

Skunk Lake

Final Results Portage County Lake Study

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

April 7, 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.

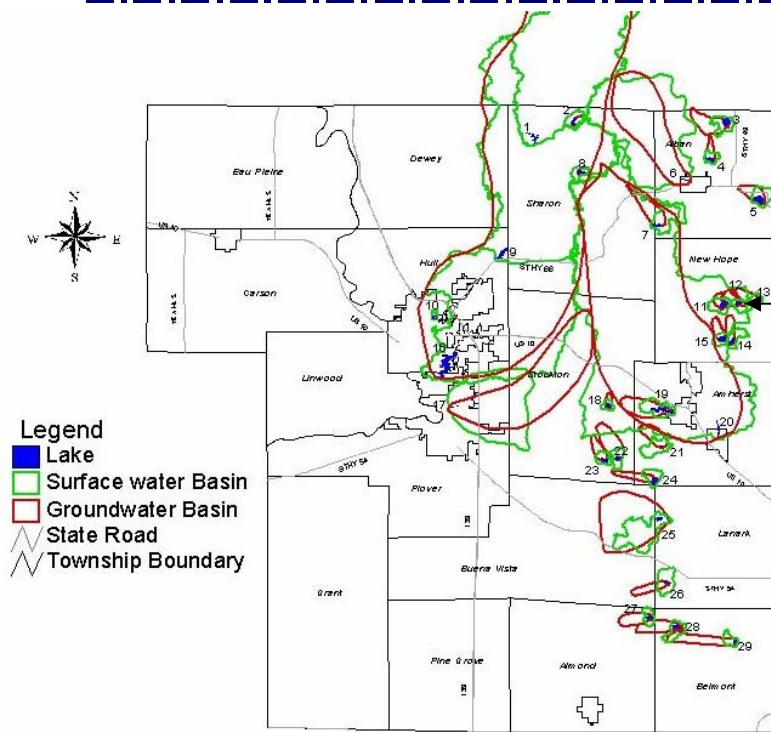
- ✓ *Develop consensus about the local goals and objectives for your lake.*
- ✓ *Identify available resources (people, expertise, time, funding).*
- ✓ *Explore and choose implementation tools to achieve your goals.*
- ✓ *Develop an action plan to achieve your lake goals.*
- ✓ *Implement your plan.*
-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



Skunk Lake ~ Location



Skunk Lake

North in the Town of New Hope, and North of the intersection of County Roads T & MM

Surface Area: 60 acres

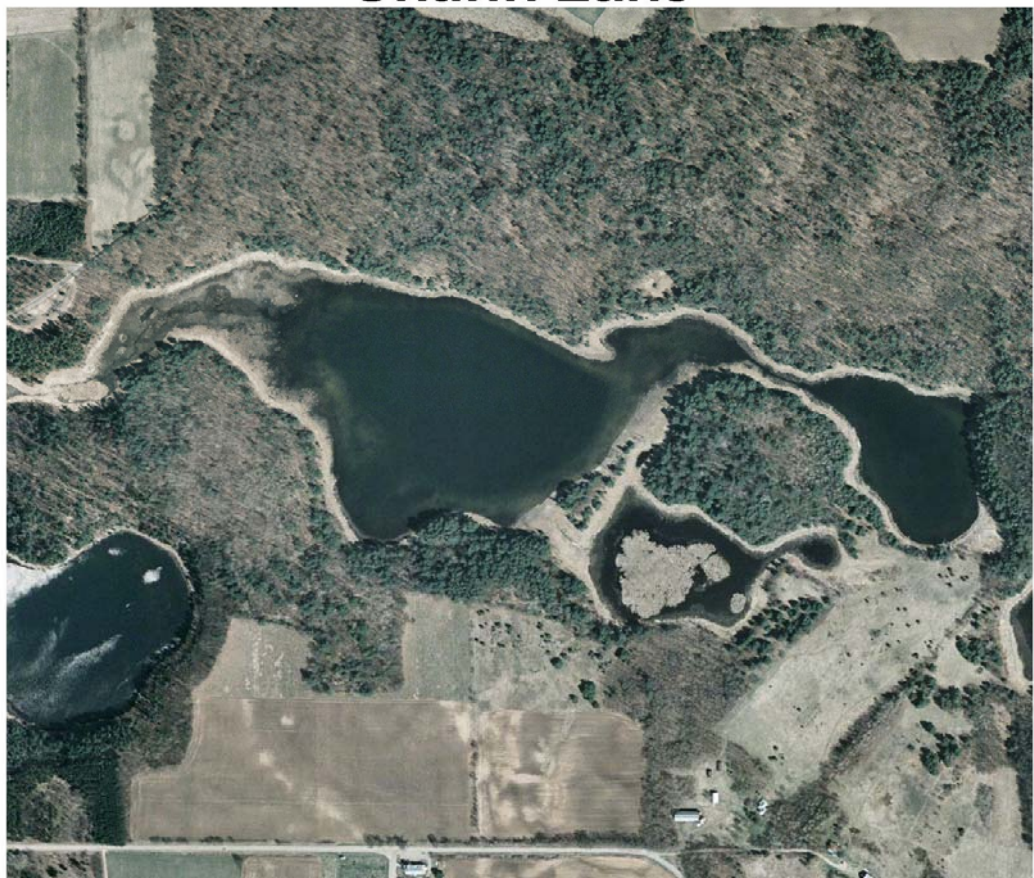
Maximum Depth: 26 feet (however two-thirds of the lake is less than 10 feet deep, making it subject to frequent winter kill)

Lake Volume: 520 acre-feet

Skunk Lake

Water Flow

- Skunk Lake is a seepage lake
- Water enters Skunk Lake from groundwater, runoff, and precipitation
- Water exits the lake through groundwater
- Water levels fluctuate with changes in the groundwater table.



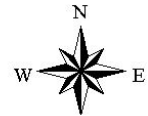
Skunk Lake ~ Land Use in the Surface Watershed



Surface Watershed: The land area where water runs off the surface of the land and drains toward the lake. The watershed shown below also includes adjacent wetlands.

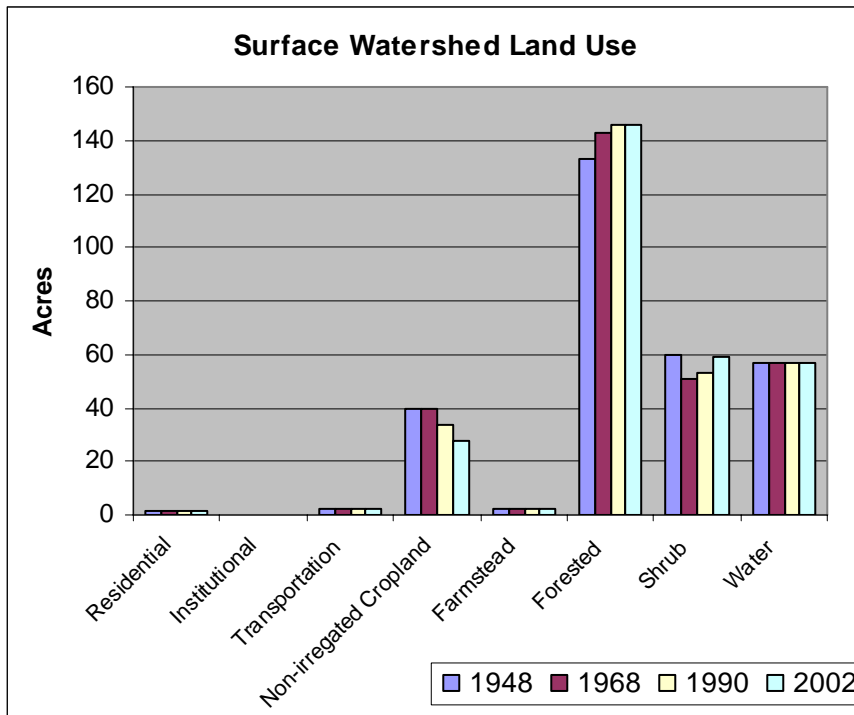
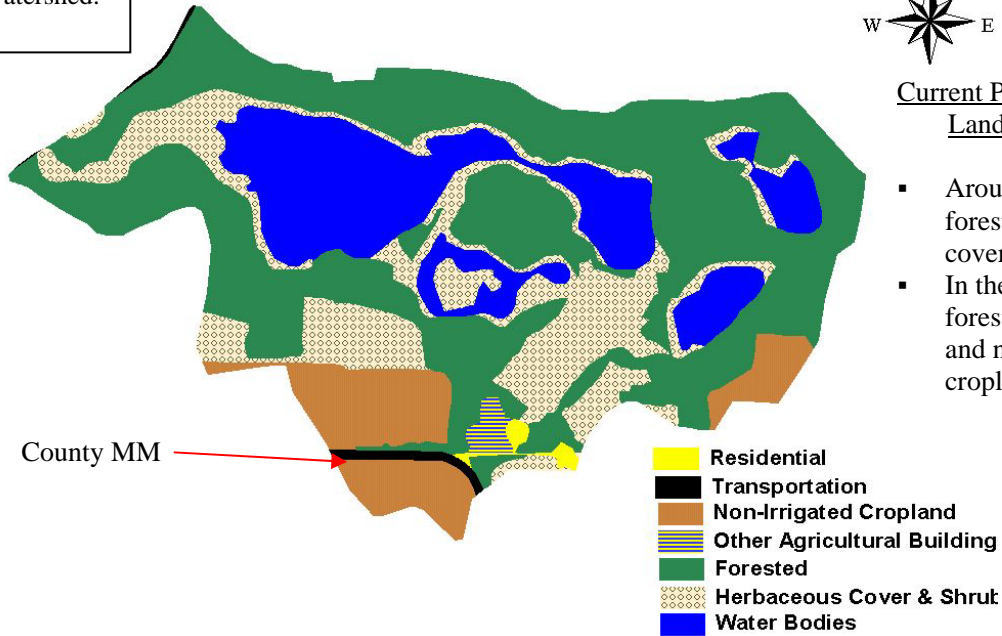
Skunk Lake Land Use

Surface Watershed:
295 Acres



Current Predominant Land Use

- Around the lake: forest, and shrub cover
- In the watershed: forest, shrub cover, and non-irrigated cropland



Surface Watershed Land Use

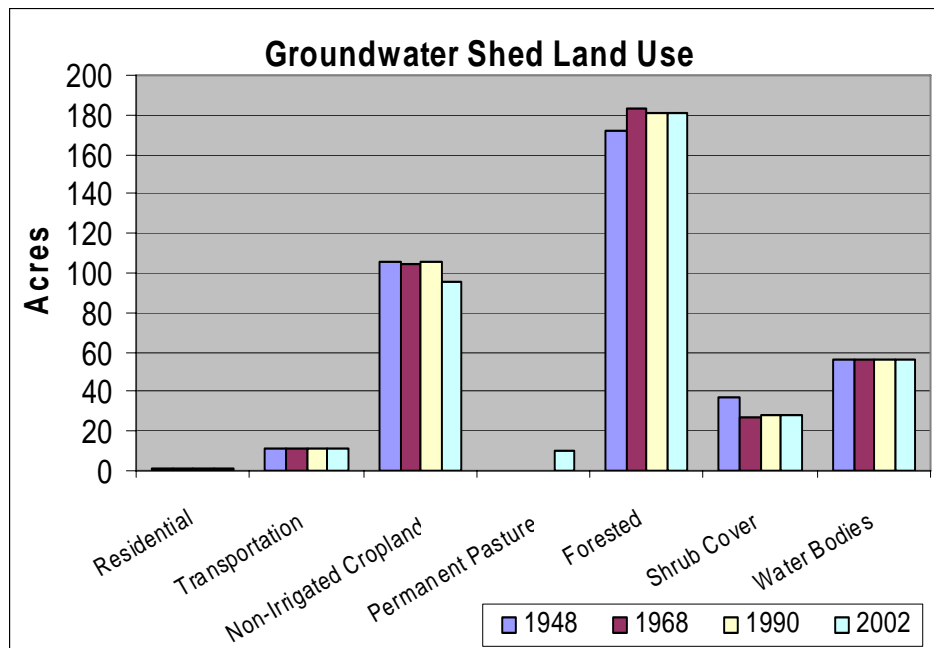
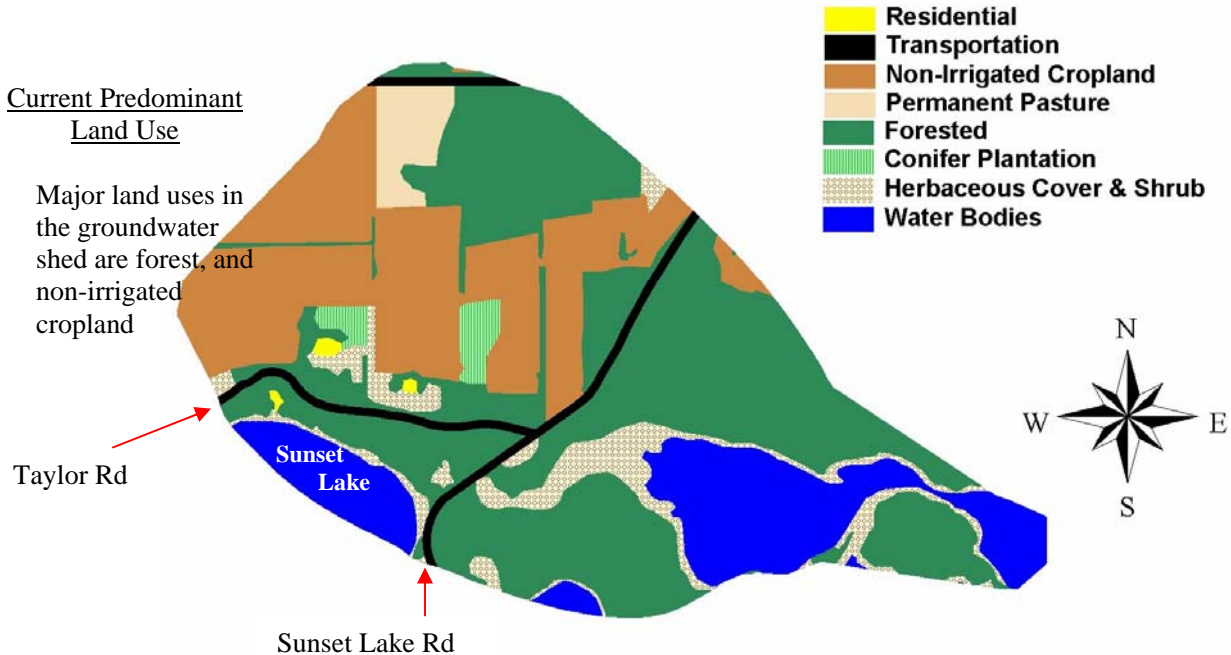
- Forestland and shrub cover dominate the land use
- Non-irrigated cropland is slowly declining
- Residential, institutional, transportation, and farmstead are land uses that exist in the watershed but are very minimal

Skunk Lake ~ Land Use in the Groundwater Shed



Groundwater Shed: The land area where water soaks into the ground and travels underground to the lake.

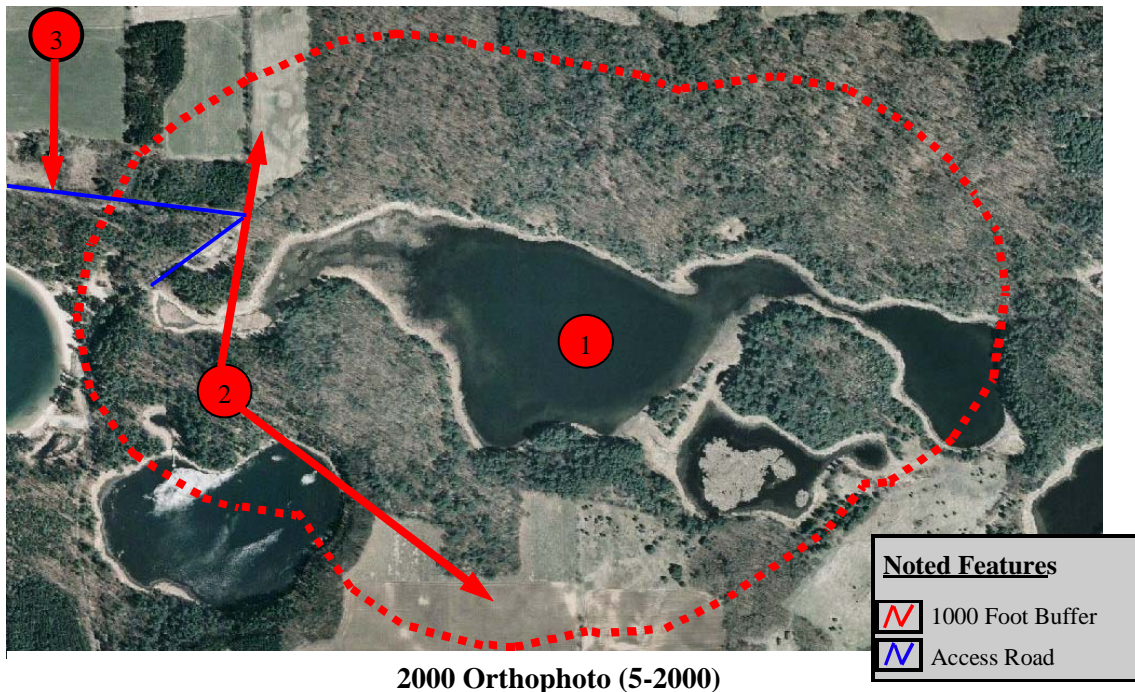
Skunk Lake Groundwater Landuse



Groundwater Shed Land Use

- Forest and non-irrigated cropland have been the dominate land use since 1948
- Permanent pasture has recently become a land use
- Shrub cover decreased slightly after 1948, but has not changed since.

Skunk Lake ~ Taking a closer look (Within 1,000 feet of the lake)



Points of Interest

1. Lake Levels in 2000 are high compared to other years. The lake shape changes with the water level and the small ponds surrounding Skunk Lake become interconnected during periods of high water.
2. Two areas around the lake are used for cropland.
3. Only a small area is available for development under the present ownership patterns. The only access to the lake is through private property



1938 Air Photo (10-10-38)

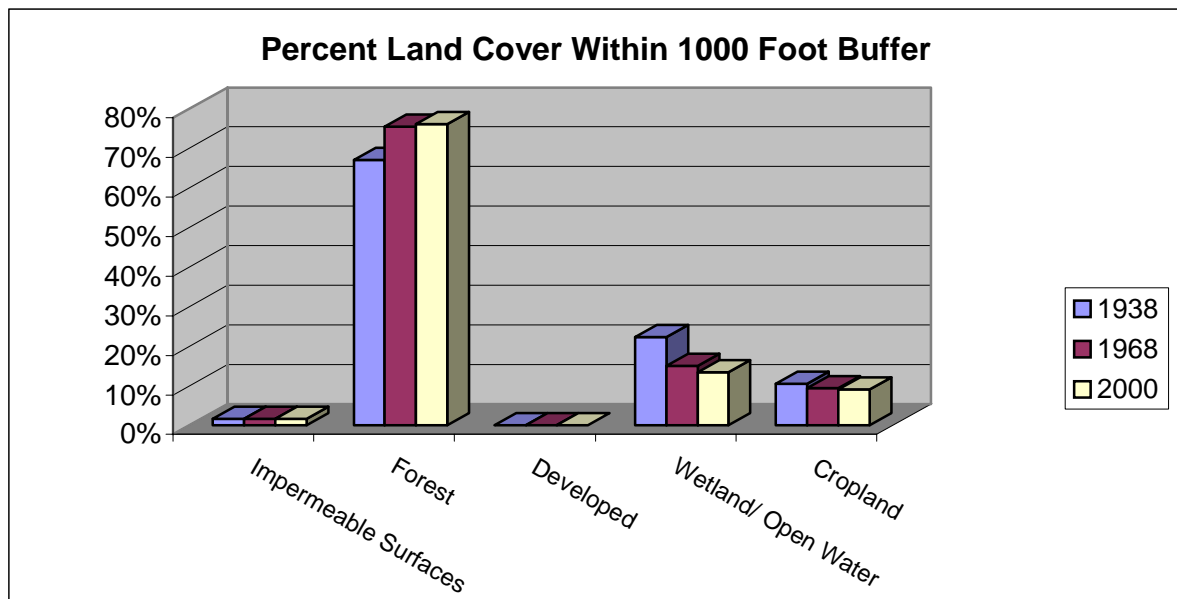


1968 Air Photo (6-4-68)

Skunk Lake ~ Taking a closer look (Within 1,000 feet of the lake)

Changes from 1938

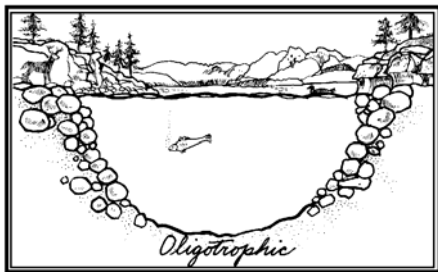
	1938	1968	2000
Impervious Surface (acres)	0.3	0.3	0.3
Residential (acres)	0	0	0
Wetland / Open Space (acres)	4	3	3
Cropland (acres)	2	2	2
Forest (acres)	13	16	16



Skunk Lake ~ 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



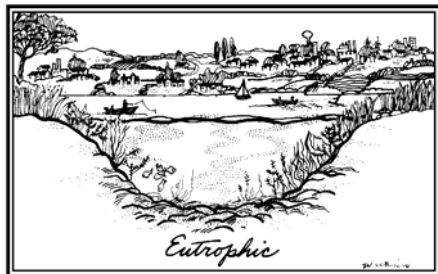
Mesotrophic Lakes

Common uses:

- ✓ Boating
- ✓ Fishing

Vegetation of mesotrophic lakes:

- ✓ Increased vegetation
- ✓ Occasional algal blooms



Eutrophic Lakes

Common uses:

- ✓ Fishing
- ✓ Wildlife watching

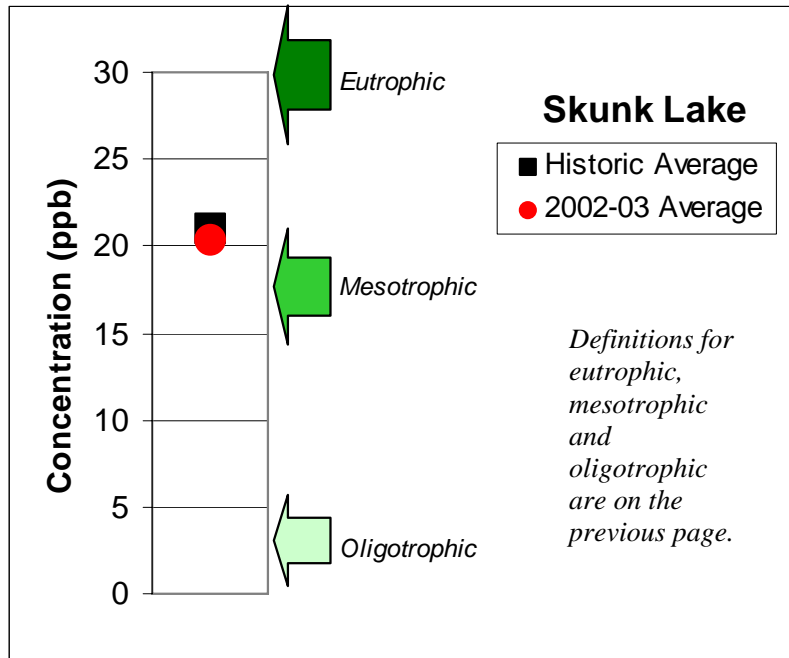
Vegetation of eutrophic lakes:

- ✓ Lots of aquatic plants
- ✓ Frequent algal blooms

Winter fish kills can occur.

Skunk Lake ~ Water Quality

Average Total Phosphorus Levels



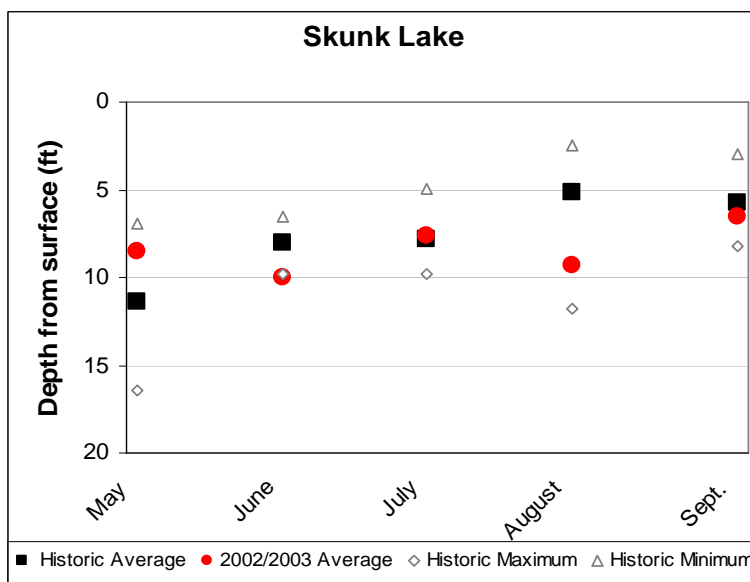
The graph to the left shows total phosphorus levels measured when the lake was well mixed (overturn). Phosphorus levels in Skunk Lake in 2002-03 were similar to average historic levels. Concentrations of phosphorus are slightly lower than the 25.5 ppb level of similar lakes in the county.



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 Skunk Lake is considered fair. The average Secchi depth reading for similar lakes in the county is 9 feet; Skunk Lake appears to typically have similar or lower readings. The water clarity of Skunk Lake during 2002-03 growing seasons was similar to the historical growing season average. The month of June had the best water clarity, and the month of September the poorest. These fluctuations are normal as algae populations and sedimentation increase and decrease. In addition, the shallow water of the lake and the sediment disturbance from the wind can reduce clarity even though nutrient concentrations are low.

2002 Amphibian Distribution at Portage County Lakes

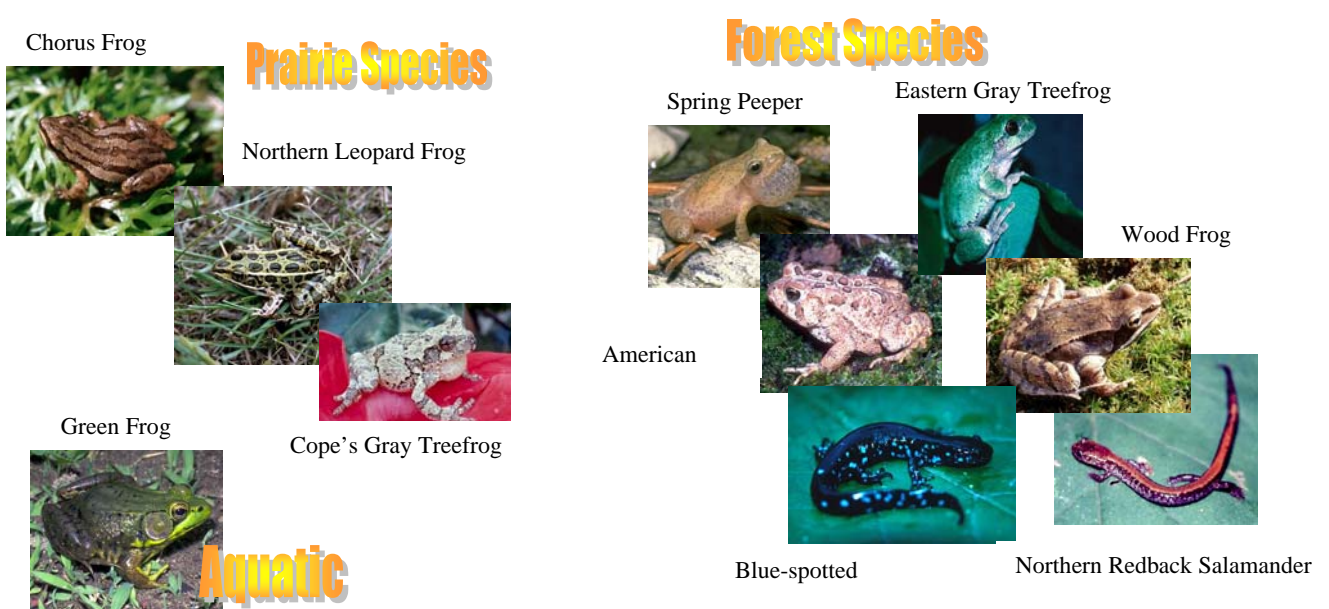
This summary provides preliminary information on the amphibian species present and their distribution at the twenty-nine Portage County lakes. Surveys were conducted from April 2002 - August 2002, the typical breeding period of the frogs and salamanders found in the county.

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.



Skunk Lake ~ Frogs



Skunk Lake

Number of species: 4

Species observed to date: green frog, spring peeper, gray treefrog, Cope's gray treefrog

Location of primary habitat: numerous areas surrounding the lake

Key features of habitat: protected areas of marsh with large amounts of submergent, emergent and floating-leaf vegetation

Map Key

Red outlined areas = primary frog habitat

Good News

natural habitat with minimal levels of development, ideal habitat for many amphibian and reptile species



Skunk Lake ~ Aquatic Plants

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

Aquatic Plant Survey

There are 53 species of aquatic and wetland plants (52 species of vascular plants plus a macrophytic alga) that have been found at Skunk Lake; most of these occur in the extensive wetlands surrounding the lake. This is above average for Portage County lakes.

The number of species of plants submersed or floating in the lake is relatively small, although only one brief survey of the lake was made prior (1972) to 2003, and some species may have been overlooked. The extensive peaty sedge meadow to the west and surrounding the lake, however, has a large rich flora. Most of the plants listed as "shore" plants occur primarily in this sedge meadow. Most abundant are tussock sedge, bottle-shaped sedge, dark green woolgrass, bulrushes, broad-leaved cattail, and amphibious smartweed. The sedge meadow is relatively free of alien species, except for some moderate-size patches of reed canary-grass. But a few plants of European swamp thistle were found here, the first known occurrence of this species in Portage County; it is likely to become more common.

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
- Thomas Lake

Curly leaf pondweed (*Potamogeton crispis*) was identified in

- Spring Lake
- Amherst Millpond

Contact the Portage County Land Conservation Department for additional information.

Skunk Lake ~ What can you do to help ?

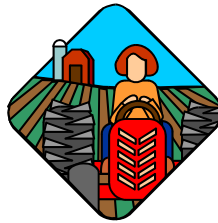
We Can All Help Take Care Of Our Lake

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



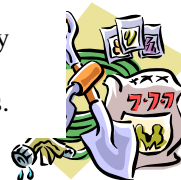
Lake Users:

- ✓ 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.

Project support provided by:

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

Study Contacts:

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Skunk Lake ~ Primary Researchers

Algae

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Aquatic Plants

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Birds

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Fish

Dr. Ron Crunkilton

Land Use Coverages/Watersheds

Steve Bradley (Portage County Conservationist)

Planning Assistance

Lynn Markham

Mike Hansen

Reptiles and Amphibians/Near Shore Habitat

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Rori Paloski (Graduate Student)

Water Quality/Watersheds

Becky Cook

Dr. Paul McGinley

Dr. Byron Shaw

Dick Stephens

Nancy Turyk

Near Shore Summary

Dr. Glenn Bowles

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