Designation of Sensitive Areas
Bass Lake, St. Croix County

Wisconsin Department of Natural Resources
Eau Claire, WI

Sensitive Area Designation
Bass Lake, St. Croix County

I. INTRODUCTION

Designation of sensitive areas within lakes provide a holistic approach to the protection of those sites within a lake that are most important for preserving the very character and qualities of the lake that initially attracted developments on the lake. These sites are those sensitive and fragile areas that support the wildlife and fish habitat, provide the mechanisms that protect the water quality in the lake, harbor quality plant communities and preserve the places of serenity and aesthetic beauty for the enjoyment of lake residents and visitors. The sensitive area designation will provide a framework for management decisions that impact the ecosystem of the lake.

A Sensitive Area Study was conducted October 6, 2003 on Bass Lake, St. Croix County.
The study team included:
Marty Engel, DNR Fish Biologist
Kris Belling, DNR Wildlife Biologist
Deborah Konkel, DNR, Aquatic Plant Specialist
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Bass Lake is a 417-acre lake with a maximum depth of 35 ft. The lake is one of only two lakes in the West-Central Region of Wisconsin that have been designated as Outstanding Resource Waters.

II. THE SENSITIVE AREAS

The shoreline and shallow water zone of lakes are all sensitive areas to some extent. This area is the primary fish and waterfowl habitat on a lake and is , unfortunately, the same area that is usually first degraded by lake use and development. It is important to preserve an adequate number of sensitive areas to insure that there is sufficient water quality protection and habitat for wildlife and fish to serve a lake of this size.

Bass Lake has the added challenge of dealing with an aggressive exotic plant species, Eurasian watermilfoil (EWM). It is not known exactly when EWM was introduced into Bass Lake, but it quickly spread throughout the lake and caused problems with lake use. After a few years, EWM declined as quickly as it had exploded and the only reasonable explanation proposed for its decline is the milfoil weevil population that already existed in Bass Lake. **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 does not provide enough protection over the winter. Weevils that hibernate there will not survive the winter

to repopulate the lake the next year. Every piece of shoreline that is cleared on Bass Lake is promoting the return of uncontrolled Eurasian watermilfoil.

All of the sensitive areas that were selected are potential milfoil weevil habitat and have the potential to be used for educational purposes.

Preserving the native plant communities in their undisturbed condition at all of the proposed sensitive areas is important for many reasons, as explained in more detail in this document. However, some important reasons are true for all sites.

1) Protecting the native plant communities will help prevent the invasion of non-native species, such as Eurasian watermilofil, curly-leaf pondweed and purple loosestrife. Nature loves a vacuum, so if the native plant communities are removed, something will take their place. The species that recolonize will likely be more aggressive, causing more conflicts with the current recreational use and habitat values of the sites.
2) The natural shoreline at the sites will provide protected cover for hibernating milfoil weevils.

Although preserving these sensitive areas will help protect the quality of Bass Lake, additional shoreland restoration projects are needed. Restoring developed shorelines with a buffer strip of natural vegetation will connect the sensitive areas and further protect the quality of Bass Lake.

More information on shoreland restoration can be found at the WI-DNR website

http://www.dnr.state.wi.us/org/water/wm/dsfm/shore/restoration.htm

or in publications:

FH-429-2003	A Fresh Look at Shoreland Restoration	DNR / UW-EX
WT-748-2003	Protecting and Restoring Shorelands	DNR / UW-EX
WT-764-2003	Protecting Our Living Shores	DNR / UW-EX

Sensitive Area BL1 – Northwest Wetland

This sensitive area encompasses the northwest bay, from the public boat landing, west and south around the entire bay feet to the point that separates the bay and out to a depth of 10ft. This site supports important near-shore terrestrial habitat, shoreline habitat and shallow water habitat. The sediment is sand, silt and gravel.

The area provides visual and sound buffers and an area of beauty for lake residents and visitors.

This area was selected because of
1) the high quality aquatic and terrestrial plant community it supports;
2) its value for fish and wildlife habitat;
3) its importance for maintaining water quality;
4) its natural scenic beauty.

The sloped shoreline is a mixture of herbaceous growth and undeveloped woods with some narrow cleared areas for riparian access. From the waterline, the littoral zone slopes gradually, supporting high quality shallow to deep marsh in many areas. Woody debris for habitat is abundant along the shore. The shoreline at this site embodies the ideal of maintaining natural shoreline while allowing riparian use and could be used as an example.

The Plant Community:

Bulrush, arrowhead and spike rush emerge from the shallow water.

White water lily and water smartweed float on the surface.

Coontail, common waterweed, water marigold, water buttercup, bushy pondweed, water stargrass, large-leaf pondweed, sago pondweed, floating-leaf pondweed, fern-leaf pondweed, clasping-leaf pondweed, small pondweed, Illinois pondweed and flat-stem pondweed colonize the underwater habitat up to a depth of 12 feet.

Two exotic species, curly-leaf pondweed and Eurasian watermilfoil occur at the site.

Water Quality

Maintaining the integrity of this sensitive area is important for protecting the water quality of Bass Lake.
1) The emergent, submerged and floating-leaf vegetation in this area ties up nutrients in their tissues that would otherwise be available for algae growth.
2) Emergent and floating-leaf vegetation are protecting the shore against erosion
3) The submergent vegetation is protecting the lake bottom from resuspension of the peat sediments by boat traffic and wind action, thus maintaining clarity.
4) The variety of structure in the plant community provides a variety micro-habitats.

Fish Habitat

The fallen woody material along the shore and the mosaic of emergent, submergent and floating-leaf vegetation with open areas provides nursery habitat and feeding areas for the fish community.

Wildlife Habitat

The variety of emergent vegetation, floating-leaf vegetation, submergent vegetation, fallen logs, brush, perch trees and snag trees provide

1) Shelter, cover and feeding areas for upland wildlife
2) cover, nesting and feeding areas for mink, ducks, songbirds, frogs, toads, turtles and snakes;
3) feeding areas for loons.

Recommendations

1) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a nutrient buffer for water quality protection.
2) Protect the emergent vegetation as an erosion buffer.
3) Do not remove fallen trees along shoreline.
4) Maintain shoreline vegetation, shrubs and trees in a natural condition to provide wildlife habitat, weevil habitat, prevent erosion and protect water quality.
5) Minimize removal of any shoreline or aquatic vegetation.
6) Recommend no-wake in the bay
7) Manage exotic species if they impede water use
8) Maintain "exotic species alert" sign at the boat landing

Sensitive Area BL2 –North West Shoreline

This sensitive area extends for 1650 feet, along the west shore on the north part of the lake, to a depth of 10 feet depth and supports near-shore terrestrial habitat, shoreline habitat and shallow water habitat. The sediment is sand in the shallow part and silt in the deeper area.

The area provides visual and sound buffers and a unique area of outstanding beauty for lake residents and visitors.

This area was selected because of
1) the aquatic and terrestrial plant community it supports;
2) value for milfoil weevil habitat;
3) natural scenic beauty.

The shoreline has a small amount of development, but is largely upland woods on a steep slope. Fallen woody material is present in the shallow zone for habitat

The Plant Community:

Rushes, bulrushes, cattails and sedges emerge from the shallow water. White water lilies float on the surface.

Coontail, water stargrass, sago pondweed, Illinois pondweed and flat-stem pondweed colonize the underwater habitat up to a depth of 15 feet.

Water Quality

Maintaining the integrity of this sensitive area is important for protecting the water quality of Bass Lake.
1) The submergent and floating-leaf vegetation in this area tie up nutrients in their tissues that would otherwise be available for algae growth.
2) The emergent plants and wooded shoreline are filtering water that enters the lake and protecting the shoreline from erosion.
3) The submergent vegetation is protecting the lake bottom from resuspension of the sand and peat sediments by boat traffic and wind action, thus maintaining clarity.

Fish Habitat

Maintaining the aquatic vegetation in this area is very important to the fish community. This site is an especially good habitat for bass and bluegill.

Wildlife Habitat

The variety of emergent vegetation, shrubs, fallen logs, boulders and snag trees provide
1) cover, nesting and feeding areas for upland wildlife, songbirds, amphibians turtles and snakes;
2) A corridor for wildlife.

Recommendations

1) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a nutrient buffer for water quality protection.
2) Protect the emergent vegetation as an erosion buffer.
3) Do not remove fallen trees along the shoreline. Preserve large woody debris for habitat.
4) Maintain shoreline vegetation, shrubs and snag trees to provide wildlife habitat, prevent erosion and protect water quality.
5) Minimize removal of any shoreline or aquatic vegetation.

Sensitive Area BL3 – West Shore

This sensitive area extends along approximately one-quarter mile of shoreline on the west side of the lake to a depth of 10 feet. The site supports shoreline habitat and shallow water habitat. The sediment is gravel, sand and silt.
This area was selected because of

1) the aquatic plant community it supports;
2) its value for milfoil weevil habitat

The shoreline is partly developed on a wooded slope. Woody material is abundant in the shallow zone for habitat.

The Plant Community:

Bulrush, sedges, Joe-Pye weed, arrowhead and spikerush emerge from the shallow water.

White water lily, lesser duckweed, greater duckweed and water smartweed floats on the surface.

Arrowhead rosettes form an open turf on the sediment.

Common waterweed, coontail, water buttercup, wild celery, northern watermilfoil, bushy pondweed, water stargrass, floating-leaf pondweed, small pondweed, sago pondweed, variable-leaf pndweed, long-leaf pondweed, fern-leaf pondweed, large-leaf pondweed, clasping-leaf pondweed, Illinois pondweed, leafy pondweed and flat-stem pondweed colonize the underwater habitat up to a depth of 8 feet.

Curly-leaf pondweed, an exotic also occurs at the site, but does not present a problem currently.

Fish Habitat

Maintaining the aquatic vegetation in this area is very important to the fish community. The fallen woody material and the mosaic of submergent and floating-leaf vegetation with open areas provides a diversity of habitat and feeding opportunities for the fish community.

Wildlife Habitat

The variety of emergent vegetation, shrubs and fallen logs provide

1) cover, nesting and feeding areas for upland wildlife, songbirds, amphibians turtles and snakes;
2) a corridor for wildlife.

Recommendations

1) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a nutrient buffer for water quality protection.
2) Protect the emergent vegetation as an erosion buffer
3) Do not remove fallen trees along the shoreline. Preserve large woody debris for habitat.
4) Maintain shoreline vegetation, shrubs and snag trees to provide wildlife habitat, prevent erosion and protect water quality.
5) Minimize removal of any emergent shoreline or submergent aquatic vegetation

Sensitive Area BL4 – Prairie Shore

This sensitive area extends for nearly three-eighths of a mile along the shoreline a steep shoreline colonized by scattered wooded and prairie habitat and out to the 10ft depth contour. The sediment is comprised of rock, gravel, silt and sand.

The area provides visual and sound buffers and beauty for lake residents and visitors.

This area was selected because of
1) the terrestrial plant community it supports;
2) the steep shoreline vulnerable to erosion
3) wintering habitat for milfoil weevils
4) woody debris valuable for fish habitat.

The shoreline is about 20% development, 25% prairie with the woodland and shrub growth. Woody material is present in the shallow zone for habitat. There is currently small areas of erosion on the steep bank that should be revegetated.

The Plant Community:

White water lilies float on the surface.

Coontail, muskgrass, bushy pondweed, Illinois pondweed, large-leaf pondweed, long-leaf pondweed, sago pondweed and flat-stem pondweed colonize the underwater habitat up to a depth of 12 feet.

Eurasian watermilfoil occurs at this site.

Water Quality

Maintaining the integrity of this sensitive area is important for preventing erosion that would be detrimental to the water quality of Bass Lake.
1) The floating-leaf and submergent vegetation in this area tie up nutrients in their tissues that would otherwise be available for algae growth.
2) The shoreline vegetation is filtering water that enters the lake and protecting the shoreline from erosion.
3) The submergent vegetation is protecting the lake bottom from resuspension of the sand sediments by boat traffic and wind action, thus maintaining clarity.

Fish Habitat

Maintaining the aquatic vegetation in this area is very important to the fish community. The fallen woody material along the shore and the submergent and floating-leaf vegetation with open area provides a diversity of habitat and feeding opportunities for the fish community.

Wildlife Habitat

The relatively natural shoreline provides

1) habitat for upland wildlife, songbirds, amphibians, turtles and snakes;
2) a corridor for wildlife

Recommendations

1) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a nutrient buffer for water quality protection.
2) Do not remove fallen trees along the shoreline. Preserve large woody debris for habitat.
3) Maintain shoreline vegetation, shrubs and snag trees to provide wildlife habitat, prevent erosion and protect water quality.
4) Minimize removal of any shoreline or aquatic vegetation
5) Revegetate eroded area on the bank with native prairie grasses.

Sensitive Area BL5 – Southwest Shore

This sensitive area extends along 1000 feet of shoreline out to the 10ft depth contour and supports littoral zone vegetation and shoreline habitat. Woody debris is common along the shore. The sediment is sand and silt.

This area was selected because of its
1) fish habitat provided by the woody debris;
2) littoral zone plant community
3) winter habitat provided for milfoil weevils
4) its scenic beauty.

The shoreline has some limited development, abundant herbaceous plant growth with some tree and shrub growth. Woody material is common in the shallow zone for habitat.

The Plant Community:

Willows are found along the edge of the water.

Reed-canary grass, sedge, green bulrush, willow-herb, water horehound and bonset emerge from the water.

White water lilies and yellow pond lilies float on the surface.

Coontail, water buttercup, wild celery, northern watermilfoil, water stargrass, muskgrass, bushy pondweed, Illinois pondweed, floating-leaf pondweed, long-leaf pondweed, sago pondweed, variable-leaf pondweed, leafy pondweed, small pondweed and flat-stem pondweed colonize the underwater habitat up to a depth of 11 feet.

Exotics, Eurasian watermilfoil and curly-leaf pondweed occur at this site.

Fish Habitat

Maintaining the fallen woody material in this area is important for fish habitat.

Wildlife Habitat

1) The shoreline vegetation provides habitat upland wildlife, songbirds amphibians, turtles and snakes;
2) a corridor for wildlife

Recommendations

1) Do not remove fallen trees along the shoreline. Preserve large woody debris for habitat.
2) Maintain the vegetation for fish habitat.
3) Protect emergent vegetation
4) Leave snag trees for wildlife habitat
5) Minimize removal of any shoreline or aquatic vegetation

Sensitive Area BL5a – South bay

This small sensitive area is found at the far southwest point of the lake. It supports littoral zone submerged vegetation and emergent vegetation habitat

This area was selected because of its
1) fish habitat provided by the emergent vegetation;
2) its value for wildlife

The shoreline has some limited development and road bed.

Plant Community

Soft-stem bulrush, blue-joint grass, reed-canary grass, sedges, water willow, water horehound, boneset and iris emergent from the shallow water.
White and yellow water lilies float on the surface.
Water stargrass, muskgrass, wild celery, coontail, northern watermilfoil, stomewort, leafy pondweed sago pondweed, Illinois pondweed, flat-stem pondweed, floating-leaf pondweed colonize the sediments.
Filamentous algae is present
Tow exotic, Eurasian watermilfol and curly-leaf pondweed are present

Fish Habitat

Maintaining the fallen woody material, lily beds and emergent vegetation in this area is important for fish spawning habitat.

Wildlife Habitat

The floating-leaf and emergent vegetation provides habitat for ducks, amphibians and reptiles.

Recommendations

1) Do not remove fallen trees along the shoreline. Preserve large woody debris for habitat.
2) Maintain the vegetation for fish habitat.
3) Minimize removal of any shoreline or aquatic vegetation
4) Restore old road bed to natural vegetation

Sensitive Area BL6 – Southeast shore

This sensitive area consists of 1200 feet of steep shoreline, extending out to the 10ft deep contour. The area supports important near-shore terrestrial habitat for milfoil weevils. The sediment is comprised of gravel, sand and silt.

The area provides visual and sound buffers and an area of natural beauty.

This area was selected because of
1) natural scenic beauty
2) its value for milfoil weevil overwintering habitat.

The shoreline has a small amount of development at the top of the steep shore, but is largely wooded. The wetlands contain emergent herbaceous wetlands and shrub wetlands. Woody material is present in the shallow zone for habitat

The Plant Community:

Scattered beds of yellow pond lilies and white water lilies and water smartweed float on the surface.

Coontail, muskgrass, northern watermilfoil, water stargrass, floating-leaf pondweed, large-leaf pondweed, sago pondweed and flat-stem pondweed colonize the underwater habitat up to a depth of 10 foot.
Filamentous algae is present

Water Quality

Maintaining the integrity of this sensitive area is important for protecting the water quality of Bass Lake.
1) The floating-leaf and submergent vegetation in this area tie up nutrients in their tissues that would otherwise be available for algae growth.
2) The shoreline vegetation is filtering water that enters the lake and protecting the steep shoreline from erosion.
3) The submergent vegetation is protecting the lake bottom from resuspension of the silt sediments by boat traffic and wind action, thus maintaining clarity.

Fish Habitat

Maintaining the aquatic vegetation in this area is very important to the fish community. The fallen woody material along the shore and the mosaic of emergent, submergent and floating-leaf vegetation with open areas provides a diversity of habitat and feeding opportunities for the fish community.

1) Maintaining and increasing large woody cover along the shore is important for fish habitat

Wildlife Habitat

The relatively natural shoreline provides
1) habitat for upland wildlife, songbirds, amphibians, turtles and snakes;
2) a corridor for wildlife

Recommendation

1) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a nutrient buffer for water quality protection.
2) Do not remove fallen trees along the shoreline. Preserve large woody debris for habitat.
3) Maintain shoreline vegetation, shrubs and snag trees to provide wildlife habitat, prevent erosion and protect water quality.
4) Minimize removal of any shoreline or aquatic vegetation.

Sensitive Area BL7 – Frog Pond Bay

This sensitive area is approximately 3 acres, including all of Frog Pond Bay and the bulrush bed at its mouth. The area includes shallow marsh, deep water marsh and hardwood swamp habitat. The maximum depth is 8 feet. The site supports important near-shore terrestrial habitat, shoreline habitat and shallow water habitat. The substrate is comprised of silt and sand.

The area provides visual and sound buffers and an area of natural beauty for lake residents and visitors.

This area was selected because of
1) the aquatic and terrestrial plant community it supports;
2) its value for fish and wildlife habitat;
3) its importance for maintaining water quality in Bass Lake;
4) its natural beauty.

The shore is 25% developed and 75% wooded and shrub growth. Fallen woody material is available in the shallow zone for habitat.

The Plant Community:

Bristly sedge, arrowheads, bulrush and water smartweed emerge from the shallow water.

White water lily, duckweeds and watermeal float on the surface.

Water buttercup, common waterweed, coontail, northern watermilfoil, water stargrass, bushy pondweed, large-leaf pondweed, floating-leaf pondweed, sago pondweed, variable-leaf pondweed, clasping-leaf pondweed, leafy pondweed and flat-stem pondweed colonize the underwater habitat to a maximum depth of 8 feet.

Eurasian watermilfoil is present

Filamentous algae is present

Water Quality

Maintaining the integrity of this sensitive area is important for protecting the water quality of Bass Lake.
1) The submerged and floating-leaf vegetation in this area ties up nutrients in their tissues that would otherwise be available for algae growth.
2) The terrestrial vegetation is filtering water that enters the lake and preventing shoreline erosion.
3) The submergent vegetation is protecting the lake bottom from resuspension of the peat, silt and muck sediments by boat traffic and wind action, thus maintaining clarity.

Fish Habitat

Maintaining the aquatic vegetation in this area is very important to the fish community. The fallen woody material along the shore and the mosaic of submergent, emergent and floating-leaf vegetation provide a diversity of habitat and feeding opportunities for the fish community.

1) The bulrush beds at the mouth provide spawning habitat;
2) The warmer waters in the bay provide good spring and fall habitat;

Wildlife Habitat

The variety of emergent vegetation, floating-leaf vegetation, submergent vegetation, fallen logs, brush, perch trees and snag trees provide

1) Shelter, cover and feeding areas for upland wildlife
2) cover, nesting and feeding areas for mink, ducks, frogs, toads, turtles and snakes;

Recommendations

1) Removal of submergent vegetation for navigation only.
2) Protect the emergent vegetation as an erosion buffer
3) Do not remove fallen trees along shoreline.
4) Maintain shoreline vegetation, shrubs and snag trees to provide wildlife habitat, prevent erosion and protect water quality.
5) Recommend slow no-wake in the bay

Sensitive Area BL8 – East Shore Weevil Hiberniculum

This sensitive area extends for 3000 feet along a steep shoreline and out to the 10ft depth. The site supports important terrestrial habitat for milfoil weevils and scattered emergent wetlands. The sediment is sand, gravel, rock and silt.

The area provides visual and sound buffers.

This area was selected because of
1) the terrestrial plant community it supports;
2) its importance for maintaining water quality, preventing erosion;
3) its value for hibernation habitat for milfoil weevils

The shoreline is about 25% wetland and the remainder wooded.

The Plant Community:

Sedges, reed-canary grass and arrowhead emerge from the shallow water in scattered wetlands.

Bushy pondweed, coontail, muskgrass, water stargrass, wild celery, clasping-leaf pondweed, fern-leaf pondweed, Illinois pondweed, leafy pondweed, sago pondweed and flat-stem pondweed colonize the underwater habitat up to a depth of 12 feet.

Filamentous algae is present.

Water Quality

Maintaining the integrity of this sensitive area is important for protecting the water quality of Bass Lake. The wetlands are filtering water that enters the lake and the wooded shoreline is protecting the steep slope from erosion.

Wildlife Habitat

The relatively natural shoreline provides
1) habitat for upland wildlife, songbirds, amphibians, turtles and snakes;
2) a corridor for wildlife

Recommendations

1) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a nutrient buffer for water quality protection.
2) Protect the emergent wetland pockets.
2) Do not remove fallen trees along the shoreline. Preserve large woody debris for habitat.
3) Maintain shoreline vegetation, shrubs and snag trees to provide wildlife habitat, prevent erosion and protect water quality.
4) Maintain natural shoreline for milfoil weevil habitat.