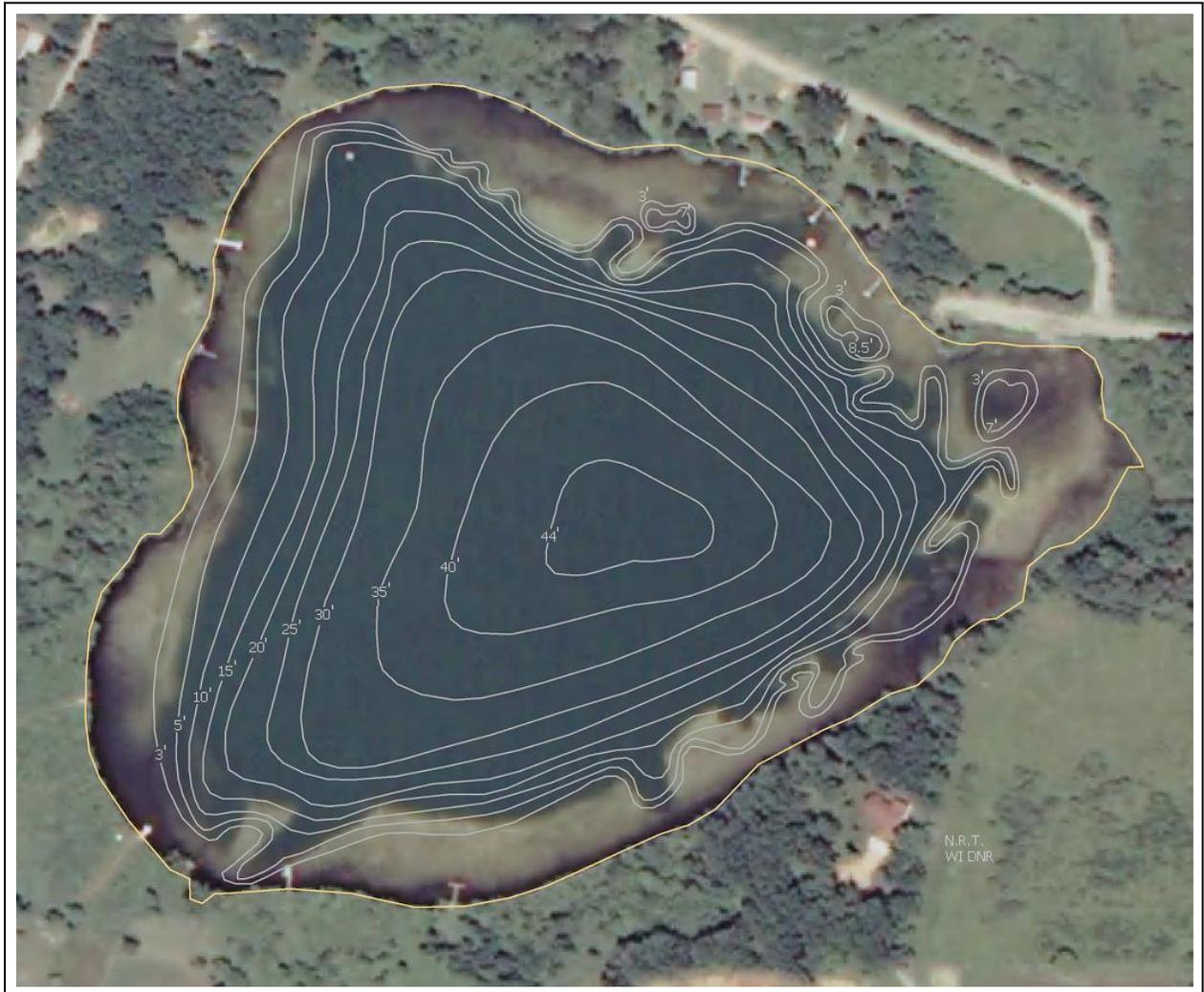


***CRITICAL HABITAT DESIGNATION
ADAMS LAKE
PORTAGE COUNTY, WI***

June, 2008



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

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 that attract us to their shores. 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)). This code provides the Wisconsin Department of Natural Resources the authority for the identification and protection of sensitive areas in a lake. 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 near shore buffer zone 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.

II. METHODS, Plant Survey Field Methods

All Critical Habitat Designations include aquatic plant surveys. This is an abbreviated review of the methods used to gather aquatic plant data on this lake for this report. Shoreline is also considered. These methods can vary from year to year and lake to lake.

The study design was based on the rake-sampling method developed by Jessen and Lound (1962), using stratified random placement of the transect lines. The shoreline was divided into 13 equal segments and a transect, perpendicular to the shoreline, was randomly placed within each segment using a random numbers table.

One sampling site was randomly located in each depth zone (0-1.5ft, 1.5-5ft, 5-10ft and 10-20ft) along each transect. Using a long-handled, steel thatching rake, four rake samples were taken at each sampling site. The four samples were taken from each quarter of a 6-foot diameter quadrat. The aquatic plant species that were present on each rake sample were

recorded. Each species was given a density rating (0-5) for each rake sample on which it was present at each sampling site.

A rating of 1 indicates that a species was present on one rake sample

A rating of 2 indicates that a species was present on two rake samples

A rating of 3 indicates that it was present on three rake samples

A rating of 4 indicates that it was present on all four rake samples

A rating of 5 indicates that a species was abundantly present on all rake samples.

Visual inspection and periodic samples were taken between transect lines to record the presence of any species that did not occur at the sampling sites. Specimens of all plant species present were collected and saved in a cooler for later preparation of voucher specimens. Nomenclature was according to Gleason and Cronquist (1991).

The type of shoreline cover was recorded at each transect. A section of shoreline, 50 feet on either side of the transect intercept with the shore and 30 feet deep was evaluated. The percent cover of land use within this 100' x 30' rectangle was visually estimated.

III. ADAMS LAKE IN BRIEF

Lake Area: 30.75 acres * (2008 DOP)

Surface Watershed Details: 260 acres** (adapted from Portage County website, 2002 data)

Forest / Shrub : 54% (140.4 acres)

Nonirrigated Agriculture: 31.5% (81.9 acres)

Other Cover: 14.5% (37.7 acres)

Lake Type: Groundwater drainage

Mean Depth: 18 feet

Maximum Depth: 44 (1963 bathymetry)

Miles of Shoreline: 0.88 miles / 4,648 feet (2008 DOP)

Lake Volume: 556 acre-feet (using 2008 DOP and projection fit of July 1963 Bathymetry lines)

Maximum Rooting Depth: 14 ft.

Number of Plant Species in 2006 Survey: 14

Littoral Area: 14.9 acres

*Wisconsin Statute **30.635 Motorboat prohibition.** On lakes 50 acres or less having public access, motorboats may not be operated in excess of slow-no-wake speed, except when such lakes serve as thoroughfares between 2 or more navigable lakes. The department by rule may modify or waive the requirements of this section as to particular lakes, if it finds that public safety is not impaired by such modification or waiver.

** The surface watershed area for a lake does not include the lake itself. However, wetlands, ponds and lakes within the watershed are included in the watershed area because all of these 'shed' water into the lake. Example, the Wisconsin portion of the Lake Michigan watershed does not include Lake Michigan but would include Lake Winnebago.

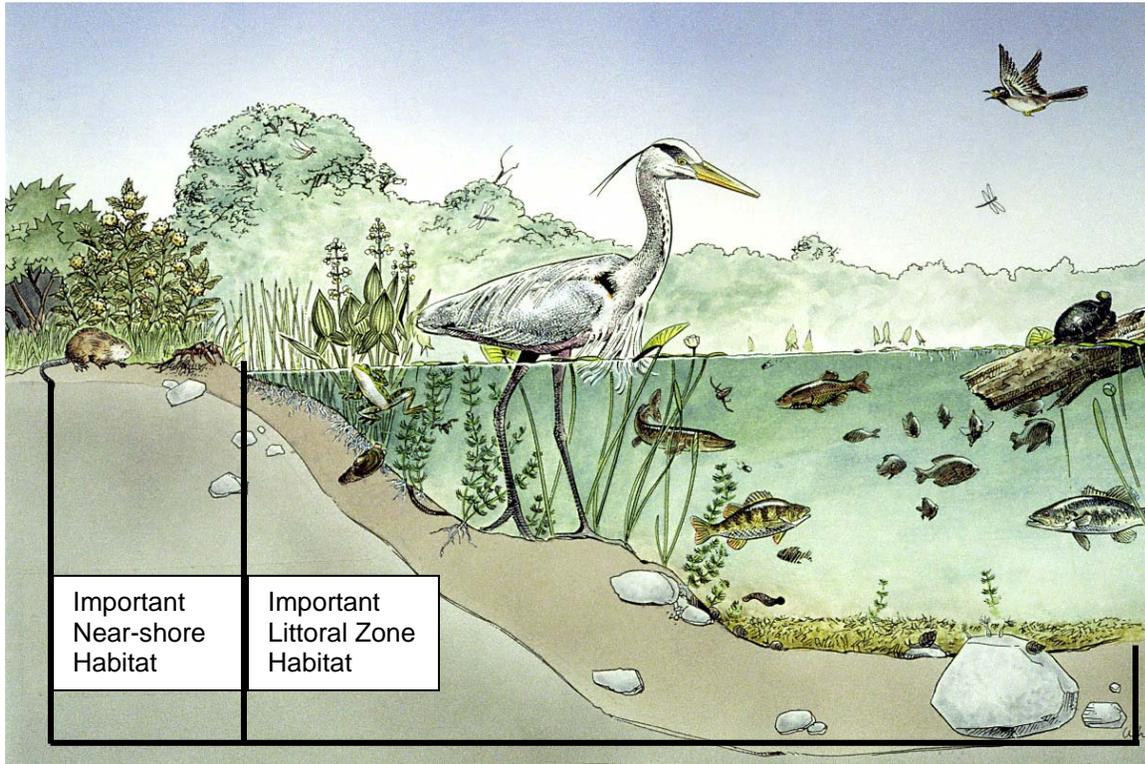


Figure 1. Location of important near-shore and littoral zone habitat.

A Critical Habitat Area Study was conducted June 16, 2008 on Adams Lake, Portage County. The designations were based on aquatic plant data collected during July 2006.

The study team included:

- Tom Meronek, DNR Fish Biologist
- Deborah Konkel, DNR, Aquatic Plant Specialist (Co-Author)
- Greg Dahl, DNR Wildlife Biologist
- Keith Patrick, DNR Water Regulation Specialist
- Neil Trombly, DNR Water Resources Specialist (Co-Author)

IV. AQUATIC OVERVIEW:

Adams Lake is a mesotrophic lake with fair-to-good water clarity and good water quality. The aquatic plant community in Adams Lake is characterized by high quality, very poor species diversity, an above average tolerance to disturbance and a condition farther from an undisturbed condition than the average lake in the state or region.

The aquatic plant community colonized the entire littoral zone, a little less than half of the total lake area, to a maximum depth of 14 feet. The 0-1.5 ft. depth zone supported the most abundant aquatic plant growth.

Fourteen (14) aquatic plant species were recorded in Adams Lake at the sites sampled in 2006. *Chara* spp., a macrophytic algae, was the dominant species within the plant community, dominating all depth zones, occurring at nearly all sample sites and exhibiting dense growth. *Potamogeton illinoensis* (Illinois pondweed) was the sub-dominant species, occurring at approximately one-third of the sites. Filamentous algae occurred, but was not common in Adams Lake in 2006.

Interpreting the Number and Prevalence of Aquatic Plant Species Cited

The number and prevalence of aquatic species cited in this report reflect only those species found within the Critical Habitat Designated area(s) at the specific time of the year and at the specific randomized sampling locations that actual sampling was done. Different years, seasons, methodology and sampling density can all affect the number and prevalence of species found in any one survey.

V. THE CRITICAL HABITAT DESIGNATED AREAS

The selection process of a Critical Habitat Designated Area is driven by its importance to the whole of the lake community.

All sites were selected because of their importance for fish and wildlife habitat and the diverse aquatic plant communities they support (Figure 2). The plant beds provide a biological buffer, reducing the possibility that introduced exotic plant species could become established.

All Critical Habitat Areas were geo-referenced.

Interpreting the Boundaries of Critical Habitat Designated (CHD) Areas

- 1) The landward extent of a CHD area may be more or less than shown on the attached map. In simple situations the CHD area typically extends to the Ordinary High Water Mark, (OHWM). Where Public Rights Features and/or wetlands and/or public lands exist other determinants may be involved. Most CHD areas include shoreland held in public trust below the OHWM.
- 2) The lakeward extent of a CHD area in deeper lakes is set by the designation team with the expectation that it not extend much beyond maximum rooting depth. Shallow lakes often have boundaries set by the designation team without regard to rooting depth because most or all of the lake may be shallower than rooting depth.

Attributes Common to All the Critical Habitat Areas

Water Quality

The aquatic and shoreline vegetation at all of the sites provides important water quality protections. The plants provide a nutrient buffer by absorbing nutrients thus reducing algae growth, a physical buffer that protects the shoreline against wave erosion and sediment stabilization. The plant beds anchor the sediments and prevent sediment resuspension by boat motors and waves that would increase turbidity.

Wildlife Habitat

All of the Critical Habitat Areas provide very important wildlife habitat. Some values are unique to a Critical Habitat Area and some habitat values are shared by all the Critical Habitat Areas. All of the sites provide:

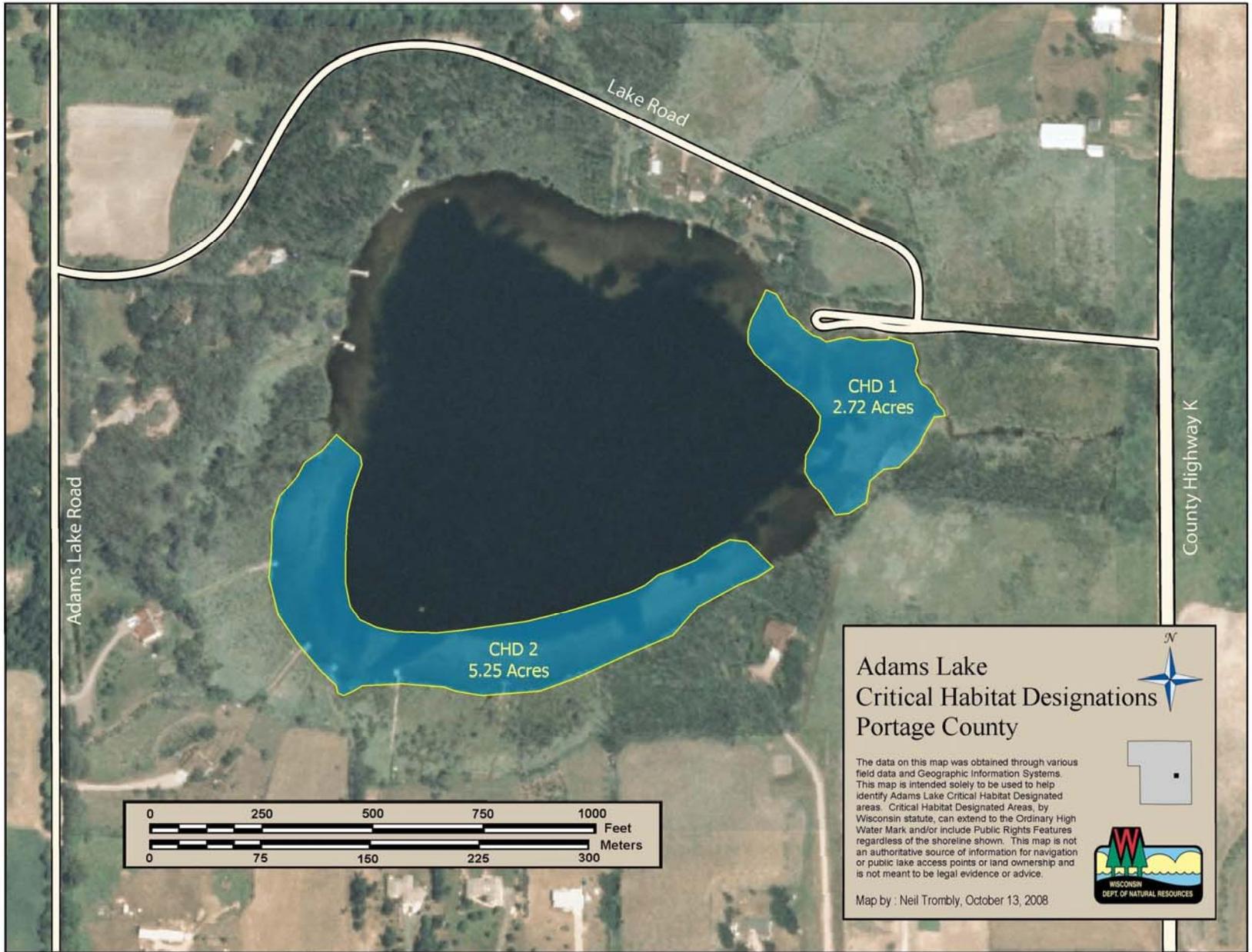
- 1) Shelter, cover, feeding and bedding/nesting areas for upland wildlife, muskrat, mink, songbirds, frogs, toads, salamanders, snakes and turtles.
- 2) Shelter, cover and feeding areas for ducks.

Fish Habitat

The designation of Critical Habitat Areas helps to preserve important fish habitat in a lake. Some values are unique to a Critical Habitat Area and some habitat values are shared by all the Critical Habitat Areas in a lake. All of the Critical Habitat Areas in Adams Lake provide:

- 1) Summer spawning, summer, fall and winter nursery areas, feeding areas and protective cover for large-mouth bass, bluegill, pumpkinseed and rock bass
- 2) Feeding area and protective cover for the brown trout that are stocked.

Figure 2. Critical Habitat Designated Areas



Critical Habitat Designated Area 1 – Bulrush Bed

This 2.72 acre area was selected because of the bulrush habitat and diverse submerged aquatic plant community that occurred among the bulrushes. The site is located on the east end of the lake. There is one public boat landing in this site and no existing piers. The shoreline is entirely natural shrub wetland except for the boat ramp and access road.

The Plant Community:

This site supports 9 species of aquatic plants.

Emergent vegetation: bulrush, sedges, and spikerush protect the shoreline and provide important food sources, cover and fish spawning habitat.

A diverse submerged plant community provides many important habitat components for the fish and wildlife community (Table 1). Muskgrass is dominant; northern watermilfoil and bushy pondweed are present. The pondweed family is likely the most important producer of habitat and is represented here by floating-leaf pondweed, sago pondweed, Frie's pondweed and Illinois pondweed, which is common.



Table 1. Wildlife and Fish Uses of Aquatic Plants in Adams Lake CHD Area1

Aquatic Plants	Fish	Water Fowl	Song and Shore Birds	Upland Game Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Chara</i> sp.(Muskgrass)	F*, S	F*, I*					
<i>Myriophyllum sibiricum</i> (northern watermilfoil)	F*, I*, S	F(Seeds, Foliage)	F(Seeds)		F		
<i>Najas flexilis</i> (busy pondweed)	F, C	F*(Seeds, Foliage)	F(Seeds)				
<i>Potamogeton illinoensis</i> ¹ (Illimois pondweed)	F, I, S*,C	F*(Seeds)	F		F*	F	F
<i>Potamogeton natans</i> (floating-leaf pondweed)	F, I, S*,C	F*(Seeds, Tubers)			F*	F	F
<i>Potamogeton pectinatus</i> ¹ (sago pondweed)	F, I, S*,C	F*			F*	F	F
<i>Potamogeton friesii</i> (Frie's pondweed)	F, C	F(Seeds)					
<u>Emergent Plants</u>							
<i>Carex stricta</i> (sedge)	S*	F*(Seeds), C		F*(Seeds)	F	F	F
<i>Eleocharis smallii</i> (spikerush) ¹	I	F, C					
<i>Scirpus acutus</i> (hardstem blurush) ¹	F, C, I	F (Seeds)*, C	F(Seeds, Tubers), C	F (Seeds)	F	F	F

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

***=Valuable Resource in this category** ¹ See final footnote at end of report.

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

Wildlife Habitat

The emergent vegetation, snag trees, perch trees and shoreline shrubs and brush are the critical wildlife habitat components at this site. In addition to the wildlife habitat values found at all the sites (page 4) this site also provides:

- 1) Nesting areas for ducks

Fish Habitat

The emergent vegetation (bulrush bed) is important for fish habitat at this site. In addition to the fish habitat values provided at all sites (page 4), this Critical Habitat Area provides:

- 1) Spring spawning for large-mouth bass

Recommendations for CHD Area 1

Recommendations for the terrestrial shoreline buffer:

- 1) Minimize removal of any shoreline vegetation. Allow removal of a maximum corridor width of 30 feet per landowner.
- 2) Maintain the current wildlife habitat
- 3) Maintain wildlife corridor
- 4) Maintain snag and cavity trees
- 5) No bank grading allowed.

Recommendations for the aquatic habitat to the Ordinary High Water Mark

- 1) Maintain the aquatic vegetation (emergent and submergent) in an undisturbed condition for wildlife habitat, fish cover and as a buffer for water quality protection. Permits required for any vegetation removal.
- 2) Protect emergent vegetation.
- 3) Maintain the current fish and wildlife habitat
- 4) Do not remove fallen trees along the shoreline, leave in water for habitat.
- 5) No shoreline erosion control needed; site is protected by aquatic vegetation and shoreline vegetation. No permits will be issued for rip-rap or retaining walls, etc.
- 6) No permit approval for pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 7) No dredging or lake bed removal or modifications.
- 8) No piers currently located in site, new pier placement by permit only.
- 9) One boat ramp is located at site, no additional boat ramps needed.
- 10) No recreational floating devices.

Critical Habitat Designated Area 2 – Southwest Shore

This Critical Habitat Area, approximately 5.25 acres along the west and south shore, was selected for its diverse submerged aquatic plant community, its natural scenic beauty and the extensive wetland along the shore. The shoreline is entirely natural Shrub Carr* wetland, except for the piers built across the wetland, the boathouse and one shed in the riparian zone. There are six private piers and one boathouse over the water.

The Plant Community:

The aquatic plant community at this site supports 10 species of plants.

Shoreline and emergent vegetation includes spikerush, cattails and sedge that provide wildlife cover and food sources, protect the shoreline and provide spawning habitat.

A diverse submergent plant community provides a diverse habitat (Table 2). Muskgrass is dominant and bushy pondweed is also present. The pondweed family is likely the most important producer of habitat and is represented here by sago pondweed, Illinois pondweed which is abundant; Frie's pondweed which is common.

**** Shrub Carr wetland :***

Shrub swamps / shrub wetlands of Wisconsin can be categorized as either shrub-carr or alder thicket depending on the dominant shrub species. Shrub carrs are hydrophytic plant communities containing tall, deciduous shrubs of small trunk diameter such as willows, red-osier dogwood, silky dogwood and native white meadowsweet growing on long-term saturated or seasonally inundated oxygen deficient soils unsuited for upland plants. Shrub Carrs are often found in bands around lakes or ponds, on the margins of river floodplains and may cover extensive marsh areas. Wet meadow, sedge meadow, and prairie vegetation such as forbs, ferns, sedges and Canada bluejoint grass or reed canary grass may be present.. The diversity of species depends on canopy cover, water source and availability as well as degree of disturbance. Undisturbed shrub-carrs may exhibit a rich diversity of both flora and fauna. Although not uncommon in Wisconsin, these wetlands should be highly valued and protected. See the following WIDNR link for additional information:

<http://www.dnr.state.wi.us/org/land/er/communities/index.asp?mode=group&Type=Wetland>

Table 2. Wildlife Uses of Aquatic Plants in Adams Lake Critical Habitat Area 2

Aquatic Plants	Fish	Water Fowl	Song and Shore Birds	Upland Game Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Chara</i> sp.(Muskgrass)	F*, S	F*, I*					
<i>Najas flexilis</i> (busy pondweed)	F, C	F*(Seeds, Foliage)	F(Seeds)				
<i>Potamogeton illinoensis</i> ¹ (Illinois pondweed)	F, I, S*,C	F*(Seeds)	F		F*	F	F
<i>Potamogeton pectinatus</i> (sago pondweed) ¹	F, I, S*,C	F*			F*	F	F
<i>Potamogeton friesii</i> (Frie's pondweed)	F, C	F(Seeds)					
<u>Floating-leaf Plants</u>							
<i>Lemna minor</i> (small duckweed)	F	F*, I	F	F	F	F	
<i>Spirodela polyrhiza</i> (greater duckweed)	F	F		F			
<u>Emergent Plants</u>							
<i>Carex stricta</i> (sedge)	S*	F*(Seeds), C		F*(Seeds)	F	F	F
<i>Eleocharis smallii</i> (spikerush) ¹	I	F, C					
<i>Typha latifolia</i> (cattail)	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

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

¹ See final footnote at end of report.

Wildlife Habitat

This emergent vegetation, wetland shrubs and brush along the shore, snag trees and perch trees at this site provides habitat for a diversity of wildlife – upland wildlife, furbearers, birds, amphibians and reptiles (pg 4).

Fish Habitat

The emergent vegetation and wetland shrubs at the shore provide habitat for a diverse fish community. In addition to the fish habitat values provided by all Critical Habitat areas in Adams Lake (page 4), this area also provides:

- 1) Fall and winter nursery areas for the brown trout which are stocked

Recommendations for CHD Area 2

Recommendations for the terrestrial shoreline buffer:

- 1) No removal of any additional shoreline vegetation; maintain undeveloped areas for wildlife habitat. Adequate access has been provided by piers.
- 2) Maintain trees near shore for perches and leave dying snag trees for cavity nesting.
- 3) No bank grading.
- 4) Increase wildlife habitat (shrub and plant cover) behind structures for wildlife habitat and corridors.

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

- 1) Maintain the aquatic vegetation (emergent and submergent) in an undisturbed condition for wildlife habitat, fish cover and as a buffer for water quality protection. Permits required for any vegetation removal.
- 2) Do not remove fallen trees along the shoreline, leave in water for habitat.
- 3) No shoreline erosion control needed, site is protected by aquatic vegetation and shoreline vegetation. No permits will be issued for rip-rap or retaining walls, etc.
- 4) No alterations to the shallow water area, such as pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 5) No dredging or lake bed removal or modifications.
- 6) No additional pier placement.
- 7) No boat ramp placement.
- 8) No recreational floating devices.

¹ These are among the high value species specifically mentioned in Wisconsin Administrative Rules. NR 107.08(4) ...“High value species are individual species of aquatic plants known to offer important values in specific aquatic ecosystems, including *Potamogeton amplifolius*, *Potamogeton Richardsonii*, *Potamogeton praelongus*, *Potamogeton pectinatus*, *Potamogeton illinoensis*, *Potamogeton robbinsii*, *Eleocharis spp.*, *Scirpus spp.*, *Valisneria spp.*, *Zizania aquatica*, *Zannichellia palustris* and *Brasenia schreberi*.”