

Lake Joanis

Final Results Portage County Lake Study

University of Wisconsin-Stevens Point, Portage County Staff and Citizens

April 5, 2005

What can you learn from this study?

You can learn a wealth of valuable information about:

- *Critical habitat that fish, wildlife, and plants depend on*
- *Water quality and quantity of your lake*
- *The current diagnosis of your lake – good news and bad news*

What can you DO in your community?

You can share this information with the other people who care about your lake and then plan together for the future.

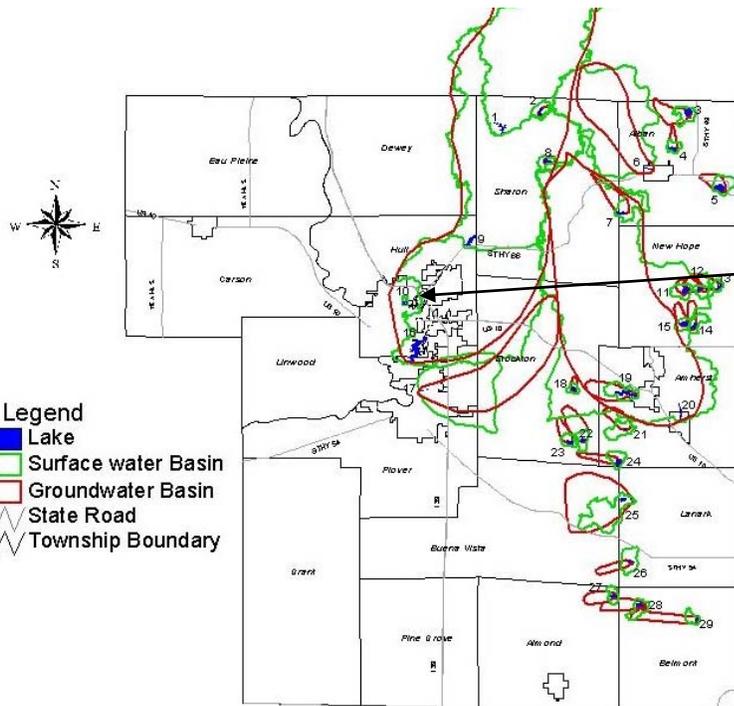
- ✓ *Develop consensus about the local goals and objectives for your lake.*
- ✓ *Identify available resources (people, expertise, time, funding).*
- ✓ *Explore and choose implementation tools to achieve your goals.*
- ✓ *Develop an action plan to achieve your lake goals.*
- ✓ *Implement your plan.*
- ✓ *Evaluate the results and then revise your goals and plans.*

To protect

the lake we must protect
the “watershed,” the land
that drains or
sheds its water
into the
lake.



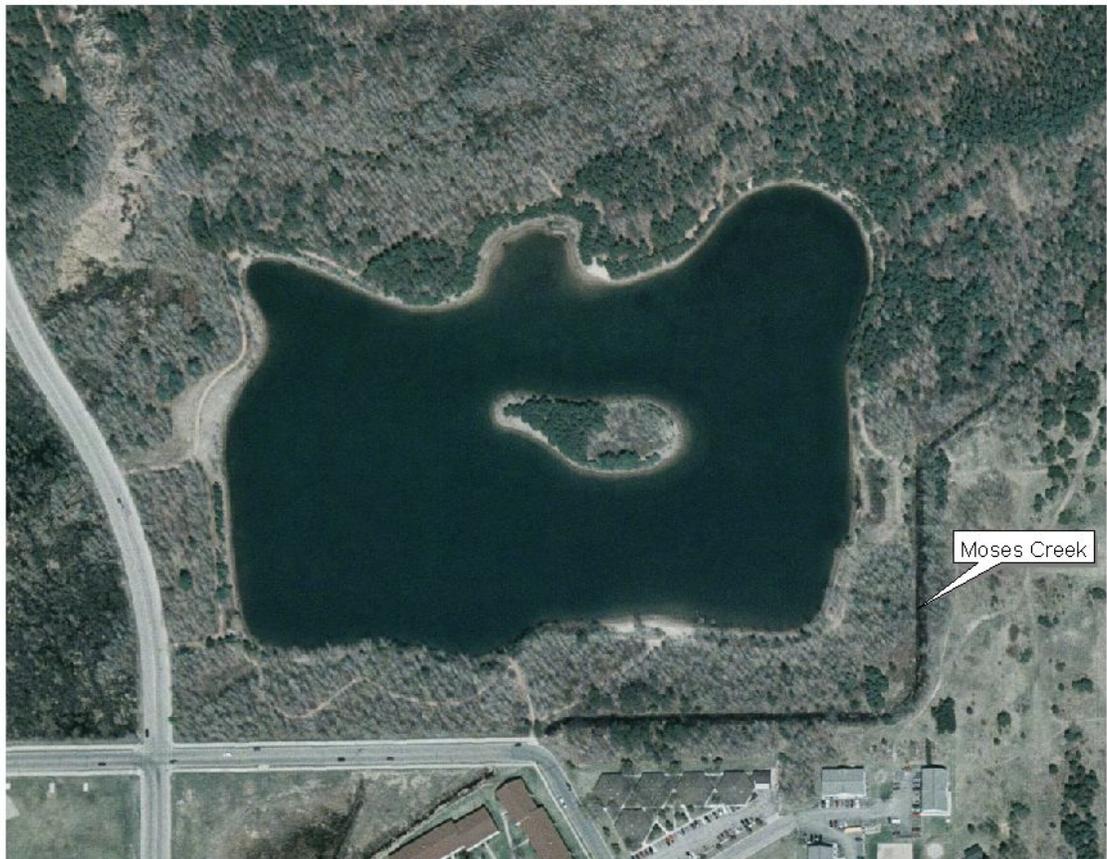
Lake Joanis ~ Location



Lake Joanis
 North of highway 66, on the north side of Stevens Point; Town of Hull.

Surface Area: 23 acres
Maximum Depth: 25 feet
Lake Volume: 276 acre-feet

Lake Jonas



Water Flow

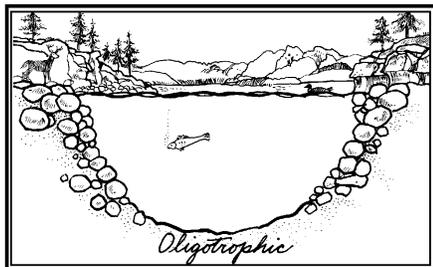
- Lake Joanis is a seepage lake
- Water enters Lake Joanis primarily from groundwater, with some runoff, and precipitation
- Water exits the lake through groundwater



Lake Joanis ~ Water Quality

Total Phosphorus

In more than 80% of Wisconsin's lakes phosphorus is the key nutrient affecting aquatic plant and algae growth. Once in a lake system phosphorus levels are difficult to reduce, so limiting phosphorus input is key. Phosphorus at levels above 30 parts per billion (ppb) can lead to nuisance aquatic plant growth and accelerate a lake's change from oligotrophic to eutrophic. Sources of phosphorus include septic systems, detergents, animal waste, farmland and storm sewer runoff, soil erosion, and fertilizers for lawns, gardens, and agriculture.



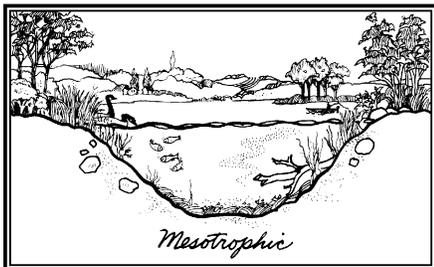
Oligotrophic Lakes

Common uses:

- ✓ Swimming
- ✓ Skiing
- ✓ Boating

Vegetation of oligotrophic lakes:

- ✓ Very little vegetation



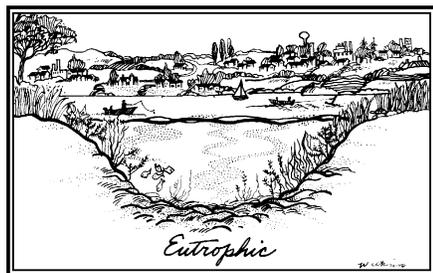
Mesotrophic Lakes

Common uses:

- ✓ Boating
- ✓ Fishing

Vegetation of mesotrophic lakes:

- ✓ Increased vegetation
- ✓ Occasional algal blooms



Eutrophic Lakes

Common uses:

- ✓ Fishing
- ✓ Wildlife watching

Vegetation of eutrophic lakes:

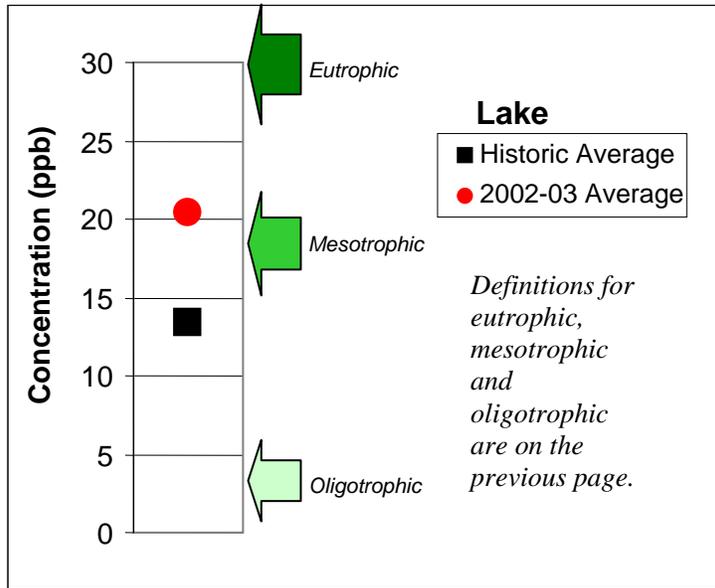
- ✓ Lots of aquatic plants
- ✓ Frequent algal blooms

Winter fish kills can occur



Lake Joanis ~ Water Quality

Average Total Phosphorus Levels



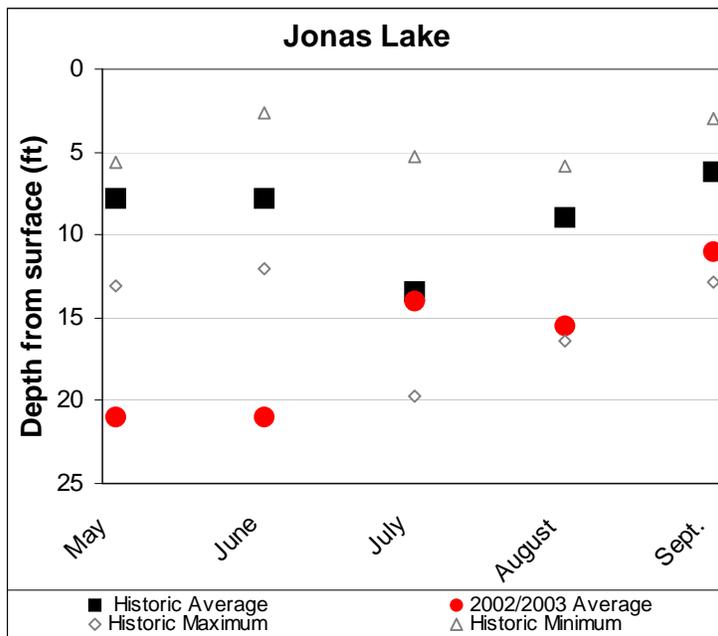
The graph to the left shows total phosphorus levels measured when the lake was well mixed (overturn). Phosphorus levels in Lake Joanis in 2002-03 were higher than average historic levels. Concentrations of phosphorus in Lake Joanis are lower than other seepage lakes in the Portage County.



Overturn: uniform temperature from top to bottom in the lake.

Water Clarity

Water clarity (Secchi disc depth) is an indicator of water quality. The two main components affecting water clarity are materials dissolved in the water and materials suspended in the water. Water clarity can indicate overall water quality, especially the amount of algae and suspended sediment present.



The water clarity in Lake Joanis is considered good. The average Secchi depth reading for similar lakes in the county is 9 feet; Lake Joanis now appears to have better clarity than this. The water clarity of Lake Joanis during 2002-03 growing seasons was much better than the historical growing season average. The months of May and June show the best water clarity and the month of September the poorest. These fluctuations throughout the summer are normal as algae populations and sedimentation increase and decrease.



2002 Amphibian Distribution at Portage County Lakes

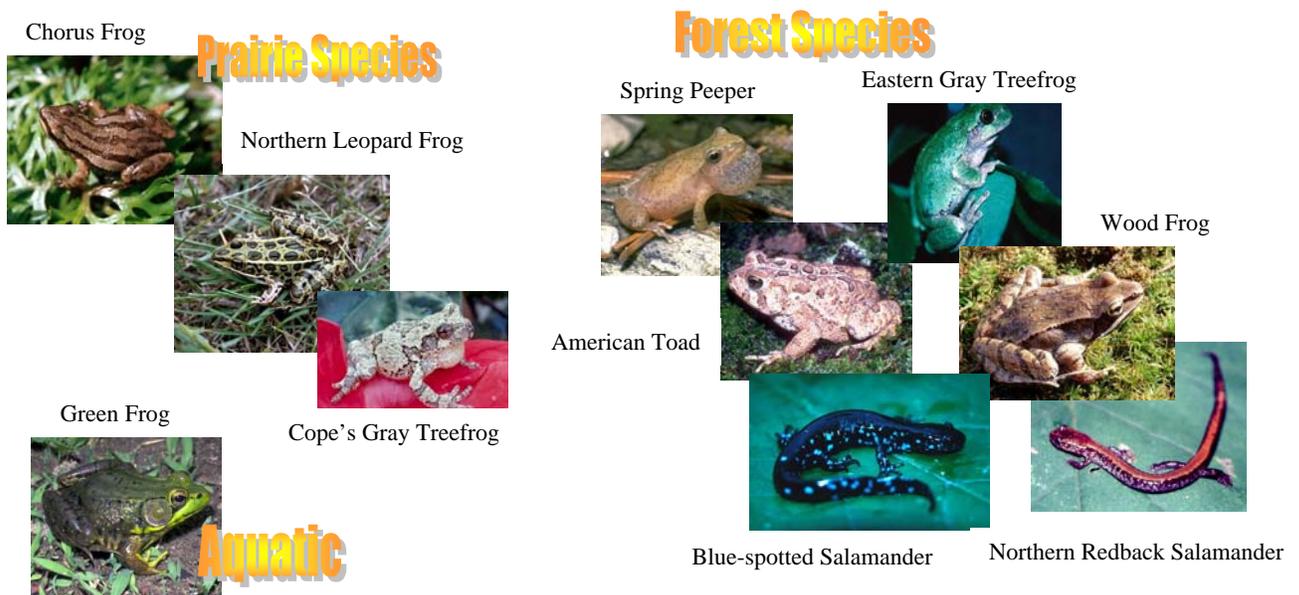
This summary provides preliminary information on the amphibian species present and their distribution at the twenty-nine Portage County lakes. Surveys were conducted from April 2002 - August 2002, the typical breeding period of the frogs and salamanders found in the county.

Twelve frog species have been documented in Wisconsin, nine of which currently inhabit Portage County: American toad, chorus frog, spring peeper, eastern gray treefrog, Cope's gray treefrog, green frog, pickerel frog, northern leopard frog, and wood frog. Historically, Blanchard's cricket frog inhabited Portage County but is believed to now exist only in southeastern Wisconsin. Of all species believed to inhabit Portage County, only the pickerel frog was not found during the spring and summer of 2002. The pickerel frog has been listed as a species of special concern in Wisconsin. No new species to Portage County were recorded in 2002.

Seven salamander species have been documented in Wisconsin, all of which currently inhabit Portage County: blue-spotted salamander, spotted salamander, tiger salamander, central newt, mudpuppy, northern redback salamander and four-toed salamander. The four-toed salamander is listed as a species of special concern in Wisconsin.

Large sections of continuous natural shoreline on lakes are ideal habitats for frog and salamander populations. Natural areas with large amounts of submergent, emergent and floating-leaf vegetation provide protection for amphibians. Many species also use the vegetation for attachment of eggs during the breeding season. Green frogs, bullfrogs, pickerel frogs and leopard frogs depend on the shoreline area throughout the year. In contrast, American toads, spring peepers, tree frogs, wood frogs and chorus frogs depend on the shoreline area in the spring for breeding and then move to other areas for the rest of the year.

Undisturbed areas of shoreline that are also connected to large natural upland areas provide ideal habitat for many amphibian species because they lessen frogs' exposure to predators. Many frog and salamander species migrate to the lakes in the spring to breed and spend the summer months foraging in the uplands. Many amphibian species will also over winter in the uplands.



Lake Joanis ~ Frogs and Turtles



Lake Joanis

Number of frog species: 6

Frog species observed: spring peeper, chorus frog, American toad, gray treefrog, Cope's gray treefrog, green frog

Location of primary habitat: west side of lake

Key features of habitat: protected areas of marsh with large amounts of submergent, emergent and floating-leaf vegetation as well as downed trees, temporary wetlands

Number of turtle species: 1

Turtle species observed: painted turtle

Map Key

Red outlined areas = primary frog habitat

Good News

Several frog species present, minimal shoreline alteration, several temporary wetlands adjacent to the lake

Bad News

There is a large amount of recreational use surrounding the lake



Lake Joanis ~ Shoreline Vegetation



Frogs and toads depend on shoreline and aquatic vegetation for:

- attachment of eggs during the breeding season,
- shelter for adults throughout the spring and summer,
- food for larvae,
- habitat for prey, and
- slowing evaporation and moderating temperature fluctuations.

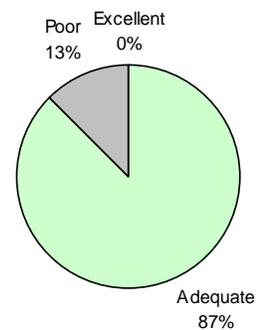
Frogs are commonly found in areas with large amounts of tree cover, aquatic plants, leaves, and downed branches, characteristics typical of natural areas. Frogs are not frequently found in sandy areas or open water, characteristics typical of altered areas. Though amphibians use drier prairies and woodlands near lakes and wetlands, this study focused on areas reaching from 16 feet into the lake to 33 feet inland.

Green frogs are used as an indicator for the health of aquatic life in Wisconsin lakes because they are abundant, live in many cover types, and remain along the edge of the lake throughout the spring and summer. While other amphibians may require more specific cover types, the green frog habitat is a useful indicator. Some cover types (as shown on map above) are better than others for green frogs. Specifically:

- Excellent green frog habitat = cover types 1 and 2
- Adequate green frog habitat = cover types 3, 4 and 6
- Poor green frog habitat = cover types 5, 7 and 8

Lakes with larger amounts of good green frog habitat will likely support more amphibians and more species of amphibians. Likewise, amphibians are more likely to be harmed or eliminated with increasing shoreland development.

Jonas Lake Green Frog Habitat



Best Green Frog Habitat: Ebert Lake
33% excellent habitat + 67% adequate

Worst Green Frog Habitat: Helen Lake
2% excellent habitat + 6% adequate + 92% poor



Lake Joanis ~ Aquatic Plants

Aquatic plant surveys were conducted in each lake. More detailed information is available in the final report.

Aquatic Plant Survey

There are 55 species of aquatic or wetland vascular plants have been found in Lake Joanis or on the wet areas of the adjacent shore. This is above the average for Portage County lakes.

Lake Joanis lies in an area excavated in the mid 1970's for landscape fill around the Sentry headquarters building. The lake filled with water shortly after the excavation, and, as far as is known, all plants within the lake arrived by natural dispersal agents, probably carried primarily by waterfowl.

The Lake has relatively sparse aquatic vegetation, but Eurasian milfoil was found dislodged and floating or washed up on shore at several points in 2003.

Because the excavation left steep banks to a berm which surrounds the lake, the lake has a very little wet shore on the west, south, and east sides, and hence relatively little biological diversity on the shoreline for the majority of the lake. Furthermore, glossy buckthorn, a very invasive alien shrub and small tree, has become abundant in recent years, further reducing diversity along the shore. Nevertheless, a small population of variegated horsetail, a special concern species, occurs at the edge of the water on the south shore. The presence of this rare plant, never found previously anywhere in central Wisconsin, is entirely unexpected.

Unlike the rest of the lake, portions of the north shore have a gradual slope and a moderately wide beach area. Bog vegetation has formed in recent years in one area, and this bog holds some relatively uncommon plants, such as sundew, and lance-leaved violet.

Invasive Exotic Aquatic Plants

Invasive species displace native species, disrupt ecosystems, and affect citizen's livelihoods and quality of life. They hamper boating, swimming, fishing, and other water recreation, and take an economic toll on commercial, agricultural and aquatic resources.

(Wisconsin DNR)

Aquatic plants surveys revealed that some of the lakes in the study have invasive aquatic plants present.

Eurasian milfoil (*Myriophyllum spicatum*) was present in Bear Lake, Lake Emily, Lake Joanis, Jordan Pond, McDill Pond, Springville Pond and Thomas Lake.

Curly leaf pondweed (*Potamogeton crispus*) was identified in Spring Lake and Amherst Millpond.

Contact the Portage County Land Conservation Department for additional information.



Lake Joanis ~ What can you do to help ?

We Can All Help Take Care Of Our Lake

A lake is a magnificent water resource. The quality of its water is a reflection of what happens on the land that surrounds it.



Lake Users:

- ✓ Run boat engines efficiently.
- ✓ Observe no/low wake zones.
- ✓ Refuel away from water.
- ✓ Dispose of trash properly
- ✓ Remove all aquatic plants from boats and trailers.



Land Owners:

- ✓ Control soil erosion.
- ✓ Keep livestock out of lakes and streams.
- ✓ Control manure runoff.
- ✓ Carefully manage nutrients and pesticides.
- ✓ Learn to identify and look for invasive species.



Home Owners:

- ✓ Leave natural vegetation buffers in place or replace them if they have been removed.
- ✓ Eliminate the use of fertilizer or use low/no phosphorus fertilizer.
- ✓ Eliminate or minimize use of pesticides.
- ✓ Control soil erosion.
- ✓ Clean up after pets.
- ✓ Learn to identify and look for invasive species.



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- Wisconsin DNR Lake Protection grants
- UW-Stevens Point
- Portage County
- Portage County Citizens

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Lake Joanis ~ Primary Researchers

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Water Quality/Watersheds

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Near Shore Summary

Dr. Glenn Bowles

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