followed by an infusion of atmospheric oxygen into the water prior to ice cover. The low dissolved oxygen concentrations observed in late winter is cause for concern, especially during longer winters with heavy snow cover. During the summer, concentrations of dissolved oxygen were high near the surface and decreased at depths of about 25 feet. Increases in dissolved oxygen during the summer at depths of 15-28 feet are usually attributed to oxygen production from algal blooms.

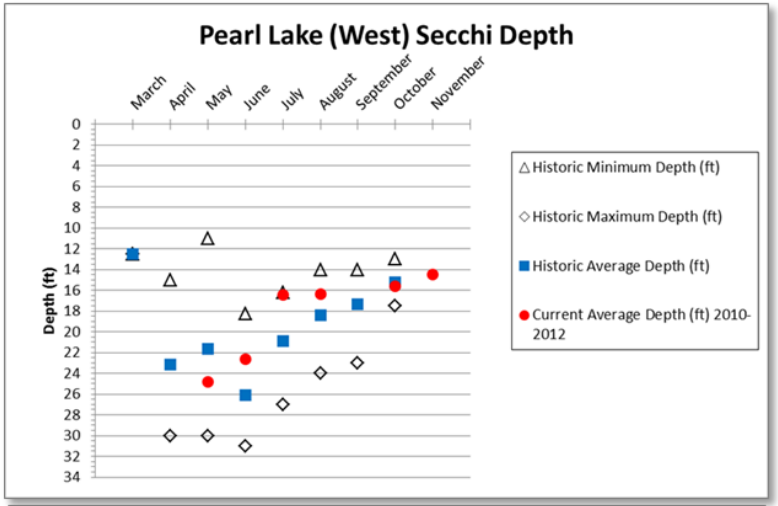
Water clarity measured in Pearl Lake was considered good, ranging from 9 feet to 24 feet in the east basin and from 13.5 feet to 27.5 feet in the west. A large dataset of water clarity measurements is available for Pearl Lake, thanks to citizen monitors. Data has been collected routinely in the east basin during 1986-95, 2010 and 2011. In the west basin, water clarity data is available from 1996 to the present. Over these time periods, only a few measurements were taken on the same day in both basins. In the west basin, when compared with historic data, the average water clarity measured during the study was better in May, similar in October, and poorer in June, July and August. In the east basin, when compared with historic data, the average water clarity measured during the study was better in September, similar in August and November, and poorer in April, May, June, July and October.

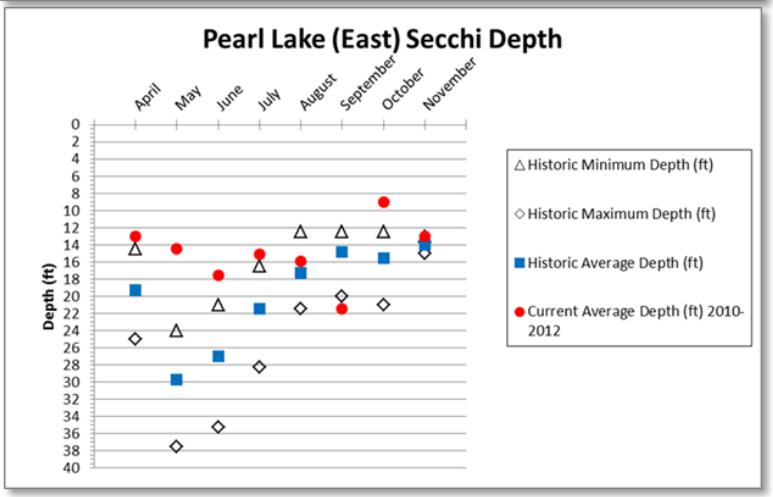
Chlorophyll *a* is a measurement of algae in the water and can effect water clarity. Chlorophyll *a* concentrations in both basins of Pearl Lake were low; however, it is important to note that the standard Wisconsin Department of Natural Resources protocol for sample acquisition was followed, with samples collected in the upper 6 feet of water. In Pearl Lake, increased dissolved oxygen concentrations from algal blooms occurred at depths of 15-25 feet, so the chlorophyll a concentrations reported are not a full representation of the algal growth in Pearl Lake.

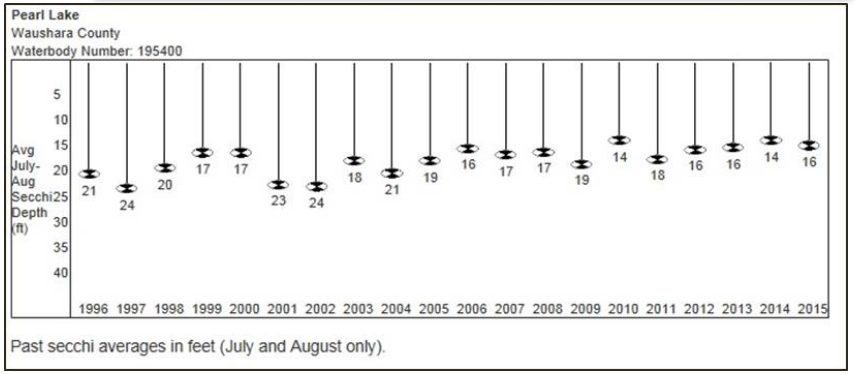
Chloride, sodium and potassium are commonly used as indicators of how a lake is being impacted by human activity. The presence of these compounds where they do not naturally occur indicates sources of water contaminants. Although these elements are not detrimental to the aquatic ecosystem, they indicate 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. Pearl Lake had low average chloride, sodium, and potassium concentrations in samples collected during the study; however, atrazine (DACT), an herbicide commonly used on corn, was detected (0.10 µg/L and 0.11 µg/L) in the samples that were analyzed. The presence of this chemical suggested that agricultural activities in the surrounding area were impacting water quality. Some toxicity studies have indicated that reproductive system abnormalities can occur in frogs at these levels (Hayes et al., 2001 and Hayes et al., 2003).

Phosphorus is an element that is essential in trace amounts to most living organisms, including aquatic plants and algae. Sources of phosphorus can include naturally-occurring phosphorus in 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.

During the study, total phosphorus concentrations in the Pearl Lake’s east basin ranged from a high of 24 ug/L in February 2011 to a low of 3 ug/L in August 2012. The summer

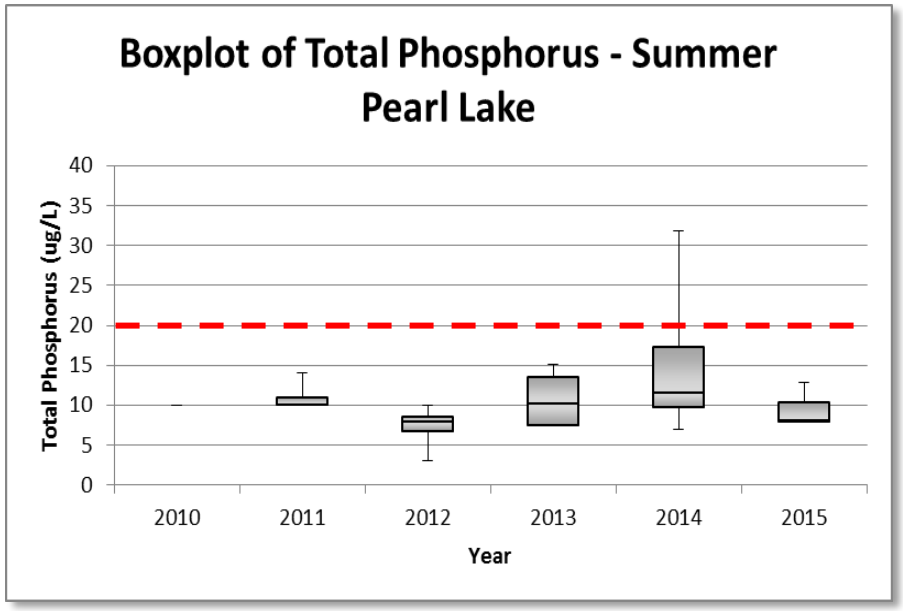






Past secchi averages in feet (July and August only).

median total phosphorus concentrations were 10 ug/L and 8 ug/L in 2011 and 2012, respectively. This is below Wisconsin's phosphorus standard of 20 ug/L for deep seepage lakes. Citizens have continued to monitor the phosphorus in Pearl Lake; while summer median concentrations were slightly above and below 10 ug/L, more variation in concentrations were observed. Inorganic nitrogen concentrations in Pearl Lake were within the natural range for lakes in Waushara County.



Managing nitrogen, phosphorus and soil erosion throughout the Pearl 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 Pearl 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.

Guiding Vision for Water Quality in Pearl Lake

Water quality in Pearl Lake will support a healthy lake ecosystem and excellent recreation.

Goal 5. Minimize nutrient and sediment loading to Pearl Lake by improving land management practices near the lake and in its watershed.

Objective 5.1. The water quality in Pearl Lake will be maintained the same or better than the average summer measurements observed during the 2010-2012 study. Spring nitrogen concentrations will show a decreasing trend over the next 5 years *(Median summer concentrations of total phosphorus less than 15 ug/L, average water clarity greater than 14 feet).*

Actions	Lead person/group	Resources	Timeline
Remind District members that septic systems need to be pumped every three years.	PLPRD	WC Planning and Zoning Dept	Annually
Take a dissolved oxygen profile (record readings every ~2 feet from top to bottom) in February of each year to monitor late winter oxygen availability in the lake. If readings are less than 4 ppm in the upper 5 feet of water, contact the WDNR Fisheries Biologist.	PLPRD Interested citizen	WCLCD (DO meter) CLMN database	Annually Especially late winter
Monitor ice-on and ice-off every year and submit observations to the WDNR database.	PLPRD Interested citizen	CLMN Coordinator	Annually late fall, early spring
Collect lake water samples for inorganic nitrogen analysis 2-4 weeks after ice-off.	PLPRD Interested citizen	WEAL State certified lab	Annually, or every other year in spring
Routinely measure water clarity throughout the growing season, with an increased frequency when algae blooms are observed.	PLPRD Interested citizen	CLMN Coordinator	Annually spring through fall
Implement/continue a summer monitoring program to include total phosphorus and chlorophyll-a analysis at least 3 times between May and September.	PLPRD Interested citizen	CLMN Coordinator	Annually May – Sept.
Submit all lake data to the WDNR SWIMS database for use by others and long term storage.	PLPRD Interested citizen	CLMN Coordinator	At least annually
Private well owners should test drinking water for atrazine and nitrate. Offer group testing to District members. Consider having UWEX groundwater specialist in to give a presentation on sample results.	PLPRD	WEAL or other state certified lab UWEX Groundwater Specialist (at UWSP)	2016

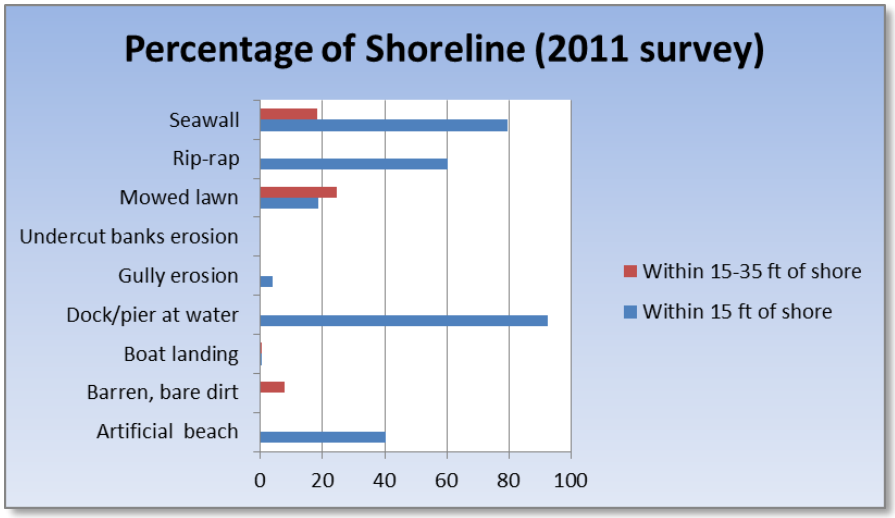
Objective 5.2. Develop strategies to ensure healthy shorelands remain intact and improvements are made to those that have disturbance.

Actions	Lead person/group	Resources	Timeline
See **Shorelands** section.			

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.

To better understand the health of the Waushara County lakes, shorelands were evaluated. The survey inventoried the type and extent of shoreland vegetation. Areas with erosion, rip-rap, barren ground, sea walls, structures and docks were also inventoried. A scoring system was developed for the collected data to provide a more holistic assessment. Areas that are healthy will need strategies to keep them healthy, and areas with potential problem areas and where management and conservation may be warranted may need strategies for improvement. The scoring system is based on the presence/absence and abundance of shoreline features, as well as their proximity to the water's edge. Values were tallied for each shoreline category and then summed to produce an overall score. Higher scores denote a healthier shoreline with good land management practices. These are areas where protection and/or conservation should be targeted. On the other hand, lower scores signify an ecologically unhealthy shoreline. These are areas where management and/or mitigation practices may be desirable for improving water quality and habitat.



The summary of scores for shorelands around Pearl Lake is displayed on the map in the Appendix. A large portion of Pearl Lake's shorelands are in moderate condition, with numerous stretches having challenges that should be addressed, including some stretches that received the poorest ranking.

Shoreland ordinances were enacted to improve water quality and habitat, and to protect our lakes. To protect our lakes, the 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 viewing 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.

Guiding Vision for Pearl Lake's Shorelands

Pearl Lake will have a shoreland that provides aesthetic beauty and benefits water quality and habitat for birds, frogs, and other animals that use or live near shore.

Goal 6. Pearl Lake shorelands will become increasingly healthy over time through the efforts of shoreland property owners.

Objective 6.1. Pearl Lake shoreland property owners will be knowledgeable about and make good decisions about shoreland practices that result in good water quality and habitat. Approximately 2,239 feet of shoreland is mowed to the water's edge (2011 survey).

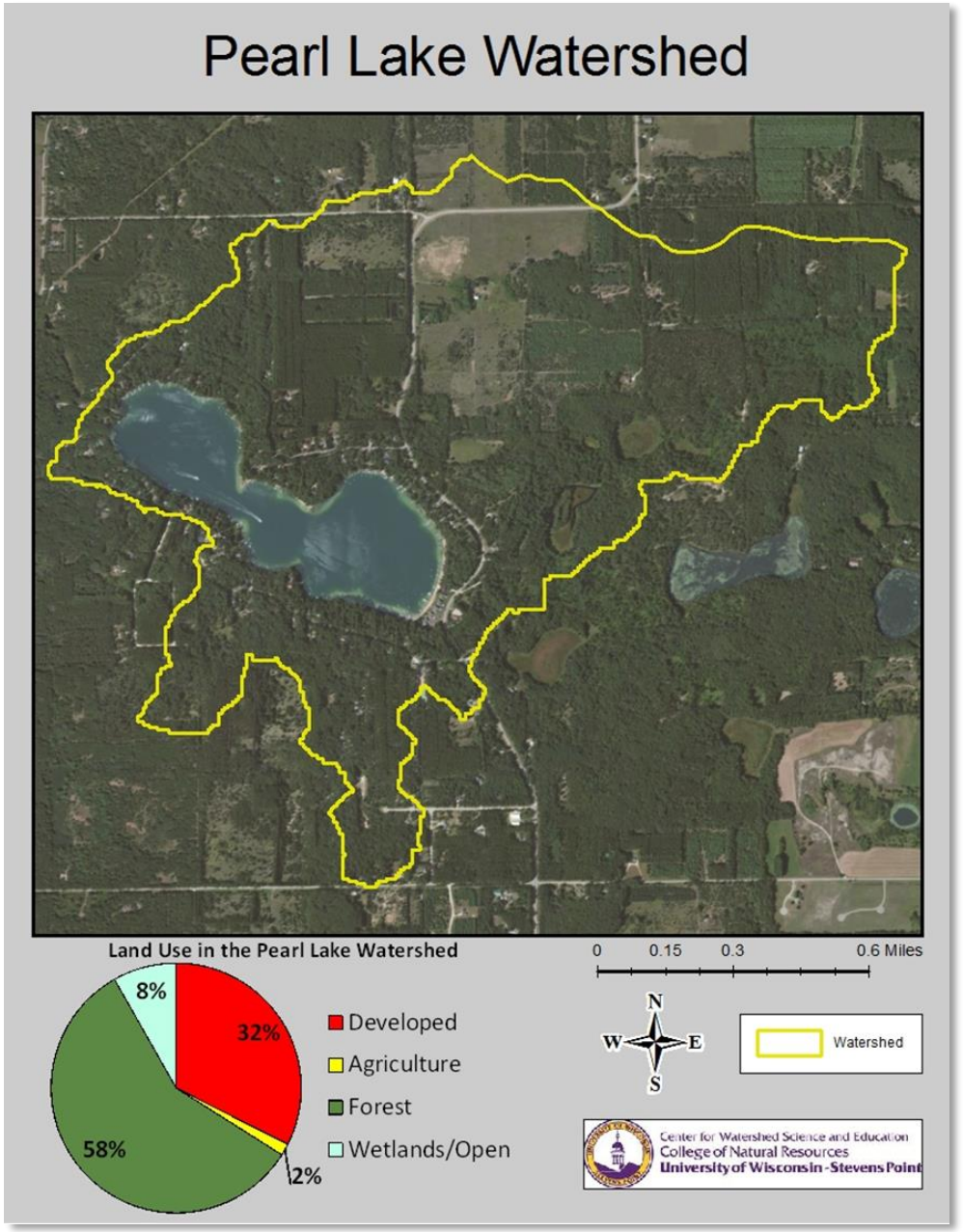
Actions	Lead person/group	Resources	Timeline
Provide informational materials to all shoreland property owners about basic lake stewardship including healthy shorelands, their composition (wildflowers, shrubs, trees, etc.), and available assistance.	PLPRD	WCWLC UWEX Lakes – info materials	Ongoing
Encourage and support shoreland owners interested in shoreland restoration.	PLPRD Shoreland property owners	UWEX Lakes – info materials WCLCD Consultants WDNR Healthy Lakes Grants	Ongoing
Consider restoring and showcasing a "demonstration site" with a sign at the water's edge about shoreland restoration and/or hosting a "shoreland tour".	PLPRD Town of Leon Shoreland property owners	WCLCD Consultants	2016
Host a speaker/demonstration: how to restore your shoreline.	PLPRD	WCLCD UWEX Lakes-Patrick Goggin Consultants	2016
Encourage those interested in shoreland restorations to contact the WCLCD for available resources.	PLPRD	WCLCD WDNR Healthy Lakes Grants Consultants	Ongoing

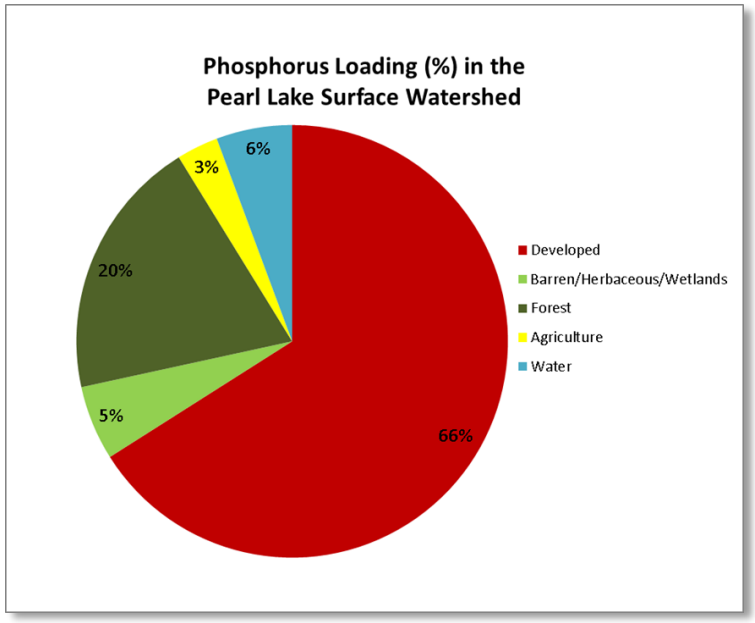
Watershed Land Use

It is important to understand where Pearl Lake's water originates in order to understand the lake's health. During snowmelt or rainstorms, water moves across the surface of the landscape (runoff) towards lower elevations such as lakes, streams, and wetlands. The land area that contributes runoff to a lake is called the surface watershed. Groundwater also feeds Pearl Lake; its land area may be slightly different than the surface watershed.

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 ultimately, the lake's water quality and quantity. Essentially, landscapes with greater capacities to hold water during rain events and snowmelt slow the delivery of the water to the lake. 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.

A variety of land management practices can be put in place to help reduce impacts to our lakes. Some practices are designed to reduce runoff. These include protecting/restoring wetlands, installing rain gardens, swales, rain barrels, and routing drainage from pavement and roofs away from the lake. Some practices are used to help reduce nutrients from moving across the landscape towards the lake. Examples include manure management practices, 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, and using erosion control practices.





The surface watershed for Pearl Lake is approximately 1,3084 acres. The dominant types of land use in the watershed are forest (58%) and developed land (32%). The land closest to the lake often has the greatest impact on water quality and habitat; Pearl Lake's shoreland is surrounded primarily by development with fragmented forests and wetlands. Estimates of phosphorus from the landscape can help to understand the phosphorus sources to Pearl Lake. Land use in the surface watershed was evaluated and used to populate the Wisconsin Lakes Modeling Suite (WILMS) model. In general, each type of land use contributes different amounts of phosphorus in runoff and groundwater. The types of land management practices that are used and their distances from the lake also affect the contributions to the lake from a parcel of land. Based on modeling results, developed land and agriculture had the greatest percentages of phosphorus contributions from the watershed to Pearl Lake. The phosphorus export coefficients used in this model were obtained from studies throughout Wisconsin (Panuska and Lillie, 1995).

Guiding Vision for Pearl Lake's Watershed

Land within the Pearl Lake watershed will be managed in a way that supports clean water and a healthy lake.

Goal 7. Explore and utilize resources for healthy lake management.

Objective 7.1. Support healthy land management activities around Pearl Lake.

Actions	Lead person/group	Resources	Timeline
Encourage the County to support and follow-up with water quality based Best Management Practices (BMPs) within the watershed.	PLPRD	WCLCD NRCS	Ongoing
Continue to use WCLCD as a resource for land management guidance.	PLPRD	WCLCD Waushara County Board	Ongoing
Support landowners interested in the protection of their land via a conservation program (i.e. Conservation Easement or Purchase of Development Rights).	PLPRD	NCCT NRCS WDNR Lake Protection Grants	Ongoing
Explore funding options for land purchase within the watershed for conservation, preservation, or restoration purposes.	PLPRD Interested property owners	Knowles-Nelson Stewardship Fund WDNR Lake Protection Grants Waushara County	Ongoing
Explore expansion of District boundaries, inviting properties not currently in the District that have a potential impact on Pearl Lake, to have an active role in protecting Pearl Lake and its surroundings.	PLPRD	UWEX Lakes WCLCD	Ongoing

People and the Lake

The people that 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 a positive impact on the lake and on those who enjoy this common resource. Collaborative efforts may have a bigger positive impact; therefore, communication and cooperation between the PLPRD, 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.

Postcard mailed in 1952. Courtesy of Mike and Cyndi Getchius

Recreation

Pearl Lake is enjoyed by people who swim, boat, fish, and appreciate its quiet and beauty. The paved oat launch located off the South Pearl Lake Road provides public access to the lake and is managed by the Town of Leon. The lake has no wake hours from 4pm to 11am. According to ordinance, between 11 a.m. and 4 p.m., no person shall operate a motorboat at a speed greater than "slow-no-wake" except in a counterclockwise direction. A swim zone, which is marked by two buoys (placed in front of Lots 22 and 23 of the Pearl Lake Plat). Copies of the ordinances associated with Pearl Lake can be found on the WDNR website http://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=195400&page=ordinances

All survey respondents indicated that they like the no wake hours as they are, but many expressed concern excessive motorized activity, high speed motorized boats coming close to docks and swimmers, and noise. These situations should be monitored and if necessary, action should be taken to reduce conflicts.

Guiding Vision for Recreation

Pearl Lake will be a place for cordial multiuse recreation including activity-filled days and quiet, cozy nights.

Goal 8. Foster an environment of compliance and consideration amongst lake users.

Objective 8.1. Inform lake users with the information they need to make responsible decisions.

Actions	Lead person/group	Resources	Timeline
Educate lake users on No Wake hours and impacts of erosion through improved signage and information available at rental units.	PLPRD Private owners	WCLCD UWEX Lakes	Ongoing
Maintain signage at Pearl Lake boat landing regarding lake rules.	Town of Leon	WC UWEX	Ongoing
Notify landowners of the Waushara County noise ordinance.	PLPRD	Handouts	Ongoing
Ask landlords to inform renters of No Wake hours and noise ordinance.	PLPRD	Handouts	Ongoing

Communication and Organization

Working together on common values will help to achieve the goals that are outlined in this plan. Many of the goals outlined in this plan focus on exchanging information with lake and watershed residents and lake users to learn from one another and make informed decisions that will result in a healthy ecosystem in Pearl Lake enjoyed by many people.

Guiding Vision for Communication

The Pearl Lake community will be connected and knowledgeable about lake stewardship.

Goal 9. Increase participation in lake stewardship.

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

Actions	Lead person/group	Resources	Timeline
Maintain the PLPRD website to provide a common source of communication. http://www.mypearllake.com/PRD.php	PLPRD	UWEX Lakes	Ongoing
Maintain an email list of shoreland property owners and others interested in Pearl Lake.	PLPRD	WC UWEX	Ongoing
Continue to distribute a welcome packet/mailing to all new shoreland property owners with basic lake stewardship information/brochures.	WCWLC	UWEX Lakes	Ongoing
Communicate updates to lake management plan and management activities to residents and users of the lake via email list and/or newsletter.	PLPRD	UWEX Lakes	Ongoing
Host an annual meeting to discuss lake management and opportunities for district members.	PLPRD	UWEX Lakes	Annually
Host gatherings to learn about topics identified in this LMP. Invite speakers or conduct demonstrations.	PLPRD	UWEX Lakes	Ongoing

Objective 9.2. Achieve good communication with clubs, municipalities, agency staff, elected officials, other lake groups and organizations interested in Pearl Lake or lake health.

Actions	Lead person/group	Resources	Timeline
Network with other lake groups in Waushara County by having Pearl Lake should be represented on the WCWLC.	PLPRD	UWEX	Quarterly

Network with other lakes in the state to learn lake management strategies, etc. by having a representative attend the Wisconsin Lake Convention.	PLPRD	UWEX Lakes	Annually in spring
Consider sending an individual interested in Pearl Lake to the Lake Leaders Institute.	PLPRD	UWEX Lakes	Even numbered years 2016, 2018, 2020, …

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.

Guiding Vision for Updates and Revisions

Pearl Lake will have an up-to-date and relevant lake management plan that is reviewed annually and documents all management activities and results.

Goal 10. Review plan annually and update as needed.

Objective 10.1. Communicate updates with community members and members of the District.

Actions	Lead person/group	Resources	Timeline
Review plan at annual meeting and discuss accomplishments and identification of goals/objectives/actions for upcoming year.	PLPRD	Partners listed in this plan.	Annually
Discuss updates with partners and formally update this LMP every 5 years.	PLPRD	WCWLC WC UWEX Partners	2021

Governance

Written by Patrick Nehring, Community Agent, UW-Extension Waushara County.

Lake Management Plan Approval

The draft lake management plan will be completed by the lake association/district board, a committee, or a committee of the whole. The final draft of the lake management plan will be approved through a vote of the lake association/district membership or board. The final draft will be approved by the Wisconsin Department of Natural Resources (DNR) to have met the lake management plan requirements and grant requirements. If the DNR requires modifications or additional information before approving the plan, the plan will be changed to meet DNR requirements that are acceptable to the lake association/district. The completed plan that has been approved by the lake association/district and the DNR will be presented to the municipalities containing the lake and Waushara County. The municipality may reference the lake management plan or parts of the plan in their comprehensive plan to guide municipal or county decisions.

Lake Assistance

The lake management plan will enhance the ability of the lake to apply for financial assistance. The lake management plan will be considered as part of the application for grants through the Wisconsin Department of Natural Resources. Current listings of grants available from the DNR can be found at http://dnr.wi.gov/aid/. Waushara County offers technical and financial assistance through the Land Conservation and Zoning Department and University of Wisconsin-Extension Department. Additional assistance may be available from other agencies and organizations, including DNR, UW-Extension Lakes Program, Golden Sands RC&D, Wisconsin Wetlands Association, and Wisconsin Trout Unlimited.

Lake Regulations

The lake management plan is superseded by federal, state, county, and municipal laws and court rulings. However, the lake management plan may influence county and municipal ordinances and enforcement, which is why the lake management plan will be reviewed and included or referenced in the county and related municipal comprehensive plans. Federal laws contain regulations related to water quality, wetlands, dredging, and filling. State laws contain regulations related to water quality, water and lake use, aquatic plants and animals, shoreline vegetation, safety, and development. County laws contain regulations related to development, safety, use, and aquatic plants and animals. Municipal laws contain regulation of use and safety. The court system interprets these rules and regulations. The rules and regulations are primarily enforced by the US Army Corps of Engineers, the Wisconsin Department of Natural Resources, the Waushara County Sheriff Department, and the Waushara County Land Conservation and Zoning Office. If considering development near or on a lake, addressing problem plants or animals, or changing the lake bottom contact the Waushara County Land Conservation & Zoning Department at the Waushara County Courthouse (920) 787-0443 and/or the Wisconsin Department of Natural Resources (888) 936-7463.

Comprehensive Plans

The lake management plan and changes to the plan will be presented to the County and the Municipality for review and possible incorporation into their comprehensive plans. The comprehensive plan is intended to be used to guide future decision. Zoning, subdivision, and official mapping decisions must be consistent with the comprehensive plan.

Process for Inclusion in the Municipal Comprehensive Plan

The Municipal Plan Commission will review the lake management plan to determine if it is consistent with the municipality's comprehensive plan. If the lake management plan is found by the Municipal Plan Commission to not be consistent with the municipality's comprehensive plan, the plan commission may (a) recommend changes to the comprehensive plan or (b) ask that an aspect of the lake management plan be revisited. When the Municipal Plan Commission has reached a consensus that the lake management plan aligns with the municipality's vision, the Municipal Plan Commission will develop an amendment to the comprehensive plan referencing the lake management plan. This could include a reference to the lake management plan under local policies in the agricultural, natural and cultural resources background information and the addition of a recommendation to support the lake management plan and to implement the applicable recommendations contained in the lake management. The Municipal Plan Commission will recommend by resolution that the amendment to the comprehensive plan be adopted by the Municipal Board. A public hearing on the changes to the comprehensive plan will be held with a thirty-day class one notice. The Municipal Board will consider the recommendations from the Municipal Plan Commission. The Municipal Board may (a) adopt the recommendations to the comprehensive plan by ordinance, (b) adopt by ordinance the recommendations with changes, or (c) request the plan commission revisit the changes to the comprehensive plan.

Process for Inclusion in the County Comprehensive Plan

Waushara County Land Use Committee will review the updates to the municipality's comprehensive plan and the lake management plan as referenced by the municipality's comprehensive plan to determine if they are consistent with the County's comprehensive plan. If they are found by the land use committee to not be consistent with the municipality's comprehensive plan, the land use committee may (a) recommend changes to the County's comprehensive plan or (b) ask that an aspect of the lake management plan or municipality's comprehensive plan be revisited. When the Land Use Committee has reached a consensus that the updates to the municipality's comprehensive plan and the lake management plan aligns with the county's vision, and if it is not already consistent, it will develop an amendment to the County's comprehensive plan. The amendment may be include a reference to the lake management plan under local policies in the agricultural, natural and cultural resources background information and the addition of a recommendation to support the lake management plan and to implement the applicable recommendations contained in the lake management. The Land Use Committee will recommend the amendment to the comprehensive plan to the Land, Water, and Education Committee.

The Land, Water, and Education Committee will review the amendment and if it concurs with the recommendation from the Land Use Committee, it will make a recommendation to the Planning & Zoning Committee. The Planning & Zoning Committee will hold a public hearing with a thirty-day class one

notice. The Planning & Zoning Committee will recommend by resolution the amendment to the comprehensive plan or the amendment with changes be adopted by the County Board.

The County Board will consider the recommendations from the Planning & Zoning Committee. The County Board may (a) adopt the amendment to the comprehensive plan by ordinance, (b) adopt the amendment with changes, or (c) request the Land Use Committee or Planning & Zoning Committee revisit the changes to the comprehensive plan.

Use of the Comprehensive Plan

The lake management plans as referenced in the comprehensive plans will be used by the County and the Municipality to consider certain actions or in the implementation of zoning and other applicable regulations. The County Board of Adjustments and the County Planning and Zoning Committee may reference the lake management plans as referenced in the comprehensive plan when considering zone changes, variances, conditional uses, and suitable mitigation measures. The Municipality and County may take action as called for in the lake management plan as referenced in the comprehensive plan, including changes to zoning and other applicable regulations, shortly after the County's comprehensive plan has been updated or may take action as needed.

The lake organization, lake residents, riparian property owners, or other citizens may request that the Municipality or County take a specific action to implement aspects of the lake management plan as referenced in the comprehensive plan. The lake organization lake residents, riparian property owners, or other citizens may provide written or oral support to encourage the Municipality and County to reference the lake management plan when considering regulation or action that may impact the lake. The lake organization will inform the Municipality and the County when the lake management plan is updated and allow the Municipality and County an opportunity to participate in the update process.

References

Boat Ed, 2013. The Handbook of Wisconsin Boating Laws and Responsibilities. Approved by Wisconsin Department of Natural Resources. www.boat-ed.com

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Cason & Associates, LLC, 2010. *Aquatic Plant Management Plan for Pearl Lake, Waushara County, Wisconsin*.

Haney, Ryan. 2015. Water Quality in Gilbert and Pearl Lakes. Presentation given October 27, 2015 at the Leon Town Hall.

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Hayes, T.K. A. Collins, M, L,, Magdelena Mendoza, N. Noriega, A. A. Stuart, and A. Vonk. 2001. Hermaphroditic, demasculinized frogs after exposure to the herbicide atrazine at low ecologically relevant doses. National Academy of Sciences vol. 99 no. 8, 5476–5480.Panuska and Lillie, 1995. Phosphorus Loadings from Wisconsin Watershed: Recommended Phosphorus Export Coefficients for Agricultural and Forested Watersheds. Bulletin Number 38, Bureau of Research, Wisconsin Department of Natural Resources.

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Turyk, Nancy. 2015. Healthy Watersheds=Healthy Lakes. Presentation given October 27, 2015 at the Leon Town Hall.

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UW-Stevens Point Center for Watershed Science and Education, 2013. Waushara County Lake Study - Pearl Lake 2010-2012 Mini-Report. Report to Waushara County and Wisconsin Department of Natural Resources. Planning Meeting Presentations

Vallentyne, J.R., 1974. The Algal Bowl-Lakes and Man. Ottawa Department of the Environment.

Wetzel, R.G., 2001. Limnology, Lake and River Ecosystems, Third Edition. Academic Press. San Diego, California.

Appendices

Appendix A: Waushara County Lakes Information Directory

Algae - Blue-Green

Contact: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@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:
http://www.dhs.wisconsin.gov/eh/bluegreenalgae/contactus.htm

Aquatic Invasive Species/Clean Boats Clean Water

Contact: Golden Sands RC&D
1100 Main St., Suite 150, Stevens Point, WI 54481
Phone: 715-343-6215
Websites: www.goldensandsrcd.org
http://dnr.wi.gov/invasives/

Aquatic Plant Management (Native and Invasive)

Contact: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov
Website: http://dnr.wi.gov/lakes/plants/

Aquatic Plant Identification

Contact: Golden Sands RC&D
1100 Main St., Suite 150, Stevens Point, WI 54481
Phone: 715-343-6215
Website: www.goldensandsrcd.org

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: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov

Aquatic Plant Surveys/Management

Contact: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov
Website: http://dnr.wi.gov/lakes/plants/

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

Contact: Ed Hernandez
Waushara County Land Conservation Department
PO Box 1109, Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/zoning.htm

Boat Landings, Signage, Permissions (County)

Contact: Scott Schuman
Waushara County Parks
PO Box 300, Wautoma, WI 54982
Phone: 920-787-7037
E-mail: wcparks.parks@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/parks.htm

Boat Landings (State)

Contact: Dave Bartz
Wisconsin Department of Natural Resources
Hwy 22N, Box 430, Montello, WI 53949
Phone: 608-635-4989
E-mail: David.Bartz@wisconsin.gov
Website:
http://dnr.wi.gov/org/land/facilities/boataccess/

Boat Landings (Town)

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

Citizen Lake Monitoring Network
Contact: Brenda Nordin
Wisconsin Department of Natural Resources
Phone: 920-662-5141
E-mail: brenda.nordin@wisconsin.gov

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: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov

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

Contact: North Central Conservancy Trust
PO Box 124, Stevens Point, WI 54481
Phone: 715-344-1910
E-mail: info@ncctwi.org
Website: http://www.ncctwi.org/

Contact: NRCS Stevens Point Service Center
1462 Strongs Ave., Stevens Point, WI 54481
Phone: 715-346-1325

Critical Habitat and Sensitive Areas

Contact: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov
Website: http://dnr.wi.gov/lakes/criticalhabitat/

Dams

Contact: Joe Behlen
Wisconsin Department of Natural Resources
473 Griffith Ave., Wisconsin Rapids, WI 54494
Phone: 715-421-9940
E-mail: joseph.behlen@wisconsin.gov
Website: http://dnr.wi.gov/org/water/wm/dsfm/dams/

Fertilizers/Soil Testing

Contact: Ken Williams
Waushara County UW- Extension
209 S St. Marie St, PO Box 487, Wautoma, WI 54982
Phone: 920-787-0416
E-mail: ken.williams@ces.uwex.edu
http://waushara.uwex.edu/agriculture/services

Fisheries Biologist (management, habitat)

Contact: Dave Bartz
Wisconsin Department of Natural Resources
Hwy 22N, Box 430, Montello, WI 53949
Phone: 608-635-4989
E-mail: David.Bartz@wisconsin.gov
Website: http://dnr.wi.gov/fish/

Frog Monitoring—Citizen Based

Contact: Andrew Badje
Wisconsin Department of Natural Resources
Phone: 608-266-3336
E-mail: Andrew.badje@wisconsin.gov
E-mail: WFTS@wisconsin.gov

Grants

Contact: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov
Website: http://dnr.wi.gov/Aid/Grants.html#tabx8

Contact: Ed Hernandez
Waushara County Land Conservation Department
PO Box 1109, Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/zoning.htm

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: Ed Hernandez
Waushara County Land Conservation Department
Address: PO Box 1109 Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.wi.us

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

Groundwater Levels/Quantity (cont'd)

Contact: Scott Provost
Wisconsin Department of Natural Resources
473 Griffith Ave., Wisconsin Rapids, WI 54494
Phone: 715-421-7881
E-mail: scott.provost@wisconsin.gov

http://prodoasext.dnr.wi.gov/inter1/hicap$.startup

Informational Packets

Contact: UWSP Center for Watershed Science & Education
TNR 224, 800 Reserve St. Stevens Point, WI 54481
Phone: 715-346-2497
E-mail: pclakes@uwsp.edu

Lake Groups – Friends, Associations, Districts

Contact: Patrick Nehring
UWEX Economic Resource Development Agent
PO Box 487, Wautoma, WI 54982
Phone: 920-787-0416
E-mail: Patrick.nehring@ces.uwex.edu

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

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

Contact: Susan Tesarik
Wisconsin Lakes
4513 Vernon Blvd., Suite 101, Madison, WI 53705
Phone: 1-800-542-5253
E-mail: lakeinfo@wisconsinlakes.org
Website: http://wisconsinlakes.org/

Lake Levels

See: Groundwater

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

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

Land Use Plans and Zoning Ordinances

Contact: Terri Dopp-Paukstat
Waushara County Planning and Zoning
PO Box 1109, Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.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: Ed Hernandez
Waushara County Land Conservation Department
PO Box 1109, Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/zoning.htm

Contact: NRCS Stevens Point Service Center
1462 Strongs Ave., Stevens Point, WI 54481
Phone: 715-346-1325

Parks (County)

Contact: Scott Schuman
Waushara County Parks
PO Box 300, Wautoma, WI 54982
Phone: 920-787-7037
E-mail: wcparks.parks@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/parks.htm

Purchase of Development Rights

Contact: North Central Conservancy Trust
PO Box 124, Stevens Point, WI 54481
Phone: 715-341-7741
E-mail: info@ncctwi.org
Website: http://www.ncctwi.org/

Purchase of Land

Contact: Ted Johnson

Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov
Website: http://dnr.wi.gov/topic/stewardship/

Rain Barrels – Order

Contact: Golden Sands RC&D
1100 Main St., Suite 150, Stevens Point, WI 54481
Phone: 715-343-6215
Website: http://www.goldensandsrcd.org/store

Rain Gardens and Stormwater Runoff

Contact: Ed Hernandez
Waushara County Land Conservation Department
PO Box 1109, Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/zoning.htm

Septic Systems/Onsite Waste

Contact: Terri Dopp-Paukstat
Waushara County Planning and Zoning
PO Box 1109, Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/zoning.htm

Shoreland Management

Contact: Ed Hernandez
Waushara County Land Conservation Department
PO Box 1109, Wautoma, WI 54982
Phone: 920-787-0453
E-mail: lcdzoning.courthouse@co.waushara.wi.us
Website: http://www.co.waushara.wi.us/zoning.htm

Shoreland Vegetation

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

Shoreland Zoning Ordinances

See: Land Use Plans and Zoning Ordinances

Soil Fertility Testing

Contact: Ken Williams
Waushara County UW- Extension
209 S St. Marie St., Wautoma, WI 54982
Phone: 920-787-0416
E-mail: Ken.williams@ces.uwex.edu
Website: http://waushara.uwex.edu/index.html

Water Quality Monitoring

Contact: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov

Water Quality Problems

Contact: Ted Johnson
Wisconsin Department of Natural Resources
Phone: 920-424-2104
E-mail: TedM.Johnson@wisconsin.gov

Contact: Nancy Turyk
UWSP Center for Watershed Science and Education
TNR 216, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-4155
E-mail: nturyk@uwsp.edu

Wetlands

Contact: Keith Patrick
Wisconsin Department of Natural Resources
5301 Rib Mountain Drive, Wausau, WI 54401
Phone: 715-241-7502
E-mail: keith.patrick@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

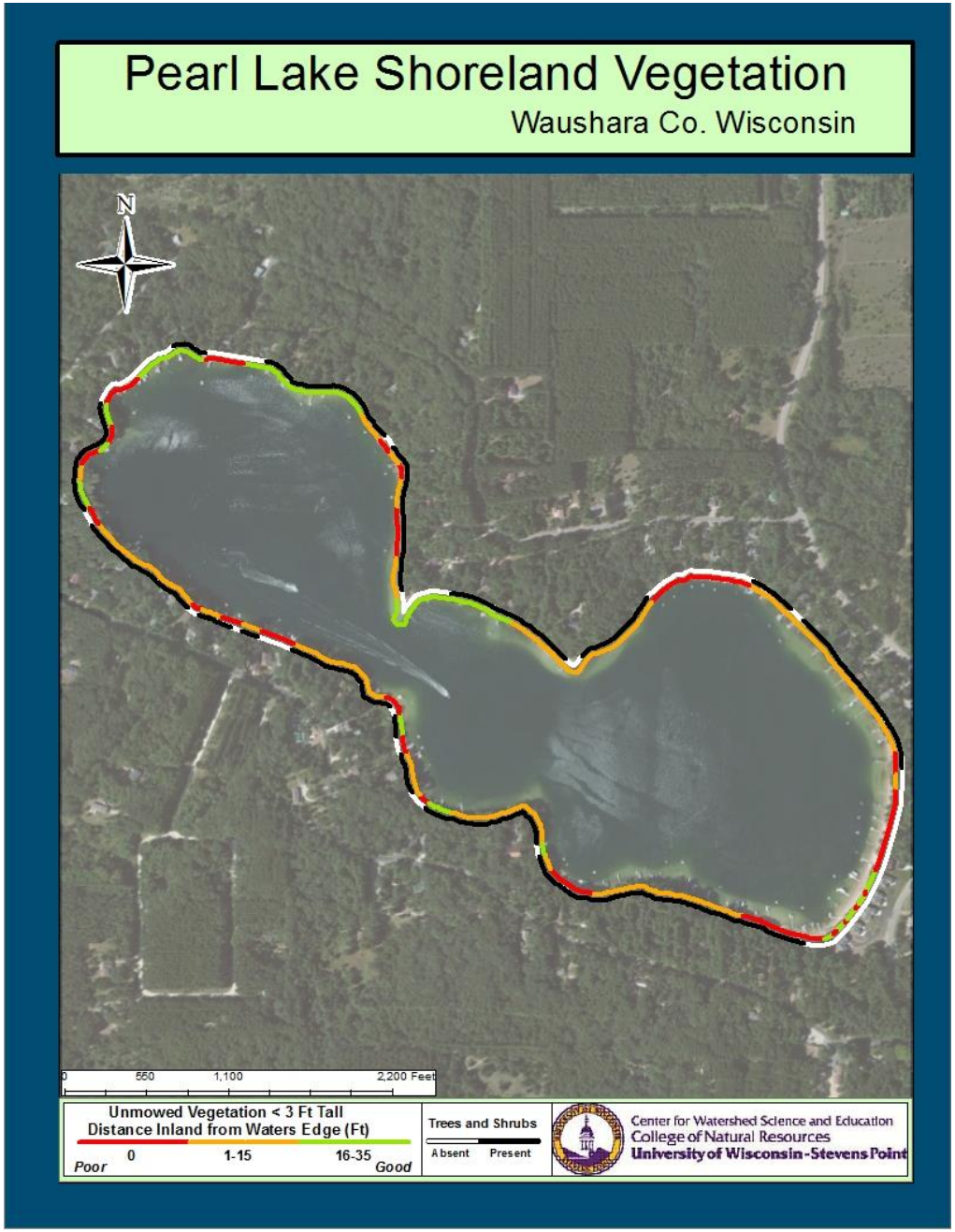
Woody Habitat

Contact: Dave Bartz
Wisconsin Department of Natural Resources
Phone: 608-635-4989
Address: Hwy 22N Box 430, Montello, WI 53949
E-mail: David.Bartz@wisconsin.gov

Appendix B: Shoreland Survey – 2011

A scoring system was developed for the collected data to provide a more holistic assessment. Areas that are healthy will need strategies to keep them healthy, and areas with potential problem areas and where management and conservation may be warranted may need a different set of strategies for improvement. The scoring system is based on the presence/absence and abundance of shoreline features, as well as their proximity to the water's edge. Values were tallied for each shoreline category and then summed to produce an overall score. Higher scores denote a healthier shoreline with good land management practices. These are areas where protection and/or conservation should be targeted. On the other hand, lower scores signify an ecologically unhealthy shoreline. These are areas where management and/or mitigation practices may be desirable for improving water quality.

The summary of scores for shorelands around Pearl Lake are displayed below. The shorelands were color-coded to show their overall health based on natural and physical characteristics. Blue shorelands identify healthy shoreland with sufficient vegetation and few disturbances. Red shorelands indicate locations where changes in management or mitigation may be warranted. Several stretches of Pearl Lake's shorelands are in good to moderately-good shape, but many sections have challenges that should be addressed. Two stretches of shoreland are ranked as poor. For a more complete understanding of the ranking, an interactive map showing results of the shoreland surveys can be found on Waushara County's website at http://gis.co.waushara.wi.us/ShorelineViewer/.



Waushara County Shoreline Assessment

PEARL LAKE

Map Date -- July, 2011
Aerial Date -- April, 2010

Summary

Shorelines are color-coded to show their overall health based on natural and physical characteristics. For example, shorelines shown in red indicate locations where management or mitigation may be warrented. Blue shorelines mark healthy riparian areas with natural vegetation and few human influences.

Calculating Shoreline Scores

Scores are based on the presence/absence of:

+ Natural vegetation
+ Human influences (docks, boathouses, etc)
+ Erosion
+ Structures

Center for Land Use Education

Map created by Dan McFarlane
Center for Land Use Education

Appendix C: Rapid Response Plan

SURVEY/MONITOR

1. Learn how to survey/monitor the lake.	**Contacts:** **Water Resource Management Specialist** Wisconsin Department of Natural Resources Phone: 920-424-2104 E-Mail: TedM.Johnson@wisconsin.gov **Regional Aquatic Invasive Species (AIS) Coordinator** Golden Sands RC&D 1100 Main St., Suite #150 Stevens Point, WI 54481 Phone: 715-343-6278 E-Mail: info@goldensandsrcd.org
2. Survey/monitor the lake monthly/seasonally/annually.	If you find a suspected invasive species, report it as soon as possible using the procedure below.

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. You can use TopoZone.com to find the precise location on a digital topographic map. Click the cursor on the exact collection site and note the coordinates (choose UTM or Latitude/Longitude).	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 (Latitude/Longitude or UTM preferred, or Township/Range/Section) • Plant name (common or scientific) • Land ownership (if known) • Population description (estimated number of plants and area covered) • Habitat type(s) 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** 427 E. Tower Drive, Suite 100 Wautoma, WI 54982 Phone: (920) 787-4686 **Regional AIS Coordinator** Golden Sands RC&D 1100 Main St., Suite #150 Stevens Point, WI 54481 Phone: 715-343-6214 E-Mail : info@goldensandsrcd.org **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
5. Once the specimen is dropped off or sent for positive identification, be sure to contact:	**Regional AIS Coordinator** Golden Sands RC&D 1100 Main St., Suite #150 Stevens Point, WI 54481 Phone: 715-343-6214 E-Mail : info@goldensandsrcd.org

If an invasive species is confirmed, the Regional AIS Coordinator will make the following public information contacts:

- **Wisconsin Department of Natural Resources**
  427 E. Tower Drive, Suite 100
  Wautoma, WI 54982
  Phone: (920) 787-4686

  The town board(s) in which the water body is located

  Town of: Leon

- **The Lake Association** in which the waterbody is located.
  Contact: Roger Volden
  Phone: 920-427-2029

- **University of Wisconsin-Stevens Point**
  Water Resource Scientist
  Nancy Turyk
  Trainer Natural Resources Building
  800 Reserve Street
  Stevens Point, WI 54481Telephone: 715-346-4155
  E-mail: nturyk@uwsp.edu

- **Local Residents**

- **Pearl Lake Protection and Rehabilitation District**

If an invasive species is confirmed the secretary of the Pearl Lake Protection and Rehabilitation District will make the following public information contacts:

- **Newspapers**: The Argus, The Resorter

Contact the WDNR to post notice(s) at the access point(s) to the water body.

Appendix D: Aquatic Plant Management Strategies

General recommendations:

- Reduce nutrients traveling to the lake from the landscape.
- Avoid increasing algal blooms by maintaining a healthy amount of aquatic plants.
- Don't denude the lakebed.
    - Increases potential for aquatic invasive species establishment.
    - Sediments can add phosphorus to the water which may lead to increased algal growth.
- Choose options that are appropriate for your lake's situation.
- Monitor and adjust your strategies if you are not making headway!

List of Aquatic Plant Management Options (selection of options varies with situation):

No Action

ADVANTAGES	LIMITATIONS
∗ No associated cost. ∗ Least disruptive to lake ecosystem.	∗ May not be effective in achieving aquatic plant management objectives.

Hand Pulling

ADVANTAGES	
∗ Can be used for thinning aquatic plants around docks. ∗ Can target specific plants - with proper training. ∗ Can be effective in controlling small infestations of aquatic invasive species. ∗ If aquatic invasive species are not pulled properly, could worsen the problem.	∗ No associated cost. LIMITATIONS ∗ Removes near-shore wildlife and fish habitat. ∗ Opens up areas where invasives to become established.

Hand Pulling Using Suction

ADVANTAGES	
∗ Can be used for thinning plants around docks. ∗ Can be used in deeper areas (with divers). ∗ Can target specific plants with proper training.	∗ Can be effective in controlling small infestations of aquatic invasive species. ∗ May be useful in helping to remove upper root mass of aquatic invasive species. LIMITATIONS

∗ Costs associated with hiring a diver may be comparable to chemical treatment expenses. ∗ Currently an experimental treatment – not readily available.	∗ If aquatic invasive species are not pulled properly, could worsen the problem.

Mechanical Harvesting

ADVANTAGES	LIMITATIONS
∗ Removes plant material and nutrients. ∗ Can target specific locations. ∗ Used to manage larger areas for recreational access or fishery management.	∗ Not used in water depths less than 3 feet. ∗ Some harm to aquatic organisms. ∗ Is a temporary control. ∗ Risk of introduction of new aquatic invasive species (on a hired harvester) or spread of some existing invasive species. ∗ Hired cost at least $150/hr.

Water Level Manipulation

ADVANTAGES	LIMITATIONS
∗ Controls aquatic plants in shallower, near-shore areas. ∗ Can be low cost.	∗ Requires a controlling structure on the lake. ∗ May cause undesired stress on ecosystem. ∗ Cannot be used frequently.

Milfoil Weevils

ADVANTAGES	LIMITATIONS
∗ Natural, native maintenance of native and exotic milfoils. ∗ Prefers the aquatic invasive Eurasian Watermilfoil. ∗ Some lakes may already have a native populations; need a professional stem count and assessment of shoreland health, structure of fishery, etc. ∗ Doesn't harm lake ecosystem.	∗ Require healthy shoreline habitat for overwintering. ∗ Cannot survive in areas of mechanical harvesting or herbicide application. ∗ Effectiveness highly variable between lakes (only works well for some lakes). ∗ Limited access to weevils for purchase in WI. ∗ Still considered experimental.

Chemical Treatment: Spot

ADVANTAGES	LIMITATIONS
∗ May be less destructive to lake ecosystem than lake-wide treatment.	∗ Only considered in lakes with aquatic invasive plants. ∗ Usually not fully effective in eradicating target species. ∗ Contaminants may remain in sediment. ∗ Effects on lake ecosystem not fully understood. ∗ Does not remove dead vegetation, which depletes oxygen and releases nutrients, adds to build-up of muck. ∗ Extra nutrients may spur additional aquatic plant and algae growth.

Chemical Treatment: Lake-wide

ADVANTAGES	LIMITATIONS
∗ May reduce aquatic invasives for a time. ∗ Treatment not needed as frequently.	∗ Only considered in lakes with aquatic invasive plants. ∗ Usually not fully effective in eradicating target species. ∗ Contaminants may remain in sediment. ∗ Does not remove dead vegetation, which depletes oxygen and releases nutrients, adds to build-up of muck. ∗ Extra nutrients may spur additional aquatic plant and algae growth. ∗ Negatively affects native vegetation. ∗ Effects on lake ecosystem not fully understood. ∗ Opens up space once taken up by natives for invasive species to colonize once again. ∗ ~$4000 per 5 acres.

Appendix E: Lake User Survey Results

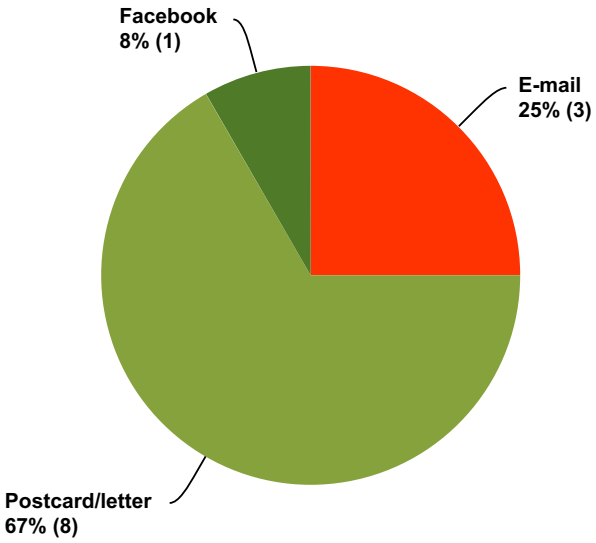
Q1 What is your Waushara County Lakes Survey ID?

Answered: 13 Skipped: 0

#	Responses	Date
1	[redacted]	10/2/2015 11:21 AM
2	[redacted]	10/1/2015 4:55 PM
3	[redacted]	9/30/2015 8:56 PM
4	[redacted]	9/29/2015 1:42 PM
5	[redacted]	9/29/2015 10:29 AM
6	[redacted]	9/28/2015 3:14 PM
7	[redacted]	9/27/2015 7:48 PM
8	[redacted]	9/27/2015 11:51 AM
9	[redacted]	9/27/2015 8:48 AM
10	[redacted]	9/24/2015 11:04 AM
11	[redacted]	9/23/2015 12:01 PM
12	[redacted]	9/22/2015 8:42 PM
13	[redacted]	9/21/2015 7:08 PM

Q2 How did you hear about this survey?

Answered: 12 Skipped: 1

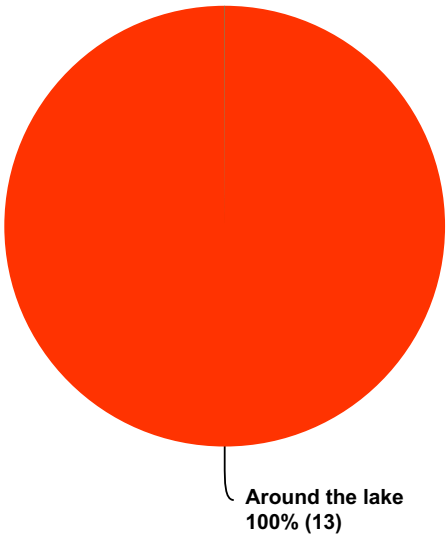


Answer Choices	Responses	
E-mail	25%	3
Newspaper	0%	0
Postcard/letter	67%	8
Facebook	8%	1
Radio	0%	0
Total		12

#	Other (please specify)	Date
1	neighbor gave us the flyer	9/24/2015 11:04 AM

Q3 Do you own or rent property...

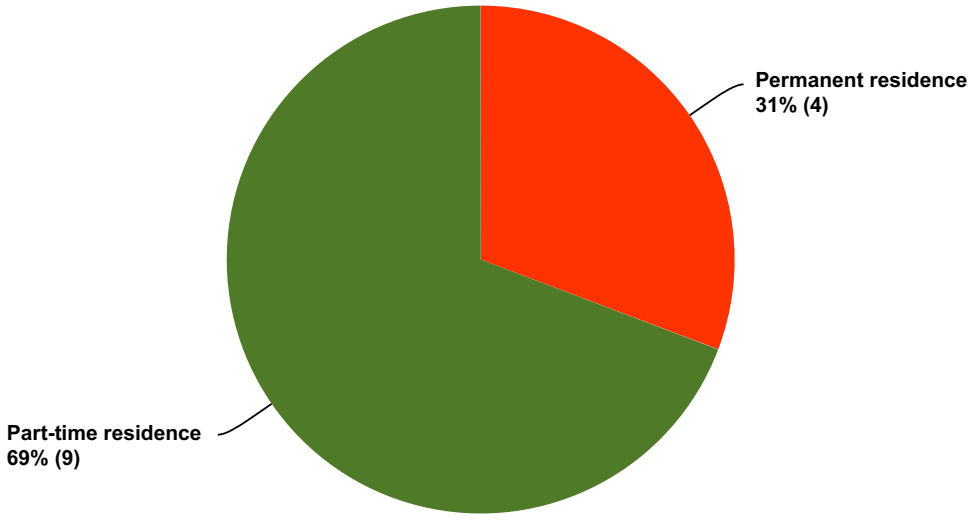
Answered: 13 Skipped: 0



Answer Choices	Responses	
Around the lake	**100%**	13
Less than 1/2 mile from the lake	**0%**	0
1/2 mile to 1 mile of the lake	**0%**	0
More than 1 mile from the lake	**0%**	0
I do not own or rent property near the lake	**0%**	0
Total		**13**

Q4 If you own or rent property near the lake, is this property your permanent residence, a part-time residence (such as a vacation home, rental, etc.), or other?

Answered: 13 Skipped: 0

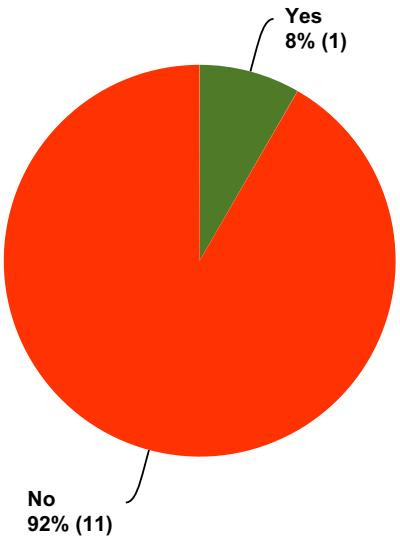


Answer Choices	Responses	
Permanent residence	31%	4
Part-time residence	69%	9
I do not own or rent property near the lake	0%	0
Total		13

#	Other (please specify)	Date
	There are no responses.	

Q5 I own property on or near the lake because I inherited it.

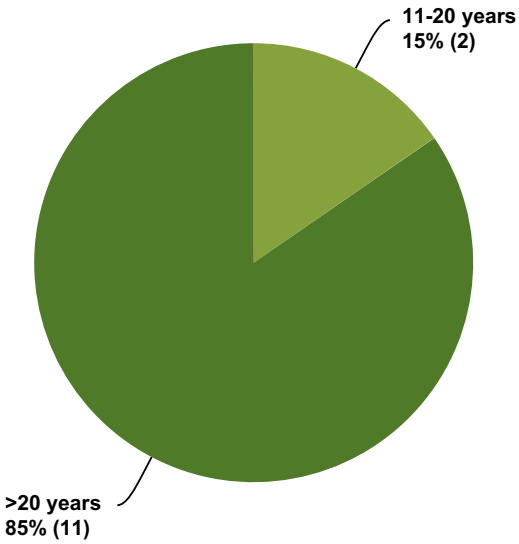
Answered: 12 Skipped: 1



Answer Choices	Responses	
Yes	8%	1
No	92%	11
Total		12

Q6 How long have you lived on, visited or recreated on the lake?

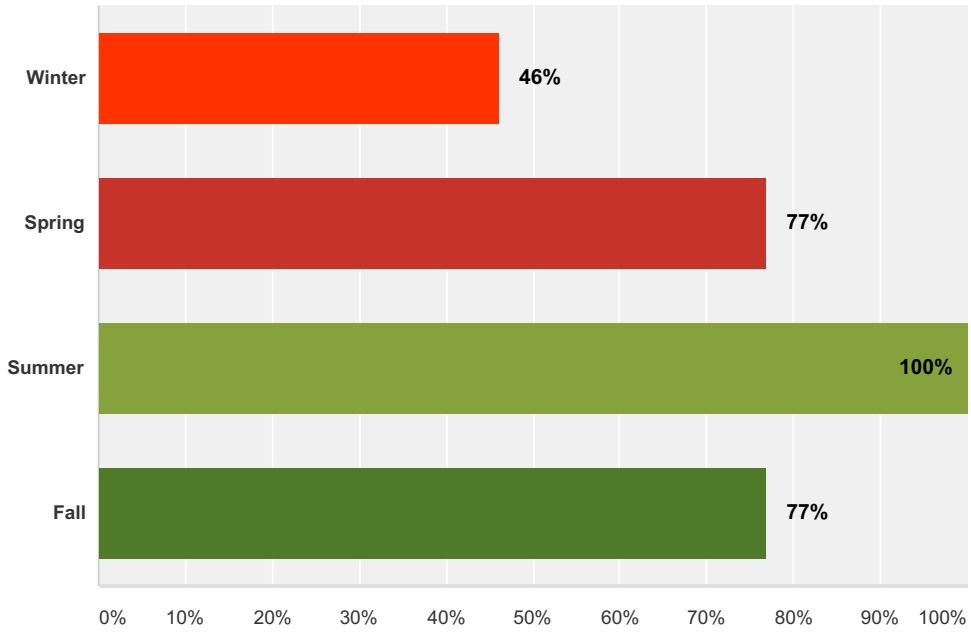
Answered: 13 Skipped: 0



Answer Choices	Responses	
<2 years	0%	0
2-5 years	0%	0
6-10 years	0%	0
11-20 years	15%	2
>20 years	85%	11
Total		13

Q7 What time of year do you generally use the lake? Select all that apply.

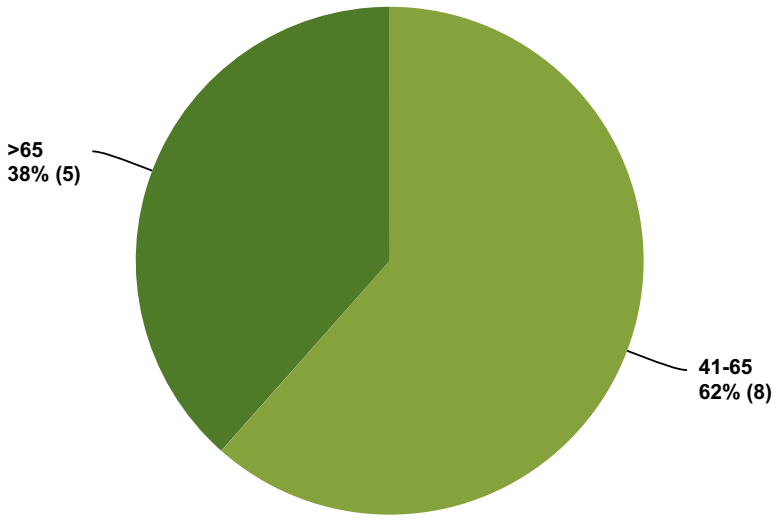
Answered: 13 Skipped: 0



Answer Choices	Responses	
Winter	46%	6
Spring	77%	10
Summer	100%	13
Fall	77%	10
Total Respondents: 13		

Q8 Which category below includes your age?

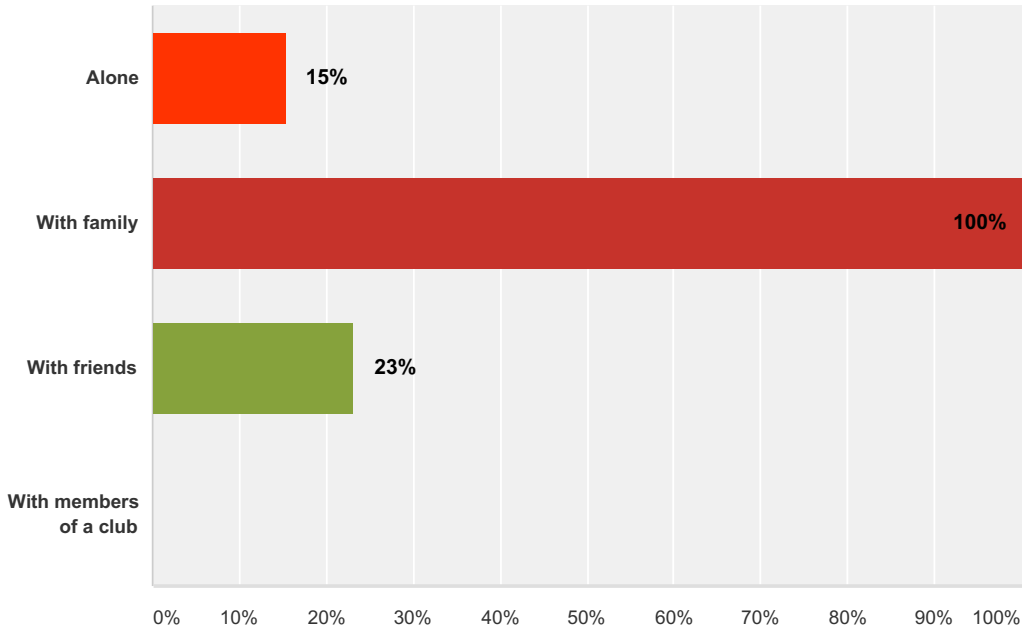
Answered: 13 Skipped: 0



Answer Choices	Responses	
Under 18	0%	0
18-40	0%	0
41-65	62%	8
>65	38%	5
Total		13

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

Answered: 13 Skipped: 0

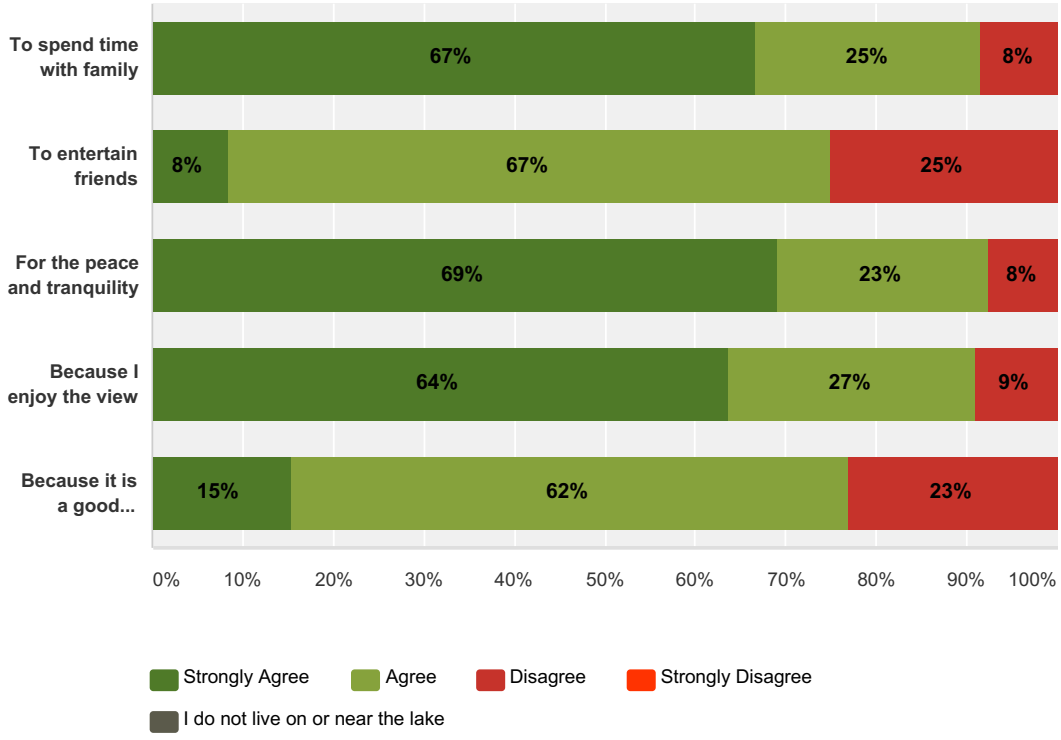


Answer Choices	Responses	
Alone	15%	2
With family	100%	13
With friends	23%	3
With members of a club	0%	0
Total Respondents: 13		

#	Other (please specify)	Date
	There are no responses.	

Q10 I live on or near the lake...

Answered: 13 Skipped: 0



	Strongly Agree	Agree	Disagree	Strongly Disagree	I do not live on or near the lake	Total
To spend time with family	**67%** 8	**25%** 3	**8%** 1	**0%** 0	**0%** 0	12
To entertain friends	**8%** 1	**67%** 8	**25%** 3	**0%** 0	**0%** 0	12
For the peace and tranquility	**69%** 9	**23%** 3	**8%** 1	**0%** 0	**0%** 0	13
Because I enjoy the view	**64%** 7	**27%** 3	**9%** 1	**0%** 0	**0%** 0	11
Because it is a good investment	**15%** 2	**62%** 8	**23%** 3	**0%** 0	**0%** 0	13

Q11 What do you value most about Pearl Lake?

Answered: 13 Skipped: 0

#	Responses	Date
1	clean lake	10/2/2015 11:29 AM
2	Clean water, limited "wake" times, location within Wisconsin	10/1/2015 5:03 PM
3	Clear, clean water	9/30/2015 9:00 PM
4	clarity and health	9/29/2015 1:45 PM
5	clean,clear water, calm surrounding, long time family attachment, space for extended family	9/29/2015 10:34 AM
6	a place to get away	9/28/2015 3:17 PM
7	clean water	9/27/2015 7:50 PM
8	Peace	9/27/2015 11:52 AM
9	Peace and quiet	9/27/2015 8:51 AM
10	the peace and stillness, seeing wild animals	9/24/2015 11:08 AM
11	The clean water	9/23/2015 12:03 PM
12	The simple life of peace and quiet away from hassle of city living. The family has 75+ years of lake ownership. Privacy.	9/22/2015 8:59 PM
13	Clarity of water No wake curfew Swimming and fishing	9/21/2015 7:14 PM

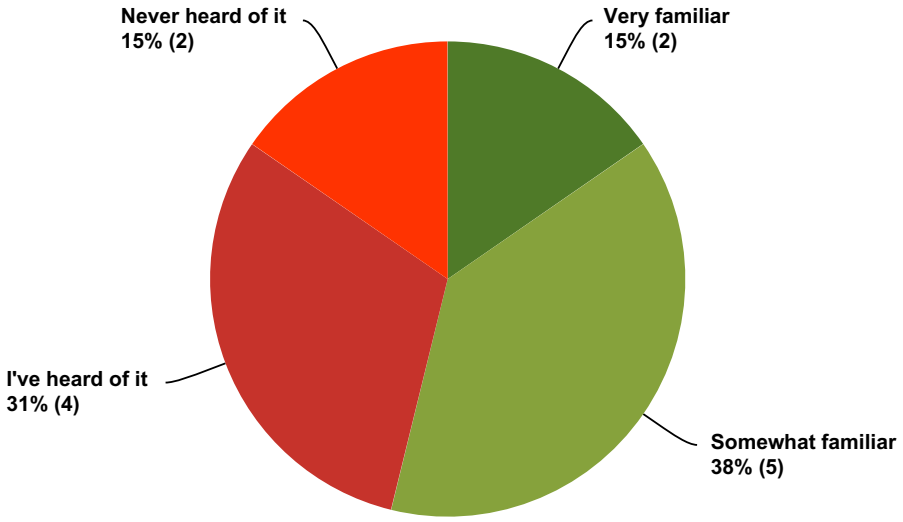
Q12 In your opinion, what should be done to restore, maintain, or improve Pearl Lake?

Answered: 13 Skipped: 0

#	Responses	Date
1	regulate the size of boats on the lake-the shoreline is being destroyed by the waves from boats that belong on larger lakes	10/2/2015 11:29 AM
2	Continue invasive species program, keep "wake/no wake" times, improve boat landing, continue consistent fish stocking to have adequate fishing for years to come.	10/1/2015 5:03 PM
3	Continue to manage Invasive species	9/30/2015 9:00 PM
4	continue and increase EIS protections	9/29/2015 1:45 PM
5	Monitor water quality, enforce Leon town rules discourage fireworks except July 4.	9/29/2015 10:34 AM
6	maintain or increase restrictions on power boats	9/28/2015 3:17 PM
7	sewer inspections	9/27/2015 7:50 PM
8	Leave it alone	9/27/2015 11:52 AM
9	Make sure everyone visiting the lake knows boating regulations, continue to keep our lake clean and free of invasive species	9/27/2015 8:51 AM
10	restore shoreline native plantlife	9/24/2015 11:08 AM
11	keep invasive species out	9/23/2015 12:03 PM
12	Reduce high speed boat traffic and promote native species on land. Require outsiders, including renters, to respect our lake rules and ownership.	9/22/2015 8:59 PM
13	I have concern about the low water level and would like to better understand how it is influenced by other activity within the watershed.	9/21/2015 7:14 PM

Q13 How familiar are you with Wisconsin's Public Trust Doctrine?

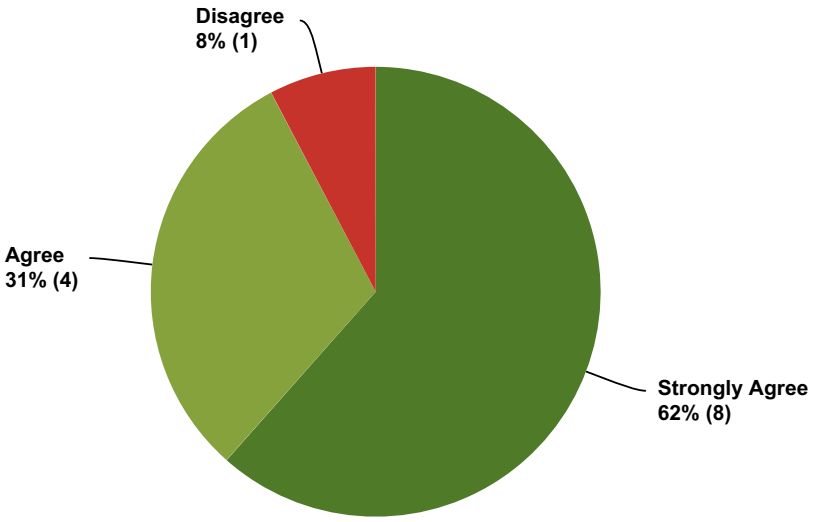
Answered: 13 Skipped: 0



Answer Choices	Responses	
Very familiar	15%	2
Somewhat familiar	38%	5
I've heard of it	31%	4
Never heard of it	15%	2
Total		13

Q14 How I recreate in and around the lake can affect other lake users.

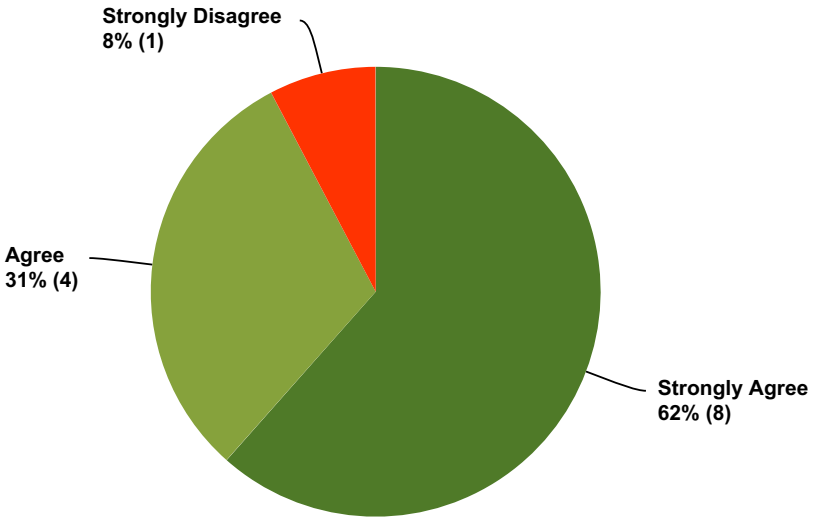
Answered: 13 Skipped: 0



Answer Choices	Responses	
Strongly Agree	62%	8
Agree	31%	4
Disagree	8%	1
Strongly Disagree	0%	0
Total		13

Q15 How I manage my land can affect other lake users.

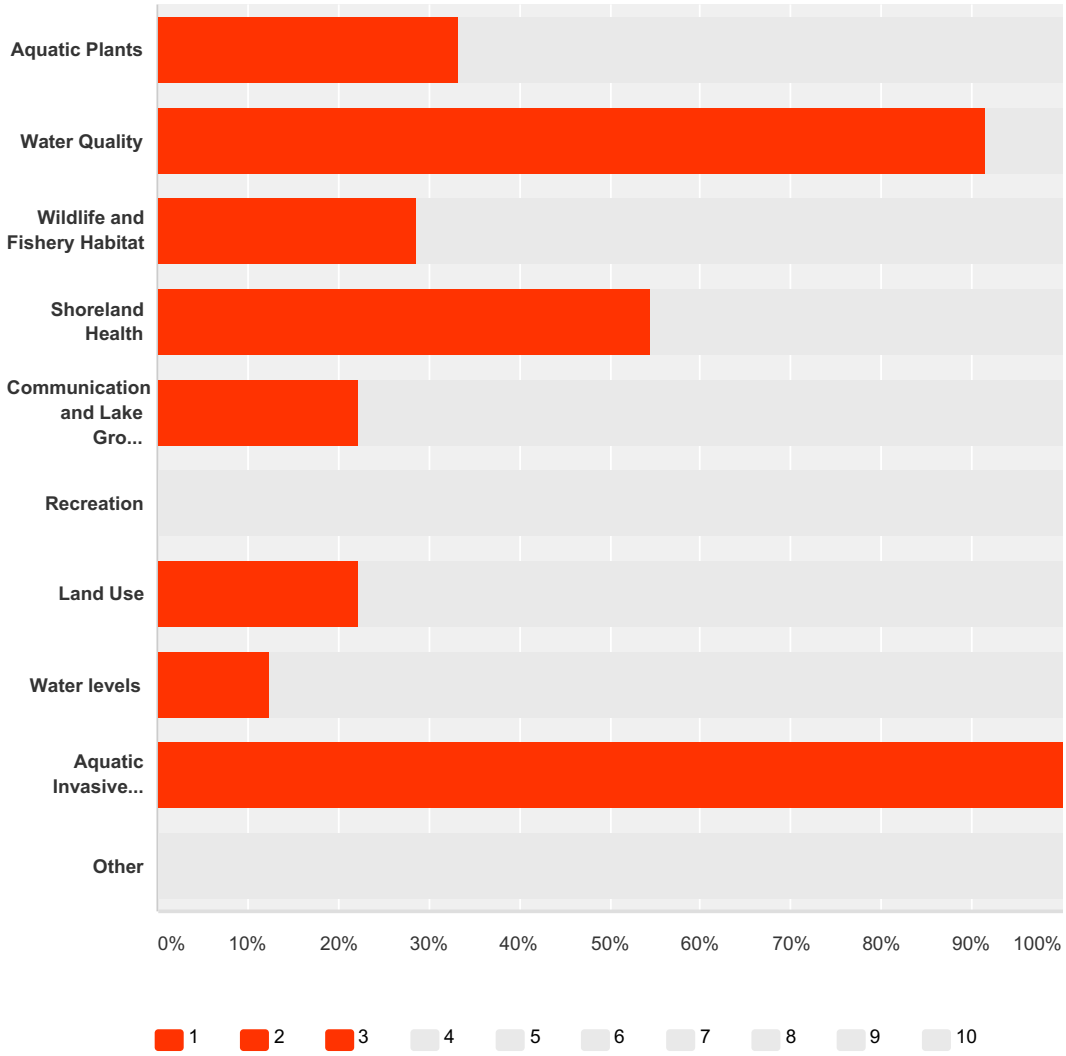
Answered: 13 Skipped: 0



Answer Choices	Responses	
Strongly Agree	62%	8
Agree	31%	4
Disagree	0%	0
Strongly Disagree	8%	1
Total		13

Q16 Which of the following meeting topics, in your opinion, are the most important to talk about regarding Pearl Lake? (Please rank at least your top three.)

Answered: 13 Skipped: 0

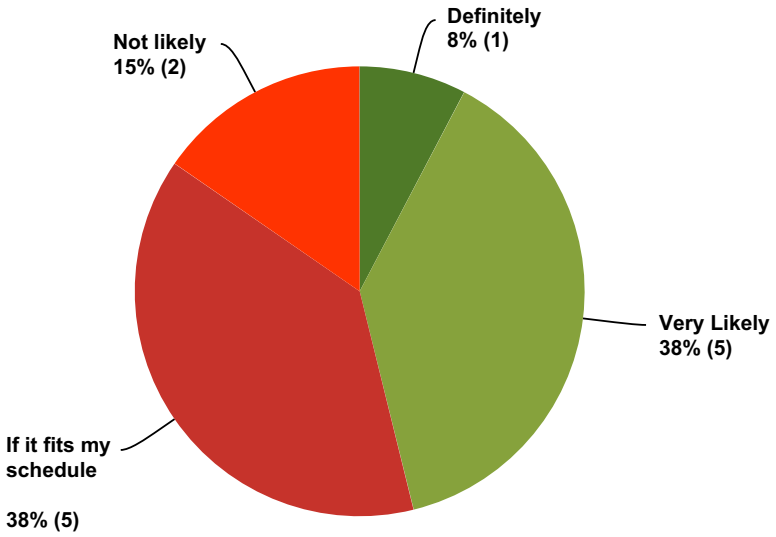


	1	2	3	4	5	6	7	8	9	10	Total	Score
Aquatic Plants	0% 0	17% 1	17% 1	17% 1	33% 2	0% 0	17% 1	0% 0	0% 0	0% 0	6	6.67
Water Quality	50% 6	17% 2	25% 3	8% 1	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	12	9.08
Wildlife and Fishery Habitat	14% 1	0% 0	14% 1	29% 2	14% 1	0% 0	14% 1	14% 1	0% 0	0% 0	7	6.43
Shoreland Health	9% 1	27% 3	18% 2	18% 2	9% 1	9% 1	0% 0	9% 1	0% 0	0% 0	11	7.36
Communication and Lake Group Support	11% 1	0% 0	11% 1	22% 2	11% 1	22% 2	0% 0	11% 1	11% 1	0% 0	9	5.89

Recreation	**0%** 0	**0%** 0	**0%** 0	**13%** 1	**25%** 2	**25%** 2	**25%** 2	**13%** 1	**0%** 0	**0%** 0	8	5.00
Land Use	**0%** 0	**0%** 0	**22%** 2	**0%** 0	**0%** 0	**11%** 1	**33%** 3	**22%** 2	**11%** 1	**0%** 0	9	4.56
Water levels	**13%** 1	**0%** 0	**0%** 0	**13%** 1	**0%** 0	**13%** 1	**0%** 0	**13%** 1	**38%** 3	**13%** 1	8	4.00
Aquatic Invasive Species	**25%** 3	**50%** 6	**25%** 3	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	12	9.00
Other	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**17%** 1	**83%** 5	6	1.17

Q17 Many of the decisions determining the final lake management plan will be made at the planning sessions. Sessions will typically take place monthly on weeknights or Friday afternoons. How likely is it that you will attend one or more of the planning sessions?

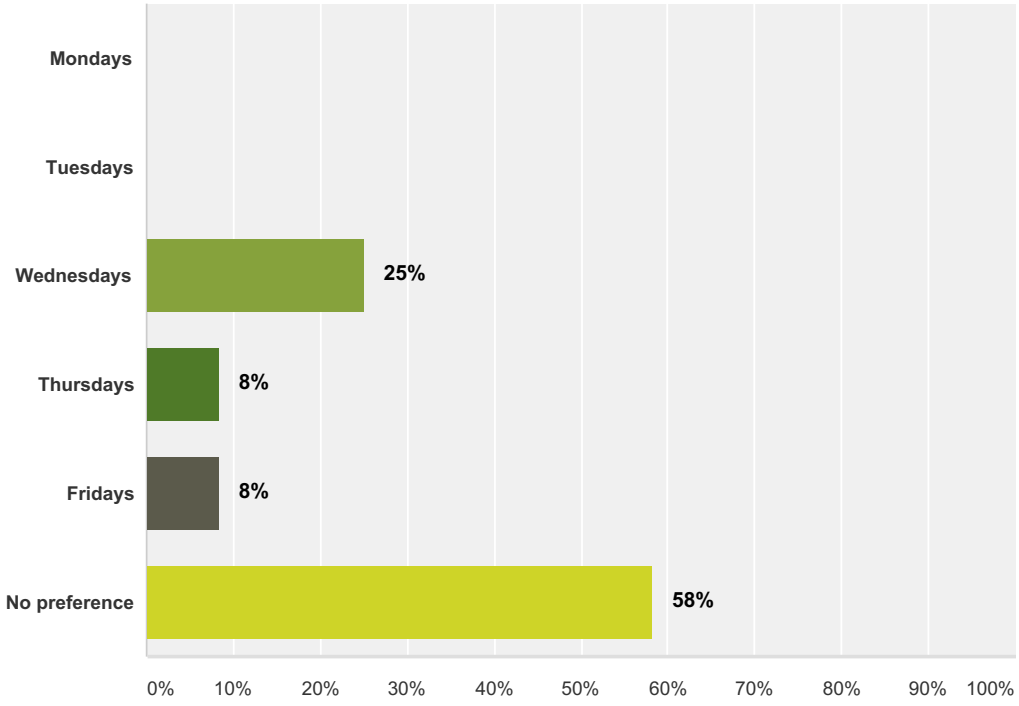
Answered: 13 Skipped: 0



Answer Choices	Responses	
Definitely	8%	1
Very Likely	38%	5
If it fits my schedule	38%	5
Not likely	15%	2
I won't attend any	0%	0
Total		13

Q18 If you will attend the planning sessions, which days do you prefer?

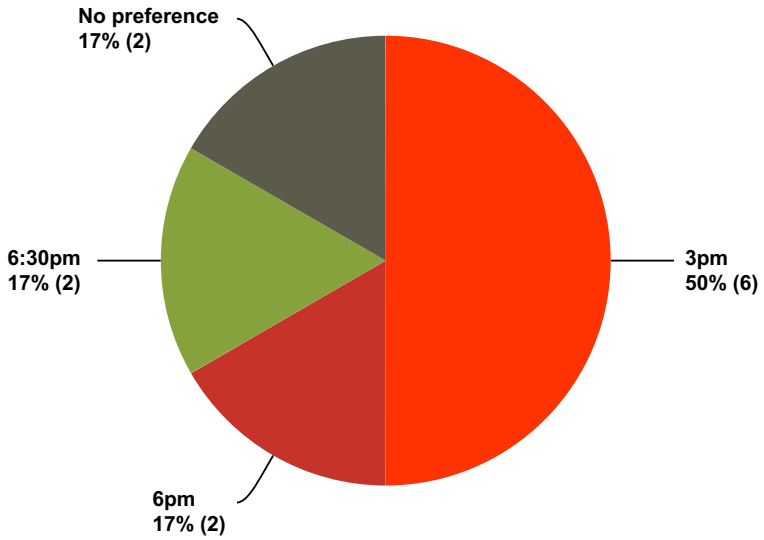
Answered: 12 Skipped: 1



Answer Choices	Responses	
Mondays	0%	0
Tuesdays	0%	0
Wednesdays	25%	3
Thursdays	8%	1
Fridays	8%	1
No preference	58%	7
Total Respondents: 12		

Q19 Most sessions will last around 2 hours. If you will attend the planning sessions, which times do you prefer to start?

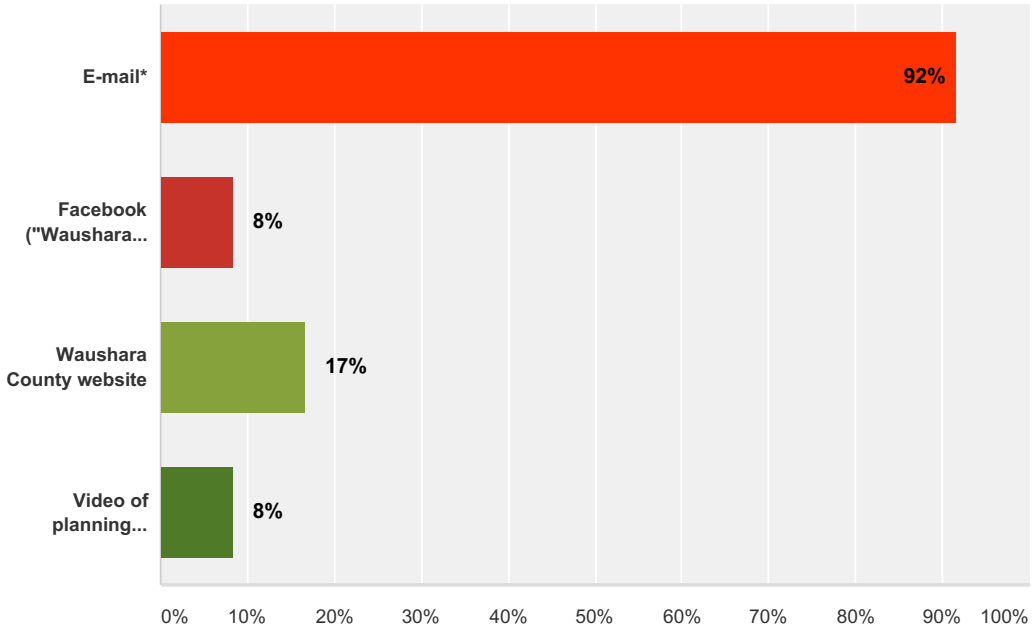
Answered: 12 Skipped: 1



Answer Choices	Responses	
3pm	50%	6
6pm	17%	2
6:30pm	17%	2
7pm	0%	0
No preference	17%	2
Total		12

Q20 How would you like to receive information about meetings (agendas, minutes), the planning process, and updates? (Select all that apply)

Answered: 12 Skipped: 1



Answer Choices	Responses	
E-mail*	92%	11
Facebook ("Waushara County Lakes Project")	8%	1
Waushara County website	17%	2
Video of planning meeting posted on the web	8%	1
Total Respondents: 12		

#	Other (please specify)	Date
	There are no responses.	

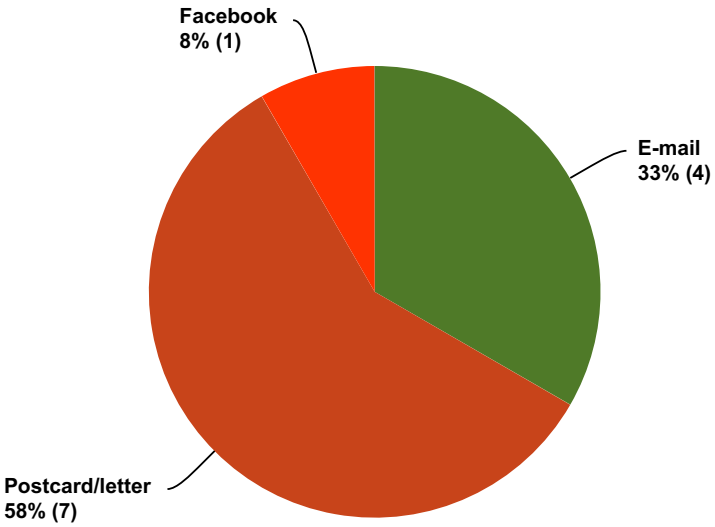
Q1 Enter your Waushara County Lakes Survey ID. If you've forgotten your ID or haven't created one yet, follow the instructions below.

Answered: 13 Skipped: 0

#	Responses	Date
1	[redacted]	10/1/2015 5:36 PM
2	[redacted]	9/30/2015 9:10 PM
3	[redacted]	9/29/2015 10:55 AM
4	[redacted]	9/28/2015 3:23 PM
5	[redacted]	9/27/2015 7:55 PM
6	[redacted]	9/27/2015 11:58 AM
7	[redacted]	9/27/2015 8:53 AM
8	[redacted]	9/24/2015 11:20 AM
9	[redacted]	9/23/2015 6:18 PM
10	[redacted]	9/23/2015 12:07 PM
11	[redacted]	9/22/2015 9:07 PM
12	[redacted]	9/22/2015 9:48 AM
13	[redacted]	9/21/2015 7:20 PM

Q2 How did you hear about this survey?

Answered: 12 Skipped: 1

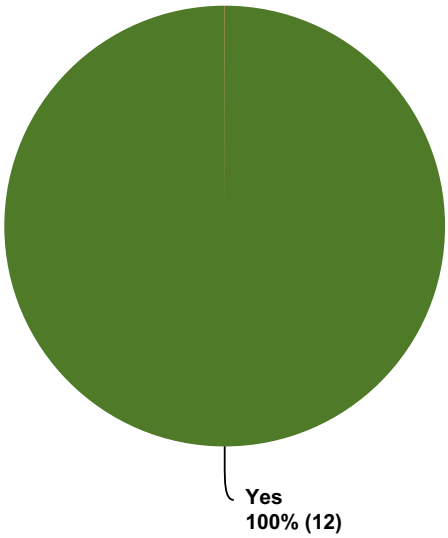


Answer Choices	Responses	
E-mail	33%	4
Newspaper	0%	0
Postcard/letter	58%	7
Facebook	8%	1
Radio	0%	0
Total		12

#	Other (please specify)	Date
1	neighbor gave us the flyer	9/24/2015 11:20 AM

Q3 Were you aware of the importance of aquatic plants?

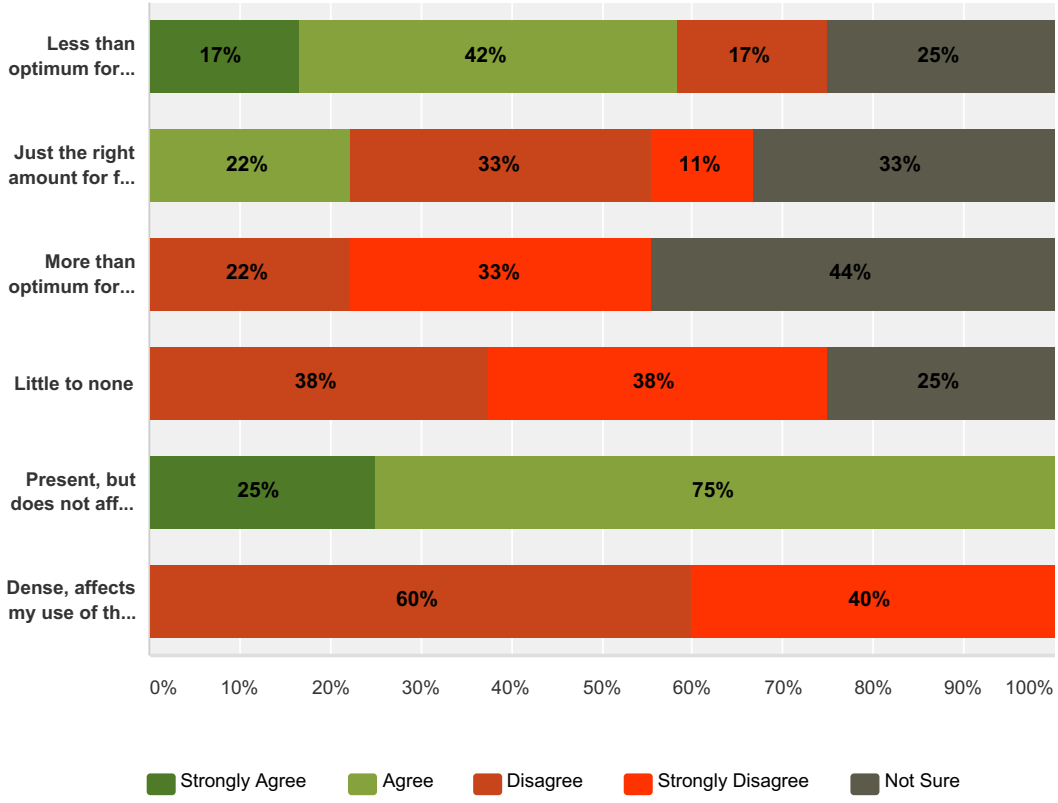
Answered: 12 Skipped: 1



Answer Choices	Responses	
Yes	**100%**	12
No	**0%**	0
Unsure	**0%**	0
Total		**12**

Q4 In your opinion, which statement best describes the amount of aquatic plant growth in Pearl Lake?

Answered: 12 Skipped: 1



	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure	Total
Less than optimum for fish and wildlife	**17%** 2	**42%** 5	**17%** 2	**0%** 0	**25%** 3	12
Just the right amount for fish and wildlife	**0%** 0	**22%** 2	**33%** 3	**11%** 1	**33%** 3	9
More than optimum for fish and wildlife	**0%** 0	**0%** 0	**22%** 2	**33%** 3	**44%** 4	9
Little to none	**0%** 0	**0%** 0	**38%** 3	**38%** 3	**25%** 2	8
Present, but does not affect my use of the lake	**25%** 2	**75%** 6	**0%** 0	**0%** 0	**0%** 0	8
Dense, affects my use of the lake	**0%** 0	**0%** 0	**60%** 6	**40%** 4	**0%** 0	10

Q5 If you selected dense or choked, what month(s) do the problems occur? Check all that apply.

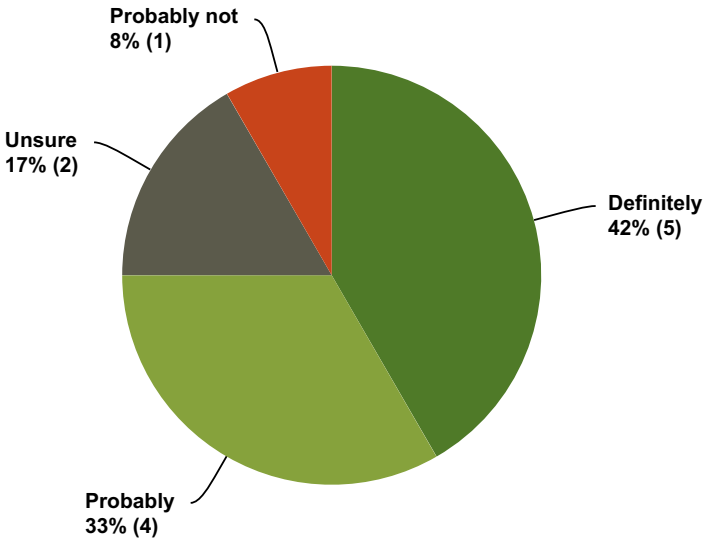
Answered: 0 Skipped: 13

! No matching responses.

Answer Choices	Responses	
May	**0%**	0
June	**0%**	0
July	**0%**	0
August	**0%**	0
September	**0%**	0
Total Respondents: 0		

Q6 Do you believe aquatic plant control is needed on Pearl Lake?

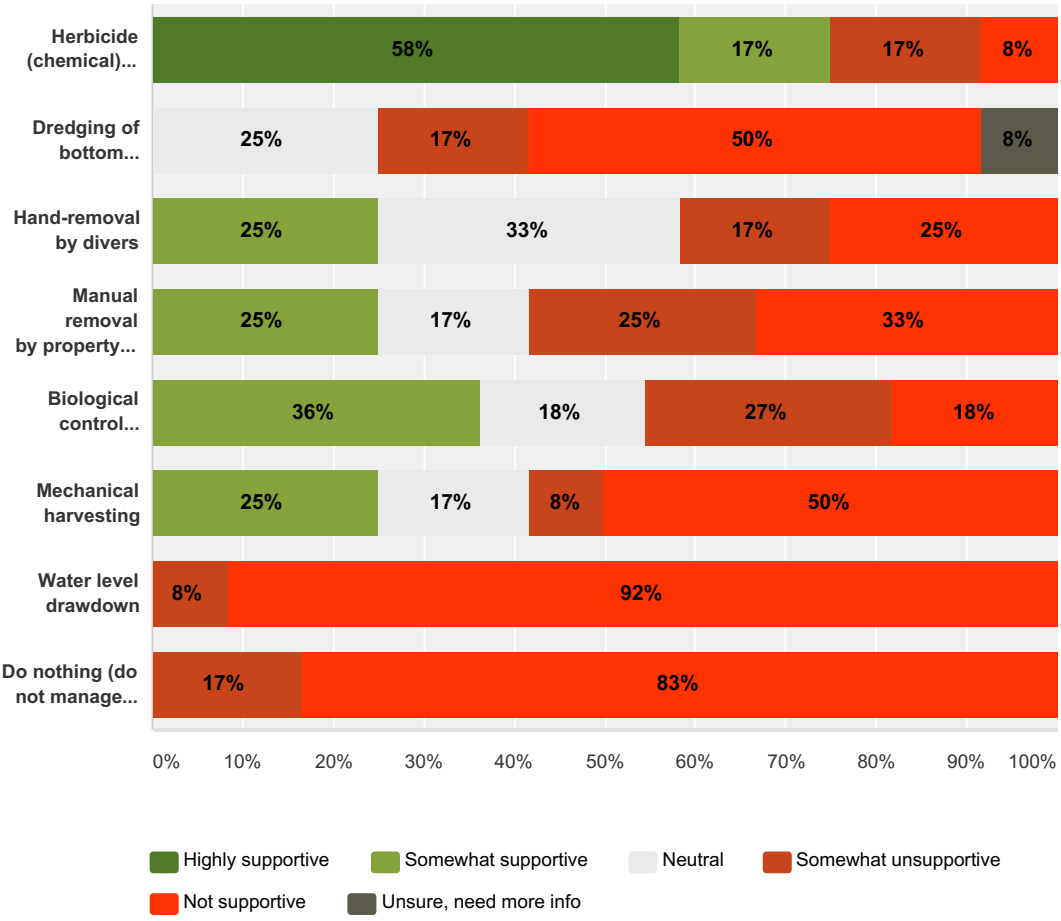
Answered: 12 Skipped: 1



Answer Choices	Responses	
Definitely	42%	5
Probably	33%	4
Unsure	17%	2
Probably not	8%	1
Definitely not	0%	0
Total		12

Q7 What is your level of support for the responsible use of the following techniques TO MANAGE AQUATIC PLANTS on Pearl Lake?

Answered: 12 Skipped: 1

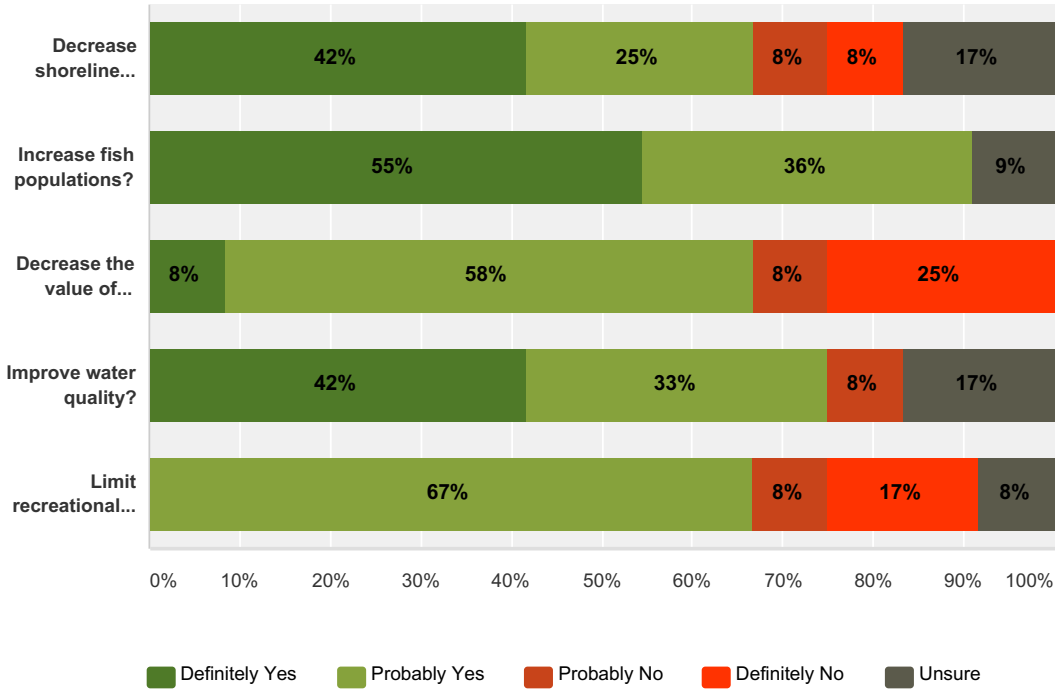


	Highly supportive	Somewhat supportive	Neutral	Somewhat unsupportive	Not supportive	Unsure, need more info	Total	Weighted Average
Herbicide (chemical) control	58% 7	17% 2	0% 0	17% 2	8% 1	0% 0	12	2.00
Dredging of bottom sediments	0% 0	0% 0	25% 3	17% 2	50% 6	8% 1	12	3.92
Hand-removal by divers	0% 0	25% 3	33% 4	17% 2	25% 3	0% 0	12	3.42
Manual removal by property owners	0% 0	25% 3	17% 2	25% 3	33% 4	0% 0	12	3.67
Biological control (milfoil weevil, loosestrife beetle, etc.)	0% 0	36% 4	18% 2	27% 3	18% 2	0% 0	11	3.27
Mechanical harvesting	0% 0	25% 3	17% 2	8% 1	50% 6	0% 0	12	3.83
Water level drawdown	0% 0	0% 0	0% 0	8% 1	92% 11	0% 0	12	4.92

Do nothing (do not manage plants)	**0%** 0	**0%** 0	**0%** 0	**17%** 2	**83%** 10	**0%** 0	12	4.83

Q8 In your opinion, does establishing or maintaining native vegetation IN THE WATER in the near-shore area…

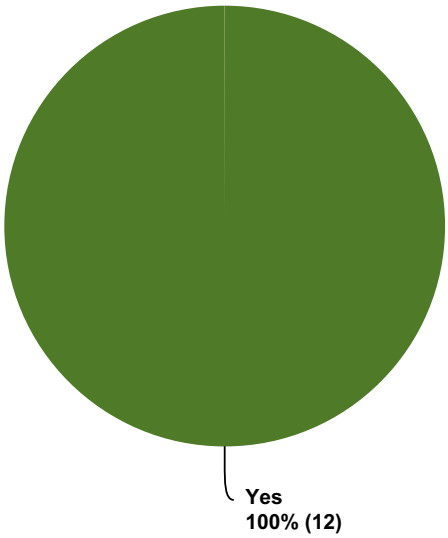
Answered: 12 Skipped: 1



	Definitely Yes	Probably Yes	Probably No	Definitely No	Unsure	Total
Decrease shoreline erosion?	**42%** 5	**25%** 3	**8%** 1	**8%** 1	**17%** 2	12
Increase fish populations?	**55%** 6	**36%** 4	**0%** 0	**0%** 0	**9%** 1	11
Decrease the value of shoreline property?	**8%** 1	**58%** 7	**8%** 1	**25%** 3	**0%** 0	12
Improve water quality?	**42%** 5	**33%** 4	**8%** 1	**0%** 0	**17%** 2	12
Limit recreational enjoyment?	**0%** 0	**67%** 8	**8%** 1	**17%** 2	**8%** 1	12

Q9 Have you ever heard of aquatic invasive species?

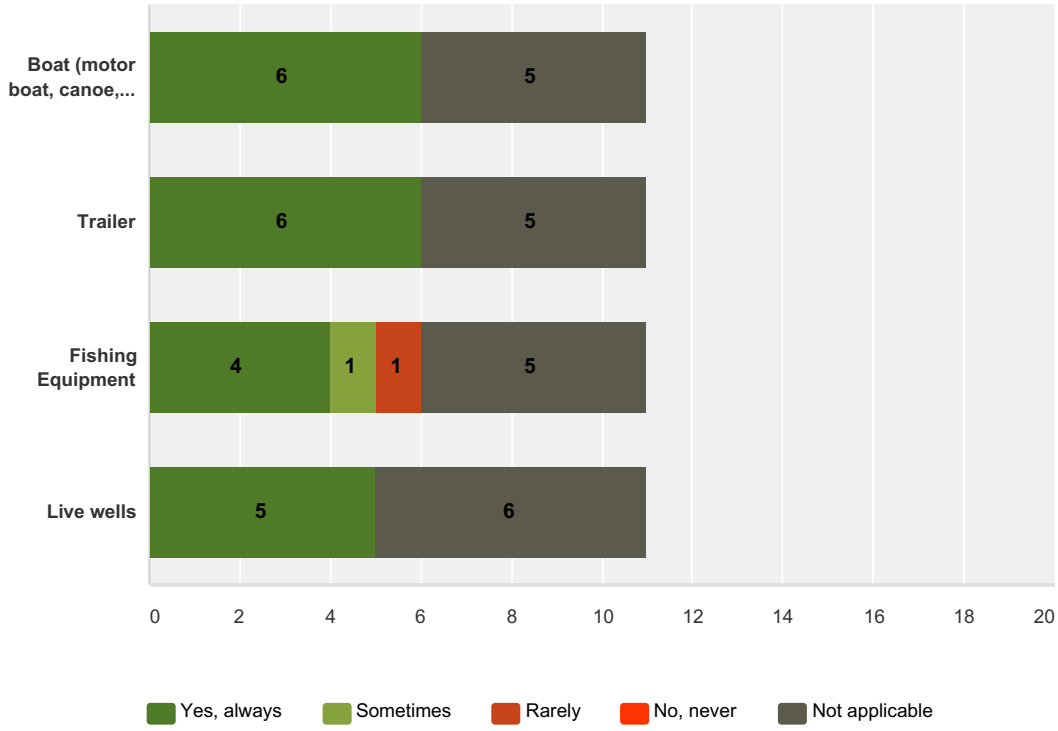
Answered: 12 Skipped: 1



Answer Choices	Responses	
Yes	**100%**	12
No	**0%**	0
Total		**12**

Q10 After you have been to another lake, do you clean your ... before bringing it back to Pearl Lake?

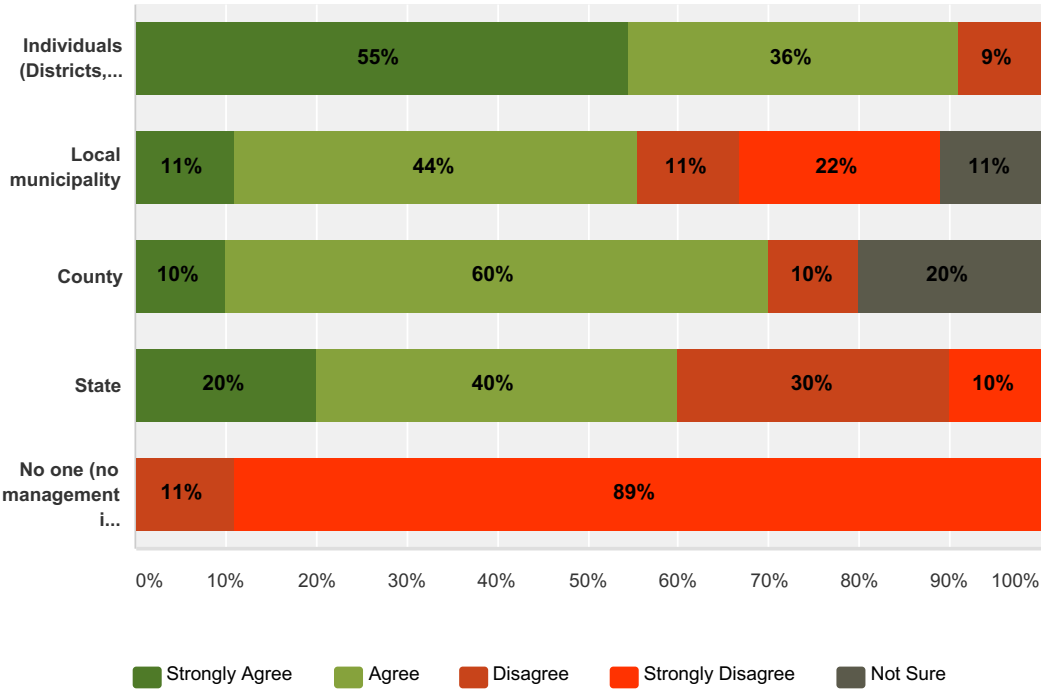
Answered: 11 Skipped: 2



	Yes, always	Sometimes	Rarely	No, never	Not applicable	Total Respondents
Boat (motor boat, canoe, kayak, etc.)	**55%** 6	**0%** 0	**0%** 0	**0%** 0	**45%** 5	11
Trailer	**55%** 6	**0%** 0	**0%** 0	**0%** 0	**45%** 5	11
Fishing Equipment	**36%** 4	**9%** 1	**9%** 1	**0%** 0	**45%** 5	11
Live wells	**45%** 5	**0%** 0	**0%** 0	**0%** 0	**55%** 6	11

Q11 Who should pay for the cost of managing invasive aquatic plants? Check all that apply.

Answered: 12 Skipped: 1

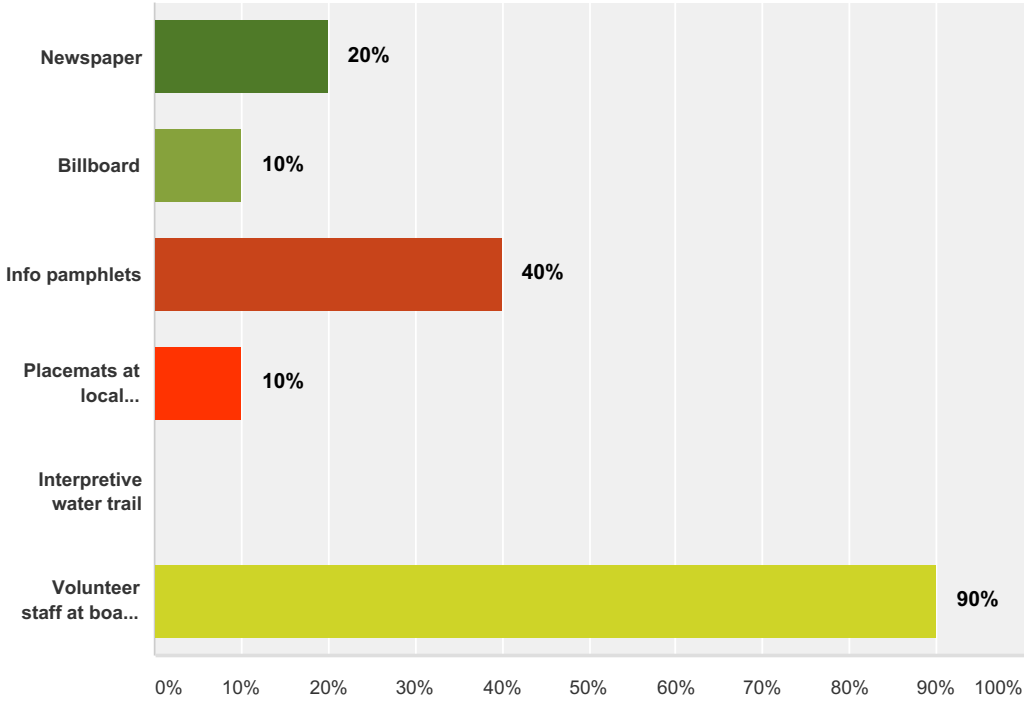


	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure	Total
Individuals (Districts, associations, lakefront property owners)	**55%** 6	**36%** 4	**9%** 1	**0%** 0	**0%** 0	11
Local municipality	**11%** 1	**44%** 4	**11%** 1	**22%** 2	**11%** 1	9
County	**10%** 1	**60%** 6	**10%** 1	**0%** 0	**20%** 2	10
State	**20%** 2	**40%** 4	**30%** 3	**10%** 1	**0%** 0	10
No one (no management is undertaken)	**0%** 0	**0%** 0	**11%** 1	**89%** 8	**0%** 0	9

#	Other (please specify)	Date
	There are no responses.	

Q12 What is the most effective way to inform others about aquatic invasive species?

Answered: 10 Skipped: 3

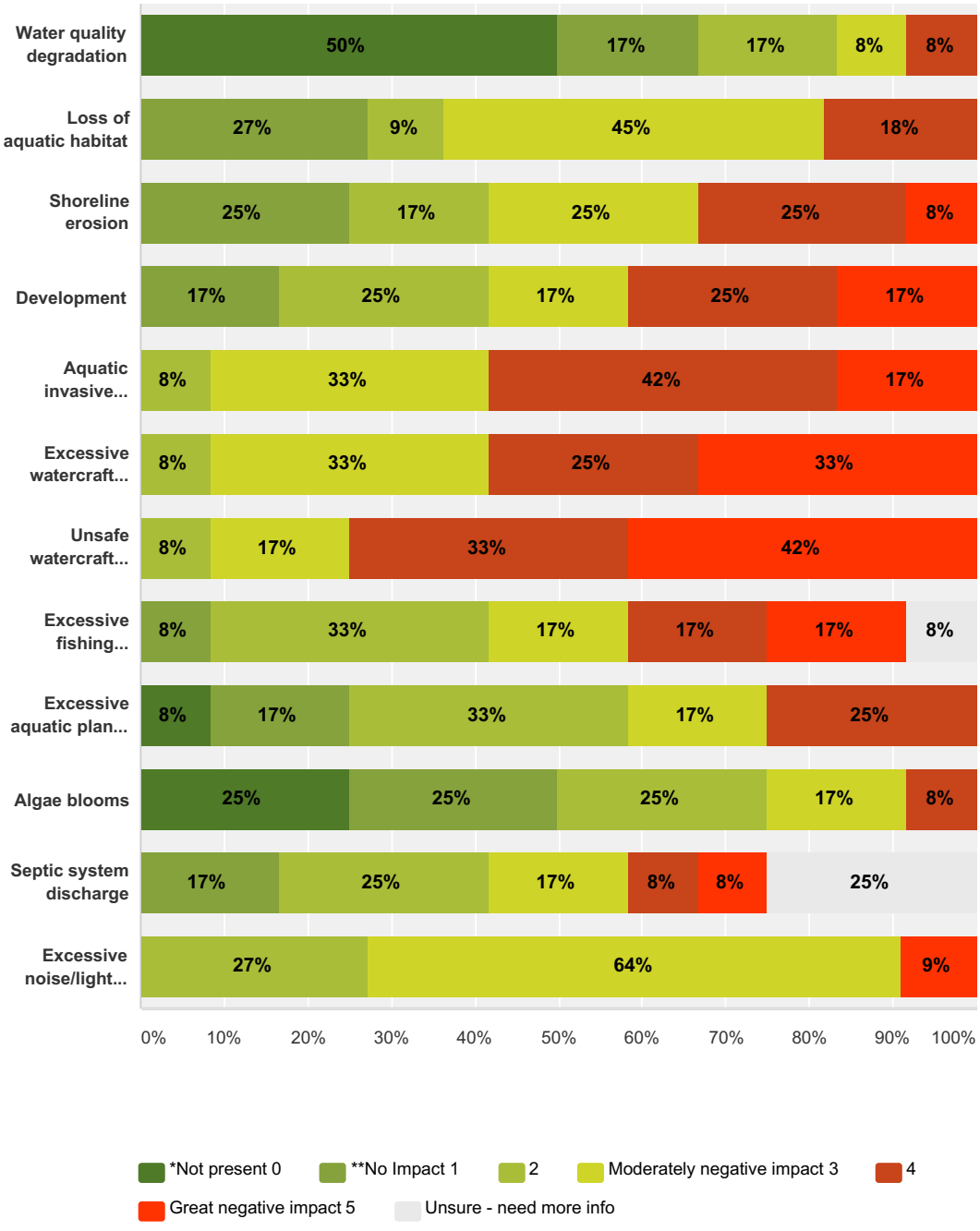


Answer Choices	Responses	
Newspaper	20%	2
Billboard	10%	1
Info pamphlets	40%	4
Placemats at local restaurants	10%	1
Interpretive water trail	0%	0
Volunteer staff at boat launch	90%	9
Total Respondents: 10		

#	Other (please specify)	Date
1	speaker at lake association mtg.	9/29/2015 11:03 AM
2	paid staff at boat launch	9/27/2015 8:00 PM

Q13 Below is a list of possible negative impacts commonly found in Wisconsin lakes. To what level do you believe each of the following factors may be impacting Pearl Lake? (Please rate 0 - 5)* Not Present means that you believe the issue does not exist on Pearl Lake.**No Impact means that the issue may exist on Pearl Lake but it is not negatively impacting the lake.

Answered: 12 Skipped: 1

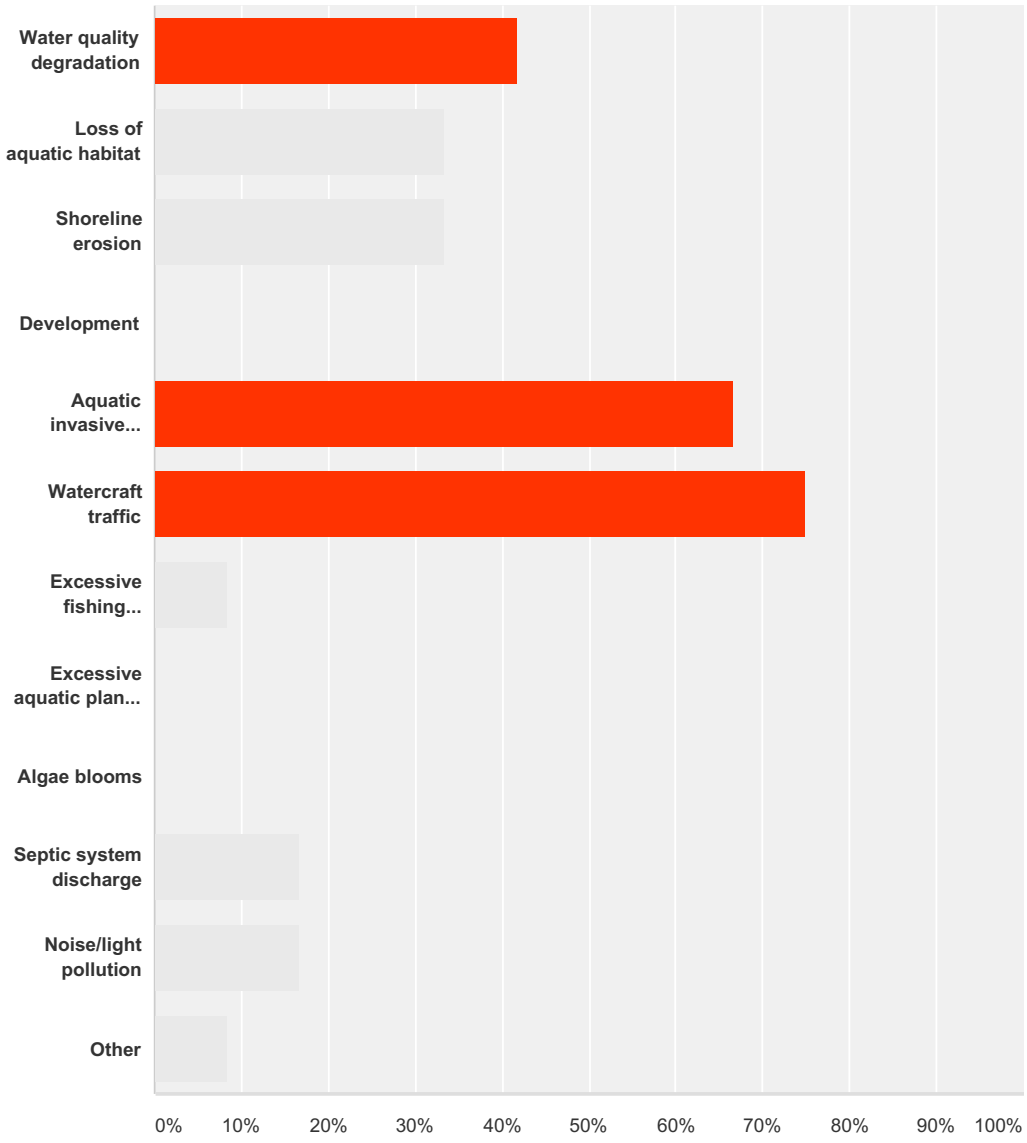


	*Not present 0	**No Impact 1	2	Moderately negative impact 3	4	Great negative impact 5	Unsure - need more info	Total	Weighted Average
Water quality degradation	**50%** 6	**17%** 2	**17%** 2	**8%** 1	**8%** 1	**0%** 0	**0%** 0	12	1.08
Loss of aquatic habitat	**0%** 0	**27%** 3	**9%** 1	**45%** 5	**18%** 2	**0%** 0	**0%** 0	11	2.55
Shoreline erosion	**0%** 0	**25%** 3	**17%** 2	**25%** 3	**25%** 3	**8%** 1	**0%** 0	12	2.75
Development	**0%** 0	**17%** 2	**25%** 3	**17%** 2	**25%** 3	**17%** 2	**0%** 0	12	3.00
Aquatic invasive species introduction	**0%** 0	**0%** 0	**8%** 1	**33%** 4	**42%** 5	**17%** 2	**0%** 0	12	3.67
Excessive watercraft traffic	**0%** 0	**0%** 0	**8%** 1	**33%** 4	**25%** 3	**33%** 4	**0%** 0	12	3.83
Unsafe watercraft practices	**0%** 0	**0%** 0	**8%** 1	**17%** 2	**33%** 4	**42%** 5	**0%** 0	12	4.08
Excessive fishing pressure	**0%** 0	**8%** 1	**33%** 4	**17%** 2	**17%** 2	**17%** 2	**8%** 1	12	2.75
Excessive aquatic plant growth (excluding algae)	**8%** 1	**17%** 2	**33%** 4	**17%** 2	**25%** 3	**0%** 0	**0%** 0	12	2.33
Algae blooms	**25%** 3	**25%** 3	**25%** 3	**17%** 2	**8%** 1	**0%** 0	**0%** 0	12	1.58
Septic system discharge	**0%** 0	**17%** 2	**25%** 3	**17%** 2	**8%** 1	**8%** 1	**25%** 3	12	1.92
Excessive noise/light pollution	**0%** 0	**0%** 0	**27%** 3	**64%** 7	**0%** 0	**9%** 1	**0%** 0	11	2.91

#	Other (please specify)	Date
1	Boaters are supposed to self-patrol, explaining rules to each other which is not working	9/24/2015 11:31 AM
2	Bass preying on smaller species and reducing population of overall fish population	9/21/2015 7:31 PM

Q14 From the list below, please mark your top three concerns regarding Pearl Lake.

Answered: 12 Skipped: 1



Answer Choices	Responses	
Water quality degradation	**42%**	5
Loss of aquatic habitat	**33%**	4
Shoreline erosion	**33%**	4
Development	**0%**	0
Aquatic invasive species introduction	**67%**	8
Watercraft traffic	**75%**	9
Excessive fishing pressure	**8%**	1

Excessive aquatic plant growth (excluding algae)	**0%**	0
Algae blooms	**0%**	0
Septic system discharge	**17%**	2
Noise/light pollution	**17%**	2
Other	**8%**	1
Total Respondents: 12		

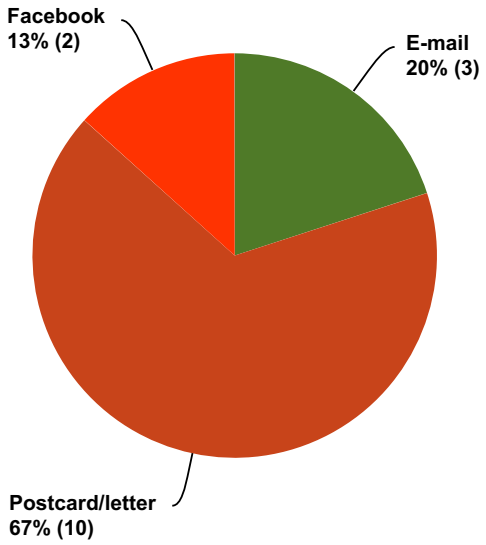
Q1 What is your Waushara County Lakes Study ID?

Answered: 16 Skipped: 0

#	Responses	Date
1	[redacted]	10/26/2015 8:36 PM
2	[redacted]	10/26/2015 7:49 PM
3	[redacted]	10/26/2015 7:03 PM
4	[redacted]	10/26/2015 4:41 PM
5	[redacted]	10/23/2015 1:57 PM
6	[redacted]	10/23/2015 12:47 PM
7	[redacted]	10/22/2015 8:55 PM
8	[redacted]	10/22/2015 3:13 PM
9	[redacted]	10/21/2015 6:47 PM
10	[redacted]	10/21/2015 6:23 PM
11	[redacted]	10/21/2015 4:38 PM
12	[redacted]	10/21/2015 2:54 PM
13	[redacted]	10/21/2015 9:03 AM
14	[redacted]	10/19/2015 6:31 PM
15	[redacted]	10/19/2015 3:49 PM
16	[redacted]	10/19/2015 11:17 AM

Q2 How did you hear about this survey?

Answered: 15 Skipped: 1

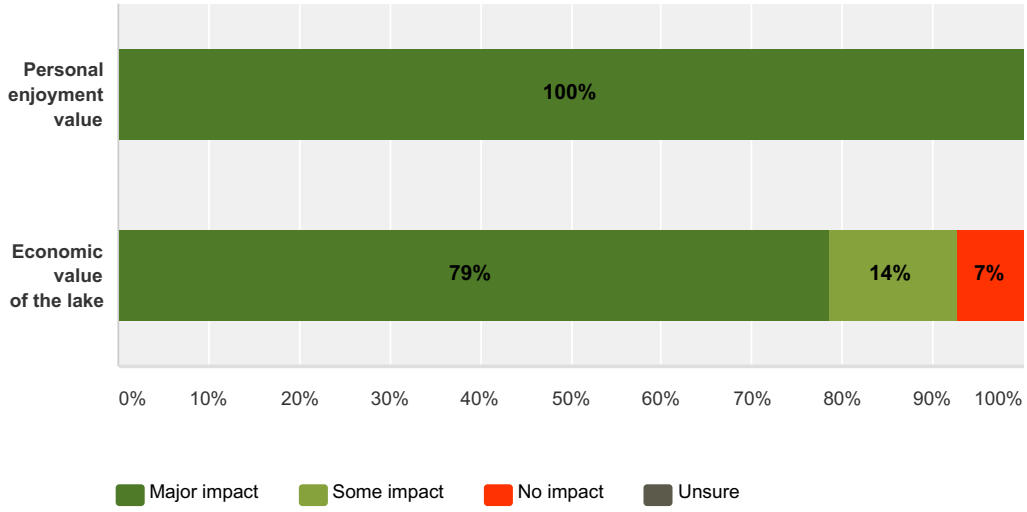


Answer Choices	Responses	
E-mail	20%	3
Newspaper	0%	0
Postcard/letter	67%	10
Facebook	13%	2
Radio	0%	0
Word of mouth	0%	0
Total		15

#	Other (please specify)	Date
	There are no responses.	

Q3 How much impact does the water quality of Pearl Lake have on the following?

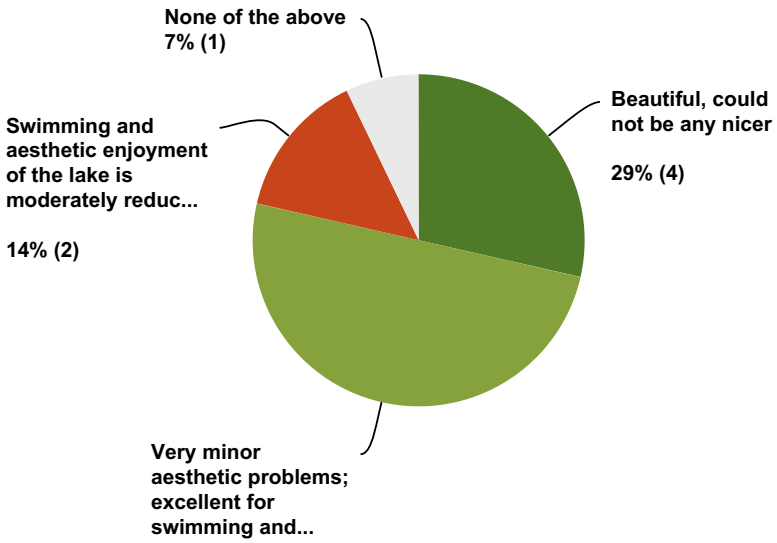
Answered: 14 Skipped: 2



	Major impact	Some impact	No impact	Unsure	Total
Personal enjoyment value	**100%** 14	**0%** 0	**0%** 0	**0%** 0	14
Economic value of the lake	**79%** 11	**14%** 2	**7%** 1	**0%** 0	14

Q4 Which statement best describes water clarity during the times you spend most on the lake?

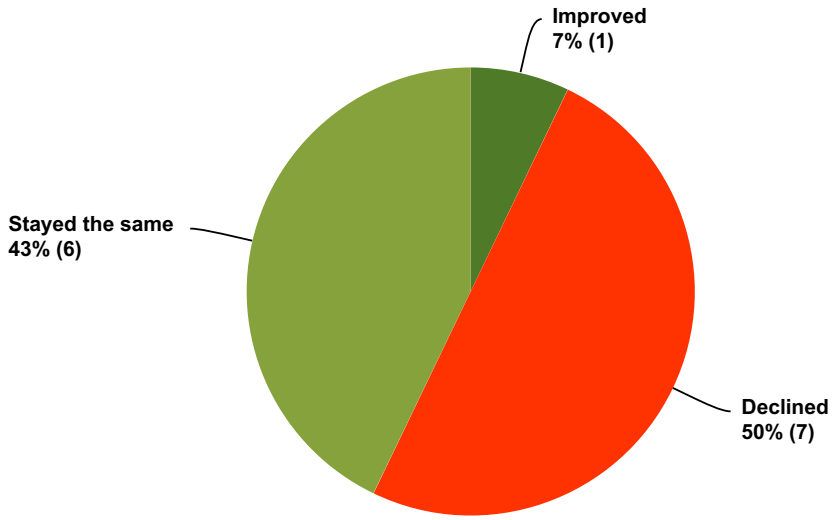
Answered: 14 Skipped: 2



Answer Choices	Responses	
Beautiful, could not be any nicer	29%	4
Very minor aesthetic problems; excellent for swimming and boating enjoyment	50%	7
Swimming and aesthetic enjoyment of the lake is slightly impaired because of algae	0%	0
Swimming and aesthetic enjoyment of the lake is moderately reduced because of algae	14%	2
Swimming and aesthetic enjoyment of the lake is substantially reduced because of algae	0%	0
None of the above	7%	1
Unsure	0%	0
Total		**14**

Q5 During the time that you have lived on, visited, or recreated on the lake, how would you say the water quality has changed?

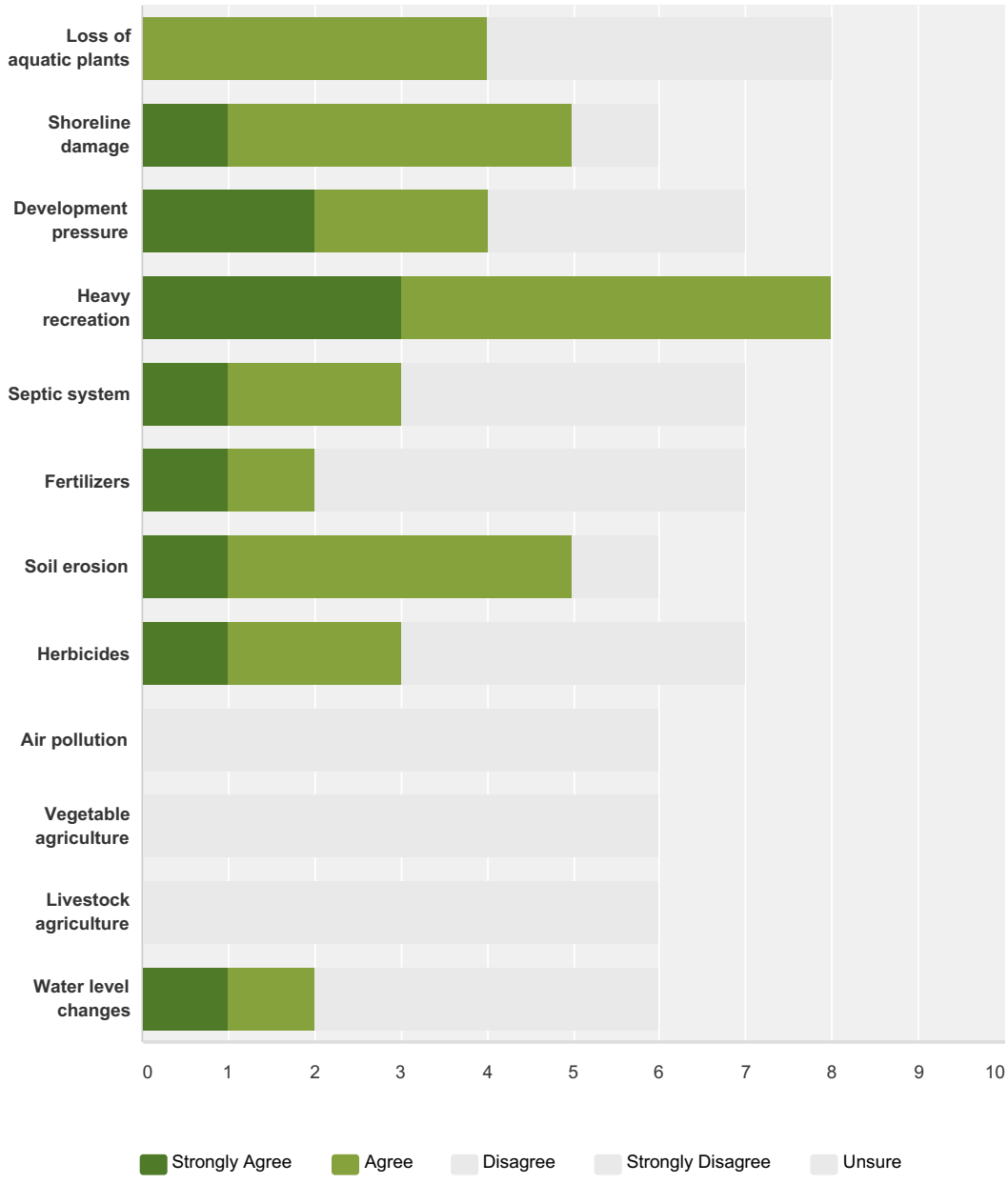
Answered: 14 Skipped: 2



Answer Choices	Responses	
Improved	7%	1
Declined	50%	7
Stayed the same	43%	6
Unsure	0%	0
Total		14

Q6 If it has declined, in your opinion, what are the primary causes?

Answered: 8 Skipped: 8

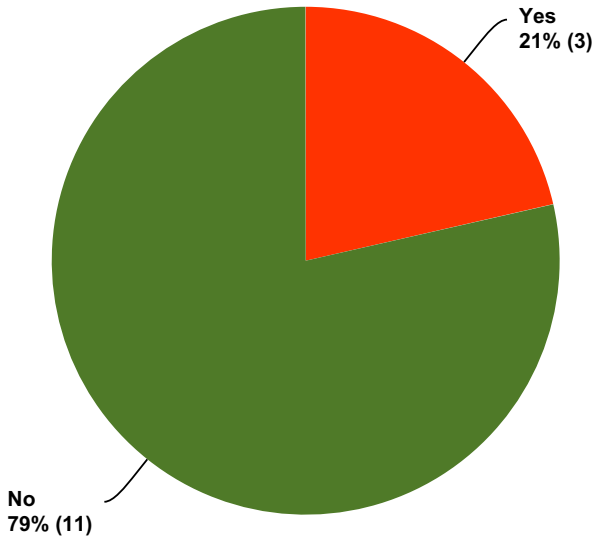


	Strongly Agree	Agree	Disagree	Strongly Disagree	Unsure	Total Respondents
Loss of aquatic plants	0% 0	50% 4	0% 0	13% 1	38% 3	8
Shoreline damage	17% 1	67% 4	17% 1	0% 0	0% 0	6
Development pressure	29% 2	29% 2	43% 3	0% 0	0% 0	7
Heavy recreation	38% 3	63% 5	0% 0	0% 0	0% 0	8

Septic system	**14%** 1	**29%** 2	**29%** 2	**0%** 0	**29%** 2	7
Fertilizers	**14%** 1	**14%** 1	**14%** 1	**0%** 0	**57%** 4	7
Soil erosion	**17%** 1	**67%** 4	**17%** 1	**0%** 0	**0%** 0	6
Herbicides	**17%** 1	**33%** 2	**17%** 1	**0%** 0	**50%** 3	6
Air pollution	**0%** 0	**0%** 0	**67%** 4	**0%** 0	**33%** 2	6
Vegetable agriculture	**0%** 0	**0%** 0	**50%** 3	**17%** 1	**33%** 2	6
Livestock agriculture	**0%** 0	**0%** 0	**50%** 3	**17%** 1	**33%** 2	6
Water level changes	**17%** 1	**17%** 1	**33%** 2	**0%** 0	**33%** 2	6

Q7 Do you use herbicides or pesticides (i.e. "weed and feed") on your land?

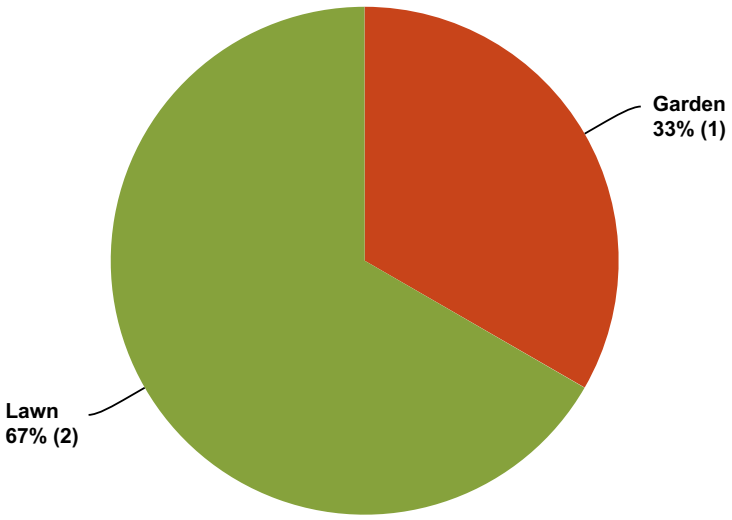
Answered: 14 Skipped: 2



Answer Choices	Responses	
Yes	21%	3
No	79%	11
Total		14

Q8 Where do you apply herbicides and/or pesticides?

Answered: 3 Skipped: 13

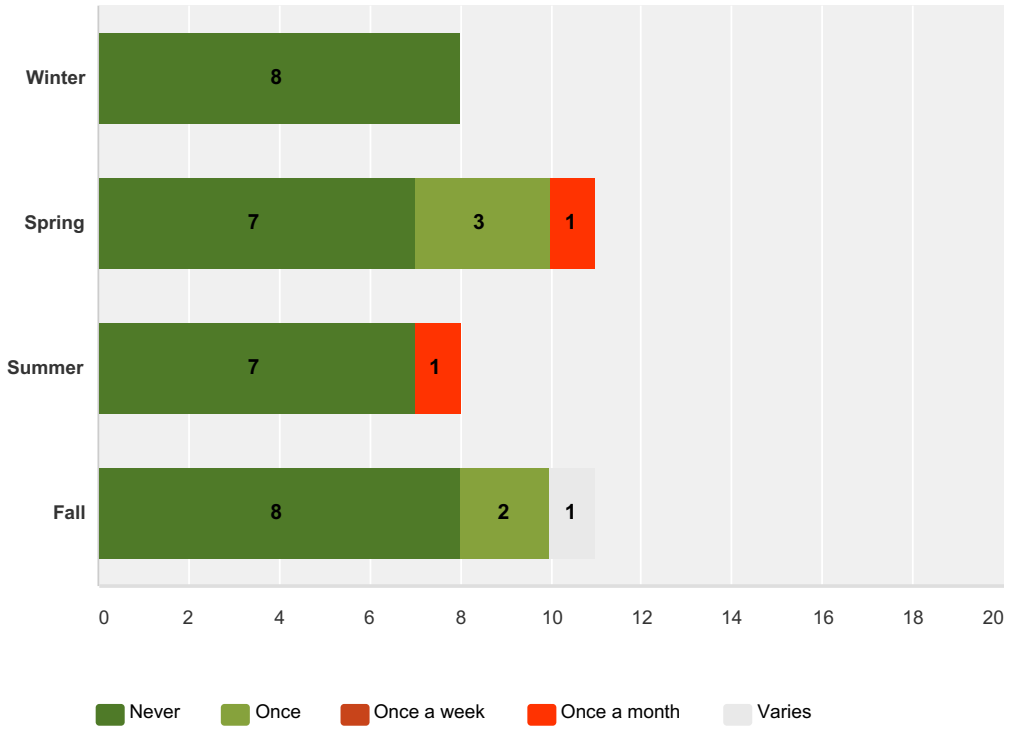


Answer Choices	Responses	
Agricultural fields	0%	0
Garden	33%	1
Lawn	67%	2
Total		3

#	Other (please specify)	Date
1	None	10/23/2015 12:49 PM
2	weed killer - in the undergrowth	10/22/2015 9:01 PM
3	only use it uphill from the water and a distance of 50 yds.	10/21/2015 4:42 PM
4	trying to decrease	10/21/2015 9:07 AM

Q9 In a typical year, how often do you apply herbicides and/or pesticides?

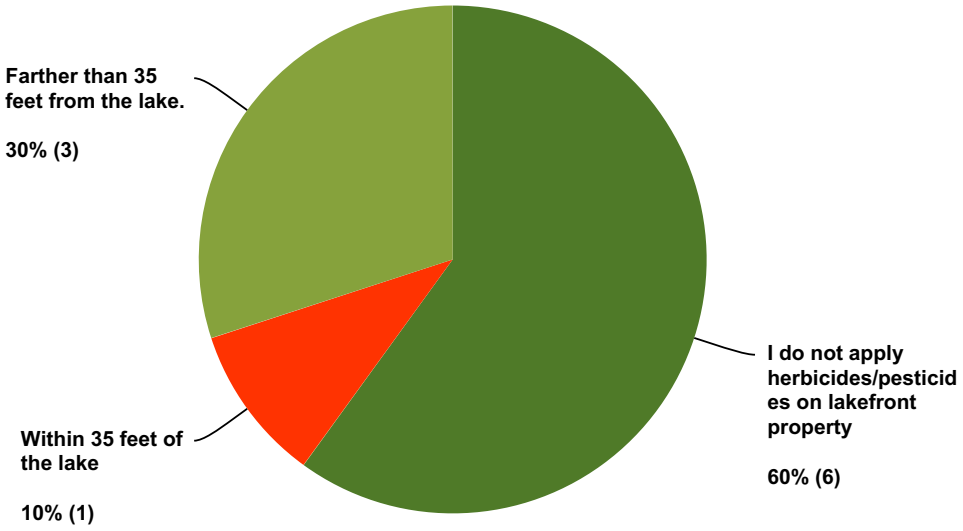
Answered: 11 Skipped: 5



	Never	Once	Once a week	Once a month	Varies	Total Respondents
Winter	**100%** 8	**0%** 0	**0%** 0	**0%** 0	**0%** 0	8
Spring	**64%** 7	**27%** 3	**0%** 0	**9%** 1	**0%** 0	11
Summer	**88%** 7	**0%** 0	**0%** 0	**13%** 1	**0%** 0	8
Fall	**73%** 8	**18%** 2	**0%** 0	**0%** 0	**9%** 1	11

Q10 If you apply herbicides and/or pesticides on lakefront property, how close to the lake are they applied (select the closest distance to the lake where herbicides/pesticides are applied)?

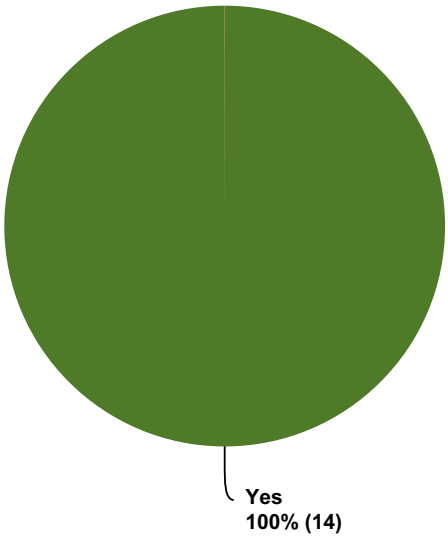
Answered: 10 Skipped: 6



Answer Choices	Responses	
I do not apply herbicides/pesticides on lakefront property	60%	6
Up to the lake	0%	0
Within 35 feet of the lake	10%	1
Farther than 35 feet from the lake.	30%	3
Total		10

Q11 Do you have your septic tank pumped at least every 3 years?

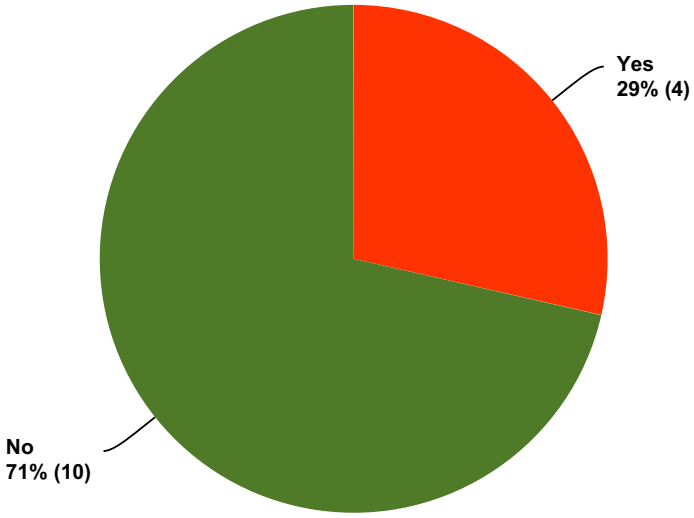
Answered: 14 Skipped: 2



Answer Choices	Responses	
Yes	**100%**	14
No	**0%**	0
I don't have a septic tank	**0%**	0
Total		**14**

Q12 Do you use fertilizer on your land?

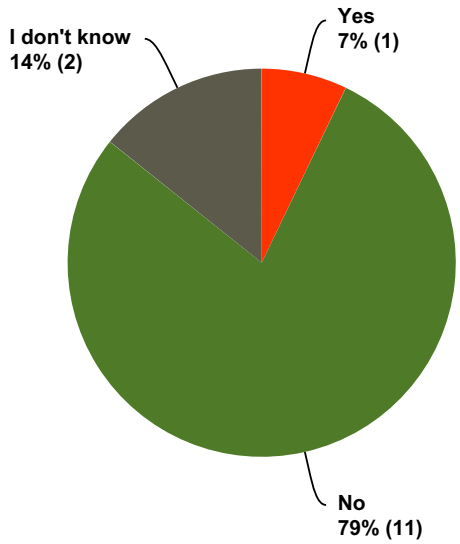
Answered: 14 Skipped: 2



Answer Choices	Responses	
Yes	29%	4
No	71%	10
Total		14

Q13 Do you use fertilizer which contains phosphorus?

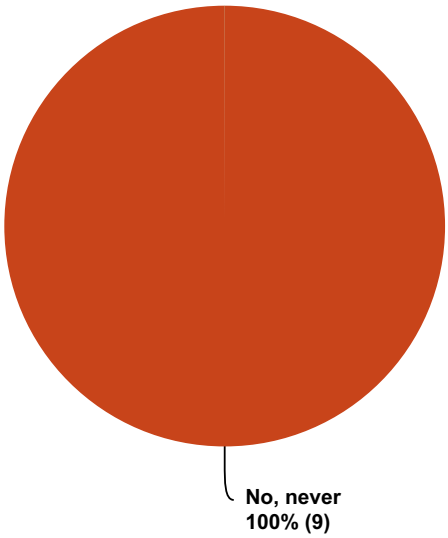
Answered: 14 Skipped: 2



Answer Choices	Responses	
Yes	7%	1
No	79%	11
I don't know	14%	2
Total		14

Q14 Do you have your soil tested before applying fertilizer?

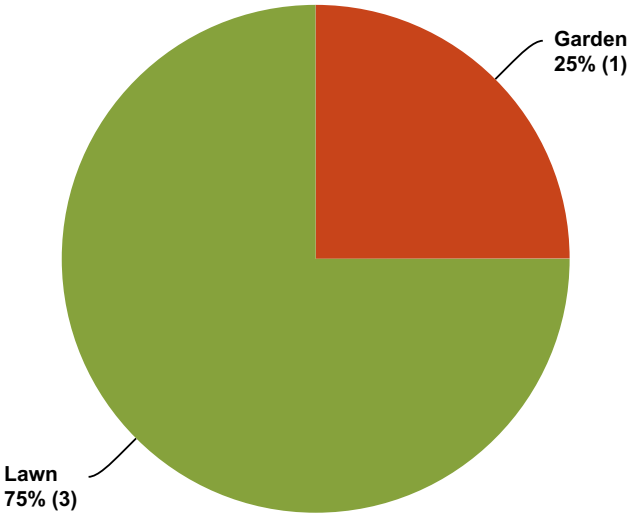
Answered: 9 Skipped: 7



Answer Choices	Responses	
Yes, all of the time	0%	0
Yes, some of the time	0%	0
No, never	100%	9
Total		9

Q15 Where do you apply fertilizer?

Answered: 4 Skipped: 12

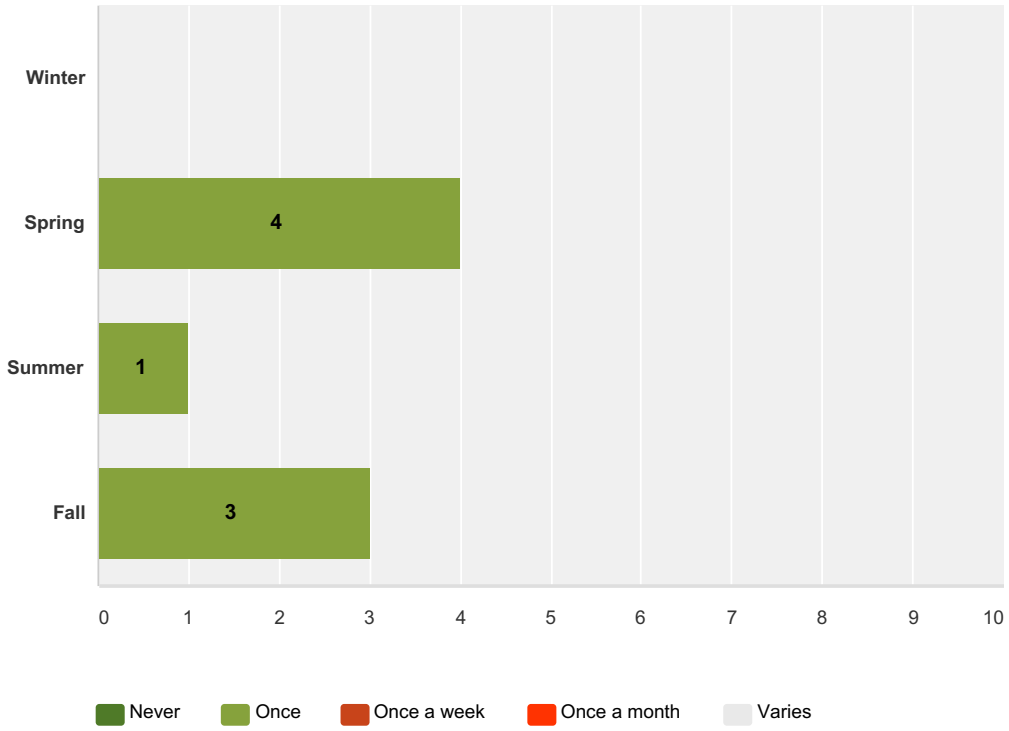


Answer Choices	Responses	
Agricultural fields	0%	0
Garden	25%	1
Lawn	75%	3
Total		4

#	Other (please specify)	Date
	There are no responses.	

Q16 In a typical year, how often do you apply fertilizer?

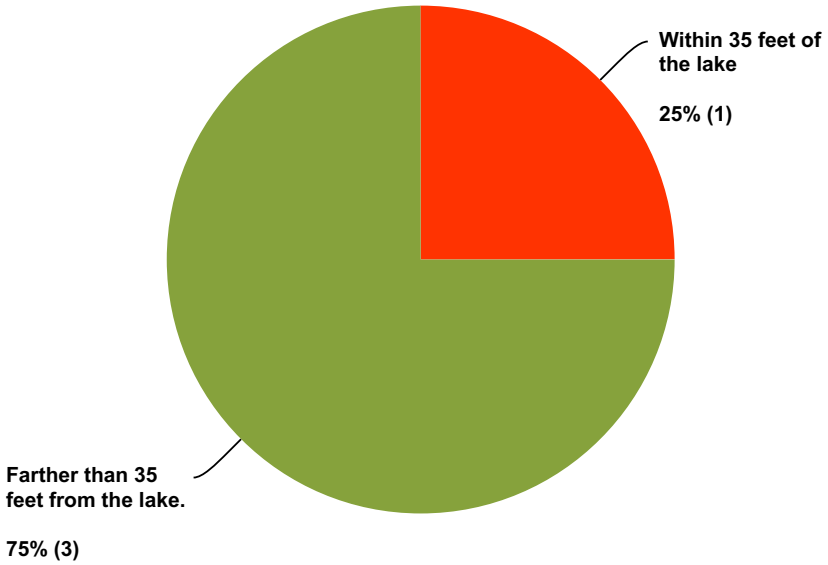
Answered: 4 Skipped: 12



	Never	Once	Once a week	Once a month	Varies	Total Respondents
Winter	0% 0	0% 0	0% 0	0% 0	0% 0	0
Spring	0% 0	100% 4	0% 0	0% 0	0% 0	4
Summer	0% 0	100% 1	0% 0	0% 0	0% 0	1
Fall	0% 0	100% 3	0% 0	0% 0	0% 0	3

Q17 If you apply fertilzer on lakefront property, how close to the lake is it applied (select the closest distance to the lake where fertilzer is applied)?

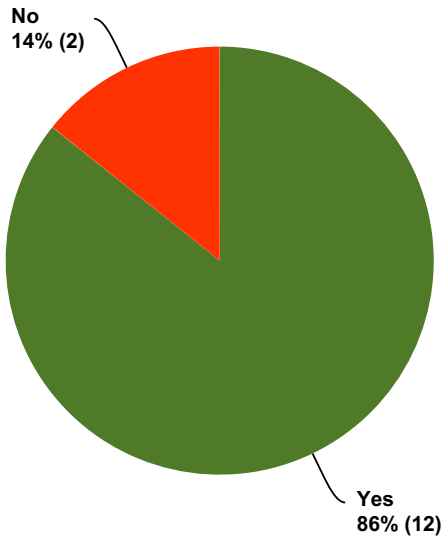
Answered: 4 Skipped: 12



Answer Choices	Responses	
I do not apply fertilizer on lakefront property	0%	0
Up to the lake	0%	0
Within 35 feet of the lake	25%	1
Farther than 35 feet from the lake.	75%	3
Total		4

Q18 Before reading the previous paragraph, did you know about the effects of phosphorus on lakes?

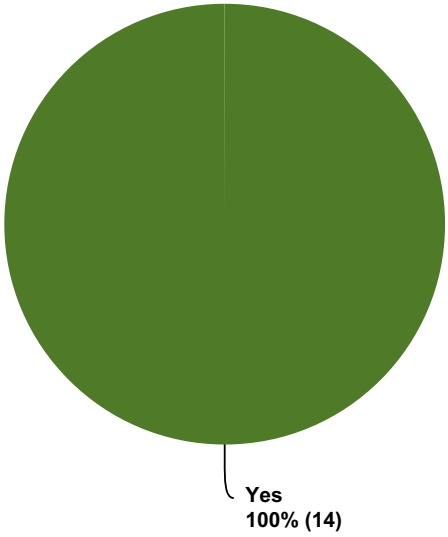
Answered: 14 Skipped: 2



Answer Choices	Responses	
Yes	86%	12
No	14%	2
Unsure	0%	0
Total		14

Q19 Do you own shoreland property?

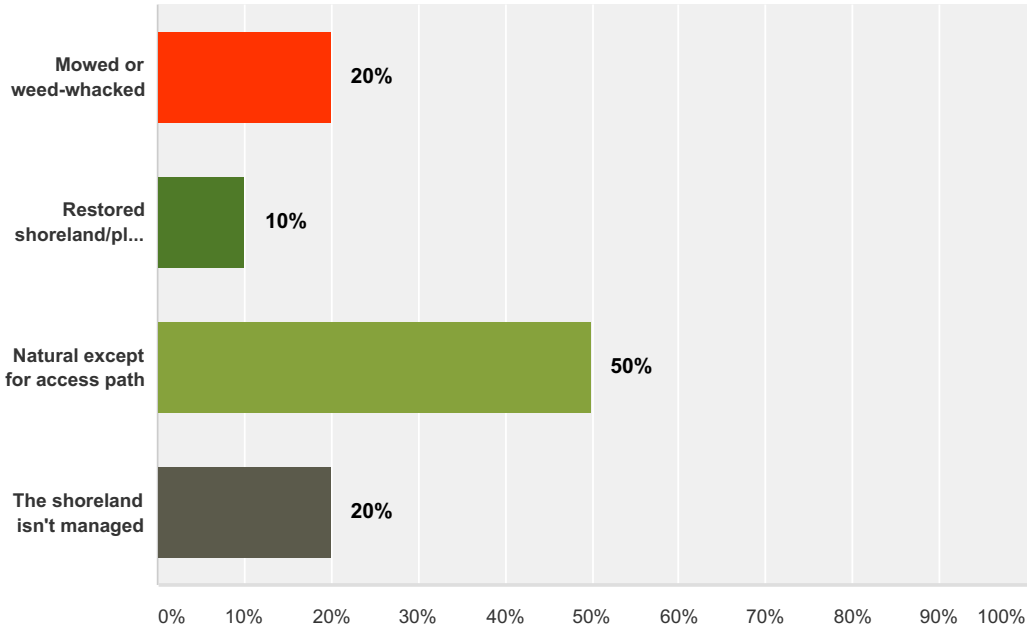
Answered: 14 Skipped: 2



Answer Choices	Responses	
Yes	**100%**	14
No	**0%**	0
Total		**14**

Q20 How do you currently manage the majority of your property within 35 feet of the lake?

Answered: 10 Skipped: 6

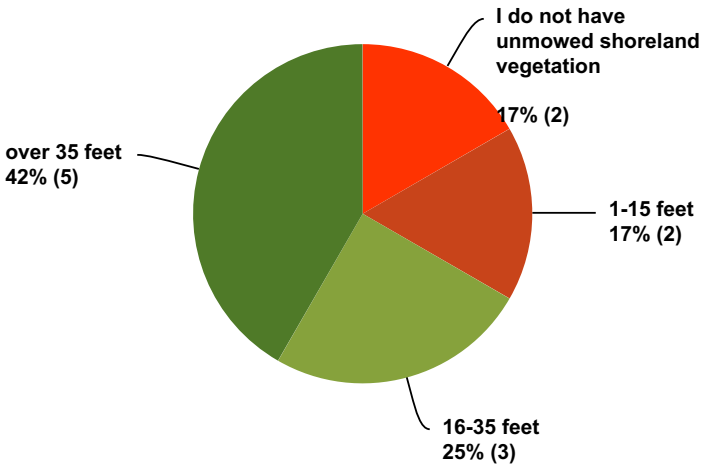


Answer Choices	Responses	
Mowed or weed-whacked	20%	2
Restored shoreland/planted	10%	1
Natural except for access path	50%	5
The shoreland isn't managed	20%	2
Total Respondents: 10		

#	Other (please specify)	Date
1	sand beach	10/26/2015 8:41 PM
2	Part is mowed/weed whacked and part is native vegetation.	10/26/2015 7:14 PM
3	enough sand for a beach, rest natural	10/21/2015 4:44 PM

Q21 If you have unmowed shoreland vegetation, how far inland from the water's edge does it extend?

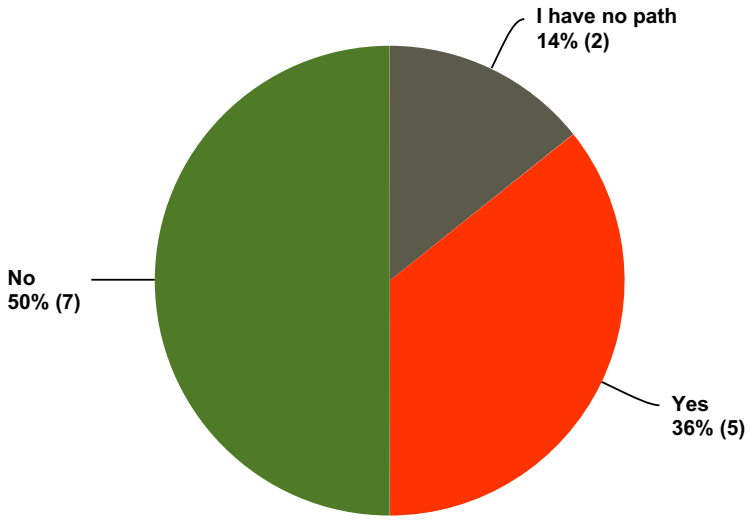
Answered: 12 Skipped: 4



Answer Choices	Responses	
I do not have unmowed shoreland vegetation	17%	2
1-15 feet	17%	2
16-35 feet	25%	3
over 35 feet	42%	5
Total		12

Q22 Have you observed erosion from your path to the lake?

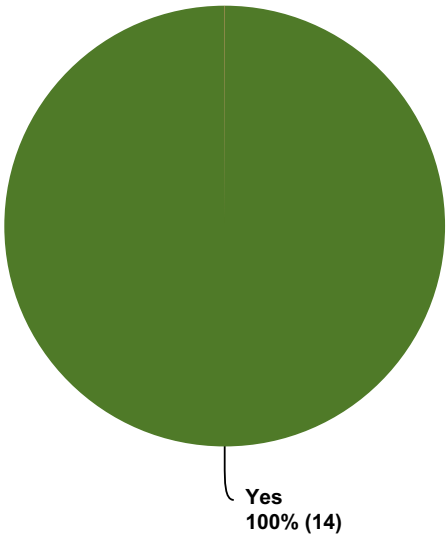
Answered: 14 Skipped: 2



Answer Choices	Responses	
I have no path	14%	2
Yes	36%	5
No	50%	7
Unsure	0%	0
Total		14

Q23 Did you understand the importance of shoreland vegetation before reading this?

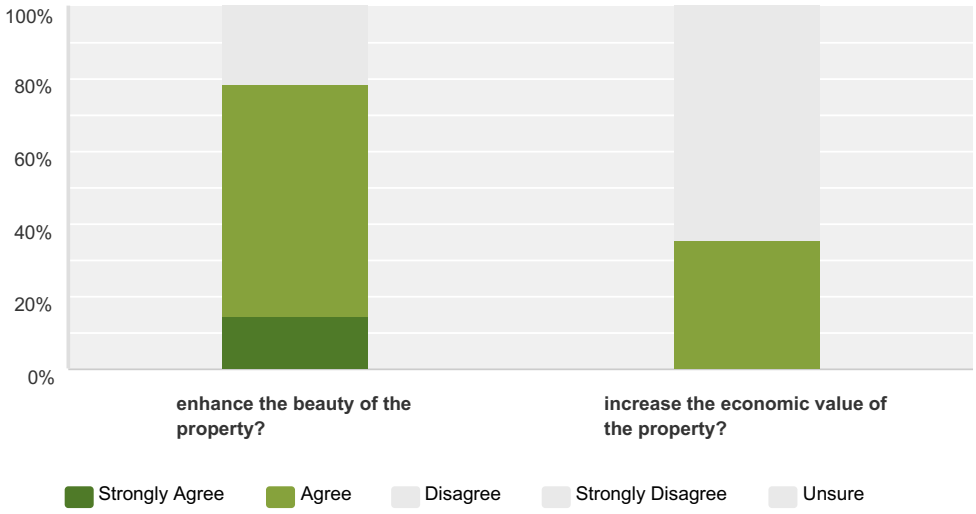
Answered: 14 Skipped: 2



Answer Choices	Responses	
Yes	100%	14
No	0%	0
Unsure	0%	0
Total		14

Q24 In your opinion, does shoreland vegetation...

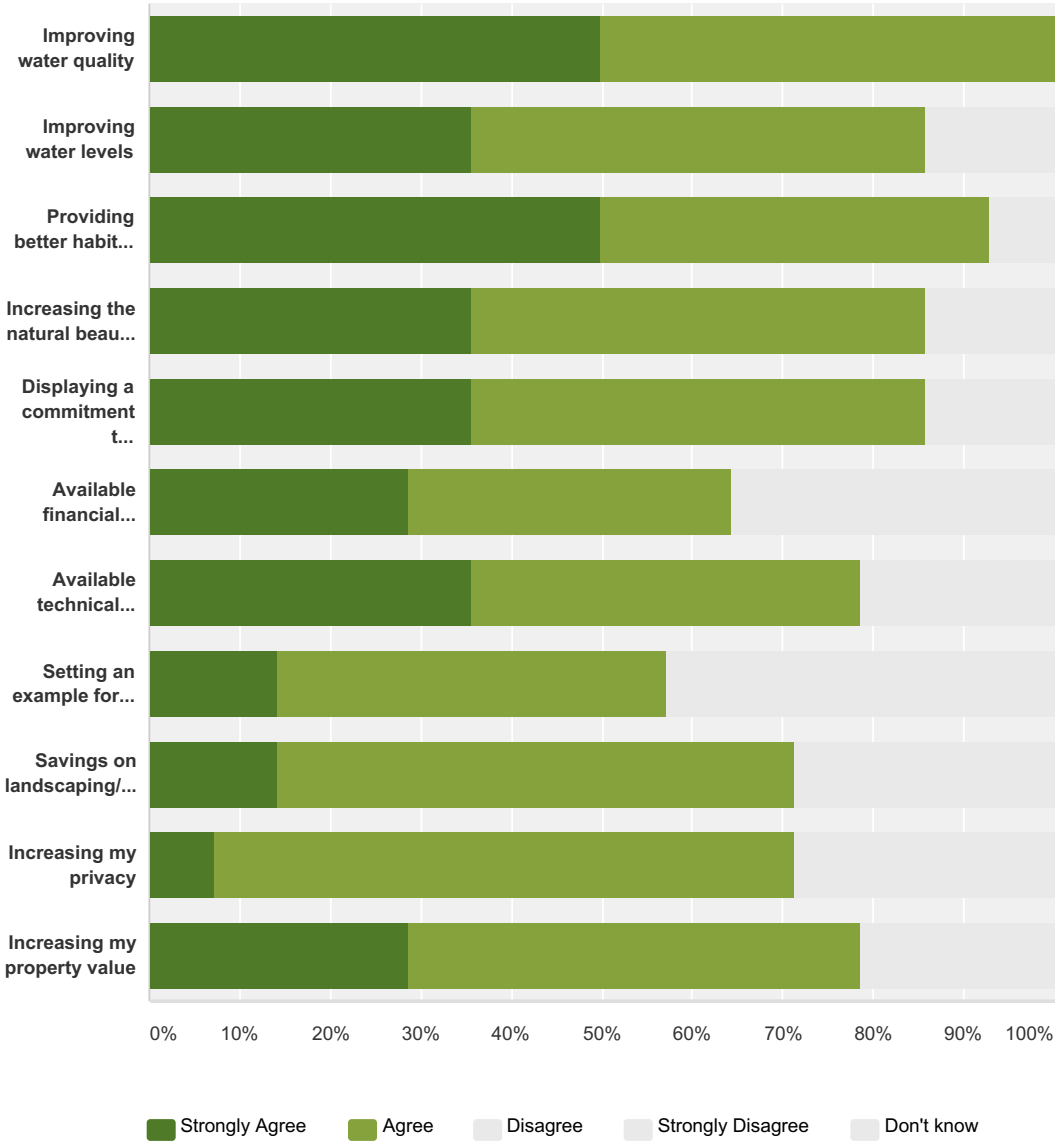
Answered: 14 Skipped: 2



	Strongly Agree	Agree	Disagree	Strongly Disagree	Unsure	Total
enhance the beauty of the property?	**14%** 2	**64%** 9	**14%** 2	**7%** 1	**0%** 0	14
increase the economic value of the property?	**0%** 0	**36%** 5	**21%** 3	**7%** 1	**36%** 5	14

Q25 What might motivate you to change how you manage your land?

Answered: 14 Skipped: 2



	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't know	Total
Improving water quality	50% 7	50% 7	0% 0	0% 0	0% 0	14
Improving water levels	36% 5	50% 7	7% 1	0% 0	7% 1	14
Providing better habitat for fish and wildlife	50% 7	43% 6	7% 1	0% 0	0% 0	14
Increasing the natural beauty of my property	36% 5	50% 7	7% 1	0% 0	7% 1	14
Displaying a commitment to the environment	36% 5	50% 7	7% 1	7% 1	0% 0	14

Available financial assistance	**29%** 4	**36%** 5	**14%** 2	**7%** 1	**14%** 2	14
Available technical assistance	**36%** 5	**43%** 6	**7%** 1	**0%** 0	**14%** 2	14
Setting an example for community members	**14%** 2	**43%** 6	**14%** 2	**7%** 1	**21%** 3	14
Savings on landscaping/maintenance costs	**14%** 2	**57%** 8	**14%** 2	**0%** 0	**14%** 2	14
Increasing my privacy	**7%** 1	**64%** 9	**29%** 4	**0%** 0	**0%** 0	14
Increasing my property value	**29%** 4	**50%** 7	**21%** 3	**0%** 0	**0%** 0	14

#	Other (please specify)	Date
	There are no responses.	

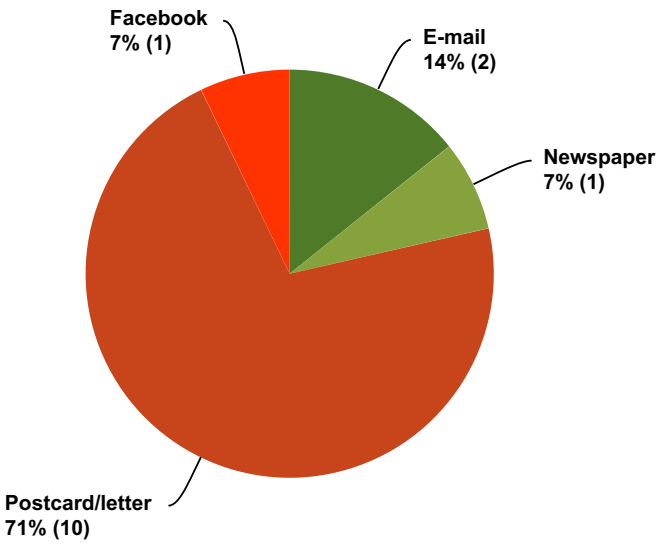
Q1 Enter your Waushara County Lakes Survey ID. Your survey cannot be processed without this information. If you've forgotten your ID or haven't created one yet, follow the instructions below.

Answered: 14 Skipped: 0

#	Responses	Date
1	[redacted]	11/30/2015 4:51 PM
2	[redacted]	11/30/2015 4:00 PM
3	[redacted]	11/30/2015 3:55 PM
4	[redacted]	11/29/2015 9:15 PM
5	[redacted]	11/29/2015 11:53 AM
6	[redacted]	11/28/2015 4:53 PM
7	[redacted]	11/26/2015 5:28 PM
8	[redacted]	11/25/2015 12:47 PM
9	[redacted]	11/25/2015 11:47 AM
10	[redacted]	11/24/2015 7:12 PM
11	[redacted]	11/24/2015 6:30 PM
12	[redacted]	11/24/2015 4:35 PM
13	[redacted]	11/17/2015 5:51 PM
14	[redacted]	11/17/2015 9:30 AM

Q2 How did you hear about this survey?

Answered: 14 Skipped: 0

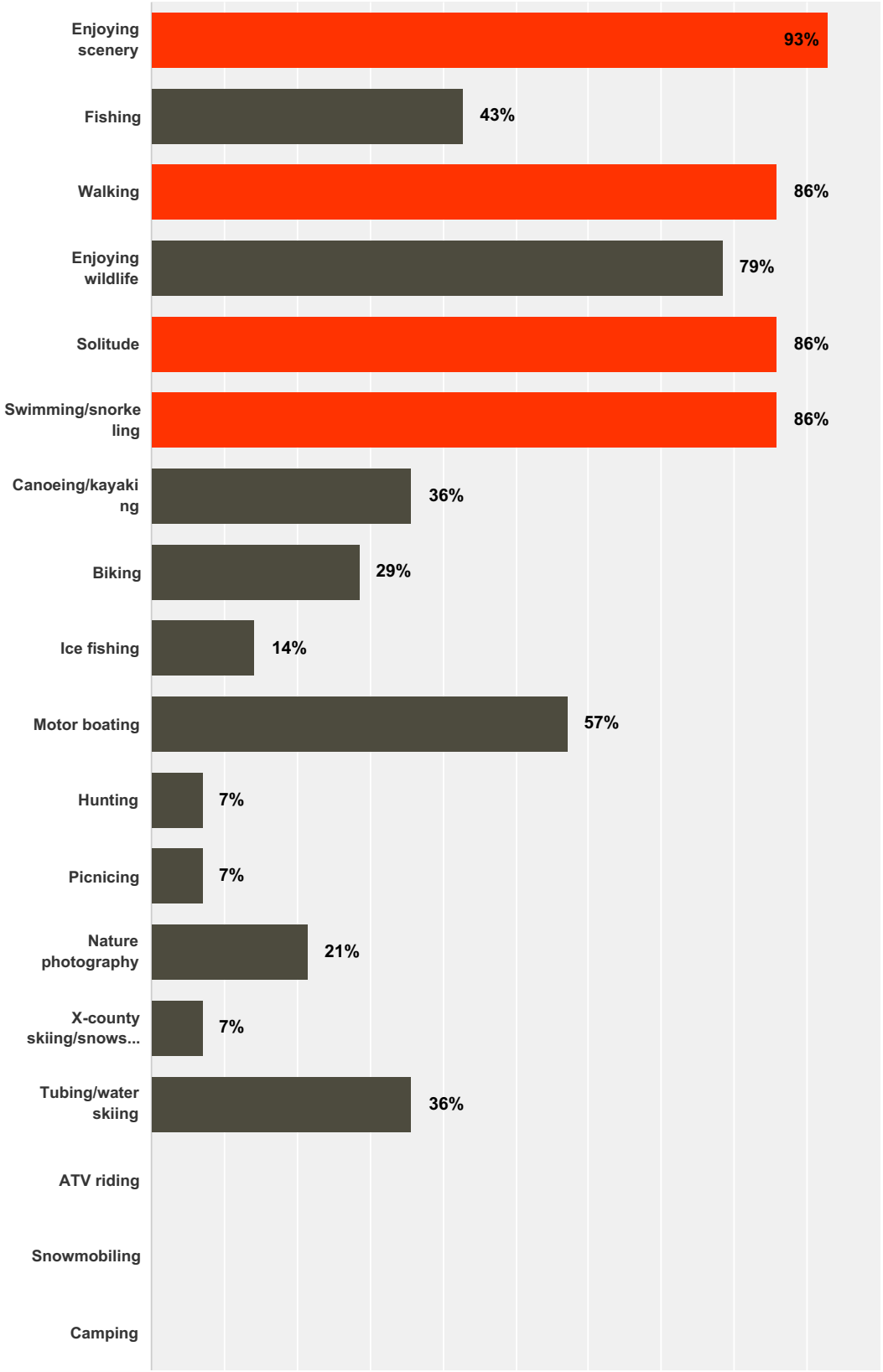


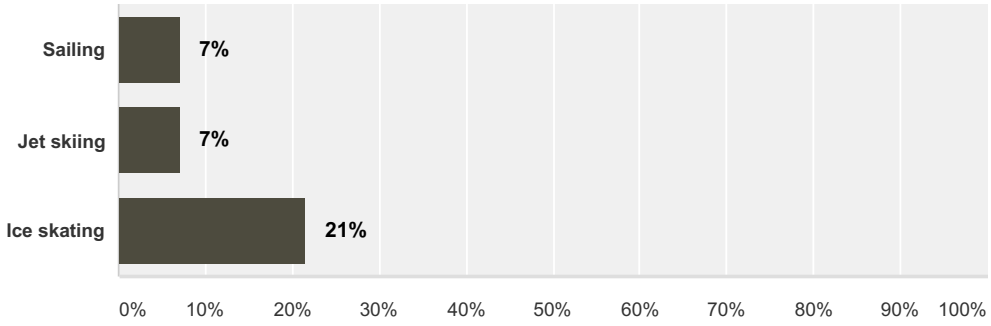
Answer Choices	Responses	
E-mail	14%	2
Newspaper	7%	1
Postcard/letter	71%	10
Facebook	7%	1
Radio	0%	0
Total		14

#	Other (please specify)	Date
	There are no responses.	

Q3 What recreational activities do you partake in on Pearl Lake (check all that apply)?

Answered: 14 Skipped: 0



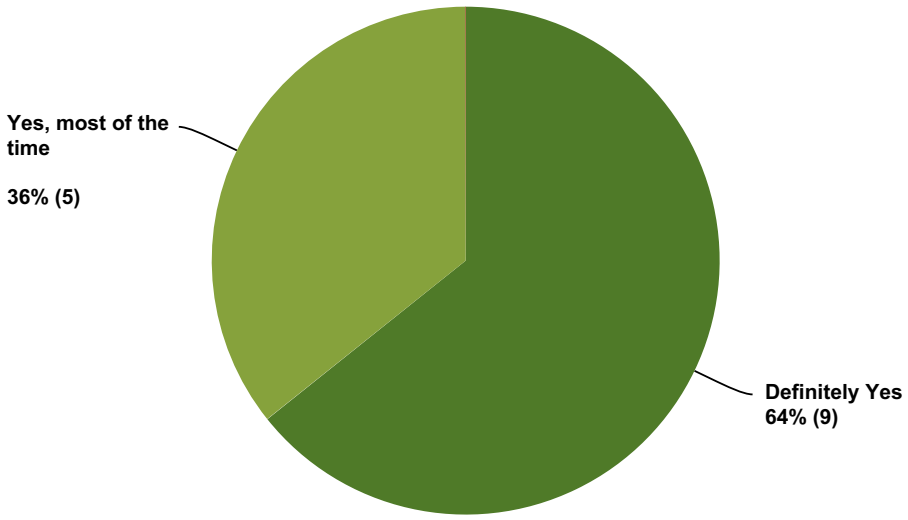


Answer Choices	Responses	
Enjoying scenery	**93%**	13
Fishing	**43%**	6
Walking	**86%**	12
Enjoying wildlife	**79%**	11
Solitude	**86%**	12
Swimming/snorkeling	**86%**	12
Canoeing/kayaking	**36%**	5
Biking	**29%**	4
Ice fishing	**14%**	2
Motor boating	**57%**	8
Hunting	**7%**	1
Picnicing	**7%**	1
Nature photography	**21%**	3
X-county skiing/snowshoeing	**7%**	1
Tubing/water skiing	**36%**	5
ATV riding	**0%**	0
Snowmobiling	**0%**	0
Camping	**0%**	0
Sailing	**7%**	1
Jet skiing	**7%**	1
Ice skating	**21%**	3
Total Respondents: 14		

#	Other (please specify)	Date
1	Taking a sauna	11/30/2015 4:53 PM
2	Rowing a boat	11/30/2015 4:02 PM
3	Rowing a boat	11/30/2015 3:58 PM

Q4 "No Wake" is allowed on Pearl Lake between 4pm and 11am. Do you like the current "No Wake" rules as they are?

Answered: 14 Skipped: 0



Answer Choices	Responses	
Definitely Yes	64%	9
Yes, most of the time	36%	5
No, not most of the time	0%	0
Definitely No	0%	0
Unsure	0%	0
Total		14

Q5 If you think the "No Wake" rules should be adjusted...in what way?

Answered: 6 Skipped: 8

#	Responses	Date
1	"No Wake should be allowed on Pearl Lake between 3pm and 11am	11/30/2015 4:02 PM
2	"No Wake" should be allowed on Pearl Lake between 3pm and 11 am	11/30/2015 3:58 PM
3	DO NOT CHANGE!	11/29/2015 11:54 AM
4	I do not motor boat - but I think it is a fair use of the lake. Splitting up time for motor boating/tubing/etc and more quite pass times.	11/25/2015 11:52 AM
5	Rules as they are have worked for 50 years. There is a balance so everyone has some of what they would want.	11/24/2015 7:17 PM
6	5:00pm to 10:00AM - would allow more boating time to prevent "rush hours" that currently occurs.	11/24/2015 4:37 PM

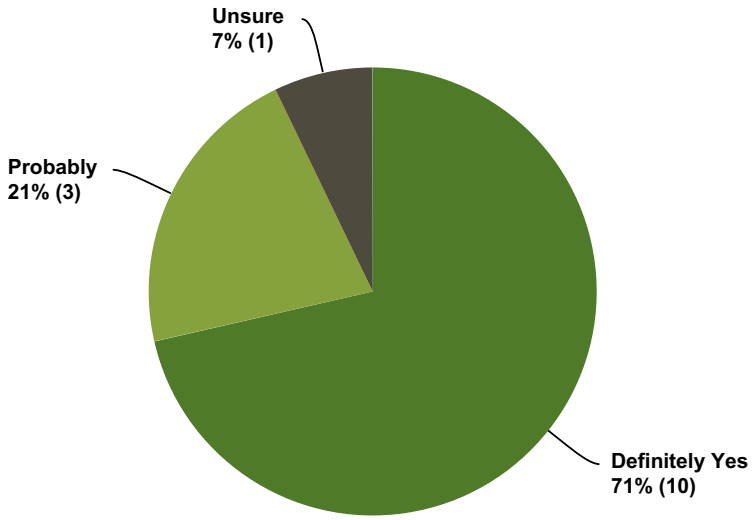
Q6 What could be done to improve your recreation experience on Pearl Lake?

Answered: 7 Skipped: 7

#	Responses	Date
1	Safer boating	11/30/2015 4:53 PM
2	A decrease in the amount of noise from motorized boats, jet skis etc.	11/30/2015 4:02 PM
3	Decrease the amount of noise from motors	11/30/2015 3:58 PM
4	I am fearful about how some of the speed boats pulling tubers or skiers come so close to docks and swim rafts. I wish we could curtail that dangerous practice.	11/28/2015 4:55 PM
5	More DNR warden activity	11/25/2015 12:48 PM
6	I think that the shooting off of fireworks has gotten very out of hand. I do not mind 4th of July. But now it is every weekend. The debris is polluting the lake (we clean up buckets full of paper and plastic each summer on the east shore.) and it is very disturbing to humans and wildlife.	11/25/2015 11:52 AM
7	Closer adherence to the rules we have developed, time sharing, counter clockwise movement	11/24/2015 7:17 PM

Q7 Does a desire to provide better habitat for fish and wildlife motivate you to support (morally) efforts to improve Pearl Lake?

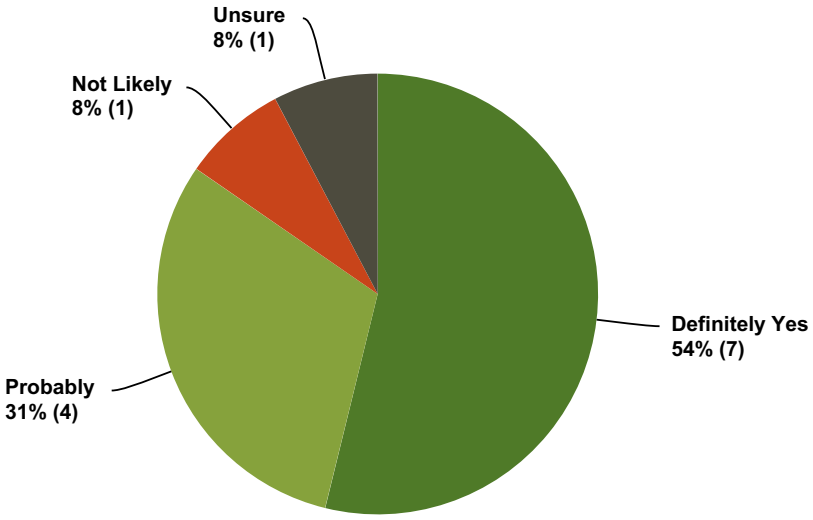
Answered: 14 Skipped: 0



Answer Choices	Responses	
Definitely Yes	71%	10
Probably	21%	3
Not Likely	0%	0
Definitely No	0%	0
Unsure	7%	1
Total		14

Q8 Does a desire to provide better habitat for fish and wildlife motivate you to support (by direct action) efforts to improve Pearl Lake?

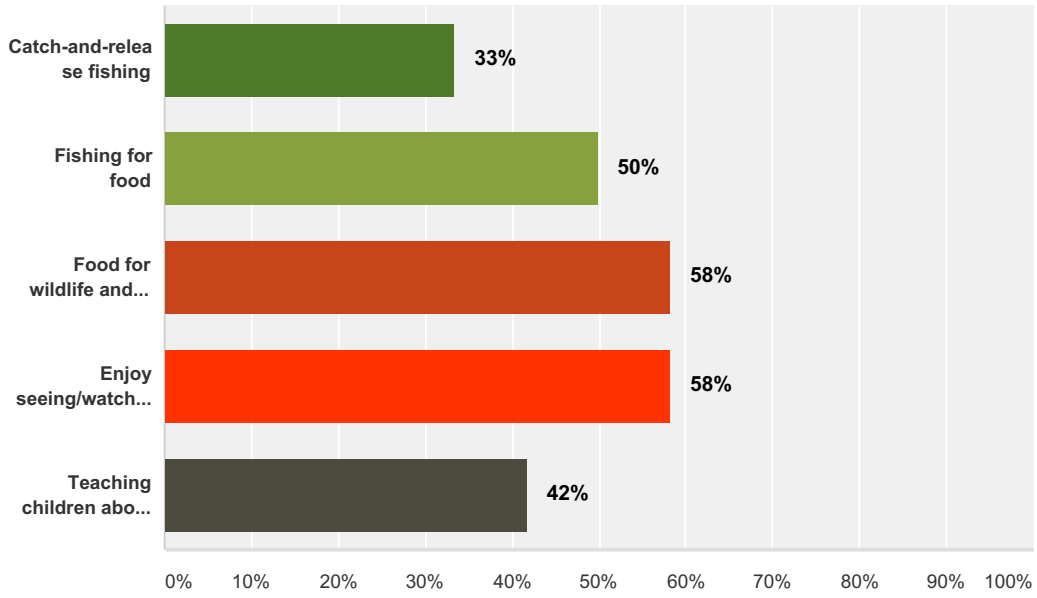
Answered: 13 Skipped: 1



Answer Choices	Responses	
Definitely Yes	54%	7
Probably	31%	4
Not Likely	8%	1
Definitely No	0%	0
Unsure	8%	1
Total		13

Q9 For what purposes do you value the fishery in Pearl Lake? (Check all that apply.)

Answered: 12 Skipped: 2

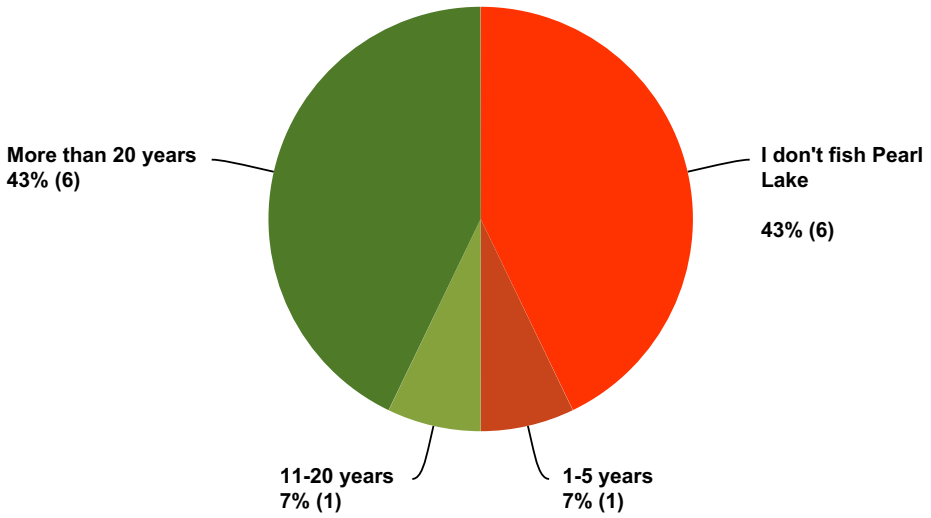


Answer Choices	Responses	
Catch-and-release fishing	33%	4
Fishing for food	50%	6
Food for wildlife and birds	58%	7
Enjoy seeing/watching fish	58%	7
Teaching children about fishing/lakes	42%	5
Total Respondents: 12		

#	Other (please specify)	Date
1	No interest in fishing but happy that others do.	11/24/2015 7:18 PM

Q10 How many years of fishing experience do you have on Pearl Lake?

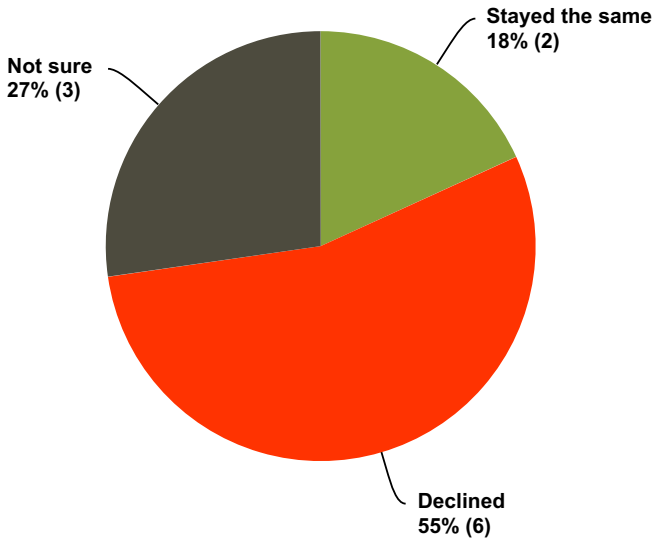
Answered: 14 Skipped: 0



Answer Choices	Responses	
I don't fish Pearl Lake	43%	6
1-5 years	7%	1
6-10 years	0%	0
11-20 years	7%	1
More than 20 years	43%	6
Total		14

Q11 In the years you have been fishing Pearl Lake, would you say the quality of fishing has...

Answered: 11 Skipped: 3



Answer Choices	Responses	
Improved	0%	0
Stayed the same	18%	2
Declined	55%	6
Not sure	27%	3
Total		11

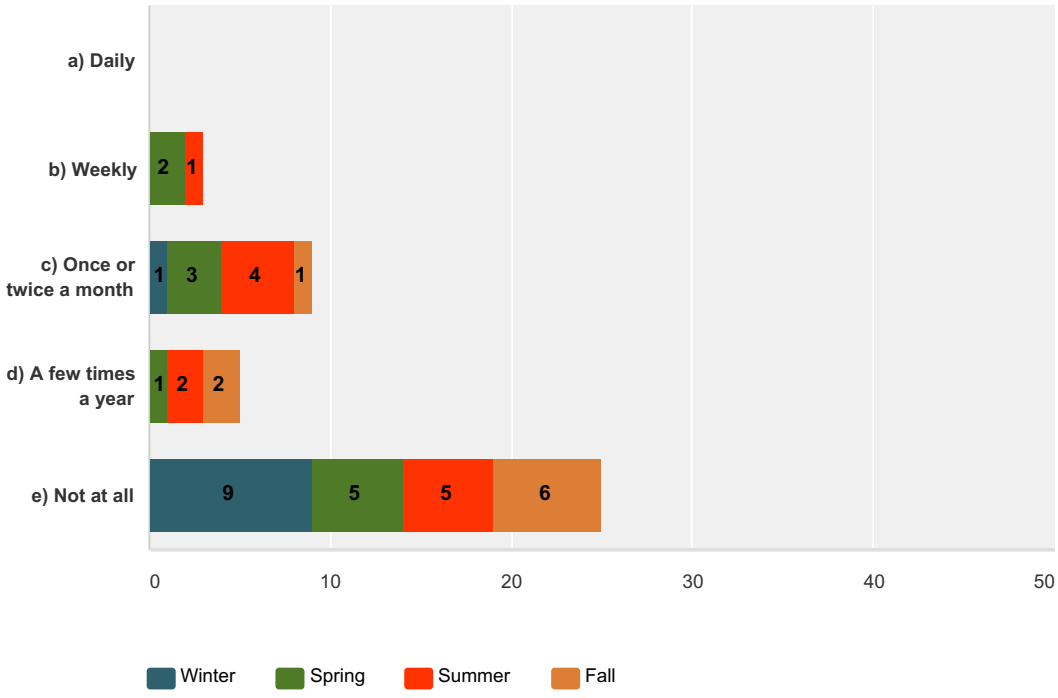
Q12 What factors do you feel have contributed to the change in fishing?

Answered: 6 Skipped: 8

#	Responses	Date
1	Loss of natural shoreline vegetation, boating, loss/change of aquatic plants and indiscriminate fishing	11/30/2015 5:00 PM
2	overfishing	11/29/2015 11:59 AM
3	Fishing pressure, both spring and winter, also DNR refusal to stock bluegills	11/25/2015 12:49 PM
4	I do not fish.	11/25/2015 11:54 AM
5	Over fishing by some fishermen	11/24/2015 6:33 PM
6	the fish that have been planted there	11/17/2015 9:41 AM

Q13 When and how often do you typically fish Pearl Lake?(Please answer a-e)

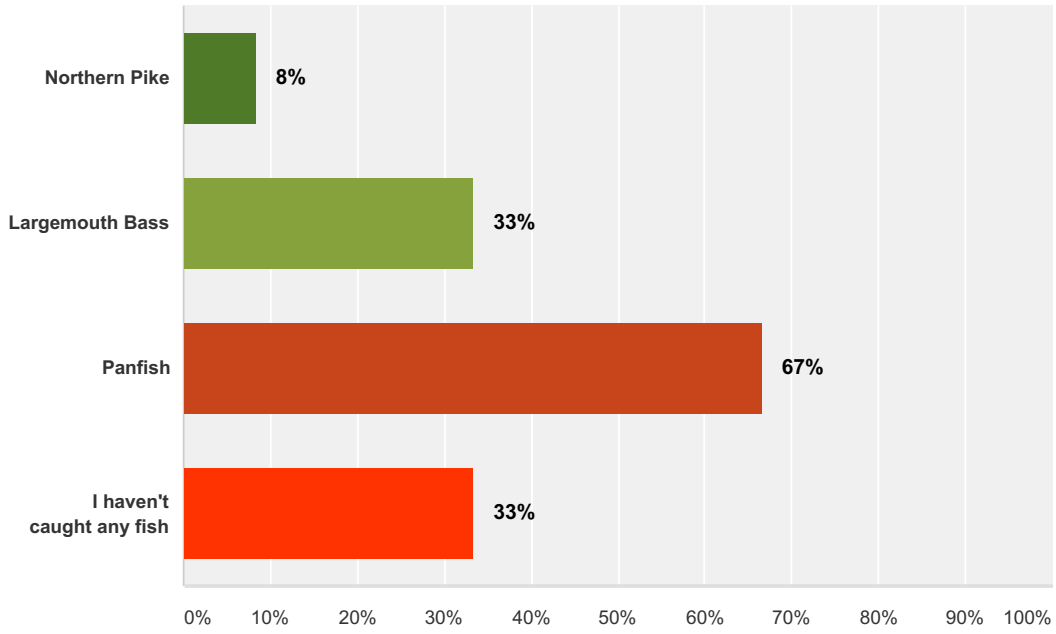
Answered: 12 Skipped: 2



	Winter	Spring	Summer	Fall	Total Respondents
a) Daily	0% 0	0% 0	0% 0	0% 0	0
b) Weekly	0% 0	100% 2	50% 1	0% 0	2
c) Once or twice a month	25% 1	75% 3	100% 4	25% 1	4
d) A few times a year	0% 0	33% 1	67% 2	67% 2	3
e) Not at all	100% 9	56% 5	56% 5	67% 6	9

Q14 What fish do you typically catch at Pearl Lake? Check all that apply.

Answered: 12 Skipped: 2

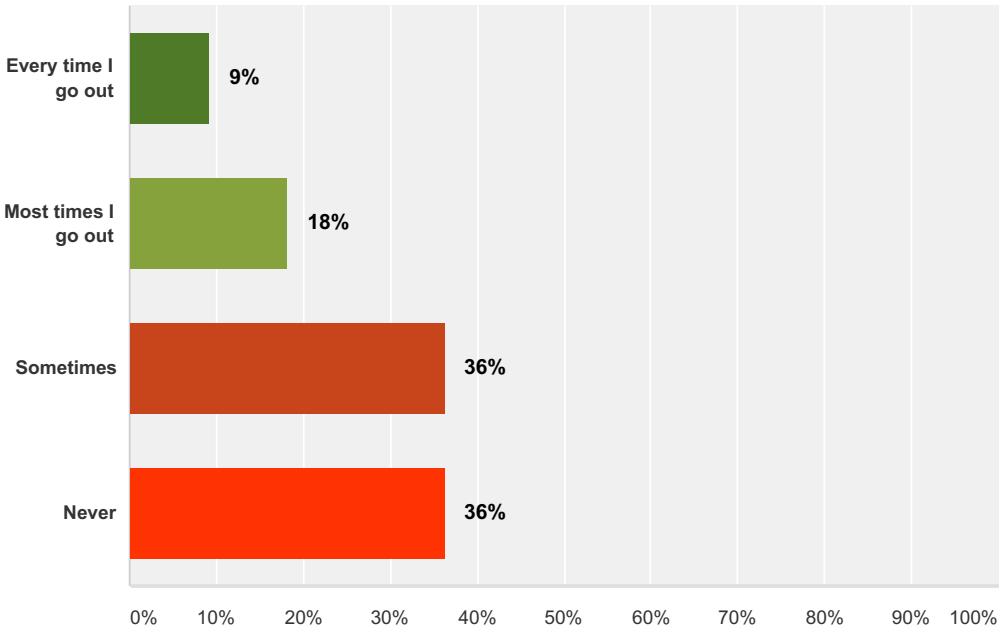


Answer Choices	Responses	
Northern Pike	8%	1
Largemouth Bass	33%	4
Panfish	67%	8
I haven't caught any fish	33%	4
Total Respondents: 12		

#	Other (please specify)	Date
1	perch, trout....saw a dead walleye floating last summer.	11/24/2015 4:45 PM

Q15 In general, how often do you catch fish on Pearl Lake?

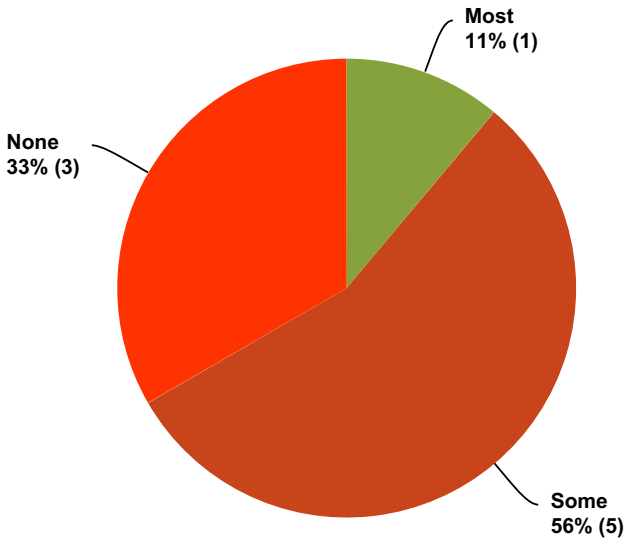
Answered: 11 Skipped: 3



Answer Choices	Responses	
Every time I go out	9%	1
Most times I go out	18%	2
Sometimes	36%	4
Never	36%	4
Total Respondents: 11		

Q16 In general, how many of the fish you catch are big enough to keep?

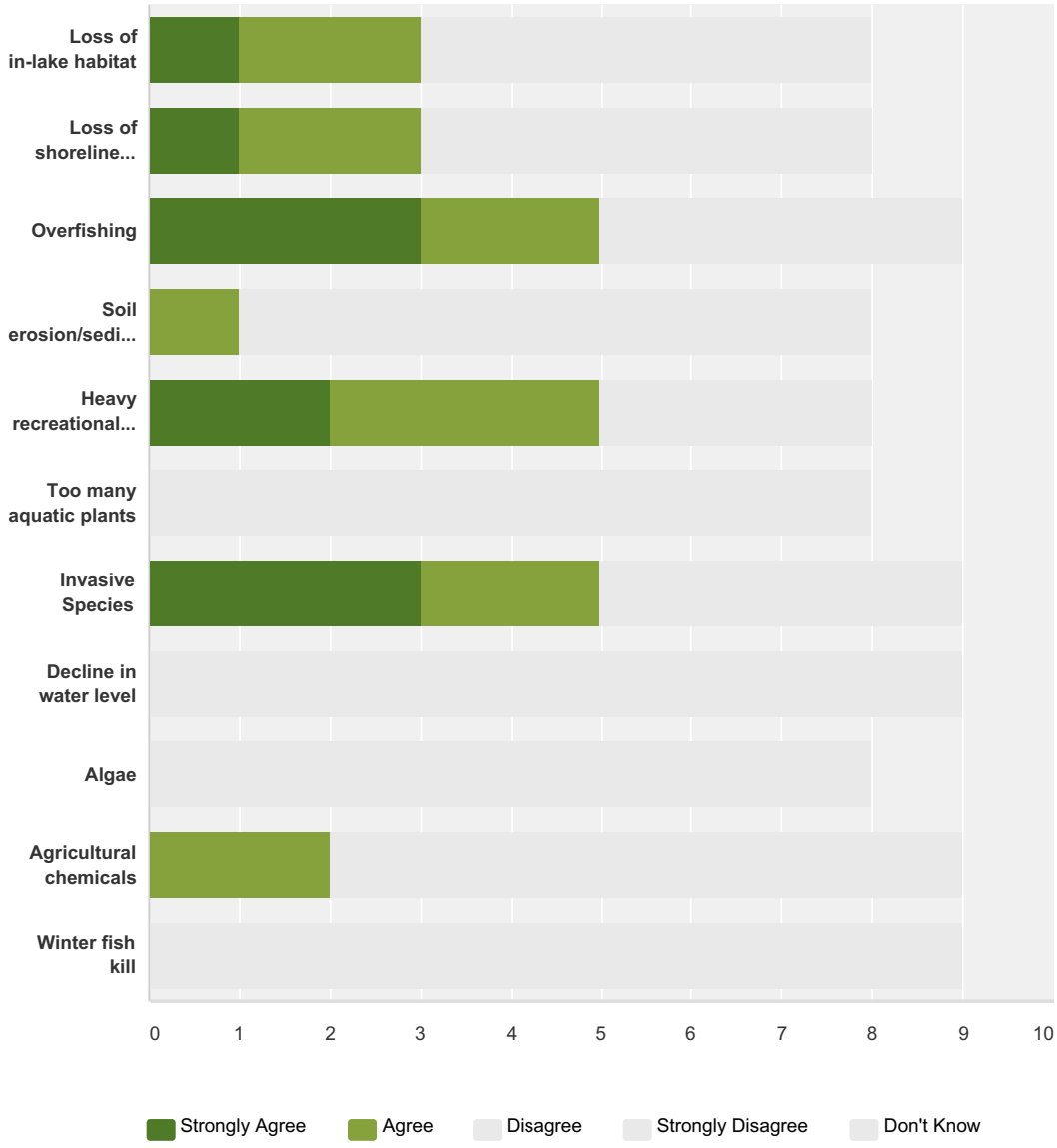
Answered: 9 Skipped: 5



Answer Choices	Responses	
All	0%	0
Most	11%	1
Some	56%	5
None	33%	3
Total		9

Q17 What do you believe is the greatest threat to the fishery in Pearl Lake in the next 10 years?

Answered: 10 Skipped: 4



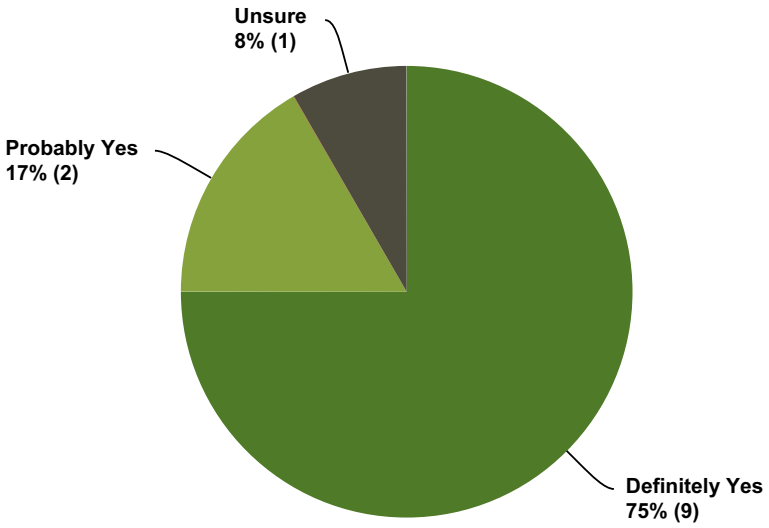
	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	Total Respondents
Loss of in-lake habitat	13% 1	25% 2	0% 0	0% 0	63% 5	8
Loss of shoreline habitat	13% 1	25% 2	25% 2	0% 0	38% 3	8
Overfishing	33% 3	22% 2	11% 1	0% 0	33% 3	9
Soil erosion/sedimentation	0% 0	13% 1	38% 3	0% 0	50% 4	8

Heavy recreational use	**25%** 2	**38%** 3	**13%** 1	**0%** 0	**25%** 2	8
Too many aquatic plants	**0%** 0	**0%** 0	**38%** 3	**0%** 0	**63%** 5	8
Invasive Species	**33%** 3	**22%** 2	**11%** 1	**0%** 0	**33%** 3	9
Decline in water level	**0%** 0	**0%** 0	**50%** 4	**13%** 1	**50%** 4	8
Algae	**0%** 0	**0%** 0	**13%** 1	**25%** 2	**63%** 5	8
Agricultural chemicals	**0%** 0	**25%** 2	**0%** 0	**38%** 3	**50%** 4	8
Winter fish kill	**0%** 0	**0%** 0	**13%** 1	**38%** 3	**63%** 5	8

#	Other (please specify)	Date
1	planting fish	11/29/2015 9:19 PM
2	Not being able to replace bluegills.	11/25/2015 12:49 PM
3	the planting of the wrong species of fish	11/17/2015 9:41 AM

Q18 Do you believe fish from Pearl Lake are safe to eat?

Answered: 12 Skipped: 2



Answer Choices	Responses	
Definitely Yes	75%	9
Probably Yes	17%	2
Probably No	0%	0
Definitely No	0%	0
Unsure	8%	1
Total		12

Q19 Do you have any additional comments regarding the fishery in Pearl Lake?

Answered: 2 Skipped: 12

#	Responses	Date
1	Size of panfish have gotten smaller	11/29/2015 11:59 AM
2	We need a reduced bag limit on panfish	11/25/2015 12:49 PM