

# Bass Lake



## Management Plan 2009

Bass Lake Rehabilitation District

St. Croix County Land & Water Conservation Department

St. Croix County Sportsmen's Alliance

WI Department of Natural Resources



# What I Can Do to Protect My Lake!

*No cost/Low cost options*



**1. Leave plants near the shore.**



**2. Leave fallen trees in the water.**

**3. Slow stormwater from roofs and driveways.**

- a. Direct downspouts away from lake.
- b. Capture stormwater in ground depressions, rain barrels, or raingardens.



**4. Use Phosphorus-Free fertilizers and soaps.**



**5. Check for Invasive Species.**

- a. Remove aquatic plants from all watercraft.
- b. Drain water from your boat, motor, bilge, live wells, and bait containers.





## **ACKNOWLEDGEMENTS**

We would like to thank all of those who were involved in the creation of this document.

Bass Lake Rehabilitation District Commissioners:  
John Coughlin, William Lawson, Richard Allyn, Ron Laumeyer, John Haag, Brett Bader (St. Joseph town representative), and Linda Luckey (St. Croix County Representative).



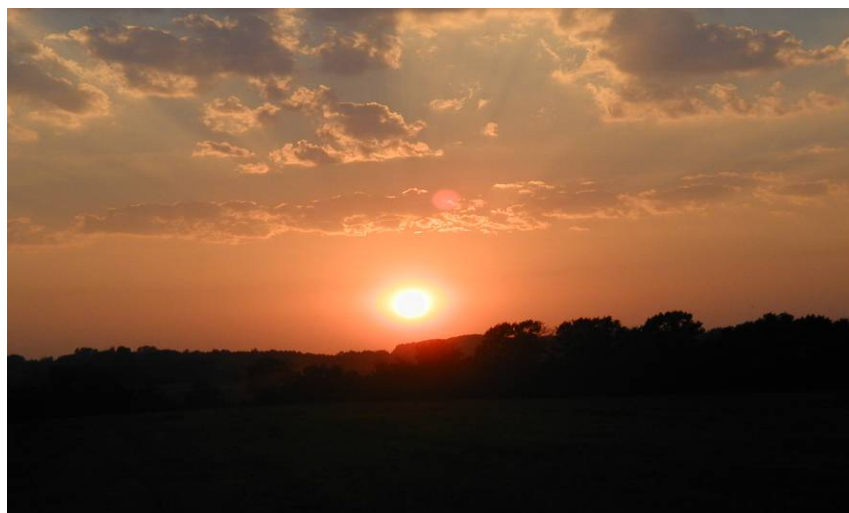
Bass Lake residents: Bye Barsness, Carol Benish, Jackie Engelhart, Regina Rippel, Connie Counter, and Tom Spaniol.

St. Croix County: Aleisha Miller (Land & Water Conservation Department Information & Education Specialist), Kevin Grabau (Zoning Specialist).



Wisconsin Department of Natural Resources: Patrick "Buzz" Sorge (Lake Management Planner), Marty Engel (Fisheries Biologist), Paul Sickman (Conservation Warden).

St. Croix County Sportsmen's Alliance: Mike Reiter.





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## SUMMARY

Bass Lake is an Outstanding Resource Water enjoyed by many residents and visitors. In an effort to protect this resource, the Bass Lake Rehabilitation District (BLRD) worked with the WI Department of Natural Resources and St. Croix County Land & Water Conservation Department (LWCD) to write the Bass Lake Management Plan. The writing of this plan included surveying lake residents, gathering watershed land use information, and research of past and on-going studies on Bass Lake. These studies included information on water quality, shoreland habitat, aquatic habitat, aquatic invasive species, and lake levels. The following goals and objectives are derived from the values and concerns of the members and residents of the Bass Lake Rehabilitation District and the science evaluating the health of Bass Lake.

GOAL I: Protect water quality, prevent the occurrence of algae blooms and reduce nutrient levels in Bass Lake.

GOAL II: Protect and improve the diverse aquatic life of Bass Lake; including a self sustaining fishery and diverse aquatic plant community.

GOAL III: Protect and restore healthy, stable shoreland habitats.

GOAL IV: Prevent the expansion and new infestations of invasive species.

GOAL V: Provide safe and multifaceted recreational opportunities.

## MANAGEMENT GOALS AND OBJECTIVES

The following goals and objectives are derived from the values and concerns of the members and residents of the Bass Lake Rehabilitation District and the science evaluating the health of Bass Lake.

Implementing the goals and objectives of the Bass Lake Management Plan will protect what we value most for the current and future generations of those that love and use Bass Lake. The Bass Lake goals will guide lake management activities by shore land property owners, the Bass Lake Rehabilitation District, the towns of St. Joseph and Somerset, St. Croix County and the Wisconsin Department of Natural Resources who will work together as a community to preserve and protect Bass Lake. This plan will be evaluated on an annual basis to review, update and document the successful implementation of these goals and objectives and implemented as funding is available.

Bass Lake Rehabilitation District will create and appoint members to a new Standing committee. The committee, to be named "Lake Quality Committee," will report to and be supervised by the BLRD Board of Commissioners.

### BLRD vision statement:

*Bass Lake Rehabilitation District is a proactive force to improve and protect the environmental quality of Bass Lake and its immediate watershed and assure its use for recreational purposes for this and future generations while maintaining its designation as an "outstanding resource water." Its focus will be to monitor environmental conditions, diagnose threats and deficiencies, and conduct programs to eliminate threats, correct deficiencies and make desired lake quality improvements. BLRD residents will become model stewards of this precious resource.*

## **BASS LAKE PLAN OBJECTIVES:**

### GOAL I: *Protect water quality, prevent the occurrence of algae blooms and reduce nutrient levels in Bass Lake.*

Bass Lake is an Outstanding Resource Water and residents enjoy its good water quality. Families, individuals and especially our children deserve to have a clean lake to use and enjoy. Reducing the total phosphorus concentration will help prevent summer algae blooms and protect or slightly improve summer water clarity. Protecting water quality will be achieved by reducing summer surface total phosphorus concentrations from 16 micrograms/liter (ug/l) to 15 ug/l. To reach this total phosphorus concentration goal, controllable sources of phosphorus to the lake must be reduced by 19 Kilograms/year (41.8 lbs/year) and future sources of phosphorus must be minimized. This will require involvement by all lakeshore residents.

We will measure our success of 15 ug/l as the five year running average and modeling our total phosphorus load reductions.

- **Encourage shoreland owners to manage stormwater.**

BLRD will apply for two lake planning grants in February 2010 to inventory shorelines for total phosphorus reductions, develop demonstration projects and conduct educational activities.

BLRD and LWCD will educate shoreland owners about the importance of capturing rain water from roofs and driveways with a goal of 10 homeowners implementing stormwater control each year.

LWCD will provide technical assistance for raingarden design and installation. A raingarden design class will be offered to lake residents 2010.

LWCD will provide technical support to assist in implementing storm water management practices and shoreland restorations.

- **Continue current water quality monitoring in Long Term Trends and Volunteer Monitoring Programs.**

WDNR (water quality staff) will continue annual water quality monitoring to show trends or changes. Water quality samples will be taken five times during the year: spring turnover, summer (three times) and fall turnover.

Current volunteer monitoring will be evaluated to more closely follow Citizen Lake Monitoring Network. Volunteers will monitor temperature & dissolved oxygen (*YSI*) and water clarity (*Secchi disk*). (Spring 2009, BLRD, LWCD)

Encourage other lake residents to participate in Citizen Lake Monitoring. (Spring 2009 newsletter article, LWCD)

- **Determine sources of phosphorus reduction**

WDNR will work with the University of Wisconsin Steven's Point Center for Watershed Science & Education to develop build out scenerios for Bass Lake phosphorus reduction using current zoning regulations and watershed land use data 2009.

- **Encourage reduction of nutrient loading from cropland**

LWCD will run the SNAP+ model to determine nutrient reduction of cropland.

- **Research feasibility of using pump to remove phosphorus from Bass Lake.**

WDNR will do a benefit analysis of pumping phosphorus loaded water from Bass Lake into the Willow River.

- **Research feasibility of removing cows from shoreline pasture.**

- **Create map of Bass Lake**

BLRD will work with Dr. Sean Hartnett from UW-Eau Claire Geography Department to produce a detailed lake map 2009.

- **Request the St. Croix County Planning and Zoning Department to update the Shoreland Zoning Ordinance to include shoreland buffer restorations and storm water management activities as requirements for riparian properties which are being developed or redeveloped.**

BLRD will survey membership by 2010 on support of such a proposal, vote at the annual meeting and if passed, submit a request to the St. Croix County Planning and Zoning Department.

LWCD & Planning and Zoning Department will develop a lake and river classification system based on WDNR and county labeling of waters for use in revised shoreland zoning ordinance. (2010)

- **Annually disseminate monitoring results on-line.**

WDNR Long Term Trends water quality monitoring results will be posted at:  
<http://dnr.wi.gov/lakes/CLMN/>

Citizen Lake Monitoring water quality monitoring results will be posted at:  
<http://dnr.wi.gov/lakes/CLMN/> & <http://www.blrd.org/>

GOAL II: *Protect and improve the diverse aquatic life of Bass Lake; including a self sustaining fishery and diverse aquatic plant community.*

Leaving fallen trees in the water and protecting high quality aquatic plant beds will improve fishing for anglers and many generations of future anglers. Healthy lake ecosystems are valuable natural resources for all lake users and help prevent invasive species from becoming a nuisance. Fish and aquatic populations will be protected and improved by: maintaining good water quality conditions; protecting high quality aquatic plant populations; protecting, improving and restoring in-lake habitats; and managing angler harvest.

- **Objectives from Goal I will help accomplish this goal.**
- **Educating riparian landowners on the importance of leaving fallen trees along shorelines and exposed beach areas and protecting aquatic vegetation for aquatic life.**

BLRD, LWCD and WDNR will provide educational information to lakeshore residents through a variety of outlets such as newsletters, email notices and brochures available at public meetings. Target date annual meeting 2010 and future annual meetings.

WDNR and LWCD will develop and present a short power point presentation to be given at the 2010 annual meeting.

- **Work with riparian landowners to increase woody habitat through the development and implementation of a woody habitat plan.**

WDNR and LWCD have mapped shorelines suitable for woody habitat restoration. Completed 2008.

BLRD will send out letters and maps to lakeshore owners with annual meeting announcement asking for voluntary participation by fall 2009. Requests will be repeated annually until a goal of at least 10% of the suitable shoreline is restored.

WDNR and LWCD will work with individual lakeshore owners to develop site specific plans for implementation during 2010.

BLRD will work with WDNR, LWCD and St. Croix County Sportsman's Alliance during 2009 to seek funding for implementation starting in 2010.

BLRD and WDNR will begin implementation during winter of 2010-2011. Implementation will be repeated as time and funding allows or until the large woody habitat project goal is reached.

- **Continue Trends Monitoring for aquatic plants, shoreland habitat and fisheries on present schedule.**

WDNR (water quality staff) will conduct aquatic plant survey. The survey will repeat past survey protocol to show trends or changes. Plant surveys will be completed every 3 years.

BLRD will conduct a shoreline habitat survey. The survey will document the current condition and status of shoreline habitat: completed 2007.

BLRD and LWCD will continue BLRD surveys, repeated annually to show trends or changes and to determine if shoreline goals are being met. Results of the shoreline habitat survey will be shared with BLRD and residents.

WDNR (fisheries staff) will conduct a comprehensive fishery survey, tentative date: spring 2011. The survey will be repeated every 10-15 years using past survey protocol to show trends or changes and to determine if fishery goals are being met.

- **Implement a 14-18" protection slot for bass.**

BLRD, St. Croix County Sportsman's Alliance, WDNR, will discuss the merit of changing the bass size and bag limit from 14 inch minimum, bag limit of five; to a 14-18 inch protected slot limit with a bag limit of 3 fish of which only one can be over 18 inches.

If approved by county vote the St. Croix County Sportsman's Alliance and WDNR will seek a permanent rule change by 2012.

- **Protection of pan fishery**

St. Croix County has a 10 fish bag limit on pan fish. Bass Lake is part of a study to evaluate whether the 10 pan fish limit will help improve the quality of the pan fishery. This may take 8 years to evaluate and is dependent on future funding.

GOAL III: *Protect and restore healthy, stable shoreland habitats.*

Restoring and protecting shorelands will provide privacy and tranquility as well as a natural space for families to enjoy nature. The shorelands of Bass Lake have changed over the years due to development and lake level changes. Restored and properly maintained shorelands are buffers that will provide water quality protection and critical habitat areas for water dependant aquatic and wildlife.

This objective will be reached when the annual shoreline inventory shows shoreline buffer improvement and the county shoreland ordinance is updated with clear objectives for shoreland habitat.

- **Objectives from the Goal I will help accomplish this goal.**
- **Educate riparian land owners on the importance of shoreland vegetation and develop a list of appropriate shoreland plants for restorations and to replace weedy species, i.e. sweet white clover.**

BLRD will apply for two lake planning grants in February 2010 to inventory shorelines for total phosphorus reductions, develop demonstration projects and conduct educational activities.

WDNR and LWCD will provide educational information to BLRD which will be disseminated to lakeshore residents through a variety of outlets such as newsletters, email notices and brochures available at public meetings. Target date annual meeting 2010.

WDNR and LWCD will develop and present a short PowerPoint presentation to be given at the 2010 annual meeting. The power point presentation will be viewable at BLRD website.

- **Work with riparian landowners to protect and improve shoreland habitat through the development and implementation of a shoreland habitat plan.**

WDNR and LWCD will annually map the condition and status of shoreline habitat and determine areas suitable for restoration.

BLRD will send out letters and maps to lakeshore owners with annual meeting announcement asking for voluntary participation by fall 2010. Requests will be repeated annually until a goal of at least 80% of the suitable shoreline is restored.

WDNR and LWCD will work with individual lakeshore owners to develop site specific plans for implementation (restoration or maintenance) during 2011.

BLRD and partners will begin implementation of demonstration projects during the spring of 2011. Implementation will be repeated as time and funding allows or until the shoreland restoration project goal is reached.

- **Request the St. Croix County Planning and Zoning Department to update the Shoreland Zoning Ordinance to include shoreland buffer restorations and storm water management activities as requirements for riparian properties which are being developed or redeveloped.**

BLRD will survey membership by 2010 on support of such a proposal, vote at the annual meeting and if passed, submit a request to the St. Croix County Planning and Zoning Department.

LWCD & Planning and Zoning Department will develop a lake and river classification system based on WDNR and county labeling of waters for use in revised shoreland zoning ordinance. (2011)

GOAL IV: Prevent the expansion and new infestations of invasive species

Many families and lake users enjoy recreating on Bass Lake. Bass Lake's high use and close proximity to the St. Croix and Mississippi Rivers put it at risk for invasive species introduction. Eurasian Watermilfoil (EWM) exists in the lake and has the potential to grow into large mats that clog boat propellers, invade swimming areas and out-compete less aggressive native plant populations. Bass Lake has experienced this in the past. Currently EWM has become a natural part of the ecosystem and is not acting like an invasive species. Native weevils which control EWM have been found at high densities in the past in Bass Lake. It is critical to continue to manage EWM to protect fishing and aquatic plant populations. Preventing new infestations of invasive aquatic species are critical to maintaining the integrity of native plant and animal communities which will protect and maintain the ecosystem health of Bass Lake.

- **Objectives from the Goal III will help accomplish this goal.**
- **Continue to protect the over-wintering habitat of the milfoil weevil by restoring and maintaining natural shorelines (On-going, Lake Residents).**
- **Encourage riparian landowners to leave aquatic vegetation which serves as competition for invasive species. (On-going, BLRD)**
- **Develop and implement Clean Boats, Clean Water program for the prevention of infestations of invasive species.**

BLRD will work with Beaver Creek Reserve in having the Clean Boats, Clean Waters program at the Bass Lake Landing (2009-2011)

BLRD will encourage lake residents and users to become Clean Boats, Clean Waters volunteers (summer 2009).

- **Monitoring for all invasive species, including zebra mussels and purple loosestrife.**

BLRD will work with the Beaver Creek Reserve Citizen Science Center to establish and train volunteer monitors.

WDNR (water quality staff) will conduct aquatic plant survey. The survey will repeat past survey protocol to show trends or changes. Plant surveys will be completed every 3 years.

- **Monitor for the current densities of weevils which have the potential to control EWM.**

BLRD will work with the Beaver Creek Reserve Citizen Science Center to discuss monitoring weevils.



GOAL V: Provide safe and multifaceted recreational opportunities.

Boating and fishing are favorite family and social activities for many lake users. Recreational needs and uses of Bass Lake will continue to grow as populations increase and development continues to occur in St. Croix County. It will be important to provide safe recreational opportunities for all lake users while protecting critical lake habitats and water quality.

- **Provide appropriate and safe public lake access**

BLRD will continue working with the Somerset Township to address excess parking on 153<sup>rd</sup> avenue.

County and BLRD will research funding options for boat landing maintenance.

- **Provide opportunities for peace and tranquility, such as non-motorized boating, wildlife watching and swimming activities.**

BLRD will continue the 8p.m-8a.m. Slow-No-Wake according to the Bass Lake Ordinance.

BLRD will continue buoy placement according to the Bass Lake ordinance.

- **Restore the walleye fishery to a minimum of one adult per acre. Stock extended growth walleyes (6"+) at a stocking rate of 10 fish per acre on an alternate year basis or 5 fish per acre annually.**

BLRD by fall 2009 will seek an agreement with Somerset Youth Athletic Association on an annual commitment for ½ the cost of annual walleye stocking.

The St. Croix County Sportsman's Alliance will work with BLRD to seek funding for ½ the cost of annual walleye stocking. BLRD will seek partial funding through its membership. To be completed by fall of 2009.

The WDNR will monitor walleye stocking success to determine if goals are being met. If determined necessary the WDNR can stock small walleye fingerling (<3 inches) at a rate of 35 per acre on alternate year basis, however such small walleye at this time have been determined to be unsuccessful at maintaining a walleye population in Bass Lake.

BLRD will post a sign on the ordinance board with contact information for making donations for walleye stocking.

- **Educate lake residents on the number/configuration of slips (docks) allowed by state statute.**

BLRD newsletter will have an article concerning this issue.

- **Educate Lake Users on boating regulations.**

BLRD newsletter will have an article concerning this issue.

BLRD will explore the feasibility of offering boater safety courses to community members.

## Background

Bass Lake is located in St. Croix County in the townships of Somerset and St. Joseph, approximately 50 miles east of the Minneapolis-St. Paul metropolitan area of Minnesota. It is a long, narrow 389 acre lake, with a maximum depth of 40 feet. It has an immediate watershed area of 529.9 acres. The land uses within the watershed (*the area of land where all of the water that drains off of it goes into the same place*) are rural residential and agriculture. Bass Lake is listed by the WI DNR as an “Outstanding Resource Water.”

St. Croix County is the fastest growing county in Wisconsin and the Bass Lake area is experiencing rapid population growth. There are currently 106 shoreline residents. The lake sees heavy use by anglers both winter and summer, and is a very popular site for recreational boating of all types. Its location close to the Twin Cities makes it a popular destination.



### BLRD vision statement:

*Bass Lake Rehabilitation District is a proactive force to improve and protect the environmental quality of Bass Lake and its immediate watershed and assure its use for recreational purposes for this and future generations while maintaining its designation as an “outstanding resource water.” Its focus will be to monitor environmental conditions, diagnose threats and deficiencies, and conduct programs to eliminate threats, correct deficiencies and make desired lake quality improvements. BLRD residents will become model stewards of this precious resource.*

Rapid residential development in the watershed and heavy recreational use are having a negative effect on the water quality of Bass Lake. WI DNR and Citizen Lake Monitoring Data show a decline in the water quality over the past 20 years. Shoreline and lake habitat have been lost due to riparian development. Bass Lake currently has Eurasian Milfoil, and with its heavy recreational use, is susceptible to further introduction of invasive species. Residents of Bass Lake are concerned with the public over-usage of the lake.

The protection of social values, water quality, fisheries, aquatic life and natural beauty of Bass Lake is dependant upon the continued stewardship of the Bass Lake Rehabilitation District, as well

as those who visit and enjoy the lake. The development of a riparian property (*a dwelling adjacent to a body of water*) increases water runoff and nutrient inputs to Wisconsin’s lakes (United States Geological Survey 2003). Runoff studies conducted on several northern Wisconsin lakes found that phosphorus inputs to lakes from developed lots were 8 times higher than phosphorus inputs from adjacent undeveloped forested lands.

Phosphorus is the nutrient responsible for stimulating algae growth in Wisconsin lakes. The major sources of phosphorus to northern Wisconsin lakes are lawn fertilizers and increased runoff from roof tops, roadways and other impervious surfaces associated with developed lake lots. Maintaining or

slightly decreasing phosphorus inputs to Bass Lake will protect water quality for future generations.



High quality shore land habitats are critical to the protection and production of fisheries and aquatic life. Over 90% of the aquatic life that lives in Bass Lake is dependent upon the near shore shallow water habitat for some or all life stages. This fact demonstrates why it is critical to protect and improve shoreland habitats of Bass Lake. Several studies of Wisconsin lakes (Christensen 1996, Schindler 2000, Jennings et al 2003, Woodford and Meyer 2003, Lindsay et al 2002, Garrison et al 2005, and Garrison and Wakeman 2000) have documented that current and historical development practices have been detrimental to Wisconsin lake ecosystems. Water quality, fish populations, woodland bird populations, frog populations, aquatic insects and plants, and near shore habitat have all been significantly degraded in developed Wisconsin lakes. The protection and restoration of lake shorelines can restore many critical habitat features.

Several studies have been conducted on Bass Lake to assess the health, condition and to assess protection and restoration potential of the Lake. Since 1986, the Wisconsin Department of Natural Resources has conducted trends studies for: water quality, shorelands, fisheries, and aquatic plants to characterize changes.

High lake levels prompted actions on Bass Lake. A hydrogeology study in 1979 determined

groundwater generally flows from east to west through Bass Lake and was not influenced by Mounds Pond of the Willow River. A Flood Hazard and Mitigation Plan was developed in 1996.

The Phase I Diagnostic and Feasibility Study of 1992 found that more than twice the nutrient loads of pre-settlement times were entering Bass Lake. As a result, Bass Lake became part of the St. Croix County Lakes Cluster Priority Watershed Project, from 1997-2008. During this time 12 shoreline owners helped protect Bass Lake's water quality by participating in the program with shoreline restorations and raingardens. (Voss. 2009)

Soil tests taken from a small sample of shoreline properties around Bass Lake found extremely high phosphorus levels. Optimum soil phosphorus is 18-25 ppm. Only one sample came back in this range; all others were 35 ppm or greater. The highest came back at 130 ppm. Soils around Bass Lake are naturally high in phosphorus and do not require lawn phosphorus fertilization.

An intern hired by the BLRD in 2007 conducted a shoreline survey of Bass Lake. She found that a majority of property owners were keeping their shorelines as natural as possible and many requested information on how to better protect their shore. Bass Lake residents should be proud of the way they are protecting their lake.

**...A majority of property owners were keeping their shorelines as natural as possible...  
Bass Lake residents should be proud of the way they are protecting their lake.**



## *Bass Lake Rehabilitation District Survey 2008*

Bass Lake Rehabilitation District residents were asked to complete a survey during the summer of 2008. Of the 106 lake residents, 63 replied. The survey asked several questions regarding why people chose to own property on Bass Lake, their perception of the quality of the lake and a variety of question related to owning property and recreating on the lake. The majority of residents chose to live on Bass Lake to spend time with their family (17%), as their home (14%) and to appreciate peace and tranquility (14%).

Responses were divided evenly between year round residents and summer/weekend residents. Boating is an important recreation activity on Bass Lake. All but two residents own at least one boat. The majority of boat owners have both a motorized and non-motorized boat such as a canoe or rowboat, showing the importance of motorized and non-motorized recreation activities to Bass Lake Residents. Fishing is also an important recreation activity to Bass Lake residents. 71% of respondents commented on the quality of fishing in Bass Lake.



Over all, Bass Lake residents are happy with its water quality. 83% list the lake as fairly clear or clear and 81% list the water quality as good or excellent. 83% say the water quality on Bass Lake has slightly worsened or remained the same since they have owned property on Bass Lake.

Boat traffic on weekdays seems good, while boat traffic on weekends is of concern. The overall experiences people have had with other boaters are good. Regarding public access to the lake, most residents feel there is too much access, specifically on the weekends.



Bass Lake residents were asked what issues regarding owning waterfront property concern you the most. These issues are addressed in the lake plan as a goal or as background information.

1. Protecting the natural lake environment (14.7%)
2. Paying property taxes (13.6%)
3. Excessive aquatic plant growth (12.4%)

Lake level (10.2%), water clarity (9%) and aquatic invasive species (9%) will also be addressed as they relate back to protection of the natural lake environment.

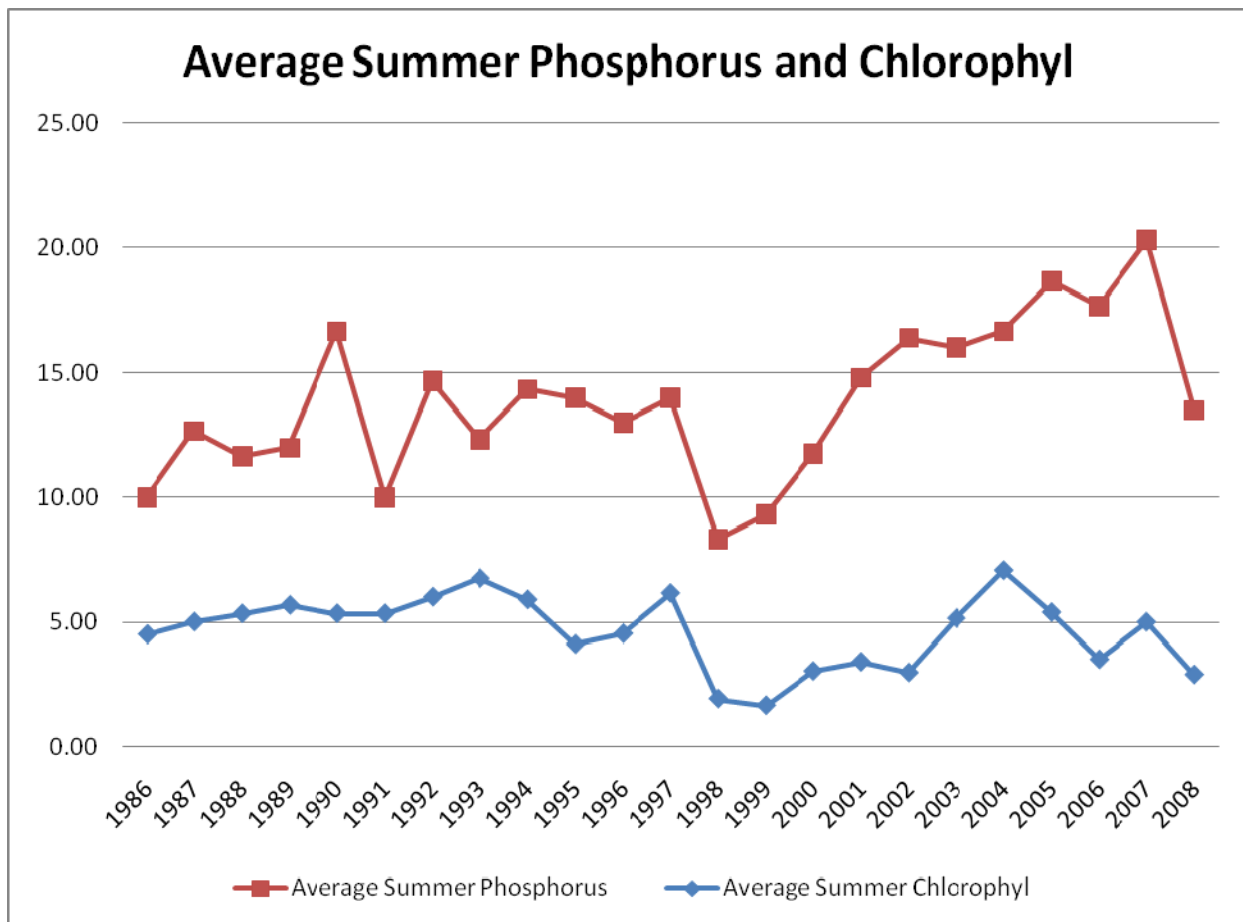


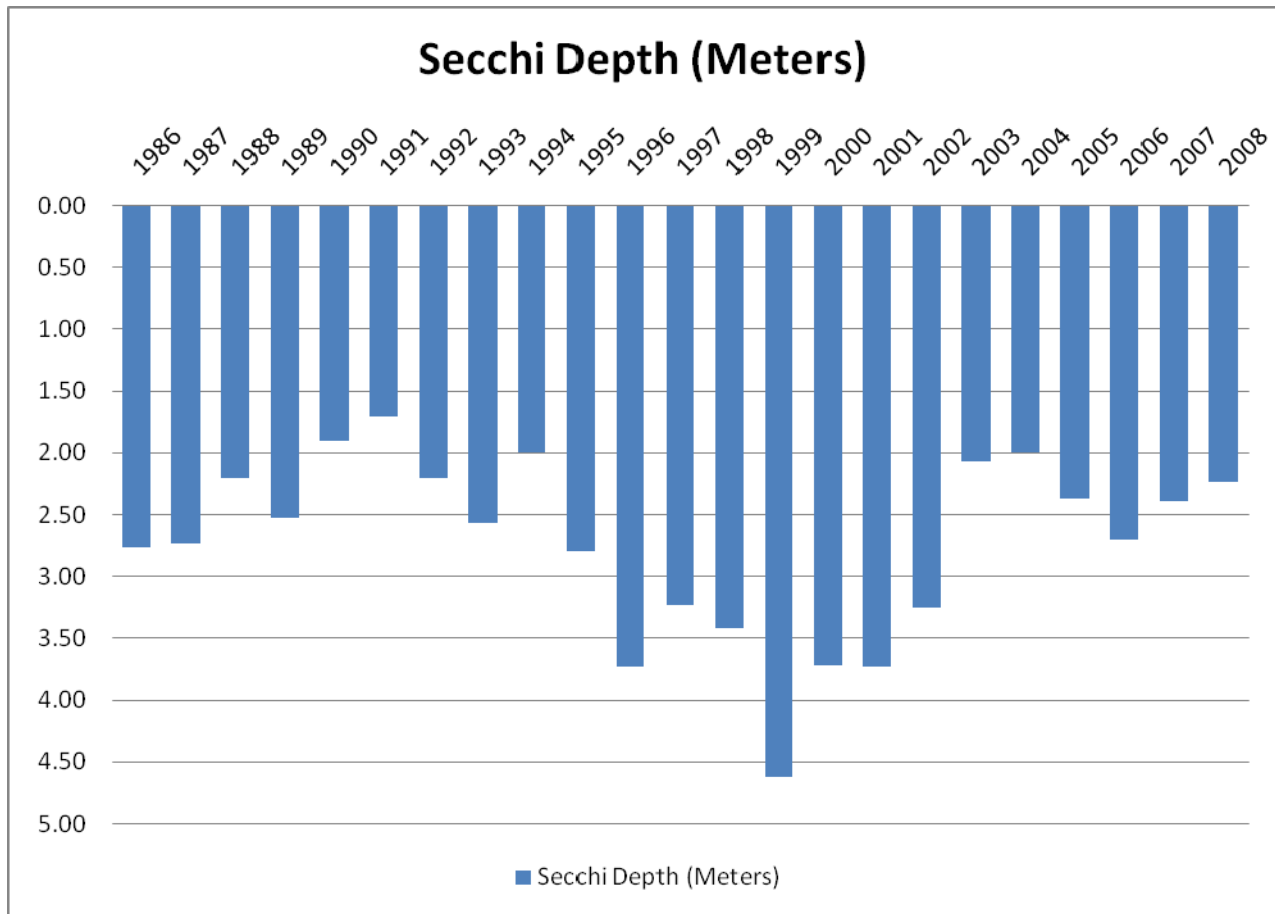
## Water Quality

Water quality monitoring is a tool to assess the health of a lake. Measurements of water clarity (secchi depth), algae abundance (chlorophyll) and nutrient enhancement (phosphorus) are used to determine water quality of lakes. To monitor water clarity, a secchi disk is used to measure the depth to which you are able to see. A low secchi depth can indicate low water clarity. Visibility in water can be affected by algae blooms or by natural coloration of the water. (Think of water which has a high amount of iron – the water is dark.) To determine if algae abundance is causing the visibility problems chlorophyll, a chemical found in plants, is also

tested. High amounts of chlorophyll indicate high levels of algae in the water. Phosphorus is the nutrient plants need to grow and that causes algae blooms. High total phosphorus leads to low water quality.

Water quality has been monitored annually in Bass Lake since 1986 as part of the WI-DNR Long Term Trends Monitoring Program. Volunteers have also monitored water quality off and on through the WI-DNR Self Help Monitoring Program. Since this monitoring began, water quality in Bass Lake has slightly declined. Total phosphorus and chlorophyll measurements have slowly increased and the secchi depth reading has decreased.

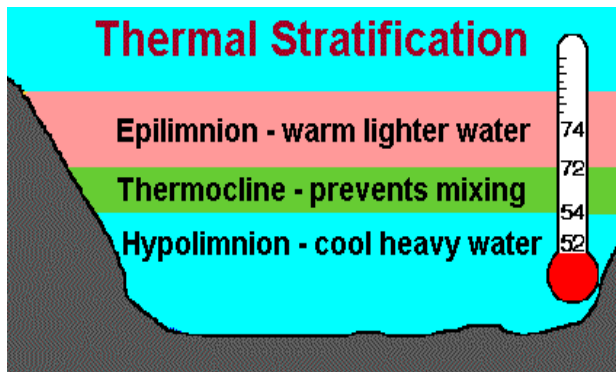




Currently, phosphorus levels in Bass Lake are 16 ug/l (ten year rolling average.) When lake phosphorus levels reach 20 ug/l lakes have more frequent algae blooms and water clarity decreases.

By mid-July there is no oxygen below a depth of 21 feet of Bass Lake.

Each year as the waters of Bass Lake warm in late spring and early summer the lake stratifies, or layers, into 3 distinct layers by water density. The colder bottom layer (hypolimnion) of the lake is separated by a mid layer

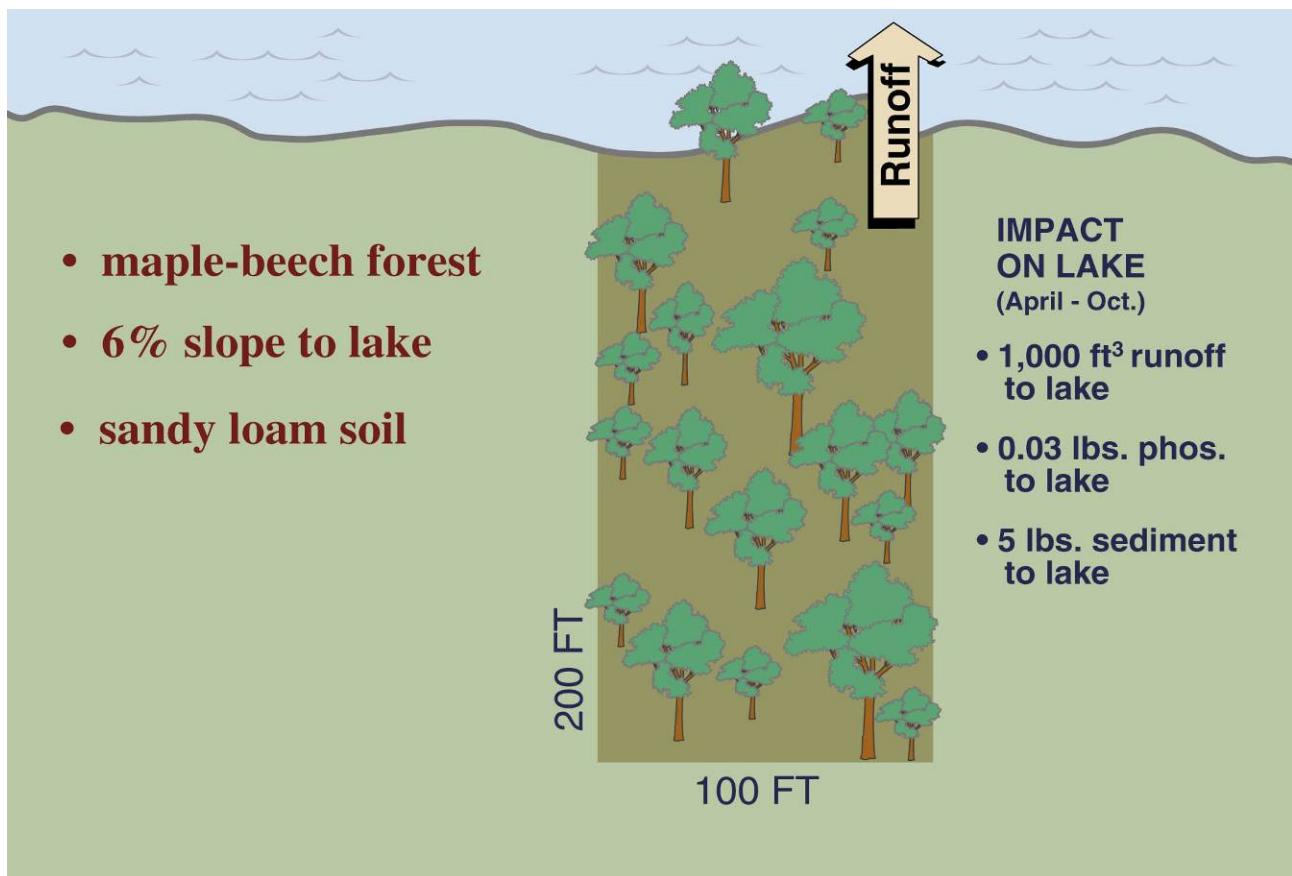


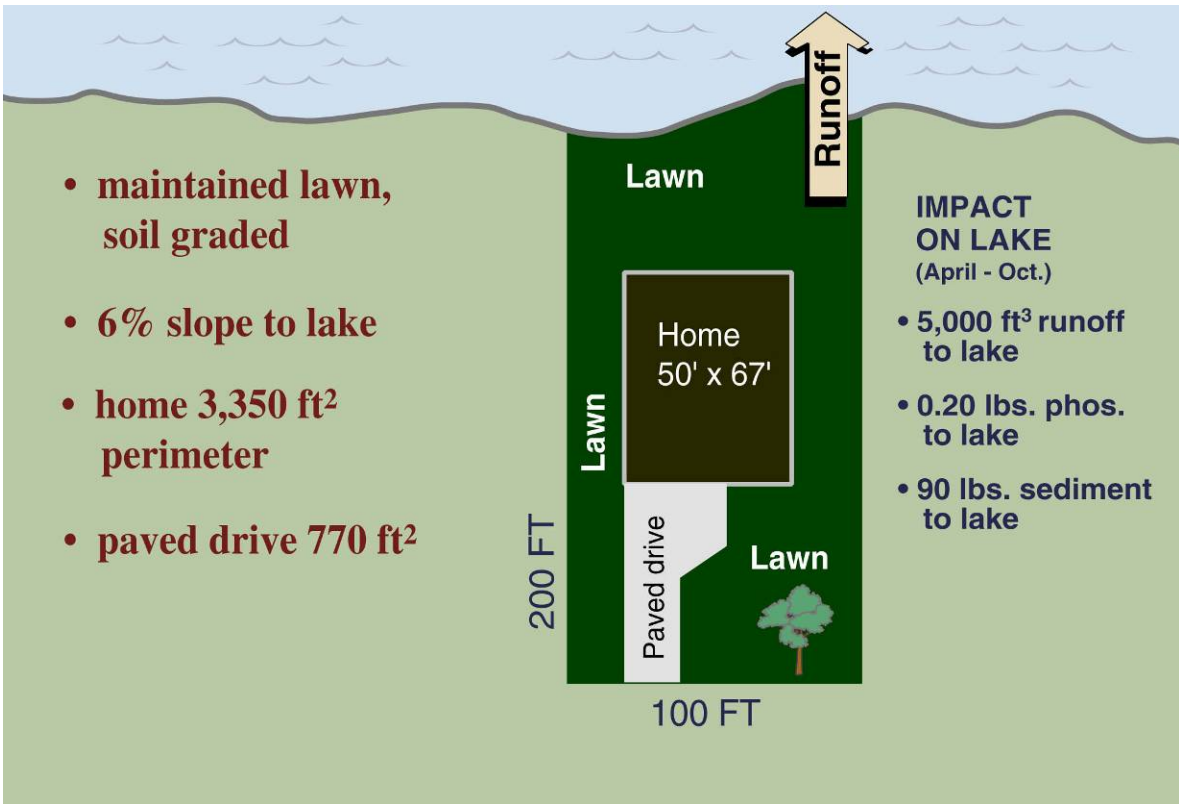
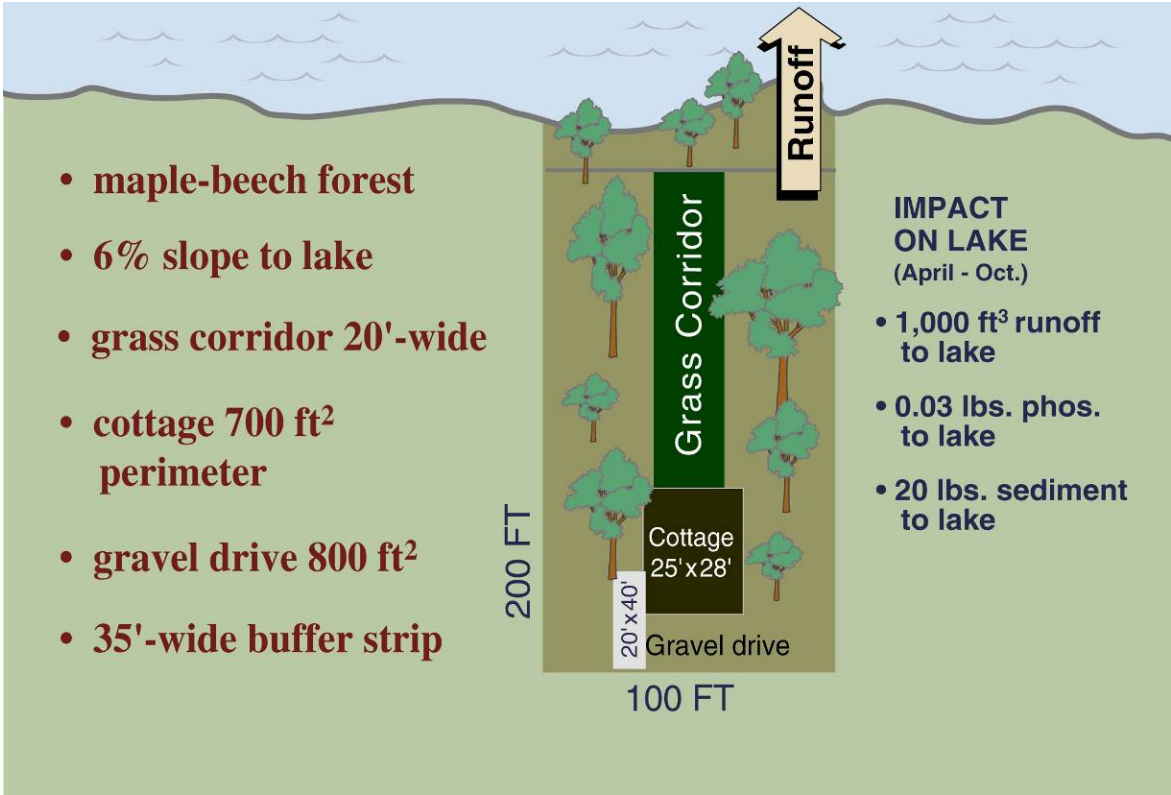
(thermocline) from the warmer surface layer (epilimnion). These layers remain stratified into three distinct layers until late fall when the lake mixes top to bottom and again with spring turnover. During these mixing periods, oxygen is returned to the lowest layer of the lake. By mid-July there is no oxygen on average below a depth of 21 feet in Bass Lake. This means no fish can survive below 21 feet. The loss of oxygen is caused by bacteria decomposing algae. This rapid loss of oxygen from the bottom layer is an indication of declining water quality.

## Land Use

There is a common phrase among lake managers – “Lakes are products of their watersheds.” Most often the land use of the lands within a watershed will influence the water quality of the lake. Natural land uses such as forest, grasslands and wetlands deliver natural amounts of storm water runoff and nutrients to lakes. The development of land for residential, commercial or agricultural purposes significantly increases the amount of storm water runoff and nutrients delivered to lakes.

Development increases the amount of storm water runoff by: adding impervious surfaces (rooftops, sidewalks, and roadways), decreasing the soils ability to infiltrate storm water due to compaction during construction and changing natural drainage patterns by grading. The concentration of nutrients in storm water runoff is increased by: excessive amounts of yard fertilizers, animal manure, agricultural fertilizer, atmospheric deposition and increased soil erosion.





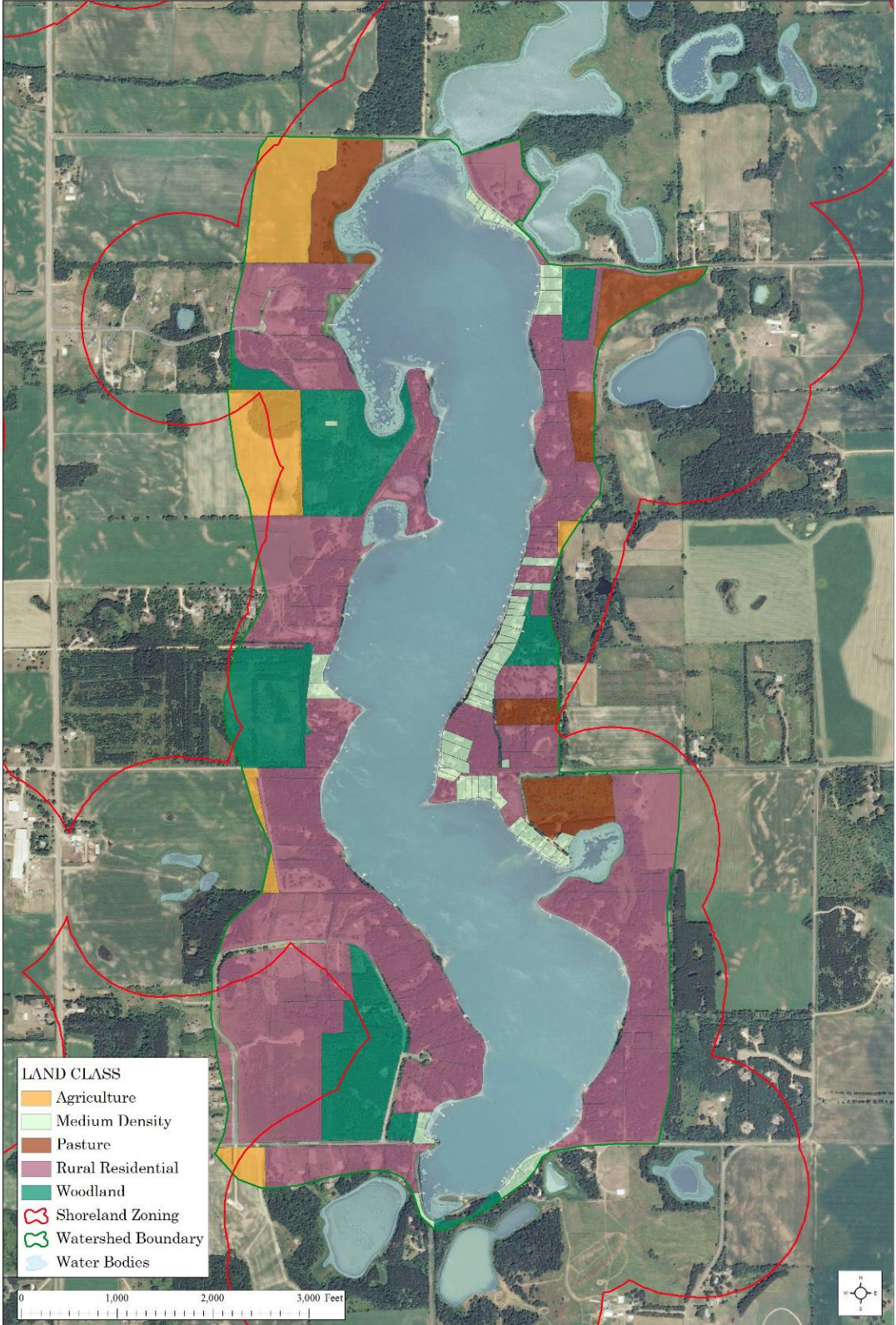


Land Use within the Bass Lake watershed has changed in the past 70 years. During the 1930's most of the watershed was in agriculture, with a small amount forested and a few homes. Aerial photos show changes as agricultural shoreland areas are converted to homes and more trees are allowed to grow. Currently Bass Lake land use within the watershed is: Medium Density development (1/4-1acre) = 26.86 acres, Rural Residential development (>1 acre) = 342.65 acres, Agricultural = 48.78 acres, Pasture = 41.25 acres, Woodland = 92.83 acres.

The change from an agricultural watershed to rural residential developed watershed is a benefit to Bass Lake. Agricultural runoff now has a much smaller impact on the water quality than in the 1930's. As previously stated, residential development can also cause harmful impacts if not done properly. Impervious surface currently accounts for 52.6 acres or 9% of the Bass Lake watershed. As lakes approach impervious surfaces of 7%, lakes begin seeing increased water quality declines.

The land use information was collected for Bass Lake and used to predict existing and potential water quality in the Lake.

Bass Lake Watershed  
Land Use



## Water Quality Modeling

Water quality models are computer based mathematical models which simulate lake water quality and watershed runoff conditions. The models are based on the mathematical representation of lake functions which determine lake water quality. The model is a tool which assists in predicting changes in water quality when watershed management activities are simulated. The model can answer the question: “what is the estimated water quality improvement when watershed sources of phosphorus are reduced?” It must be acknowledged that models predict a relative and not an exact environmental response.

A key component of the water quality model is the phosphorus budget. The phosphorus budget is the estimated amount of phosphorus delivered to the lake from each land use type annually. The phosphorus budget can be thought of as the fuel which drives the algae population in Bass Lake. With the current land use, the following is the phosphorus (P) budget of Bass Lake.



	Acre	Loading (Kg/Yr)	% of P Budget
Row Crop agriculture	51.5	21	11%
Pasture/Grassland	43.5	5	3%
Medium Density Development	28.3	6	3%
Rural Residential Development	361.6	44	23%
Woodlands	98	4	2%
Septic Tanks		8	4%
Groundwater		54	29%
Atmosphere	388.8	47	25%
<b>Total Phosphorus</b>		<b>189</b>	<b>100%</b>

### What to take from this table:

1st – 189 kilograms of Phosphorus enters Bass Lake each year.

2nd – we can't control all sources of phosphorus:

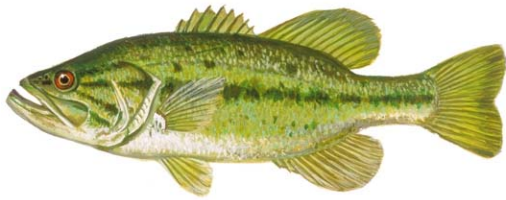
- Woodlands, septic tank, groundwater, Atmosphere

3rd – we can control the following sources:

- Agriculture Row Crops, Pasture, Medium Density & Rural Residential Development

## Fisheries

Historically, bass and pan fish were the predominate fish species found in Bass Lake. The pan fish population includes primarily bluegill and black crappie. Walleyes have been stocked in Bass Lake since the 1930's. Northern pike were introduced by fishermen, in the 1970's. Northern Pike populations expanded rapidly during high water periods, but since have declined as water levels drop.



**Largemouth Bass**

Pan fish and bass are considered to be abundant. These fish populations are influenced by the amount of littoral zone habitat found throughout the lake. Fluctuations in water level, loss of near shore habitat and the removal of large woody habitat from the lake by riparian land owners influence pan fish and bass spawning success. Bass and pan fish (especially crappie) depend on woody habitat in the water for spring spawning areas and for protection of juvenile fish from predation.



**Bluegill**

Woody habitat is the only shallow water cover available in spring as aquatic plants have not started to grow. As water levels drop or lake shores are developed, emergent vegetation and wood that was previously in the water becomes exposed and/or removed. Protection and restoration of riparian vegetation and large woody habitat is critical in maintaining healthy bass and pan fish populations.

Recent fish surveys indicate that there are a large number of small bass but not many large fish. The current bag limit is 5 fish over 14". A protected slot size limit of 14-18" fish may help improve the quality of bass populations. Bluegill are considered abundant but the number of quality size fish has been declining which prompted the DNR to implement a reduced pan fish bag limit from 25 to 10 in the spring of 2008. Crappie populations are currently of high quality, but low density. This is most likely due to limited spawning sites.

Walleye populations have been declining in Bass Lake. Walleye do not naturally reproduce in Bass Lake, but rely on stocking to support a recreational fishery. Natural walleye habitat is often associated with shallow, riverine lake environments with low bass and bluegill populations. The Wisconsin Department of Natural Resources has been stocking Bass Lake at a rate of 15,000 walleye every other year, the maximum allowed for a recreational fishery. But the high demand



**Walleye**

for walleye on the state fish hatcheries has caused the quality of walleye fingerlings stocked to decline. In recent years fish are smaller than they used to be and these fish are more vulnerable to predation. In the fall of 2009, 625 fingerlings (7+ inches) were purchased from a private fishery, (through a donation from the Somerset Youth Athletic Association), and stocked in Bass Lake. This was done on a trial basis with approval from local DNR staff. Recommended stocking rates for large fingerling (6 inch) are 10 per acre on alternate years or 5 per acre annually. A steady source of funding and support is needed to restore a quality walleye population to Bass Lake through large fingerling stocking.

## Aquatic Plants

Aquatic plants form the foundation of healthy and flourishing lake ecosystems - both within lakes and rivers and on the shores around them. They not only protect water quality, but they also produce life-giving oxygen. Aquatic plants are a lake's own filtering system, helping to clarify the water by absorbing nutrients like phosphorus and nitrogen that could stimulate algal blooms. Plant beds stabilize soft lake and river bottoms and reduce shoreline erosion by reducing the effect of waves and current. Healthy native aquatic plant communities help prevent the establishment of invasive non-native plants like Eurasian Watermilfoil.

It makes sense that the best fishing spots are typically near aquatic plant beds. Aquatic plants provide important reproductive, food, and cover habitat for fish, invertebrates, and wildlife. Its aquatic plants that fashion a nursery for all sorts of creatures ranging from birds to beaver to bass to bugs. In order to maintain healthy lakes and rivers, we must maintain healthy native aquatic plant communities.

*Aquatic plants are a lake's own filtering system, helping to clarify the water by absorbing nutrients like phosphorus.*



Aquatic plant populations have been monitored in Bass Lake from 1987-present. Aquatic plant studies have been conducted every three years by the WI Department of Natural Resources as part

of the *Long Term Trends Lakes Monitoring Program*. The most recent study was conducted in 2006. The aquatic plant community was stable during 1987-1993. Between 1993 and 2002, the plant community underwent significant change due to water level fluctuations and Eurasian Watermilfoil introduction in 1997. Eurasian Watermilfoil became the dominant species and then

dramatically declined, likely due to the milfoil weevil. In 2002-2006, the aquatic plant community stabilized and reached its highest quality (Konkel 2007).

## Sensitive Areas

A Sensitive Area Study was conducted by the WI Department of Natural Resources in October, 2003. Nine sensitive areas were identified in Bass Lake. These are sensitive and fragile areas on Bass Lake that support wildlife and fish habitat, provide water quality protection, harbor quality plant communities and preserve the places of serenity and aesthetic beauty for the enjoyment of lake residents and visitors. These sites also provide over-winter habitat for the milfoil weevil. By identifying and mapping these sensitive areas we are able to preserve and protect the most critical habitats within Bass Lake.

<http://dnr.wi.gov/lakes/criticalhabitat/>

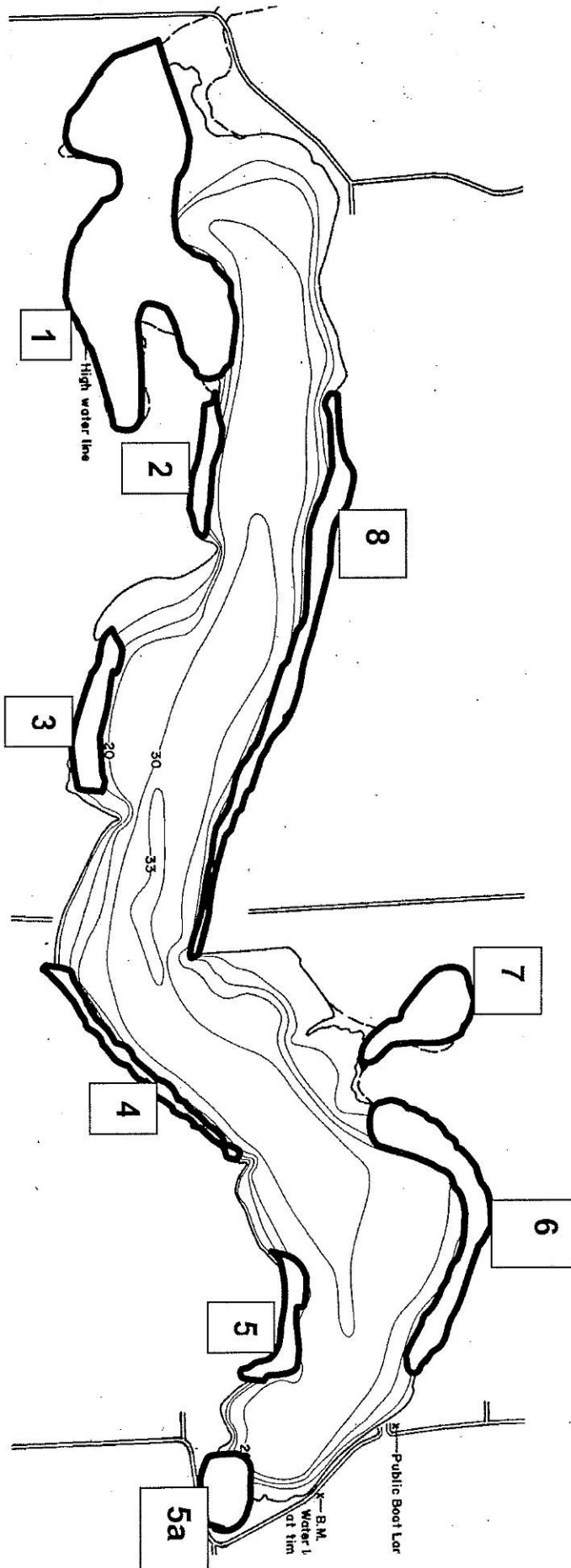
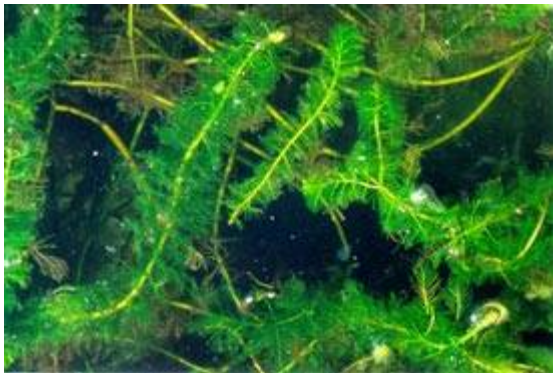


Figure 1. Location of Designated Sensitive Areas on Bass Lake, St. Croix County

## *Eurasian Watermilfoil*

In August 1997, Eurasian Watermilfoil was first found in Bass Lake. By 1999 dense stands of Eurasian Watermilfoil were beginning to limit the use of some docks. In June 2000 and May 2001, selective chemical treatments for Eurasian Watermilfoil were conducted at the docks of individual landowners that requested treatment. A permit for chemical treatment of Eurasian Watermilfoil was applied for in 2002, but the exotic milfoil did not appear at the docks that year. A survey conducted that year found that Eurasian Watermilfoil had declined lake-wide and has since remained at very low levels in scattered locations (Konkel 2007).



*Every piece of shoreline that is cleared on Bass Lake is promoting the return of uncontrolled Eurasian Watermilfoil*

Potential explanations for the decline of Eurasian Watermilfoil on Bass Lake include the drop in lake level and native milfoil weevil control.

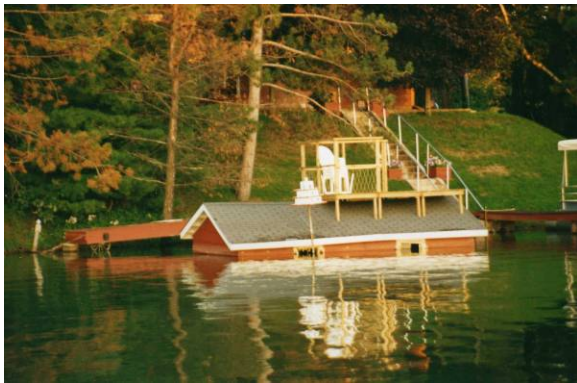
Natural shoreline is critical for weevil survival. Although the weevil is an aquatic insect during the growing season, it must hibernate on land in leaf litter or thick plant cover during the winter. Rip-rap, sand beaches and mowed grass do not provide enough protection over the winter. Every piece of shoreline that is cleared on Bass Lake is promoting the return of uncontrolled Eurasian Watermilfoil (WI DNR 2003).

If Bass Lake is to be protected from future uncontrolled invasion of Eurasian Watermilfoil, it is critical that natural shorelines are protected and restored to provide overwintering habitat for the milfoil weevil.



## Lake Level

Bass Lake is a seepage lake. Seepage lakes do not have a stream in or out, and only occasionally overflow. As landlocked waterbodies, the main source of water is groundwater and precipitation or runoff. Since seepage lakes commonly reflect groundwater levels and rainfall patterns, water levels may fluctuate seasonally, rising with high precipitation and dropping during long droughts. Seepage lakes are the most common lake type in Wisconsin.



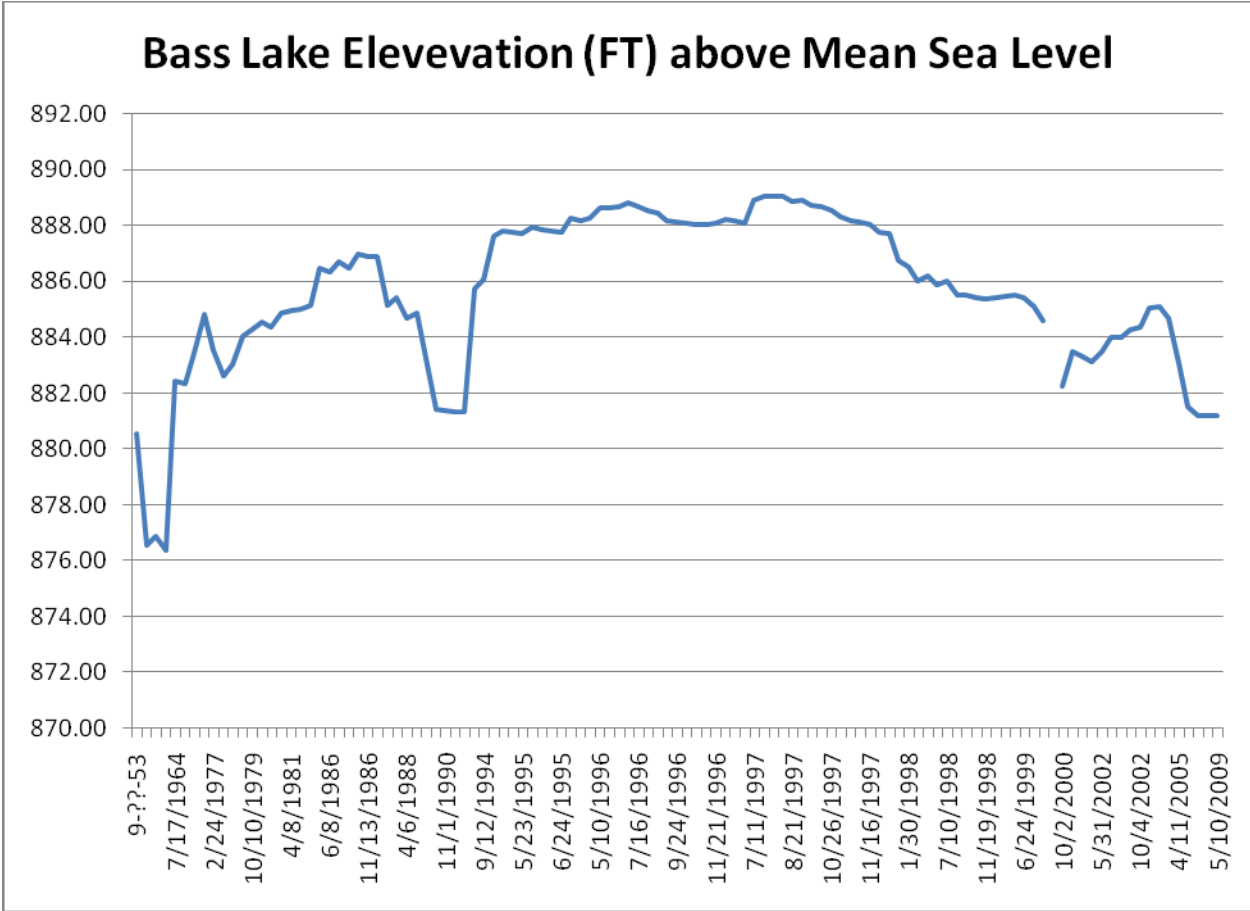
Bass Lake water levels have fluctuated over 10 feet. In the late 1970's and mid 1980's, homes and roads were flooded. In 1995, lake elevation exceeded all previous recorded levels. Adverse impacts have included damaged and unusable roads,

impaired use of the boat landing, property loss and damage, and shoreline erosion. In the spring of 1995, the BLRD enacted an emergency slow, no-wake ordinance for the entire lake. (Voss. 1997)



Below is a graph of the lake elevation data since 1953.





The following aerial photos show the changes in Bass Lake over the past 70 years. Notice that in 1965, the northern end of Bass Lake was dry. This area was used as a pasture and the current boat landing would not reach water.





1957



1965



1973





## RESOURCES

Bass Lake Rehabilitation District: <http://www.blrd.org/index.html>

Citizen Lake Monitoring Network: <http://dnr.wi.gov/lakes/CLMN/>

Lakescaping for Wildlife & Water Quality by Henderson, Dindorf & Rozumaliski:  
[http://www.dnr.state.mn.us/eco/pubs\\_restoration.html](http://www.dnr.state.mn.us/eco/pubs_restoration.html)

Life on the Edge...Owning Waterfront Property: <http://www.uwsp.edu/cnr/uwexplakes/publications/edge/>

UW-Extension Lakes Program: <http://www.uwsp.edu/cnr/uwexplakes/>

UW-Extension Water Resources Publications: <http://clean-water.uwex.edu/pubs/>

Wisconsin Association of Lakes: <http://www.wisconsinlakes.org/>

Wisconsin Department of Natural Resources – Lakes: <http://www.dnr.state.wi.us/org/water/fhp/lakes/>

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(Christensen 1996, Schindler 2000, Jennings et al 2003, Woodford and Meyer 2003, Lindsay et al 2002, Garrison et al 2005, and Garrison and Wakeman 2000)

(United States Geological Survey 2003)

Voss. 1997. Nonpoint Source Control Plan for the St. Croix County Lakes Cluster Priority Watershed Project.

Voss. 2009. St. Croix County Lakes Cluster Priority Watershed Project Final Report 2009.

Gabriel. 2007. Bass Lake Rehabilitation District: Summer Intern Report.

## Appendix A: Bass Lake Resident Survey 2008

### 1. In what year did you purchase your lake property?

Average: 1982      Blank: 7      30's - 2      50's - 4      70's - 8      90's - 8  
 40's - 1      60's - 4      80's - 17      00's - 12

### 2. Why did you buy property on a lake?

#### Order of importance based on %

A.	Spending time with family	17.4%
O.	Primary residence	13.5%
D.	Appreciating peace and tranquility	13.5%
P.	Secondary residence	8.4%
J.	Swimming/SCUBA/snorkeling	6.2%
B.	Entertaining friends	5.6%
C.	Investment	5.6%
E.	Enjoying the view	5.6%
G.	Water quality	5.1%
M.	Water skiing/tubing	5.1%
I.	Fishing/ice fishing	4.5%
L.	Motorized boating	3.4%
Q.	Other:	2.8%
H.	Observing wildlife	1.7%
K.	Non-motorized boating	1.1%
F.	Water clarity	0.5%
N.	Jet skiing	0.0%

#### Order of Importance based on weighted score

A.	Spending time with family	72
O.	Primary residence	65
D.	Appreciating peace and tranquility	45
P.	Secondary residence	36
B.	Entertaining friends	20
M.	Water skiing/tubing	18
C.	Investment	16
E.	Enjoying the view	15
J.	Swimming/SCUBA/snorkeling	14
I.	Fishing/ice fishing	13
G.	Water quality	12
Q.	Other:	12
L.	Motorized boating	10
K.	Non-motorized boating	4
H.	Observing wildlife	3
F.	Water clarity	1
N.	Jet skiing	0

3 Blank

#### Q. Other Comments:

\*commuting distance to twin cities

\*all water activities (swimming, fishing, boating)

\*farm purchased to use land and live on

\*(additional choices the person made) water clarity, water quality, water skiing, motorized boating, investment

\*location on lake

\*we've always been on a lake and wanted to move back to WI

### 3. Why did you choose property on Bass Lake?

#### Order of importance based on %

F.	Met your needs from Question 2	29.8%
A.	Distance from primary residence	16.5%
C.	Cost of property	14.6%
B.	Family tradition	11.9%
D.	Low number of people using the lake	9.9%
E.	Because of the neighborhood	8.6%
G.	Other:	8.6%

#### Order of Importance based on weighted score

F.	Met your needs from Question 2	101
A.	Distance from primary residence	70
B.	Family tradition	44
C.	Cost of property	34
G.	Other:	29
D.	Low number of people using the lake	28
E.	Because of the neighborhood	25

2 Blank

#### G. Other Comments:

\*we like Bass Lake

\*wanted to live on a lake

\*friends

\*closer to family

\*distance from family and friends

\*keep it in the family

\*close to work, friends and school

\*not far from cities where we work 3 days/week

\*proximity to Twin Cities

\*location to work

\*distance from work

\*water quality and distance to workplace

\* water quality

\*already has....(I couldn't read the rest of the writing)

### 4. Which of the following best describes when you use your lake property?

13 Weekends

1 Vacations/Holidays

7 Summertime resident

6 Spring/Summer/Fall

34 Year round resident

2 Other:

#### Other:

\*year round non primary resident

\*never

\*home (building) is not on lake (Orf Farm)

\*weekends year round

\*year round part time



**5. What structures exist on your property?**

49 Winterized house

14 Summer cottage

6 Boathouse

47 Garage/storage shed

48 Dock/pier

3 Other:

Other:

\*gazebo

\*pole barn

\*beach house

\*buildings not on/near lake (Orf farm - referring to garage/storage shed)

**6. How many of the following watercraft are kept at your property?**

40 Canoe/Kayak

15 Rowboat

12 Sailboat

7 Jet ski

14 Motor boats under 25 HP

52 Motor boats 25 HP and over

12 Other:

2 None

2 Blank

Min watercraft: none

Max watercraft: 6

Other:

\*Lake patrol boat

\*raft

\*pontoon

\*pontoon

\*pontoon

\*pontoon

\*pontoon, paddle boat

\*paddle boat

\*rowing shell, paddle wheeler

\*wind surfer

\*2 water bikes

\*none

**7. How many feet of lake frontage do you own?**

Average: 253'

Max: 1250' Min: 30'

  9   Blank

**8. Which of the following best describes your shoreline?**

 51  Natural vegetation

 12  Lawn

   6  Planted trees or shrubs

   2  Masonry retain wall

   1  Wood retaining wall

  12  Rocks added for stabilization

   6  Other:

   1  Blank

Other:

\*biologs   \*roadway

\*sand       \*(can't read comment)

\*sand       \*not rip rap! (Indicated they had rocks added for stabilization)

\*sand

**9. Do you maintain a lawn on your property?**

 55  Yes

   7  No: skip to question 11

   1  Blank

**10. If you have a lawn, do you ever apply fertilizer containing phosphorus?**

   2  Yes

 50  No

    Unsure

   4  Blank

   7  skipped to question 11

Notes:

\*very small lawn, pitches away from the lake into a ravine, 200' infiltration before entering lake. (They choose yes)

**11. During the time you have owned property on Bass Lake to what extent have you noticed the following occur on this lake?**

	Never	Occasionally	Often	Blank	
Reduced water clarity	5	33	18	7	
Excessive weeds	2	35	22	4	
Sedimentation	22	22	4	15	
Large fluctuations in water levels	5	29	24	5	
Erosion	24	24	3	12	
Fish kills	20	31	1	9	2 - one time
Unusual water smell or coloration	38	13	0	12	
Failing septic systems	27	15	1	20	

*Notes:*

- \* during the high water years (referring to: "sedimentation", "large fluctuations in water levels" and "erosion")
- \*when water was high (referring to: "sedimentation", "large fluctuations in water levels", "erosion" and "failing septics")
- \*don't care
- \*carp virus (referring to "fish kills")

**12. How would you define the water clarity of Bass Lake?**

- Cloudy
- 3 Fairly cloudy
- 7 Unsure
- 43 Fairly clear
- 9 Clear
- 1 Blank

*Notes:*

- \*depends which month

**13. How would you define the water quality of Bass Lake?**

- Poor
- 5 Fair
- 6 Unsure
- 42 Good
- 9 Excellent
- 1 Blank

*Notes:*

\*Except where there is weeds (They choose "good")

**14. Since you have owned your property on Bass Lake, would you say the water quality has:**

- 6 Greatly worsened
- 27 Slightly worsened
- 25 Remained the same
- 2 Slightly improved
- Greatly improved
- 2 Blank
- 1 Don't Know

**15. Do you believe that establishing or maintaining native vegetation, such as a buffer zone, along your shoreline...**

**a. Improves the water quality of Bass Lake?**

5 Definitely no

3 Probably no

10 Unsure

15 Probably yes

29 Definitely

1 Blank

**b. Enhances the beauty of your property?**

13 Definitely no 20.6%

9 Probably no 14.3%

11 Unsure 17.5%

14 Probably yes 22.2%

15 Definitely yes 23.8%

1 Blank

**c. Increases the economic value of your property?**

14 Definitely no 22.2%

10 Probably no 15.8%

18 Unsure 28.6%

9 Probably yes 14.3%

11 Definitely yes 17.5%

1 Blank

*Notes:*

\*farmer's runoff ruins the lake I believe

**16. Which, if any, are contributing to water quality problems in Bass Lake?**

	<b>Major problem</b>	<b>Moderate problem</b>	<b>Not a problem</b>	<b>Don't know</b>	<b>Blank</b>
Fertilizers & pesticides from residential development	16	20	3	15	9
Soil erosion from:					
1. Residential areas	4	17	16	18	8
2. Construction areas	5	11	19	18	10
3. Agricultural areas	10	12	13	19	9
4. Natural shorelines	3	4	28	16	12
5. Developed shorelines	7	22	6	19	9
Stormwater running off:					
1. Streets, highways, parking lots	4	23	12	14	10
2. House roofs, driveways, and residential lands	3	19	17	16	8
3. Agricultural land	10	21	10	15	7
Accidental spills of gas/oil from boats in the lake	5	19	12	19	8
Loss of natural shoreline to lawns and development	8	25	10	11	9
Yard or grass clippings or leaves disposed of in lake	8	9	15	23	8
Improper disposal of household chemicals	5	7	10	31	10
Introduction of non-native plants and animals	13	19	4	19	8
Animal waste (pets, geese, etc.)	6	20	10	21	6
Septic systems	3	20	5	28	7
Other: please list	2				

Other:

- \*Cudd boat house falling into the lake, shingles, boards, etc.
- \*too much boating by non-residents
- \*lower water volume, less dilution of nitrates, chlorophyl

Notes:

- \*What problems? What good is a survey that assumes problems exist?
- \*Does this really happen? (referring to: "yard/grass clippings/leaves disposed of in lake" and "Improper disposal of household chems")

**17. Do you think the water that runs off your property negatively impacts Bass Lake?**

- 25 Definitely no
- 27 Probably no
- 5 Unsure
- 3 Probably yes
- 3 Definitely yes

**18. How would you rate the fishing in Bass Lake?**

- |   |       |
|---|-------|
| <u>8</u> Poor                                     | 17.7% |
| <u>11</u> Fair                                    | 24.4% |
| <u>8</u> Unsure                                   | 17.7% |
| <u>16</u> Good                                    | 35.5% |
| <u>2</u> Excellent                                | 0.4%  |
| <u>16</u> N/A: I don't fish → Skip to question 21 |       |
| <u>2</u> Blank                                    |       |

**19. How has the quality of fishing changed since you started?**

<u>11</u> Greatly declined	<u>Notes</u>
<u>12</u> Somewhat declined	* lost walleyes
<u>15</u> Stayed the same	*bigger fish
<u>4</u> Somewhat improved	*forget the fishing contest
<u>0</u> Greatly improved	*never saw fish with black spots before
<u>16</u> Skipped to question 21	
<u>5</u> Blank	

**20. If you indicated that fishing quality has declined, what do you think has contributed to the decline?**

<u>Order of importance based on %</u>	
C. Over fishing	23.1%
G. Heavy recreation	23.1%
A. Loss of habitat	15.4%
L. Other	11.5%
F. Development	9.6%
B. Shoreline damage	3.8%
I. Herbicides	3.8%
J. Agriculture	3.8%
D. Fertilizer use	1.9%
E. Soil erosion	1.9%
K. Weeds	1.9%
H. Septic systems	0.0%

<u>Order of Importance based on weighted score</u>	
C. Over fishing	44
G. Heavy recreation	23
A. Loss of habitat	19
L. Other	15
F. Development	6
B. Shoreline damage	5
J. Agriculture	4
I. Herbicides	2
D. Fertilizer use	2
E. Soil erosion	1
K. Weeds	1
H. Septic systems	0

16 Skipped to question 21  
24 Blank  
Notes:  
 \*(Can't read writing)

L. Other Comments:  
 \*DNR practices  
 \*DNR stock fry not finterling  
 \*lack of stocking by DNR

\*lack of stocking as is done in other lakes in a 30-40 mile range  
 \*addition of Northern, S.M. Bass, Sauger; Limit 14" size on Bass  
 \*not sure



**21. How would you describe the overall shoreline of Bass Lake?**

- 1 Overdeveloped
- 45** Moderately developed
- 2 Unsure
- 14 Lightly developed
- 1 Natural

**22. What is the level of aquatic plant growth in Bass Lake?**

Dense growth	1	6
	2	13
	3	21
Unsure	4	13
	5	8
	6	2
Very light growth	7	0

Average: 3.16

Notes:

\*north end/bays very dense

**23. How would you rate the peace and tranquility on Bass Lake?**

Many disturbances	1	3
	2	6
	3	9
Unsure	4	5
	5	17
	6	18
No disturbance	7	3
Blank		1

Average: 4.45

Notes:

\*very good with the exception of late night bow fishing, very disturbing

\*only with late night partyers

\* on weekends (they choose 2)

**24. What is the level of boat traffic on Bass Lake?**

Overused	1	6
	2	9
	3	19
Unsure	4	13
	5	8
	6	5
Underused	7	1
Blank		1

Average: 3.38

Notes:

\*1 on weekends, 5 on weekdays. (I used the worst value in the rankings)

\*weekends only (refers to their rating of 2)

\*2 weekends, 6 weekdays (I used the worst value in the rankings)

**25. How have your experiences been with other boaters?**

Major conflict with boats	1	0
	2	2
	3	6
Unsure	4	3
	5	12
	6	13
No conflict with boats	7	25
blank		1

Average: 5.59

**26. What is the level of public access to the lake?**

Overwhelming access	1	10
	2	13
	3	18
Unsure	4	12
	5	7
	6	1
Not enough access	7	0
blank		2

Average: 2.93

Notes:

\*I think we should keep down public access

\* on weekends (they choose 2)

\*needs control!!!

**27. What issues regarding owning waterfront property on Bass Lake concern you the most?**

<u>Order of importance based on %</u>	
C. Protecting the natural lake environment	14.7%
A. Paying property taxes	13.6%
F. Excessive aquatic plant growth	12.4%
I. Lake level	10.2%
D. Water clarity at the end of my dock	9.0%
J. Aquatic invasive species	9.0%
H. Boat traffic	7.3%
G. Slow-no wake, 8pm-8am	5.6%
B. Maintaining the investment value of my property	5.1%
E. Water clarity in the middle of the lake	4.0%
K. Loss of natural scenery	4.0%
L. Fishing opportunities	2.8%
M. Other:	2.3%

<u>Order of Importance based on weighted score</u>	
C. Protecting the natural lake environment	68
A. Paying property taxes	60
F. Excessive aquatic plant growth	40
I. Lake level	39
D. Water clarity at the end of my dock	31
H. Boat traffic	25
J. Aquatic invasive species	23
B. Maintaining the investment value of my property	19
G. Slow-no wake, 8pm-8am	16
E. Water clarity in the middle of the lake	12
K. Loss of natural scenery	9
L. Fishing opportunities	9
M. Other:	8

1 Blank

M. Other Comments:

- \*nutrients
- \*get rid of hired lake patrol
- \*BLRD no longer needed
- \*over fishing
- \*all of the above

Notes

- \*G not needed (Slow-no wake, 8pm-8am)
- \*G keep this going! Do not change because of skiing pressures. More lakes should have this program.
- \* C, J & K lead to B (They had chosen C, J & K as their top 3 priorities)
- \*we have a boat house falling apart in the lake
- I have siding, paint chips and other things floating around. What are you going to do about that??
- \*boat traffic on weekends
- \*water level is dropping too much

**28. What water quality practices do you already have/do on your property?**

39 35' Buffer zone or greater

20 Downspouts directed away from the lake

46 Natural shoreline

37 Don't fertilize

10 Rain gardens

6 Rain barrels

10 Rain infiltration areas

34 Leave aquatic vegetation

6 Other:

4 Blank

3 Blank

Other:

\* No P fertilizer and cleaning supplies

\*uses low P products

\*P free fertilizer

\*very little fertilizer

\*plantings

\*no gutters period

\*all of the above

Notes:

\*except swimming area near shore. (They had marked "Leave aquatic vegetation")

**29. What would motivate you to install a water quality practice, such as a shoreline buffer or rain garden, on your property?**

Order of importance based on %

A. Improving lake water quality	29.1%
C. Providing better habitat for fish and wildlife	14.9%
B. Improving water quality around my dock	9.5%
E. Displaying a commitment to the environment	8.9%
F. Available financial and technical assistance	8.9%
D. Increasing the natural beauty of my property	6.8%
K. Other:	6.8%
G. Setting an example for other lake residents	6.1%
J. Increasing my property value	5.4%
H. Savings on landscaping/maintenance costs	2.7%
I. Increasing my privacy	1.4%

Order of Importance based on weighted score

A. Improving lake water quality	113
C. Providing better habitat for fish and wildlife	39
B. Improving water quality around my dock	31
K. Other:	30
F. Available financial and technical assistance	24
E. Displaying a commitment to the environment	23
D. Increasing the natural beauty of my property	20
G. Setting an example for other lake residents	12
J. Increasing my property value	11
H. Savings on landscaping/maintenance costs	6
I. Increasing my privacy	3

6 Blank

K. Other Comments:

- |  |                          |
|--|--------------------------|
| *Already doing all possible              | * Just ask us!           |
| *alread have it                          | *time to make it happen  |
| *we have done everything we are aware of | *nothing                 |
| *existing is 98% natural                 | *won't do it             |
| *did shore restoration with DNR grant    | *close the public access |
| *nothing: already have shoreline buffer  |                          |

Notes:

- \*We have no extra money at all!
- \*N/A

General Notes:

\* noticed Tri-county Sanitation truck dumping in several locations on Bass Lake Road several times. One property is owned by Orf, the other on the opposite side of the road. Noticed small lake quality change in the last two years. Wonder if it seeps into Bass Lake?!

