2015 Update

Lake Joanis Management Plan
Portage County, Wisconsin

Lake Joanis Management Planning Committee

Created: January 26, 2011

Revised: November 2014

Prepared by UW-Stevens Point
Center for Watershed Science and Education

Plan approved by Lake Joanis Management Planning Committee:	January 2011
Plan approved by Wisconsin Department of Natural Resources:	_____
Plan approved by Portage County:	_____
Plan updated by Lake Joanis management plan update participants:	November 3, 2014

A special thanks to all who helped to create the Lake Joanis Management Plan and provided the necessary data in the Portage County Lakes Study.

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List of Goals

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Goal 3. Prevent any new aquatic invasive species from becoming established in Lake Joanis.

Goal 4. Eurasian water milfoil (EWM) will be effectively managed or eradicated in Lake Joanis.

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Goal 9. The quiet nature and health of Lake Joanis will be protected while also allowing for recreational opportunities.

Goal 10. Lake Joanis lake stewards and lake users will be knowledgeable about lake issues.

Introduction

Lake Joanis is located in Schmeeckle Reserve on the University of Wisconsin-Stevens Point campus. Those who use and enjoy the lake value it for its natural beauty, peace and tranquility, wildlife viewing, and urban recreational opportunities.

The purpose of lake management plans is to provide guidance to prevent or solve problems that may harm lake ecosystems. The development of lake management plans for Lake Joanis and 28 other Portage County lakes is the second phase of the Portage County Lakes Study. During the first phase, data collection was completed for the 29 lakes. Researchers focused on data related to topics affecting lake health, including water quality, shoreline development, amphibian habitat, fisheries, and aquatic plants.

The purpose of this lake management plan is to provide guidance to prevent or solve problems that may harm Lake Joanis and its watershed.

As important as data collection is to any management plan, the success of the plan depends upon citizen involvement. The Lake Joanis management plan was developed by a committee of interested citizens, local organizations, and professionals who applied the data while actively gathering additional citizen input.

The overall goal for Lake Joanis is to improve its water quality by working to modify land management practices throughout the watershed.

Who can use this 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 Lake Joanis can have the greatest influence on the lake by understanding and choosing lake-friendly options to manage their land and the lake.
- **Friends of Schmeeckle Reserve:** This plan provides the Friends group with a well thought-out plan for the lake and lists options that can easily be prioritized. Annual review of the plan will also help the Friends group to realize their accomplishments related to the lake. Resources and funding opportunities for lake management activities are made more available by placement of goals into the lake management plan, and the Friends group can identify partners to help achieve their goals for Lake Joanis.
- **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 City of Stevens Point**: The City can consider the visions, wishes, and goals documented in this lake management plan when considering municipal-level management planning or decisions within the watershed that may affect the lake.
- **Portage 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 Portage County lakes, streams, wetlands and groundwater.

- **Wisconsin Department of Natural Resources**: Professionals working with lakes in Portage 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 Portage County lakes have similar goals in their lake management plans, they can join together when seeking grant support to increase competitiveness for statewide resources.

Goals, Objectives and Actions

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

Although each lake is different, to ensure a lake management plan considers the many aspects associated with a lake, the Wisconsin Department of Natural Resources requires that a comprehensive lake management plan address, at a minimum, a list of topics that affect the character of a lake, whether each topic has been identified as a priority or as simply something to preserve. These topics comprise the chapters in this plan. For the purposes of this plan, the chapters have been grouped as follows:

In-Lake Habitat and a Healthy Lake

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

Landscapes and the Lake

Water Quality and Quantity—water chemistry, clarity, contaminants, lake levels
Shorelands—habitat, erosion, contaminant filtering, water quality, vegetation, access
Watershed Land Use—land use, management practices, conservation programs

People and the Lake

Recreation—access, sharing the lake, informing lake users, rules
Communication and Organization—maintaining connections for partnerships, implementation, community involvement
Updates and Revisions—continuing the process
Governance—protection of the lake, constitution, state, county, Stevens Point, University of Wisconsin-Stevens Point, and Friends of Schmeekle Reserve

In-Lake Habitat and a Healthy Lake

Many lake users value Lake Joanis for its fishing, wildlife, and good water quality. These attributes are all interrelated; the health of one part of the lake system affects the health of the rest of the plant and animal community, the experiences of the people seeking pleasure at the lake, and the quality and quantity of water in the lake. Habitat is the structure for a healthy fishery and wildlife community. It can provide shelter for some animals and food for others.

Lake habitat occurs within the lake, along all of its shorelands, and even extends into its watershed for some species. Many animals that live in and near the lake are only successful if their needs – food, a healthy environment, and shelter – are met. Native vegetation including wetlands along the shoreline and adjacent to the lake provides habitat for safety, reproduction, and food, and can improve water quality and balance water quantity. Some lake visitors such as birds, frogs, and turtles use limbs from trees that are sticking out of the water for perches or to warm themselves in the sun. Aquatic plants infuse oxygen into the water and provide food and shelter for waterfowl, small mammals, and people. The types and abundance of plants and animals that comprise the lake community also vary based on the water quality, and the health and characteristics of the shoreland and watershed. Healthy habitat in Lake Joanis includes the aquatic plants, branches, and tree limbs above and below the water.

The Fish Community

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

Photo courtesy of Limnology Center, UW Madison.

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.

Goal 1. Determine the composition and use of fishery on Lake Joanis.

Objective 1.1. Work with University partners to determine the types of fish species that can be found within the lake, as well as the abundance of those species and the fishing pressure on Lake Joanis.

Action	Lead person/group	Start/end dates	Resources
Conduct a fish survey on Lake Joanis.	Schmeeckle Reserve	2015	UWSP Fisheries Society WDNR Fisheries Biologist – Tom Meronek
Explore options to shorten regulation-related delays to help increase number of predatory fish.		2015	WDNR Fisheries Biologist – Tom Meronek
Explore the option of creating fish radials once fish survey has been completed.		Once fish survey is completed.	
Examine the number of carp present in Lake Joanis. Consider a management/removal program.	UWSP Fisheries Society		
Support the UWSP Fisheries society proposal for a long term study of the fishery and fishing pressure in Lake).	UWSP Fisheries Society		
Explore the impact of sunfish on the EWM weevil populations and develop a plan for management.	UWSP Fisheries Society		
Using data collected in the fisheries study, create a fisheries management plan for Lake Joanis.	Schmeeckle Reserve		UWSP Fisheries Society

The Aquatic Plant Community

Aquatic plants provide the forested landscape within Lake Joanis. 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. Aquatic plants help to baffle waves thus reducing shoreline erosion and some species of plants (water lilies) help to keep the water cool in the summer. 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.

Guiding Vision for the Aquatic Plant Community

The Lake Joanis planning committee envisions maintaining the aquatic plant communities of Lake Joanis for the visual appearance, habitat quality, and benefits to water quality.

Goal 2. Lake Joanis will have a healthy and diverse native aquatic plant community similar to as it was in 2002/2003.

Objective 2.1. Monitor and maintain aquatic vegetation communities in Lake Joanis.

Actions	Lead person/group	Start/end dates	Resources
Develop a long term monitoring plan for aquatic plant communities in Lake Joanis.	Schmeeckle Reserve		Golden Sands RC&D UW-Extension Lakes
Identify and protect the area in which variegated horsetail (a special concern species) is found.	Schmeeckle Reserve	2015	UWSP Robert R. Freckmann Herbarium

Aquatic Invasive Species (AIS)

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

2014 Updates: The aquatic invasive species that are currently known to be in or around Lake Joanis include: Eurasian watermilfoil (EWM) (2004), freshwater jellyfish (2011), goldfish, and phragmites. Lake Joanis currently hosts several aquatic invasive species, including Eurasian watermilfoil (EWM, *Myriophyllum spicatum*). Milfoil weevils (*Euhrychiopsis lecontei*) are a biological control for EWM that have been studied in Lake Joanis for many years by Dr. Ron Crunkilton and his graduate students. The extent of this research and ability to conduct it over a long period provides a unique opportunity. Details about this research can be found in the thesis section of the UWSP Learning Resource Center. Golden Sands RC&D is working with the WDNR to remove the Phragmites that is nearby in Schmeeckle Reserve. The Portage County Lakes study webpage has a full list of aquatic plant species that were identified in Lake Joanis in the 2002/2003 lake study.

Goal 3. Prevent any new aquatic invasive species from becoming established in Lake Joanis.

Objective 3.1. Prevent new aquatic invasive species from entering Lake Joanis. If invasive species do get into the lake, the objective is to quickly identify their presence, notify the correct professionals and remove them using professionally guided procedures and techniques.

Actions	Lead person/group	Start/end dates	Resources
Request that an aquatic plant survey be conducted.			Portage Co. AIS Coordinator - Golden Sands RC&D WDNR Consultants
Monitor Lake Joanis for invasive/exotic plants other than EWM and remove as soon as possible.	Schmeeckle Reserve	Ongoing	Portage Co. AIS Coordinator - Golden Sands RC&D
Utilize the Aquatic Invasive Species Rapid Response Plan if new invasive species are found.	Schmeeckle Reserve		UWSP

Eurasian Watermilfoil (EWM)

In some lakes, Eurasian watermilfoil (EWM) can exist as a part of the plant community, while in others EWM can create dense beds that can damage boat motors, make areas non-navigable, and inhibit activities like swimming and fishing. This plant can produce viable seed; 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. According to the WDNR website, EWM can potentially hybridize with northern milfoil. Hybrid forms (HWM) tend to be more resistant to chemical treatment. Monitoring for EWM/HWM is essential to keep populations at bay. Golden Sands RC&D can assist with manual removal trainings, and identification techniques.

Eurasian watermilfoil (EWM)

Goal 4. Eurasian water milfoil (EWM) will be effectively managed or eradicated in Lake Joanis.

Objective 4.1. Manage Eurasian water milfoil in Lake Joanis.

Actions	Lead person/group	Start/end dates	Resources
Explore options for EWM removal using divers equipped with suction technology (grant may be available). This would require a boat that can be loaded with the necessary equipment.	Schmeeckle Reserve	2015	Portage Co. AIS Coordinator - Golden Sands RC&D
Support the WDNR study for weevil control for EWM.	Schmeeckle Reserve		Portage Co. AIS Coordinator - Golden Sands RC&D
Continue to use EWM committee.	Schmeeckle Reserve		
Consider changing the makeup of the EWM management committee. Perhaps put out a call for new/additional members.	Schmeeckle Reserve		
Determine the impact of fish predation on weevils.			UWSP Fisheries Society Dan Miller – Graduate Research Assistant
Monitor and protect shoreland plants and habitat for weevils.	Schmeeckle Reserve	Ongoing	UWSP
Protect critical weevil habitat from foot-traffic.	Schmeeckle Reserve		
Install signs to educate about EWM, use of weevils for control, and why areas need to be protected.	Schmeeckle Reserve		
Research the impact of the chemicals used to eradicate buckthorn on weevils.	Schmeeckle Reserve		
Explore the possibility of drawing down the water level as part of the strategy for controlling EWM.	Schmeeckle Reserve		WDNR Lakes Specialist Golden Sands RC&D

Critical Habitat

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

More details about critical habitat areas are available online at: http://dnr.wi.gov/lakes/criticalhabitat/ .

Goal 5. The critical habitat areas around Lake Joanis will be protected and undisturbed.

Objective 5.1. Work to protect sensitive areas around Lake Joanis.

Actions	Lead person/group	Start/end dates	Resources
Protect the sensitive amphibian areas around Lake Joanis.	Schmeeckle Reserve	Ongoing	UWSP
Update the sensitive areas map for Lake Joanis.	Schmeeckle Reserve		UWSP
Work with the UWSP Herpetological Society to conduct regular monitoring of amphibians (indicator species) and amphibian habitat for the health of the lake.	UWSP Herpetological Society		

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 Lake Joanis 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 Lake Joanis 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 and Land Use

A variety of water chemistry measurements were used to characterize the water quality in Lake Joanis. Water quality was assessed during the 2002-2003 lake study and involved a number of measures including temperature, dissolved oxygen, water chemistry, and nutrients (phosphorus and nitrogen). Nutrients are important measures of water quality in lakes because they are used for growth by algae and aquatic plants. Each of these interrelated measures plays a part in the lake's overall water quality. In addition, water quality data collected in past years was also reviewed to determine trends in Lake Joanis' water quality.

It is important to understand where Lake Joanis' 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 Lake Joanis; its land area may be slightly different than the surface watershed.

The capacity of the landscape to shed or hold water and contribute or filter particles determines the amount of erosion that may occur, the amount of groundwater feeding a lake, and ultimately, the lake's water quality and quantity. Essentially, landscapes with greater capacities to hold water during rain events and snowmelt slow the delivery of the water to the lake. Less runoff is desirable because it allows more water to recharge the groundwater, which feeds the lake year-round - even during dry periods or when the lake is covered with ice. A variety of land management practices can be put in place to help reduce impacts to our lakes. Some practices are designed to reduce runoff. These include protecting/restoring wetlands, installing rain gardens, swales, rain barrels, and routing drainage from pavement and roofs away from the lake. Some practices are used to help reduce nutrients from moving across the landscape towards the lake. Examples include manure management practices, eliminating/reducing the use of fertilizers, increasing the distance between the lake and a septic drainfield, protecting/restoring wetlands and native vegetation in the shoreland, and using erosion control practices.

Lake Joanis is host to a wide variety of plants, insects, fish, amphibians, and a variety of other animals that all depend on good water quality in the lake. Data from 2002/2003 shows that water quality Lake Joanis is good when compared to similar lake types and WDNR phosphorus criteria values. Currently, Lake Joanis has concentrations of phosphorus that fall below WDNR criteria levels. However, nitrogen levels in Lake Joanis are somewhat elevated and are high enough to fuel algae growth. The majority of the water entering Lake Joanis originates in its watershed; therefore, water quality in the lake is directly related to the land uses in the watershed and especially near shore.

Goal 6. Maintain phosphorus concentrations at 2002/2003 levels.

The total phosphorus goal for Lake Joanis is 20 ug/L.

Objective 6.1. Monitor the water quality in Lake Joanis to evaluate if we are meeting our goals.

Action	Lead person/group	Start/end dates	Resources
Routinely monitor for phosphorus and test water clarity. Probes for measuring DO, pH, conductivity and temperature are available through the UWSP CWSE.	Schmeeckle Reserve	Ongoing	UWSP UWSP Center for Watershed Science & Education AWRA WDNR CLMN
If phosphorus levels increase, consideration should be given to mechanical removal of aquatic plants. This should be done while the weevil study is in progress.	Schmeeckle Reserve		WDNR Lakes Specialist UWSP

Goal 7. Lake Joanis will be monitored for any additional chemicals or pollutants that may be affecting water quality.

Objective 7.1. Monitor the water quality in Lake Joanis to evaluate if we are meeting our goals.

Action	Lead person/group	Start/end dates	Resources
Monitor for the presence of atrazine in Lake Joanis.	Schmeeckle Reserve		UWSP
Test water for presence of “golf course” herbicides and insecticides.	Schmeeckle Reserve	2015	UWSP

Shorelands

Shorelines are some of the most important habitat near lakes for aquatic and terrestrial wildlife, such as turtles, frogs, birds, and many other creatures. Shoreline vegetation helps to slow runoff moving to the lake and filter runoff before it enters the lake. Shoreland vegetation is critical to a healthy lake ecosystem. 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. Restoring and protecting shorelines can also help to provide scenery, solitude, and natural space for lake users.

Sensitive areas are important places in and near Lake Joanis that are essential to keeping a healthy sustainable ecosystem. These sensitive areas within Lake Joanis offer critical or unique fish and wildlife habitat, offering water quality or erosion control benefits, and are areas that would be greatly impacted by disturbances.

2014 Update: Little has changed around Lake Joanis since the 2002-2003 survey (Appendix). The 2012 shoreland survey indicated there were 470 feet of healthy shoreland vegetation (greater than 35 feet deep) and 3900 feet of shoreland in need of restoration. Other disturbances documented include six artificial beaches, three sites with rip-rap, five sites with undercut banks and two structures within 75 feet of the shoreline (Appendix).

Goal 8. Protect existing natural shorelands around Lake Joanis.

Objective 8.1. Maintain or exceed 2002/2003 shoreland vegetation levels.

Actions	Lead person/group	Start/end dates	Resources
Monitor shoreland vegetation around Lake Joanis to track any changes that might be taking place.	Schmeeckle Reserve	Ongoing	UWSP
Monitor disturbed shorelines for change and develop maintenance plans where needed.	Schmeeckle Reserve	Ongoing	UWSP
Utilize erosion control measures where necessary along the lake shoreline.	Schmeeckle Reserve	Ongoing	UWSP UW-Extension Lakes
Continue to monitor and manage buckthorn; support current buckthorn eradication program.	Schmeeckle Reserve	Ongoing	UWSP

People and the Lake

Recreation

Lake Joanis users enjoy many different recreational opportunities on the lake, including fishing, hiking the trails surrounding the lake, and canoeing/kayaking. Conflicts with the different activities may potentially occur as recreational needs and uses on the lake will likely continue to increase as populations and development in the area increases.

Goal 9. The quiet nature and health of Lake Joanis will be protected while also allowing for recreational opportunities.

Objective 9.1. Provide recreational opportunities that allow users to enjoy the lake while being in accordance to Schmeeckle Reserve rules.

Actions	Lead person/group	Start/end dates	Resources
Develop a strategy to keep user on trails (i.e. brush barricades, signage, education efforts, etc.).	Schmeeckle Reserve	Ongoing	
Install trail counters and analyze recreational use of the preserve.	Schmeeckle Reserve	Ongoing	

Communication and Organization

Many of the goals outlined in this plan are focused on disseminating information to lake users and interested citizens, ultimately to help them make informed decisions that will result in a healthy ecosystem in Lake Joanis that is enjoyed by many people. There is no single best way to distribute information to those that enjoy and/or affect Lake Joanis so the planning committee has identified a variety of options to communicate with one another and in the community. Working together on common values will help to achieve the goals that have been outlined in this plan.

2014 Updates: The "Friends of Schmeekle Reserve" group was formed.

Goal 10. Lake Joanis lake stewards and lake users will be knowledgeable about lake issues.

Objective 10.1. Provide lake stewards and Lake Joanis users with lake-related information.

Action	Lead person/group	Start/end dates	Resources
Conduct an outreach effort gather past research data on Schmeeckle Reserve and Lake Joanis.	Schmeeckle Reserve		UWSP
Hold an annual Lake Joanis research meeting to share information and plan of additional studies. Use this meeting to update the lake management plan.	Schmeeckle Reserve	Annually	UWSP
Add additional information to existing signs and consider new signage around the lake and in the visitor center to explain/educate about Lake Joanis issues.	Schmeeckle Reserve		
Consider presenting research findings at the public education sessions offered by Schmeeckle Reserve.	Schmeeckle Reserve		UWSP
Consider presenting information at or soliciting help from the UWSP L.I.F.E. program, Friends of Schmeeckle Reserve, etc.	Schmeeckle Reserve		UWSP L.I.F.E. Program
Annually review and update the Lake Joanis Management Plan. Include and inform Friends group and other entities.	Schmeeckle Reserve	Annually	
Create a Friends of Schmeeckle Reserve group.	Schmeeckle Reserve	Completed	

Background Information (from 2002-2003 study)

A lake is the reflection of the health and activities that occur in the lake, near its shore, and in the surrounding watershed. A healthy lake ecosystem is comprised of components that support aquatic plants, fish, wildlife and more – not only in the lake, but also in the surrounding landscape.

Data collected during the first phase of the Portage County Lakes Study are summarized in this section. For more detail, see the complete study reports. These reports, as well as citizen survey results collected during plan development, can be found at: http://www.co.portage.wi.us/planningzoning/PCL/Main%20Page/Main%20Page.shtm

Updated information is located in each section of this plan and when available, is appended to this plan. More information about Lake Joanis can be found at http://dnr.wi.gov/lakes/lakepages/Results.aspx?location=50.

Description

Lake Joanis is a manmade 32 acre seepage lake in the City of Stevens Point, Portage County, Wisconsin. It is located on the University of Wisconsin-Stevens Point (UWSP) campus in Schmeeckle Reserve. Lake Joanis was constructed in 1976 as a joint project between UWSP and Sentry Insurance. The purpose of the project was to provide soil needed for the construction of the Sentry Insurance headquarters complex, while creating an outdoor lab and recreation area for the UWSP community. The lake has a maximum depth of 25 feet (Wisconsin Department of Natural Resources, 2005) and its bottom consists of sand and fine gravel.

Watersheds

Lake Joanis's surface watershed, the land area where surface water from higher elevations drains towards the lake, is approximately 58 acres and is defined on its western side by commercial development and on its northern side by the Sentry Insurance golf course (Figure 1).

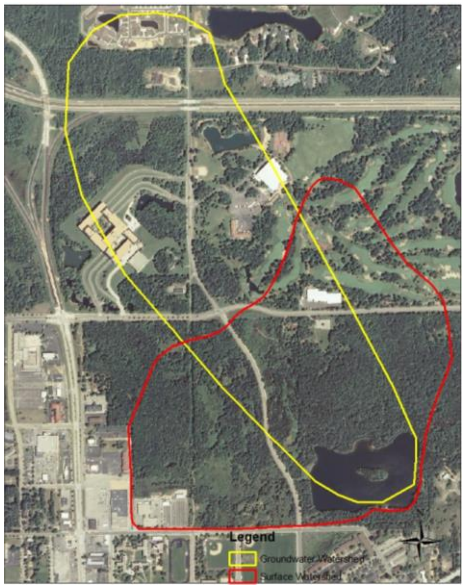


Figure 1. Lake Joanis groundwater and surface watersheds.

The groundwater watershed is similar to the surface watershed, except it is the land area where groundwater, instead of surface water, drains towards the lake. Within the groundwater watershed, precipitation soaks into the ground and recharges the groundwater. The groundwater slowly moves towards the lake and enters it via springs and seeps. Surface watersheds and groundwater watersheds often do not match each other, which is the case for Lake Joanis. Lake Joanis's groundwater watershed is approximately 284 acres (Figure 1).

UWSP owns 92 acres of the lake's groundwater watershed as part of Schmeeckle Reserve. Sentry Insurance owns 111 acres as part of their office complex and golf course. The remainder of the land use is split between residential, commercial, transportation, and vacant or undeveloped land that is not part of the Schmeeckle Reserve.

Sensitive Areas

Sensitive areas associated with Lake Joanis are defined by lands adjacent to the water that are particularly valuable to the lake's ecosystem or would be significantly impacted by disturbances or development. The habitats of amphibians and reptiles are of importance because they depend on both aquatic and terrestrial habitats and the shoreline interface between the two. **These areas of habitat are not only important to reptiles and amphibians but also to other aquatic and terrestrial species.**

The primary amphibian habitat on Lake Joanis is located on the western side of the lake, with additional sensitive areas around the lake. Key features of the primary habitat include areas of marsh with large amounts of submergent, emergent, and floating-leaf vegetation, as well as downed trees and several temporary wetlands. The amphibian populations around Lake Joanis have benefited from minimal shoreline alteration and several temporary wetlands adjacent to the lake; however, intensive recreational activities around the lake have had an unknown impact on amphibian populations (Appendix).

Amphibian surveys were conducted in 2002-2003. Since then, there have been numerous restoration projects at Schmeeckle Reserve, including the Moses Creek restoration, which may have had significant impacts on amphibians. Additional amphibian surveys should be conducted to determine changes to habitat areas and populations.

Shoreline

Lake Joanis's shoreline is primarily vegetated (44%), characterized by tall grasses and/or shrubs. The remaining 56% has some degree of disturbance. Of the disturbed shoreline, approximately 45.2% is considered to have a low level of disturbance, 5.8% is considered to have a moderate level of disturbance, and 4.6% is highly disturbed. Areas of low disturbance may contain unaltered shore except for pier access. Areas of moderate disturbance may contain a mowed area, but have an intact overstory. Areas of high disturbance are defined as beaches, rip-rap, lawn mowed to the water line, and boat accesses.

Protecting the existing shoreland and restoring disturbed shoreland would improve near shore habitat, the lake's water quality, algae and aquatic plant growth, and the fishery and other inhabitants. Surfaces such as walking paths, roads, boardwalks and compacted soils may increase the amount of runoff moving across the landscape towards Lake Joanis. Runoff that enters the lake can carry a variety of pollutants. Negative impacts to lakes due to increased runoff include the introduction of more nutrients (such as phosphorus), which can cause algae blooms and excessive plant growth, and an increased amount of sediment, which can create cloudy or turbid water and bury fish spawning areas and other critical habitat. Sediment can also transport additional contaminants to the lake, such as bacteria, debris, metals and pesticides.

Aquatic Plants

Aquatic plants play many important roles in aquatic ecosystems. They provide habitat for aquatic and semi-aquatic organisms, and food for fish, waterfowl, and other animals. Aquatic plants take up nutrients that would otherwise be used by algae, and moderate water temperatures on hot days.

Fifty-five species of aquatic macrophytes, or aquatic plants, have been identified in or around Lake Joanis. This is above average when compared to other Portage County lakes. Lake Joanis lies in an area excavated to provide landscape fill; the excavated area filled with water shortly afterwards, and a large number of the aquatic plants arrived by natural dispersal agents.

The lake has relatively sparse aquatic vegetation, but Eurasian watermilfoil (EWM) was found floating and washed up on shore in several locations in 2003. UWSP is currently implementing a plan to manage the EWM.

Water Quality and Land Use

As water moves across the landscape, its quality can either improve or degrade depending upon what it comes into contact with on its way to the lake. Land uses and their associated management practices can have significant impacts on water quality. **Although land uses may not easily be changed, land management practices can be modified to improve water quality.**

Land uses within the Lake Joanis surface watershed have remained fairly stable because the lake is within the city limits and it has only existed since 1976. UWSP owns all of the property adjacent to the lake (Schmeeckle Reserve) and manages it as a natural area.

The areas near shore have the most direct impact on habitat and water quality in a lake. For Lake Joanis, this area is currently comprised of herbaceous and shrub covered areas (Appendix).

Assessing a lake's water quality involves a number of measures, including temperature, dissolved oxygen, water chemistry, chlorophyll *a*, and algae. Each of these measures plays a part in the lake's overall water quality.

Chloride concentrations, and to lesser degrees sodium and potassium concentrations, are commonly used as indicators of how strongly a lake is being impacted by human activity. In Lake Joanis, sodium and chloride concentrations were high, while potassium concentrations were low.

Atrazine, an agricultural herbicide, was detected in Lake Joanis. Some toxicity studies have indicated reproductive system abnormalities can occur in frogs at low levels. The presence of atrazine indicated other agri-chemicals may also be entering Lake Joanis.

The temperature in Lake Joanis was generally mixed, or the same at the top and bottom of the lake, throughout much of the year. There was some weak stratification during July and August. Dissolved oxygen was plentiful at most depths throughout the year.

Water clarity is a measure of how deep light can penetrate the water. It is an aesthetic measure and is related to the depth that rooted aquatic plants can grow. Water clarity can be affected by sediment, algae, and color in water. Clarity measurements in Lake Joanis ranged from 10.5 feet to 21 feet, with an average of 16 feet. May and June had the best water clarity and September had the worst water clarity. Fluctuations in water clarity throughout the summer are normal as algae and aquatic plant populations and sedimentation increase and decrease. Changes in

water quality are best monitored by taking measurements over time; these measurements can be taken by trained citizens.

Chlorophyll *a* is a measure of algae. Chlorophyll *a* concentrations in Lake Joanis were relatively low and ranged from 0.005 mg/L to 4.6 mg/L, with an average of 2.3 mg/L. Chlorophyll *a* measurements over 5 mg/L are considered to be high.

The 41 algal genera identified during the sample periods were relatively common, but a significant fraction of facultative heterotrophs from the dinoflagellates, euglenoids, and cryptophytes were present. This noticeable presence of motile animal-like organisms is not common or expected of oligotrophic lakes like Lake Joanis. These organisms are an indication of organic matter being present in the lake.

Nutrients

Nutrients (nitrogen and phosphorus) are important measures of water quality in lakes because they are used for growth by algae and aquatic plants.

Nitrogen concentrations in Lake Joanis were low, including nitrate, which is easily used for growth by aquatic plants and algae (Figure 2). Concentrations were below the 0.3 mg/L needed to fuel algae growth in spring and winter. The nitrate levels in Lake Joanis should be monitored to ensure they are not increasing.

Phosphorus is an element that is essential to most living organisms including plants. Sources of phosphorus can include naturally occurring phosphorus in soils, wetlands and groundwater. Sources from human influence include soil erosion, agricultural and residential runoff, septic systems, and animal waste.

In Lake Joanis, the aquatic plant and algae growth is highly responsive to phosphorus due to its limited supply relative to other elements necessary for growth. Small Increases in phosphorus result in increased growth rates and abundance of aquatic plants and algae.

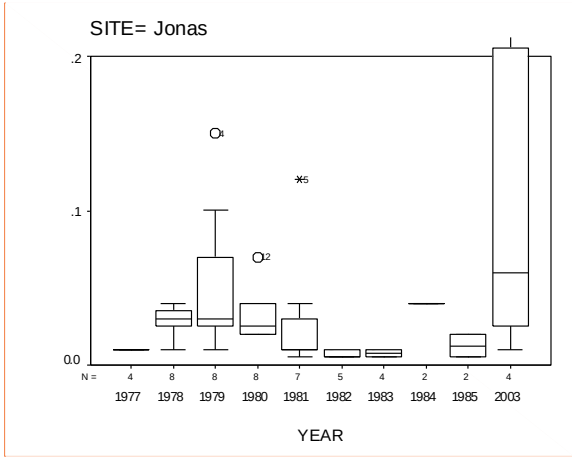


Figure 2. Median Nitrate-N concentrations (mg/L) in Lake Joanis, 1977-2003.

Phosphorus concentrations in Lake Joanis were variable throughout the year. Median total phosphorus (TP) concentrations in spring/fall for 2002-2003 were 15.2 ug/L (Figure 3).

The Wisconsin Department of Natural Resources has phosphorus criteria values for lakes in Wisconsin. The phosphorus criteria value for deep groundwater seepage lakes is 20 ug/L. Average summer concentrations at or above this value would result in noticeably degraded water quality. The average summer total phosphorus concentrations in Lake Joanis was 16.6 ug/L in 2002-2003. Total

Commented [HS1]: A couple things… 1) misspelling of Joanis, 2) the graph may need adjusting because it has moving parts. (see red line)

May need to double check the accuracy of this graph and crop the SITE=Jonas off the top.

(Same applies to TP graph)

phosphorus should be monitored in Lake Joanis, and any observed increases should be addressed prior to noticeable changes in algal and aquatic plant communities.

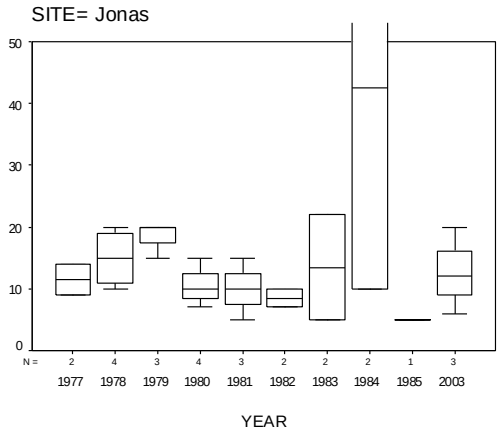


Figure 3. Median total phosphorus concentrations (ug/L) in Lake Joanis in samples collected in summer, 1977-2003.

Managing phosphorus in the Lake Joanis watershed is key to protecting the lake itself. Positive changes in land use and management practices can result in improved water quality. Phosphorus inputs can be controlled through the use of best management practices (BMPs) that minimize the movement of runoff to the lake. BMPs that should be used near shore and throughout the watershed include developing water quality-based nutrient management plans, only applying fertilizer or manure based on soil tests for specific crops or turf, providing cover and/or appropriate mitigation when open soils are necessary during construction or cropping, using cover crops, properly storing manure, and spreading manure only when the ground is not frozen. Some of the near shore land use practices that can decrease phosphorus loading to Lake Joanis include leaving native vegetation (trees, bushes, and grasses), eliminating the use of fertilizers, minimizing runoff/increasing infiltration, and minimizing and securing exposed soil. The Portage County Land Conservation Department is one of many organizations that can provide assistance to landowners who want to reduce impacts to Lake Joanis from their lands.

Estimates of phosphorus from the landscape can help to understand the phosphorus sources to Lake Joanis. 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. Based on modeling results, institutional land practices had the greatest percentages of phosphorus contributions from the watershed to Lake Joanis (Figure 4).

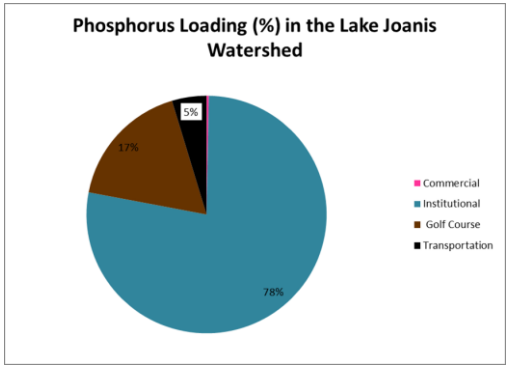


Figure 4. WILMS modeling results for Lake Joanis (McGinley, 2008).

Future degradation of water quality in Lake Joanis can be minimized with thoughtful land use planning throughout the watershed. This includes locating roads away from the lake, diverting runoff from infrastructure so it can infiltrate the soil rather than run towards the lake, and controlling runoff and nutrient inputs from new and existing developments.

Recreation

According to the Schmeeckle Reserve Visitor Center, popular activities at Lake Joanis include hiking, fishing, jogging, wildlife viewing, and non-motorized boating. More information can be found at:
http://www.uwsp.edu/cnr-ap/schmeeckle/Pages/visit/recreation.aspx

Governance

Lake Joanis is located in the City of Stevens Point in Portage County, Wisconsin. It is located on the University of Wisconsin-Stevens Point (UWSP) campus.

There are a variety of management plans, regulations and ordinances that provide guidance for the development, use and protection of natural resources in and around Lake Joanis. These pieces of governance serve as tools to help achieve the goals, objectives and actions outlined in the Lake Joanis Lake Management Plans.

Land management plans that influence the land uses around Lake Joanis and in its watersheds include:

- Wolf River DNR Basin Plan that covers a regional area: http://dnr.wi.gov/water/basin/wolf/wolf_final_801.pdf
- Portage County Comprehensive Plan: http://www.co.portage.wi.us/Comprehensive%20Plan/Index.html
- Portage County Land and Water Conservation Plan: http://www.co.portage.wi.us/planningzoning/LWRM%20PLAN%20LCC%20Approved%20Draft%205-5-09.pdf
- City of Stevens Point Comprehensive Plan: http://www.co.portage.wi.us/Comprehensive%20Plan/Planning%20Program/Stevens%20Point/Stevens%20Point.html

Portage County has eight ordinances that may impact the water quality of Lake Joanis. The ordinances include the Zoning Ordinance, Shoreland Zoning Ordinance, Wellhead Protection Zone Ordinance, Subdivision Ordinance, Open Space Design Ordinance, Floodplain Zoning Ordinance, Private Sewage Septic System Ordinance, and Animal Manure Storage and Nutrient Management Plan Ordinance. These ordinances can all be found at:
http://www.co.portage.wi.us/ordinances/Chapter%207.pdf

See the appendices for a map of the Atrazine Prohibition Area.
In addition to these county ordinances, there are several state regulations that have a direct impact on water quality in Lake Joanis. These regulations include:

- Agricultural Runoff Regulation: http://dnr.wi.gov/topic/nonpoint/AgPerformanceStandards.html
- Storm Water Runoff Regulation – including NR 151, 152, 153, 155, 216, 243, and ATCP 50: http://dnr.wi.gov/topic/stormwater/learn_more/regulations.html
- Shoreland-Wetland Zoning Regulations: http://www.legis.state.wi.us/rsb/code/nr/nr115.pdf
- Critical Habitat Areas Regulations: http://dnr.wi.gov/lakes/criticalhabitat/
- Pesticide prohibitions and use restrictions including ATCP 30 which regulates atrazine applications: http://datcp.wi.gov/Plants/Pesticides/?AspxAutoDetectCookieSupport=1

In addition to pieces of governance that will assist with the goals, objectives and actions outlined in this plan, there are a number of community groups and organizations that can provide support and assistance. These include citizen and professional organizations, UW-Extension, and others. Please see the appendices for a list of resources and contact information.

References

Fassbender, R.L., and L.M. Nelson. 1971. Surface Water Resources of Portage County. Wisconsin Department of Natural Resources, Madison, Wisconsin.

Turyk, N; R. Bell; R. Cook; T. Ginnett; R. Crunkilton; L. Markham; P. McGinley; B. Shaw; and E. Wild; 2006. Final report to Portage County and Wisconsin DNR. http://www.co.portage.wi.us/plzo/lakes.html

Glossary

Algae:

One-celled (phytoplankton) or multi-cellular plants either suspended in water (Plankton) or attached to rocks and other substrates (periphyton). Their abundance, as measured by the amount of chlorophyll *a* (green pigment) in an open water sample, is commonly used to classify the trophic status of a lake. Numerous species occur. Algae are an essential part of the lake ecosystem and provide the food base for most lake organisms, including fish. Phytoplankton populations vary widely from day to day, as life cycles are short.

Atrazine:

A widely used herbicide.

Blue-Green Algae:

Algae often associated with problem blooms in lakes. Some produce chemicals toxic to other organisms, including humans. They often form floating scum as they die. Many can fix nitrogen (N_2) from the air to provide their own nutrient.

Calcium (Ca++):

The most abundant cation found in Wisconsin lakes. Its abundance is related to the presence of calcium-bearing minerals in the lake watershed. Reported as milligrams per liter (mg/l) as calcium carbonate ($CaCO_3$), or milligrams per liter as calcium ion (Ca++).

Chloride (Cl-):

Chlorine in the chloride ion (Cl-) form has very different properties from chlorine gas (Cl2), which is used for disinfecting. The chloride ion (Cl-) in lake water is commonly considered an indicator of human activity. Agricultural chemicals, human and animal wastes, and road salt are the major sources of chloride in lake water.

Chlorophyll *a*:

Green pigment present in all plant life and necessary for photosynthesis. The amount present in lake water depends on the amount of algae and is therefore used as a common indicator of algae and water quality.

Clarity:

See "Secchi disc".

Color:

Measured in color units that relate to a standard. A yellow-brown natural color is associated with lakes or rivers receiving wetland drainage. The average color value for Wisconsin lakes is 39 units, with the color of state lakes ranging from zero to 320 units. Color also affects light penetration and therefore the depth at which plants can grow.

Concentration units:

Express the amount of a chemical dissolved in water. The most common ways chemical data is expressed is in milligrams per liter (mg/l) and micrograms per liter (ug/L). One milligram per liter is equal to one part per million (ppm). To convert micrograms per liter (ug/l) to milligrams per liter (mg/l), divide by 1000 (e.g. 30 ug/l = 0.03 mg/l). To convert milligrams per liter (mg/l) to micrograms per liter (ug/l), multiply by 1000 (e.g. 0.5 mg/l = 500 ug/l). Microequivalents per liter (ueq/l) is also sometimes used, especially for alkalinity; it is calculated by dividing the weight of the compound by 1000 and then dividing that number into the milligrams per liter.

Cyanobacteria:

See “Blue-Green Algae”.

Dissolved Oxygen:

The amount of oxygen dissolved or carried in the water.

Drainage Basin:

The total land area that drains towards a lake.

Drainage lakes:

Lakes fed primarily by streams and with outlets into streams or rivers. They are more subject to surface runoff problems but generally have shorter residence times than seepage lakes. Watershed protection is usually needed to manage lake water quality.

Emergent:

A plant rooted in shallow water that has most of its vegetative growth above water.

Eutrophication:

The process by which lakes and streams are enriched by nutrients, and the resulting increase in plants and algae. The extent to which this process has occurred is reflected in a lake's trophic classification: oligotrophic (nutrient poor), mesotrophic (moderately productive), and eutrophic (very productive and fertile).

Groundwater Drainage Lake:

Often referred to as a spring-fed lake, has large amounts of groundwater as its source, and a surface outlet. Areas of high groundwater in-flow may be visible as springs or sand boils. Groundwater drainage lakes often have intermediate retention times with water quality dependent on groundwater quality.

Hardness:

The quantity of multivalent cations (cations with more than one +), primarily calcium (Ca++) and magnesium (Mg++), in the water expressed as milligrams per liter of CaCO3. Amount of hardness relates to the presence of soluble minerals, especially limestone, in the lake watershed.

Intermittent:

Coming and going at intervals, not continuous.

Macrophytes:

See "Rooted aquatic plants."

Marl:

White to gray accumulation on lake bottoms caused by precipitation of calcium carbonate (CaCO3) in hard-water lakes. Marl may contain many snail and clam shells, which are also calcium carbonate. While it gradually fills in lakes, marl also precipitates phosphorus, resulting in low algae populations and good water clarity. In the past, marl was recovered and used to lime agricultural fields.

Mesotrophic:

A lake with an intermediate level of productivity. Commonly clear water lakes and ponds with beds of submerged aquatic plants and medium levels of nutrients. See also “eutrophication”.

Nitrate (NO3-):

An inorganic form of nitrogen important for plant growth. Nitrate often contaminates groundwater when water originates from manure, fertilized fields, lawns, or septic systems. High levels of nitrate-nitrogen (over 10 mg/L) are dangerous to infants and expectant mothers. A concentration of nitrate-nitrogen (NO3-N) plus ammonium-nitrogen (NH4-N) of 0.3 mg/L in spring will support summer algae blooms if enough phosphorus is present.

Oligotrophic:

Lakes with low productivity, the result of low nutrients. Often these lakes have very clear waters with lots of oxygen and little vegetative growth. See also “eutrophication”.

Overturn:

Fall cooling and spring warming of surface water increases density, and gradually makes temperature and density uniform from top to bottom. This allows wind and wave action to mix the entire lake. Mixing allows bottom waters to contact the atmosphere, raising the water's oxygen content. However, warming may occur too rapidly in the spring for mixing to be effective, especially in small, sheltered kettle lakes.

Phosphorus:

Key nutrient influencing plant growth in more than 80% of Wisconsin lakes. Soluble reactive phosphorus is the amount of phosphorus in solution that is available to plants. Total phosphorus includes the amount of phosphorus in solution (reactive) and in particulate form.

Rooted Aquatic Plants: (macrophytes)

Refers to multi-celled plants growing in or near water. Macrophytes are beneficial to lakes because they produce oxygen and provide substrate for fish habitat and aquatic insects. Overabundance of such plants, especially problem species, is related to shallow water depth and high nutrient levels.

Secchi Disc (Secchi Disk):

An 8-inch diameter plate with alternating quadrants painted black and white that is used to measure water clarity (light penetration). The disc is lowered into water until it disappears from view. It is then raised until just visible. An average of the two depths, taken from the shaded side of the boat, is recorded as the Secchi disc reading. For best results, the readings should be taken on sunny, calm days.

Sedimentation:

Materials that are deposited after settling out of the water.

Stratification:

The layering of water due to differences in density. Water's greatest density occurs at 39 Deg.F (4 Deg.C). As water warms during the summer, it remains near the surface while colder water remains near the bottom. Wind mixing determines the thickness of the warm surface water layer (epilimnion), which usually extends to a depth of about 20 ft. The narrow transition zone between the epilimnion and cold bottom water (hypolimnion) is called the metalimnion or thermocline.

Watershed: See “drainage basin”.

APPENDICES

Aquatic Invasive Species Rapid Response Plan – 2011

Survey/Monitor

1. **Learn to survey/monitor the lake** from:

   Water Resources Management Specialist
   Wisconsin Dept. of Natural Resources
   Scott Provost
   473 Griffith Ave, Wisconsin Rapids, WI, 54494
   Phone: 715-421-7881
   E-Mail: Scott.Provost@wisconsin.gov

   Portage County Aquatic Invasive Species (AIS) Coordinator
   Golden Sands RC&D
   Address: 1100 Main St, Suite #150
   Stevens Point, WI 54481
   Phone: 715-343-6215
   E-Mail : info@goldensandsrcd.org

2. **Survey the Lake monthly/seasonally/annually**

What to Do When You Find a Suspected Invasive Species

1. **Collect Specimens or Take Pictures**
   - Collect, press, and dry a complete sample. This method is best because a plant expert can then examine the specimen.

   Or –

   - Collect a fresh sample. Enclose in a plastic bag with a moist paper towel and refrigerate.

   Or --

   - Take detailed photos (digital or film) and send them by mail or e-mail.

   Regardless of 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.

   Note location (Provide one or more of the following)
   - Latitude & Longitude
   - UTM (Universal Transverse Mercator) coordinates
   - County, Township, Range, Section, Part-section
   - Precise written site description, noting nearest city & road names, landmarks, local topography

   If possible, give the exact geographic location using a GPS (global positioning system) unit, topographic map, or the Wisconsin Gazetteer map book. If using a map, include a photocopy with a dot showing the plant's location. You can use TopoZone.com to find the precise location on a digital topographic map. Click the cursor on the exact collection site and note the coordinates (choose UTM or Latitude/Longitude).

2. **To positively I.D. the species, send or bring specimen and additional information:**
   - Collection date & county
   - Your name, address, phone, email
   - Exact location (Latitude/Longitude or UTM preferred, or Township/Range/Section)
   - Plant name (common or scientific)
   - Land ownership (if known)
   - Population description (estimate number of plants, area covered)
   - Habitat type(s) where found (forest, field, prairie, wetland, open water)

   Send or bring specimen to:

   Portage County AIS Coordinator
   Golden Sands RC&D
   Address: 1100 Main St, Suite #150
   Stevens Point, WI 54481
   Phone: 715-343-6215
   E-Mail : info@goldensandsrcd.org

   Wisconsin Dept. Natural Resources
   Invasive Plant Education, Early Detection, and Mapping Specialist
   Brendon Panke
   WI Dept. of Natural Resources
   P.O. Box 7921
   Madison, WI 53707-7921
   Phone: (608) 267-7438
   E-Mail: invasiveplants@mailplus.wisc.edu

   UW-Stevens Point Herbarium
   301 Daniel O. Trainer Natural Resources Building
   Stevens Point, WI 54481
   Phone: 715-346-4248
   E-Mail: ejudziew@uwsp.edu

3. **Once the specimen is dropped off or sent for confirmation, make sure to contact:**

   Portage County AIS Coordinator
   Golden Sands RC&D
   Address: 1100 Main St, Suite #150
   Stevens Point, WI 54481
   Phone: 715-343-6215
   E-Mail : info@goldensandsrcd.org

4. **If an invasive species is confirmed, the Portage County AIS Coordinator will contact the following people along with the contact list of citizens.**

   Wisconsin Department of Natural Resources
   Water Resources Management Specialist
   Scott Provost
   473 Griffith Ave, Wisconsin Rapids, WI, 54494
   Phone: 715-421-7881
   E-Mail: Scott.provost@wisconsin.gov

UWSP Schmeeckle Reserve
Contact: Ron Zimmerman – Executive Director
Address: 2419 North Point Drive Stevens Point, WI 54481
Phone: 715-346-4992
E-Mail: Schmeeckle@uwsp.edu

University of Wisconsin-Stevens Point
Water Resource Scientist
Contact: Nancy Turyk
Address: 216 TNR 800 Reserve St.
Stevens Point, WI 54481
Telephone: 715-346-4155
E-mail: pclakes@uwsp.edu

Newspapers
Who will contact them: Schmeeckle Reserve
Portage County Gazette
Stevens Point Journal
UWSP News Office

Post notice at the access points to the waterbody

Aquatic Plant Management Strategies

General recommendations:

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

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

No Action

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

Hand Pulling

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

Hand Pulling Using Suction

ADVANTAGES	LIMITATIONS
∗ Can be used for thinning plants around docks ∗ Can be used in deeper areas (with divers) ∗ Can target specific plants with proper training ∗ Can be effective in controlling small infestations of aquatic invasive species ∗ May be useful in helping to remove upper root mass of aquatic invasive species	∗ Costs associated with hiring a diver may be comparable to chemical treatment expenses ∗ Currently an experimental treatment – not readily available ∗ If aquatic invasive species are not pulled properly, could worsen the problem

Mechanical Harvesting

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

Water Level Manipulation

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

Milfoil Weevils

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

Chemical Treatment: Spot

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

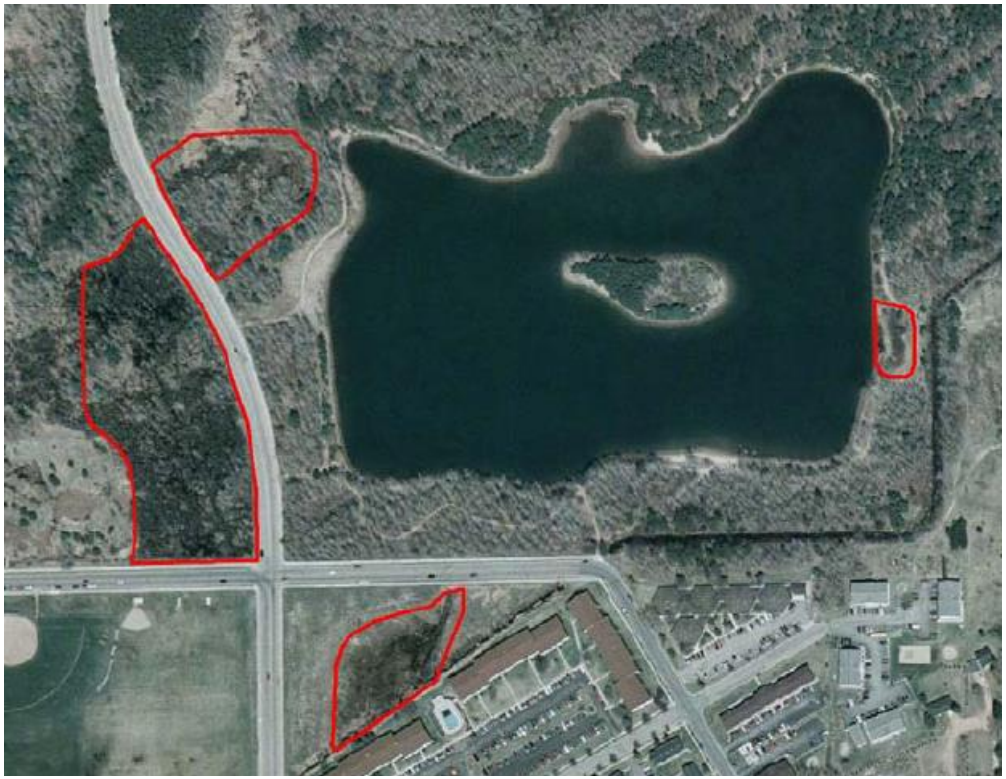
Chemical Treatment: Lake-wide

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

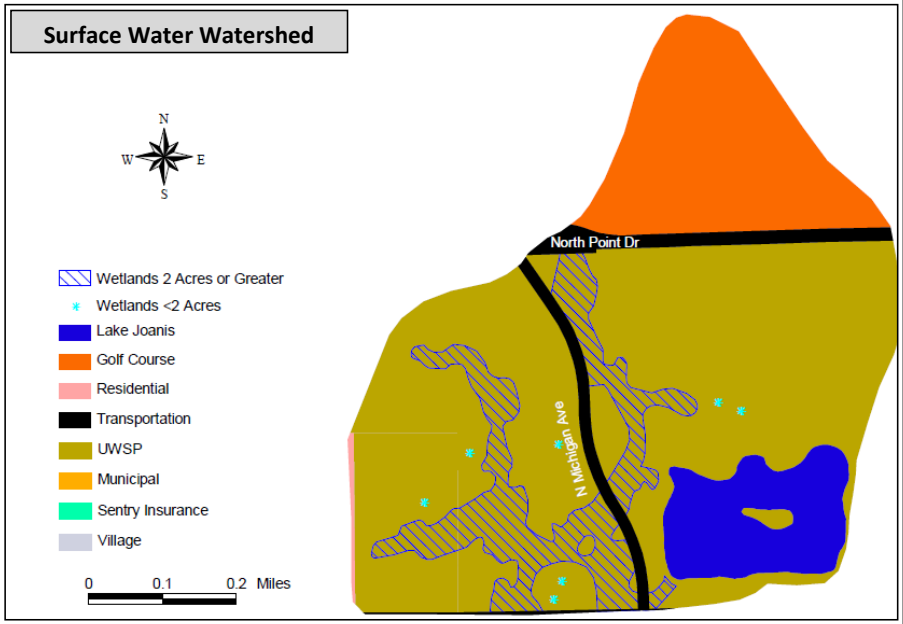
Reptile and Amphibian Habitat

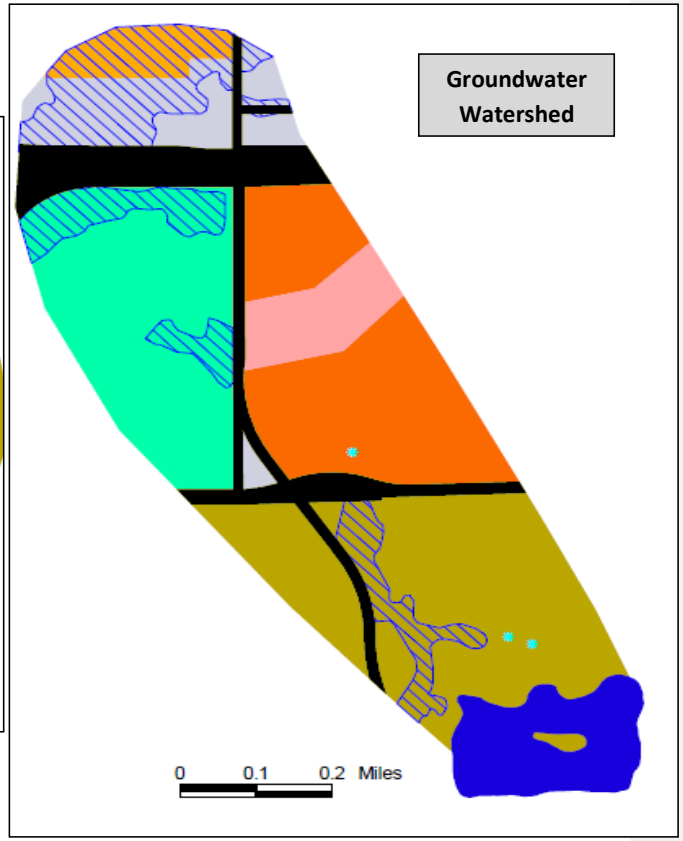
(highlighted in red)

From: Paloski and Wild, UWSP Portage County Lake Study, 2003.



Watershed Land Uses

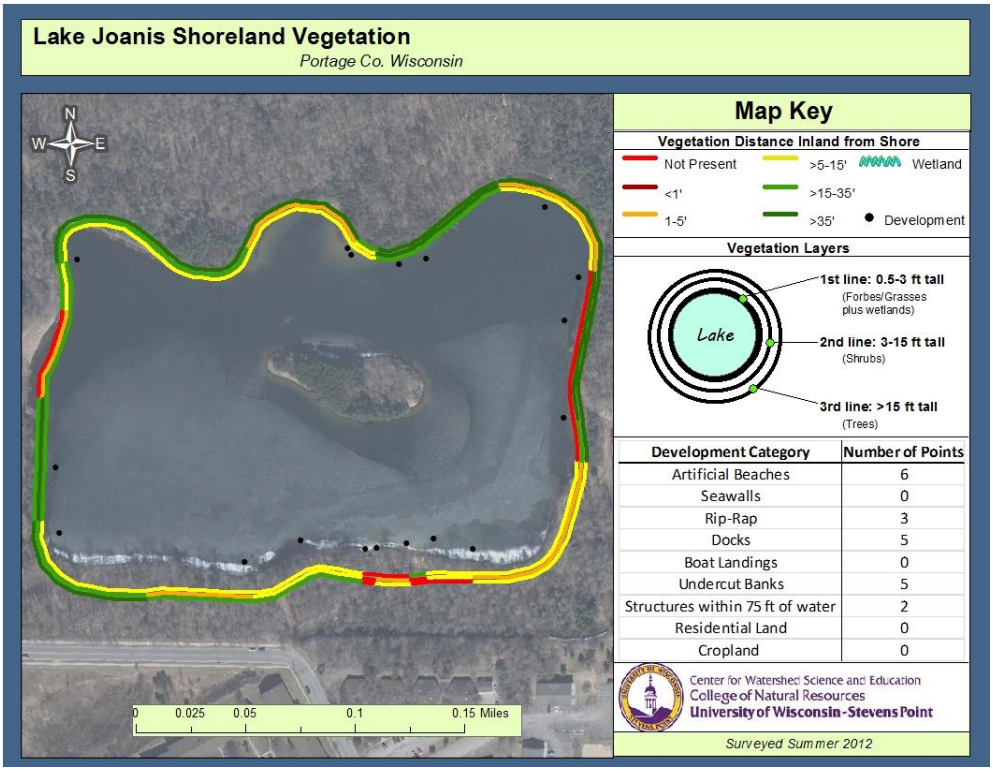




Lake Joanis Shoreland Inventory

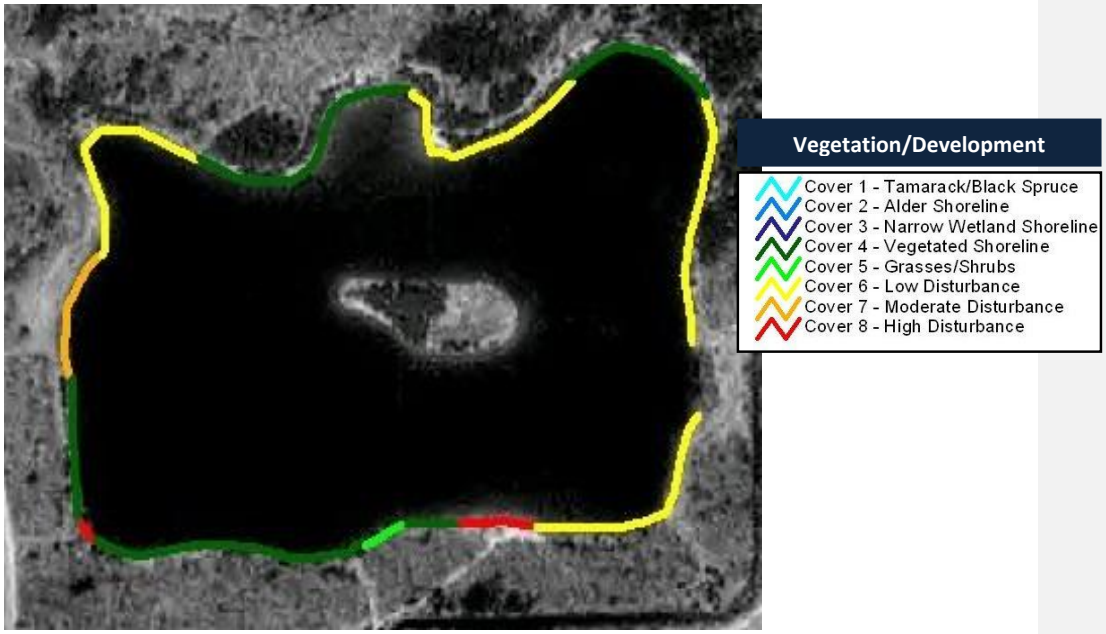
Shoreland vegetation is critical to a healthy ecosystem in and around Lake Joanis. It provides habitat for many aquatic and terrestrial animals including birds, frogs, turtles, and many small and large mammals. It also helps to improve the quality of the runoff that is flowing across the landscape towards the lake. Healthy shoreland vegetation includes a mix of tall grasses/flowers, shrubs and trees.

The results of the 2012 survey of Lake Joanis's shoreland are shown in the Figure below. The ring nearest the lake depicts the shoreland vegetation depth inland from the water's edge for the 0.5 to 3 foot tall vegetation (forbs and grasses), the middle ring depicts the depth of the vegetation that is 3 to 5 feet tall (shrubs), and the outer ring depicts the depth of the vegetation that is greater than 15 feet in height (trees). Little has changed around Lake Joanis since the 2002-2003 survey (**Error! Reference source not found.**).



2002-2003 Portage County Shoreland Inventory

A shoreland survey was conducted in 2002-2003 during the Portage County Lakes Study. The survey categories differed from those in the 2012 survey, but some comparisons can be made.

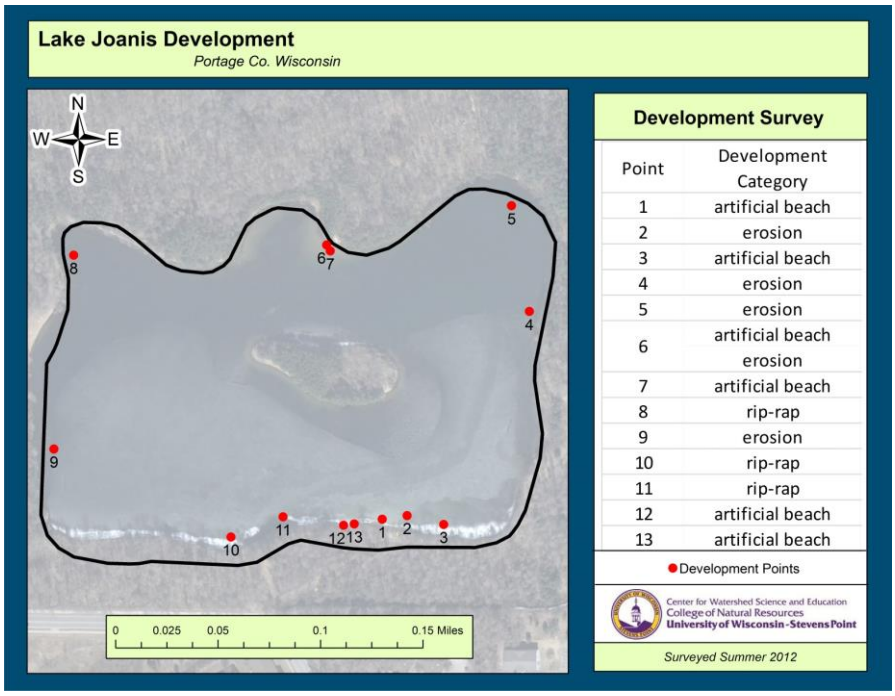


Shoreland vegetation survey around Lake Joanis, 2002-2003.

Categories applied during the 2002-2003 shoreland survey of Portage County lakes. Observations were predominant category 15 feet inland from the water's edge.

Category Code and Cover-type Description	
Wetlands	
Cover 1	All wetland shore zone with a sweet gale or leather leaf shrub layer associated with tamarack or black spruce.
Cover 2	All wetland shore zone with an alder shrub layer.
Cover 3	Narrow wetland shore zone (< 5 m) with an adjacent upland component that was not developed.
Upland with No Development	
Cover 4	Upland shore zone with a densely vegetated shoreline component (i.e., tall grasses or dense shrub component adjacent to the water). Also has a non-rocky substrate within the water zone area.
Cover 5	Upland shore zone that lacked dense shoreline grasses or shrubs, or a water zone area with a rocky substrate.
Development Categories	
Cover 6	Low level of vegetation disturbance: Unaltered shore zone except for pier access.
Cover 7	Moderate level of vegetation disturbance: Shore zone area containing mowed lawn but having intact overstory.
Cover 8	High level of vegetation disturbance: Highly disturbed cover including shorelands that were mowed to the water line (e.g., beach, rip-rap, or seawall).

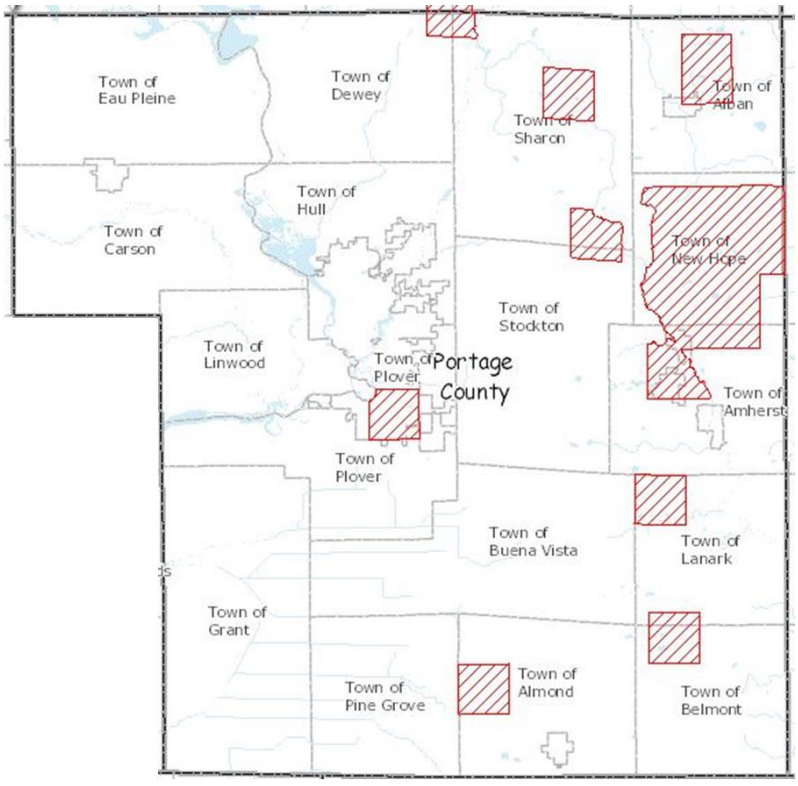
During the 2012 survey, an assessment of human influence features was also conducted around Lake Joanis (**Error! Reference source not found.**). These inventoried features included artificial beaches, docks, rip-rap, seawalls, erosion, and structures built near the water's edge. Structures such as seawalls, rip-rap (rocked shoreline), and artificial beach result in reduction of habitat which directly impacts the fishery and wildlife. Docks and artificial beaches can result in altered in-lake habitat, and denuded lake beds provide opportunities for invasive species to become established and reduce habitat that is important to fish and other lake inhabitants. Erosion can contribute sediment to the lake, which can alter spawning habitat and carry nutrients into the lake. Unmanaged runoff from the rooftops of structures located near shore can also contribute more sediment to the lake. Each human-made feature by itself may not result in a large impact to the lake, but when these features occur more frequently around the lake, the cumulative impact can be a problem for habitat and water quality.



Features of human influence around Lake Joanis, summer 2012.

Atrazine Prohibition Areas

https://datcpgis.wi.gov/maps/?viewer=pa



United States Geological Survey:
45,527 acres of land within Portage County are in atrazine prohibition areas.

Atrazine is a popular corn herbicide that is used to control weeds in corn fields and has been used in Wisconsin for over 25 years. Atrazine may have entered Wisconsin's groundwater as a result of its use on farm fields. In some cases it may be the result of a spill or improper disposal of unwanted or unused product. As of 2006, there are 102 atrazine prohibition areas in Wisconsin, covering about 1.2 million acres. An atrazine prohibition area is an area of land where all uses of atrazine are prohibited.

http://wi.water.usgs.gov/gwcomp/find/portage/atrazine.html

Lake Joanis Contact Sheet

Lake Joanis Contact Sheet				
First Name	Last Name	Address	Phone	E-Mail

Support Groups for Lake Protection

- Lake Associations, districts, in Portage County. For contact information: http://www.uwsp.edu/cnr-ap/UWEXLakes/Pages/organizations/lakelist/default.aspx
    - Boelter Lake Association
    - DuBay Property Owners Association
    - Friends of Lake Emily
    - Lake Helen Protection and Rehabilitation District
    - Lake Jacqueline Protection and Rehabilitation District
    - McDill Inland Lake protection and Rehabilitation District
    - Rinehart Lake Association
    - Tree Lake Association
    - Village of Plover Springville Pond Committee
- Wisconsin Association of Lakes – www.wisconsinlakes.org
- Wisconsin Lakes Partnership - http://dnr.wi.gov/lakes/lakespartnership/

Portage County Lake Information Directory – 2015

Algae - Blue-Green
Contact: Portage County Health & Human Services Department
817 Whiting Ave. Stevens Point, WI 54481
Phone: 715-345-5350
E-mail: PCHHSD@co.portage.wi.us

Contact: Wisconsin Department of Health Services
1 West Wilson Street, Madison, WI 53703
Phone: 608-267-3242
Website: http://www.dhs.wisconsin.gov/eh/bluegreenalgae/contactus.htm

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

Aquatic Invasive Species/Clean Boats Clean Water
Contact: Amy Thorstenson, Executive Director
Golden Sands Resource Conservation & Development Council, Inc.
1100 Main St., Suite 150, Stevens Point, WI 54481
Phone: 715-343-6215
Email: amy.thorstenson@goldensandsrcd.org
Websites: www.goldensandsrcd.org
http://dnr.wi.gov/topic/Invasives/

Aquatic Plant Identification
Contact: Amy Thorstenson, Executive Director
Golden Sands Resource Conservation & Development Council, Inc.
Phone: 715-343-6215
E-mail: amy.thorstenson@goldensandsrcd.org
1100 Main St., Suite 150, Stevens Point, WI 54481
Website: http://www.goldensandsrcd.org/

Contact: UWSP Freckmann Herbarium
TNR 301, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-4248
E-mail: ejudziew@uwsp.edu

Aquatic Plant Management (Native and Invasive)
Contact: Scott Provost
Water Resources Management Specialist
Wisconsin Department of Natural Resources
473 Griffith Avenue
Wisconsin Rapids WI 54494
Phone: 715-421-7881
Fax: 920-787-2477
Email: Scott.Provost@wisconsin.gov
Website: http://dnr.wi.gov/lakes/plants/

Boat Landings - County
Contact: Gary Speckmann, Portage County Parks
1903 County Hwy Y Stevens Point, WI 54481
Phone: 715-346-1433
E-mail: parks@co.portage.wi.us
Website: http://www.co.portage.wi.us/parks/

Boat Landings - State
Contact: Tom Meronek, Fisheries Biologist
Wisconsin Department of Natural Resources
5301 Rib Mountain Drive, Wausau, WI 54401
Phone: 715-359-7582
Email: thomas.meronek@wisconsin.gov

Boat Landings - Town
Contact the clerk for the specific town/village in which the boat landing is located.

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

Conservation Easements
Contact: Gathering Waters Conservancy
211 S. Paterson St., Suite 270, Madison, WI 53703
Phone: 608-251-9131
E-mail: info@gatheringwaters.org
Website: http://gatheringwaters.org/

Conservation Easements (cont'd)
Contact: Buzz Sorge
Wisconsin Department of Natural Resources
PO Box 4001, Eau Claire, WI 54702
Phone: 715-839-3794
E-mail: Patrick.Sorge@wisconsin.gov

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

Contact: Natural Resources Conservation Service (NRCS) Stevens Point Service Center
1462 Strongs Ave., Stevens Point, WI 54481
Phone: 715-346-1325

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

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

Fertilizers and Soil Testing
Contact: Ken Schroeder, Portage County UW-Extension
817 Whiting Ave. Stevens Point, WI 54481
Phone: 715-346-1316
E-mail: Ken.Schroeder@ces.uwex.edu
Website:
http://portage.uwex.edu/horticulture/soil-testing/

Fisheries Biologist (management, habitat)
Contact: Tom Meronek, Fisheries Biologist
Wisconsin Department of Natural Resources
5103 Rib Mt. Drive, Wausau, WI 54401
Phone: 715-359-7582
E-mail: Thomas.Meronek@wisconsin.gov
Website: http://dnr.wi.gov/fish/

Fish Surveys
Contact: Tom Meronek, Fisheries Biologist
Wisconsin Department of Natural Resources
5103 Rib Mt. Drive, Wausau, WI 54401
Phone: 715-359-7582
E-mail: Thomas.Meronek@wisconsin.gov
Website: http://dnr.wi.gov/topic/fishing/

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

Funding and Grants
Contact: Steve Bradley, County Conservationist
Portage County Land Conservation
1462 Strongs Avenue, Stevens Point, WI 54481
Phone: 715-346-1334
Fax: 715-346-1677
Email: Bradleys@co.portage.wi.us

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

Groundwater – Portage County
Contact: Ray Schmidt, Groundwater Specialist
Portage County Courthouse Annex Building
1462 Strongs Avenue, Stevens Point, WI 54481
Phone: 715-346-1334
E-mail: schmidtr@co.portage.wi.us
Website:
http://www.co.portage.wi.us/groundwater/undrstnd/index.htm

Groundwater Quality
Contact: Kevin Masarik
UWSP Center for Watershed Science & Education
TNR 224, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-4276
E-mail: kmasarik@uwsp.edu
Website: http://www.uwsp.edu/cnr-ap/watershed/Pages/GWHome.aspx

Informational Lake Brochures
Contact: Kim Becken, UW-Extension Lakes
TNR 212, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-3212
Email: kbecken@uwsp.edu

Lake Groups – Friends, Associations, Districts
Contact: Randy Slagg
Portage County Land Conservation
1462 Strongs Avenue, Stevens Point, WI 54481
Phone: 715-346-1334
Email: Slaggr@co.portage.wi.us

Contact: Patrick Goggin, UW-Extension Lakes
Phone: 715-295-8903
203 TNR 800 Reserve St. Stevens Point, WI 54481
E-mail: pgoggin@uwsp.edu
Website: http://www.uwsp.edu/cnr-ap/UWEXLakes/Pages/default.aspx

Contact: Kim Becken, UW-Extension Lakes
TNR 212, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-3212
Email: kbecken@uwsp.edu

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

Lake Levels – Volunteer Monitoring
Contact: Ray Schmidt, Groundwater Specialist
Portage County Courthouse Annex Building
1462 Strongs Avenue, Stevens Point, WI 54481
Phone: 715-346-1334
E-mail: schmidtr@co.portage.wi.us
Website:
http://www.co.portage.wi.us/groundwater/undrstnd/index.htm

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

Lake Level Studies
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

Lake-Related Law Enforcement (no-wake, transporting invasives, etc.)
Contact: Jon Scharbarth or Bryan Lockman
State Conservation Wardens
Wisconsin Department of Natural Resources
301 Cedar St. Stevens Point, WI 54481
Phone: 715-344-2752
Website: http://dnr.wi.gov/emergency/

Land Use Plans and Zoning Ordinances
Contact: Jeff Schuler
Portage County Planning and Zoning
Phone: 715-346-1334
1462 Strongs Ave. Stevens Point, WI 54481
E-mail: Planning&Zoning@co.portage.wi.us
Website:
http://www.co.portage.wi.us/planningzoning/

Contact: UWSP Center for Land Use Education
TNR 208, 800 Reserve St., Stevens Point, WI 54481
Phone: 715-346-3783
E-mail: Center.for.Land.Use.Education@uwsp.edu
Website: http://www.uwsp.edu/cnr/landcenter/

Nutrient Management Plans
Contact: Randy Slagg
Portage County Land Conservation Department
1462 Strongs Ave. Stevens Point, WI 54481
Phone: 715-346-1334
E-mail: Planning&Zoning@co.portage.wi.us
Websites:
http://www.co.portage.wi.us/planningzoning/
http://dnr.wi.gov/topic/AgBusiness/CAFO/NutrientManagementPlan.html

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

Parks - County
Contact: Gary Speckmann
Portage County Parks Director
1903 County Hwy Y, Stevens Point WI 54482
Phone: 715-346-1433
Fax: 715-346-1994
Email: parks@co.portage.wi.us

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

Purchase of Land
Contact: Buzz Sorge
Wisconsin Department of Natural Resources
P.O. Box 4001, Eau Claire, WI 54702
Phone: 715-839-3794
E-mail: Patrick.Sorge@wisconsin.gov
Website: http://dnr.wi.gov/topic/Lands/RealEstate/

Rain Barrels – Order
Golden Sands Resource Conservation & Development Council, Inc.
Phone: 715-343-6215
1100 Main St., Suite 150, Stevens Point, WI 54481
Website: http://www.goldensandsrcd.org/store

Rain Gardens and Stormwater Runoff – Assistance for Property Owners
Contact: Randy Slagg
Portage County Land Conservation Department
1462 Strongs Ave. Stevens Point, WI 54481
Phone: 715-346-1334
E-mail: Planning&Zoning@co.portage.wi.us
Website: http://dnr.wi.gov/topic/stormwater/

Contact: Ken Schroeder, Portage County UW-Extension
817 Whiting Ave. Stevens Point, WI 54481
Phone: 715-346-1316
E-mail: Ken.Schroeder@ces.uwex.edu
Website: http://portage.uwex.edu/

Septic Systems/On-site Waste
Contact: Ralph Loeffler
Portage County Planning and Zoning
Phone: 715-346-1334
Address: 1462 Strongs Ave. Stevens Point, WI 54481
E-mail: Planning&Zoning@co.portage.wi.us
Website:
http://www.co.portage.wi.us/planningzoning/

Shoreland Management and Restoration
Contact: Randy Slagg
Portage County Land Conservation
1462 Strongs Avenue, Stevens Point, WI 54481
Phone: 715-346-1334
Email: Slaggr@co.portage.wi.us
Websites:
http://dnr.wi.gov/topic/ShorelandZoning/Programs/programs.html

Shoreland Zoning Ordinances
See: Land Use Plans and Zoning Ordinances

Soil Fertility Testing
See: Fertilizer and Soil Testing

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

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

Water Quality Problems
Contact: Buzz Sorge
Wisconsin Department of Natural Resources
P.O. Box 4001, Eau Claire, WI 54702
Phone: 715-839-3794
E-mail: Patrick.Sorge@wisconsin.gov

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

Wetlands
Contact: Wisconsin Wetlands Association
214 N. Hamilton Street, #201, Madison, WI 53703
Phone: 608-250-9971
Email: info@wisconsinwetlands.org

Contact: Will Stites
Water Regulations & Zoning Specialist
Wisconsin Rapids Service Center
473 Griffith Avenue, Wisconsin Rapids, WI 54494
Phone: 715-421-7815
Fax: 715-421-7830
Email: will.stites@wisconsin.gov

Contact: Keith Patrick
Wisconsin Department of Natural Resources
5301 Rib Mountain Drive, Wausau, WI 54401
Phone: 715-241-7502
E-mail: keith.patrick@wisconsin.gov
Website: http://dnr.wi.gov/topic/wetlands/

Woody Habitat
Contact: Tom Meronek, Fisheries Biologist
Wisconsin Department of Natural Resources
5301 Rib Mountain Drive, Wausau, WI 54401
Phone: 715-359-7582
Email: thomas.meronek@wisconsin.gov