

Designation of Critical Habitat Areas Bear Lake, Portage County



**Wisconsin Department of Natural Resources
Eau Claire, WI**

March 2007

Critical Habitat Area Designation Bear Lake, Portage County

I. INTRODUCTION

Designations of Critical Habitat Areas within lakes provide a holistic approach to ecosystem assessment and the protection of those areas within a lake that are most important for preserving the very character and qualities of 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.

Critical Habitat Areas include Sensitive Areas and Public Rights Features. Sensitive Areas ...”offer critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality or erosion control benefits to the area” (Administrative code 107.05(3)(1)(1)). Wisconsin Department of Natural Resources is given the authority for the identification and protection of sensitive areas of the lake in this code. Public Rights Features are areas that fulfill the right of the public for navigation, quality and quantity of water, fishing, swimming or natural scenic beauty. Protecting these Critical Habitat Areas requires the protection of shoreline and in-lake habitat.

Protecting the terrestrial plant community on shore provides a buffer that absorbs nutrient runoff, prevents erosion, protects water quality, maintains water temperatures and provides important habitat. The habitat is important for species that require habitat on shore and in the water as well as those species that require a corridor in order to move along the shore (Figure 1).

Protecting the littoral zone and littoral zone plant communities is critical for fish, wildlife and the invertebrates that both feed upon (Figure 1).

The Critical Habitat Area designation will provide a framework for management decisions that impact the ecosystem of the lake.

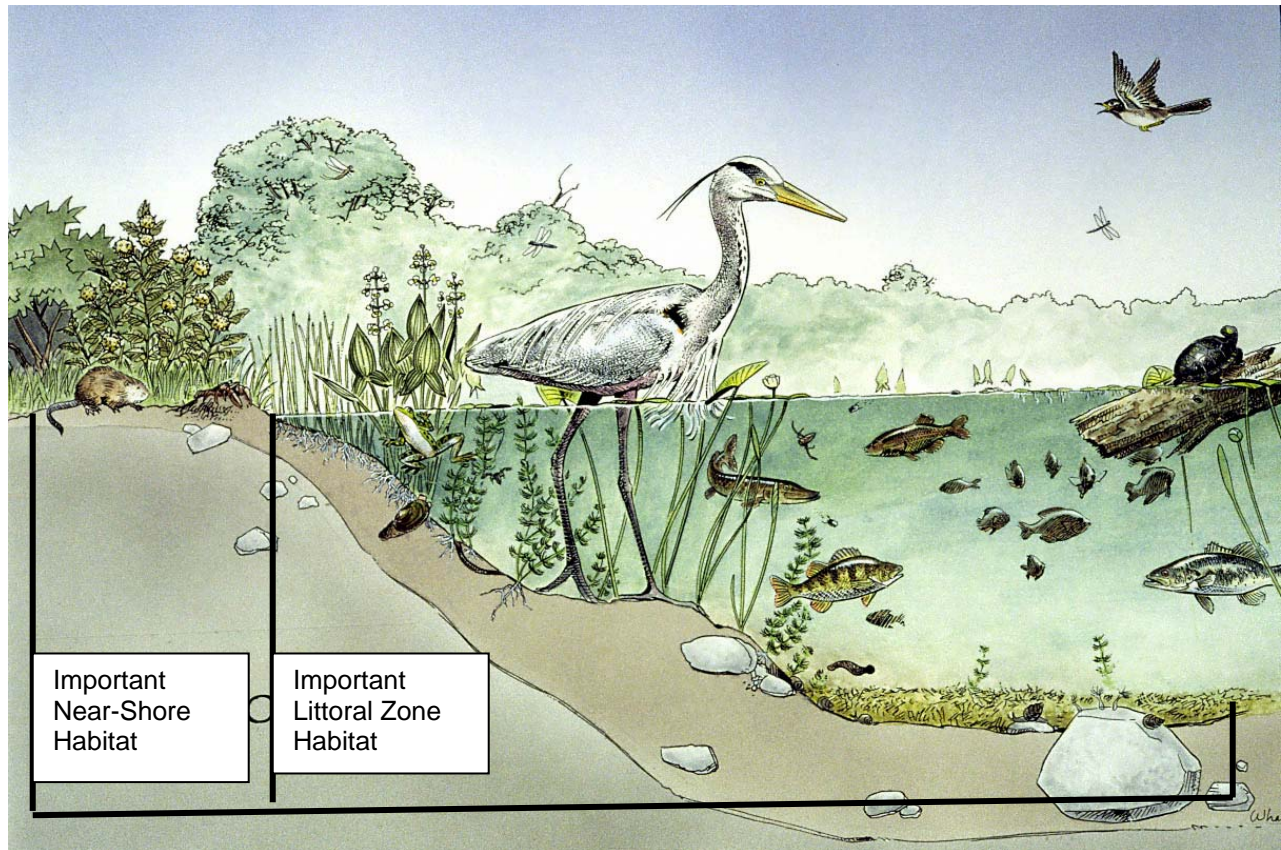


Figure 1. Location of important near-shore and littoral zone habitat.

A Critical Habitat Area Study was conducted October 9, 2006 on Bear Lake, Portage County. The designations were based on aquatic plant data collected during July 2006 and previous fish surveys. The water level during the time of the plant survey and the designation study was extremely low. This may be a natural cycle or a response to the unusually warm summers and drought the last two years.

The study team included:

Tom Meronek, DNR Fish Biologist
 Deborah Konkel, DNR, Aquatic Plant Specialist
 Buzz Sorge, DNR Lakes Manager
 Jon Robaidek, DNR Wildlife Biologist
 Amy Lesik-Marcon, DNR Water Resource Specialist

Bear Lake is a mesotrophic lake with very good water clarity and good water quality. Filamentous algae occurred in Bear Lake and was common in the 0-5ft depth zones.

Aquatic plant community colonized the entire littoral zone, approximately 60% of the total lake area, to a maximum depth of 13 feet. The 0-1.5 ft. depth zone supported the most abundant aquatic plant growth.

Brasenia schreberi (watershield) was the dominant species within the plant community, especially in the 0-5ft depth zones, occurring at more than half of the sample sites and exhibiting a dense growth form. *Ceratophyllum demersum* (coontail) and *Potamogeton pusillus* (small pondweed) were sub-dominant species, both occurring at approximately half of the sites and at above average densities. The dominant and common species occur throughout the lake.

The aquatic plant community in Bear Lake is characterized by high quality, very good species diversity, an average tolerance to disturbance and within the quartile of lakes in the region closest to an undisturbed condition.

II. CRITICAL HABITAT AREAS

The reasons for selection of Critical Habitat Areas are important, as this is what drives the selection process, their importance to the whole lake community.

Bear Lake Critical Habitat Area – Littoral Zone

This site was selected because of the high quality aquatic plant community (Figure 2). This site also has the potential to be used for educational purposes; it also provides a visual and sound buffer from structures and road and boat noises.

This Critical Habitat Area was geo-referenced.

This Critical Habitat Area includes approximately 22-acres of the shallow water in Bear Lake; it covers the lake from the Ordinary High Water Mark, out to the maximum rooting depth of 13 feet (Figure 2). The bay includes deep marsh wetlands and shallow marsh wetlands and supports important near-shore terrestrial habitat, shoreline habitat. The shoreland zone habitat supports areas of wooded and shrub cover. A small developed property is visible but the shoreland buffers have been maintained (Figure 3). About 80% of the shoreline is wetland, 15% is wooded and 5% developed.

The sediment is composed of silt and detritus. Fallen trees are common at the site for fish and wildlife habitat.

The Plant Community:

This site supports 17 species of aquatic plants.

Emergent vegetation, bulrush is common and cattail is present, protects the shoreline and provides important food sources, cover and fish spawning habitat.

Floating-leaf vegetation: white water lilies, yellow pond lilies, and watershield, dampen wave action and provide important fish cover.

A diverse submerged plant community provides many important habitat components for the fish and wildlife community (Table 1). Slender naiad, common waterwort and small bladderwort are present. Water bulrush and flat-leaf bladderwort are common and coontail is abundant. Turf-forming needle spikerush protects the lake bed from sediment resuspension. The pondweed family, which is an important food source for waterfowl and fish, is represented by an abundance of large-leaf pondweed and small pondweed. Variable-leaf pondweed is common; floating-leaf pondweed and flat-stem pondweed are also present at this site.

Three sensitive species occurred at this site (Table 2). The species sensitivity is measured by its Coefficient of Conservatism. A Coefficient of Conservatism is an assigned value, 0-10, the probability that the species will occur in an undisturbed habitat. A coefficient of 9 or 10 were given to native plants found only in area of high quality, of which many are Endangered, Threatened or Special Concern Species (Nichols 1998).



Figure 3. Bear Lake Critical Habitat Area: east and south shores (above); northwest shore (below)

Table 1. Wildlife Uses of Aquatic Plants in Bear Lake Critical Habitat Area

Aquatic Plants	Fish	Water Fowl	Song and Shore Birds	Upland Game Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Ceratophyllum demersum</i>	F,I*, C, S	F(Seeds*), I, C			F		
<i>Eleocharis acicularis</i>	S	F			F		
<i>Elodea canadensis</i>	C, F, I	F(Foliage) I					
<i>Najas flexilis</i>	F, C	F*(Seeds, Foliage)	F(Seeds)				
<i>Potamogeton amplifolius</i>	F, I, S*,C	F*(Seeds)			F*	F	F
<i>Potamogeton gramineus</i>	F, I, S*,C	F*(Seeds, Tubers)			F*	F	F
<i>Potamogeton natans</i>	F, I, S*,C	F*(Seeds, Tubers)			F*	F	F
<i>Potamogeton pusillus</i>	F, I, S*,C	F*(All)			F*	F	F
<i>Potamogeton zosteriformis</i>	F, I, S*,C	F*(Seeds)			F*	F	F
<i>Utricularia gibba</i>	F, C, I*	I*			F		
<u>Floating-leaf Plants</u>							
<i>Brasenia schreberi</i>	S, I, C	F(Seeds)			F	F	F
<i>Nuphar variegata</i>	F,C, I, S	F, I	F		F*	F	F*
<i>Nymphaea odorata</i>	F,I, S, C	F(Seeds)	F		F	F	F
<u>Emergent Plants</u>							
<i>Carex</i> spp.	S*	F*(Seeds), C	F*(Seeds)	F*(Seeds)	F	F	F

Aquatic Plants	Fish	Water Fowl	Song and Shore Birds	Upland Game Birds	Muskrat	Beaver	Deer
<i>Scirpus validus</i>	F, C, I	F (Seeds)*, C	F(Seeds, Tubers), C	F (Seeds)	F	F	F
<i>Typha latifolia</i>	I, C, S	F(Entire), C	F(Seeds), C, Nest	Nest	F* (Entire), C*, Lodge	F	

F=Food, I= Shelters Invertebrates, a valuable food source C=Cover, S=Spawning

***=Valuable Resource in this category**

*Current knowledge as to plant use. Other plants may have uses that have not been determined.

After Fassett, N. C. 1957. A Manual of Aquatic Plants. University of Wisconsin Press. Madison, WI

Nichols, S. A. 1991. Attributes of Wisconsin Lake Plants. Wisconsin Geological and Natural History Survey. Info. Circ. #73

Table 2. Sensitive Species Recorded at Bear Lake Critical Habitat Area.

Species		Coefficient of Conservatism
<i>Scirpus subterminalis</i>	Water bulrush	9
<i>Utricularia gibba</i>	Small bladderwort	9
<i>Utricularia gibba</i>	Small bladderwort	9

Wildlife Habitat

This site provides important habitat structure via emergent vegetation, floating-leaf vegetation and shoreline shrubs and brush. This site provides habitat for:

- 1) feeding areas for upland wildlife
- 2) shelter, cover, nesting and feeding areas for muskrat, ducks, geese, songbirds, frogs, toads and turtles

Fish Habitat

The high diversity of habitat and cover types provide for many life stages of the fish community.

- 1) spring spawning areas, spring and summer nursery areas, feeding areas and protective cover for northern pike, large-mouth bass and black crappie
- 2) spring spawning areas, spring, summer and fall nursery areas, feeding areas and protective cover for yellow perch
- 3) summer spawning, summer and fall nursery areas, feeding areas and cover for bluegill and pumpkinseed

Water Quality

The vegetation in the Critical Habitat Area, both near shore terrestrial and in lake aquatic vegetation, provides important water quality protections.

- 1) Shoreland and aquatic vegetation provide a nutrient buffer by absorbing nutrients thus reducing algae growth.
- 2) The plants provide a physical buffer that protects the shoreline against wave erosion.
- 3) Aquatic plants provide sediment stabilization, their roots anchoring the sediments and preventing resuspension by boat motors and waves and the resulting turbidity.
- 4) The aquatic vegetation provides a biological buffer that reduces the chance of invasion by exotic species.
- 5) The plant beds provide areas temperature variation that support higher diversity
- 6) Groundwater inputs in the lake add cold water that provides temperature fluctuations that increase diversity.

Recommendations for Bear Lake Critical Habitat Area

Recommendations for the terrestrial shoreline buffer:

- 1) Maintain shore land buffer.
- 2) Minimize removal of any shoreline vegetation. Limit removal to a maximum viewing/access corridor width of 30
- 3) Maintain the current wildlife habitat in the shoreline buffer feet.
- 4) No shoreline erosion control needed. If needed use biological methods. No permits approved for rip-rap or retaining walls.
- 5) No bank grading.

Recommendations for the aquatic habitat below the Ordinary High Water Mark:

- 1) No bank grading.
- 2) Maintain the aquatic vegetation (emergent, floating-leaf and submergent) in an undisturbed condition for wildlife habitat, fish cover and as a buffer for water quality protection.
- 3) Removal of vegetation only for navigation. Permits required for any vegetation removal.
- 4) Protect emergent vegetation.
- 5) Maintain the current wildlife habitat below the Ordinary High Water Mark.
- 6) Do not alter the littoral zone except for improvement of spawning habitat.
- 7) Do not remove fallen trees along the shoreline, leave in water for fish and wildlife habitat.
- 8) Designate slow no-wake in the lake.
- 9) No permit approval for pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 10) No dredging or lake bed removal or modifications.
- 11) Pier placement by permit only to minimize number of piers and their size and disturbance; require light-penetrating pier material such as metal grating.
- 12) No additional boat ramp placement.
- 13) No recreational floating devices.