

# 2015

## Twin Lake, Waushara County, Wisconsin Lake Management Plan



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



Center for Watershed Science and Education  
College of Natural Resources  
**University of Wisconsin-Stevens Point**



## Lake Management Plan for Twin Lake, Waushara County, Wisconsin

The Twin Lake Management Plan was developed with input from residents and lake users at a series of four public planning sessions held at the Wild Rose Community Center, Camp Twin Lakes, and Crossways Pine Lake Camp in August, September, October and November 2014. 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 Twin Lake Property Owners, Ltd. on: May 2, 2015.  
Date

The plan was adopted by the Town of Springwater on: \_\_\_\_\_.  
Date

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

The plan was approved by the Wisconsin Department of Natural Resources on: April 19, 2016.  
Date

***A special thanks to all who helped to create the Twin 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

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## Overarching Vision for Twin Lake

*Twin Lake will be a quiet refuge where generations of friends and family gather to enjoy clean, clear water with great fishing and swimming. Memories of summer camp, still evenings and wildlife encounters will continue to be a tradition for the lake's residents and visitors.*

## Introduction

Twin Lake is a 93-acre seepage lake with a maximum depth of 13 feet located in northern Waushara County. The lake is relatively developed on the northern end, but sparsely developed on the western and southern ends. Little Twin Lake lies directly to the south, and Pine Lake lies to the west. Land in the towns of Springwater and Saxeville are located in the Twin Lake watershed. Twin Lake is valued by its residents for family gatherings, quiet summer nights and pleasurable swimming. It is often described as a serene respite from the bustle of the world, where generations of friends and family have gathered to enjoy the outdoors. The desire to preserve these values inspired community members to come together in partnership with local professionals and experts to develop this lake management plan.

The purpose of this plan is to provide a framework for the protection and improvement of Twin Lake. Implementing the content of this lake management plan (LMP) will enable citizens and other supporters to achieve the vision for Twin 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 Twin 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 Twin 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 Twin Lake can have the greatest influence on the lake by understanding and choosing lake-friendly options to manage their land and the lake.
- **Twin Lake Property Owners, Ltd.:** This plan provides the organization 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 organization to realize its accomplishments. Resources and funding

opportunities for management activities are made more available by placement of goals into the lake management plan, and the organization can identify partners to help achieve their goals for Twin 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 enjoyable.
- **The Towns of Springwater and Saxeville:** The towns 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 state funding— 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.

Several reports from the Twin 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 - Twin Lake 2010-2012*, University of Wisconsin-Stevens Point.



## The Planning Process

The planning process included a series of four public planning sessions held between August and November 2014 at the Wild Rose Community Center, Camp Twin Lakes, and Crossways Pine Lake Camp. The Twin Lake Planning Committee consisted of property owners, lake users and residents. 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 sent directly to Twin Lake waterfront property owners and by press releases in local newspapers. In addition, members of the planning committee were provided with 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 Twin 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 then 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 and members of the Twin Lake planning committee, as well as the known science about Twin 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 the Twin Lake Management Plan will ensure 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, lake organization*

## List of Goals

- Goal 1. Twin Lake will have a sustainable, balanced fishery.
- Goal 2. Twin Lake will have a diverse, healthy aquatic plant community consisting of submergent, emergent, and floating plants.
- Goal 3. Prevent new introductions of aquatic invasive species (AIS) to Twin Lake and control existing AIS.
- Goal 4. High quality habitat for fish and wildlife will be identified and protected.
- Goal 5. Water quality in Twin Lake will be maintained the same or better than the average measurements observed during the 2010-2012 study.
- Goal 6. Maintain vegetated shorelands where they already exist, and encourage restoration where shorelands are less than the minimum standards.
- Goal 7. Watershed property owners and town board members will know about and utilize resources for healthy land management practices.
- Goal 8. Lake users will make informed decisions.
- Goal 9. Maintain open communications between shoreland property owners, lake users, the community, and lake stewards.
- Goal 10. Keep this plan current to the needs of the lake.

### The following goals were identified as 'high priority':

**Goal 1. Twin Lake will have a sustainable, balanced fishery. (Fish Community)**

**Objective 1.1.** Work toward a balanced fish community including northern pike in Twin Lake.

Consult with WDNR Fisheries Biologist regarding recommendations for lower size limit for northern pike; determine if change in bag limit would also be beneficial.

**Goal 3. Prevent new introductions of aquatic invasive species (AIS) to Twin Lake and control existing AIS. (Aquatic Invasive Species (AIS))**

**Objective 3.2.** Enact EWM control/removal strategy to preserve and protect the native plant community.

Conduct lake-wide assessment of EWM, arrange training sessions for identification and proper removal of EWM, determine if biological controls would be feasible, explore hiring SCUBA divers for hand-pulling, create herbicide strategy if warranted.

**Goal 5. Water quality in Twin Lake will be maintained the same or better than the average measurements observed during the 2010-2012 study. (Water Quality)**

**Objective 5.1.** Minimize nutrient and sediment loading to the lake by improving existing practices near the lake.

Refrain from the use of fertilizers on shoreland properties. Inform others about impacts of nutrients and land management on lake water quality, encourage restoration of unmowed vegetation along the shore.

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.

<b>Resource</b>	<b>Acronym</b>
<b>WDNR Citizen Lake Monitoring Network</b>	<b>CLMN</b>
<b>UWSP Center for Watershed Science and Education</b>	<b>CWSE</b>
<b>Gathering Waters Conservancy</b>	<b>GWC</b>
<b>North Central Conservancy Trust</b>	<b>NCCT</b>
<b>USDA Natural Resources Conservation Service</b>	<b>NRCS</b>
<b>Golden Sands Resource Conservation &amp; Development Council, Inc.</b>	<b>RC&amp;D</b>
<b>Twin Lake Property Owners, Ltd.</b>	<b>TLPO</b>
<b>UW-Extension</b>	<b>UWEX</b>
<b>University of Wisconsin-Stevens Point</b>	<b>UWSP</b>
<b>Waushara County Land Conservation</b>	<b>WCLCD</b>
<b>Waushara County Watershed Lakes Council</b>	<b>WCWLC</b>
<b>Wisconsin Department of Natural Resources</b>	<b>WDNR</b>
<b>Wisconsin Department of Transportation</b>	<b>WDOT</b>
<b>UWSP Water and Environmental Analysis Laboratory</b>	<b>WEAL</b>
<b>Wisconsin Lakes</b>	<b>WL</b>

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

## **In-Lake Habitat and a Healthy Lake**

Many lake users value Twin Lake for its fishing, wildlife, good water quality, and relaxing atmosphere. 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 Twin Lake includes the aquatic plants, branches, and tree limbs above and below the water.

## **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. Half of the survey respondents felt the quality of fishing had declined in the years they had been at the lake.

According to Dave Bartz, Fisheries Biologist with the WDNR, Twin Lake has a history of winter fish kills and fluctuating water levels. Operating an aerator would be the only way to avoid this situation. The results of the most recent electroshocking survey of sports fish conducted in 2012 indicated the abundance of largemouth bass was fair with good size structure; bluegill abundance was high with a poor size structure; and, pumpkinseed abundance was fair with good size structure.

Recommendations made by the fisheries biologist during the November 18, 2014 planning session were to protect and enhance fish habitat by placing additional coarse woody structure in the water and effectively managing aquatic invasive plants.

### Guiding Vision for the Fish Community

*Twin Lake will host healthy, abundant fish communities and the habitat to support them.*

#### Goal 1. Twin Lake will have a sustainable, balanced fishery.

**Objective 1.1.** Work toward a balanced fish community in Twin Lake, including northern pike.

Actions	Lead person/group	Resources	Timeline
Consult with WDNR Fisheries Biologist regarding recommendations for lower size limit for northern pike; determine if change in bag limit would also be beneficial.	TLPO	WDNR Fisheries Biologist	Annually
Introduce a resolution to Conservation Congress to initiate changes in northern pike management and associated regulations. Contact WDNR Fisheries Biologist for guidance on the process and suggested recommendations.	TLPO	Dave Bartz, WDNR Fisheries Biologist WC representative for Conservation Congress	April- Conservation Congress Spring Hearing

**Objective 1.2.** Protect healthy shorelines and improve degraded shorelines.

<b>Actions</b>	<b>Lead person/group</b>	<b>Resources</b>	<b>Timeline</b>
Protect natural shorelands and restore denuded shorelands (referenced in Objective 6.1)	Shoreland property owners	WCLCD	Ongoing
Inform property owners about the habitat value of near-shore fallen trees or branches; encourage property owners not to remove deadfall from their shoreline except as necessary for access or safety (welcome packets and other means).	TLPO	WCLCD UWEX Lakes (educational material)	Ongoing

**Aquatic Plant Community**

Aquatic plants provide the forested landscape within Twin 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 an aquatic plant survey conducted in September 2013, twenty-six species of aquatic plants were observed within Twin Lake, which was above average when compared with the other lakes in the Waushara County Lakes Study (Golden Sands Resource Conservation & Development Council, Inc., 2014). The greatest depth at which aquatic plant growth was found was 13.5 feet. The dominant plant species found in Twin Lake were muskgrasses, followed by slender naiad and floating-leaf pondweed. Four of the species found in Twin Lake are considered high quality plants, indicating good health in the aquatic plant community. Small bladderwort, a carnivorous plant, is a species especially sensitive to disturbance. Efforts should be made to avoid disturbing the sensitive plants in Twin Lake. The 2013 aquatic plant survey also documented three invasive plant species: Eurasian watermilfoil (EWM), common reed and narrow-leaf cattail. More detailed information can be found in the Twin Lake Aquatic Plant Report, the Twin Lake 2010-2012 Lake Study Report, and in Appendix B. Aquatic Plants.

**Guiding Vision for Aquatic Plants in Twin Lake**

*Twin Lake will have a healthy aquatic plant community as the foundation of its ecosystem.*



**Goal 2. Twin Lake will have a diverse, healthy aquatic plant community consisting of submergent, emergent, and floating plants.**

**Objective 2.1.** Protect and enhance the native plant community in Twin Lake.

Actions	Lead person/group	Resources	Timeline
Inform property owners about the unique native aquatic plants found in Twin Lake and the benefits they bring to the lake (fish habitat, invertebrate breeding grounds, oxygen production, etc.) – Aquatic plant “tour of lakes”, welcome packets, pressed plants from the lake at the camps, etc.	TLPO	WCWLC UWEX Lakes (educational material) RC&D	Ongoing
Inventory and monitor the native aquatic plants in Twin Lake.	TLPO Interested citizen	Consultant	Every 5 years - 2018
Protect and leave in place as much native vegetation as possible to prevent establishment of new aquatic invasive species.	Shoreland property owners	UWEX Lakes	Ongoing

**Objective 2.2.** Provide access to open water in the western bay.

Actions	Lead person/group	Resources	Timeline
Explore methods for managing white water lily without encouraging spread of Eurasian watermilfoil where both are present.	TLPO	WDNR Aquatic Plant Biologist	Ongoing
Inform property owners about benefits of white water lily for wave reduction on shore and maintaining cooler water temperatures for fish in summer.	TLPO	WDNR Aquatic Plant Biologist UWEX Lakes (educational materials)	Ongoing

**Aquatic Invasive Species (AIS)**

Aquatic invasive species are non-native aquatic plants and animals that are most often unintentionally transported into lakes via lake users. This most commonly occurs on trailers, boats, equipment, and from the release of bait. The 2013 aquatic plant survey identified three aquatic invasive plant species (AIS) in Twin Lake: Eurasian watermilfoil (EWM), narrow-leaf cattail and two patches of invasive common reed (*Phragmites australis*). Purple loosestrife and non-native phragmites were also identified along the shoreline in a 2014 survey conducted by RC&D.

Eurasian watermilfoil (EWM) was first identified in Twin Lake in 1993 and has been managed intermittently with chemical spot treatments. The locations of EWM populations observed in 2013 are displayed in the map in Appendix B. Aquatic Plants . In some lakes, EWM can exist as part of the plant community, while in others it can create dense beds that can damage boat motors, make areas non-navigable, stunt or alter the fishery, and inhibit

activities like swimming and fishing. This plant can produce 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.

Common reed can crowd and shade out native grasses, sedges and forbs that are favored by many species of native birds. Narrow-leaf cattail also harms shoreline and wetland habitat by crowding out native vegetation.

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, the management strategies for EWM management in Twin Lake should be adapted as EWM populations in the lake change and as new information becomes available.

Hybrid watermilfoil (HWM) results from a hybridization of native watermilfoil with EWM. There is some evidence suggesting HWM can be tolerant of certain herbicides such as 2,4-D products; therefore, it is important to know if HWM is present in Twin Lake. HWM may be suspected in a lake if 1) the plant's appearance is different than EWM; 2) management with chemicals becomes difficult or ineffective; and, 3) the lake is near other lakes with HWM. If HWM is suspected, plant samples should be submitted to a lab for confirmation. Once HWM is confirmed, a review of past herbicide use in the lake and surrounding lakes may be necessary to assess the likelihood of herbicide tolerance. A "challenge test" may be appropriate if tolerance to herbicides is suspected. This entails obtaining live specimens from Twin Lake and then having them grown in a controlled setting where a combination of herbicides at different rates will be applied to evaluate the effectiveness in controlling that particular strain of HWM. There are many combinations of herbicides and concentrations that can potentially be used to treat HWM – the only way to know the appropriate combination is by sending samples to be challenge tested. 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.

#### Summary of Aquatic Plant Management Planning Session Discussion – September 16, 2014

Various aquatic plant management options involving the control of aquatic invasive species were discussed at the September 16, 2014 lake management planning meeting. It was determined that a few of the shoreland property owners were interested in working with RC&D to eradicate phragmites and purple loosestrife. "No action" was the approach identified for the narrow-leaf cattails.

Meeting attendees considered the responses to questions about EWM control in the aquatic plant survey provided to residents and the public. The majority of survey respondents wanted to do something to control EWM in Twin Lake. The favored options in order of preference were: mechanical



**Eurasian watermilfoil.**

harvesting, manual removal by property owners, hand pulling by SCUBA divers, and biological control (the native milfoil weevil, *Euhrychiopsis lecontei*). The less favored option was chemical control (herbicides). Mechanical harvesting and dredging of bottom sediments were determined to be inappropriate approaches for the situation in Twin Lake and therefore were not elaborated on at the meeting. Detailed resident opinion survey results regarding aquatic plants can be found in Appendix E. Lake User Survey Results.

Management options will change depending upon the amount and location of EWM in Twin Lake and if HWM is determined to be present; therefore, routine annual monitoring of this invasive species is essential. The presence of EWM will also define the type of aquatic plant management that can be conducted to address recreational impediments. Harvesting plants could result in fragmenting EWM which could further its distribution in Twin Lake. The following aquatic plant management strategies were determined to be the most practical and effective options to minimize impacts to Twin Lake as a whole.

***Manual removal. Target species: EWM – no permit required for AIS***

**With the low populations of EWM currently in Twin Lake, manual removal is the preferred approach for removal.** This is being done by individual lake front property owners who have been trained in removal techniques intended to both successfully remove and minimize fragmentation of the plant. Those trained to properly identify and remove EWM and other aquatic invasive species can remove those plants manually at any time of year, without a permit. Shoreland property owners are permitted to clear an area up to 30' around their dock for boat and swimming access to open water; however, caution should be used to minimize the extent of cleared lakebed, as this open habitat allows for easy establishment of many invasive species. Trained divers can be hired to manually remove AIS in deeper parts of the lake.

***Chemical spot treatment. Target species: EWM – permit required***

Results of recent studies of the effectiveness of chemical spot treatment suggest the treatment is less effective than previously thought and may actually promote chemically-resistant forms of EWM; however, chemical spot treatments may still be appropriate in certain conditions to control EWM in the future. If a 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 *challenge testing*. If EWM is found to not be a hybrid, and are typically less than 5 acres, a contact herbicide such as endothall or diquat should be used. Systemic herbicides should be avoided. Chemical treatment should occur early in the season, prior to emergence of native plants. To reduce the chance of developing resilient strains of EWM, different chemicals should be used in consecutive years. Point-intercept surveys should be conducted both pre- and post-treatment.

***Milfoil weevils. Target species: EWM, HWM, northern watermilfoil – no permit required***

This option could be considered in areas of the lake with native or restored shorelines. Milfoil weevils are expensive to purchase, so obtaining a starter population and rearing them in predator-free conditions can be desirable. Professional assistance from staff at RC&D should be sought if stocking or rearing is pursued. It is unknown if a native milfoil weevil populations is present in Twin Lake.

**Do nothing.** In some lakes, AIS is present, but does not flourish or become a nuisance even without the intervention of mechanical or chemical treatments. With the current low populations of EWM in Twin Lake, efforts to eliminate are recommended because elimination of this species is still possible.

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

### Guiding Vision for Aquatic Invasive Species

*Twin Lake will not be detrimentally affected by aquatic invasive species.*

### Goal 3. Prevent new introductions of aquatic invasive species (AIS) to Twin Lake and control existing AIS.

**Objective 3.1.** Work proactively to prevent the introduction of new AIS.

Actions	Lead person/group	Resources	Timeline
Inform lake users about the importance of using boat, trailer and equipment hygiene to avoid introduction of AIS.	TLPO	RC&D WDNR – Aquatic Plant Biologist UWEX-Lakes (educational materials)	Ongoing
Discourage shoreland property owners from removing native aquatic vegetation to prevent establishment of AIS.	TLPO	RC&D WDNR – Aquatic Plant Biologist UWEX-Lakes (educational materials)	Ongoing
Learn to identify AIS and routinely monitor for known and new AIS infestations, including zebra mussels.	Interested volunteers	RC&D WDNR – Aquatic Plant Biologist	Ongoing
If a new species of AIS is identified in Twin Lake, refer to the Rapid Response Plan in the appendices of this plan.	TLPO		As needed
Support regional or local programs that offer CBCW monitoring on busy weekends.	TLPO	RC&D/CBCW Coordinator WDNR – Aquatic Plant Biologist WCWLC	Busy holidays/weekends in summer

**Objective 3.2.** Enact EWM removal strategy to preserve and protect the native plant community. Seek to eliminate EWM from Twin Lake.

Actions	Lead person/group	Resources	Timeline
Conduct a lake-wide assessment of EWM. Work with aquatic plant biologist to select the control strategy using the options listed above and adjust annually. If chemical controls are being used, a point-intercept survey would be required.	TLPO	WDNR Aquatic Plant Biologist RC&D (visual survey) Consultant (point-intercept survey)	Begin 2015 and ongoing
Arrange training sessions in EWM hand pulling methods for interested lakeshore property owners.	TLPO	RC&D WDNR Aquatic Plant Biologist WDNR AIS Grant	
Volunteers trained in identification of EWM should monitor for it periodically spring-fall and use proper techniques to remove it.	Volunteers	RC&D WDNR Aquatic Plant Biologist	Ongoing Spring - Fall
Coordinate EWM hand-pulling events or a means for tracking when and where individuals engage in hand-pulling activities.	TLPO	WDNR AIS Grant RC&D	As needed
Explore the possibility of hiring SCUBA divers for hand-pulling EWM; work with area lakes to apply jointly for a grant to hire divers to hand pull EWM.	TLPO	RC&D WCWLC WDNR AIS Grant	As needed
Determine if biological control with EWM weevils would be effective or feasible at this site.	TLPO	RC&D	2017

**Objective 3.2.** Eliminate or limit the spread of shoreland invasives such as phragmites and purple loosestrife.

Actions	Lead person/group	Resources	Timeline
Host training for interested residents on identification and removal of phragmites.	Volunteers	RC&D WDNR AIS Grant	2016
Explore options for removal or biological control of purple loosestrife.	TLPO	RC&D	2016
Eliminate purple loosestrife through rearing and release of beetles.	TLPO Volunteers	RC&D Local camps Local schools	2016

## Critical Habitat

Critical habitat areas are designated by the WDNR to protect features in a lake that are important to the overall health of the aquatic plants, animals, and lake itself. Every lake contains important natural features, but not all lakes have official critical habitat designations. Designating areas of the lake in this way creates special protections for these areas, and recognizes these areas by mapping and sharing information about them so many can know the locations and importance of areas that could be vulnerable to damage by human activity. Having a critical habitat designation on a lake can help lake groups and landowners plan waterfront projects to minimize impact and protect habitat that will help to ensure long-term health of the lake.

Although Twin Lake does not have an official critical habitat area designation, there are areas within Twin 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. The aquatic plant survey conducted in 2013 identified four high quality aquatic plant species in the western half of the lake. Identifying 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 for Twin Lake's Critical Habitat

*Twin Lake will continue to have healthy habitat for fish, wildlife and water quality.*

#### Goal 4. High quality habitat for fish and wildlife will be identified and protected.

**Objective 4.1.** Critical habitat in and around Twin Lake will be identified.

Actions	Lead person/group	Resources	Timeline
Request Critical Habitat Designation from WDNR.	TLPO	WDNR Fish, Wildlife and Aquatic Plant Biologists Lake Manager	2016
Once identified, help others understand the value of these areas.	TLPO	UWEX-Lakes (educational materials) WDNR Aquatic Biologist and Lake Managers	2017

## 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 Twin 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 Twin 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.



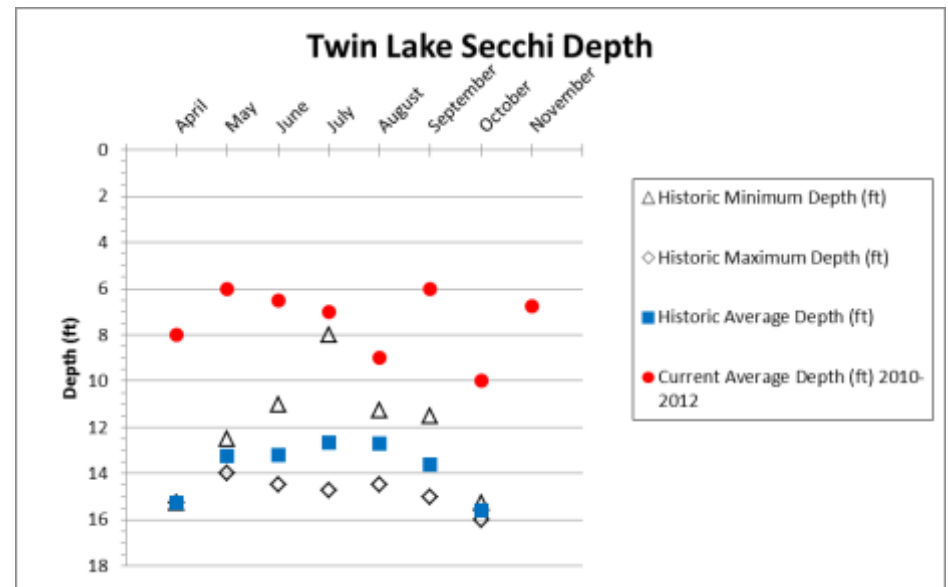
## Water Quality

The vast majority of respondents to the public survey indicated the water quality of Twin Lake has a major impact on their personal enjoyment value and the economic value of their property; however, 63% of respondents felt the water quality had declined in the time they had lived on, visited, or recreated on the lake. A variety of water chemistry measurements were used to characterize the water quality in Twin 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. Water quality data collected in past years was also reviewed to determine trends in Twin Lake's water quality.

Dissolved oxygen is an important measure in Twin 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. Throughout the study period, dissolved oxygen concentrations remained plentiful in Twin Lake throughout the year and were sufficient to support an unstressed fish community; however, based on observed fish kills, oxygen depletion has occurred during long winters (Bartz, 2014).

The water clarity measured in Twin Lake during the study is considered fair. Water clarity ranged from 6 feet to 12 feet with an average of 7.4 feet over the monitoring period. When compared with historic data, the average water clarity measured during the study was worse than historic averages in every month that measurements were taken. Water clarity in Twin Lake is typically poorer during the summer months with the shallowest Secchi depth recorded in late summer.

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. Twin Lake had low average chloride and sodium concentrations over the monitoring period indicating minimal pollution from certain human activities. 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. Atrazine, a common herbicide, was not detected in the water samples collected from Twin 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 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.

Total phosphorus concentrations for Twin Lake ranged from a high of 59 ug/L in November 2010 to a low of 9 ug/L in August. The summer median total phosphorus concentrations were 16.5 ug/L and 14.5 ug/L in 2011 and 2012, respectively. This is below Wisconsin’s phosphorus water quality standard of 40 ug/L for a shallow seepage lake. During the study, inorganic nitrogen concentrations in samples collected during the spring averaged 0.22 mg/L. Concentrations above 0.3 mg/L are sufficient to enhance algal blooms throughout the summer (Shaw et al., 2000). Inorganic nitrogen typically moves to lakes with groundwater.

Estimates of phosphorus from the landscape can help to understand the phosphorus sources to Twin 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. Forests comprised the greatest percent land use in the watershed. Based on water quality modeling results, agriculture and forests had the greatest contributions of phosphorus from the watershed to Twin Lake (see Watershed Land Use Section). The phosphorus export coefficients have been obtained from studies throughout Wisconsin (Panuska and Lillie, 1995).

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

Managing nitrogen, phosphorus and soil erosion throughout the Twin 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 Twin 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 Twin Lake**

*Twin Lake will have clean, clear water that supports a robust fishery, superb swimming and recreation, and a healthy lake ecosystem.*

**Goal 5. Water quality in Twin Lake will be maintained the same or better than the average measurements observed during the 2010-2012 study.**

**(Median summer concentrations of total phosphorus less than 15.5 ug/L, spring inorganic nitrogen less than 0.22 mg/L, average water clarity greater than 7 feet).**

**Objective 5.1.** Minimize nutrient and sediment loading to the lake by improving existing practices near the lake.

Actions	Lead person/group	Resources	Timeline
Refrain from the use of fertilizers on shoreland properties (see Shorelands section). Consider distributing educational materials around the lake.	Shoreland property owners	UWEX Lakes (educational materials)	2016, Ongoing
Inform others around the lake about the impacts of nutrients and land management on water quality through the distribution of an Association newsletter and neighborly discussions. Consider including information on a lake sign.	TLPO	UWEX Lakes (educational materials)	2016, Ongoing
Encourage the restoration of unmowed vegetation along the shore to slow and absorb runoff and pollutants (see Shorelands section).	TLPO	UWEX Lakes (educational materials)	2016, Ongoing

**Objective 5.2.** Monitor the water quality in Twin Lake to evaluate long-term trends and if goals are being met.

Actions	Lead person/group	Resources	Timeline
Learn to monitor water clarity and take measurements	Volunteer	CLMN coordinator Local campers	Annually - 5 times/summer
Collect samples in spring and have them analyzed for inorganic nitrogen.	Volunteer	State-certified lab WEAL	Annually - spring
Measure dissolved oxygen in late winter (every 2 feet until it falls below 3 mg/L)	Volunteer	WCLCD	Annually - winter
Make ice on/ice off observations	Volunteer	CLMN coordinator	Annually – spring and fall
Submit all monitoring data to the WDNR SWIMS database for long term storage.	Volunteer monitors	CLMN coordinator	Min. annually

**Objective 5.3.** Develop strategies to ensure healthy shorelands remain intact and improvements are made to those that have disturbance.

Actions	Lead person/group	Resources	Timeline
See <b>Shorelands</b> section.			

## Shorelands

Shoreland vegetation is critical to a healthy lake ecosystem. It provides habitat for many aquatic and terrestrial animals including birds, frogs, turtles, and small and large mammals. It also helps to improve the quality of the runoff that is flowing across the landscape towards the lake. Healthy shoreland vegetation includes a mix of unmowed grasses/flowers, shrubs, trees, and wetlands which extends at least 35 feet landward from the water's edge.

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

The summary of scores for shorelands around Twin Lake is displayed on the map in Appendix C. Shoreland Survey – 2011. Large portions of Twin Lake's shorelands are in good shape, but a few segments have challenges that should be addressed. There were no stretches of Twin Lake shoreland that ranked as poor. For a more complete understanding of the ranking, an interactive map showing results of the shoreland surveys can be found on the County's webpage. Minimizing impacts to Twin Lake from future development should include planning to ensure that perspective developers have the right information to make informed decisions and that zoning is in place to achieve habitat, water quality, and aesthetic goals.

Shoreland ordinances were enacted to improve water quality and habitat, and to protect our lakes. To protect our lakes, county and state (NR 115) shoreland ordinances state that vegetation should extend at least 35 feet inland from the water's edge, with the exception of an optional 30 foot access corridor for each shoreland lot. With a total of 20 lakefront lots, a total of 600 feet (5%) of disturbed shoreland is permitted as access corridors. Based on the 2011 shoreland inventory, 15% (1,859 feet) of Twin Lake's shoreland was mowed to the edge of the water.

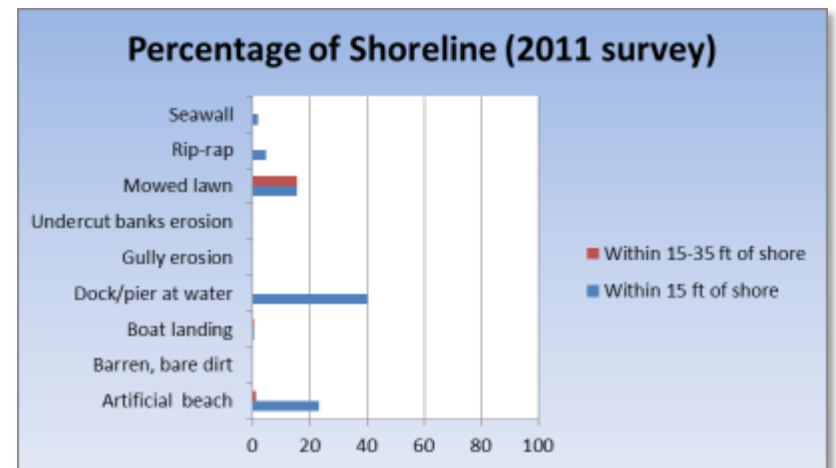


Figure 1. Percentage of shoreline disturbance, 2011.

## Guiding Vision for Twin Lake's Shorelands

*Twin Lake will have largely natural shoreland needed to support a healthy lake ecosystem for aquatic and terrestrial life and for recreation.*

**Goal 6. Maintain vegetated shorelands where they already exist, and encourage restoration where shorelands are less than the minimum standards.**

**Objective 6.1.** Protect large stretches of natural shorelands around Twin Lake.

Actions	Lead person/group	Resources	Timeline
Gather and disseminate information about long-term land protection options, such as conservation easements, to lakefront property owners. Support those that initiate long-term protection efforts.	TLPO	GWC NCCT Lake Protection Grants Knowles-Nelson Stewardship Funds	Ongoing

**Objective 6.2.** Restore 50% (630 feet) of disturbed shorelands over the next 10 years.

Actions	Lead person/group	Resources	Timeline
Inform shoreland property owners about the benefits of healthy shorelands on lake water quality and habitat. (welcome packets, newsletters, demo sites, etc.)	TLPO	WCWLC WCLCD UWEX Lakes (educational material)	Ongoing
Encourage property owners to stop mowing to the water's edge and to consider increasing unmowed shoreland incrementally each year.	Chuck Webb, TLPO	WCLCD UWEX Lakes (educational material)	Ongoing
Seek recommendations from county conservationist for assistance in prioritizing restoration sites and developing a restoration plan.	TLPO	WCLCD Consultant	As needed
Identify shoreland property owners who might be motivated to install a demonstration shoreland restoration on their property.	Chuck Webb, TLPO	WCLCD Consultants WDNR Healthy Lakes grant	Ongoing
Explore funding options to pay for plants, landscaping, and associated costs of restoration.	Shoreland property owners	WCLCD Consultants WDNR Healthy Lakes grant	Ongoing

## Watershed Land Use

It is important to understand where Twin Lake's water originates in order to understand the lake's health. During snowmelt or rainstorms, water moves across the surface of the landscape (runoff) towards lower elevations such as lakes, streams, and wetlands. The land area that contributes runoff to a lake is called the surface watershed. Groundwater also feeds Twin Lake; its land area may be slightly different than the surface watershed. The surface watershed for Twin Lake is 841 acres. Primary land use is forest and developed land (Figure 2). The lake's shoreland is surrounded primarily by forest, wetland and development. In general, the land closest to the lake has the greatest immediate impact on water quality.

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. In the case of Twin Lake, forest land contributes the greatest amount of phosphorus (Figure 3).

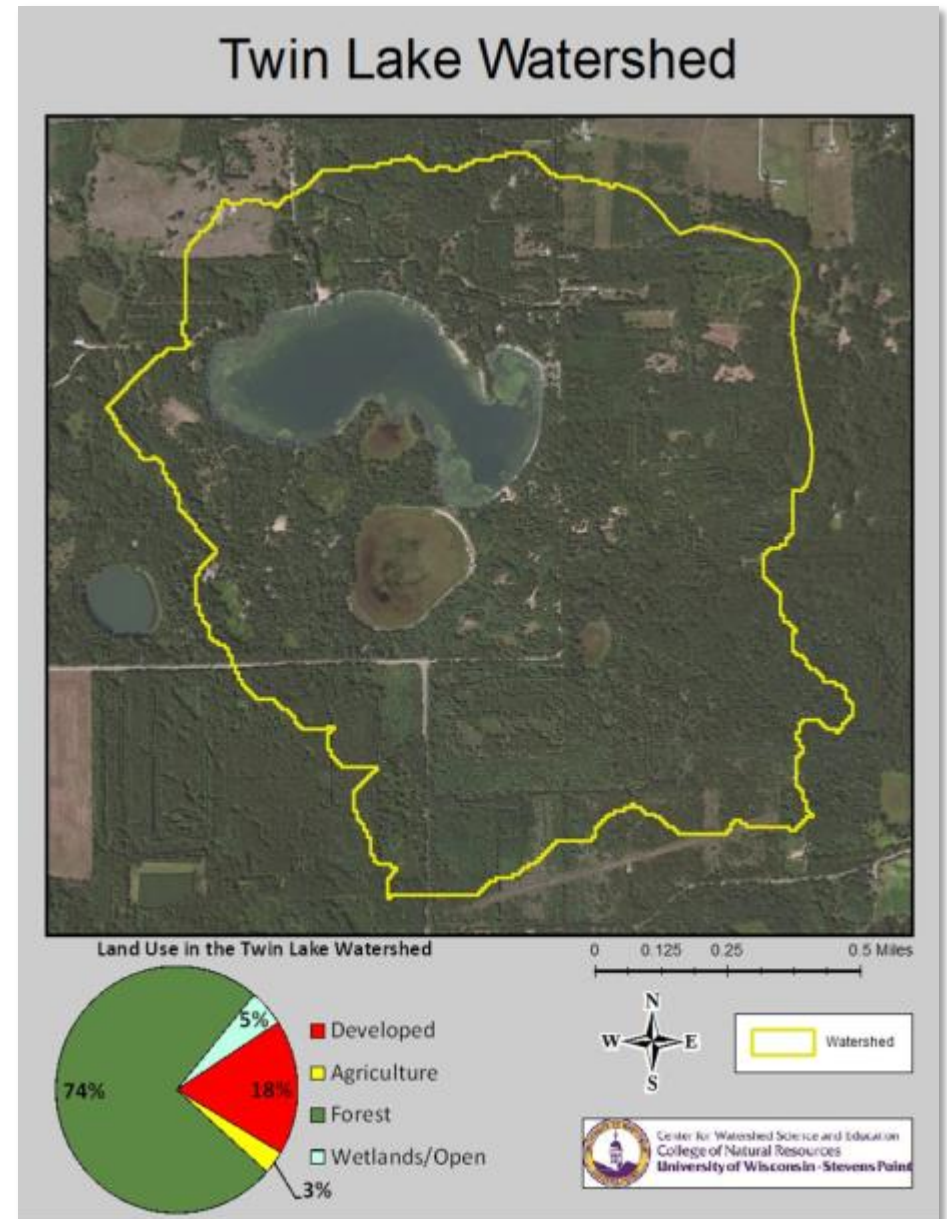


Figure 2. Surface watershed of Twin Lake.

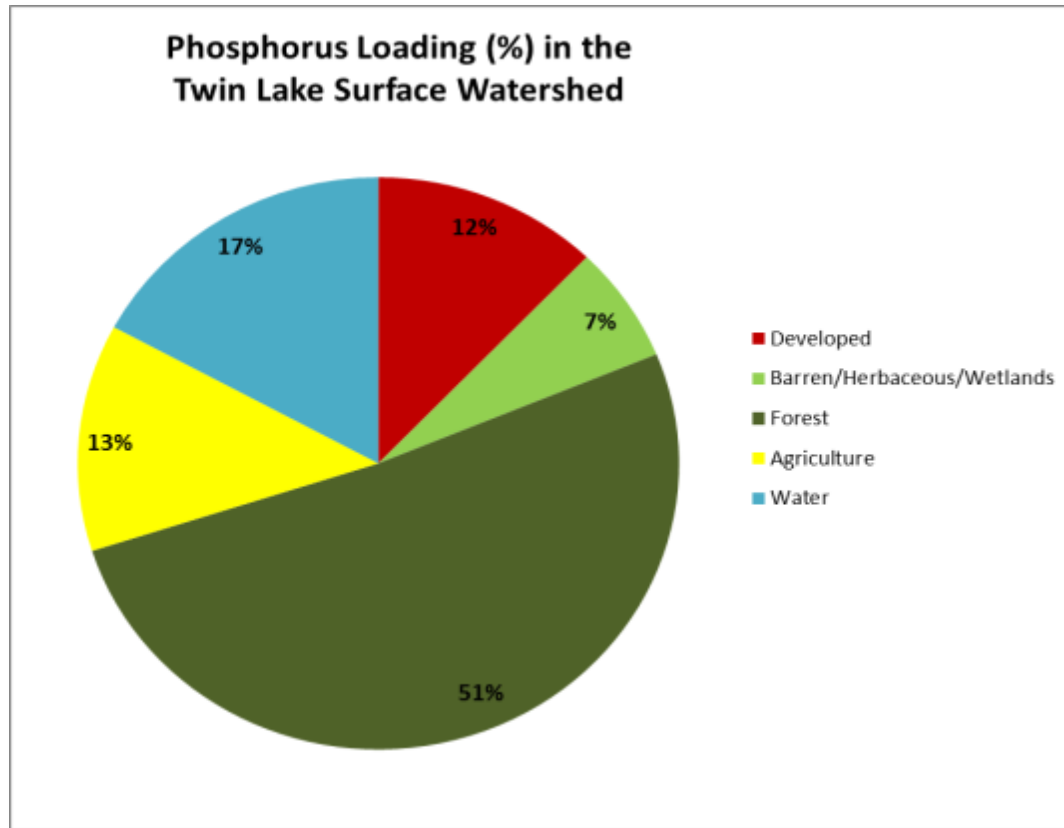


Figure 3. Estimated phosphorus loads from land in the Twin Lake watershed.

### Guiding Vision for Twin Lake’s Watershed

*Twin Lake’s watershed will have minimal adverse impact to the lake water quality.*

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

**Objective 7.1.** Work together to support healthy land management activities around Twin Lake and its watershed.

<b>Actions</b>	<b>Lead person/group</b>	<b>Resources</b>	<b>Timeline</b>
County will support and follow up with water quality-based Best Management Practices (BMPs) within the watershed, including strategies to reduce excess nitrogen leaching to groundwater.	WCLCD	NRCS DATCP WDNR Lake Protection Grants County Board	Ongoing
Continue to use WCLCD as a resource for land management conservation activities.	Watershed land managers	WCLCD	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).	Interested property owner	GWC NCCT NRCS WDNR Lake Protection grants Knowles-Nelson Stewardship Funds	Ongoing
Explore funding options for land purchase within the watershed for conservation, preservation or restoration purposes.	TLPO	WDNR Lake Protection grants Knowles-Nelson Stewardship Funds Private funds/foundations	As needed
Encourage subdivisions and other new developments to manage stormwater on site and consider septic system impacts to Twin Lake.	TLPO	WC Planning and Zoning Dept Towns of Springwater and Saxeville Developers	As needed
Discourage large water withdrawal projects that may impact the water levels in Twin Lake.	TLPO	WCLWC Wisconsin Lakes Friends of the Central Sands	As needed
Protect wetlands to maintain the water budget of Twin Lake. Any altered wetlands should be mitigated within the lake's watershed.	TLPO	WCLCD NRCS WC Highway Dept. WDOT Towns of Springwater and Saxeville	Ongoing
Encourage design of road and construction projects that will minimize impacts to Twin Lake.	TLPO	WCLCD WC Highway Dept. WDOT Town of Springwater and Saxeville	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 the TLP, 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**

Twin Lake has one public boat launch on the northern side of the lake which is owned and managed by the Town of Springwater. It is a “no wake” lake and the survey respondents indicated they are satisfied with current boating regulations and did not suggest any changes. The no wake boat ordinance helps to reduce conflicts with the other uses common to Twin Lake. The lake is enjoyed by people who swim, fish and appreciate its beauty. Two camps share the shores of Twin Lake. Both camps provide opportunities for youth and/or families to get away from the city and experience the sights, sounds, and activities of Twin Lake. Committee members enjoy the camps and the sounds of the campers and expressed gratitude for their presence on Twin Lake.

### **Guiding Vision for Recreation**

*Visitors to Twin Lake will continue to appreciate and respect the lake and recreate responsibly.*

*Twin Lake will continue to provide a quiet atmosphere without user conflicts.*



## Goal 8. Lake users will make informed decisions.

**Objective 8.1.** Provide lake users with information and rules necessary to make responsible decisions.

Actions	Lead person/group	Resources	Start/end dates
Maintain signage at boat landings and around the lake with important lake, recreation, habitat, and AIS information.	Town of Springwater	WDNR RC&D	Ongoing
Install and maintain an interpretive kiosk at the boat landing that informs visitors of the lake's unique characteristics and encourages respectful use.	TLPO	Town of Springwater UWEX Lakes	2016
Support the no-wake designation on Twin Lake.	TLPO	Town of Springwater	Ongoing
Protect the fishery by supporting the enforcement of current fishing regulations (i.e. valid fishing license, bag limits, ice fishing regulations re: fish shanties, bag limit, tip-ups, etc.).	TLPO	WDNR Warden	Ongoing

### 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 Twin 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

*Communication will be fluid between the Twin Lake Property Owners Association and within the community.*

**Goal 9. Maintain open communications between shoreland property owners, lake users, the community, and lake stewards.**

**Objective 9.1.** Distribute lake and related land management information to residents.

<b>Actions</b>	<b>Lead person/group</b>	<b>Resources</b>	<b>Timeline</b>
Distribute a welcome packet to all new and current residents of Twin Lake.	WC	WCLWC UWEX Lakes (educational material)	Ongoing
Announce lake happenings and management activities, events, and host speakers at the annual meeting.	TLPO		Annually
Plan a post-annual meeting “social hour” or other social events.	TLPO Interested citizen	TLPO members	Annually
Start annual newsletter; post information on the town website.	TLPO	Town of Springwater	

**Objective 9.2.** Network and keep informed about lake related topics.

<b>Actions</b>	<b>Lead person/group</b>	<b>Resources</b>	<b>Timeline</b>
Encourage property owners and stewards to obtain “Lake Tides”, a quarterly newsletter about Wisconsin lakes.	TLPO	UWEX Lakes	
Keep informed about lake-related information in Waushara County by having a representative on the WCWLC.	TLPO	WCWLC	Ongoing
Keep elected officials informed about health or concerns related to Twin Lake	TLPO	Towns of Springwater and Saxeville County Board Supervisor	Routinely
Encourage property owners to participate in Lake Leaders Institute.	TLPO	Town board members County board members	Fall – even numbered years
Encourage property owners and stewards to attend the Wisconsin Lakes Convention in Stevens Point.	TLPO	Town board members County board members	Annually - spring

## 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 at least every five years (if conducting aquatic plant permitted management activities) with any necessary changes.

### Goal 10. Keep this plan current to the needs of the lake.

**Objective 10.1.** Receive input from and communicate updates with community and Twin Lake property owners.

Actions	Lead person/group	Resources	Timeline
Review this LMP annually to prioritize upcoming activities and recognize achievements. Include plan updates as a regular agenda item at the annual meeting.	TLPO		Annually
Notify organizations that adopted Twin Lake Management Plan of proposed changes to the plan.	TLPO	WCLCD Towns of Springwater and Saxeville WDNR Lake Manager	As needed
If aquatic plant management activities require a permit – conduct an aquatic plant survey using point-intercept methods prior to updating the LPM every 5 years.	TLPO	Consultant	2018

## **Governance**

### ***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 include a reference to the lake management plan under local policies in the agricultural, natural and cultural resources background information and the addition of a recommendation to support the lake management plan and to implement the applicable recommendations contained in the lake management. The Land Use Committee will recommend the amendment to the comprehensive plan to the Land, Water, and Education Committee.

The Land, Water, and Education Committee will review the amendment and if it concurs with the recommendation from the Land Use Committee, it will make a recommendation to the Planning & Zoning Committee. The Planning & Zoning Committee will hold a public hearing with a thirty-day class one notice. The Planning & Zoning Committee will recommend by resolution the amendment to the comprehensive plan or the amendment with changes be adopted by the County Board.

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

### ***Use of the Comprehensive Plan***

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

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

## References

- Bartz, David, 2014. Habitat and the Fishery of Twin and Pine Lakes. Presentation given at Crossways Pine Lake Camp on November 18, 2014.
- Boat Ed, 2013. The Handbook of Wisconsin Boating Laws and Responsibilities. Approved by Wisconsin Department of Natural Resources. [www.boat-ed.com](http://www.boat-ed.com)
- Borman, Susan, Robert Korth, and Jo Temte, 2001. Through the looking glass, a field guide to aquatic plants. Reindl Printing, Inc. Merrill, Wisconsin.
- Johnson, Ted, 2014. Aquatic Plant Management. Presentation given at the Camp Twin Lakes Boy Scout Camp on September 16, 2014.
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- Turyk, Nancy, 2014. Healthy Land = Healthy Water. Presentation given at Camp Twin Lakes Boy Scout Camp on October 14, 2014.
- UW-Stevens Point Center for Watershed Science and Education, 2014. Waushara County Lake Study - Twin Lake 2010-2012. Final Report to Waushara County and Wisconsin Department of Natural Resources.
- UW-Stevens Point Center for Watershed Science and Education, 2013. Waushara County Lake Study - Twin Lake 2010-2012 Mini-Report. Report to Waushara County and Wisconsin Department of Natural Resources. Planning Meeting Presentations
- Vallentyne, J.R., 1974. The Algal Bowl-Lakes and Man. Ottawa Department of the Environment.
- Wetzel, R.G., 2001. Limnology, Lake and River Ecosystems, Third Edition. Academic Press. San Diego, California.

# Appendices



## Appendix A. Waushara County Lake Information Directory

### Algae - Blue-Green

Contact: Ted Johnson  
Wisconsin Department of Natural Resources  
Phone: 920-424-2104  
E-mail: [TedM.Johnson@wisconsin.gov](mailto: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  
<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://www.goldensandsrcd.org) and  
<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](mailto: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](http://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](mailto:ejudziew@uwsp.edu)

Contact: Ted Johnson  
Wisconsin Department of Natural Resources  
Phone: 920-424-2104  
E-mail: [TedM.Johnson@wisconsin.gov](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto:Andrew.badje@wisconsin.gov)  
E-mail: [WFTS@wisconsin.gov](mailto:WFTS@wisconsin.gov)

### **Grants**

Contact: Ted Johnson  
Wisconsin Department of Natural Resources  
Phone: 920-424-2104  
E-mail: [TedM.Johnson@wisconsin.gov](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto:scott.provost@wisconsin.gov)  
Website:  
[http://prodoasext.dnr.wi.gov/inter1/hicap\\$.st  
artup](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](mailto: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](mailto: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](mailto:pgoggin@uwsp.edu)  
Website:  
[http://www.uwsp.edu/cnr/uwexlakes/o  
rganizations/](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](mailto:eolson@uwsp.edu)  
Website:  
[http://www.uwsp.edu/cnr/uwexlake  
s/organizations/](http://www.uwsp.edu/cnr/uwexlake/s/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](mailto: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](mailto:lcdzoning.courthouse@co.waushara.wi.us)  
Website:  
<http://www.co.waushara.wi.us/zoning.htm>

Contact: UWSP Center for Land Use Education  
TNR 208, 800 Reserve St., Stevens Point, WI 54481  
Phone: 715-346-3783  
E-mail: [Center.for.Land.Use.Education@uwsp.edu](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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](mailto:TedM.Johnson@wisconsin.gov)

**Water Quality Problems (cont'd)**E-mail: [David.Bartz@wisconsin.gov](mailto:David.Bartz@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](mailto: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](mailto: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](mailto: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](mailto: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

If you are looking for any information that is not listed in this directory, please contact:  
Ryan Haney ([wclakes@uwsp.edu](mailto: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. Aquatic Plants

### Twin Lake aquatic plant survey summary, 2013.

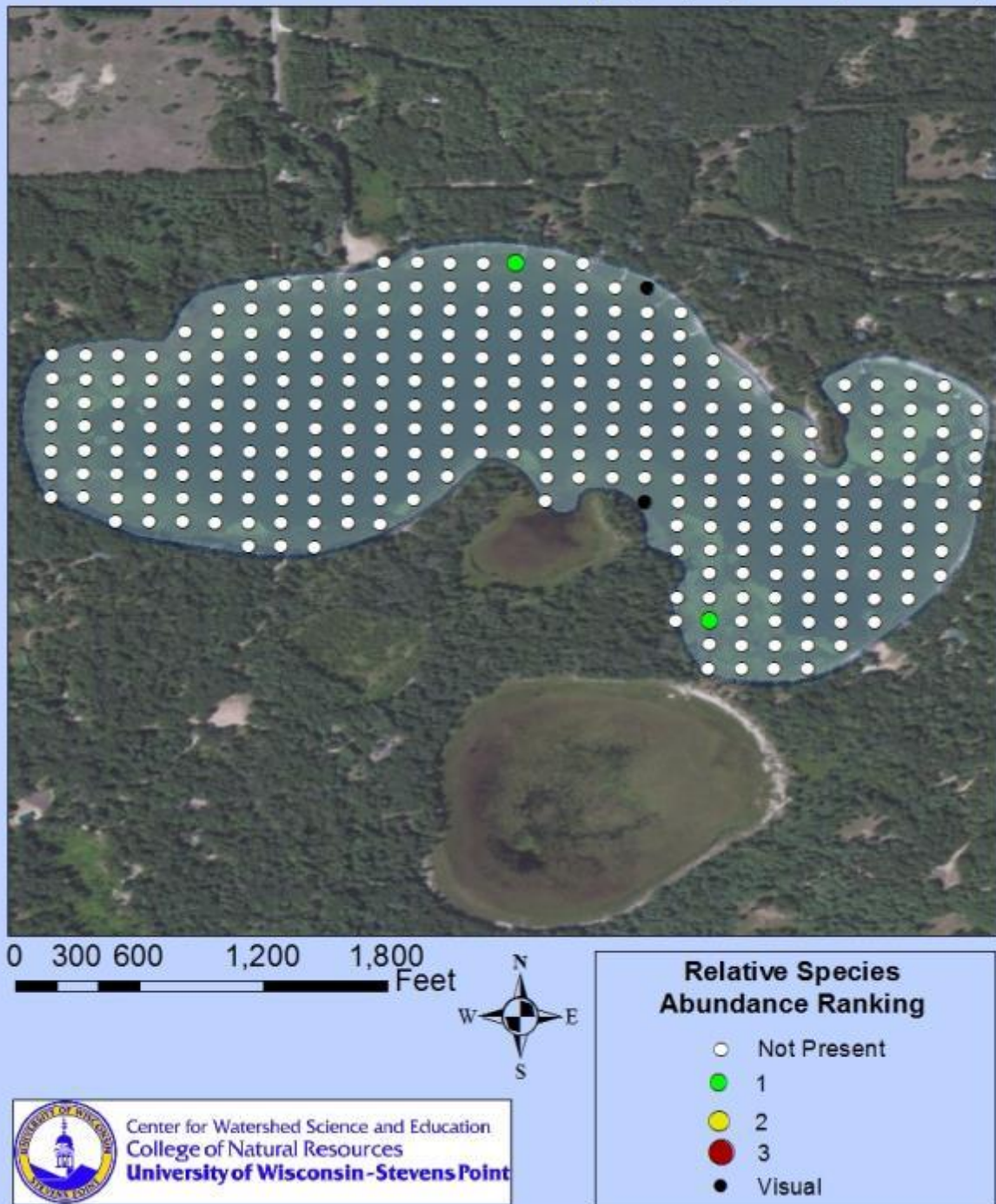
	Lake Average	Statewide Average	North Central Hardwood Forests Ecoregion Average
Littoral Frequency of Occurrence (%)	93.9	74.3	76
Maximum Depth of Plant Growth (ft)	13.5	15.3	15.9
Species Richness (Including visuals)	26	16.8	16.2
Floristic Quality Index (FQI)	27.5	24.1	23.3

### Frequency of occurrence of aquatic plant species observed in Twin Lake, 2013.

Scientific Name	Common Name	Coefficient of Conservatism Value (C Value)	2013 % Frequency of Occurrence
<b>Floating Leaf Species</b>			
<i>Nymphaea odorata</i>	White water lily	6	14.08
<i>Brasenia schreberi</i>	Watershield	6	1.81
<b>Emergent Species</b>			
<i>Eleocharis palustris</i>	Creeping spikerush	6	0.72
<b>Submergent Species</b>			
<i>Chara</i>	Muskgrasses	7	80.14
<i>Najas flexilis</i>	Slender naiad	6	29.6
<i>Potamogeton natans</i>	Floating-leaf pondweed	5	15.88
<i>Potamogeton illinoensis</i>	Illinois pondweed	6	7.22
<i>Potamogeton gramineus</i>	Variable pondweed	7	2.89
<i>Schoenoplectus acutus</i>	Hardstem bulrush	6	2.89
<i>Najas guadalupensis</i>	Southern naiad	8	1.81
<i>Potamogeton friesii</i>	Fries' pondweed	8	1.81
<i>Potamogeton praelongus</i>	White-stem pondweed	8	1.81
<i>Potamogeton zosteriformis</i>	Flat-stem pondweed	6	1.44
<i>Vallisneria americana</i>	Wild celery	6	1.44
<i>Potamogeton amplifolius</i>	Large-leaf pondweed	7	1.08
<i>Myriophyllum spicatum</i>	Hybrid watermilfoil	0	0.72
<i>Schoenoplectus pungens</i>	Three-square bulrush	5	0.72
<i>Stuckenia pectinata</i>	Sago pondweed	3	0.72
<i>Schoenoplectus tabernaemontani</i>	Softstem bulrush	4	0.36
<i>Utricularia minor</i>	Small bladderwort	10	0.36



# Big Twin Lake Aquatic Plant Survey 2013: Presence of Eurasian Water-Milfoil (*Myriophyllum spicatum*)



Occurrences of Eurasian watermilfoil in Big Twin Lake, 2013.

**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**

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ADVANTAGES

- \* No associated cost.
- \* Least disruptive to lake ecosystem.

LIMITATIONS

- \* May not be effective in achieving aquatic plant management objectives.

**Hand Pulling**

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ADVANTAGES

- \* Can be used for thinning aquatic plants around docks.
- \* Can target specific plants - with proper training.
- \* Can be effective in controlling small infestations of aquatic invasive species.
- \* No associated cost.

LIMITATIONS

- \* Removes near-shore wildlife and fish habitat.
- \* Opens up areas where invasives to become established.
- \* If aquatic invasive species are not pulled properly, could worsen the problem.

**Hand Pulling Using Suction**

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ADVANTAGES

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

LIMITATIONS

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

**Mechanical Harvesting (not appropriate for Twin Lake)**

---

ADVANTAGES

- \* Removes plant material and nutrients.
- \* Can target specific locations.
- \* Used to manage larger areas for recreational access or fishery management.

LIMITATIONS

- \* 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 (not appropriate for Twin Lake)**

---

#### **ADVANTAGES**

- \* Controls aquatic plants in shallower, near-shore areas.
- \* Can be low cost.

#### **LIMITATIONS**

- \* Requires a controlling structure on the lake.
- \* May cause undesired stress on ecosystem.
- \* Cannot be used frequently.

### **Milfoil Weevils**

---

#### **ADVANTAGES**

- \* Natural, native maintenance of native and exotic milfoils.
- \* Prefers the aquatic invasive Eurasian Watermilfoil.
- \* Some lakes may already have a native populations; need a professional stem count and assessment of shoreland health, structure of fishery, etc.
- \* Doesn't harm lake ecosystem.

#### **LIMITATIONS**

- \* 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**

May be less destructive to lake ecosystem than lake-wide treatment.

#### **LIMITATIONS**

- \* 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 (not currently needed in Twin Lake)**

---

#### **ADVANTAGES**

- \* May reduce aquatic invasives for a time.
- \* Treatment not needed as frequently.

#### **LIMITATIONS**

- \* 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, releases nutrients, adds to muck build-up.
- \* 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 C. 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 Twin Lake are displayed in the figure on the next page. 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. Large portions of Twin Lake's shorelands are in good shape, but a few segments have challenges that should be addressed. There were no stretches of Twin Lake shoreland that ranked as poor. For a more complete understanding of the ranking, an interactive map showing results of the shoreland surveys can be found on the County's webpage <http://gis.co.waushara.wi.us/ShorelineViewer/>.

Minimizing impacts to Twin Lake from future development should include planning to ensure that perspective developers have the right information to make informed decisions and that zoning is in place to achieve habitat, water quality, and aesthetic goals.



# Waushara County Shoreline Assessment *TWIN LAKE*

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



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

**Calculating Shoreline Scores**  
Scores are based on the presence/absence of:

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

  
Center for Land Use Education  
Map created by Dan McFarlane  
Center for Land Use Education

## Appendix D. Rapid Response Plan

### SURVEY/MONITOR

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

### REPORTING A SUSPECTED INVASIVE SPECIES

<p><b>1. Collect specimens or take photos.</b></p> <p>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.</p>	<p>Collect, press and dry a complete sample. This method is best because a plant expert can then examine the specimen.</p> <p><b>-OR-</b></p> <p>Collect a fresh sample. Enclose in a plastic bag with a moist paper towel and refrigerate.</p> <p><b>-OR-</b></p> <p>Take detailed photos (digital or film).</p>
<p><b>2. Note the location where the specimen was found.</b></p> <p>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 <a href="http://TopoZone.com">TopoZone.com</a> 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).</p>	<p>Provide one or more of the following:</p> <ul style="list-style-type: none"><li>• Latitude &amp; Longitude</li><li>• UTM (Universal Transverse Mercator) coordinates</li><li>• County, Township, Range, Section, Part-section</li><li>• Precise written site description, noting nearest city &amp; road names, landmarks, local topography</li></ul>



<p><b>3. Gather information to aid in positive species identification.</b></p>	<ul style="list-style-type: none"> <li>• Collection date and county</li> <li>• Your name, address, phone, email</li> <li>• Exact location (Latitude/Longitude or UTM preferred, or Township/Range/Section)</li> <li>• Plant name (common or scientific)</li> <li>• Land ownership (if known)</li> <li>• Population description (estimated number of plants and area covered)</li> <li>• Habitat type(s) where found (forest, field, prairie, wetland, open water)</li> </ul>
<p><b>4. Mail or bring specimens and information to any of the following locations:</b></p> <p>Digital photos may be emailed.</p>	<p><b>Wisconsin Dept. Natural Resources</b>  427 E. Tower Drive, Suite 100  Wautoma, WI 54982  Phone: (920) 787-4686</p> <p><b>Regional AIS Coordinator</b>  Golden Sands RC&amp;D  1100 Main St., Suite #150  Stevens Point, WI 54481  Phone: 715-343-6214  E-Mail : <a href="mailto:info@goldensandsrcd.org">info@goldensandsrcd.org</a></p> <p><b>UW-Stevens Point Herbarium</b>  301 Trainer Natural Resources Building  800 Reserve Street  Stevens Point, WI 54481  Phone: 715-346-4248  E-Mail: <a href="mailto:ejudziew@uwsp.edu">ejudziew@uwsp.edu</a></p> <p><b>Wisconsin Invasive Plants Reporting &amp; Prevention Project</b>  Herbarium-UW-Madison  430 Lincoln Drive  Madison, WI 53706  Phone: (608) 267-7612  E-Mail: <a href="mailto:invasiveplants@mailplus.wisc.edu">invasiveplants@mailplus.wisc.edu</a></p>
<p><b>5. Once the specimen is dropped off or sent for positive identification, be sure to contact:</b></p>	<p><b>Regional AIS Coordinator</b>  Golden Sands RC&amp;D  1100 Main St., Suite #150  Stevens Point, WI 54481  Phone: 715-343-6214  E-Mail : <a href="mailto:info@goldensandsrcd.org">info@goldensandsrcd.org</a></p>

**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 municipal board(s)** in which the water body is located

Town of Springwater

- **The Lake District/Association** in which the waterbody is located.  
Contact: Charles Webb  
Phone: 414-333-6237

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

- **Local Residents**

**If an invasive species is confirmed the secretary of the Twin Lake Property Owners, Ltd. will make the following public information contacts:**

- **Newspapers:** Argus, Resorter

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

## **Appendix E. Lake User Survey Results**

# Twin Lake Survey #1

## Q1 What is your Waushara County Lakes Survey ID?

Answered: 5 Skipped: 0

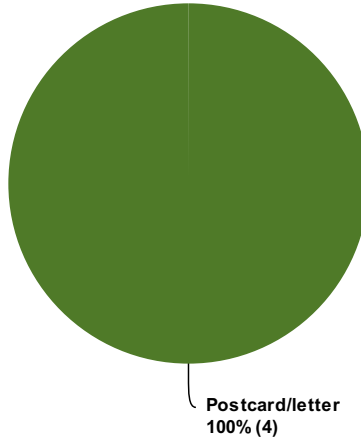
#	Responses	Date
1	[REDACTED]	8/16/2014 7:37 PM
2	[REDACTED]	8/15/2014 3:14 PM
3	[REDACTED]	8/14/2014 1:36 PM
4	[REDACTED]	8/13/2014 3:18 PM
5	[REDACTED]	8/13/2014 1:09 PM



# Twin Lake Survey #1

## Q2 How did you hear about this survey?

Answered: 4 Skipped: 1



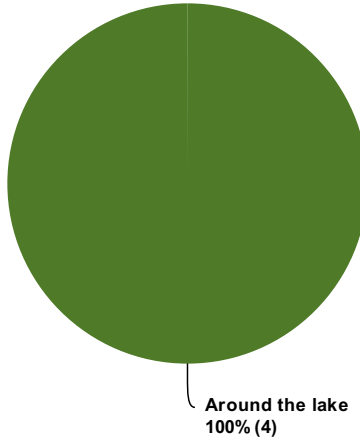
Answer Choices	Responses
E-mail	0% 0
Newspaper	0% 0
Postcard/letter	100% 4
Facebook	0% 0
Radio	0% 0
<b>Total</b>	<b>4</b>

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

# Twin Lake Survey #1

## Q3 Do you own or rent property...

Answered: 4 Skipped: 1

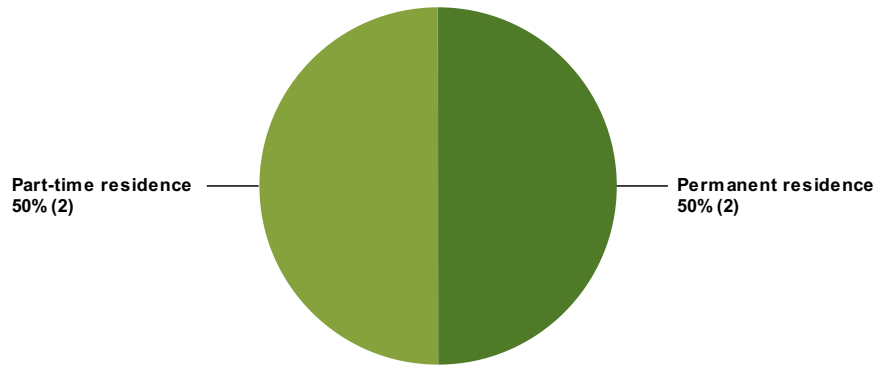


Answer Choices	Responses	
Around the lake	100%	4
Less than 1/2 mile from the lake	0%	0
1/2 mile to 1 mile of the lake	0%	0
More than 1 mile from the lake	0%	0
I do not own or rent property near the lake	0%	0
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

**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: 4 Skipped: 1



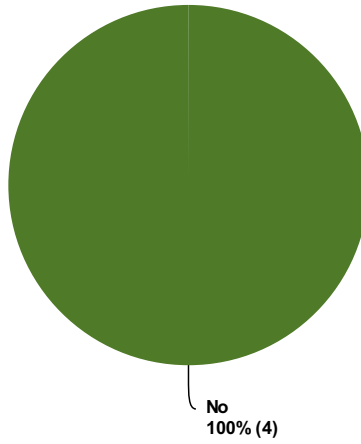
Answer Choices	Responses
Permanent residence	50% 2
Part-time residence	50% 2
I do not own or rent property near the lake	0% 0
<b>Total</b>	<b>4</b>

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

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1

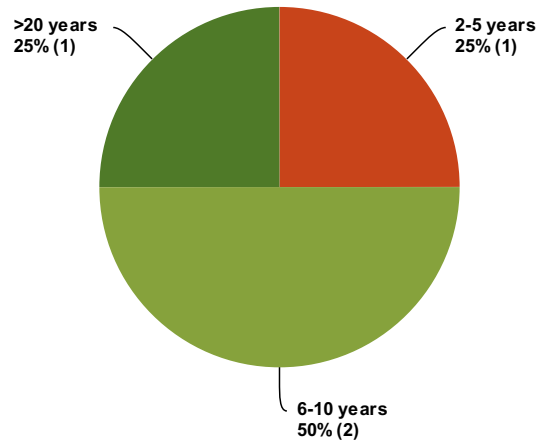


Answer Choices	Responses	
Yes	0%	0
No	100%	4
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1

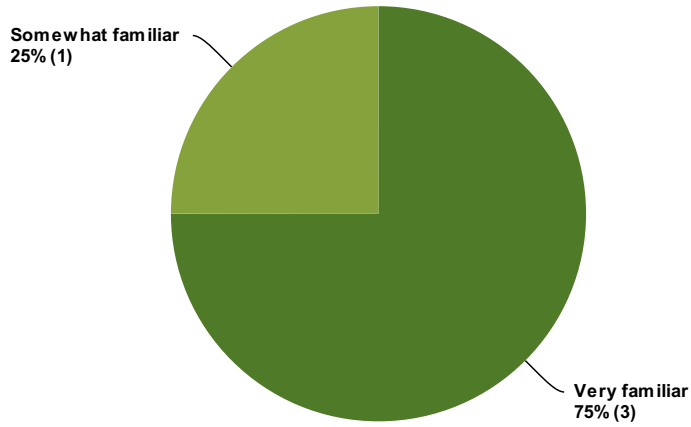


Answer Choices	Responses	
<2 years	0%	0
2-5 years	25%	1
6-10 years	50%	2
11-20 years	0%	0
>20 years	25%	1
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

## Q7 Are you familiar with the Twin Lake Property Owners Association?

Answered: 4 Skipped: 1

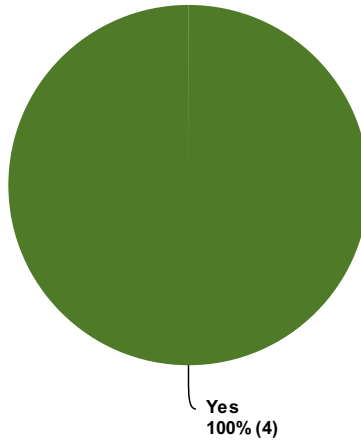


Answer Choices	Responses	
Very familiar	75%	3
Somewhat familiar	25%	1
I've heard of it	0%	0
Never heard of it	0%	0
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

## Q8 Are you a member of the Twin Lake Property Owners Association?

Answered: 4 Skipped: 1

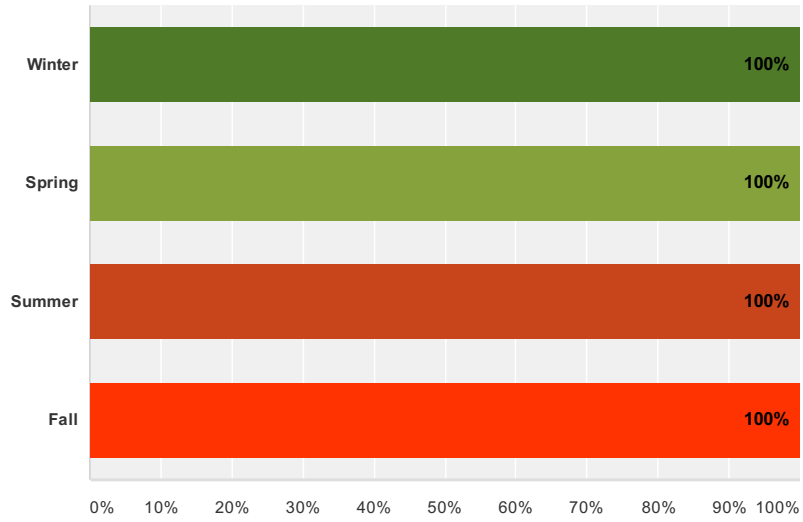


Answer Choices	Responses	
Yes	100%	4
No	0%	0
I don't know	0%	0
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1



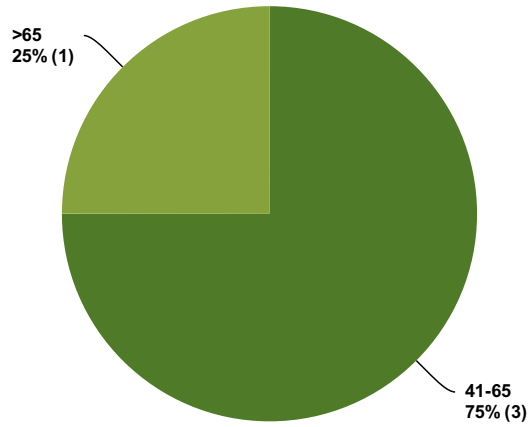
Answer Choices	Responses
Winter	100% 4
Spring	100% 4
Summer	100% 4
Fall	100% 4
<b>Total Respondents: 4</b>	



# Twin Lake Survey #1

## Q10 Which category below includes your age?

Answered: 4 Skipped: 1

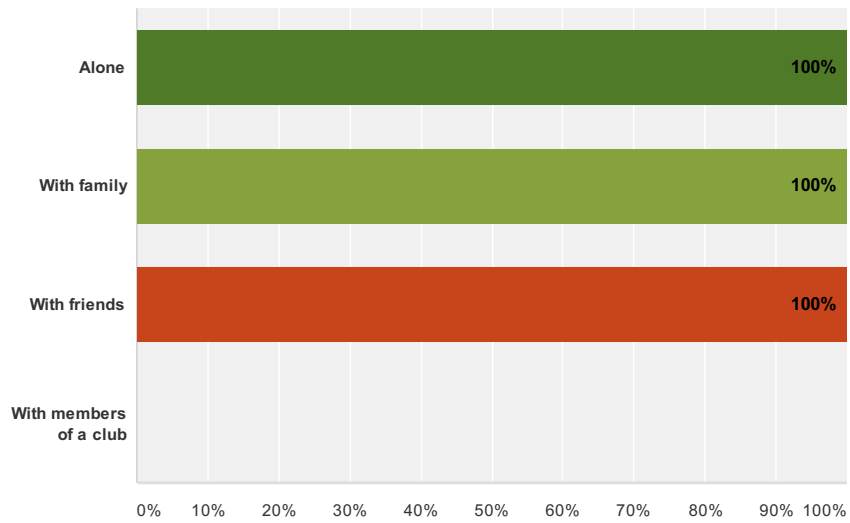


Answer Choices	Responses
Under 18	0% 0
18-40	0% 0
41-65	75% 3
>65	25% 1
<b>Total</b>	<b>4</b>

# Twin Lake Survey #1

## Q11 When you visit Twin Lake, are you typically...(check all that apply)

Answered: 3 Skipped: 2



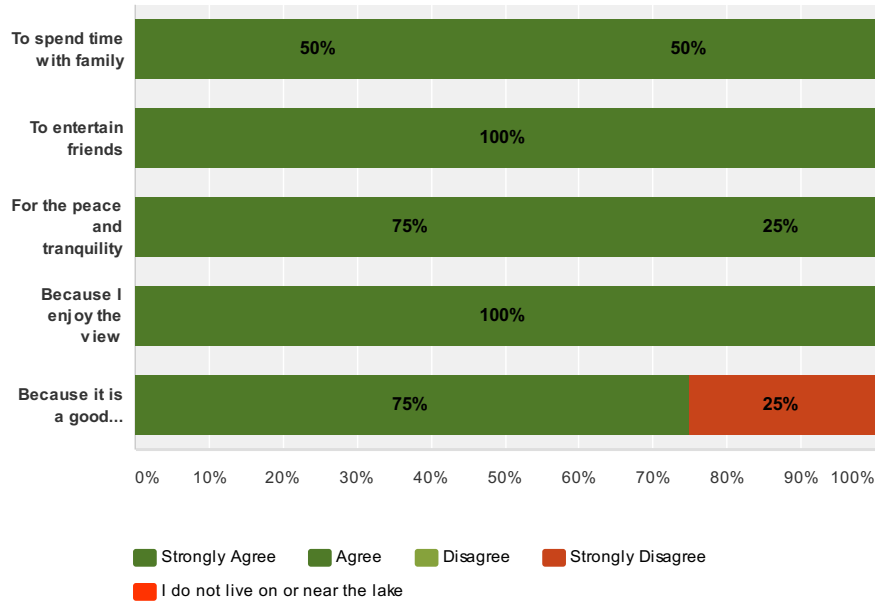
Answer Choices	Responses	
Alone	100%	3
With family	100%	3
With friends	100%	3
With members of a club	0%	0
<b>Total Respondents: 3</b>		

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

# Twin Lake Survey #1

## Q12 I live on or near the lake...

Answered: 4 Skipped: 1



	Strongly Agree	Agree	Disagree	Strongly Disagree	I do not live on or near the lake	Total
To spend time with family	50% 2	50% 2	0% 0	0% 0	0% 0	4
To entertain friends	0% 0	100% 4	0% 0	0% 0	0% 0	4
For the peace and tranquility	75% 3	25% 1	0% 0	0% 0	0% 0	4
Because I enjoy the view	100% 4	0% 0	0% 0	0% 0	0% 0	4
Because it is a good investment	0% 0	75% 3	0% 0	25% 1	0% 0	4

# Twin Lake Survey #1

## Q13 What do you value most about Twin Lake?

Answered: 3 Skipped: 2

#	Responses	Date
1	The small number of residences on lake. The no-wake status.	8/14/2014 1:39 PM
2	The connection to nature and the peace and quite. We value that it is not over developed.	8/13/2014 3:25 PM
3	wildlife, quiet lake, no wake rules, location	8/13/2014 1:14 PM

# Twin Lake Survey #1

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

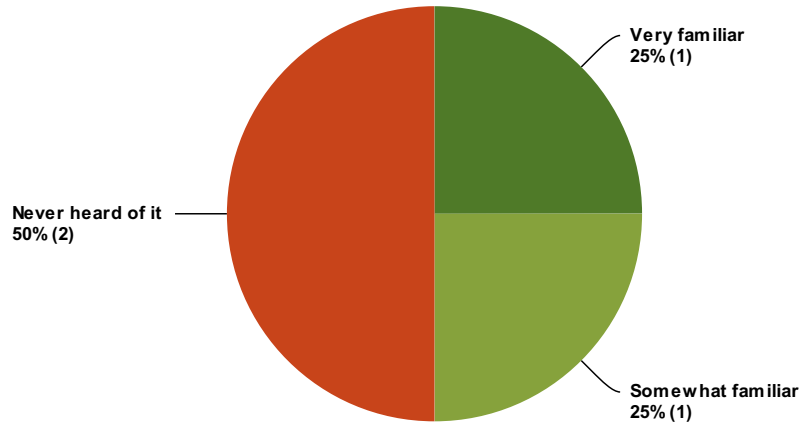
Answered: 4 Skipped: 1

#	Responses	Date
1	Raise the water level of the lake. Get rid of the water lilies and weeds.	8/15/2014 3:19 PM
2	Get invasive species under better control.	8/14/2014 1:39 PM
3	Keep it a no wake lake. Dredge the lake to make it deeper and reduce the muck. Restrict high capacity wells and pumping from the lake itself. Continue to stock it with game fish.	8/13/2014 3:25 PM
4	milfoil removal or control, encourage more property owners to join the association	8/13/2014 1:14 PM

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1

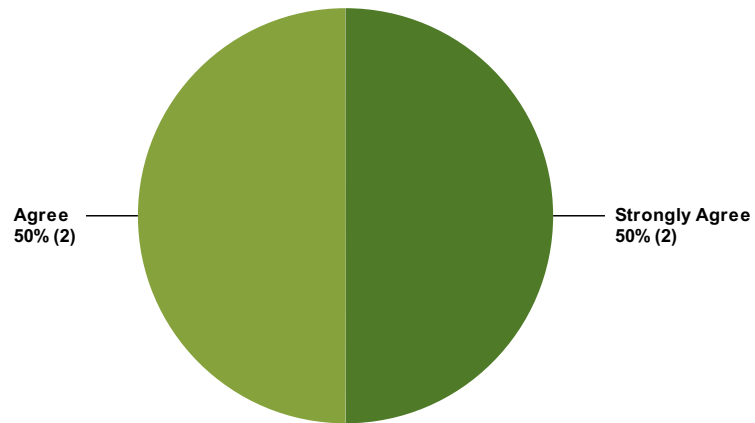


Answer Choices	Responses	
Very familiar	25%	1
Somewhat familiar	25%	1
I've heard of it	0%	0
Never heard of it	50%	2
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1

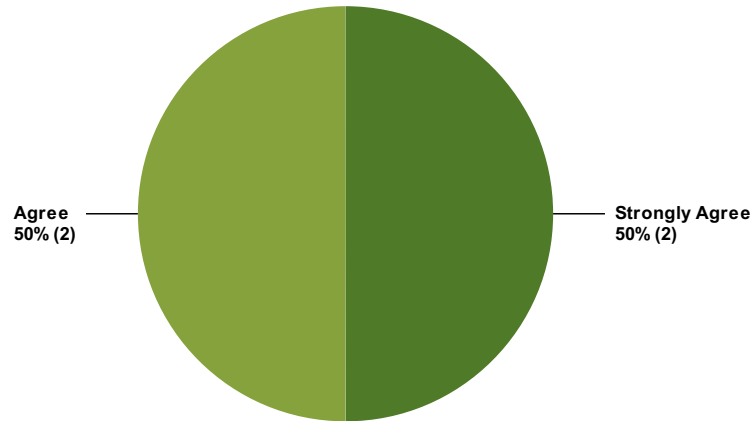


Answer Choices	Responses	
Strongly Agree	50%	2
Agree	50%	2
Disagree	0%	0
Strongly Disagree	0%	0
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1



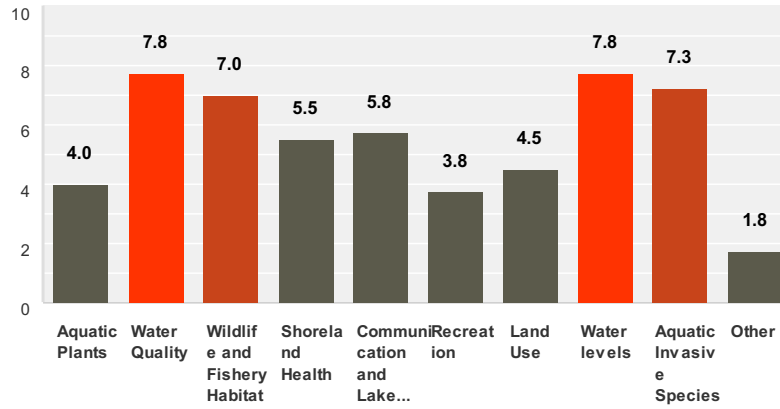
Answer Choices	Responses	
Strongly Agree	50%	2
Agree	50%	2
Disagree	0%	0
Strongly Disagree	0%	0
<b>Total</b>		<b>4</b>



# Twin Lake Survey #1

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

Answered: 4 Skipped: 1

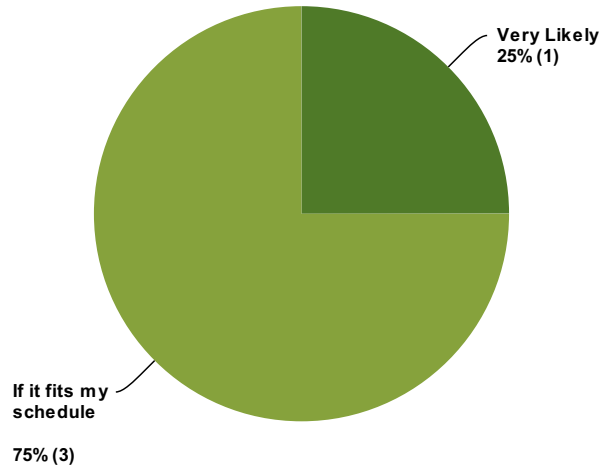


	1	2	3	4	5	6	7	8	9	10	Total	Average Ranking
Aquatic Plants	0% 0.0	0% 0.0	0% 0.0	0% 0.0	50% 2.0	0% 0.0	0% 0.0	0% 0.0	50% 2.0	0% 0.0	4	4.00
Water Quality	25% 1.0	0% 0.0	0% 0.0	75% 3.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	4	7.75
Wildlife and Fishery Habitat	0% 0.0	50% 2.0	0% 0.0	0% 0.0	25% 1.0	0% 0.0	25% 1.0	0% 0.0	0% 0.0	0% 0.0	4	7.00
Shoreland Health	0% 0.0	0% 0.0	50% 2.0	0% 0.0	0% 0.0	0% 0.0	25% 1.0	0% 0.0	25% 1.0	0% 0.0	4	5.50
Communication and Lake Group Support	0% 0.0	0% 0.0	25% 1.0	25% 1.0	0% 0.0	25% 1.0	0% 0.0	25% 1.0	0% 0.0	0% 0.0	4	5.75
Recreation	0% 0.0	0% 0.0	0% 0.0	0% 0.0	25% 1.0	0% 0.0	25% 1.0	25% 1.0	25% 1.0	0% 0.0	4	3.75
Land Use	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	75% 3.0	0% 0.0	25% 1.0	0% 0.0	0% 0.0	4	4.50
Water levels	75% 3.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	25% 1.0	4	7.75
Aquatic Invasive Species	0% 0.0	50% 2.0	25% 1.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	25% 1.0	0% 0.0	0% 0.0	4	7.25
Other	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	0% 0.0	25% 1.0	0% 0.0	0% 0.0	75% 3.0	4	1.75

# Twin Lake Survey #1

**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: 4 Skipped: 1

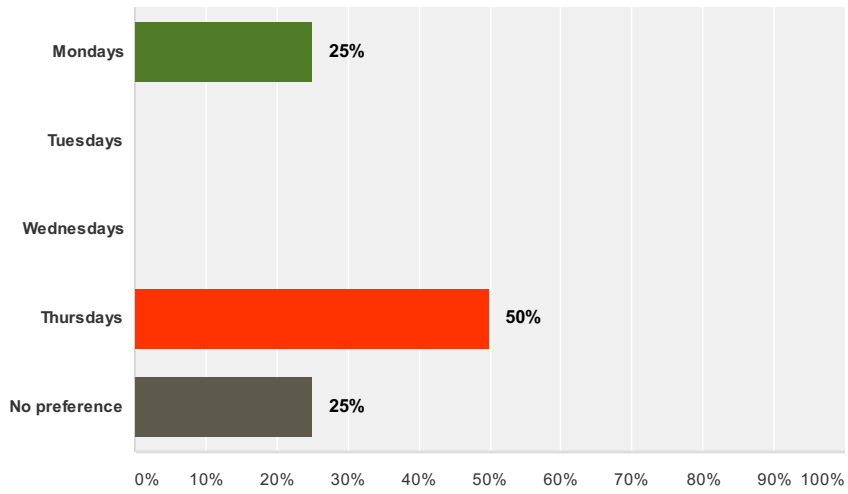


Answer Choices	Responses	
Definitely	0%	0
Very Likely	25%	1
If it fits my schedule	75%	3
Not likely	0%	0
I won't attend any	0%	0
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

**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: 4 Skipped: 1

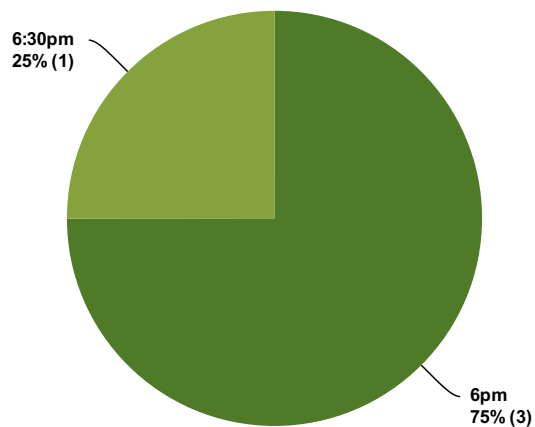


Answer Choices	Responses
Mondays	25% 1
Tuesdays	0% 0
Wednesdays	0% 0
Thursdays	50% 2
No preference	25% 1
<b>Total Respondents: 4</b>	

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1

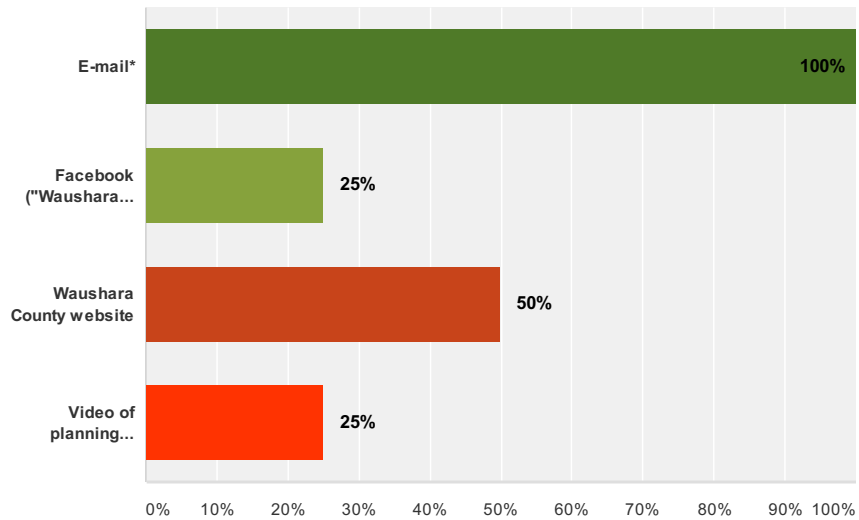


Answer Choices	Responses	
6pm	75%	3
6:30pm	25%	1
7pm	0%	0
7:30pm	0%	0
No preference	0%	0
<b>Total</b>		<b>4</b>

# Twin Lake Survey #1

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

Answered: 4 Skipped: 1



Answer Choices	Responses
E-mail*	100% 4
Facebook ("Waushara County Lakes Project")	25% 1
Waushara County website	50% 2
Video of planning meeting posted on the web	25% 1
<b>Total Respondents: 4</b>	

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

Twin Lake Survey #2

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

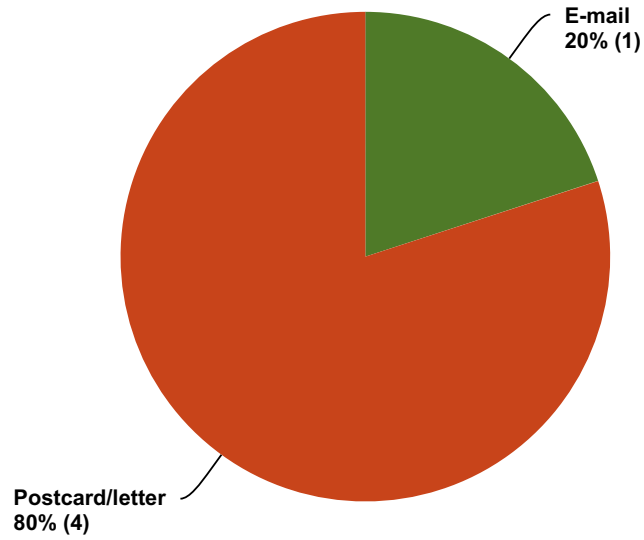
Answered: 5 Skipped: 0

#	Responses	Date
1	██████	9/14/2014 1:14 PM
2	██████	9/11/2014 1:44 PM
3	██████	9/11/2014 12:40 PM
4	██████	9/10/2014 12:25 PM
5	██████	9/8/2014 9:37 AM

Twin Lake Survey #2

Q2 How did you hear about this survey?

Answered: 5 Skipped: 0

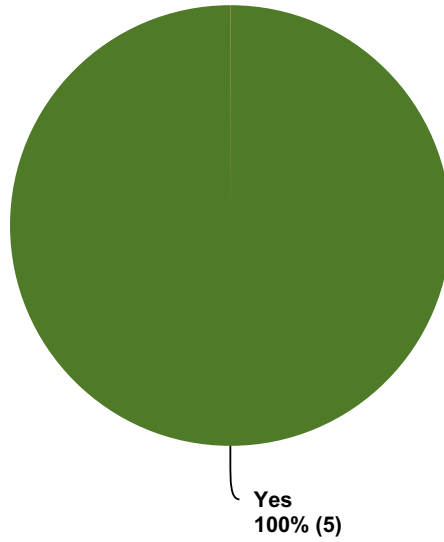


Answer Choices	Responses
E-mail	20% 1
Newspaper	0% 0
Postcard/letter	80% 4
Facebook	0% 0
Radio	0% 0
<b>Total</b>	<b>5</b>

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

### Q3 Were you aware of the importance of aquatic plants?

Answered: 5 Skipped: 0



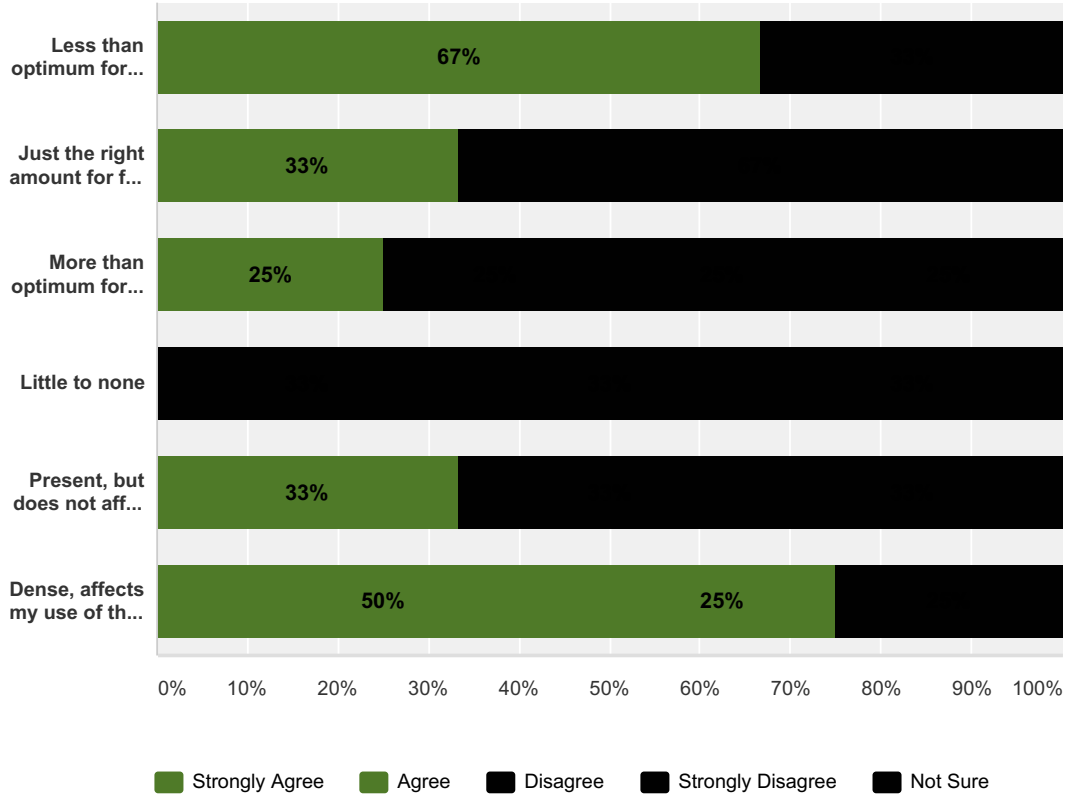
Answer Choices	Responses
Yes	100% 5
No	0% 0
Unsure	0% 0
<b>Total</b>	<b>5</b>



## Twin Lake Survey #2

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

Answered: 5 Skipped: 0

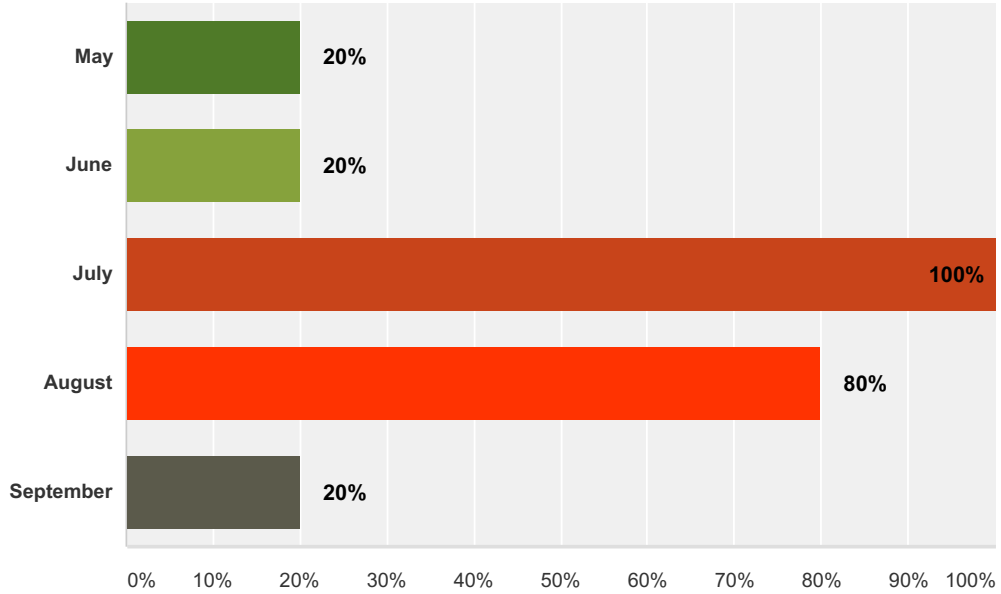


	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure	Total
Less than optimum for fish and wildlife	0% 0	67% 2	0% 0	0% 0	33% 1	3
Just the right amount for fish and wildlife	0% 0	33% 1	67% 2	0% 0	0% 0	3
More than optimum for fish and wildlife	25% 1	0% 0	25% 1	25% 1	25% 1	4
Little to none	0% 0	0% 0	33% 1	33% 1	33% 1	3
Present, but does not affect my use of the lake	0% 0	33% 1	33% 1	33% 1	0% 0	3
Dense, affects my use of the lake	50% 2	25% 1	25% 1	0% 0	0% 0	4

Twin Lake Survey #2

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

Answered: 5 Skipped: 0

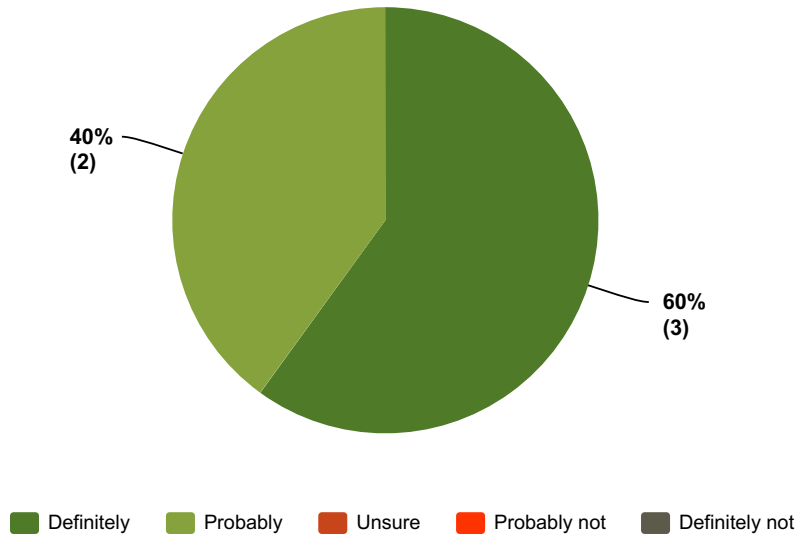


Answer Choices	Responses
May	20% 1
June	20% 1
July	100% 5
August	80% 4
September	20% 1
<b>Total Respondents: 5</b>	

## Twin Lake Survey #2

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

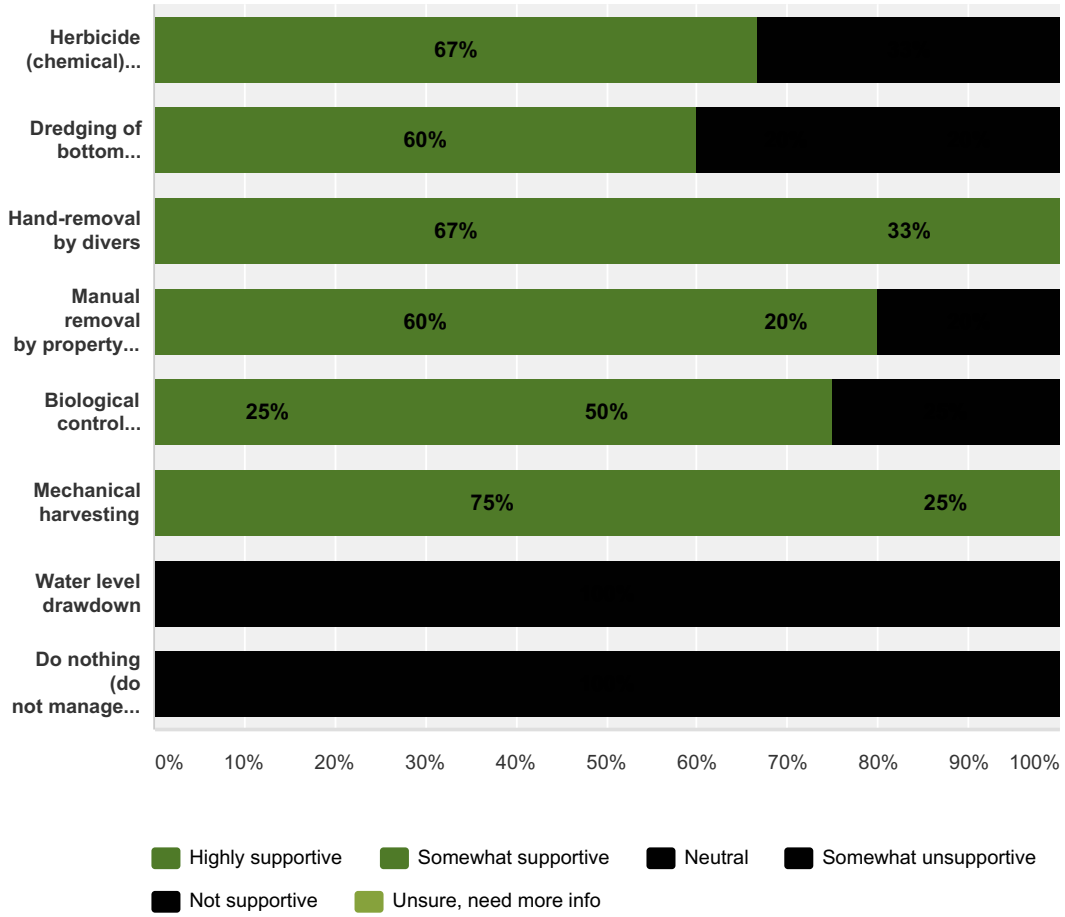
Answered: 5 Skipped: 0



Answer Choices	Responses	
Definitely	60%	3
Probably	40%	2
Unsure	0%	0
Probably not	0%	0
Definitely not	0%	0
<b>Total</b>		<b>5</b>

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

Answered: 5 Skipped: 0



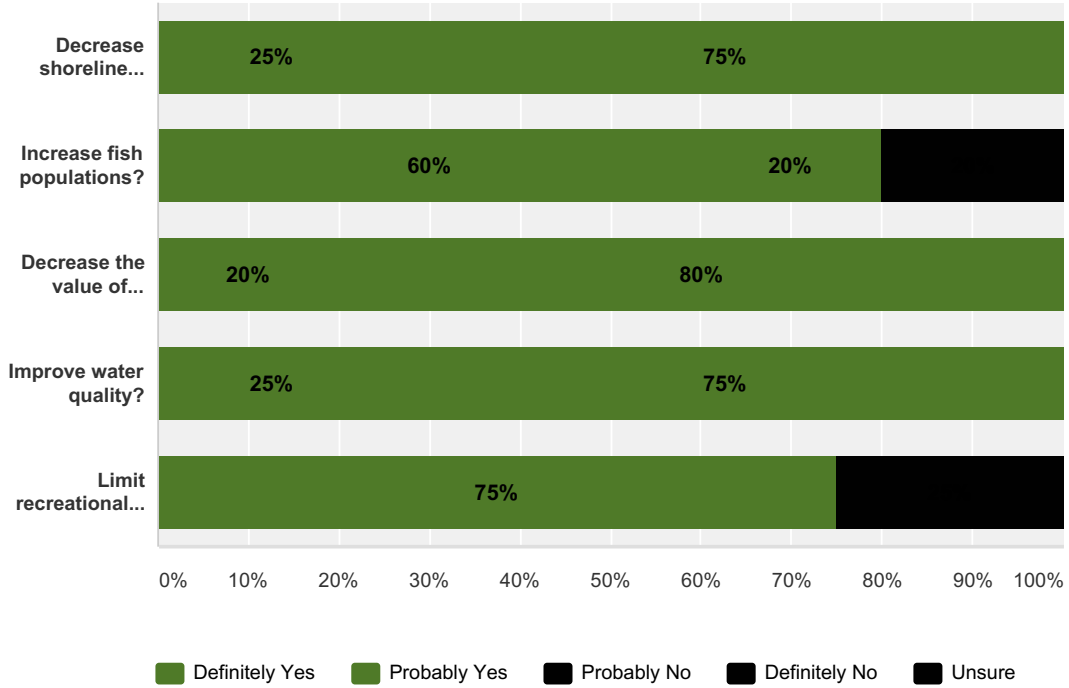
	Highly supportive	Somewhat supportive	Neutral	Somewhat unsupportive	Not supportive	Unsure, need more info	Total	Average Rating
Herbicide (chemical) control	67% 2	0% 0	0% 0	0% 0	33% 1	0% 0	3	2.33
Dredging of bottom sediments	60% 3	0% 0	20% 1	0% 0	20% 1	0% 0	5	2.20
Hand-removal by divers	67% 2	33% 1	0% 0	0% 0	0% 0	0% 0	3	1.33
Manual removal by property owners	60% 3	20% 1	20% 1	0% 0	0% 0	0% 0	5	1.60
Biological control (milfoil weevil, loosestrife beetle, etc.)	25% 1	50% 2	25% 1	0% 0	0% 0	0% 0	4	2.00
Mechanical harvesting	75% 3	25% 1	0% 0	0% 0	0% 0	0% 0	4	1.25

## Twin Lake Survey #2

Water level drawdown	<b>0%</b> 0	<b>0%</b> 0	<b>0%</b> 0	<b>0%</b> 0	<b>100%</b> 3	<b>0%</b> 0	3	5.00
Do nothing (do not manage plants)	<b>0%</b> 0	<b>0%</b> 0	<b>0%</b> 0	<b>0%</b> 0	<b>100%</b> 3	<b>0%</b> 0	3	5.00

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

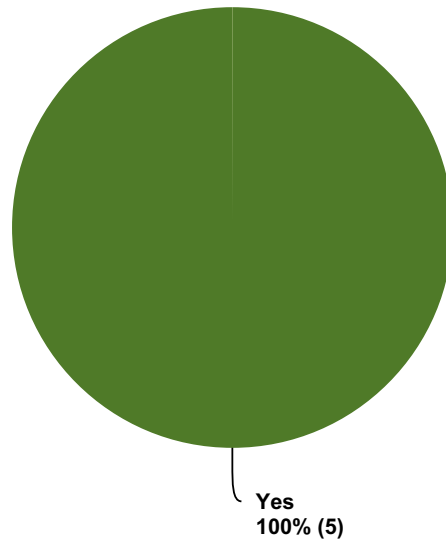
Answered: 5 Skipped: 0



	Definitely Yes	Probably Yes	Probably No	Definitely No	Unsure	Total
Decrease shoreline erosion?	25% 1	75% 3	0% 0	0% 0	0% 0	4
Increase fish populations?	60% 3	20% 1	20% 1	0% 0	0% 0	5
Decrease the value of shoreline property?	20% 1	80% 4	0% 0	0% 0	0% 0	5
Improve water quality?	25% 1	75% 3	0% 0	0% 0	0% 0	4
Limit recreational enjoyment?	75% 3	0% 0	25% 1	0% 0	0% 0	4

### Q9 Have you ever heard of aquatic invasive species?

Answered: 5 Skipped: 0

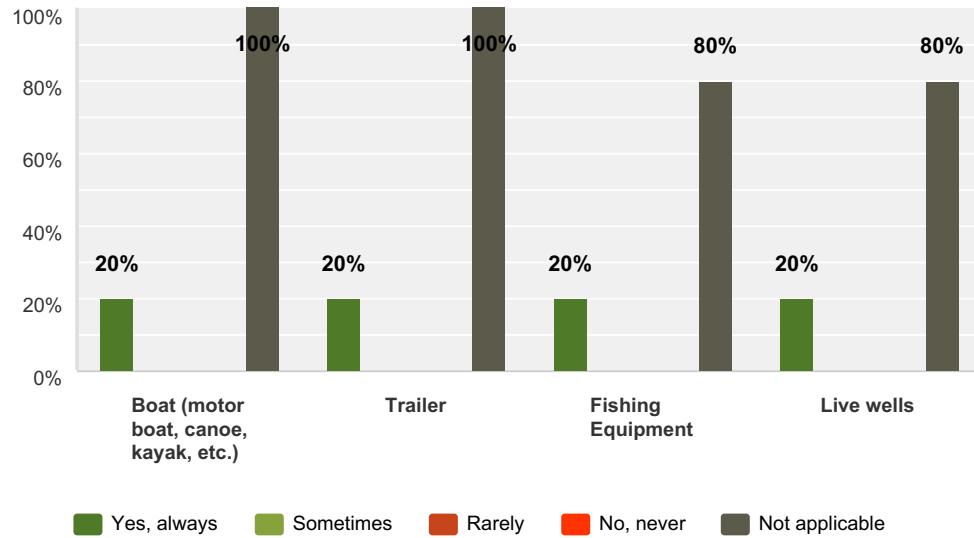


Answer Choices	Responses
Yes	100% 5
No	0% 0
<b>Total</b>	<b>5</b>

## Twin Lake Survey #2

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

Answered: 5 Skipped: 0

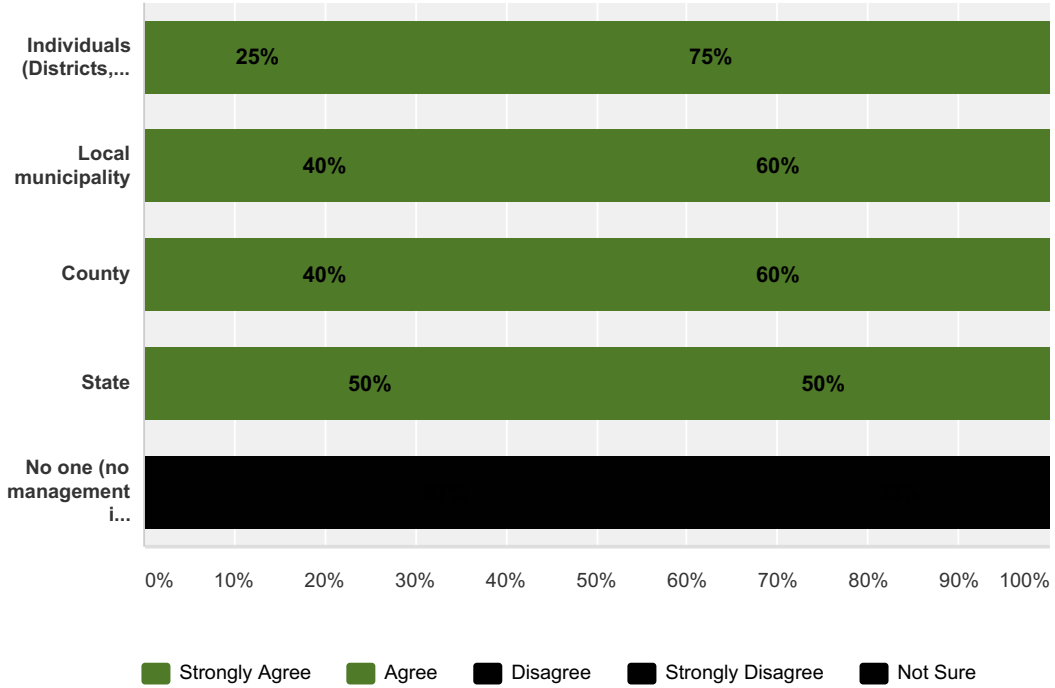


	Yes, always	Sometimes	Rarely	No, never	Not applicable	Total Respondents
Boat (motor boat, canoe, kayak, etc.)	20% 1	0% 0	0% 0	0% 0	100% 5	5
Trailer	20% 1	0% 0	0% 0	0% 0	100% 5	5
Fishing Equipment	20% 1	0% 0	0% 0	0% 0	80% 4	5
Live wells	20% 1	0% 0	0% 0	0% 0	80% 4	5



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

Answered: 5 Skipped: 0

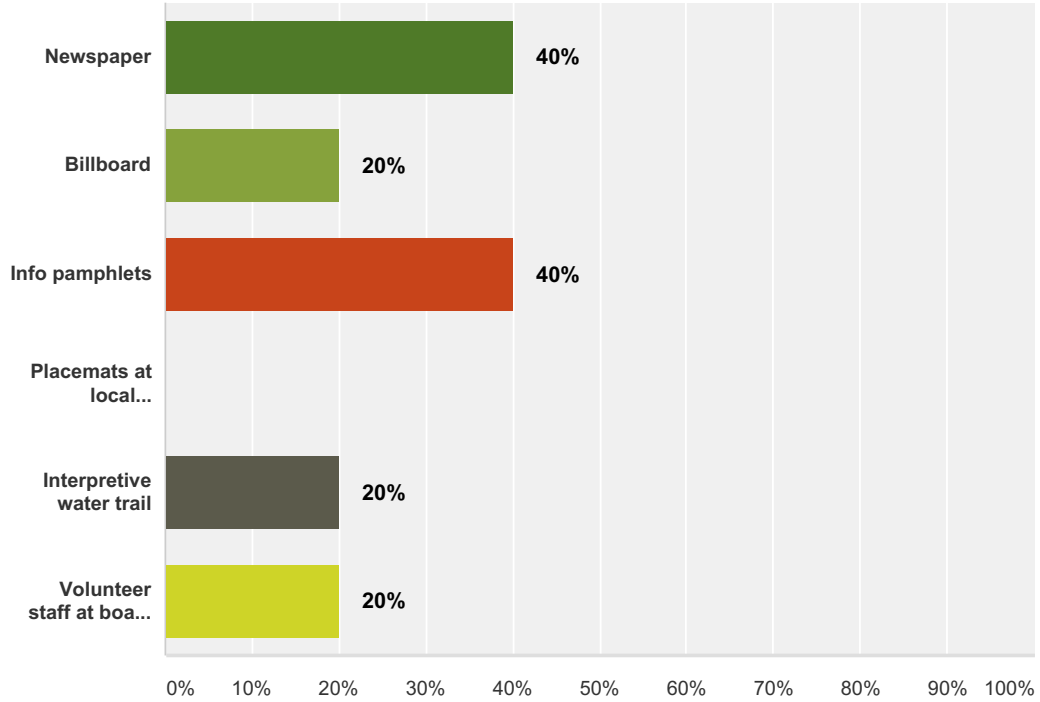


	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure	Total
Individuals (Districts, associations, lakefront property owners)	25% 1	75% 3	0% 0	0% 0	0% 0	4
Local municipality	40% 2	60% 3	0% 0	0% 0	0% 0	5
County	40% 2	60% 3	0% 0	0% 0	0% 0	5
State	50% 2	50% 2	0% 0	0% 0	0% 0	4
No one (no management is undertaken)	0% 0	0% 0	0% 0	67% 2	33% 1	3

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

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

Answered: 5 Skipped: 0



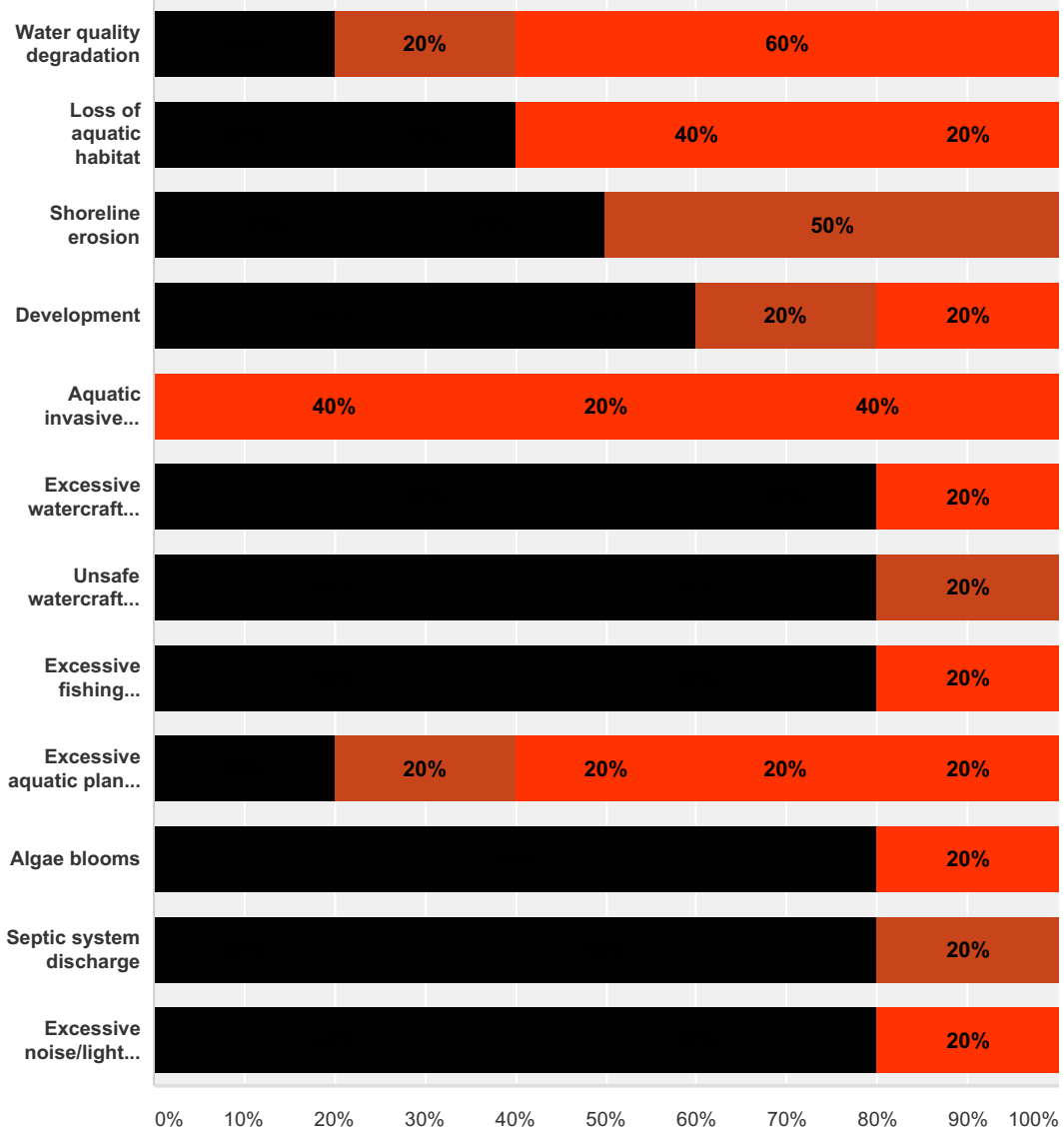
Answer Choices	Responses
Newspaper	40% 2
Billboard	20% 1
Info pamphlets	40% 2
Placemats at local restaurants	0% 0
Interpretive water trail	20% 1
Volunteer staff at boat launch	20% 1
<b>Total Respondents: 5</b>	

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

Twin Lake Survey #2

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

Answered: 5 Skipped: 0



\*Not present 0
  \*\*No Impact 1
  2
  Moderately negative impact 3
  4
  Great negative impact 5
  Unsure - need more info

## Twin Lake Survey #2

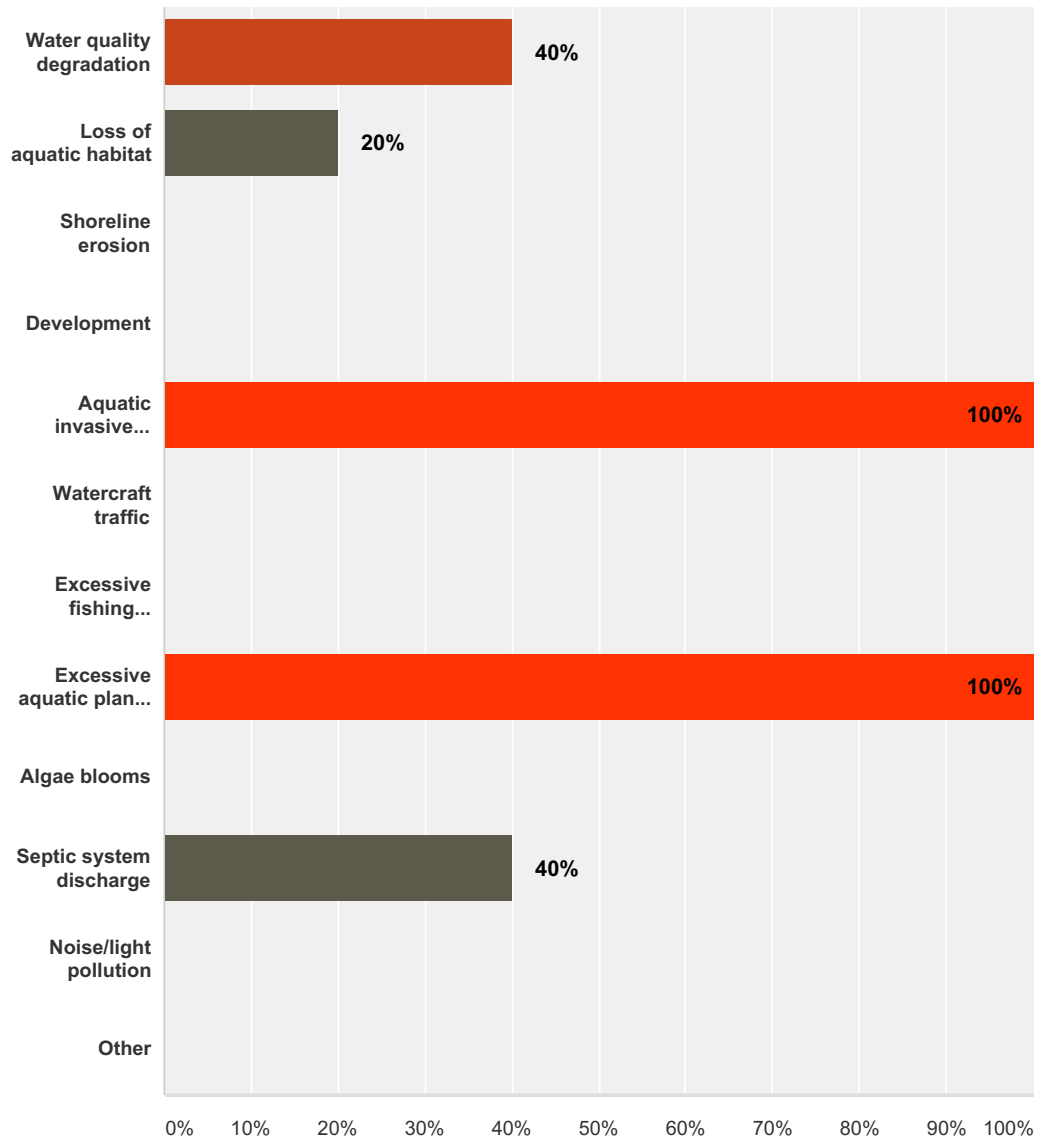
	<b>*Not present 0</b>	<b>**No Impact 1</b>	<b>2</b>	<b>Moderately negative impact 3</b>	<b>4</b>	<b>Great negative impact 5</b>	<b>Unsure - need more info</b>	<b>Total</b>	<b>Average Rating</b>
Water quality degradation	0% 0	20% 1	20% 1	60% 3	0% 0	0% 0	0% 0	5	2.40
Loss of aquatic habitat	20% 1	20% 1	0% 0	40% 2	20% 1	0% 0	0% 0	5	2.20
Shoreline erosion	25% 1	25% 1	50% 2	0% 0	0% 0	0% 0	0% 0	4	1.25
Development	40% 2	20% 1	20% 1	20% 1	0% 0	0% 0	0% 0	5	1.20
Aquatic invasive species introduction	0% 0	0% 0	0% 0	40% 2	20% 1	40% 2	0% 0	5	4.00
Excessive watercraft traffic	60% 3	20% 1	0% 0	20% 1	0% 0	0% 0	0% 0	5	0.80
Unsafe watercraft practices	40% 2	40% 2	20% 1	0% 0	0% 0	0% 0	0% 0	5	0.80
Excessive fishing pressure	40% 2	40% 2	0% 0	20% 1	0% 0	0% 0	0% 0	5	1.00
Excessive aquatic plant growth (excluding algae)	0% 0	20% 1	20% 1	20% 1	20% 1	20% 1	0% 0	5	3.00
Algae blooms	0% 0	80% 4	0% 0	20% 1	0% 0	0% 0	0% 0	5	1.40
Septic system discharge	20% 1	60% 3	20% 1	0% 0	0% 0	0% 0	0% 0	5	1.00
Excessive noise/light pollution	40% 2	40% 2	0% 0	0% 0	20% 1	0% 0	0% 0	5	1.20

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

## Twin Lake Survey #2

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

Answered: 5 Skipped: 0



Answer Choices	Responses	Count
Water quality degradation	40%	2
Loss of aquatic habitat	20%	1
Shoreline erosion	0%	0
Development	0%	0
Aquatic invasive species introduction	100%	5
Watercraft traffic	0%	0

## Twin Lake Survey #2

Excessive fishing pressure	0%	0
Excessive aquatic plant growth (excluding algae)	100%	5
Algae blooms	0%	0
Septic system discharge	40%	2
Noise/light pollution	0%	0
Other	0%	0
<b>Total Respondents: 5</b>		

Twin Lake Survey #3

**Q1 What is your Waushara County Lakes  
Study ID?**

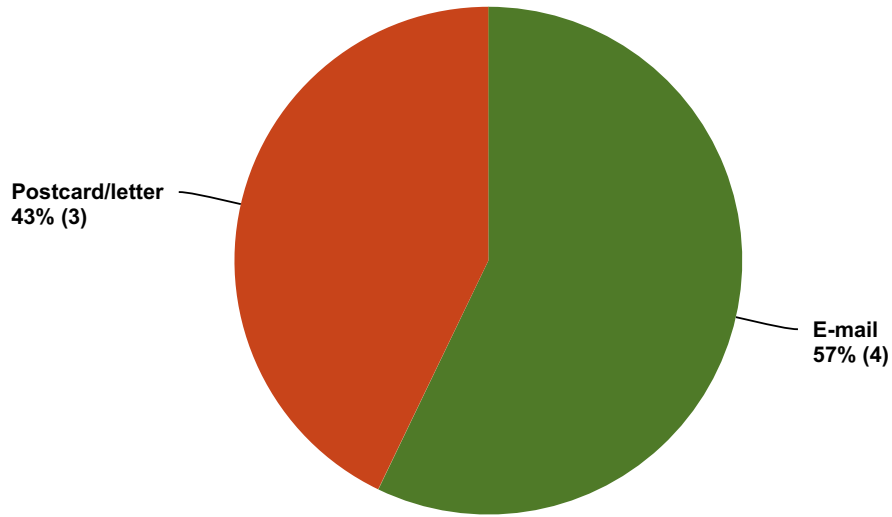
Answered: 8 Skipped: 0

#	Responses	Date
1	██████	10/10/2014 5:31 PM
2	██████	10/7/2014 9:30 AM
3	██████	10/6/2014 8:43 AM
4	██████	10/4/2014 8:27 AM
5	██████	10/3/2014 1:58 PM
6	██████	10/3/2014 11:18 AM
7	██████	10/3/2014 11:00 AM
8	██████	10/3/2014 10:21 AM

# Twin Lake Survey #3

## Q2 How did you hear about this survey?

Answered: 7 Skipped: 1



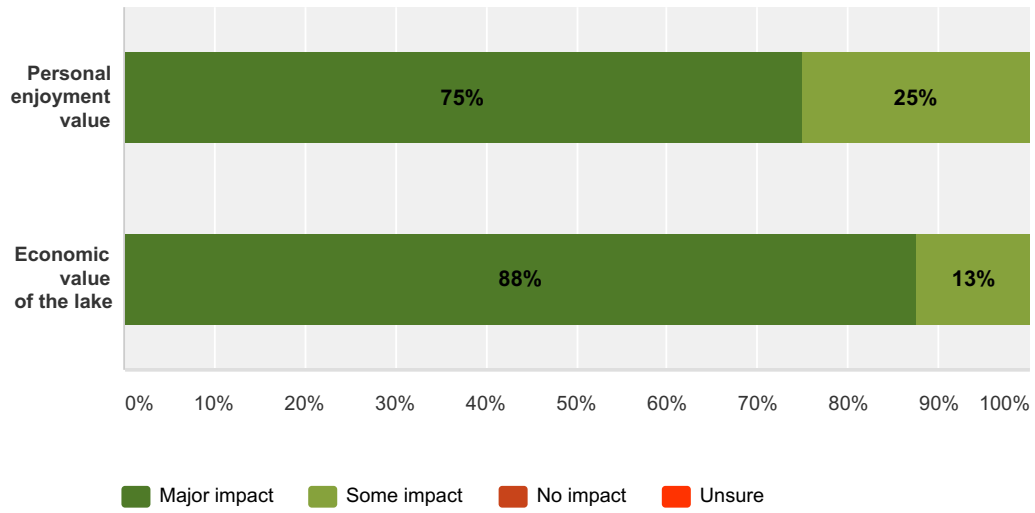
Answer Choices	Responses
E-mail	57% 4
Newspaper	0% 0
Postcard/letter	43% 3
Facebook	0% 0
Radio	0% 0
Word of mouth	0% 0
<b>Total</b>	<b>7</b>

#	Other (please specify)	Date
1	From the meetings	10/3/2014 10:21 AM



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

Answered: 8 Skipped: 0

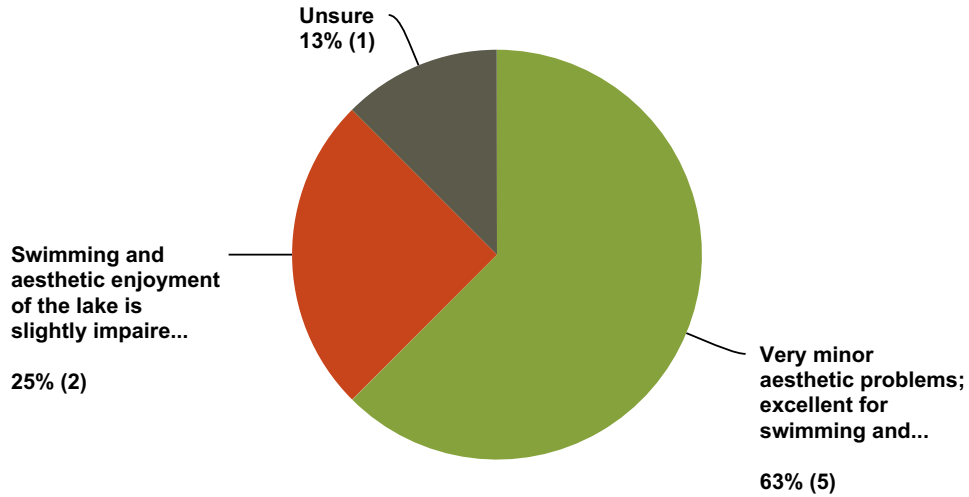


	Major impact	Some impact	No impact	Unsure	Total
Personal enjoyment value	75% 6	25% 2	0% 0	0% 0	8
Economic value of the lake	88% 7	13% 1	0% 0	0% 0	8

Twin Lake Survey #3

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

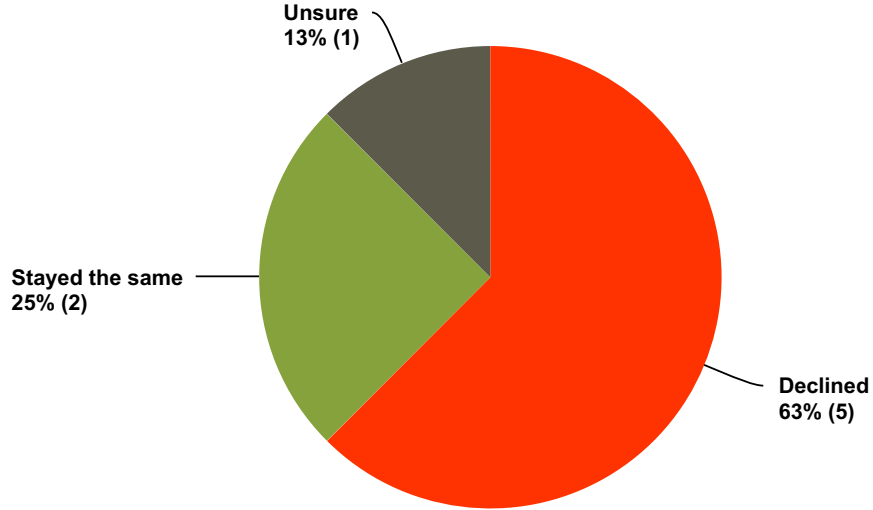
Answered: 8 Skipped: 0



Answer Choices	Responses	
Beautiful, could not be any nicer	0%	0
Very minor aesthetic problems; excellent for swimming and boating enjoyment	63%	5
Swimming and aesthetic enjoyment of the lake is slightly impaired because of algae	25%	2
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	13%	1
<b>Total</b>		<b>8</b>

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

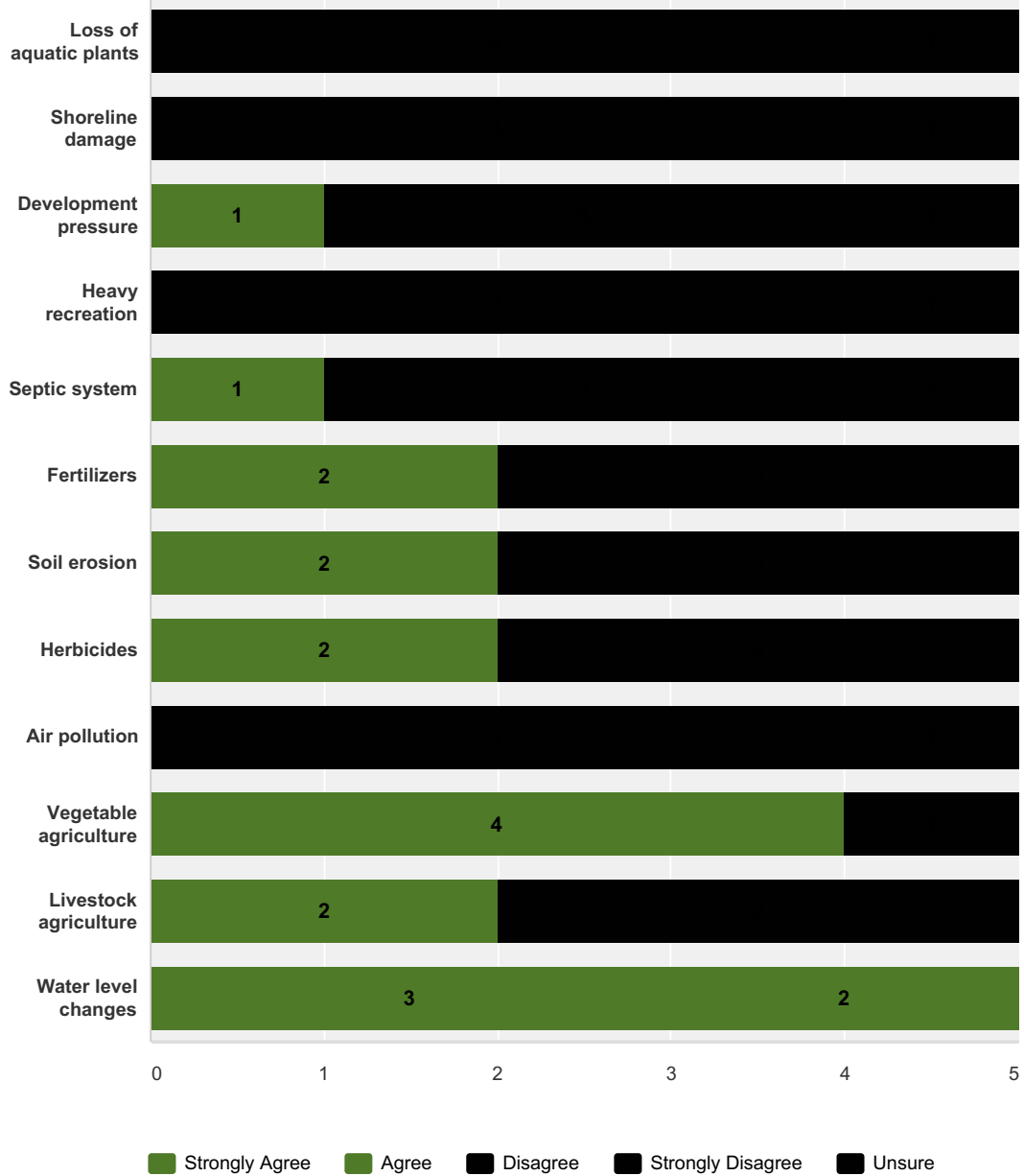
Answered: 8 Skipped: 0



Answer Choices	Responses	
Improved	0%	0
Declined	63%	5
Stayed the same	25%	2
Unsure	13%	1
<b>Total</b>		<b>8</b>

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

Answered: 5 Skipped: 3



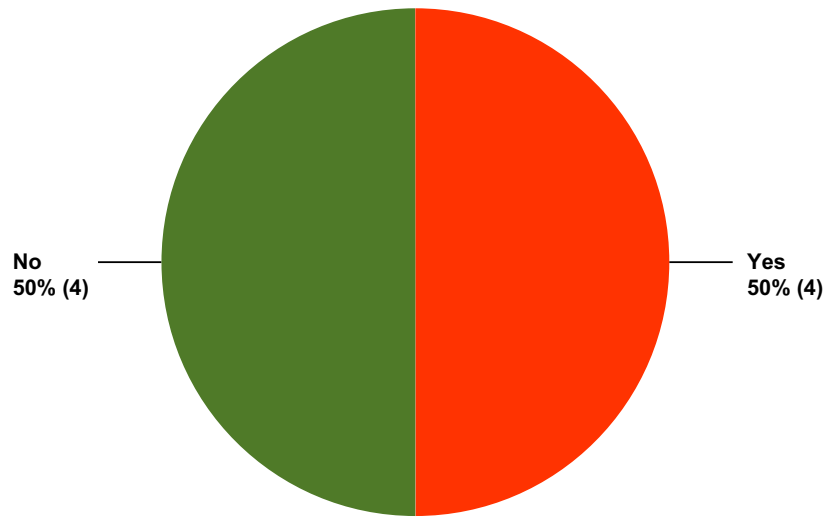
	Strongly Agree	Agree	Disagree	Strongly Disagree	Unsure	Total Respondents
Loss of aquatic plants	0%	0%	80%	0%	20%	5
Shoreline damage	0%	0%	80%	0%	20%	5
Development pressure	0%	20%	60%	20%	0%	5
Heavy recreation	0%	0%	80%	20%	0%	5

### Twin Lake Survey #3

Septic system	<b>0%</b> 0	<b>20%</b> 1	<b>60%</b> 3	<b>20%</b> 1	<b>0%</b> 0	5
Fertilizers	<b>0%</b> 0	<b>40%</b> 2	<b>60%</b> 3	<b>0%</b> 0	<b>0%</b> 0	5
Soil erosion	<b>0%</b> 0	<b>40%</b> 2	<b>60%</b> 3	<b>0%</b> 0	<b>0%</b> 0	5
Herbicides	<b>0%</b> 0	<b>40%</b> 2	<b>60%</b> 3	<b>0%</b> 0	<b>0%</b> 0	5
Air pollution	<b>0%</b> 0	<b>0%</b> 0	<b>80%</b> 4	<b>0%</b> 0	<b>20%</b> 1	5
Vegetable agriculture	<b>0%</b> 0	<b>80%</b> 4	<b>20%</b> 1	<b>0%</b> 0	<b>0%</b> 0	5
Livestock agriculture	<b>0%</b> 0	<b>40%</b> 2	<b>60%</b> 3	<b>0%</b> 0	<b>0%</b> 0	5
Water level changes	<b>60%</b> 3	<b>40%</b> 2	<b>0%</b> 0	<b>0%</b> 0	<b>0%</b> 0	5

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

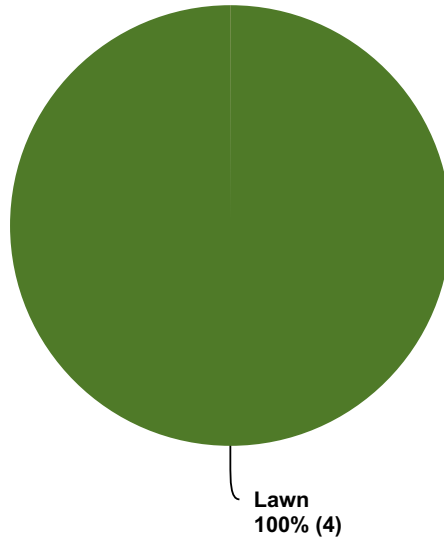
Answered: 8 Skipped: 0



Answer Choices	Responses
Yes	50% 4
No	50% 4
<b>Total</b>	<b>8</b>

### Q8 Where do you apply herbicides and/or pesticides?

Answered: 4 Skipped: 4

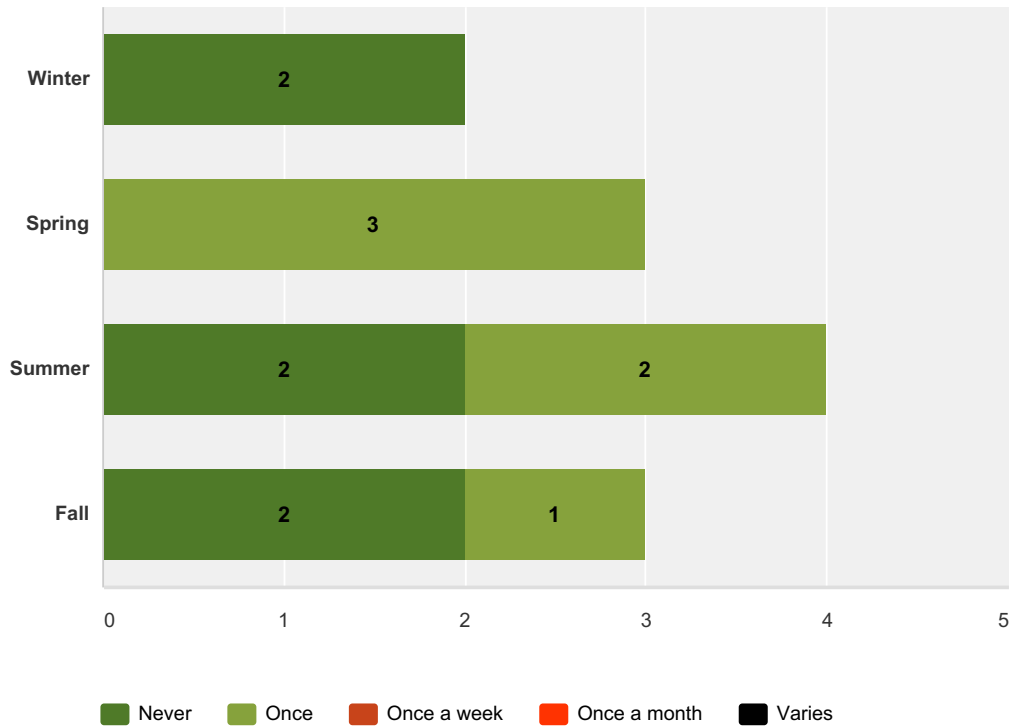


Answer Choices	Responses
Agricultural fields	0% 0
Garden	0% 0
Lawn	100% 4
<b>Total</b>	<b>4</b>

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

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

Answered: 4 Skipped: 4

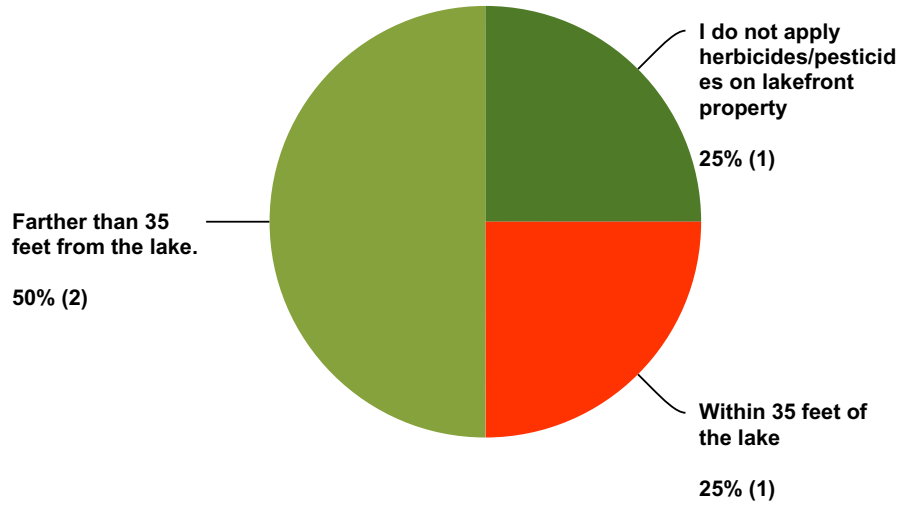


	Never	Once	Once a week	Once a month	Varies	Total Respondents
Winter	100% 2	0% 0	0% 0	0% 0	0% 0	2
Spring	0% 0	100% 3	0% 0	0% 0	0% 0	3
Summer	50% 2	50% 2	0% 0	0% 0	0% 0	4
Fall	67% 2	33% 1	0% 0	0% 0	0% 0	3



**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)?**

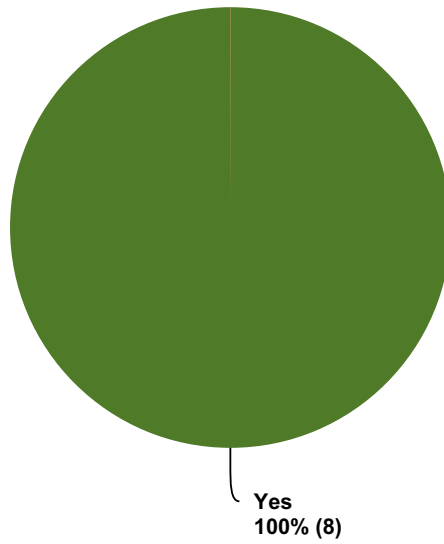
Answered: 4 Skipped: 4



Answer Choices	Responses	
I do not apply herbicides/pesticides on lakefront property	25%	1
Up to the lake	0%	0
Within 35 feet of the lake	25%	1
Farther than 35 feet from the lake.	50%	2
<b>Total</b>		<b>4</b>

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

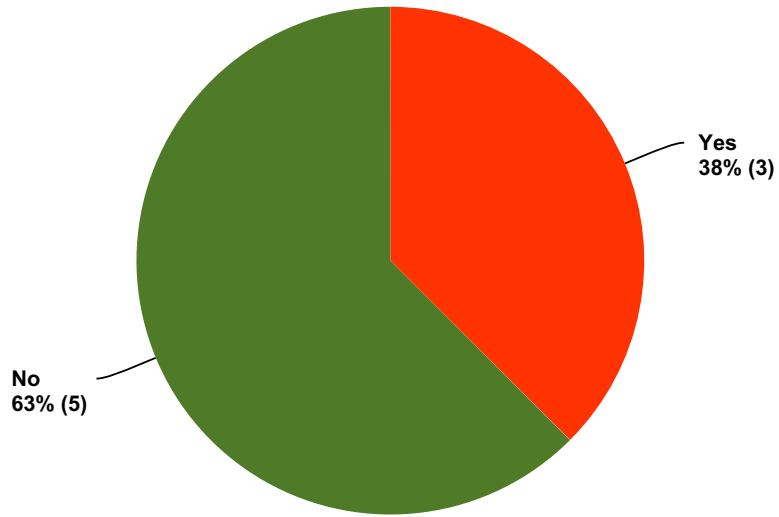
Answered: 8 Skipped: 0



Answer Choices	Responses
Yes	100% 8
No	0% 0
I don't have a septic tank	0% 0
<b>Total</b>	<b>8</b>

### Q12 Do you use fertilizer on your land?

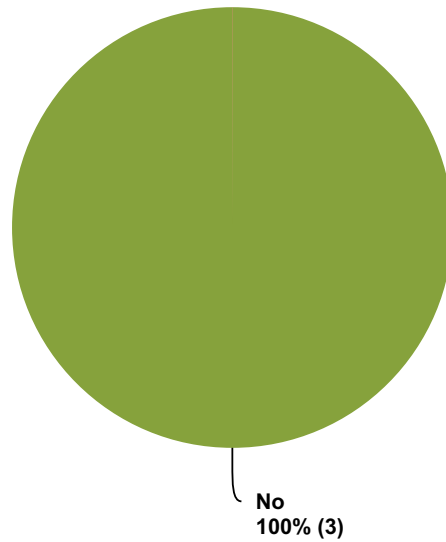
Answered: 8 Skipped: 0



Answer Choices	Responses	
Yes	38%	3
No	63%	5
<b>Total</b>		<b>8</b>

### Q13 Do you use fertilizer which contains phosphorus?

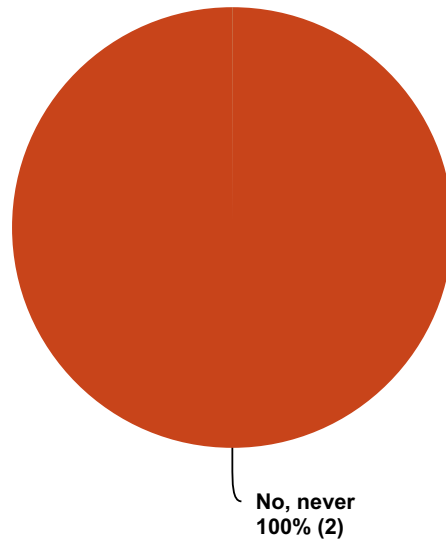
Answered: 3 Skipped: 5



Answer Choices	Responses
Yes	0% 0
No	100% 3
I don't know	0% 0
<b>Total</b>	<b>3</b>

### Q14 Do you have your soil tested before applying fertilizer?

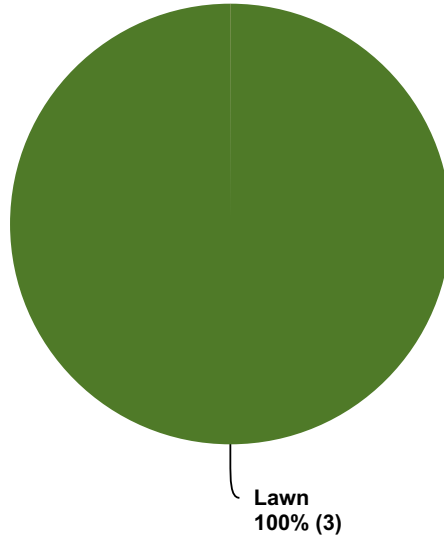
Answered: 2 Skipped: 6



Answer Choices	Responses
Yes, all of the time	0% 0
Yes, some of the time	0% 0
No, never	100% 2
<b>Total</b>	<b>2</b>

### Q15 Where do you apply fertilizer?

Answered: 3 Skipped: 5

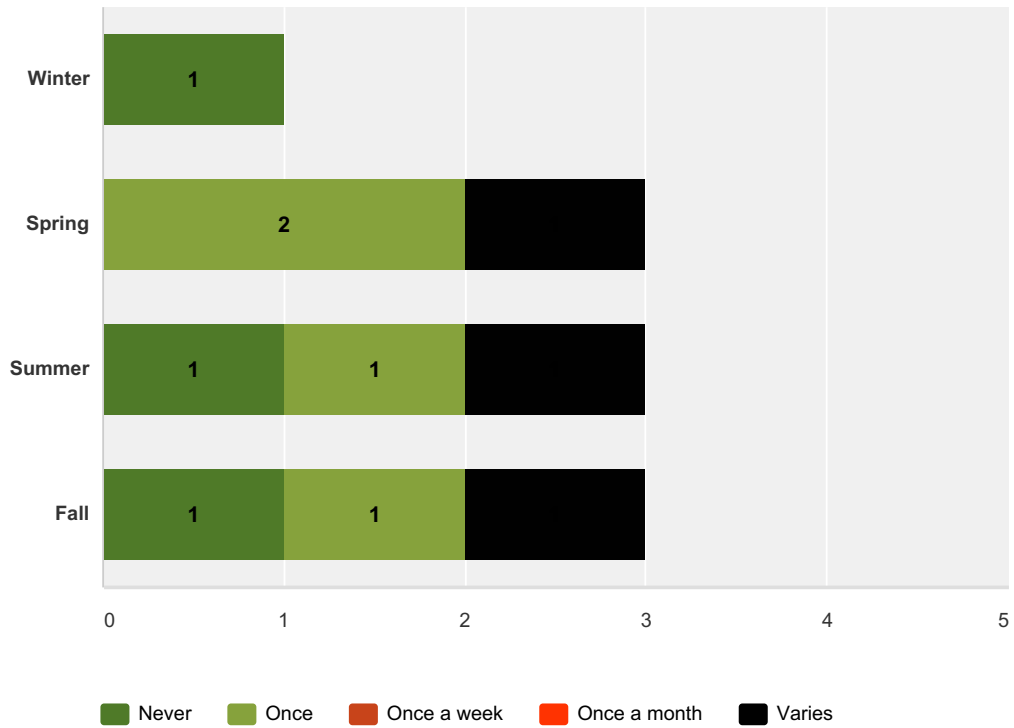


Answer Choices	Responses
Agricultural fields	0% 0
Garden	0% 0
Lawn	100% 3
<b>Total</b>	<b>3</b>

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

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

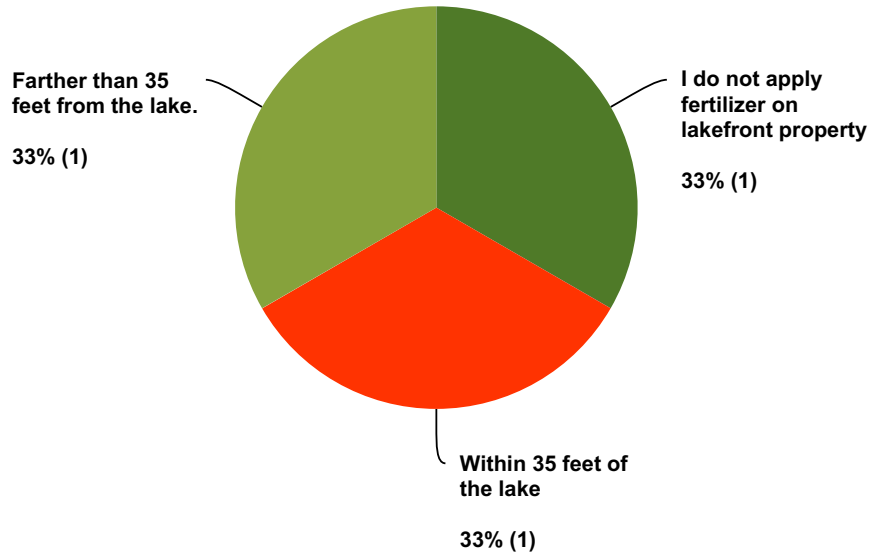
Answered: 3 Skipped: 5



	Never	Once	Once a week	Once a month	Varies	Total Respondents
Winter	100% 1	0% 0	0% 0	0% 0	0% 0	1
Spring	0% 0	67% 2	0% 0	0% 0	33% 1	3
Summer	33% 1	33% 1	0% 0	0% 0	33% 1	3
Fall	33% 1	33% 1	0% 0	0% 0	33% 1	3

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

Answered: 3 Skipped: 5

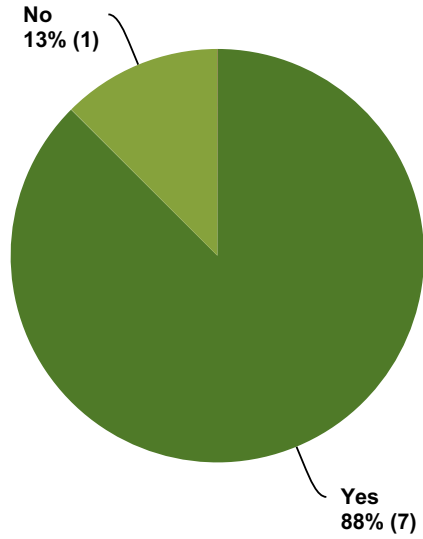


Answer Choices	Responses	
I do not apply fertilizer on lakefront property	33%	1
Up to the lake	0%	0
Within 35 feet of the lake	33%	1
Farther than 35 feet from the lake.	33%	1
<b>Total</b>		<b>3</b>



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

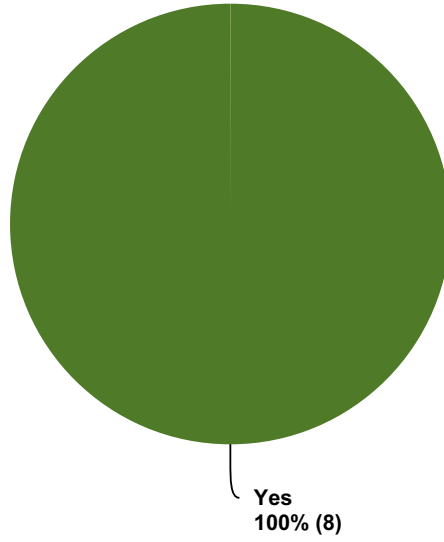
Answered: 8 Skipped: 0



Answer Choices	Responses
Yes	88% 7
No	13% 1
Unsure	0% 0
<b>Total</b>	<b>8</b>

### Q19 Do you own shoreland property?

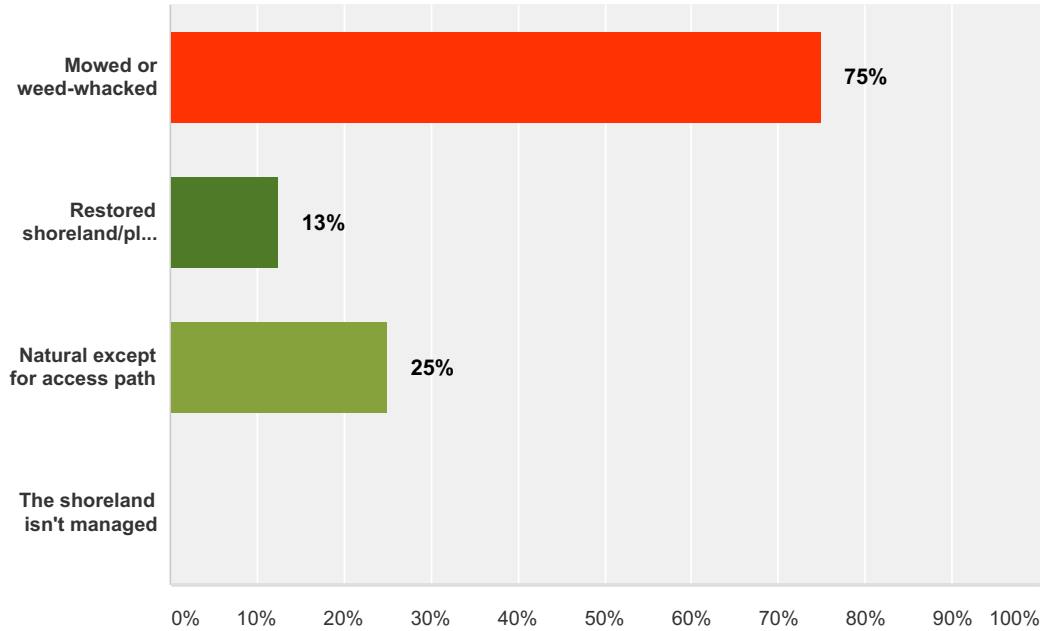
Answered: 8 Skipped: 0



Answer Choices	Responses
Yes	100% 8
No	0% 0
<b>Total</b>	<b>8</b>

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

Answered: 8 Skipped: 0

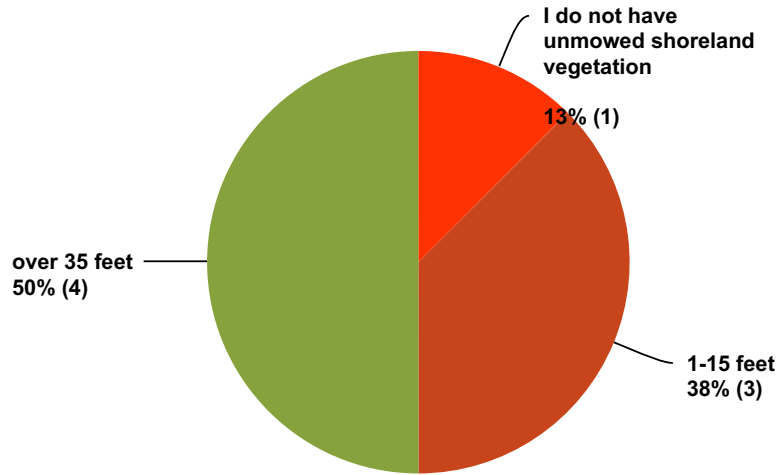


Answer Choices	Responses
Mowed or weed-whacked	75% 6
Restored shoreland/planted	13% 1
Natural except for access path	25% 2
The shoreland isn't managed	0% 0
<b>Total Respondents: 8</b>	

#	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?**

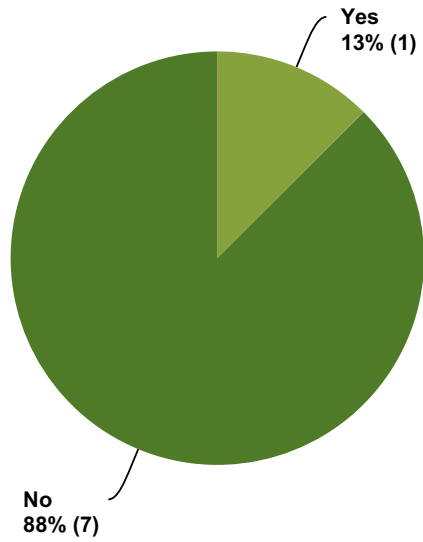
Answered: 8 Skipped: 0



Answer Choices	Responses	
I do not have unmowed shoreland vegetation	13%	1
1-15 feet	38%	3
16-35 feet	0%	0
over 35 feet	50%	4
<b>Total</b>		<b>8</b>

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

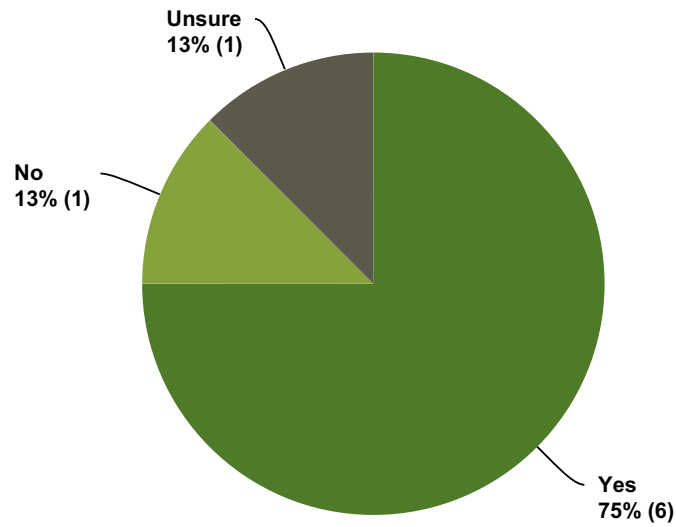
Answered: 8 Skipped: 0



Answer Choices	Responses
I have no path	0% 0
Yes	13% 1
No	88% 7
Unsure	0% 0
<b>Total</b>	<b>8</b>

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

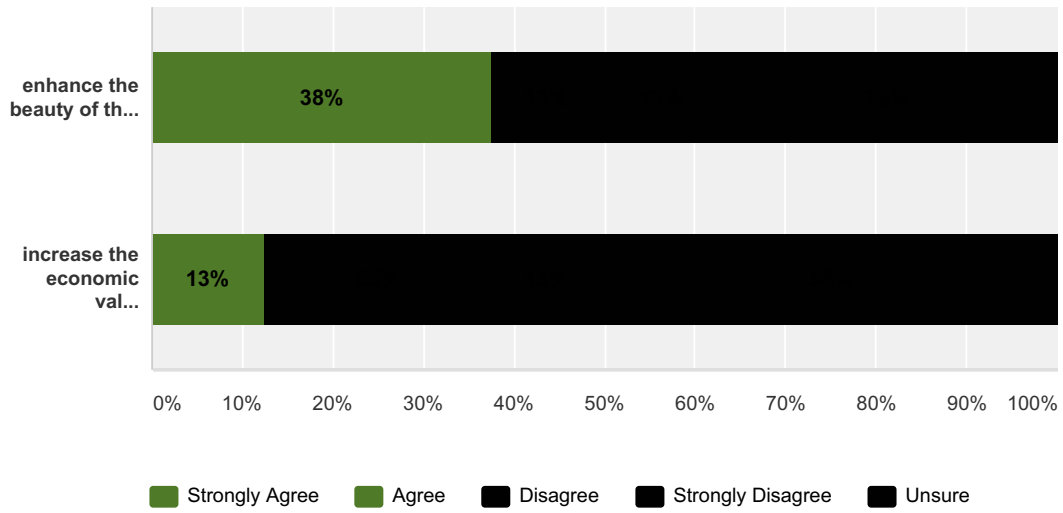
Answered: 8 Skipped: 0



Answer Choices	Responses	
Yes	75%	6
No	13%	1
Unsure	13%	1
<b>Total</b>		<b>8</b>

### Q24 In your opinion, does shoreland vegetation...

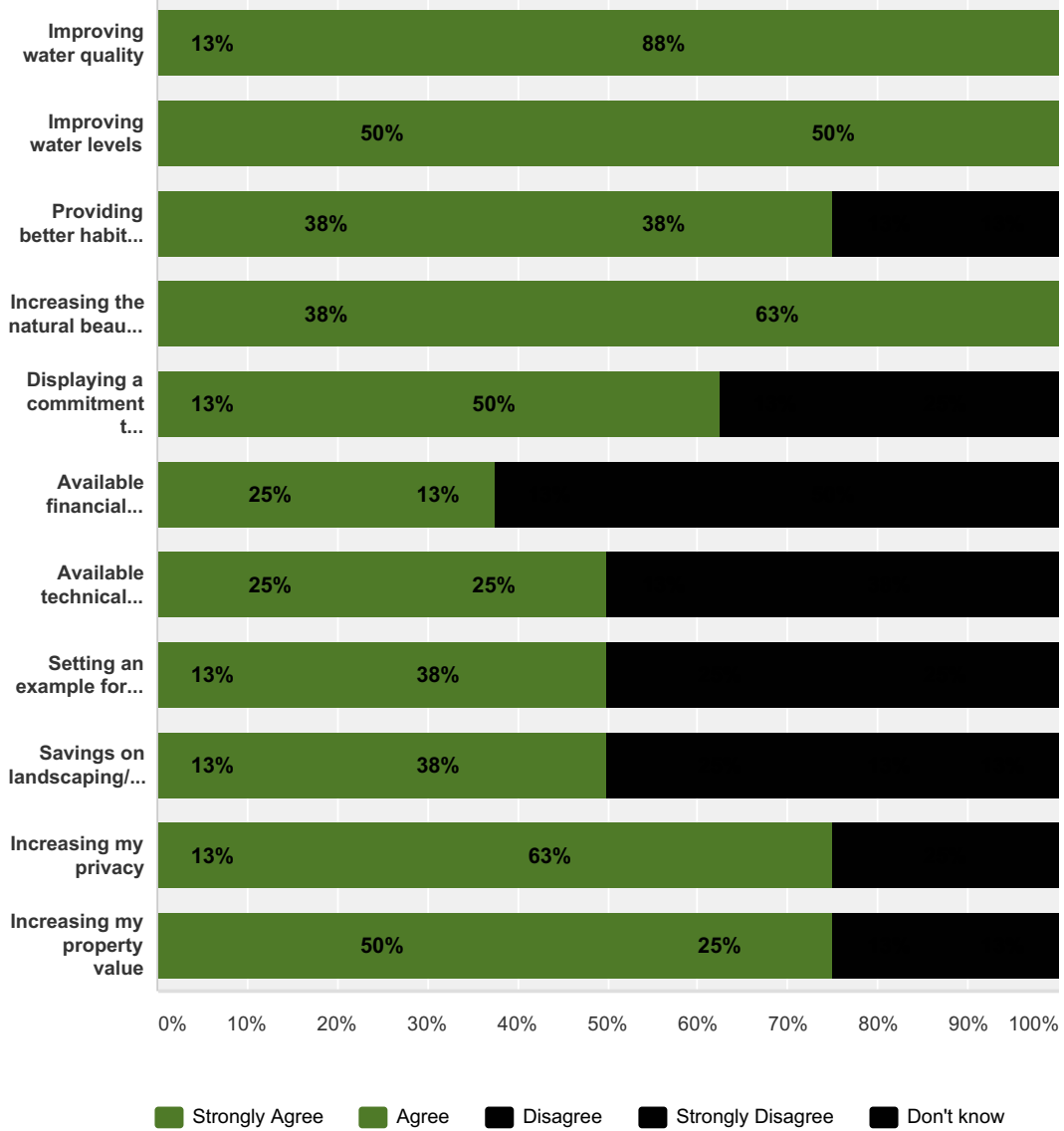
Answered: 8 Skipped: 0



	Strongly Agree	Agree	Disagree	Strongly Disagree	Unsure	Total
enhance the beauty of the property?	0% 0	38% 3	13% 1	13% 1	38% 3	8
increase the economic value of the property?	0% 0	13% 1	25% 2	13% 1	50% 4	8

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

Answered: 8 Skipped: 0



	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't know	Total
Improving water quality	13% 1	88% 7	0% 0	0% 0	0% 0	8
Improving water levels	50% 4	50% 4	0% 0	0% 0	0% 0	8
Providing better habitat for fish and wildlife	38% 3	38% 3	13% 1	0% 0	13% 1	8
Increasing the natural beauty of my property	38% 3	63% 5	0% 0	0% 0	0% 0	8
Displaying a commitment to the environment	13% 1	50% 4	13% 1	0% 0	25% 2	8



### Twin Lake Survey #3

Available financial assistance	<b>25%</b> 2	<b>13%</b> 1	<b>13%</b> 1	<b>0%</b> 0	<b>50%</b> 4	8
Available technical assistance	<b>25%</b> 2	<b>25%</b> 2	<b>13%</b> 1	<b>0%</b> 0	<b>38%</b> 3	8
Setting an example for community members	<b>13%</b> 1	<b>38%</b> 3	<b>25%</b> 2	<b>0%</b> 0	<b>25%</b> 2	8
Savings on landscaping/maintenance costs	<b>13%</b> 1	<b>38%</b> 3	<b>25%</b> 2	<b>13%</b> 1	<b>13%</b> 1	8
Increasing my privacy	<b>13%</b> 1	<b>63%</b> 5	<b>25%</b> 2	<b>0%</b> 0	<b>0%</b> 0	8
Increasing my property value	<b>50%</b> 4	<b>25%</b> 2	<b>13%</b> 1	<b>0%</b> 0	<b>13%</b> 1	8

#	Other (please specify)	Date
1	How to get rid of the floating bogs on Twin Lake that leave nasty weeds and black muck on the beach which I think also contributes to the change of clarity in the water.	10/3/2014 11:34 AM

Twin Lake Survey #4

**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.**

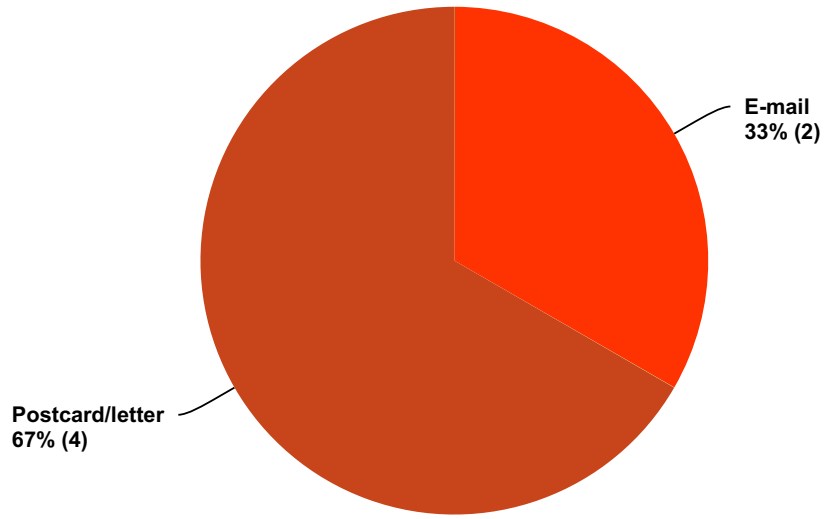
Answered: 6 Skipped: 0

#	Responses	Date
1	██████	11/17/2014 2:14 PM
2	██████	11/11/2014 3:38 PM
3	██████	11/10/2014 10:21 AM
4	██████	11/8/2014 10:34 AM
5	██████	11/6/2014 2:40 PM
6	██████	11/5/2014 9:58 AM

# Twin Lake Survey #4

## Q2 How did you hear about this survey?

Answered: 6 Skipped: 0

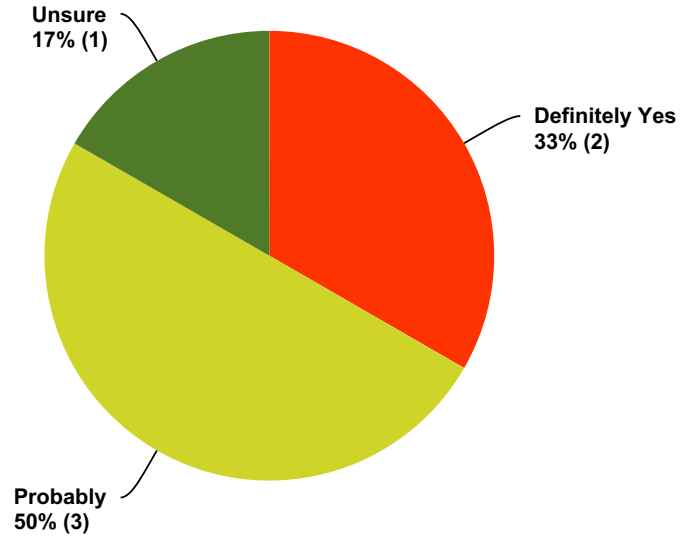


Answer Choices	Responses
E-mail	33% 2
Newspaper	0% 0
Postcard/letter	67% 4
Facebook	0% 0
Radio	0% 0
<b>Total</b>	<b>6</b>

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

**Q3 Does a desire to provide better habitat for fish and wildlife motivate you to support (morally) efforts to improve Twin Lake?**

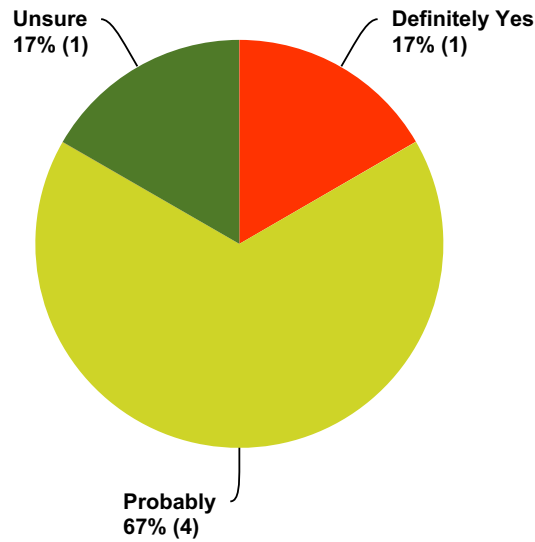
Answered: 6 Skipped: 0



Answer Choices	Responses
Definitely Yes	33% 2
Probably	50% 3
Not Likely	0% 0
Definitely No	0% 0
Unsure	17% 1
<b>Total</b>	<b>6</b>

**Q4 Does a desire to provide better habitat for fish and wildlife motivate you to support (by direct action) efforts to improve Twin Lake?**

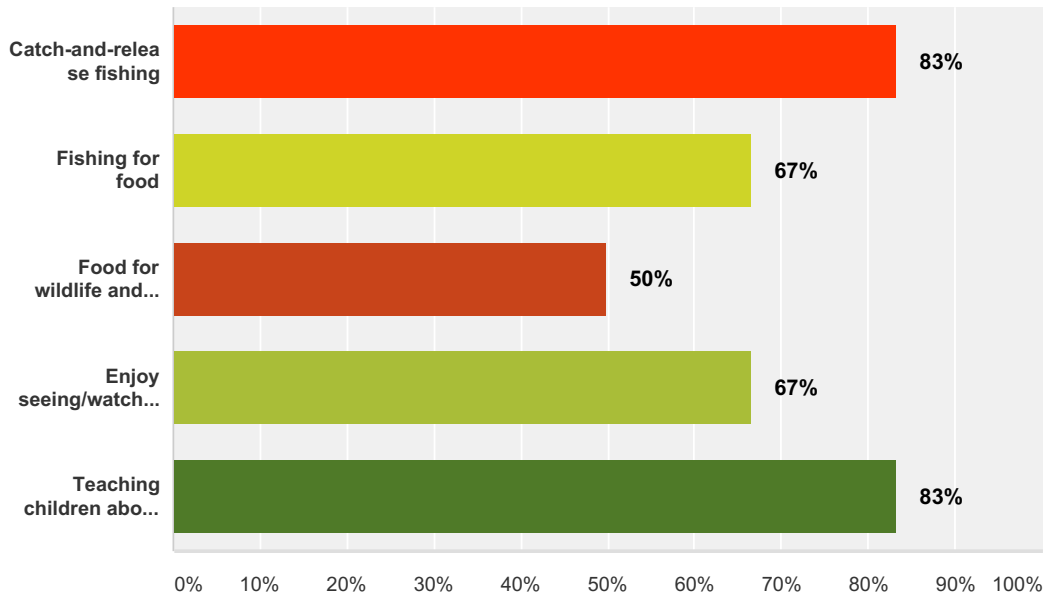
Answered: 6 Skipped: 0



Answer Choices	Responses	
Definitely Yes	17%	1
Probably	67%	4
Not Likely	0%	0
Definitely No	0%	0
Unsure	17%	1
<b>Total</b>		<b>6</b>

### Q5 For what purposes do you value the fishery in Twin Lake? (Check all that apply.)

Answered: 6 Skipped: 0

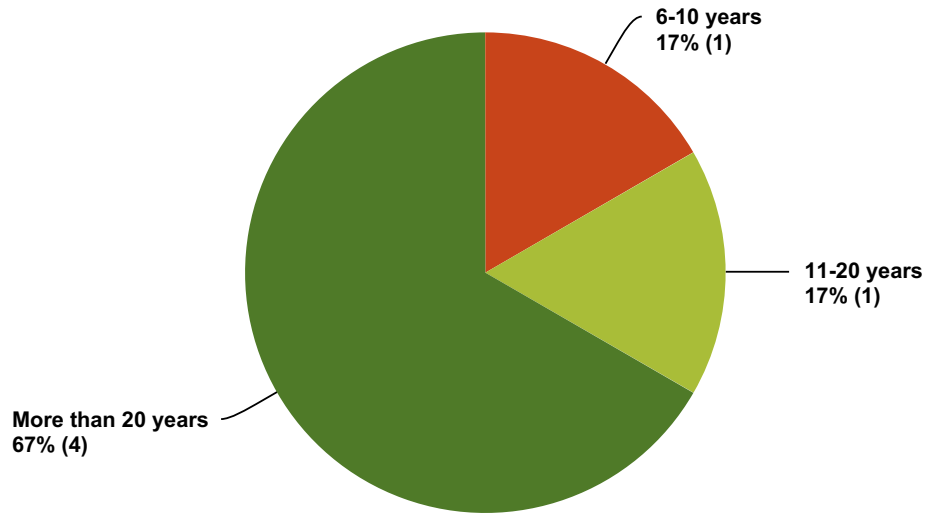


Answer Choices	Responses
Catch-and-release fishing	83% 5
Fishing for food	67% 4
Food for wildlife and birds	50% 3
Enjoy seeing/watching fish	67% 4
Teaching children about fishing/lakes	83% 5
<b>Total Respondents: 6</b>	

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

### Q6 How many years of fishing experience do you have on Twin Lake?

Answered: 6 Skipped: 0

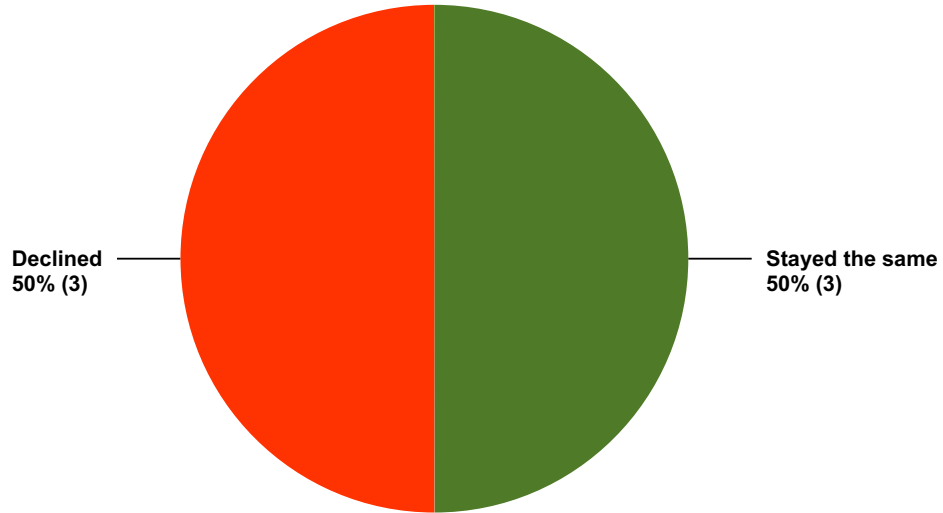


Answer Choices	Responses
I don't fish Twin Lake	0% 0
1-5 years	0% 0
6-10 years	17% 1
11-20 years	17% 1
More than 20 years	67% 4
<b>Total</b>	<b>6</b>

# Twin Lake Survey #4

## Q7 In the years you have been fishing Twin Lake, would you say the quality of fishing has...

Answered: 6 Skipped: 0



Answer Choices	Responses
Improved	0% 0
Stayed the same	50% 3
Declined	50% 3
Not sure	0% 0
<b>Total</b>	<b>6</b>



## Twin Lake Survey #4

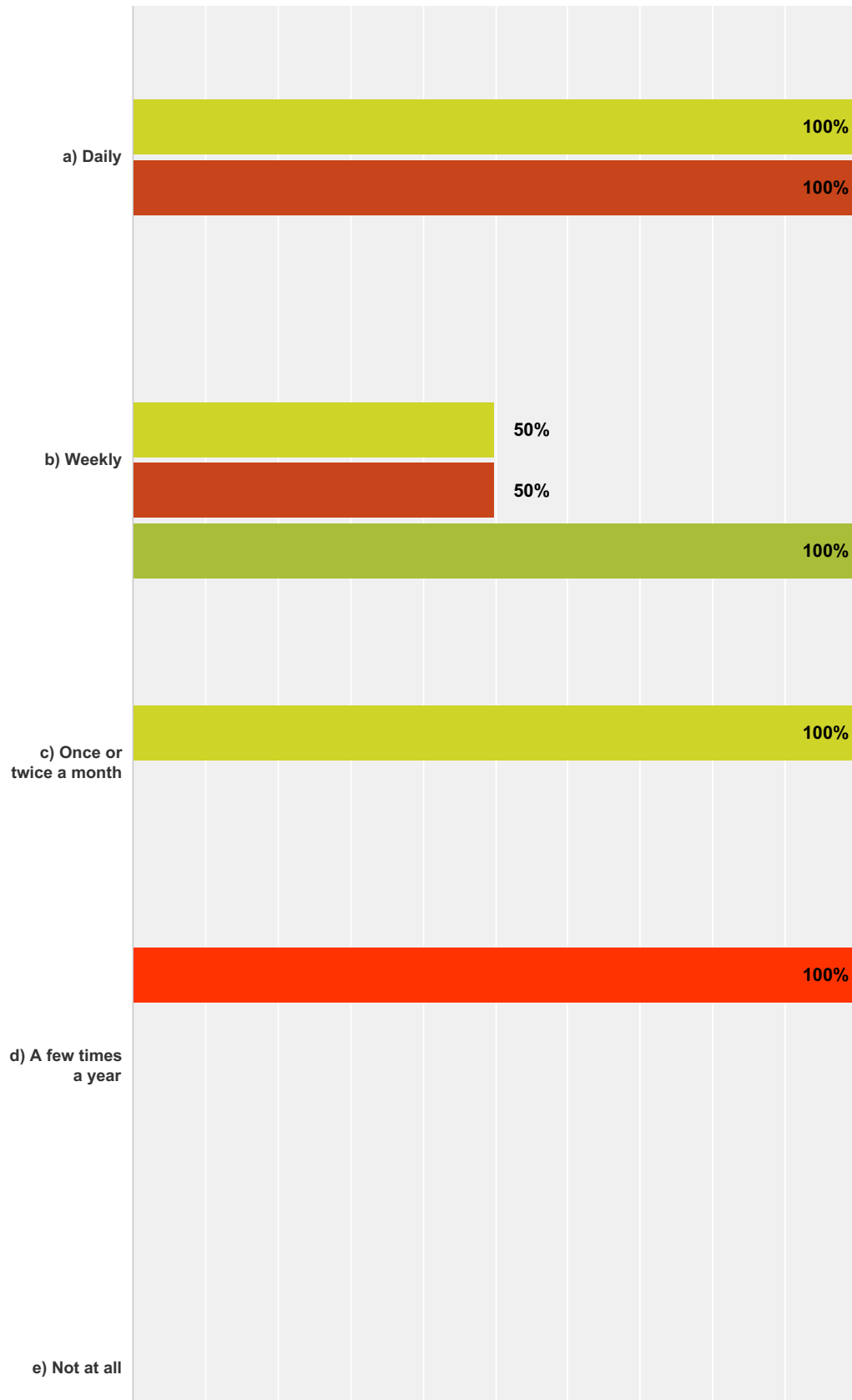
### Q8 What factors do you feel have contributed to the change in fishing?

Answered: 4 Skipped: 2

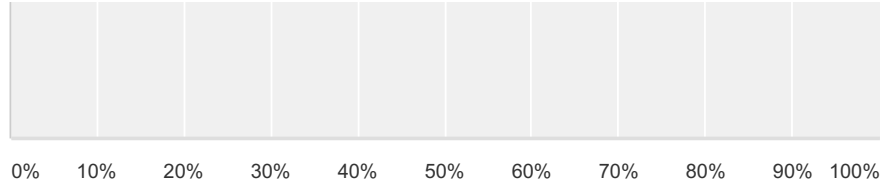
#	Responses	Date
1	Depth, bottom conditions, high capacity wells, invasive species.	11/11/2014 3:40 PM
2	2008 winter kill	11/8/2014 10:35 AM
3	Low levels of oxygen. low water levels	11/6/2014 2:54 PM
4	We no longer see very large northern pike which a few years ago there were many. In the winter people used to fish for northern and they took out a lot of small ones. I don't think that happens anymore. I am not there in the winter. So I don't know why no one catches large northern. We used to have one older gentlemen who fished only for northern and he got some huge ones.	11/5/2014 10:07 AM

### Q9 When and how often do you typically fish Twin Lake?(Please answer a-e)

Answered: 3 Skipped: 3



## Twin Lake Survey #4



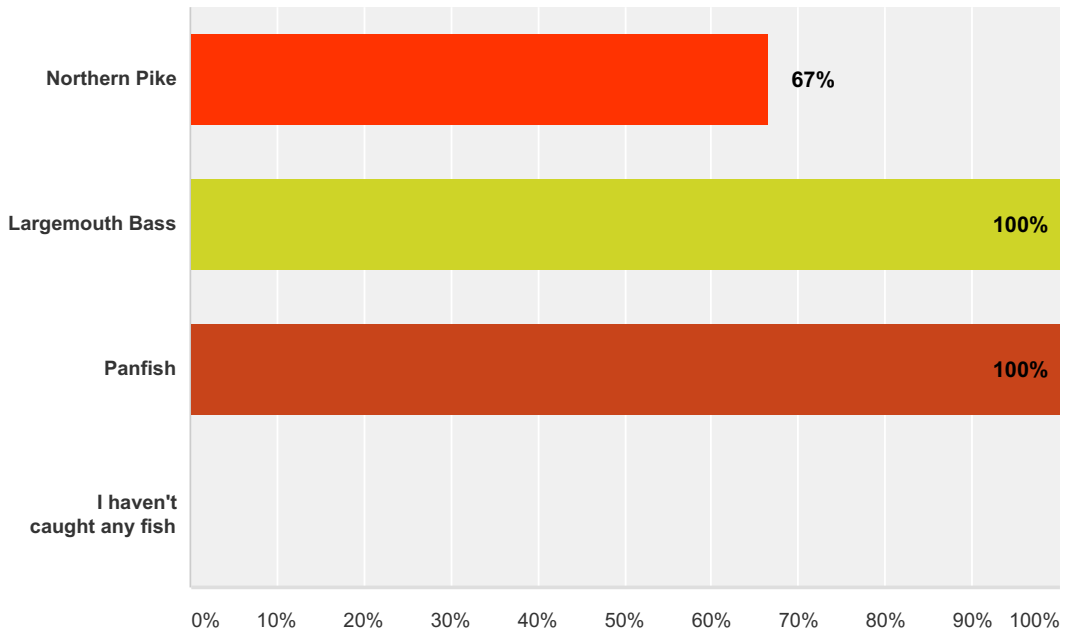
■ Winter   
 ■ Spring   
 ■ Summer   
 ■ Fall

	Winter	Spring	Summer	Fall	Total Respondents
a) Daily	0% 0	100% 1	100% 1	0% 0	1
b) Weekly	0% 0	50% 1	50% 1	100% 2	2
c) Once or twice a month	0% 0	100% 1	0% 0	0% 0	1
d) A few times a year	100% 2	0% 0	0% 0	0% 0	2
e) Not at all	0% 0	0% 0	0% 0	0% 0	0

Twin Lake Survey #4

**Q10 What fish do you typically catch at Twin Lake? Check all that apply.**

Answered: 3 Skipped: 3

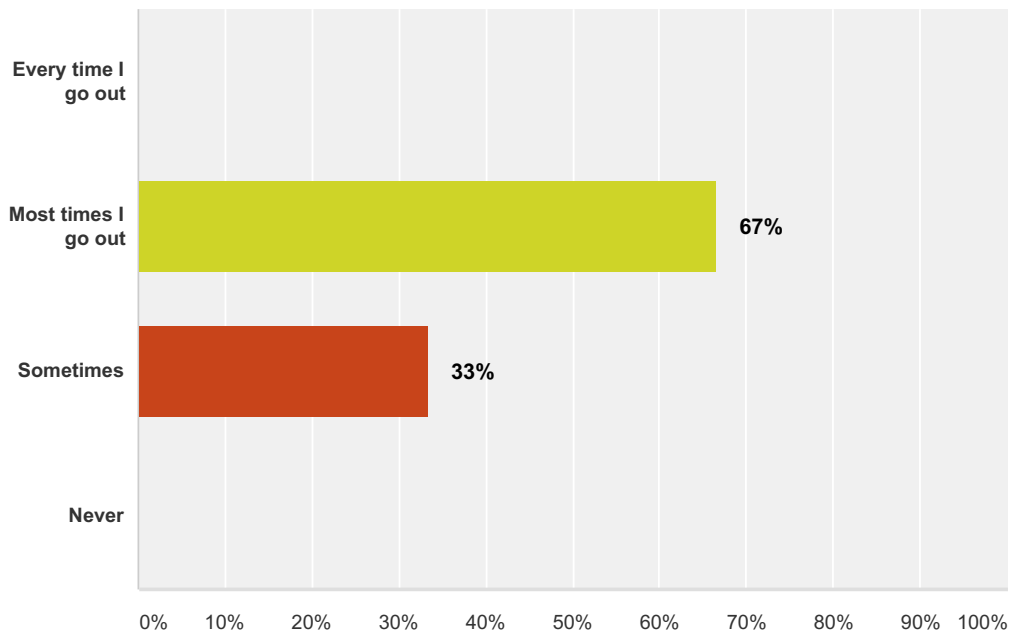


Answer Choices	Responses
Northern Pike	67% 2
Largemouth Bass	100% 3
Panfish	100% 3
I haven't caught any fish	0% 0
<b>Total Respondents: 3</b>	

#	Other (please specify)	Date
1	crappe	11/8/2014 10:38 AM

### Q11 In general, how often do you catch fish on Twin Lake?

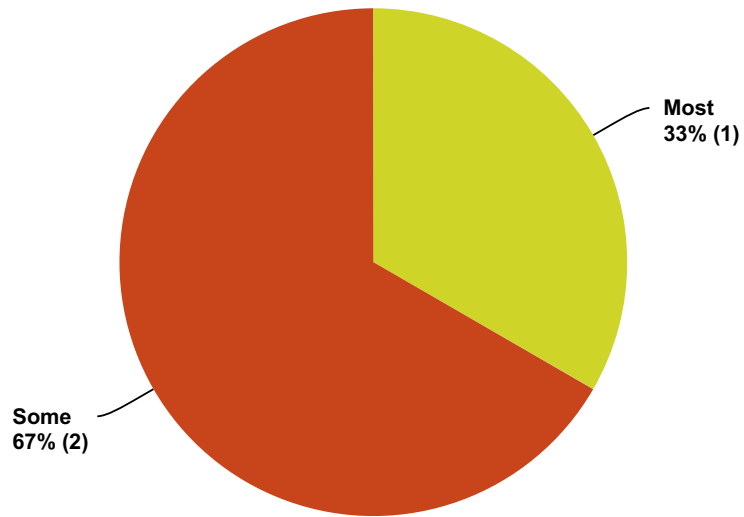
Answered: 3 Skipped: 3



Answer Choices	Responses
Every time I go out	0% 0
Most times I go out	67% 2
Sometimes	33% 1
Never	0% 0
<b>Total Respondents: 3</b>	

### Q12 In general, how many of the fish you catch are big enough to keep?

Answered: 3 Skipped: 3

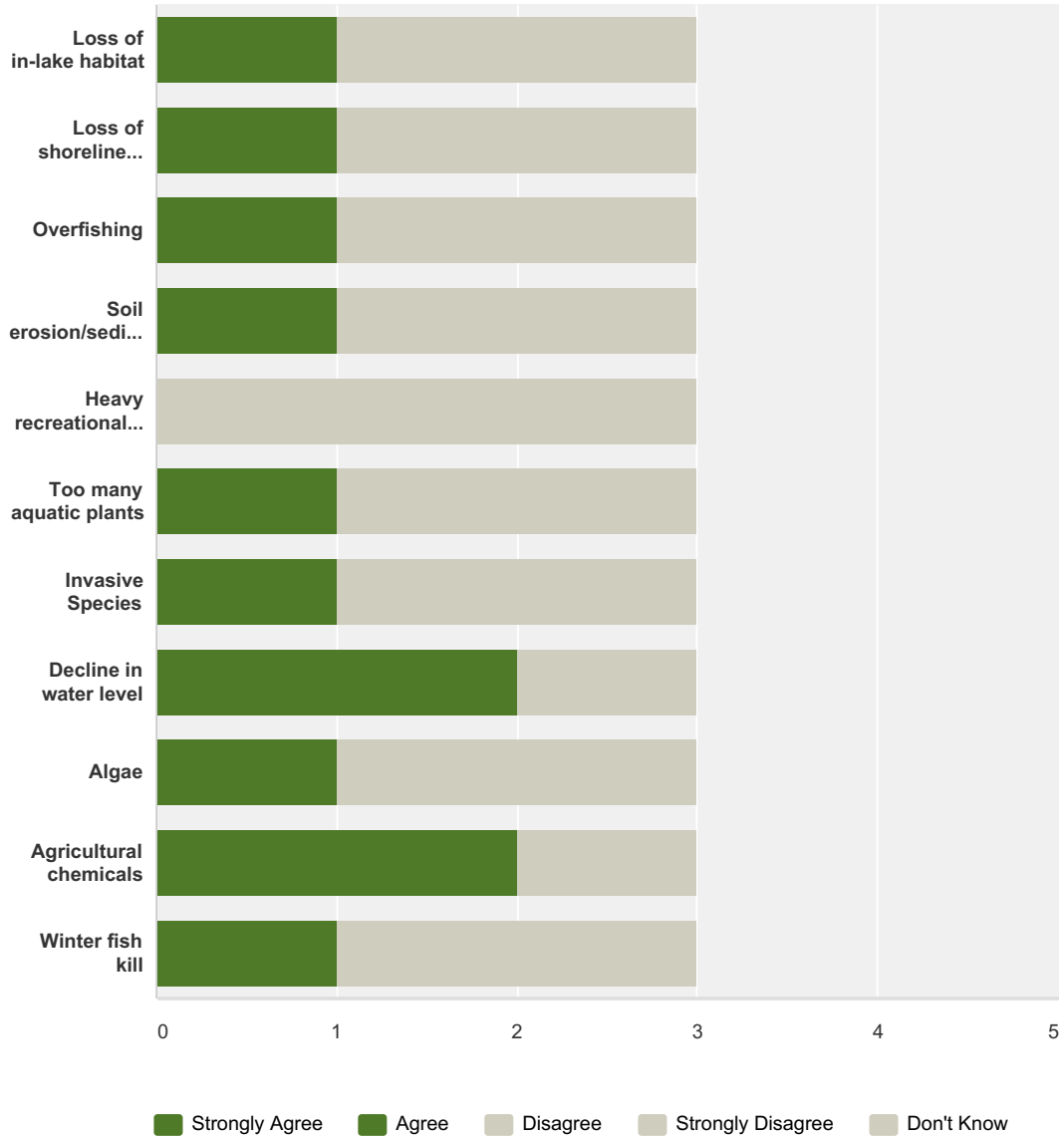


Answer Choices	Responses
All	0% 0
Most	33% 1
Some	67% 2
None	0% 0
<b>Total</b>	<b>3</b>

Twin Lake Survey #4

**Q13 What do you believe is the greatest threat to the fishery in Twin Lake in the next 10 years?**

Answered: 3 Skipped: 3



	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	Total Respondents
Loss of in-lake habitat	0% 0	33% 1	67% 2	0% 0	0% 0	3
Loss of shoreline habitat	0% 0	33% 1	67% 2	0% 0	0% 0	3
Overfishing	0% 0	33% 1	67% 2	0% 0	0% 0	3
Soil erosion/sedimentation	0% 0	33% 1	67% 2	0% 0	0% 0	3

## Twin Lake Survey #4

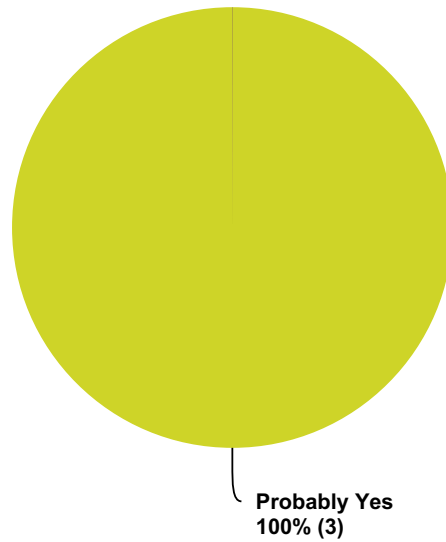
Heavy recreational use	0% 0	0% 0	100% 3	0% 0	0% 0	3
Too many aquatic plants	0% 0	33% 1	33% 1	0% 0	33% 1	3
Invasive Species	0% 0	33% 1	67% 2	0% 0	0% 0	3
Decline in water level	33% 1	33% 1	33% 1	0% 0	0% 0	3
Algae	0% 0	33% 1	67% 2	0% 0	0% 0	3
Agricultural chemicals	0% 0	67% 2	33% 1	0% 0	0% 0	3
Winter fish kill	33% 1	0% 0	67% 2	0% 0	0% 0	3

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



### Q14 Do you believe fish from Twin Lake are safe to eat?

Answered: 3 Skipped: 3



Answer Choices	Responses
Definitely Yes	0% 0
Probably Yes	100% 3
Probably No	0% 0
Definitely No	0% 0
Unsure	0% 0
<b>Total</b>	<b>3</b>

Twin Lake Survey #4

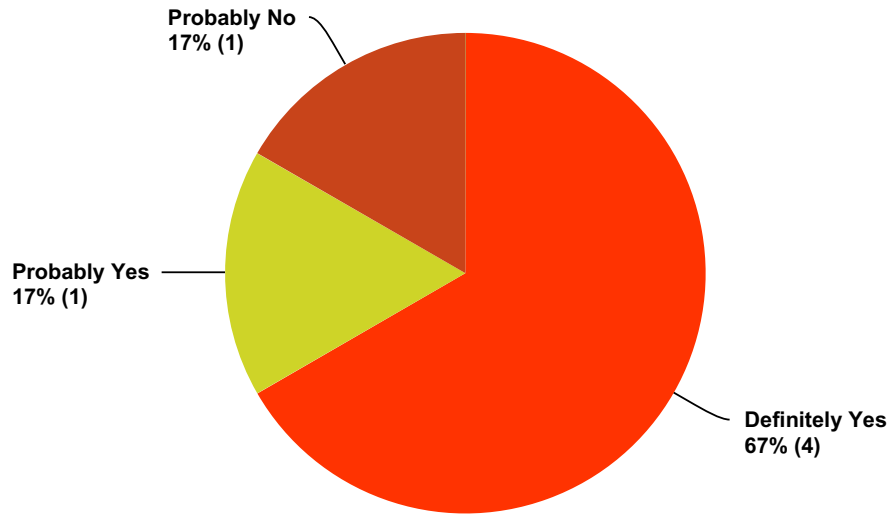
**Q15 Do you have any additional comments regarding the fishery in Twin Lake?**

Answered: 1 Skipped: 5

#	Responses	Date
1	the 26 inch norther size limit is a bad thing	11/8/2014 10:38 AM

**Q16 No wake is currently allowed on Twin Lake between 5pm and 10am. Do you like the rules as they are?**

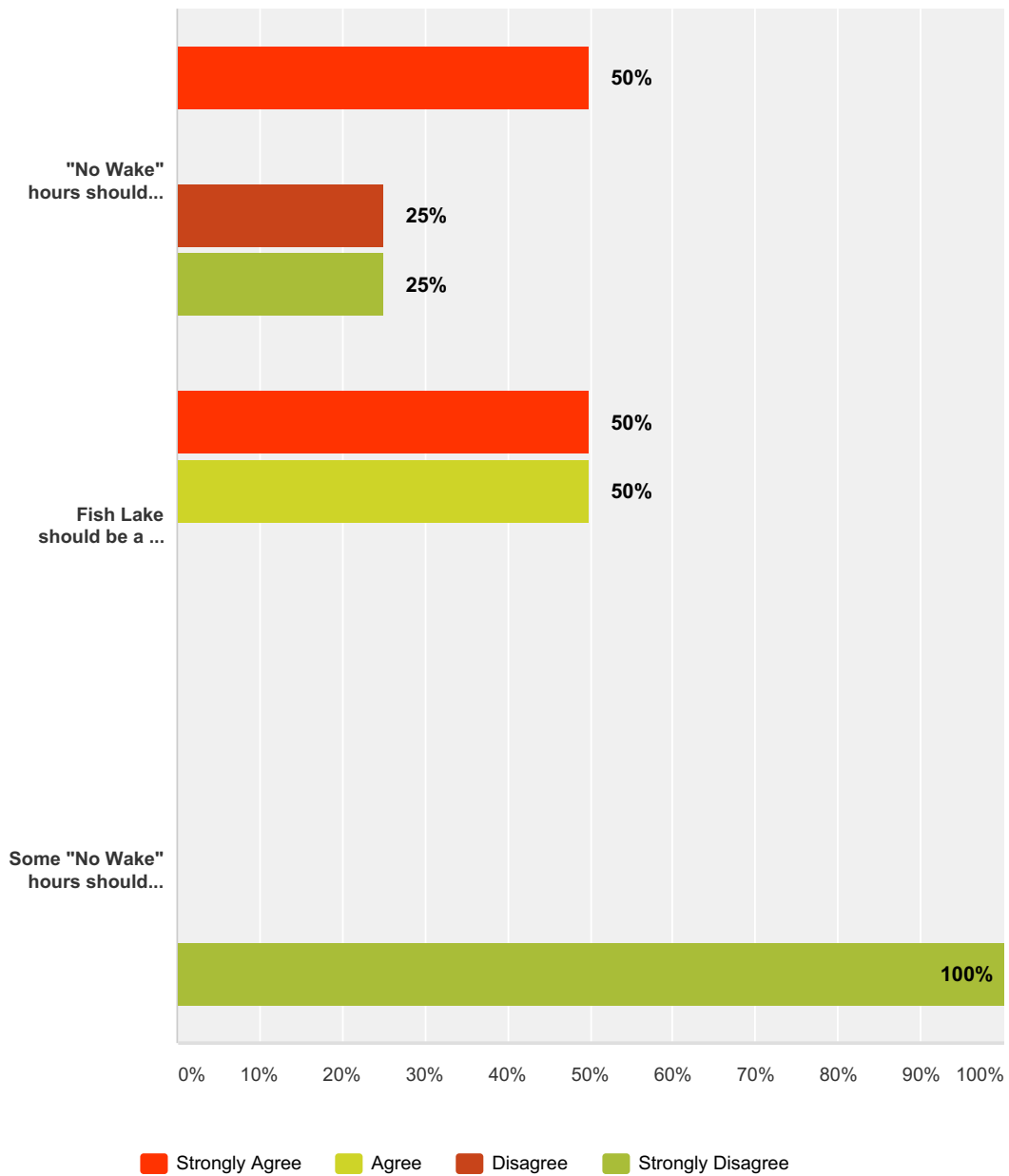
Answered: 6 Skipped: 0



Answer Choices	Responses	
Definitely Yes	67%	4
Probably Yes	17%	1
Probably No	17%	1
Definitely No	0%	0
Unsure	0%	0
<b>Total</b>		<b>6</b>

### Q17 If you think the boating regulations should be adjusted...in what way?

Answered: 5 Skipped: 1



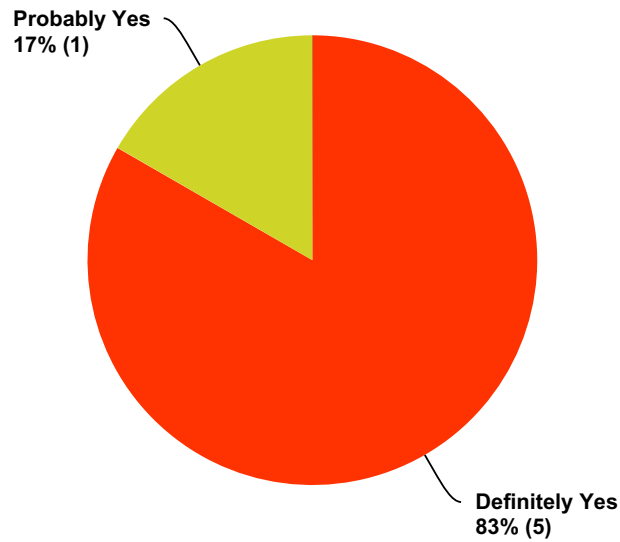
	Strongly Agree	Agree	Disagree	Strongly Disagree	Total Respondents
"No Wake" hours should be kept for evenings and mornings.	50% 2	0% 0	25% 1	25% 1	4
Fish Lake should be a "No Wake" lake.	50% 2	50% 2	0% 0	0% 0	4
Some "No Wake" hours should be established, but not sure when.	0% 0	0% 0	0% 0	100% 2	2

## Twin Lake Survey #4

#	Other (please specify)	Date
1	Twin Lake should be 'no wake' at all hours.	11/17/2014 2:18 PM
2	Twin Lake has been a slow no wake lake twenty four hours a day for a number of years.	11/5/2014 10:13 AM

### Q18 Do you think there should be a boating speed limit on Twin Lake?

Answered: 6 Skipped: 0



Answer Choices	Responses	
Definitely Yes	83%	5
Probably Yes	17%	1
Probably No	0%	0
Definitely No	0%	0
Unsure	0%	0
<b>Total</b>		<b>6</b>

## Twin Lake Survey #4

### Q19 What could be done to improve your recreation experience on Twin Lake?

Answered: 3 Skipped: 3

#	Responses	Date
1	Get rid of the water lilies in front of our propperty.	11/17/2014 2:18 PM
2	I believe we are a 24 hour no wake lake and should stay that way. I think big and little twin should be connected as it used to be before someone illegally blocked them about 15 years ago. It would provide a nursery for younger fish. and better wetlands for wildlife diversity.	11/11/2014 3:45 PM
3	I would like to see something done to get rid of some of the lily pads and the floating bogs that litter our beaches and leave black muck in the water. We seem to have a larger amount of bull rushes also. I have pictures of a number of years ago and my beach was a lot nicer than.	11/5/2014 10:13 AM