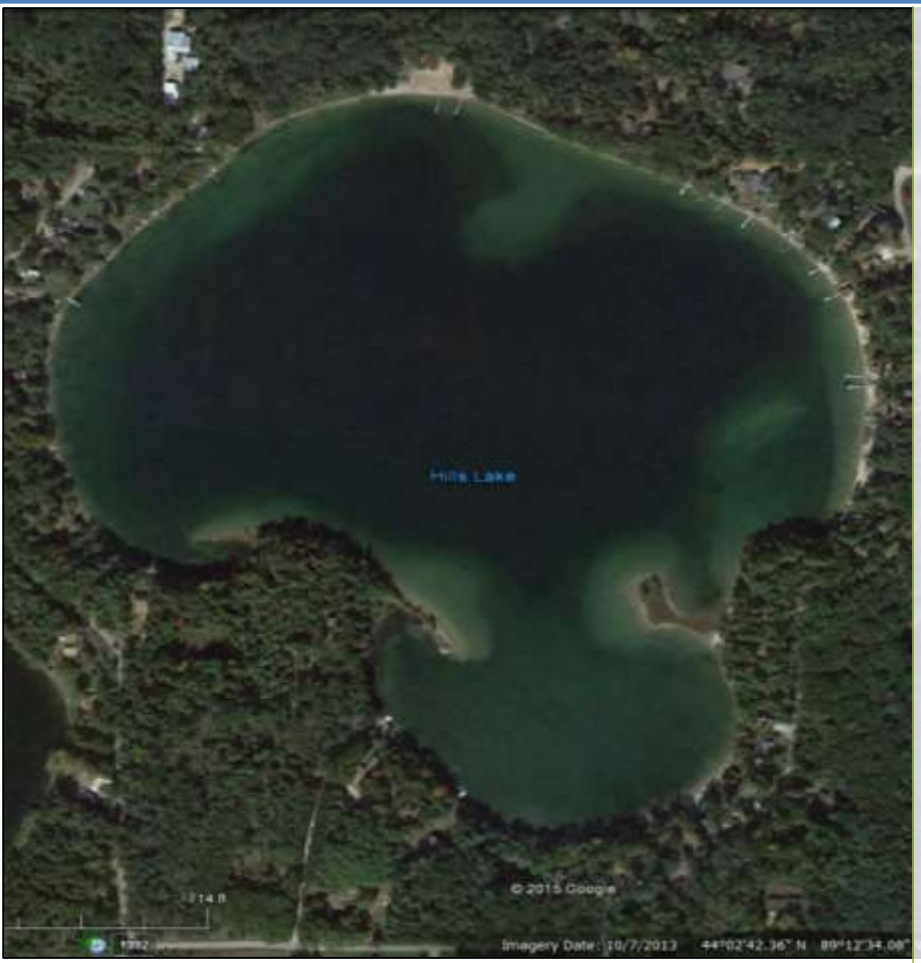
2015

Little Hills Lake, Waushara County, Wisconsin
Lake Management Plan



Prepared by staff from the Center for Watershed Science and Education
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Little Hills Lake Management Plan

The Little Hills Lake Management Plan was developed with input from residents and lake users at a series of four public planning sessions held at the Marion Town Hall in Wautoma, Wisconsin during May-August 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 Little Hills Lake Management District on: December 1, 2015.
Date

The plan was accepted by the town of Marion on: _____.
Date

The plan was accepted by Waushara County on: January 6, 2016.
Date

The plan was approved by the Wisconsin Department of Natural Resources on: May 9, 2016.
Date

A special thanks to all who helped to create the Little Hills 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 to this planning process:

Waushara County Watershed Lakes Council

Waushara County Staff and Citizens

Wisconsin Department of Natural Resources Lake Manager, Ted Johnson

Wisconsin Department of Natural Resources Lake Protection Grant Program

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Overarching Vision for Little Hills Lake

The future of Little Hills Lake will continue a long-standing tradition of compatible multiuse including a range of active daytime activities and quiet, cozy nights where generations gather to enjoy this handsome natural feature.

Introduction

Little Hills Lake is an 81-acre seepage lake located in the township of Marion in Waushara County, Wisconsin. Surface runoff and groundwater contribute most of its water, and its maximum depth is 27 feet. Its bottom sediments are mostly sand with some cobble found along the southern and northern shores. The surface watershed for Little Hills Lake is approximately 956 acres. The dominant types of land use in the watershed are agriculture (59%) and forests (28%). The land closest to the lake often has the greatest impact on water quality and habitat; Little Hills Lake is surrounded by residential properties and forests.

The purpose of this plan is to provide a framework for the protection and improvement of Little Hills Lake. Implementing the content of this lake management plan (LMP) will enable citizens and other supporters to achieve the vision for Little Hills Lake now and in the years to come. The plan was developed by community members who learned about the lake and identified features important to the Little Hills Lake community to help guide the fate of the lake. It is a dynamic document that identifies goals and action items for the purpose of maintaining, protecting and/or creating desired conditions in a lake and identifies steps to correct past problems, improve on current conditions, and provide guidance for future boards, lake users, and technical experts. Because many entities are involved in lake and land management, it can be challenging to navigate the roles, partnerships and resources that are available; the planning process and content of this plan have been designed to identify where some key assistance exists. The actions identified in this LMP can serve as a gateway for obtaining grant funding and other resources to help implement activities outlined in the plan.

Who can use the Little Hills 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 Little Hills Lake can have the greatest influence on the lake by understanding and choosing lake-friendly options to manage their land and the lake.
- **Little Hills Lake Management District:** This plan provides the Little Hills Lake Management District 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 Little Hills Lake Management District to realize its

accomplishments. Resources and funding opportunities for Little Hills Lake Management District activities are made more available by placement of goals into the lake management plan, and the Little Hills Lake Management District can identify partners to help achieve their goals for Little Hills Lake.

- **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 Marion:** 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

One of the first steps in creating this plan was to gather and compile data about the lake and its ecosystem to understand past and current lake conditions. This was done alongside 32 other lakes as part of the Waushara County Lakes Project. The Waushara County Lakes Project was initiated by citizens in the Waushara County Watershed Lakes Council who encouraged 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. There was insufficient data available for many of the lakes to evaluate current water quality, aquatic plant communities, invasive species, and shorelands. The data that were available had been collected at differing frequencies or periods of time, making it difficult to compare lake conditions. Professionals and students from UW-Stevens Point 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 Wisconsin Department of Natural Resources professionals were also incorporated into the planning process, helping to create 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.

Previous plans for Little Hills Lake include the August 2003 Little Hills Lake Comprehensive Lake Management Plan prepared by NES Ecological Services. Several reports from the Little Hills 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/ (select “Departments”, “Zoning and Land Conservation”, “Land Conservation”, and “Lake Management Planning”). Unless otherwise noted, the data used in the development of this plan were detailed in the report *Waushara County Lakes Study – Little Hills Lake 2010-2012*, University of Wisconsin-Stevens Point. A Comprehensive Lake Management Plan was prepared for Little Hills Lake in August 2003 by NES Ecological Services.

The Planning Process

The planning process included a series of four public planning sessions held between May and August at the Marion Town Hall. The Little Hills Lake Planning Management Committee consisted of property owners and recreational users of the lake. 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 & Development Council, Inc. (RC&D), University of Wisconsin-Extension (UWEX), and the University of Wisconsin-Stevens Point Center for Watershed Science and Education (CWSE).

Participation in the planning process was open to everyone and was encouraged by letters mailed to Little Hills 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. To involve and collect input from as many people as possible, a topic-specific survey related to the subject of each upcoming planning session was made available prior to each planning session. Property owners and interested lake users were notified about the surveys and how to access them (via postcards mailed to waterfront property owners and press releases in local newspapers). The surveys could be filled out anonymously online, or paper copies were available upon request. Survey questions and responses were shared at the planning sessions and can be found in Appendix E. Lake User Survey Results.

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

Guest experts and professionals attended the planning sessions. 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. This information was organized with the survey results into discussion topics, which included: 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, planning committee members identified goals, objectives, and actions for the lake management plan that were recorded by professionals from UW-Stevens Point. Planning session notes and presentations are available on the Waushara County website.

Goals, Objectives and Actions

The following goals, objectives and associated actions were derived from the values and concerns of citizens interested in Little Hills Lake and members of the Little Hills Lake Management Planning Committee, as well as the known science about Little Hills Lake, its ecosystem and the landscape within its watershed. A lake management plan is a living document that changes over time to meet the current needs, challenges and desires of the lake and its community. Implementing and regularly updating the goals and actions in Little Hills Lake Management Plan will ensure that the vision is supported and that changes or new challenges are incorporated into the plan. **The goals, objectives and actions listed in this plan should be reviewed annually and updated with any necessary changes.**

Although each lake is different, the Wisconsin Department of Natural Resources requires that each comprehensive lake management plan address a specific list of topics affecting the character of a lake, whether each topic has been identified as a priority or as simply something to preserve. In this way, every lake management plan considers the many aspects associated with lakes. These topics comprise the chapters in this plan and have been grouped as follows:

In-Lake Habitat and a Healthy Lake

Fish Community—fish species, abundance, size, important habitat and other needs
Aquatic Plant Community—habitat, food, health, native species, and invasive species
Critical Habitat—areas of special importance to the wildlife, fish, water quality, and aesthetics of the lake

Landscapes and the Lake

Water Quality 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, Little Hills Lake Management District

The following goals have been identified as 'high priority':

Goal 6. Collect long term data on Little Hills Lake to monitor trends, declines, and improvements over time.

Objective 6.1. Continue any current monitoring initiatives and begin collecting data that is not routinely recorded.

Goal 1. Little Hills Lake will restore a sustainable, balanced fishery.

Objective 1.1. Improve habitat to enhance the fishery.

Goal 7. Enhance the shoreland of Little Hills Lake through programs of education and projects that improve the aquatic plant environment. Over the next five years, 50 feet of shoreland will be restored.

Objective 7.1. Maintain and protect vegetated shorelands where they already exist, and encourage restoring a vegetated buffer where the shorelands are mowed to the edge. Show support for healthy shoreland maintenance and restoration.

Objective 7.2. Shoreland property owners around Little Hills Lake and local decision-makers will understand their roles in protecting and restoring shoreland vegetation and will make informed land management decisions.

Lead persons and resources are given 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
Clean Boats Clean Waters	CBCW
Citizen Lake Monitoring Network	CLMN
UWSP Center for Watershed Science and Education	CWSE
Wisconsin Department of Agriculture, Trade and Consumer Protection	DATCP
Little Hills Lake Management District	LHLMD
North Central Conservancy Trust	NCCT
Golden Sands Resource Conservation & Development Council, Inc.	RC&D
UW Extension	UWEX
University of Wisconsin-Stevens Point	UWSP
Waushara County Land Conservation Department	WCLCD
Waushara County Watershed Lakes Council	WCWLC
Wisconsin Department of Natural Resources	WDNR
Wisconsin Department of Transportation	WDOT
UWSP Water and Environmental Analysis Laboratory	WEAL

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

In-Lake Habitat and a Healthy Lake

Many lake users value Little Hills Lake for its fishing, wildlife, and good water quality. 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 Little Hills 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.

Table 1. History of fish stocking by Wisconsin Department of Natural Resources

Year	Species	Age Class	Number Stocked	Average Fish Length (inches)
1990	WALLEYE	FINGERLING	1,000	5
1989	WALLEYE	FINGERLING	3,200	3
1972	WALLEYE	FINGERLING	7,600	3

Participants at the August 10, 2015 planning session indicated they were generally satisfied with the fishery and felt it was improving. David Bartz, Fisheries Biologist with WDNR, was in attendance at the session to present results of monitoring on the lake in recent years. His number one recommendation for enhancing the fishery in Little Hills Lake was to improve shoreland habitat with increased native vegetation and coarse woody structure in shallow water.

The last comprehensive fish survey was conducted on Little Hills Lake in Spring 2011. However, since the removal of the 14" size limit on largemouth bass in 2005, WDNR has been monitoring annually in recent years.

Largemouth Bass are in good abundance with 151/hr >8" reported in 2014. The size structure remains fair with a PSD12 of 13% reported in 2014. The RSD14 has not changed at 2%.

Catch Rate > 8"	PSD12	RSD14	Year
109/hr	19%	2%	2011
173/hr	11%		2012
164/hr	20%		2013
151/hr	13%	2%	2014

Bluegill are in low abundance but appear to be improving every year and size structure is good. 156/hr>3" was reported in 2011, which is a 17-fold increase over what was observed in the 2004 survey.

Catch Rate > 3"	PSD6	RSD7	RSD8	Year
156/hr	41%	14%	4%	2011
	47%		7%	2012
	38%		6%	2013
	70%		25%	2014

Guiding Vision for the Fish Community

Little Hills Lake will have a healthy and abundant fish community with a good mix of panfish and bass.

Goal 1. Little Hills Lake will restore a sustainable, balanced fishery.

Objective 1.1. Improve habitat to enhance the fishery.

Actions	Lead person/group	Resources	Timeline
Determine locations of potential tree drops to provide coarse woody habitat; consult with and seek cooperation from property owners.	LHLMD	WDNR Fisheries Biologist WCLCD WDNR Healthy Habitat Grant Program	Begin 2016
Apply to WDNR for necessary permits for tree drops. Once approved, install tree drops anchored to shore.	LHLMD Shoreland property owners	WDNR Fisheries Biologist WCLCD WDNR Healthy Habitat Grant Program	Begin 2016
Inform individuals about the importance of woody habitat in shallow water near-shore areas of Little Hills Lake and encourage placement in appropriate areas.	LHLMD	We Really Kare Fishing Club	Ongoing
Continue to protect and restore shoreland areas and avoid shoreland alterations to improve fish habitat.	LHLMD Shoreland property owners	UWEX Lakes	Ongoing

Aquatic Plants

Aquatic plants provide the forested landscape within Little Hills 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.

During the aquatic plant survey conducted by UWSP in July 2011, nine species of aquatic plants were found in Little Hills Lake, which was below average when compared with other lakes in the Waushara County Lakes Study (McNelly, 2012). A diverse community of aquatic plants tends to be more stable and is desirable for a healthy lake ecosystem. Most of the plant diversity in Little Hills Lake was found in the southern bay of the lake, with some diversity also found along the western shore.

The survey was based on 195 sites that were assigned within Little Hills Lake using the WDNR's point-intercept protocol (Hauxwell et al., 2010). Of these points, 169 were sampled during this survey. Fifty-one percent (86) of the 169 sampled

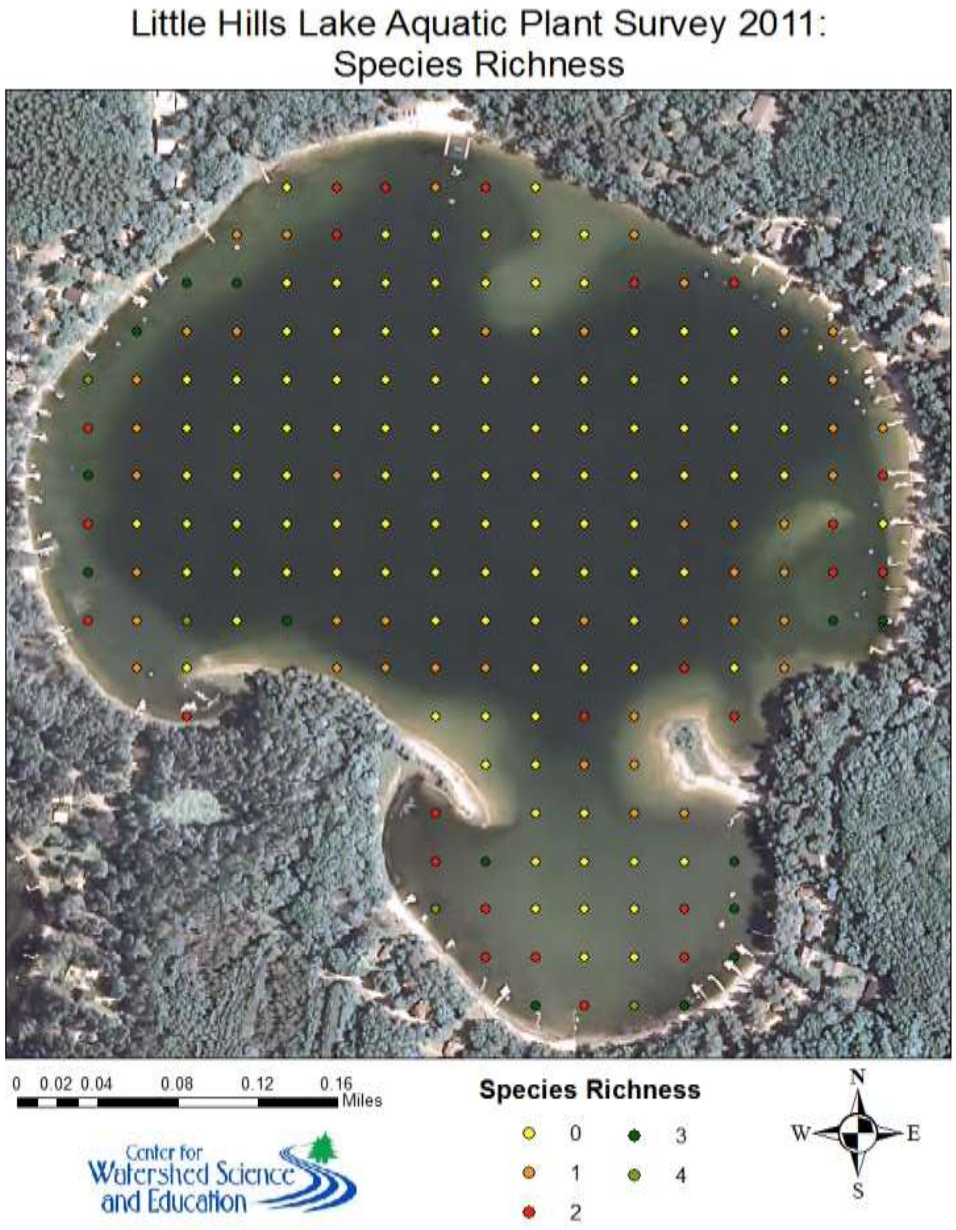


Figure 1. Species richness, 2011 Aquatic Plant Survey.

sites had vegetative growth. The points that were not surveyed were too deep for plant growth, placed on land, or in water that was landlocked. The average depth of the sampled sites was 12 feet and the deepest site in Little Hills Lake that had plant growth was 27 feet. Most plant growth occurred between 4 and 10 feet. Figure 1 shows the number of species that were identified at each sampling site.

The plants encountered most frequently during the survey were muskgrasses, slender naiad and Illinois pondweed; overall, the plant community was characterized by native aquatic plant species that are tolerant of disturbance. Muskgrass is a favorite food source for a wide variety of waterfowl, and muskgrass beds offer cover and food to fish, especially young trout, largemouth bass, and smallmouth bass (Borman et al., 2001). The habitat, food source, and water quality offered by the plant community within Little Hills Lake should be focal points of future lake management strategies. Although not observed during the July 2011 point-intercept survey, the aquatic invasive species hybrid and Eurasian watermilfoil were observed during an AIS reconnaissance survey conducted in 2013 by Golden Sands RC&D, Inc.

More detailed information can be found in the Little Hills Lake Aquatic Plant Report or the Little Hills Lake 2010-2012 Lake Study Report.

Participants at the June 5, 2015 planning session did not feel aquatic plant management was necessary other than to protect and enhance the native community in hopes of greater species diversity.

Guiding Vision for Aquatic Plants in Little Hills Lake

Little Hills Lake will host a diverse aquatic plant community that supports good water quality and a balanced fishery.

Goal 2. Protect the native plant community in and around Little Hills Lake.

Objective 2.1. Maintain the native aquatic plant community in Little Hills Lake.

Actions	Lead person/group	Resources	Timeline
Minimize removal and disturbance of native vegetation (to impede establishment of additional AIS) via educational materials provided in annual mailing, website re: mitigation methods available.	LHLMD Shoreland property owners	WCLWC UWEX	Ongoing
Obtain the appropriate permit for harvesting of any native plants beyond 30 feet from docks.	LHLMD Shoreland property owners	WDNR	Ongoing

Figure 2. EWM/HWM in Little Hills Lake, June 2013.

Aquatic Invasive Species (AIS)

Aquatic invasive 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.

The Wisconsin Department of Natural Resources documented Eurasian watermilfoil (EWM) in 2002 and hybrid Eurasian/northern watermilfoil (HWM) in 2010. EWM/HWM was observed during an AIS reconnaissance survey conducted in 2013 by Golden Sands RC&D, Inc. (Figure 2). The population consisted mostly of single scattered plants.

EWM can exist as part of the plant community or it can create dense beds that can damage boat motors, make areas non-navigable, and inhibit activities like swimming and fishing. This plant produces viable seeds; however, it often spreads by fragmentation. Just a small fragment of the stem is enough to start a new plant, so spread can occur quickly if plants are located near points of activity such as beaches and boat launches.

Each lake is different and its response to control of EWM may differ from lake to lake. No single approach will be appropriate for all lakes. Often multiple approaches and adaptive year-to-year changes in approach are most successful. The population of EWM should be evaluated using a 'point-intercept' method (accompanied by more thorough observations) before and after

treatments 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, EWM management strategies in Little Hills 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 watermilfoils with Eurasian watermilfoil. HWM tends to be more resilient and less affected by chemical treatment. Once HWM is confirmed (2010), a *challenge test* should be conducted to determine which combination of chemicals will be effective in controlling that particular strain. Over 13 combinations of chemicals can potentially be used to treat HWM; the only way to know the appropriate combination is by sending samples to be challenge tested. 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.

Yellow iris is also present in Little Hills Lake and creates the following problems (WDNR, 2015):

- Yellow flag iris can produce many seeds that can float from the parent plant, or plants can spread vegetatively via rhizome fragments. Once established, it forms dense clumps or floating mats that can alter wildlife habitat and species diversity.
- All parts of this plant are poisonous, which results in lowered wildlife food sources in areas where it dominates.
- This species has the ability to escape water gardens and ponds and grow in undisturbed and natural environments, such as wetlands, forests, bogs, swamps, marshes, lakes, streams and ponds.
- Dense areas of this plant may alter hydrology by trapping sediment.

If an invasive plant species not previously documented in Little Hills Lake is observed by any lake user, the lake user is encouraged to refer to Appendix C. Rapid Response Plan for more information on how to report it.

Summary of Aquatic Invasive Species Management Planning Session Discussion – June 5, 2015

Residents have successfully kept the EWM isolated in patches or as individual plants since its discovery in 2002 by using aggressive hand removal and occasional spot treatments. The District has participated in Clean Boats Clean Waters for years and has trained many residents on the identification and proper removal of the species. The District typically obtains a permit each season for the application of Navigate (2,4-D) on areas smaller than one acre in case treatment is needed. In 2013, 0.068 acres were treated. No chemical was applied in 2014 or 2015. On July 28, 2015, a survey for EWM conducted via SCUBA by Mike Wittlieff found no EWM present.

Management options will change depending upon the amount of EWM in Little Hills Lake; therefore, routine annual monitoring of the species is essential. The following management strategies were determined to be the most practical and effective options that would minimize impacts to Little Hills Lake as a whole.

- Manual removal (Native plants, EWM). Property owners are permitted to clear an area up to 30' around their dock for swimming and boat access to open water. Additionally, those trained to properly identify and remove EWM and other aquatic invasive species can remove those plants manually any time of year, without a permit. Trained divers can be hired to manually remove AIS in deeper parts of the lake. With the low populations of EWM currently in Little Hills Lake, this is the preferred approach for removal.

- Chemical spot treatment (EWM). 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. Because hybrid milfoil (HWM) is determined to be present, the type of chemical should be based on the specific type of hybrid. This can be determined through DNA testing. In areas smaller than 5 acres, a contact herbicide such as endothall or diquat should be used. Systemic herbicides should not be used. Treatment should occur early in the season, prior to emergence of native plants. To reduce the chance of developing resilient strains of EWM, different treatments should be used each year.

- Milfoil weevils (EWM). This option could be considered in areas of the lake with native or restored shorelines. Milfoil weevils are commercially available, but are expensive, so obtaining a starter population and rearing them in predator-free conditions can be desirable from a financial standpoint. Furthermore, weevils need undisturbed shoreline for overwintering and cannot survive if chemical treatments are being conducted. Professional assistance should be sought if stocking or rearing is pursued.

- Do nothing. Some lakes have found the invasive species do not 'take off' or become a problem even without management.

- Techniques applied within the watershed and on shoreland property can reduce the nutrient loading responsible for aquatic plant growth in the lake. This is discussed further in the Shoreland and Watershed sections.

Guiding Vision for Aquatic Invasive Species

Little Hills Lake will be free of invasive species.

Goal 3. Eliminate EWM/HWM and prevent any new populations from occurring.

Objective 3.1. Eliminate EWM/HWM from Little Hills Lake.

Actions	Lead person/group	Resources	Timeline
Inform property owners about refraining from removing native aquatic vegetation to reduce the possibility of invasive species colonization.	LHLMD	WCWLC UWEX (educational materials)	Ongoing
Re-evaluate the aquatic plant community to determine the next steps needed for EWM/HWM reduction/elimination. Review strategies for control/elimination of EWM (based on options laid out above) each year and adjust if needed.	LHLMD	Consultant WDNR Aquatic Plant Specialist	Annually
If EWM/HWM populations exceed what is manageable by hand pulling, consider using herbicides in areas of denser infestation. (manageability is dependent on the extent of growth, depth of plants, and visibility when plants are being removed).	LHLMD	RC&D Consultant	As needed
Work with area lakes to apply jointly for a grant to hire divers (DASH) to hand pull EWM/HWM.	LHLMD	RC&D WCWLC	As needed

Objective 3.2. Prevent the recurrence of EWM/HWM or the establishment of other invasive species.

Actions	Lead person/group	Resources	Timeline
Use signs (at boat landing), newsletters, and other methods to educate lake visitors about invasives and removing aquatic hitchhikers.	LHLMD	RC&D CBCW	Ongoing
Inform property owners of the importance of aquatic vegetation and to refrain from removing native aquatic vegetation to diminish the possibility of AIS colonization.	LHLMD	WCWLC RC&D	Ongoing
Learn to identify AIS and look for it routinely. Remove if found. Invite RC&D to annual meeting for training.	Volunteers	RC&D	Ongoing spring through fall

Continue the CBCW program on busy lake use days and holiday weekends.	Volunteers	RC&D	Ongoing
Remove yellow flag iris by hand pulling when observed.	Property owners	RC&D	Ongoing

Critical Habitat

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

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

Guiding Vision Little Hills Lake's Critical Habitat

Sensitive areas in and around Little Hills Lake will remain intact and protected.

Goal 4. Protect unique areas that are valuable to the habitat and water quality in and near Little Hills Lake.

Objective 4.1. Identify potentially critical habitat on Little Hills Lake.

Actions	Lead person/group	Resources	Timeline
If critical habitat is designated on Little Hills Lake, communicate to shoreland property owners why these areas are important.	LHLMD	Consultants RC&D WDNR Fisheries Biologists, Wildlife Specialists, and Lake Managers	

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.

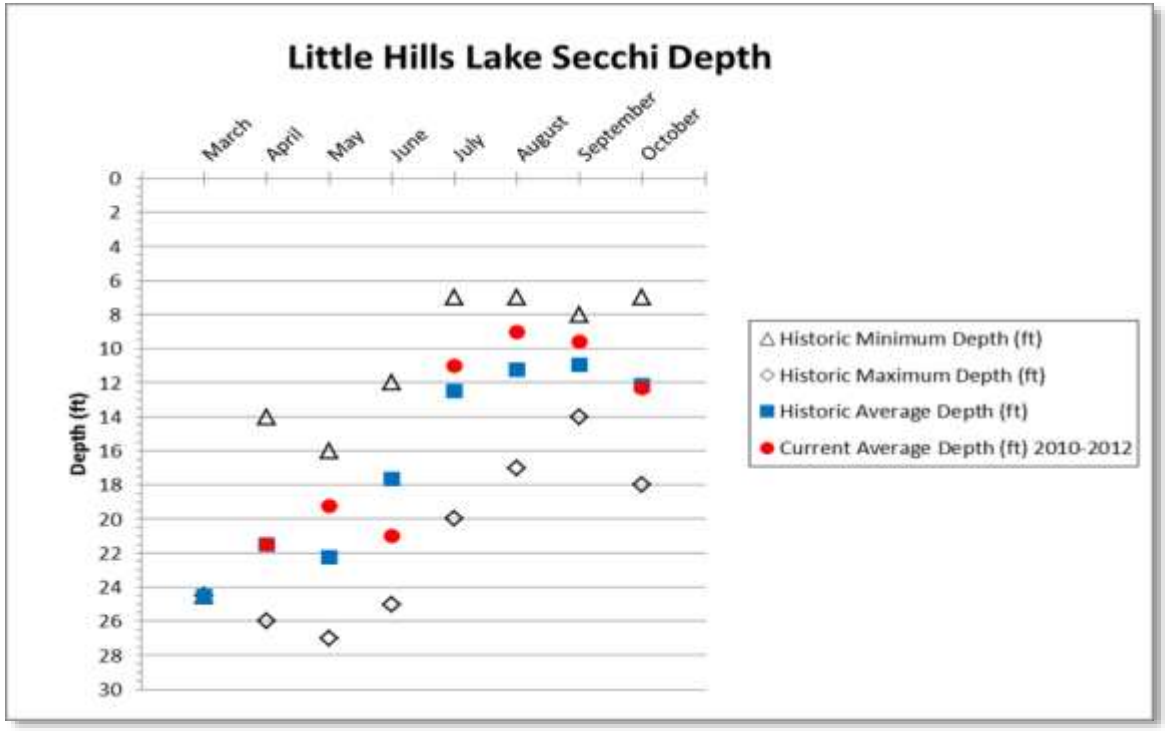
The water quality in Little Hills Lake is the result of many factors, including the underlying geology, the climate, and land management practices. Since we have little control over the climate and cannot change the geology, changes to land management practices are the primary actions that can have positive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

Water Quality

Planning participants recognized the both the personal and economic value of their lake's water quality. They also felt that their water quality was generally good and had remained unchanged during their time at the lake. A variety of water chemistry measurements were used to characterize the water quality in Little Hills 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 Little Hills Lake's water quality.

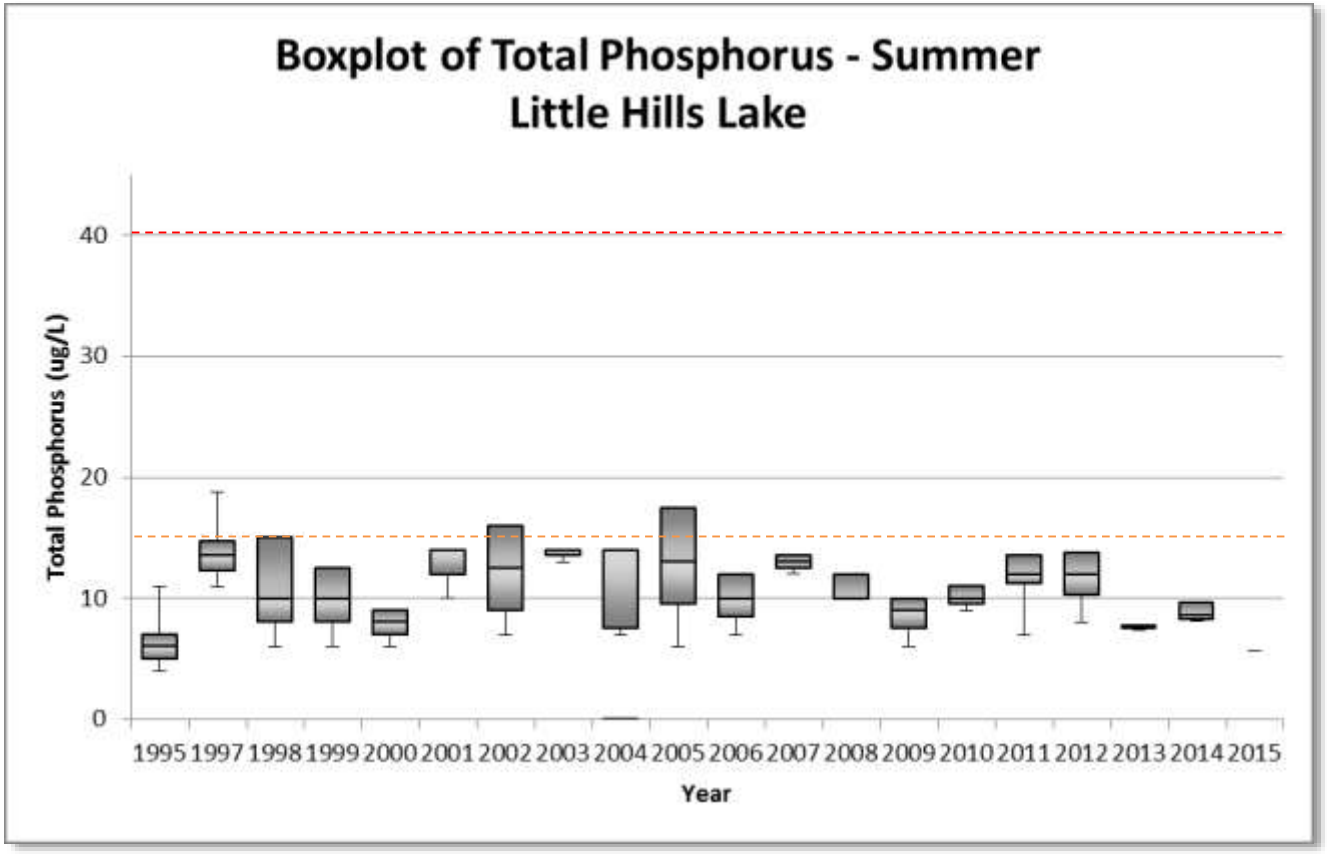
Dissolved oxygen is an important measure in Little Hills Lake because a majority of organisms in the water depend on oxygen to survive. Oxygen is dissolved into the water from contact with air, which is increased by wind and wave action. Algae and aquatic plants also produce oxygen when sunlight enters the water, but the decomposition of dead plants and algae reduces oxygen in the lake. Dissolved oxygen concentrations below 5 mg/L can stress some species of fish and over time can reduce the amount of available habitat for sensitive species of fish and other aquatic organisms. Typical of many lakes in Wisconsin, dissolved oxygen concentrations were mixed from surface to bottom during the spring and fall, with the exception of the October 2011 sample. Data from February 2011 shows a very typical late winter profile with concentrations higher near the surface and declining with depth to 2 mg/L near the bottom. The dissolved oxygen concentrations measured during the study did not reveal any cause for concern about fish kill in Little Hills Lake during the winter. Similar to winter, dissolved oxygen in Little Hills Lake was stratified during the summer months with the concentrations highest at the surface, and dropping down below 5 mg/L towards the bottom.

The water clarity measured in Little Hills Lake was considered good; however, water clarity in Little Hills Lake is typically poorer during the summer months. The shallowest Secchi depth was recorded in late summer. When compared to historic data, the average water clarity measured during the study was slightly better in June and October, about the same in April and worse in May, July, August and September (the figure at the right includes data through June 2015).



Chloride, sodium and potassium concentrations are commonly used as indicators of how a lake is being impacted by human activity. The presence of these compounds where they do not naturally occur indicates sources of water contaminants. Although these elements are not detrimental to the aquatic ecosystem, they indicate that sources of contaminants such as road salt, fertilizer, animal waste and/or septic system effluent may be entering the lake from either surface runoff or via groundwater. Little Hills Lake had moderate average chloride and sodium concentrations over the monitoring period; atrazine (DACT), an herbicide commonly used on corn, was below the detection limit (<0.01 ug/L) in the samples that were analyzed from Little Hills Lake.

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 Little Hills Lake ranged from a high of 31 ug/L in July 2011 to a low of 7 ug/l in February 2011and June 2011. Summer median total phosphorus for Little Hills Lake was 12 ug/L and 14 ug/L in 2011 and 2012, respectively. Subsequent sampling indicates even lower average concentrations. This is below Wisconsin's phosphorus standard of 40 ug/L for shallow seepage lakes such as Little Hills Lake.

Managing nitrogen, phosphorus and soil erosion throughout the Little Hills 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 Little Hills 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 Little Hills Lake

Little Hills Lake will have superb water quality that supports a healthy lake ecosystem and excellent recreational opportunities.

Goal 5. Maintain or improve water quality in Little Hills Lake.

Objective 5.1. Maintain median summer phosphorus concentrations below 15 ppb and spring inorganic nitrogen concentrations <1 ppm.

Actions	Lead person/group	Resources	Timeline
Inform others around the lake about the impacts of nutrients and land management on water quality through the distribution of a District newsletter.	LHLMD	WCWLC	Ongoing
Refrain from the use of fertilizers on shoreland properties (see Shorelands section). Encourage soil testing to determine if fertilizer is necessary.	Property owners LHLMD	WC UWEX	Ongoing
Encourage the restoration of unmowed vegetation to slow and absorb runoff and pollutants from the road (see Shorelands section).	LHLMD	WCWLC UWEX Lakes (educational materials)	Ongoing
Mitigate runoff at the public boat launch. Install a swale or other infiltration structure for runoff from the parking area. Explore a shoreland restoration demonstration site at the boat launch. Ask that the Town quit mowing within at least 35' from shore.	Town of Marion	UWEX Lakes	Begin 2016
Open dialogue with Township regarding minimizing impact to the lake from public land (boat launch). See Communication section.	LHLMD	UWEX Lakes	Begin 2016

Goal 6. Collect long term data on Little Hills Lake to monitor trends, declines, and improvements over time.

Objective 6.1. Continue any current monitoring initiatives and begin collecting data that is not routinely recorded.

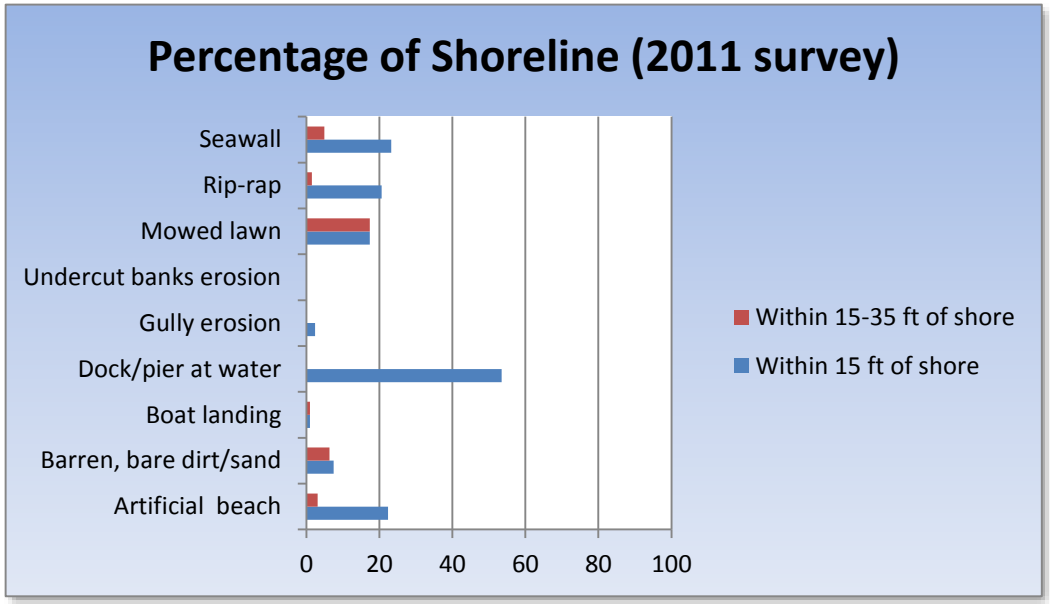
Actions	Lead person/group	Resources	Timeline
Encourage homeowners to test their drinking water for nitrates and atrazine.	LHLMD	State certified water testing lab	Ongoing - annually
Regularly monitor water clarity (5 times a summer).	Volunteer	CLMN Coordinator	Ongoing – summer
Continue monitoring water chemistry (total phosphorus, chlorophyll-*a*).	Volunteer	CLMN Coordinator	Ongoing - summer

Test for inorganic nitrogen in lake water during spring overturn.	Volunteer	State certified water testing lab (for N)	Ongoing - spring
Submit any collected data to WDNR for long term storage, interpretation, and use.	LHLMD	CLMN Coordinator	As needed

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 Little Hills Lake is displayed on the map in Appendix B. Shoreland Survey – 2011. Many stretches of Little Hills Lake's shorelands are in good to moderately-good shape, but some portions have challenges that should be addressed. A few short segments of Little Hills Lake's shoreland ranked as poor.

Shoreland ordinances were enacted to improve water quality and habitat, and to protect our lakes. County and state (NR 115) shoreland ordinances state that vegetation should extend at least 35 feet inland from the water's edge, with the exception of an optional 30-foot viewing corridor for each shoreland lot. With a total of 63 lakefront lots, 1,890 feet (20%) of disturbed shoreland is permitted. Based on the 2011 shoreland inventory, only 17% (1,655 feet) of Little Hills' shoreland was mowed lawn. 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 Little Hills Lake's Shorelands

Shorelines around Little Hills Lake will be protected and restored so that they are stable, healthy and provide good habitat to fish and wildlife.

Goal 7. Enhance the shoreland of Little Hills Lake through programs of education and projects that improve the aquatic plant environment. Over the next five years, 50 feet of shoreland will be restored.

Objective 7.1. Maintain and protect vegetated shorelands where they already exist, and encourage restoring a vegetated buffer where the shorelands are mowed to the edge. Show support for healthy shoreland maintenance and restoration.

Actions	Lead person/group	Resources	Timeline
Continue to protect and restore shoreland areas and avoid shoreland alterations to improve fish habitat, water quality, etc.	Waushara County	UWEX Lakes	Ongoing
Get assistance for restoration of shoreland vegetation, help with restoration/plantings, and cost-sharing for interested property owners.	LHLMD	WCLCD Consultants	Ongoing
Consider restoration projects to create a shoreland demonstration site and offer tours.	LHLMD	UWEX Lakes	Ongoing
Inform individuals about the importance of woody habitat in shallow water near-shore areas of Little Hills Lake and encourage placement in appropriate areas.	We Really Kare Fishing Club	WDNR UW-Stevens Point WCLCD	Ongoing
Support property owners interested in conservation easements, purchase of development rights, etc. Inform property owners of options.	LHLMD	Waushara Co. NCCT	Ongoing

Objective 7.2. Shoreland property owners around Little Hills Lake and local decision-makers will understand their roles in protecting and restoring shoreland vegetation and will make informed land management decisions.

Actions	Lead person/group	Resources	Timeline
Distribute welcome packets to all new shoreland property owners. Packets should contain information regarding the importance of healthy shoreland habitat and steps to restore areas near or surrounding the lake.	LHLMD Waushara Co.	WCWLC UWEX Lakes UWEX County Extension	As needed.
Provide materials to property owners about healthy shorelands and lake friendly practices in welcome packets.	Waushara Co.	Educational materials from: WCLCD UWEX Lakes WCWLC	Ongoing
Inform property owners of the importance of soil testing (for nutrients) to minimize or eliminate use of fertilizers. Offer/facilitate soil testing for interested landowners at an annual meeting.	LHLMD	UWEX County Extension	Winter/early spring
Decrease/eliminate the use of fertilizers on lawns around the lake to reduce inputs of nitrogen and phosphorus.	Shoreland property owners	UWEX Lakes	Ongoing
Minimize stormwater runoff by encouraging landowners to limit new construction of impervious surfaces (blacktop driveways), to utilize rain gardens/rain barrels and to restore vegetation.	LHLMD	WCLCD	Ongoing
Improve shoreland vegetation and use plantings to mitigate runoff from impervious surfaces such as driveways (see also Shoreland section).	Shoreland property owners	WCLCD WDNR Healthy Habitat grants Consultants	Ongoing

Watershed Land Use

It is important to understand where Little Hills 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 or streams. The land area that contributes runoff to a lake is called the surface watershed. Groundwater also feeds Little Hills 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 Little Hills Lake is 956 acres. Primary land uses are agriculture (59%) and forests (28%) (Figure 3). The lake's shoreland is surrounded primarily by development and forests. In general, the land closest to the lake has the greatest immediate impact on water quality.

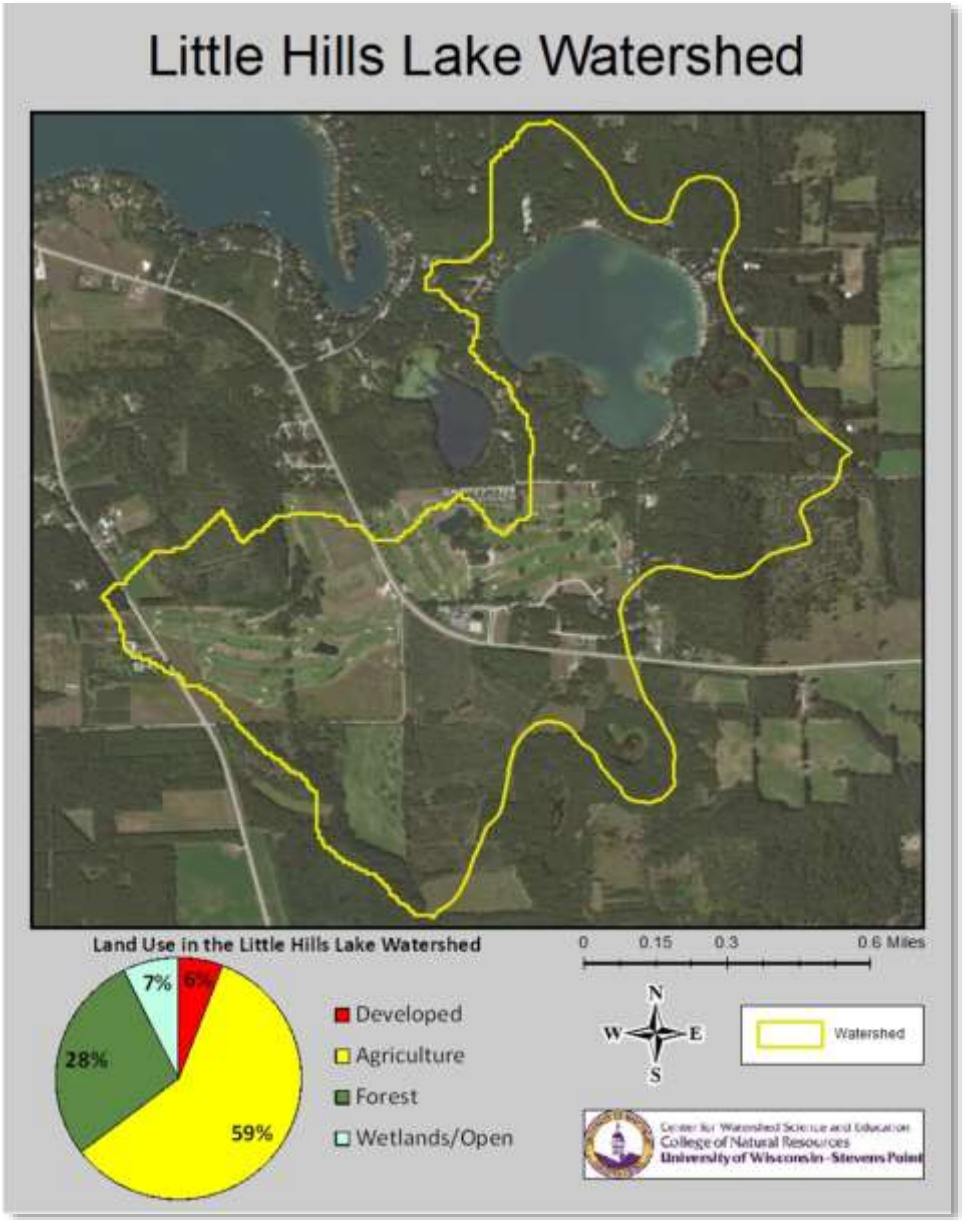


Figure 3. Surface watershed of Little Hills Lake.

Estimates of phosphorus from the landscape can help in understanding the phosphorus sources to Little Hills 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 through 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. While agriculture and forests comprised the greatest areas of the watershed, modeling results indicated that agriculture and developed land had the greatest percentages of phosphorus contributions from the watershed to Little Hills Lake. The phosphorus contributions by land use category, called phosphorus export coefficients, are shown in Figure 4. The phosphorus export coefficients have been obtained from studies throughout Wisconsin (Panuska and Lillie, 1995).

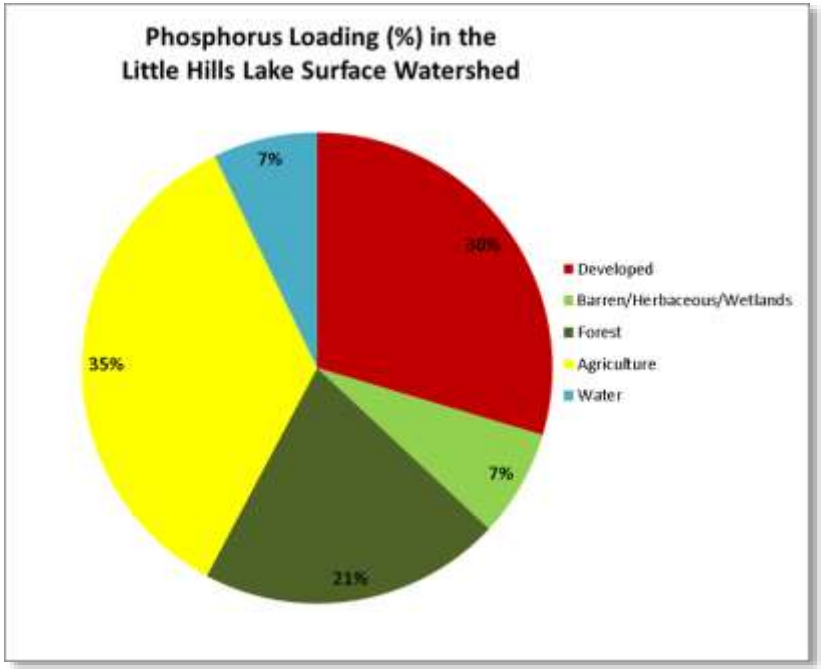


Figure 4. Estimated phosphorus contributions to Little Hills Lake by land use category.

Guiding Vision for Little Hills Lake's Watershed

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

Goal 7. Watershed property owners and municipal board members will know about and utilize resources for healthy land management practices.

Objective 7.1. Support healthy land management activities in the Little Hills Lake watershed.

Actions	Lead person/group	Resources	Timeline
Encourage the County to support and follow-up with water quality-based Best Management Practices (BMPs) within the watershed. Include BMPs that reduce application of excess nitrogen and pesticides that leach to groundwater.	WCLCD	NRCS DATCP	Ongoing
Support landowners interested in the protection of their land via a land conservation program (i.e. Conservation Easement, Purchase of Development Rights, or sale of land for protection).	LHLMD	NCCT Lake Protection grants Knowles-Nelson Stewardship Funds	As needed
Encourage subdivisions and other new developments to manage stormwater on site and consider ways to minimize impacts from septic systems on Little Hills Lake.	WC	Town of Marion Developers	As needed
Protect any wetlands in the lake's watershed to maintain the water budget of Little Hills Lake. Any altered wetlands should be mitigated within the lake's watershed.		WDNR	As needed
Encourage design of road and construction projects that will minimize impacts to Little Hills Lake.	LHLMD	Town Marion WC Highway Dept. WDOT	As needed

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 positive impacts on the lake and on those who enjoy this common resource. Collaborative efforts may have bigger positive impacts; therefore, communication and cooperation between a lake district, community, and suite of lake users are essential to maximize the effects of plan implementation.

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

Recreation

Little Hills Lake has wake hours between 10 pm and 4 pm. One public boat landing is located on the south side of the lake. The lake is enjoyed by people who swim, boat, fish, and appreciate its beauty. Participants at the planning session did not indicate any significant recreational issues, mentioning they like the boating hours as they are and most people are respectful. Any problems are typically associated with renters who are not familiar with the lake.

Guiding Vision for Recreation

Little Hills Lake will be valued for its great boating, fishing, swimming and relaxation.

Goal 8. Ensure safe recreational opportunities at Little Hills Lake.

Objective 8.1. Nurture an environment of compliance among lake users.

Actions	Lead person/group	Resources	Timeline
Work with the Towns to ensure the continuation of boat patrol on the lake, especially during busy times.	LHLMD Town of Marion	WC Sheriff WDNR Warden	Ongoing
Post/maintain signage at public access emphasizing respectable use of Little Hills Lake and information about wake hours.	Town of Marion	UWEX Lakes	As needed
Explore possibility of portable toilets at both boat launches.	Town of Marion		2016
Develop a neighborhood watch and Inform residents of who to contact if they observe something that should be reported to ensure public safety.	LHLMD	WC Sheriff WDNR Warden	Ongoing

Ask landlords to inform renters of No Wake hours and other lake rules.	LHLMD		Ongoing
Create information pamphlet for distribution to rental properties regarding lake history, highlights and rules.	Interested citizen	UWEX Lakes	As needed.

Communication and Organization

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

Guiding Vision for Communication

The Little Hills Lake community will be connected and informed in lake stewardship.

Goal 9. Increase participation in lake stewardship.

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

Actions	Lead person/group	Resources	Timeline
Maintain an email list of shoreland property owners and others interested in Little Hills Lake.	LHLMD		Ongoing
Continue to distribute a welcome packet/mailing to all new shoreland property owners with basic lake stewardship information/brochures.	WCWLC	UWEX Lakes	Ongoing
Continue biannual updates to lake management plan and management activities to residents and users of the lake via email list and/or newsletter.	LHLMD		Ongoing
Host an annual meeting to discuss lake management and opportunities for shoreland property owners.	LHLMD		Annually
Host gatherings to learn about topics identified in this lake management plan. Invite speakers or conduct demonstrations.	LHLMD	UWEX Lakes	Ongoing

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

Actions	Lead person/group	Resources	Timeline
Network with other lake groups in Waushara County by having Little Hills Lake should be represented on the WCWLC.	LHLMD	WC UWEX	Quarterly
Network with other lakes in the state to learn lake management strategies, etc. by having a representative attend the Wisconsin Lake Convention.	LHLMD	UWEX Lakes	Annually
Consider sending an individual interested in Little Hills Lake to the Lake Leaders Institute	LHLMD	UWEX Lakes	April 2016
Open dialogue with Town (at public meeting) regarding maintenance of the boat launch. Mitigate runoff; install a swale or other infiltration structure for runoff from the parking area. Explore a shoreland restoration demonstration site at the boat launch. Ask that the Town stop mowing within at least 35' from shore.	LHLMD	UWEX Lakes	Fall 2015

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

Little Hills Lake will have an up to date and relevant lake management plan.

Goal 10. Review LMP annually and update every five years or more frequently, if needed.

Objective 10.1. LMP will be reviewed to identify goals for upcoming year and reflect on achievements.

Actions	Lead person/group	Resources	Timeline
Include LPM updates as a regular agenda item at the annual meeting.	LHLMD		Annually
Notify lake district members of any potential changes in the LMP.	LHLMD		As needed
Notify organizations that adopted this Little Hills Lake Management Plan of proposed changes to the LMP.	LHLMD	WCLCD Town of Marion WDNR Lake Manager	As needed
If aquatic plant management is occurring, update the Little Hills LMP every five years.	LHLMD	Consultant	2020

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.

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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.

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/

Conservation Easements (cont'd)

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 Street, PO Box 487, Wautoma, WI 54982
Phone: 920-787-0416
E-mail: ken.williams@ces.uwex.edu
Website:
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

Groundwater Levels/Quantity (cont'd)

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

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
Website:
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/

Lake Groups (cont'd)

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

Land Use Plans and Zoning Ordinances (cont'd)

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 Street, PO Box 487, 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

Contact: UWSP Wisconsin Environmental Analysis Laboratory
TNR 200, 800 Reserve St., Stevens Point, WI 54481
Stevens Point, WI 54481
Phone: 715-346-3209
E-mail: weal@uwsp.edu
Website: http://www.uwsp.edu/cnr-ap/weal/Pages/default.aspx

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

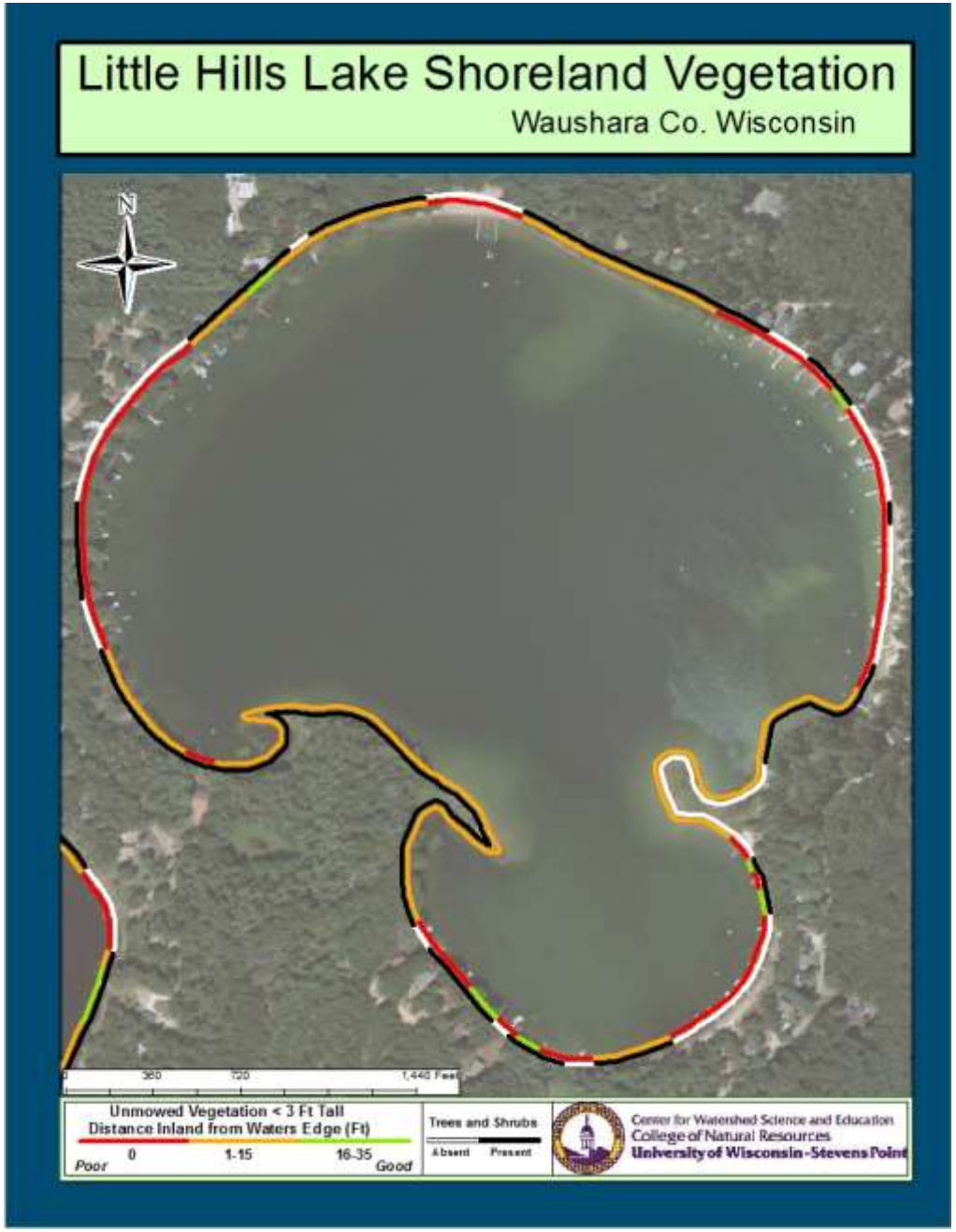
Woody Habitat

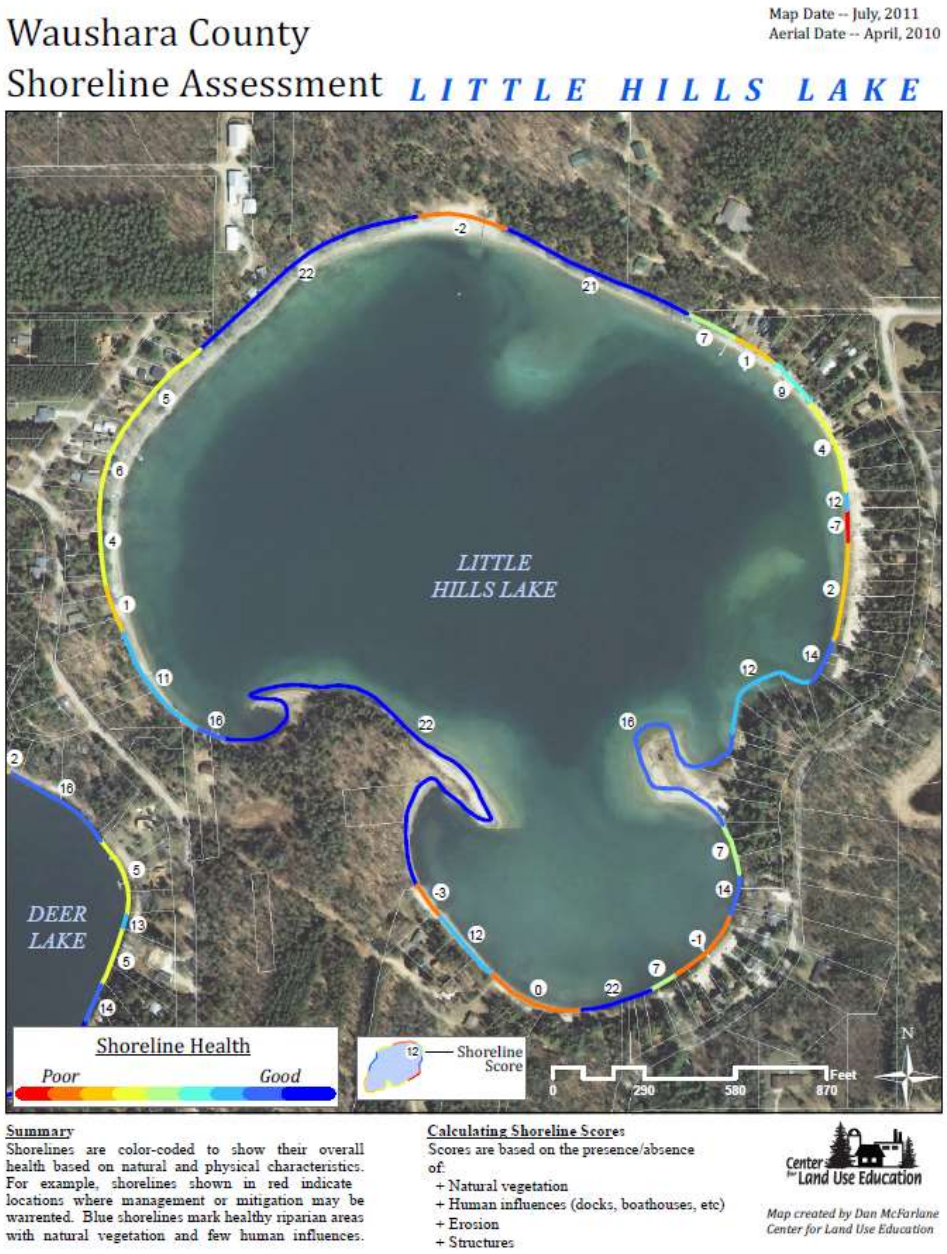
Contact: Dave Bartz
Wisconsin Department of Natural Resources
Phone: 608-635-4989
Address: Hwy 22N Box 430, Montello, WI 53949
E-mail: David.Bartz@wisconsin.gov

If you are looking for any information that is not listed in this directory, please contact:
Ryan Haney (wclakes@uwsp.edu)
UWSP Center for Watershed Science and Education
TNR 224, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-2497

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 Little Hills Lake are displayed to the left. The shorelands were color-coded to show their overall health based on natural and physical characteristics. Blue shorelands identify healthy shorelands with sufficient vegetation and few disturbances. Red shorelands indicate locations where changes in management or mitigation may be warranted. Many stretches of Little Hills Lake's shorelands are in good to moderately-good shape, but some portions have challenges that should be addressed. A few short segments of Little Hills Lake's shoreland 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/.

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: Marion

- **The Lake District** in which the waterbody is located.
  Contact: Francine Marshall
  Phone: 920-787-2976

- **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**

- **Little Hills Lake Management District**

If an invasive species is confirmed the secretary of Little Hills Lake Management 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	LIMITATIONS
∗ 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. ∗ No associated cost. ∗ If aquatic invasive species are not pulled properly, could worsen the problem.	∗ Removes near-shore wildlife and fish habitat. ∗ Opens up areas where invasives to become established.

Hand Pulling Using Suction

ADVANTAGES	LIMITATIONS
∗ 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.	∗ 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 population; 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

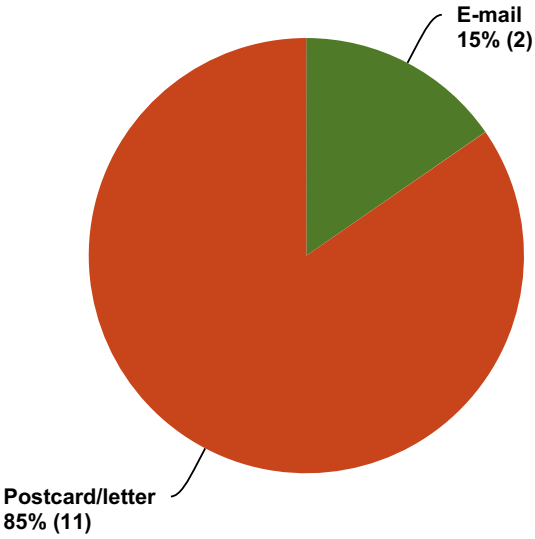
Q1 What is your Waushara County Lakes Survey ID?

Answered: 14 Skipped: 0

#	Responses	Date
1	[redacted]	4/25/2015 11:16 AM
2	[redacted]	4/22/2015 3:44 PM
3	[redacted]	4/22/2015 11:38 AM
4	[redacted]	4/22/2015 8:23 AM
5	[redacted]	4/22/2015 7:46 AM
6	[redacted]	4/22/2015 7:16 AM
7	[redacted]	4/22/2015 6:53 AM
8	[redacted]	4/22/2015 4:59 AM
9	[redacted]	4/21/2015 6:45 PM
10	[redacted]	4/21/2015 5:29 PM
11	[redacted]	4/21/2015 3:09 PM
12	[redacted]	4/21/2015 8:55 AM
13	[redacted]	4/20/2015 8:37 PM
14	[redacted]	4/20/2015 6:16 PM

Q2 How did you hear about this survey?

Answered: 13 Skipped: 1

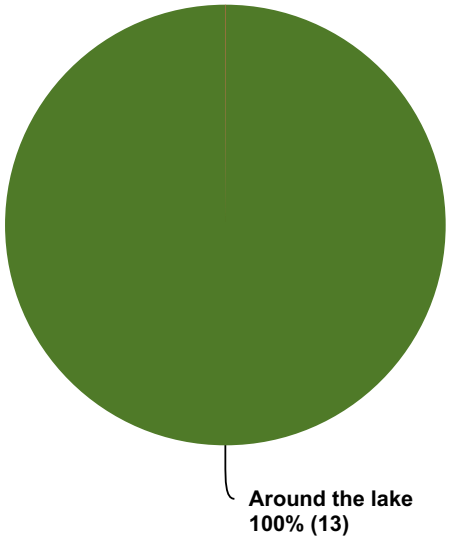


Answer Choices	Responses	
E-mail	15%	2
Newspaper	0%	0
Postcard/letter	85%	11
Facebook	0%	0
Radio	0%	0
Total		13

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

Q3 Do you own or rent property...

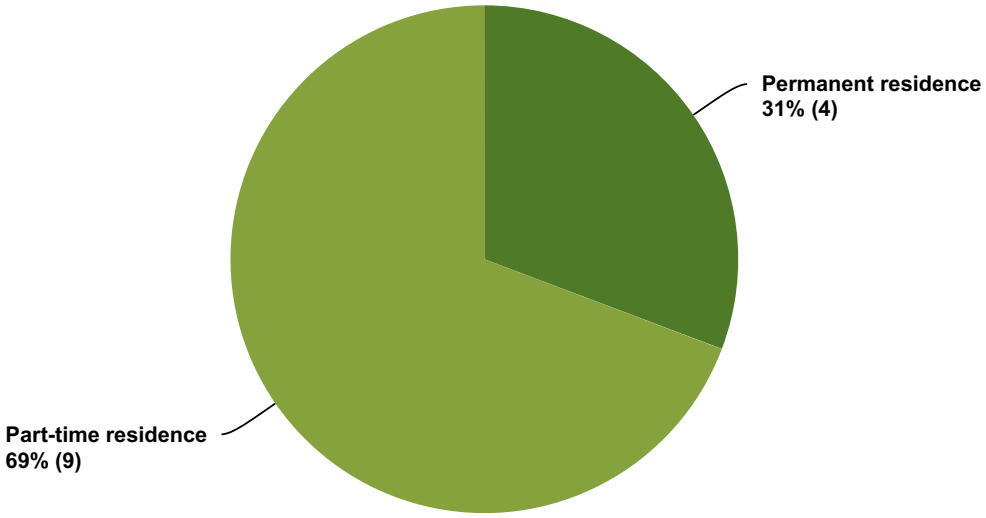
Answered: 13 Skipped: 1



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: 1

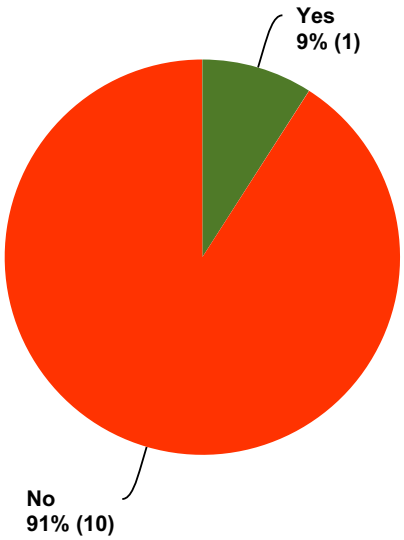


Answer Choices	Responses	
Permanent residence	31%	4
Part-time residence	69%	9
I do not own or rent property near the lake	0%	0
Total		13

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

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

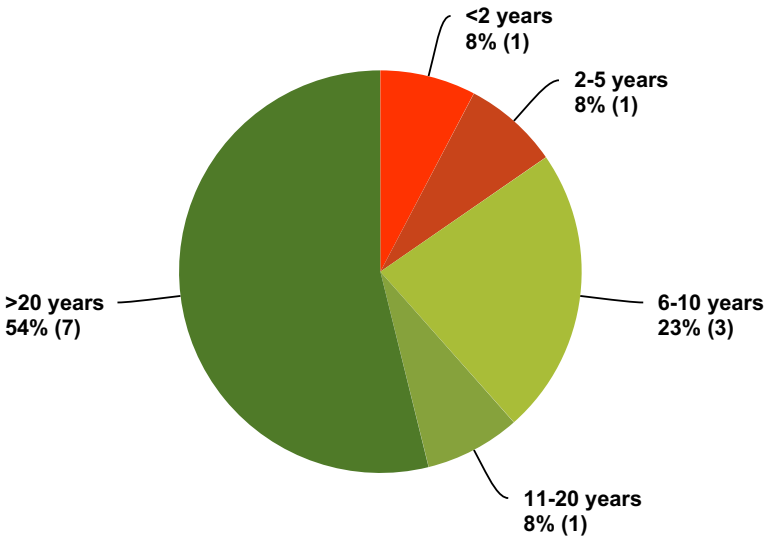
Answered: 11 Skipped: 3



Answer Choices	Responses	
Yes	9%	1
No	91%	10
Total		11

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

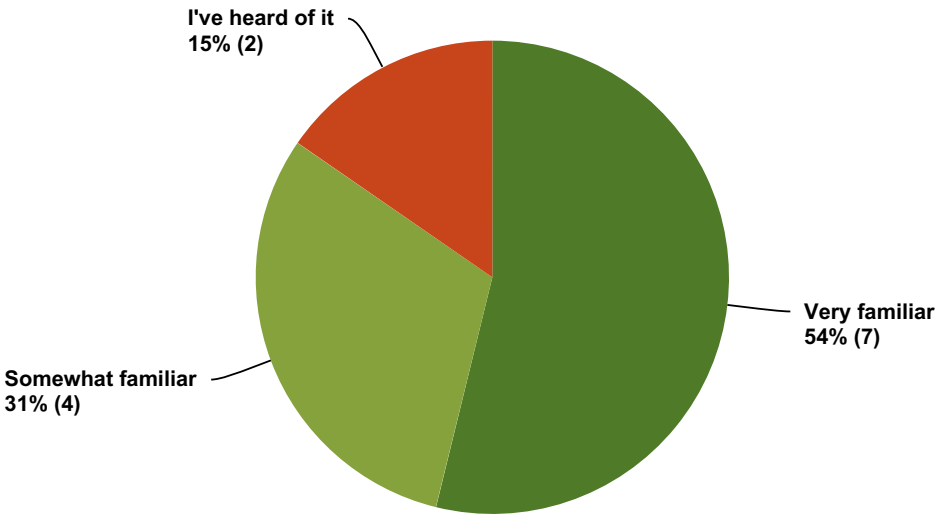
Answered: 13 Skipped: 1



Answer Choices	Responses	
<2 years	8%	1
2-5 years	8%	1
6-10 years	23%	3
11-20 years	8%	1
>20 years	54%	7
Total		13

Q7 Are you familiar with the Little Hills Lake Management District?

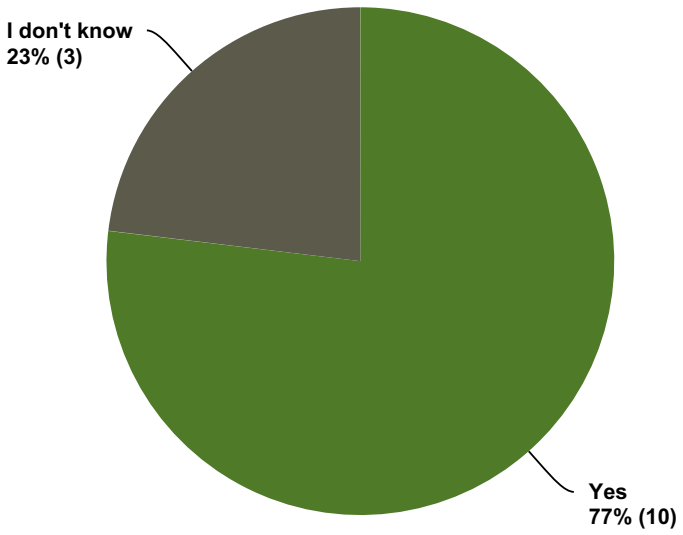
Answered: 13 Skipped: 1



Answer Choices	Responses	
Very familiar	54%	7
Somewhat familiar	31%	4
I've heard of it	15%	2
Never heard of it	0%	0
Total		13

Q8 Are you a member of the Little Hills Lake Management District?

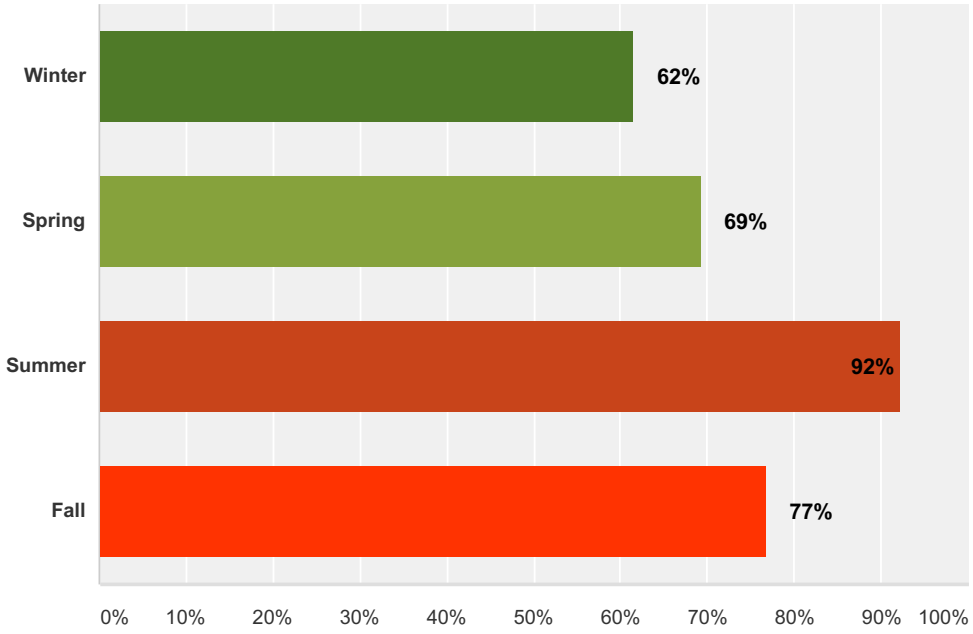
Answered: 13 Skipped: 1



Answer Choices	Responses	
Yes	77%	10
No	0%	0
I don't know	23%	3
Total		13

Q9 What time of year do you generally use the lake? Select all that apply.

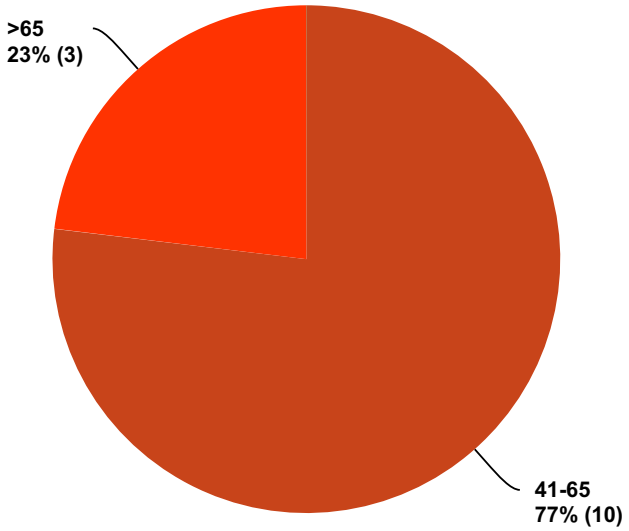
Answered: 13 Skipped: 1



Answer Choices	Responses	
Winter	62%	8
Spring	69%	9
Summer	92%	12
Fall	77%	10
Total Respondents: 13		

Q10 Which category below includes your age?

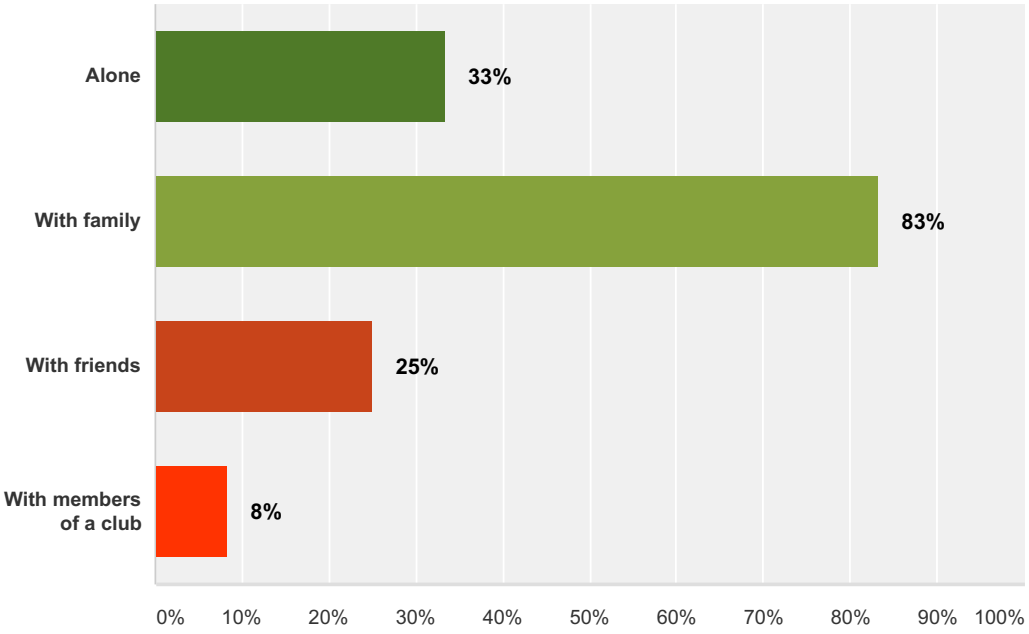
Answered: 13 Skipped: 1



Answer Choices	Responses	
Under 18	0%	0
18-40	0%	0
41-65	77%	10
>65	23%	3
Total		13

Q11 When you visit Little Hills Lake, are you typically...(check all that apply)

Answered: 12 Skipped: 2

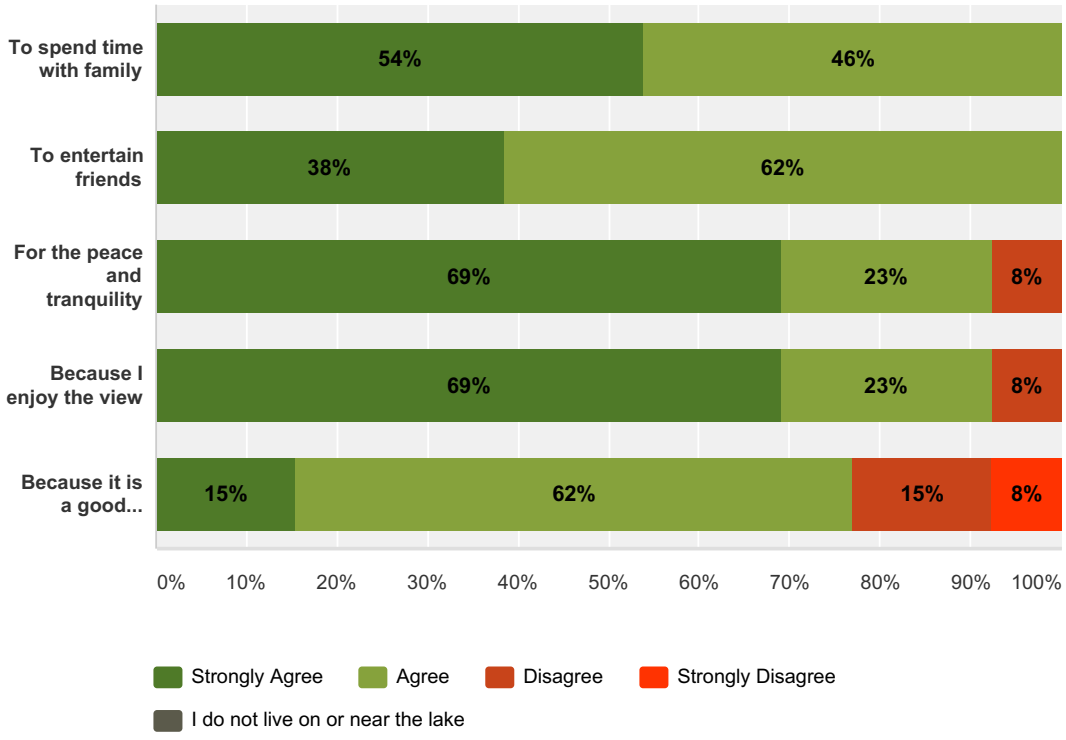


Answer Choices	Responses	
Alone	33%	4
With family	83%	10
With friends	25%	3
With members of a club	8%	1
Total Respondents: 12		

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

Q12 I live on or near the lake...

Answered: 13 Skipped: 1



	Strongly Agree	Agree	Disagree	Strongly Disagree	I do not live on or near the lake	Total
To spend time with family	**54%** 7	**46%** 6	**0%** 0	**0%** 0	**0%** 0	13
To entertain friends	**38%** 5	**62%** 8	**0%** 0	**0%** 0	**0%** 0	13
For the peace and tranquility	**69%** 9	**23%** 3	**8%** 1	**0%** 0	**0%** 0	13
Because I enjoy the view	**69%** 9	**23%** 3	**8%** 1	**0%** 0	**0%** 0	13
Because it is a good investment	**15%** 2	**62%** 8	**15%** 2	**8%** 1	**0%** 0	13

Q13 What do you value most about Little Hills Lake?

Answered: 13 Skipped: 1

#	Responses	Date
1	The balance between recreation and the peacefulness of the lake	4/25/2015 11:23 AM
2	The nature. The quiet time after fast boating time is over for the day. The friends and family.	4/22/2015 3:49 PM
3	Clean water	4/22/2015 11:40 AM
4	Clean water	4/22/2015 8:28 AM
5	1. The serenity - it is a common vision of our neighbors.	4/22/2015 7:49 AM
6	The quiet and peaceful beauty. Natures birds and animals. The water quality and generally good condition of the lake. Responsible owner management.	4/22/2015 7:10 AM
7	1. Ability to enjoy the lake with family and friends	4/22/2015 5:05 AM
8	My family history there...grandparents bought cottage in 1947.	4/21/2015 6:48 PM
9	BEAUTIFUL, CLEAN LAKE, GREAT NEIGHBORS	4/21/2015 5:39 PM
10	Beauty and recreation	4/21/2015 3:12 PM
11	beautiful lake	4/21/2015 8:58 AM
12	To be able to water ski and enjoy time when skiing is not allowed.	4/20/2015 8:47 PM
13	Water clarity.....limited wake....the beauty.....maintaining a high water level....fishing....quiet times after boating hours...etc	4/20/2015 6:25 PM

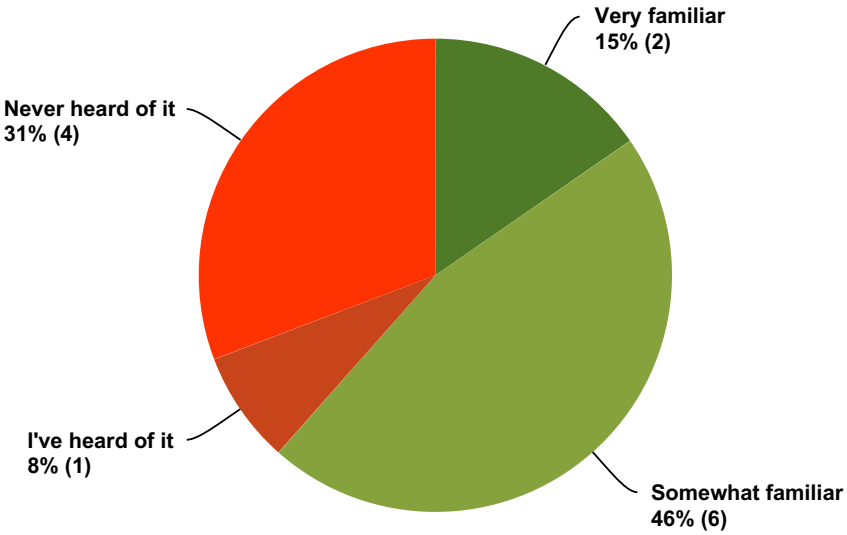
Q14 In your opinion, what should be done to restore, maintain, or improve Little Hills Lake?

Answered: 13 Skipped: 1

#	Responses	Date
1	Educate people on the facts about lake preservation	4/25/2015 11:23 AM
2	Keep on checking the water and invasive species and keep the quiet time for the fishermen to enjoy the lake.	4/22/2015 3:49 PM
3	More Fish	4/22/2015 11:40 AM
4	Improve fish habitat Close public access to stop invasive species introduction	4/22/2015 8:28 AM
5	Improve fishing	4/22/2015 7:49 AM
6	Continue monitoring the lake and habitat and take recommended action. Continue to keep owners informed. Provide lake rules to all owners. And assist rental owners in posting rules at the rental properties. Continue to post rules at the boat landing. Continue to be a good neighbor to Camp Lakota.	4/22/2015 7:10 AM
7	Continue with same management of identify invasives (EWM) and removing them. Little Hills Lake (LHL) does need to be restored, it is in good shape, it needs to be maintained.	4/22/2015 5:05 AM
8	My biggest issue is noise from boat traffic, and the number of high-speed boats on the lake. The lake is too small for the boat traffic and the size of many of the boats. Note that I do not own a boat.	4/21/2015 6:48 PM
9	Maintain the boating/fishing times. Stay proactive on treating/looking for invasive species of plants.	4/21/2015 5:39 PM
10	Limit wake type boats, enforce boating traffic laws	4/21/2015 3:12 PM
11	Keep it clear.	4/21/2015 8:58 AM
12	Try to establish and balance the fact in all minds that property owners all have a right to be allowed to utilize the lake as they each enjoy most without excluding infringing on others to do the same.	4/20/2015 8:47 PM
13	Maintain current status....maybe more game fish like walleyes? LIMIT any additional development so we do not have too many properties and people, as we feel on busy weekends...it has about as much traffic as it can handle and we want to keep its use SAFE FOR ALL!!!!	4/20/2015 6:25 PM

Q15 How familiar are you with Wisconsin's Public Trust Doctrine?

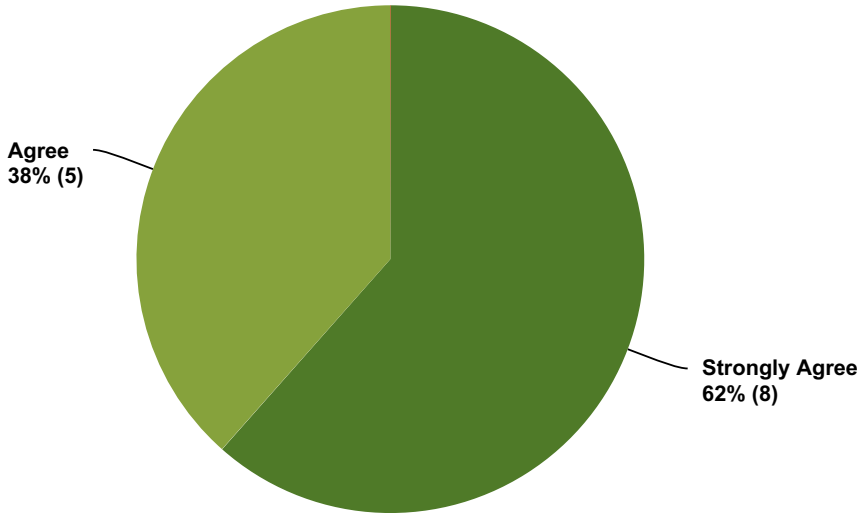
Answered: 13 Skipped: 1



Answer Choices	Responses	
Very familiar	15%	2
Somewhat familiar	46%	6
I've heard of it	8%	1
Never heard of it	31%	4
Total		13

Q16 How I recreate in and around the lake can affect other lake users.

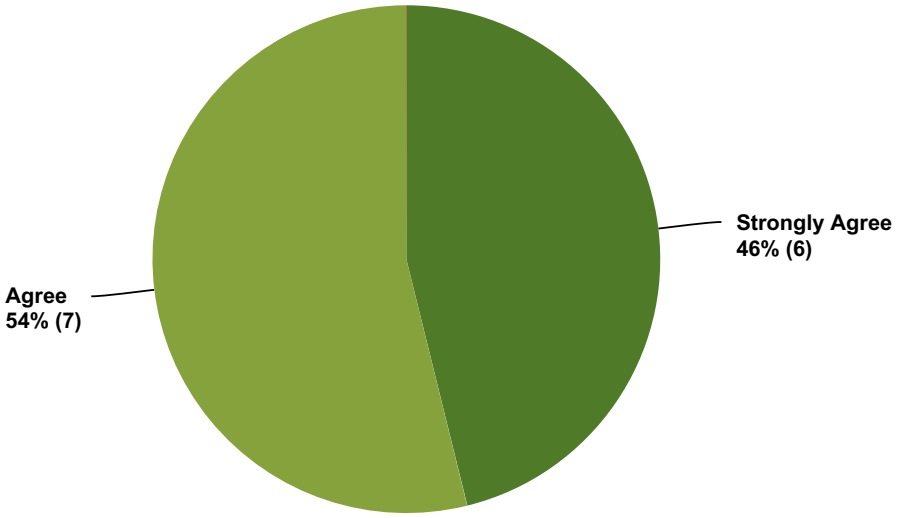
Answered: 13 Skipped: 1



Answer Choices	Responses	
Strongly Agree	62%	8
Agree	38%	5
Disagree	0%	0
Strongly Disagree	0%	0
Total		13

Q17 How I manage my land can affect other lake users.

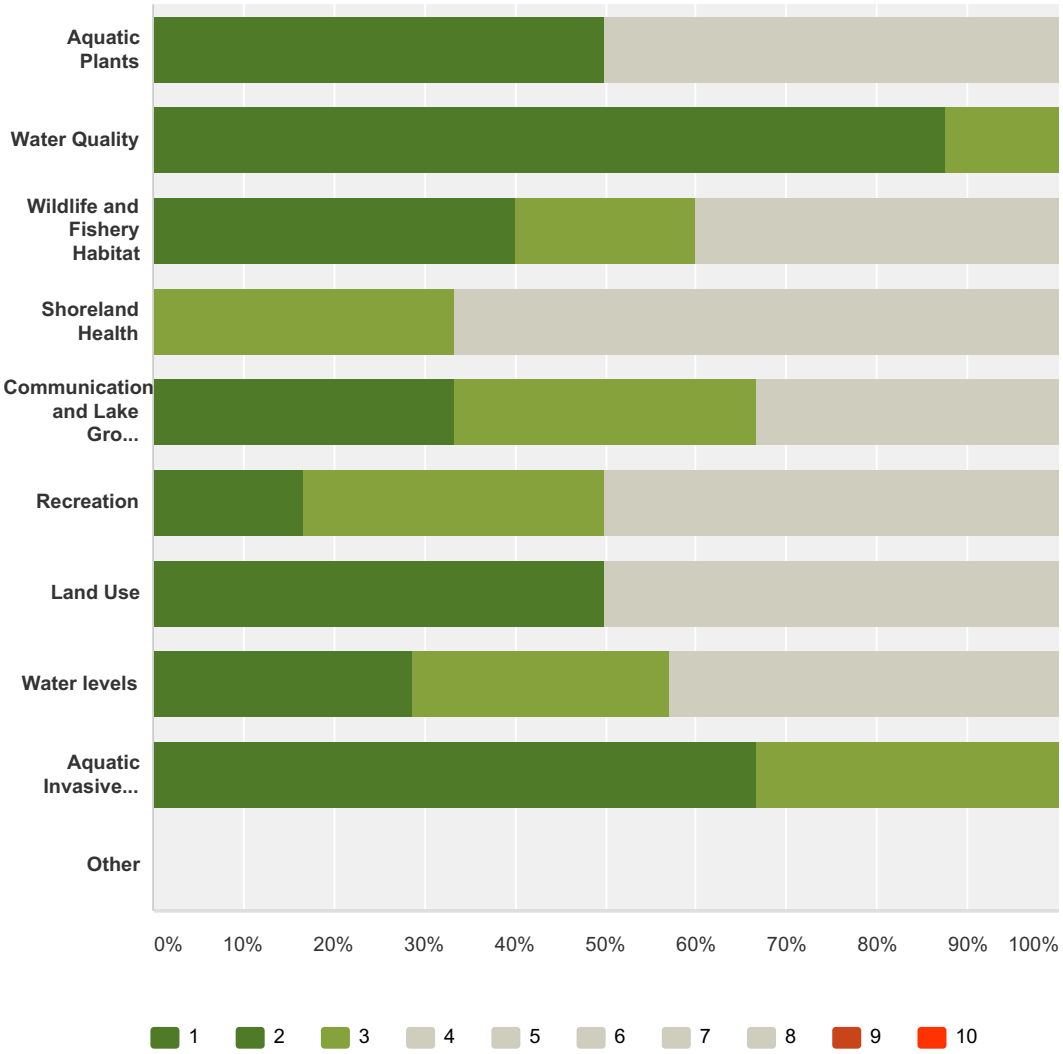
Answered: 13 Skipped: 1



Answer Choices	Responses	
Strongly Agree	46%	6
Agree	54%	7
Disagree	0%	0
Strongly Disagree	0%	0
Total		13

Q18 Which of the following meeting topics, in your opinion, are the most important to talk about regarding Little Hills Lake? (Please rank at least your top three.)

Answered: 11 Skipped: 3

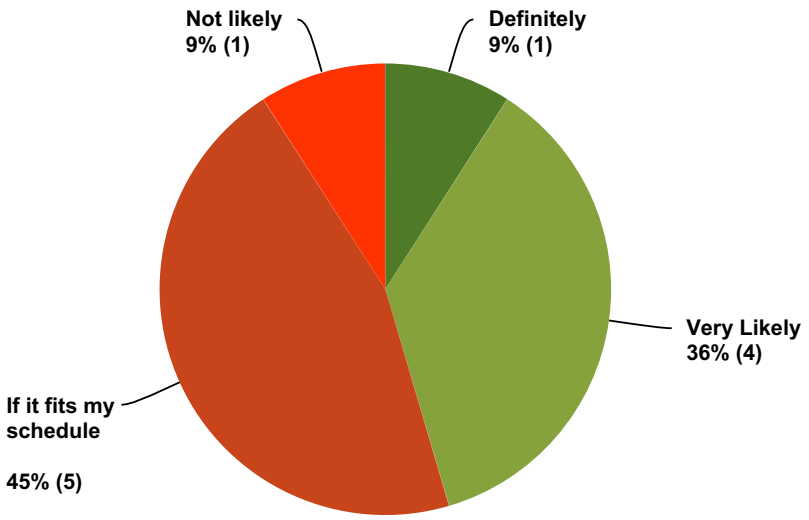


	1	2	3	4	5	6	7	8	9	10	Total	Score
Aquatic Plants	25% 1	25% 1	0% 0	0% 0	25% 1	0% 0	0% 0	25% 1	0% 0	0% 0	4	7.00
Water Quality	50% 4	38% 3	13% 1	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	8	9.38
Wildlife and Fishery Habitat	0% 0	40% 2	20% 1	0% 0	20% 1	0% 0	20% 1	0% 0	0% 0	0% 0	5	7.20
Shoreland Health	0% 0	0% 0	33% 1	67% 2	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	3	7.33
Communication and Lake Group Support	0% 0	33% 1	33% 1	33% 1	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	3	8.00

Recreation	**17%** 1	**0%** 0	**33%** 2	**0%** 0	**17%** 1	**33%** 2	**0%** 0	**0%** 0	**0%** 0	**0%** 0	6	7.00
Land Use	**0%** 0	**50%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**50%** 1	**0%** 0	**0%** 0	**0%** 0	2	6.50
Water levels	**0%** 0	**29%** 2	**29%** 2	**29%** 2	**14%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	7	7.71
Aquatic Invasive Species	**56%** 5	**11%** 1	**33%** 3	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	9	9.22
Other	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	0	0.00

Q19 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. How likely is it that you will attend one or more of the planning sessions?

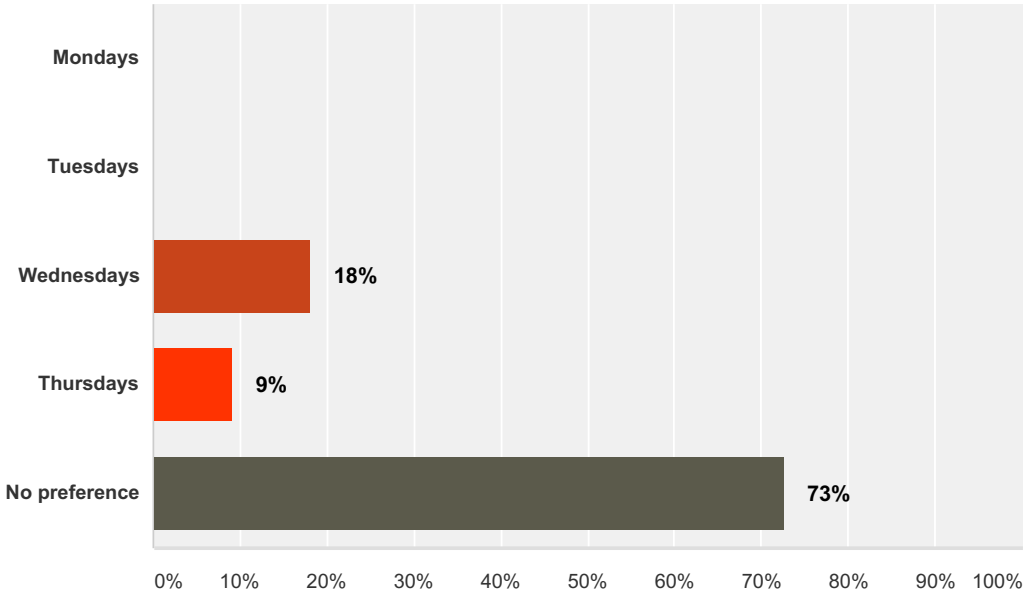
Answered: 11 Skipped: 3



Answer Choices	Responses	
Definitely	9%	1
Very Likely	36%	4
If it fits my schedule	45%	5
Not likely	9%	1
I won't attend any	0%	0
Total		11

Q20 Previous experience has shown that weekday evenings work best for most people. If you will attend the planning sessions, which weeknights do you prefer?

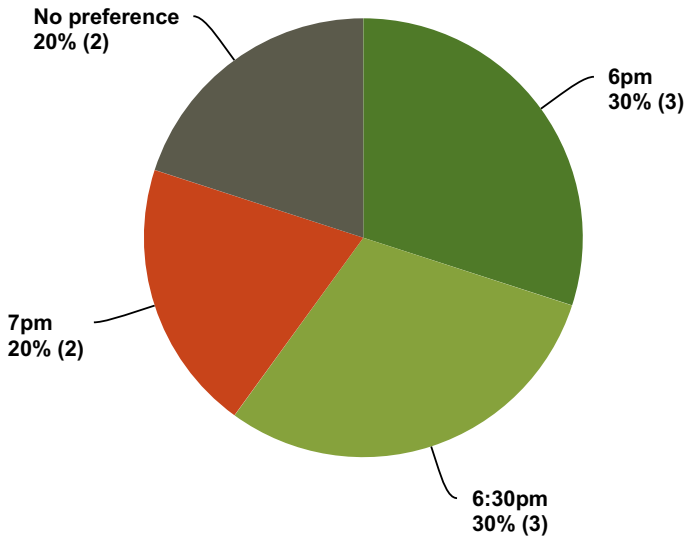
Answered: 11 Skipped: 3



Answer Choices	Responses	
Mondays	0%	0
Tuesdays	0%	0
Wednesdays	18%	2
Thursdays	9%	1
No preference	73%	8
Total Respondents: 11		

Q21 Most sessions will last around 2 hours. If you will attend the planning sessions, which times do you prefer to start?

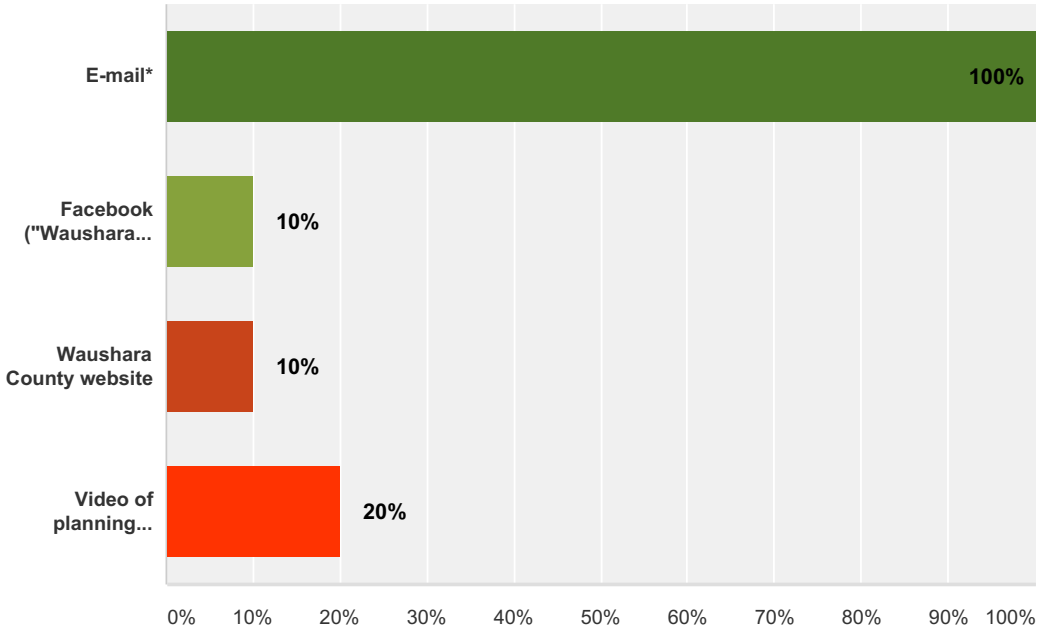
Answered: 10 Skipped: 4



Answer Choices	Responses	
6pm	30%	3
6:30pm	30%	3
7pm	20%	2
7:30pm	0%	0
No preference	20%	2
Total		10

Q22 How would you like to receive information about meetings (agendas, minutes), the planning process, and updates? (Select all that apply)

Answered: 10 Skipped: 4



Answer Choices	Responses	
E-mail*	100%	10
Facebook ("Waushara County Lakes Project")	10%	1
Waushara County website	10%	1
Video of planning meeting posted on the web	20%	2
Total Respondents: 10		

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

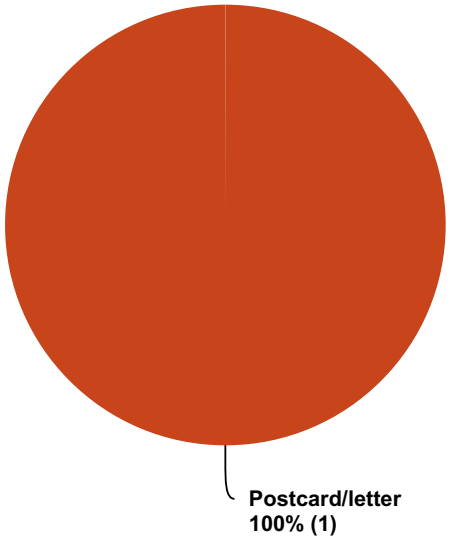
Q1 Enter your Waushara County Lakes Survey ID. If you've forgotten your ID or haven't created one yet, follow the instructions below.

Answered: 1 Skipped: 0

#	Responses	Date
1	[redacted]	5/26/2015 9:11 AM

Q2 How did you hear about this survey?

Answered: 1 Skipped: 0

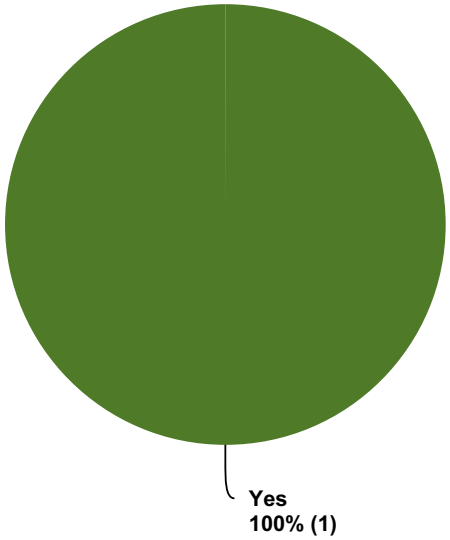


Answer Choices	Responses	
E-mail	0%	0
Newspaper	0%	0
Postcard/letter	100%	1
Facebook	0%	0
Radio	0%	0
Total		1

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

Q3 Were you aware of the importance of aquatic plants?

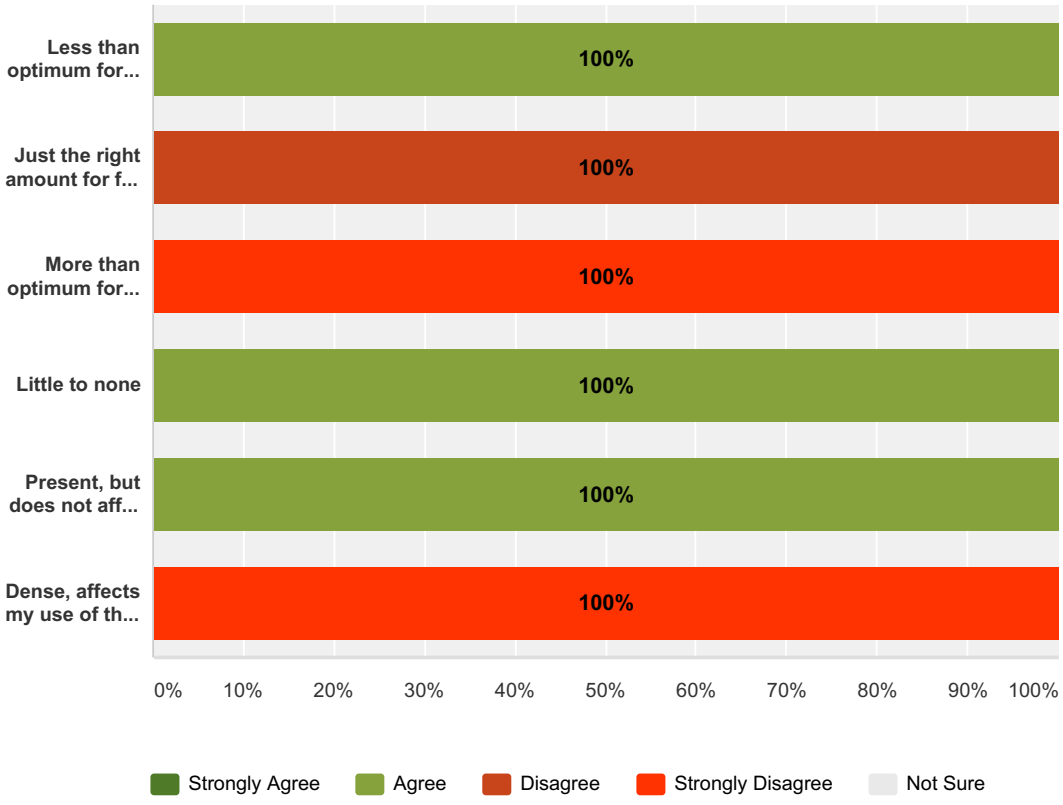
Answered: 1 Skipped: 0



Answer Choices	Responses	
Yes	100%	1
No	0%	0
Unsure	0%	0
Total		1

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

Answered: 1 Skipped: 0



	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure	Total
Less than optimum for fish and wildlife	0% 0	100% 1	0% 0	0% 0	0% 0	1
Just the right amount for fish and wildlife	0% 0	0% 0	100% 1	0% 0	0% 0	1
More than optimum for fish and wildlife	0% 0	0% 0	0% 0	100% 1	0% 0	1
Little to none	0% 0	100% 1	0% 0	0% 0	0% 0	1
Present, but does not affect my use of the lake	0% 0	100% 1	0% 0	0% 0	0% 0	1
Dense, affects my use of the lake	0% 0	0% 0	0% 0	100% 1	0% 0	1

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

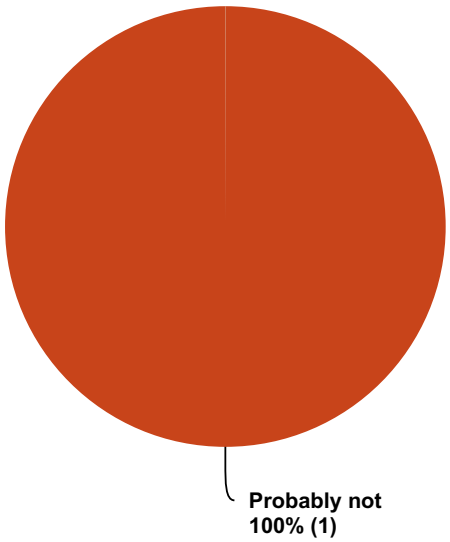
Answered: 0 Skipped: 1

! 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 Little Hills Lake?

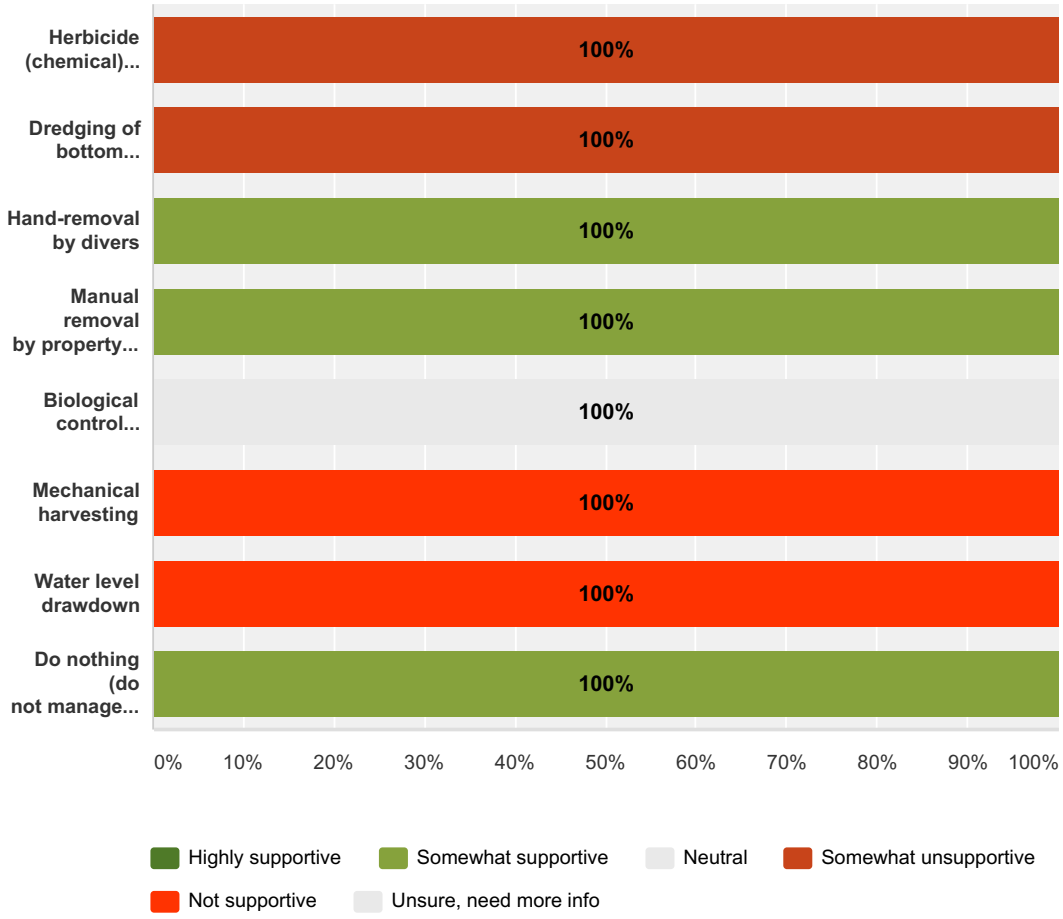
Answered: 1 Skipped: 0



Answer Choices	Responses	
Definitely	0%	0
Probably	0%	0
Unsure	0%	0
Probably not	100%	1
Definitely not	0%	0
Total		1

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

Answered: 1 Skipped: 0

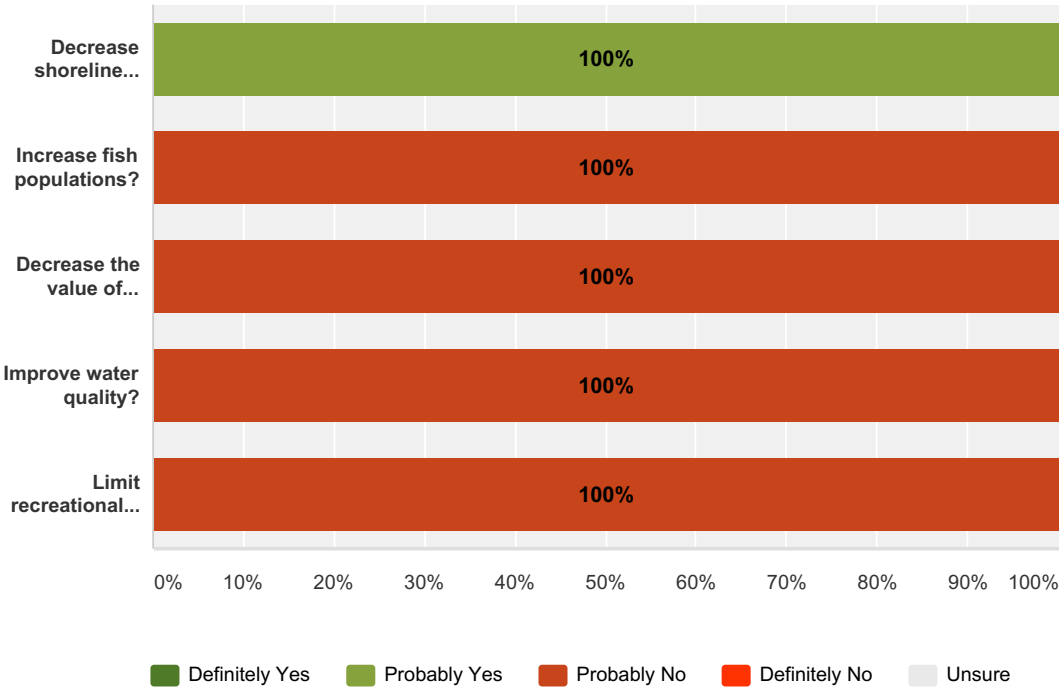


	Highly supportive	Somewhat supportive	Neutral	Somewhat unsupportive	Not supportive	Unsure, need more info	Total	Weighted Average
Herbicide (chemical) control	0% 0	0% 0	0% 0	100% 1	0% 0	0% 0	1	4.00
Dredging of bottom sediments	0% 0	0% 0	0% 0	100% 1	0% 0	0% 0	1	4.00
Hand-removal by divers	0% 0	100% 1	0% 0	0% 0	0% 0	0% 0	1	2.00
Manual removal by property owners	0% 0	100% 1	0% 0	0% 0	0% 0	0% 0	1	2.00
Biological control (milfoil weevil, loosestrife beetle, etc.)	0% 0	0% 0	100% 1	0% 0	0% 0	0% 0	1	3.00
Mechanical harvesting	0% 0	0% 0	0% 0	0% 0	100% 1	0% 0	1	5.00

Water level drawdown	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**100%** 1	**0%** 0	1	5.00
Do nothing (do not manage plants)	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	2.00

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

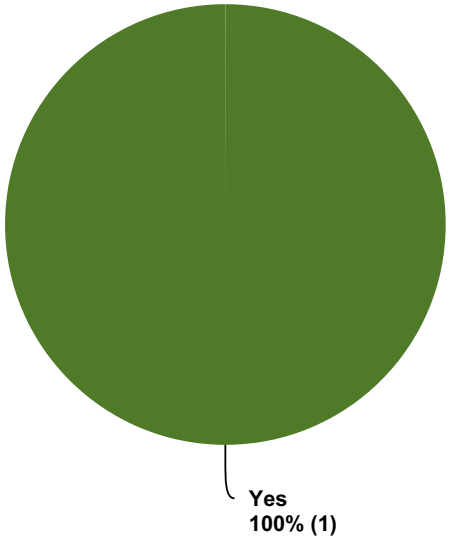
Answered: 1 Skipped: 0



	Definitely Yes	Probably Yes	Probably No	Definitely No	Unsure	Total
Decrease shoreline erosion?	0% 0	100% 1	0% 0	0% 0	0% 0	1
Increase fish populations?	0% 0	0% 0	100% 1	0% 0	0% 0	1
Decrease the value of shoreline property?	0% 0	0% 0	100% 1	0% 0	0% 0	1
Improve water quality?	0% 0	0% 0	100% 1	0% 0	0% 0	1
Limit recreational enjoyment?	0% 0	0% 0	100% 1	0% 0	0% 0	1

Q9 Have you ever heard of aquatic invasive species?

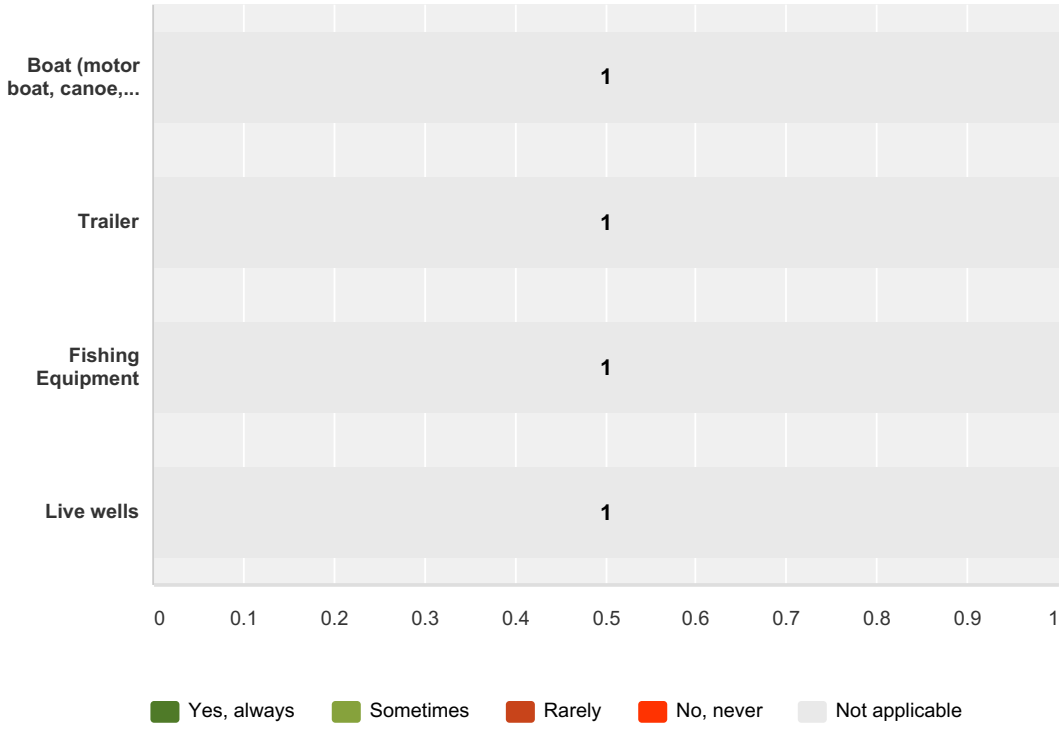
Answered: 1 Skipped: 0



Answer Choices	Responses	
Yes	100%	1
No	0%	0
Total		1

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

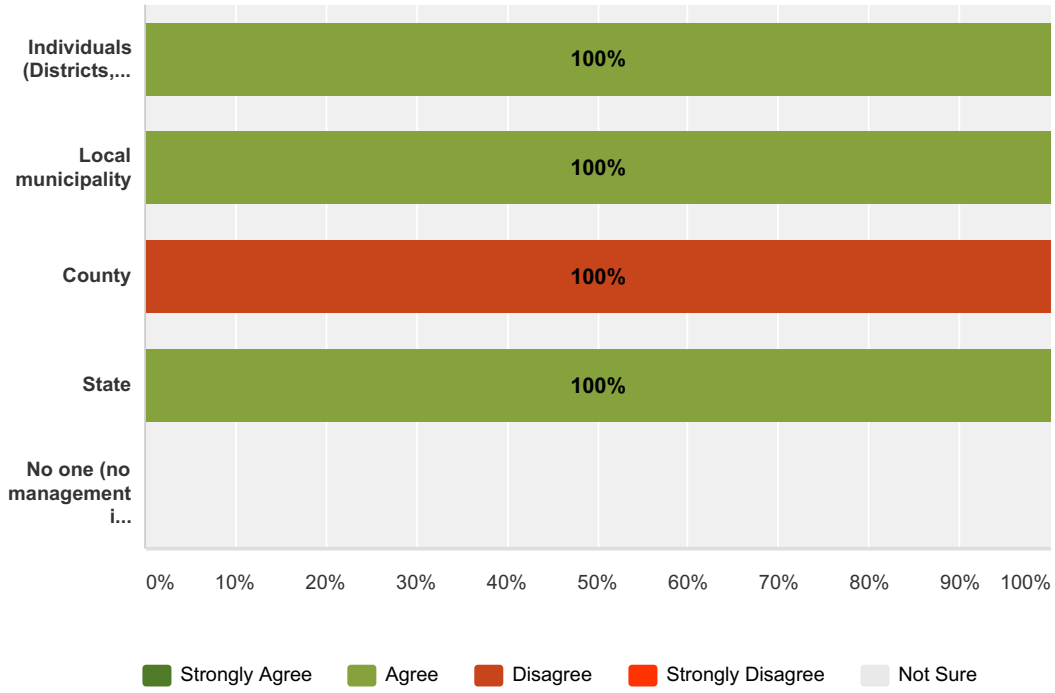
Answered: 1 Skipped: 0



	Yes, always	Sometimes	Rarely	No, never	Not applicable	Total Respondents
Boat (motor boat, canoe, kayak, etc.)	0% 0	0% 0	0% 0	0% 0	100% 1	1
Trailer	0% 0	0% 0	0% 0	0% 0	100% 1	1
Fishing Equipment	0% 0	0% 0	0% 0	0% 0	100% 1	1
Live wells	0% 0	0% 0	0% 0	0% 0	100% 1	1

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

Answered: 1 Skipped: 0

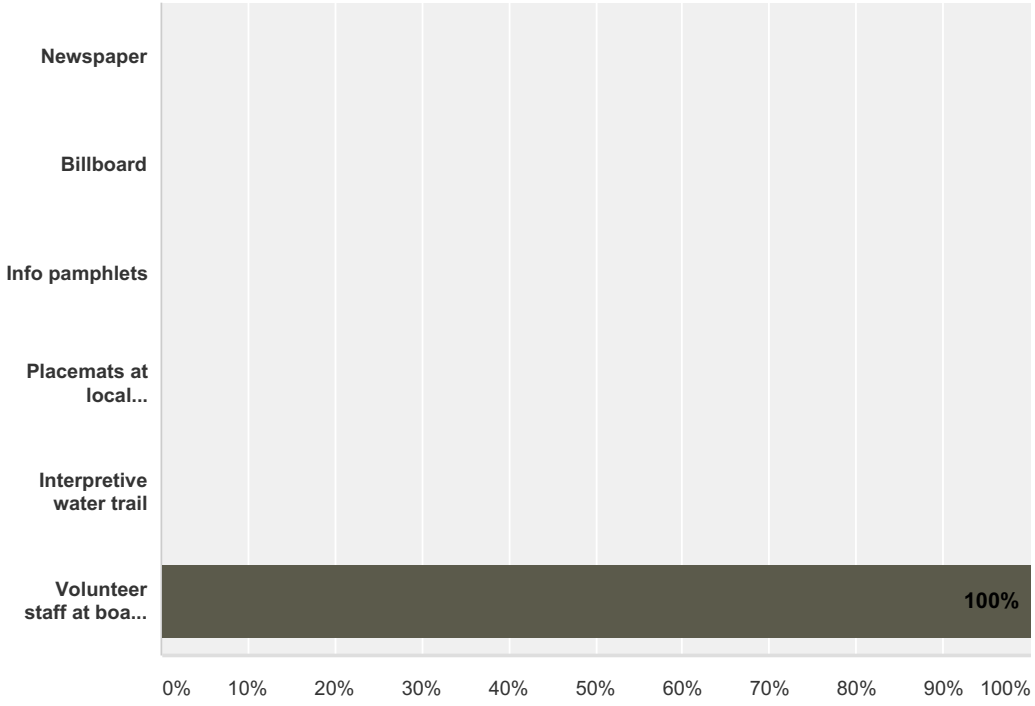


	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure	Total
Individuals (Districts, associations, lakefront property owners)	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	1
Local municipality	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	1
County	**0%** 0	**0%** 0	**100%** 1	**0%** 0	**0%** 0	1
State	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	1
No one (no management is undertaken)	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	0

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

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

Answered: 1 Skipped: 0

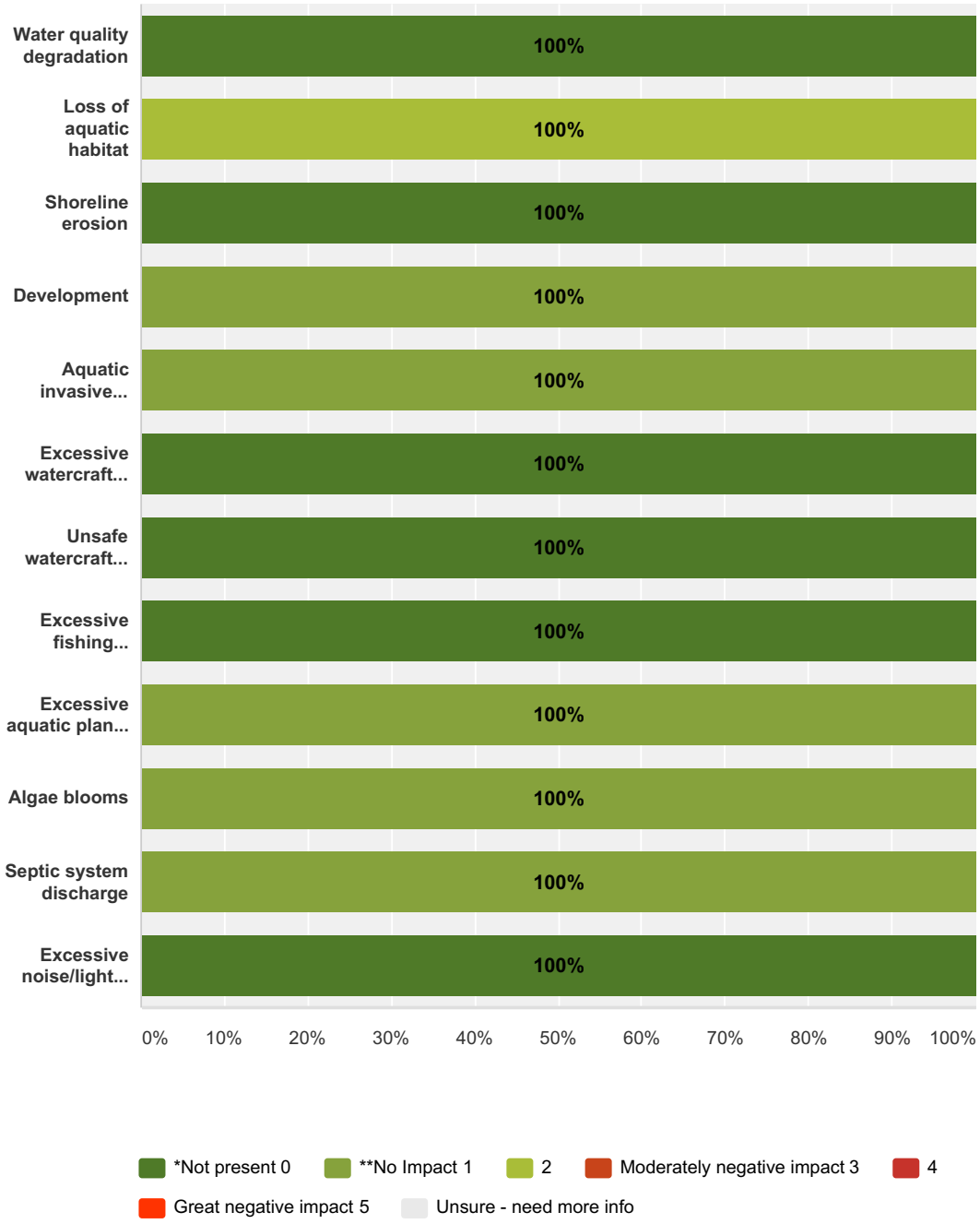


Answer Choices	Responses	
Newspaper	0%	0
Billboard	0%	0
Info pamphlets	0%	0
Placemats at local restaurants	0%	0
Interpretive water trail	0%	0
Volunteer staff at boat launch	100%	1
Total Respondents: 1		

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

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 Little Hills Lake? (Please rate 0 - 5)* Not Present means that you believe the issue does not exist on Little Hills Lake.**No Impact means that the issue may exist on Little Hills Lake but it is not negatively impacting the lake.

Answered: 1 Skipped: 0



	*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	100% 1	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	1	0.00
Loss of aquatic habitat	0% 0	0% 0	100% 1	0% 0	0% 0	0% 0	0% 0	1	2.00
Shoreline erosion	100% 1	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	1	0.00
Development	0% 0	100% 1	0% 0	0% 0	0% 0	0% 0	0% 0	1	1.00

Aquatic invasive species introduction	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	1.00
Excessive watercraft traffic	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	0.00
Unsafe watercraft practices	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	0.00
Excessive fishing pressure	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	0.00
Excessive aquatic plant growth (excluding algae)	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	1.00
Algae blooms	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	1.00
Septic system discharge	**0%** 0	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	1.00
Excessive noise/light pollution	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1	0.00

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

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

Answered: 0 Skipped: 1

! No matching responses.

Answer Choices	Responses	
Water quality degradation	**0%**	0
Loss of aquatic habitat	**0%**	0
Shoreline erosion	**0%**	0
Development	**0%**	0
Aquatic invasive species introduction	**0%**	0
Watercraft traffic	**0%**	0
Excessive fishing pressure	**0%**	0
Excessive aquatic plant growth (excluding algae)	**0%**	0
Algae blooms	**0%**	0
Septic system discharge	**0%**	0
Noise/light pollution	**0%**	0
Other	**0%**	0
Total Respondents: 0		

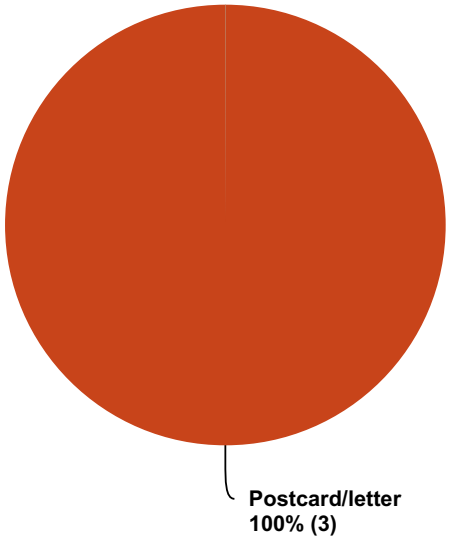
Q1 What is your Waushara County Lakes Study ID?

Answered: 3 Skipped: 0

#	Responses	Date
1	[redacted]	7/3/2015 12:11 PM
2	[redacted]	7/3/2015 8:07 AM
3	[redacted]	6/30/2015 2:15 PM

Q2 How did you hear about this survey?

Answered: 3 Skipped: 0

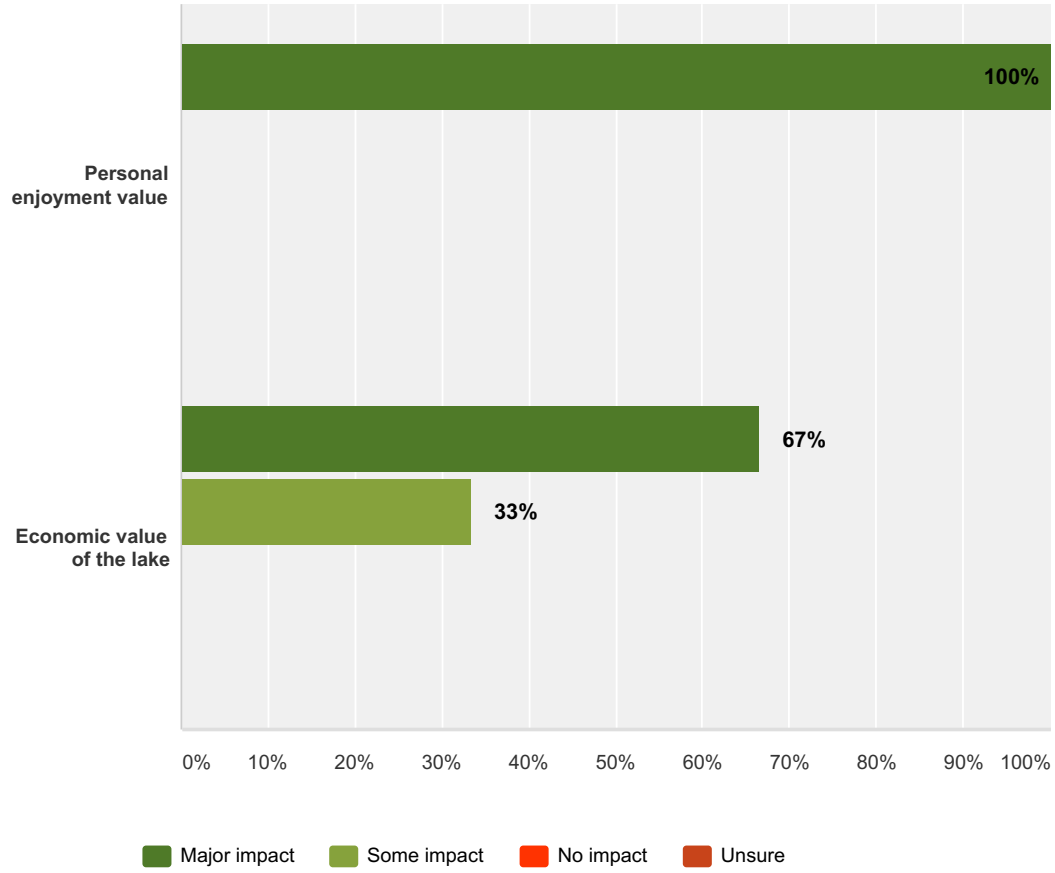


Answer Choices	Responses	
E-mail	0%	0
Newspaper	0%	0
Postcard/letter	100%	3
Facebook	0%	0
Radio	0%	0
Word of mouth	0%	0
Total		3

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

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

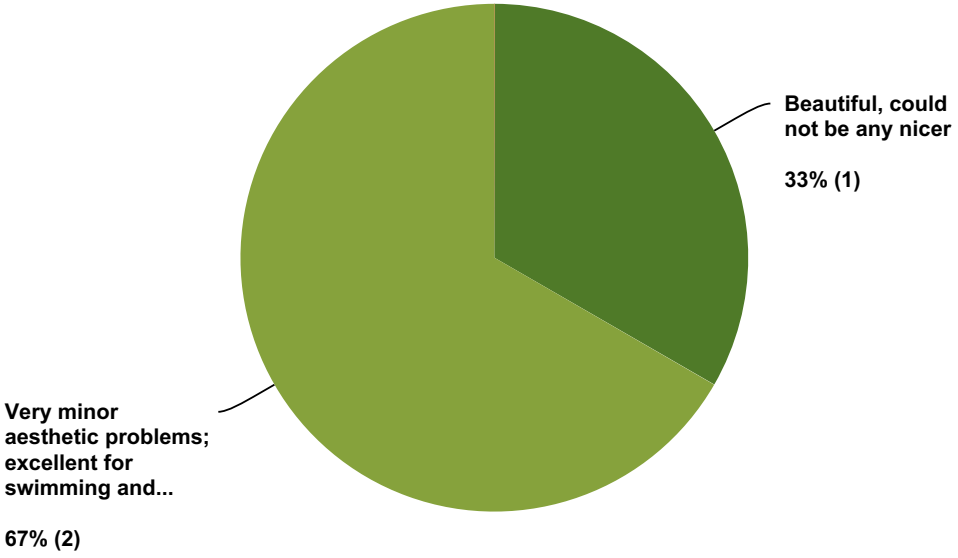
Answered: 3 Skipped: 0



	Major impact	Some impact	No impact	Unsure	Total
Personal enjoyment value	**100%** 3	**0%** 0	**0%** 0	**0%** 0	3
Economic value of the lake	**67%** 2	**33%** 1	**0%** 0	**0%** 0	3

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

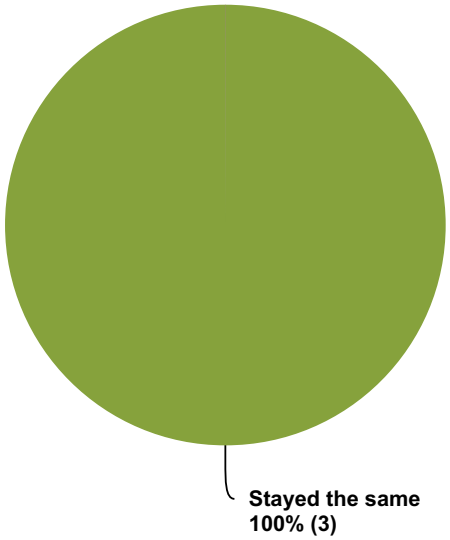
Answered: 3 Skipped: 0



Answer Choices	Responses	
Beautiful, could not be any nicer	33%	1
Very minor aesthetic problems; excellent for swimming and boating enjoyment	67%	2
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	0%	0
Swimming and aesthetic enjoyment of the lake is substantially reduced because of algae	0%	0
None of the above	0%	0
Unsure	0%	0
Total		**3**

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: 3 Skipped: 0



Answer Choices	Responses	
Improved	0%	0
Declined	0%	0
Stayed the same	100%	3
Unsure	0%	0
Total		3

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

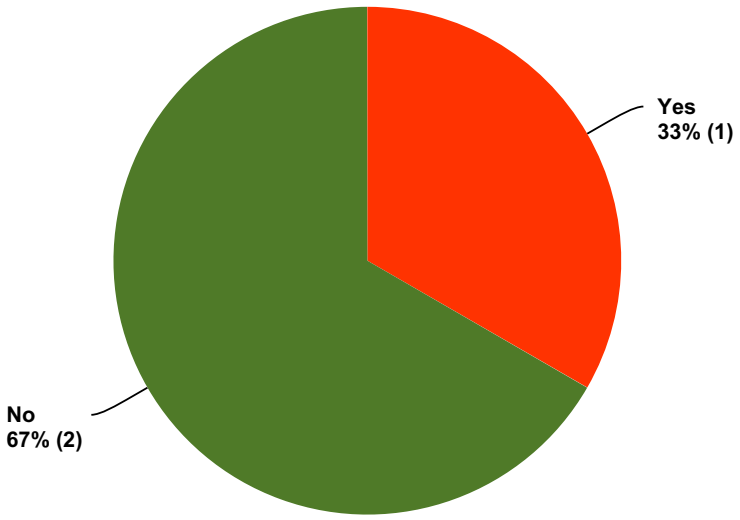
Answered: 0 Skipped: 3

! No matching responses.

	Strongly Agree	Agree	Disagree	Strongly Disagree	Unsure	Total Respondents
Loss of aquatic plants	0% 0	0% 0	0% 0	0% 0	0% 0	0
Shoreline damage	0% 0	0% 0	0% 0	0% 0	0% 0	0
Development pressure	0% 0	0% 0	0% 0	0% 0	0% 0	0
Heavy recreation	0% 0	0% 0	0% 0	0% 0	0% 0	0
Septic system	0% 0	0% 0	0% 0	0% 0	0% 0	0
Fertilizers	0% 0	0% 0	0% 0	0% 0	0% 0	0
Soil erosion	0% 0	0% 0	0% 0	0% 0	0% 0	0
Herbicides	0% 0	0% 0	0% 0	0% 0	0% 0	0
Air pollution	0% 0	0% 0	0% 0	0% 0	0% 0	0
Vegetable agriculture	0% 0	0% 0	0% 0	0% 0	0% 0	0
Livestock agriculture	0% 0	0% 0	0% 0	0% 0	0% 0	0
Water level changes	0% 0	0% 0	0% 0	0% 0	0% 0	0

Q7 Do you use herbicides or pesticides (i.e. "weed and feed") on your land? If selecting No, please skip to Question 11.

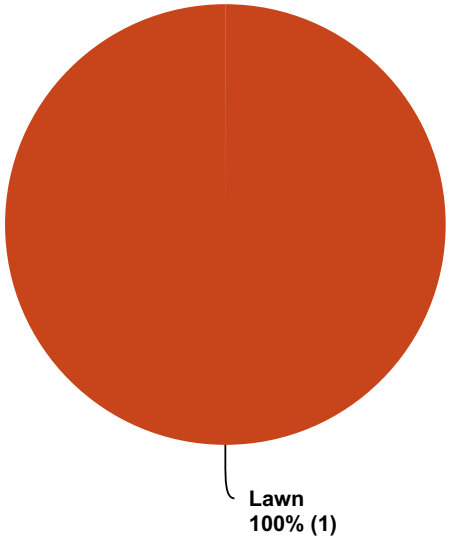
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	33%	1
No	67%	2
Total		3

Q8 Where do you apply herbicides and/or pesticides?

Answered: 1 Skipped: 2

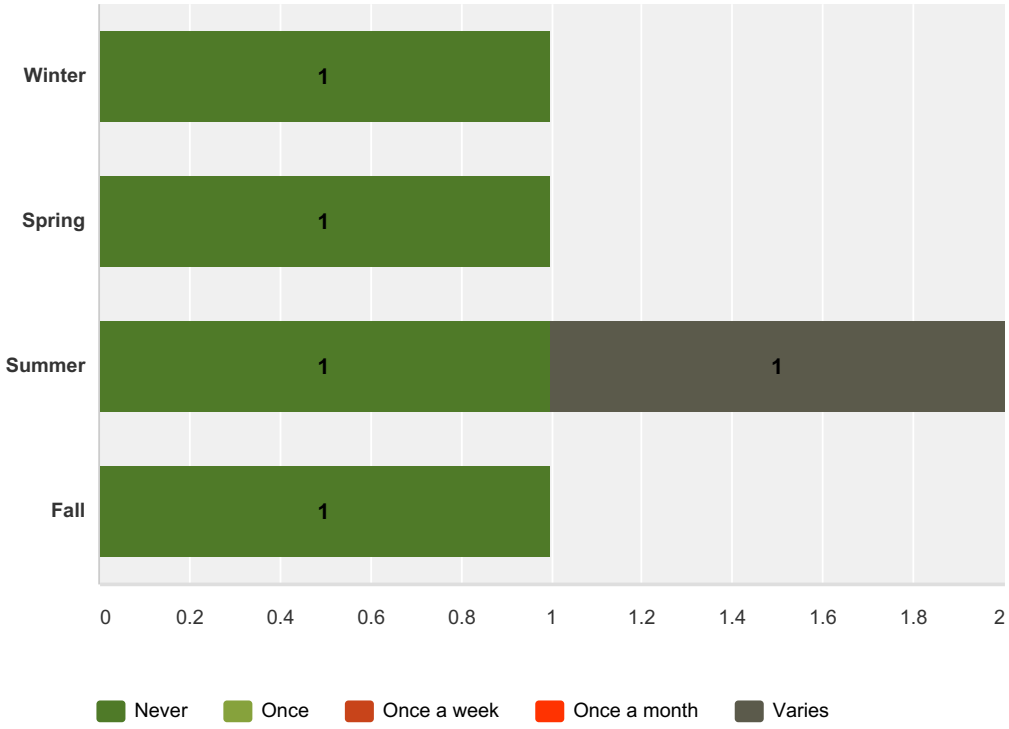


Answer Choices	Responses	
Agricultural fields	0%	0
Garden	0%	0
Lawn	100%	1
Total		1

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

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

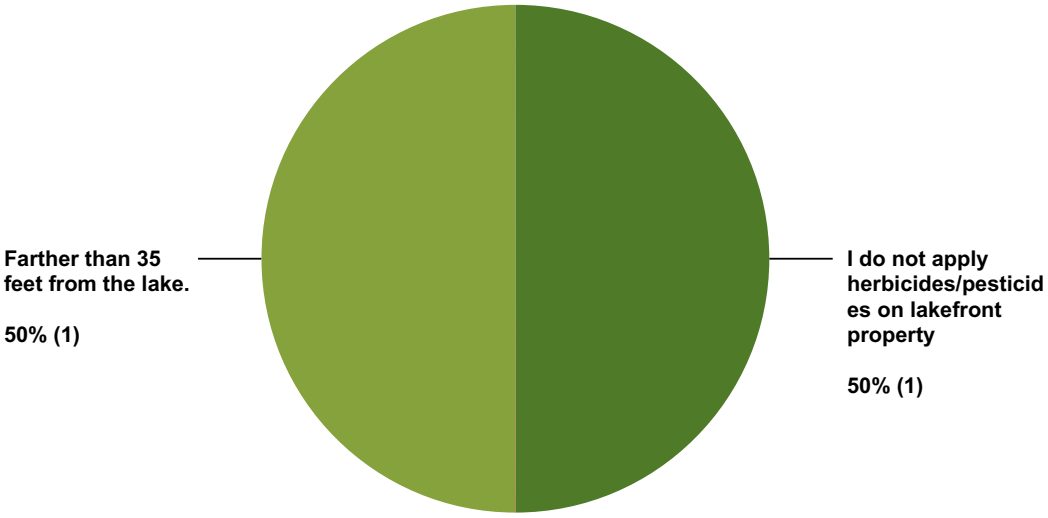
Answered: 2 Skipped: 1



	Never	Once	Once a week	Once a month	Varies	Total Respondents
Winter	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1
Spring	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1
Summer	**50%** 1	**0%** 0	**0%** 0	**0%** 0	**50%** 1	2
Fall	**100%** 1	**0%** 0	**0%** 0	**0%** 0	**0%** 0	1

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)?

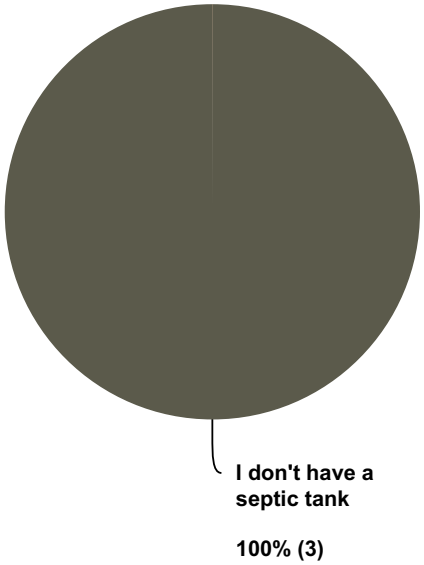
Answered: 2 Skipped: 1



Answer Choices	Responses	
I do not apply herbicides/pesticides on lakefront property	50%	1
Up to the lake	0%	0
Within 35 feet of the lake	0%	0
Farther than 35 feet from the lake.	50%	1
Total		2

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

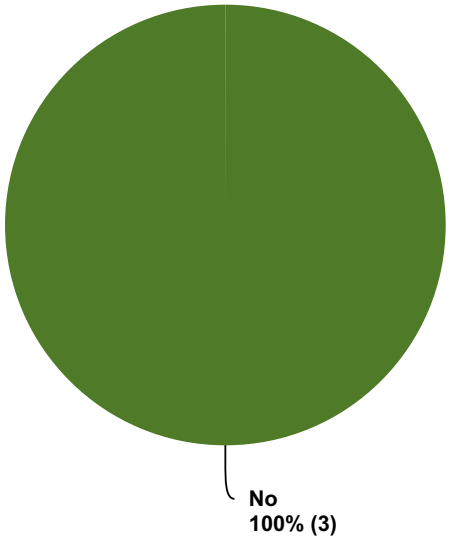
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	0%	0
No	0%	0
I don't have a septic tank	100%	3
Total		3

Q12 Do you use fertilizer on your land?

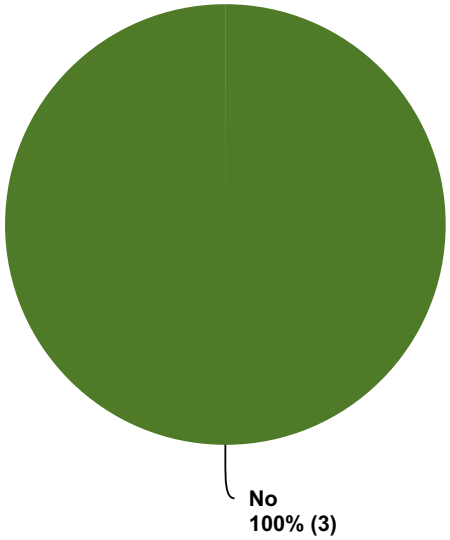
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	0%	0
No	100%	3
Total		3

Q13 Do you use fertilizer which contains phosphorus?

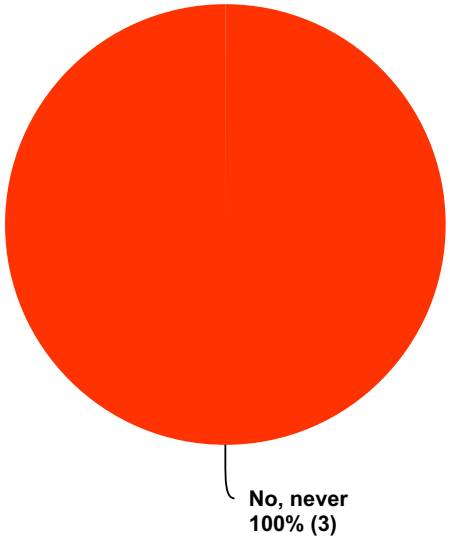
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	0%	0
No	100%	3
I don't know	0%	0
Total		3

Q14 Do you have your soil tested before applying fertilizer?

Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes, all of the time	0%	0
Yes, some of the time	0%	0
No, never	100%	3
Total		3

Q15 Where do you apply fertilizer?

Answered: 0 Skipped: 3

! No matching responses.

Answer Choices	Responses	
Agricultural fields	**0%**	0
Garden	**0%**	0
Lawn	**0%**	0
Total		**0**

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

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

Answered: 0 Skipped: 3

! No matching responses.

	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	**0%** 0	**0%** 0	**0%** 0	**0%** 0	0
Summer	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	0
Fall	**0%** 0	**0%** 0	**0%** 0	**0%** 0	**0%** 0	0

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)?

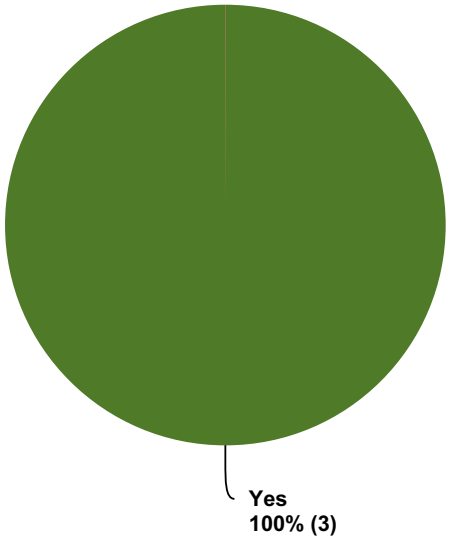
Answered: 0 Skipped: 3

! No matching responses.

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	**0%**	0
Farther than 35 feet from the lake.	**0%**	0
Total		**0**

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

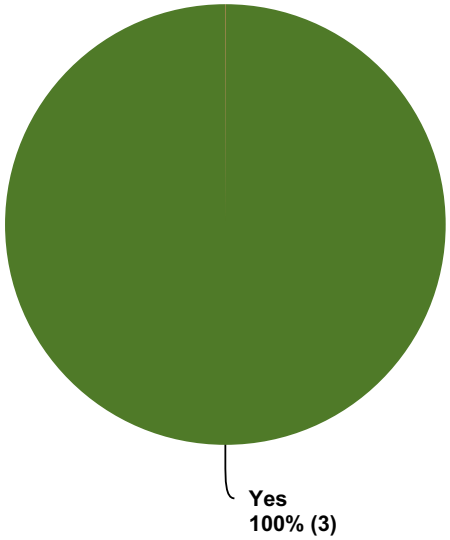
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	100%	3
No	0%	0
Unsure	0%	0
Total		3

Q19 Do you own shoreland property? If selecting No, please skip to the last page.

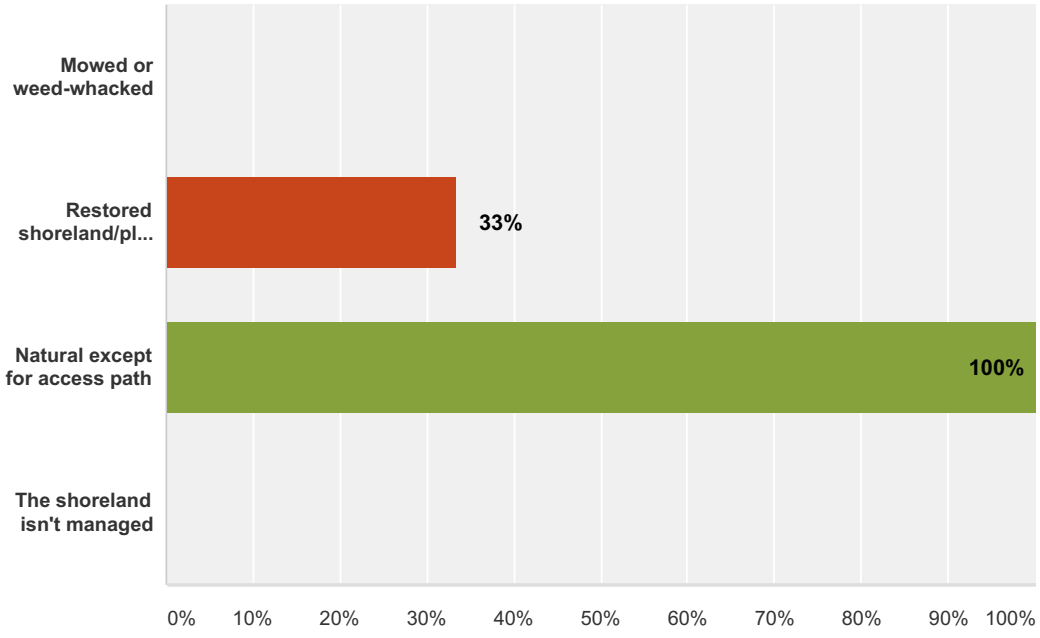
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	100%	3
No	0%	0
Total		3

Q20 How do you currently manage the majority of your property within 35 feet of the lake? Check all that apply.

Answered: 3 Skipped: 0

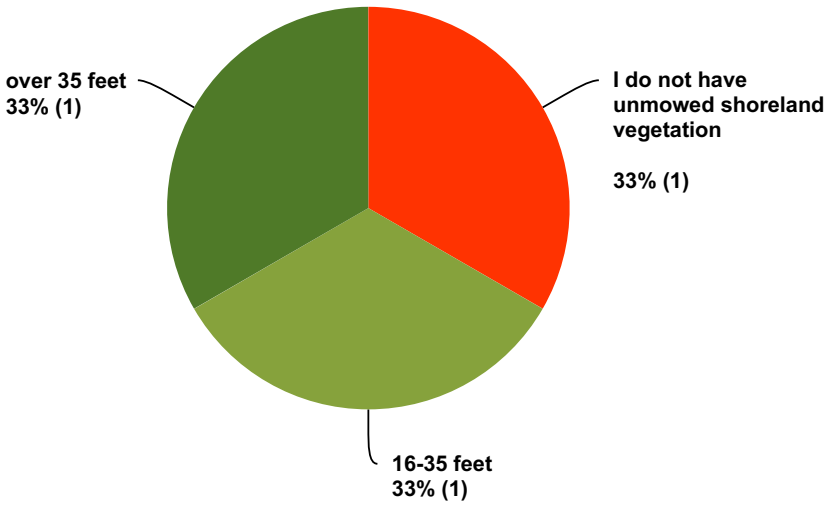


Answer Choices	Responses	
Mowed or weed-whacked	0%	0
Restored shoreland/planted	33%	1
Natural except for access path	100%	3
The shoreland isn't managed	0%	0
Total Respondents: 3		

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

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

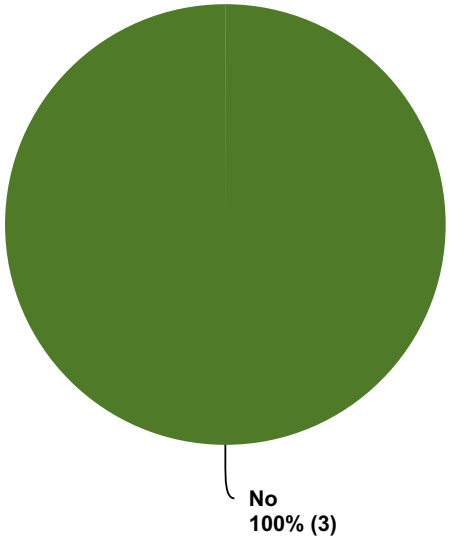
Answered: 3 Skipped: 0



Answer Choices	Responses	
I do not have unmowed shoreland vegetation	33%	1
1-15 feet	0%	0
16-35 feet	33%	1
over 35 feet	33%	1
Total		3

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

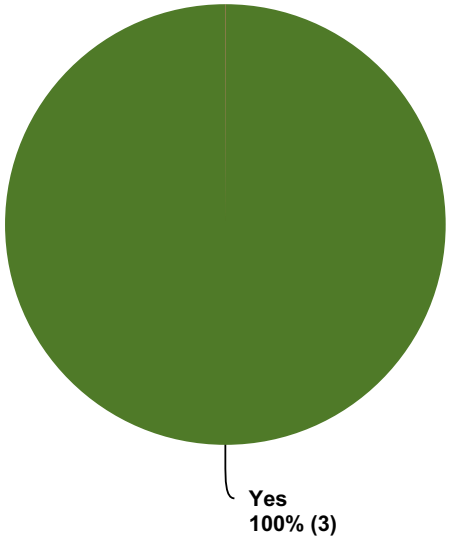
Answered: 3 Skipped: 0



Answer Choices	Responses	
I have no path	0%	0
Yes	0%	0
No	100%	3
Unsure	0%	0
Total		3

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

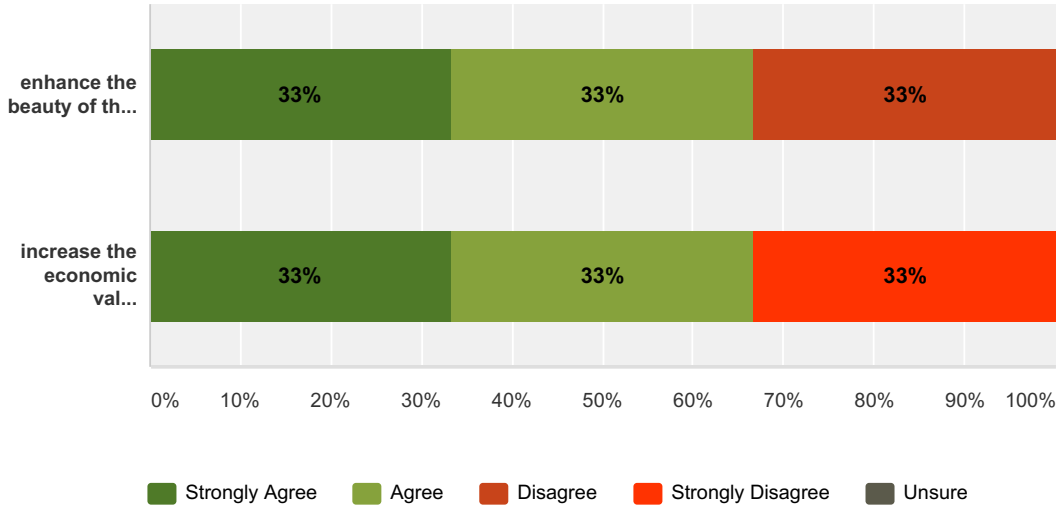
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	100%	3
No	0%	0
Unsure	0%	0
Total		3

Q24 In your opinion, does shoreland vegetation...

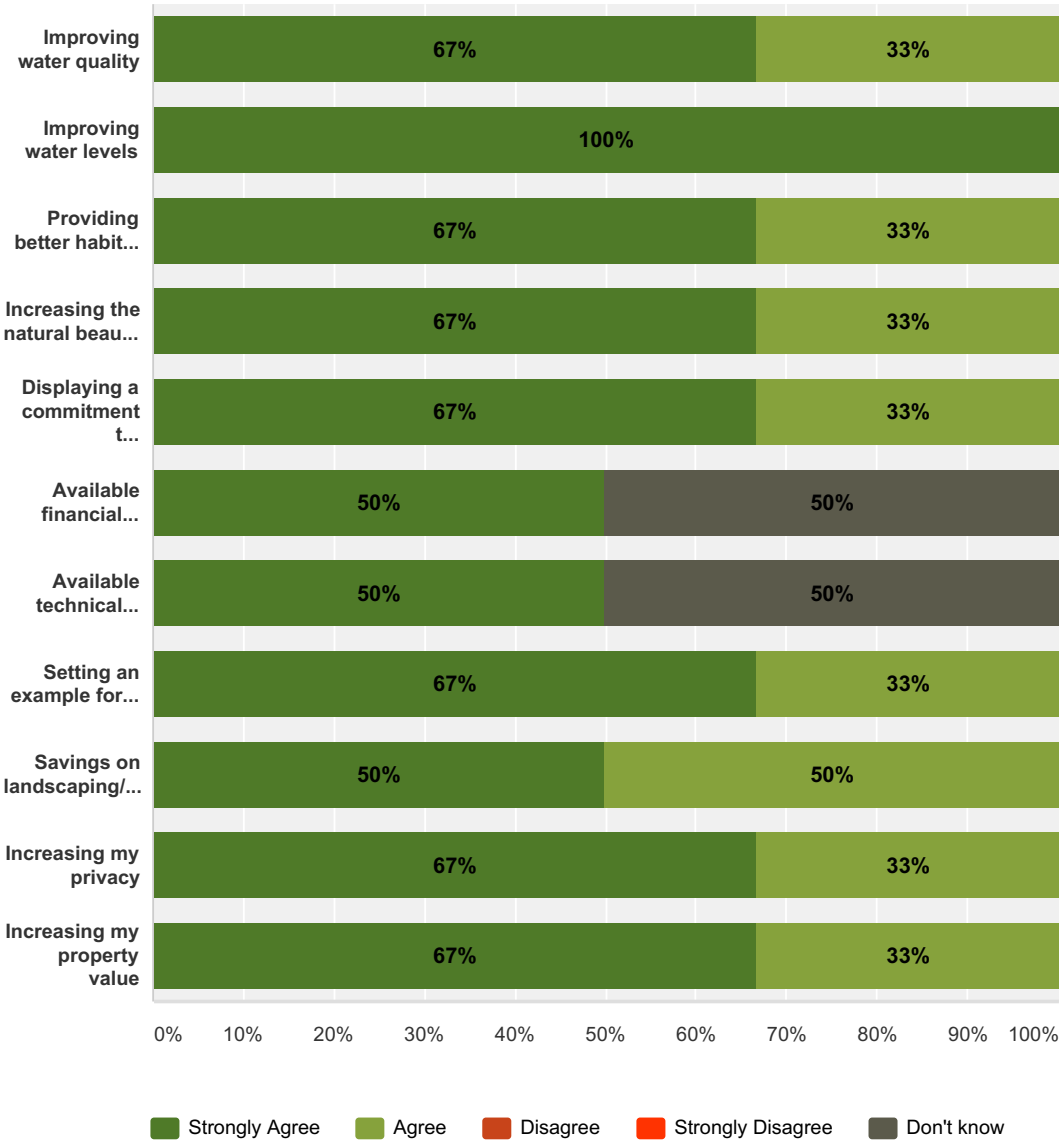
Answered: 3 Skipped: 0



	Strongly Agree	Agree	Disagree	Strongly Disagree	Unsure	Total
enhance the beauty of the property?	33% 1	33% 1	33% 1	0% 0	0% 0	3
increase the economic value of the property?	33% 1	33% 1	0% 0	33% 1	0% 0	3

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

Answered: 3 Skipped: 0



	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't know	Total
Improving water quality	67% 2	33% 1	0% 0	0% 0	0% 0	3
Improving water levels	100% 2	0% 0	0% 0	0% 0	0% 0	2
Providing better habitat for fish and wildlife	67% 2	33% 1	0% 0	0% 0	0% 0	3
Increasing the natural beauty of my property	67% 2	33% 1	0% 0	0% 0	0% 0	3
Displaying a commitment to the environment	67% 2	33% 1	0% 0	0% 0	0% 0	3

Available financial assistance	**50%** 1	**0%** 0	**0%** 0	**0%** 0	**50%** 1	2
Available technical assistance	**50%** 1	**0%** 0	**0%** 0	**0%** 0	**50%** 1	2
Setting an example for community members	**67%** 2	**33%** 1	**0%** 0	**0%** 0	**0%** 0	3
Savings on landscaping/maintenance costs	**50%** 1	**50%** 1	**0%** 0	**0%** 0	**0%** 0	2
Increasing my privacy	**67%** 2	**33%** 1	**0%** 0	**0%** 0	**0%** 0	3
Increasing my property value	**67%** 2	**33%** 1	**0%** 0	**0%** 0	**0%** 0	3

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

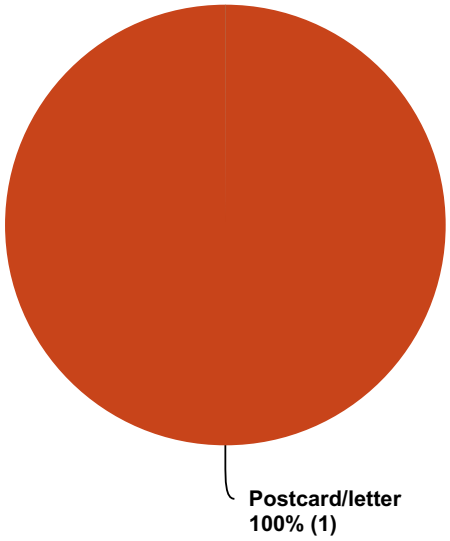
Q1 Enter your Waushara County Lakes Survey ID. Your survey cannot be processed without this information. If you've forgotten your ID or haven't created one yet, follow the instructions below.

Answered: 1 Skipped: 0

#	Responses	Date
1	[redacted]	7/31/2015 9:48 PM

Q2 How did you hear about this survey?

Answered: 1 Skipped: 0

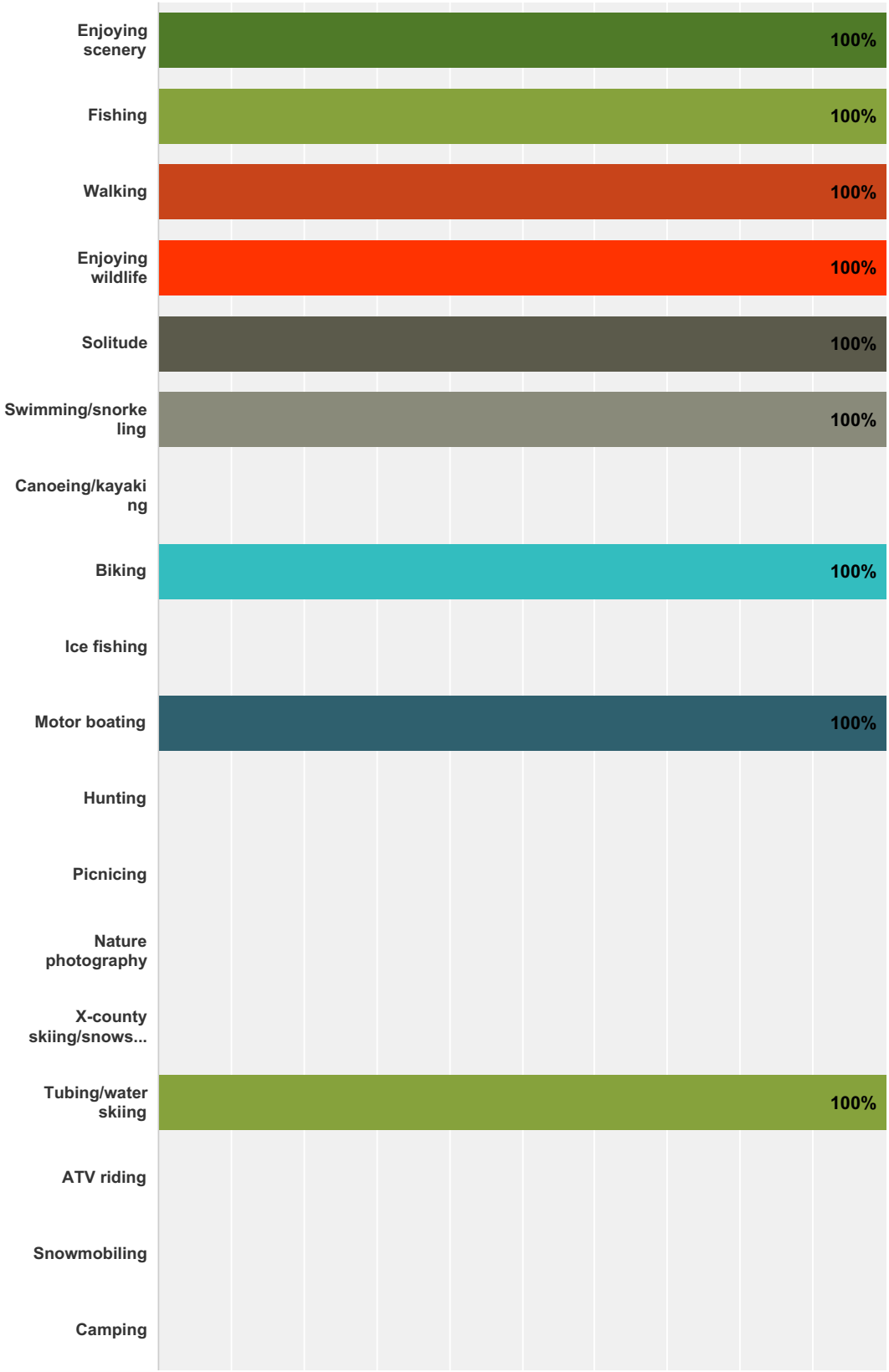


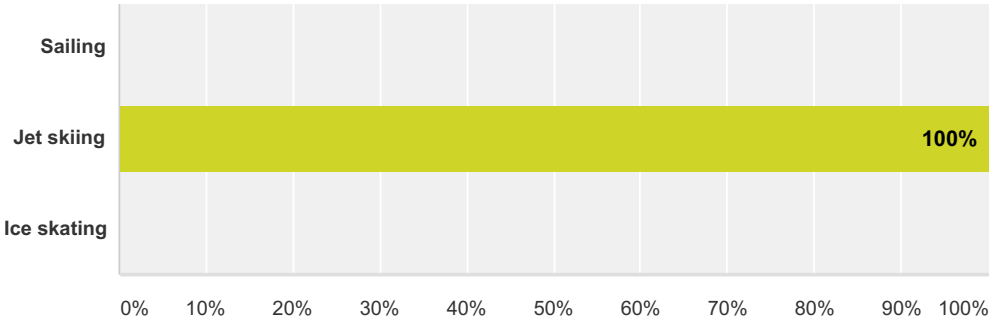
Answer Choices	Responses	
E-mail	0%	0
Newspaper	0%	0
Postcard/letter	100%	1
Facebook	0%	0
Radio	0%	0
Total		1

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

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

Answered: 1 Skipped: 0



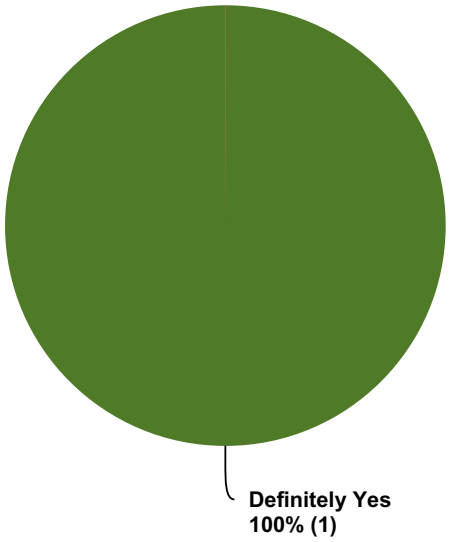


Answer Choices	Responses	
Enjoying scenery	**100%**	1
Fishing	**100%**	1
Walking	**100%**	1
Enjoying wildlife	**100%**	1
Solitude	**100%**	1
Swimming/snorkeling	**100%**	1
Canoeing/kayaking	**0%**	0
Biking	**100%**	1
Ice fishing	**0%**	0
Motor boating	**100%**	1
Hunting	**0%**	0
Picnicing	**0%**	0
Nature photography	**0%**	0
X-county skiing/snowshoeing	**0%**	0
Tubing/water skiing	**100%**	1
ATV riding	**0%**	0
Snowmobiling	**0%**	0
Camping	**0%**	0
Sailing	**0%**	0
Jet skiing	**100%**	1
Ice skating	**0%**	0
Total Respondents: 1		

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

Q4 The current "No Wake" hours on Little Hills Lake are 5pm-12pm Monday-Friday and 4pm-10am on Saturday and Sunday. Do you like the current "No Wake" hours as they are? (If answering 'Definitely Yes', please skip to Question 18.)

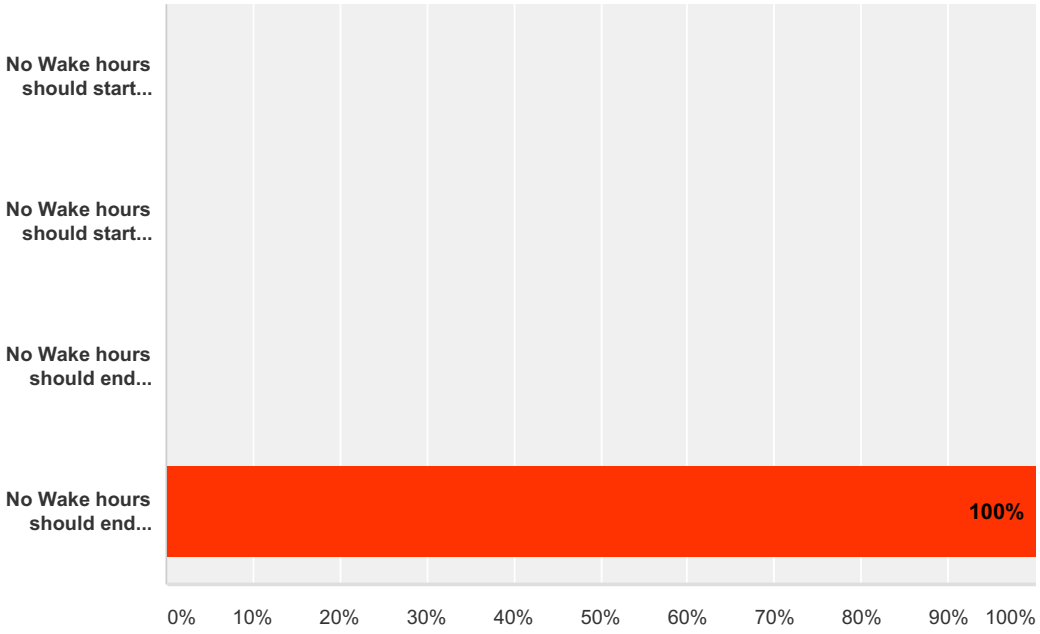
Answered: 1 Skipped: 0



Answer Choices	Responses	
Definitely Yes	100%	1
Yes, most of the time	0%	0
No, not most of the time	0%	0
Definitely No	0%	0
Unsure	0%	0
Total		1

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

Answered: 1 Skipped: 0



Answer Choices	Responses	
No Wake hours should start earlier in the day.	0%	0
No Wake hours should start later in the day.	0%	0
No Wake hours should end eariler in the day.	0%	0
No Wake hours should end later in the day.	100%	1
Total Respondents: 1		

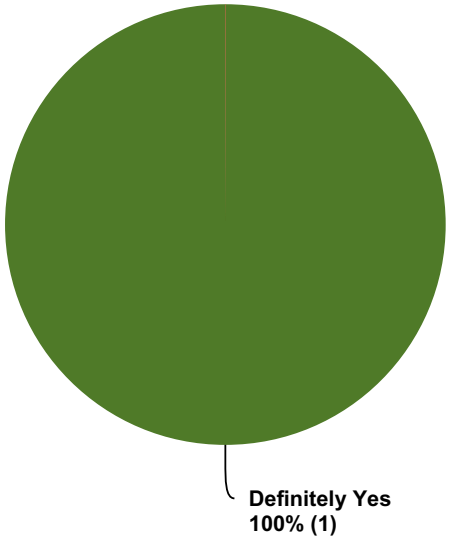
Q6 What could be done to improve your recreation experience on Little Hills Lake?

Answered: 1 Skipped: 0

#	Responses	Date
1	Better enforcement of lake rules	7/31/2015 9:54 PM

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

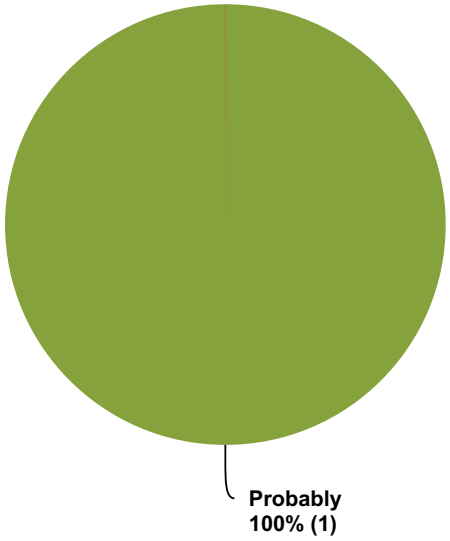
Answered: 1 Skipped: 0



Answer Choices	Responses	
Definitely Yes	100%	1
Probably	0%	0
Not Likely	0%	0
Definitely No	0%	0
Unsure	0%	0
Total		1

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

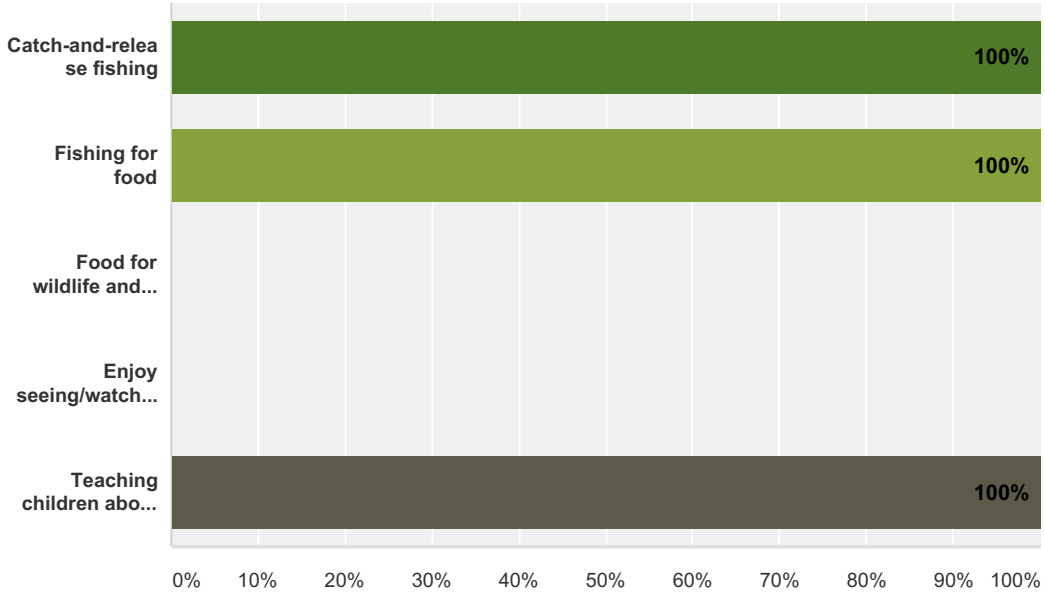
Answered: 1 Skipped: 0



Answer Choices	Responses	
Definitely Yes	0%	0
Probably	100%	1
Not Likely	0%	0
Definitely No	0%	0
Unsure	0%	0
Total		1

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

Answered: 1 Skipped: 0

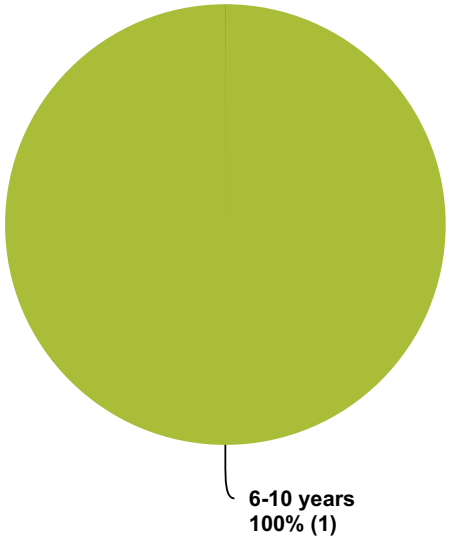


Answer Choices	Responses	
Catch-and-release fishing	**100%**	1
Fishing for food	**100%**	1
Food for wildlife and birds	**0%**	0
Enjoy seeing/watching fish	**0%**	0
Teaching children about fishing/lakes	**100%**	1
Total Respondents: 1		

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

Q10 How many years of fishing experience do you have on Little Hills Lake? If you don't fish Little Hills Lake, skip to Question 14.

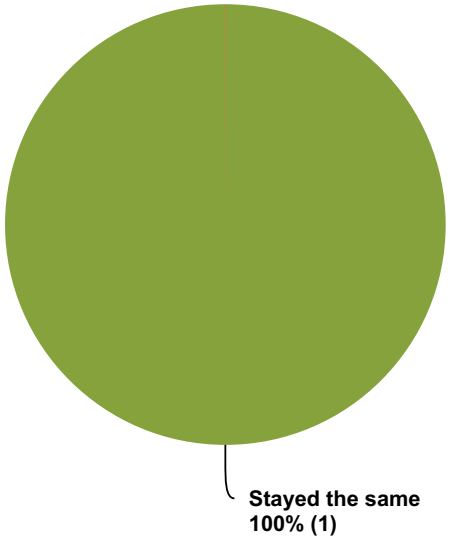
Answered: 1 Skipped: 0



Answer Choices	Responses	
I don't fish Little Hills Lake	0%	0
1-5 years	0%	0
6-10 years	100%	1
11-20 years	0%	0
More than 20 years	0%	0
Total		1

Q11 In the years you have been fishing Little Hills Lake, would you say the quality of fishing has... (If answering 'Stayed the same' or 'Not sure', skip to Question 9).

Answered: 1 Skipped: 0



Answer Choices	Responses	
Improved	0%	0
Stayed the same	100%	1
Declined	0%	0
Not sure	0%	0
Total		1

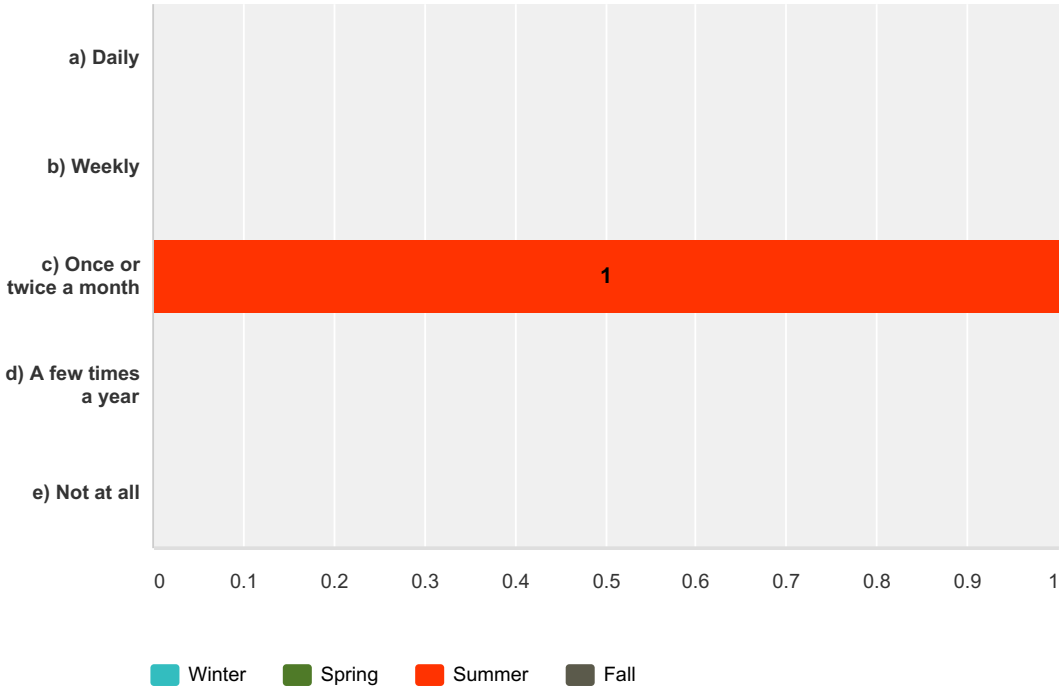
Q12 What factors do you feel have contributed to the change in fishing?

Answered: 0 Skipped: 1

#	Responses	Date
	There are no responses.	

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

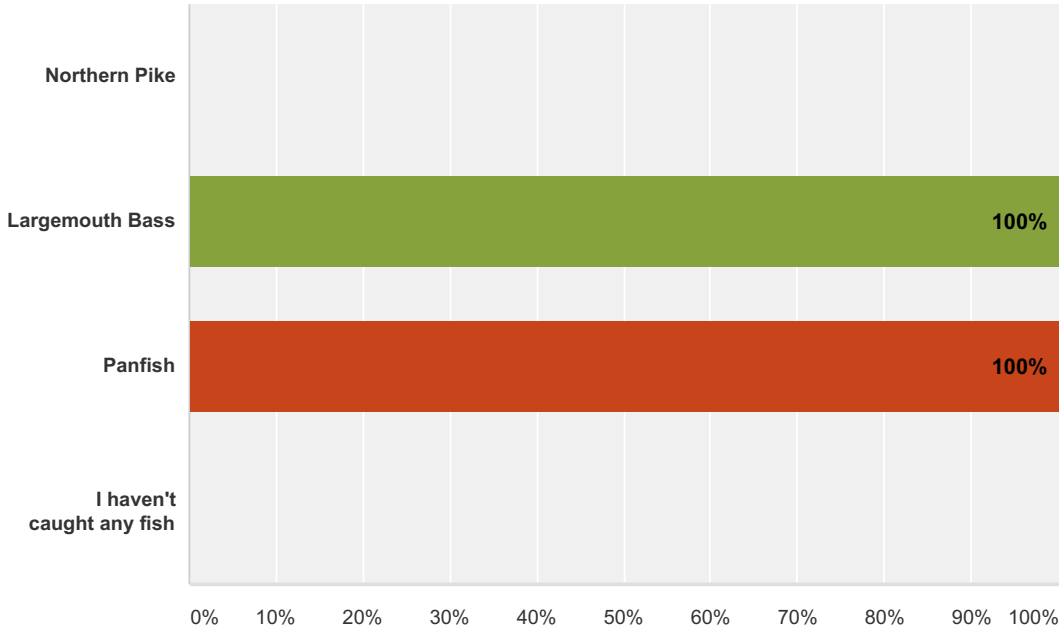
Answered: 1 Skipped: 0



	Winter	Spring	Summer	Fall	Total Respondents
a) Daily	0% 0	0% 0	0% 0	0% 0	0
b) Weekly	0% 0	0% 0	0% 0	0% 0	0
c) Once or twice a month	0% 0	0% 0	100% 1	0% 0	1
d) A few times a year	0% 0	0% 0	0% 0	0% 0	0
e) Not at all	0% 0	0% 0	0% 0	0% 0	0

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

Answered: 1 Skipped: 0

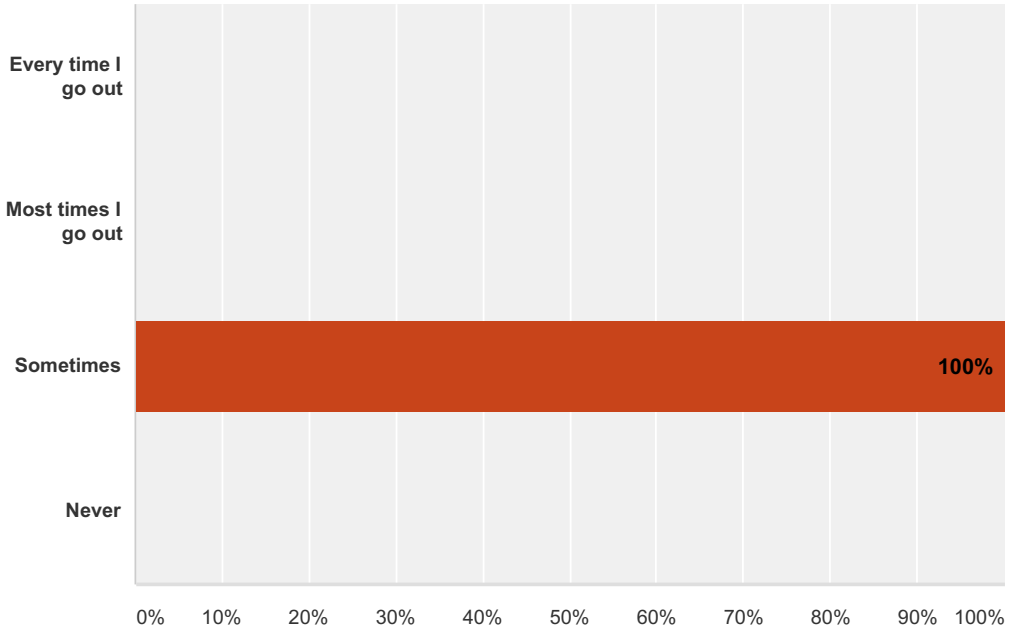


Answer Choices	Responses	
Northern Pike	0%	0
Largemouth Bass	100%	1
Panfish	100%	1
I haven't caught any fish	0%	0
Total Respondents: 1		

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

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

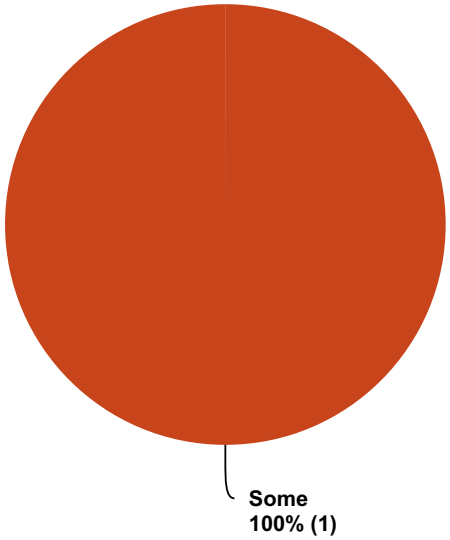
Answered: 1 Skipped: 0



Answer Choices	Responses	
Every time I go out	0%	0
Most times I go out	0%	0
Sometimes	100%	1
Never	0%	0
Total Respondents: 1		

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

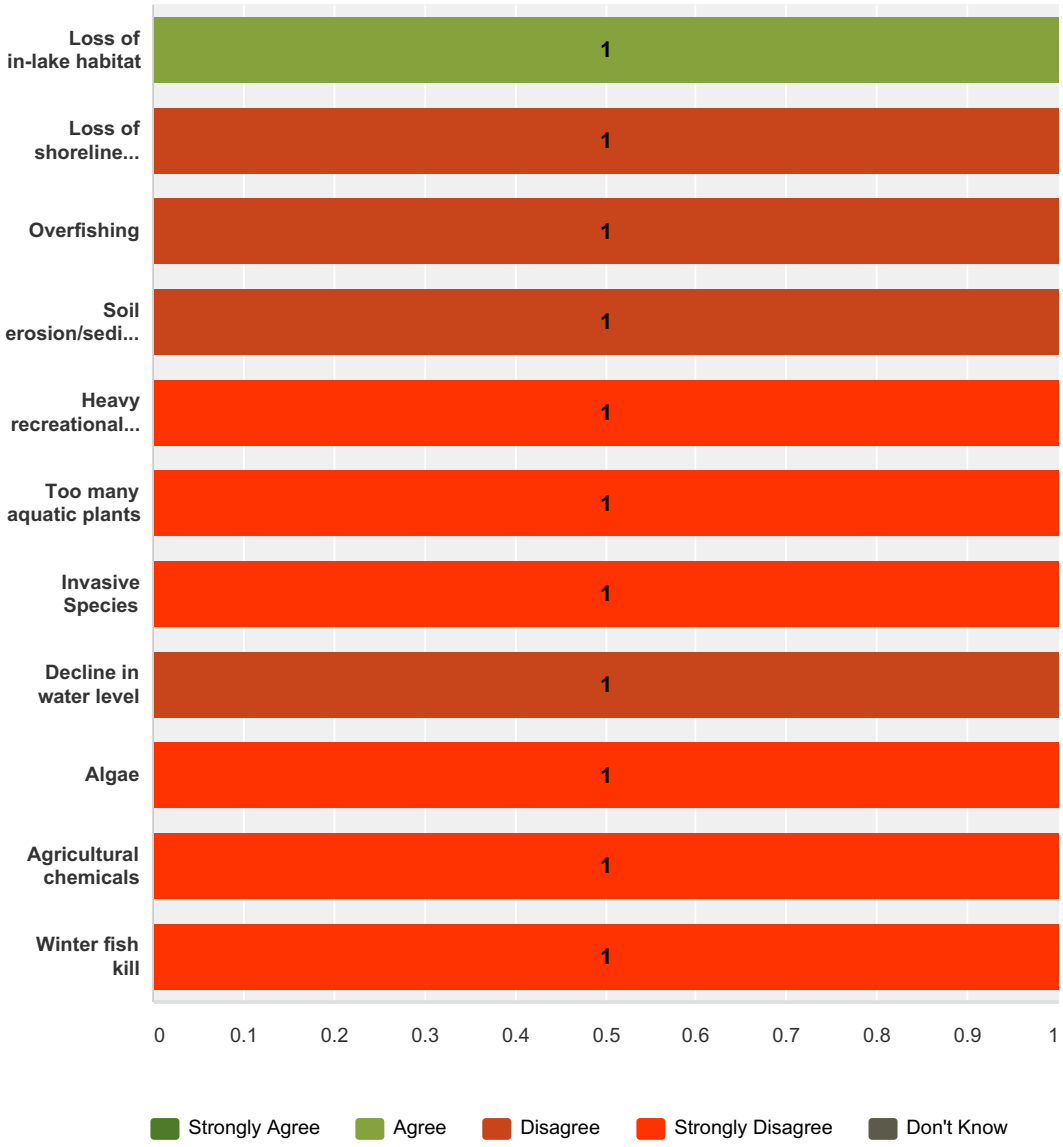
Answered: 1 Skipped: 0



Answer Choices	Responses	
All	0%	0
Most	0%	0
Some	100%	1
None	0%	0
Total		1

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

Answered: 1 Skipped: 0



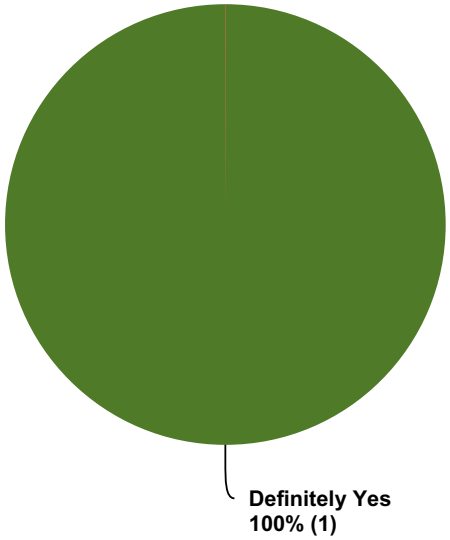
	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	Total Respondents
Loss of in-lake habitat	0% 0	100% 1	0% 0	0% 0	0% 0	1
Loss of shoreline habitat	0% 0	0% 0	100% 1	0% 0	0% 0	1
Overfishing	0% 0	0% 0	100% 1	0% 0	0% 0	1
Soil erosion/sedimentation	0% 0	0% 0	100% 1	0% 0	0% 0	1

Heavy recreational use	**0%** 0	**0%** 0	**0%** 0	**100%** 1	**0%** 0	1
Too many aquatic plants	**0%** 0	**0%** 0	**0%** 0	**100%** 1	**0%** 0	1
Invasive Species	**0%** 0	**0%** 0	**0%** 0	**100%** 1	**0%** 0	1
Decline in water level	**0%** 0	**0%** 0	**100%** 1	**0%** 0	**0%** 0	1
Algae	**0%** 0	**0%** 0	**0%** 0	**100%** 1	**0%** 0	1
Agricultural chemicals	**0%** 0	**0%** 0	**0%** 0	**100%** 1	**0%** 0	1
Winter fish kill	**0%** 0	**0%** 0	**0%** 0	**100%** 1	**0%** 0	1

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

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

Answered: 1 Skipped: 0



Answer Choices	Responses	
Definitely Yes	100%	1
Probably Yes	0%	0
Probably No	0%	0
Definitely No	0%	0
Unsure	0%	0
Total		1

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

Answered: 0 Skipped: 1

#	Responses	Date
	There are no responses.	