CRITICAL HABITAT DESIGNATION
THOMAS 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 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.

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. THOMAS LAKE STATISTICS

Lake Area: 33 acres* (Based on 2005 DOP)
Surface Watershed Details: 118 acres** (Adapted from Portage County Planning and Zoning.)
Forest / Shrub : 54% (64 acres)
Nonirrigated Agriculture: 16% (19 acres)
Other Cover: 30% (35 acres)

Lake Type: Seepage
Mean Depth: 16.46 feet
Maximum Depth: 28 feet
Miles of Shoreline: 0.84 miles / 4441 feet
Lake Volume: 543.3 acre-feet (DNR calculation based on 1972 Bathymetry lines)

Maximum Rooting Depth: 17.5 ft.
Number of Plant Species in 2006 Survey: 11
Littoral Area: 14 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.

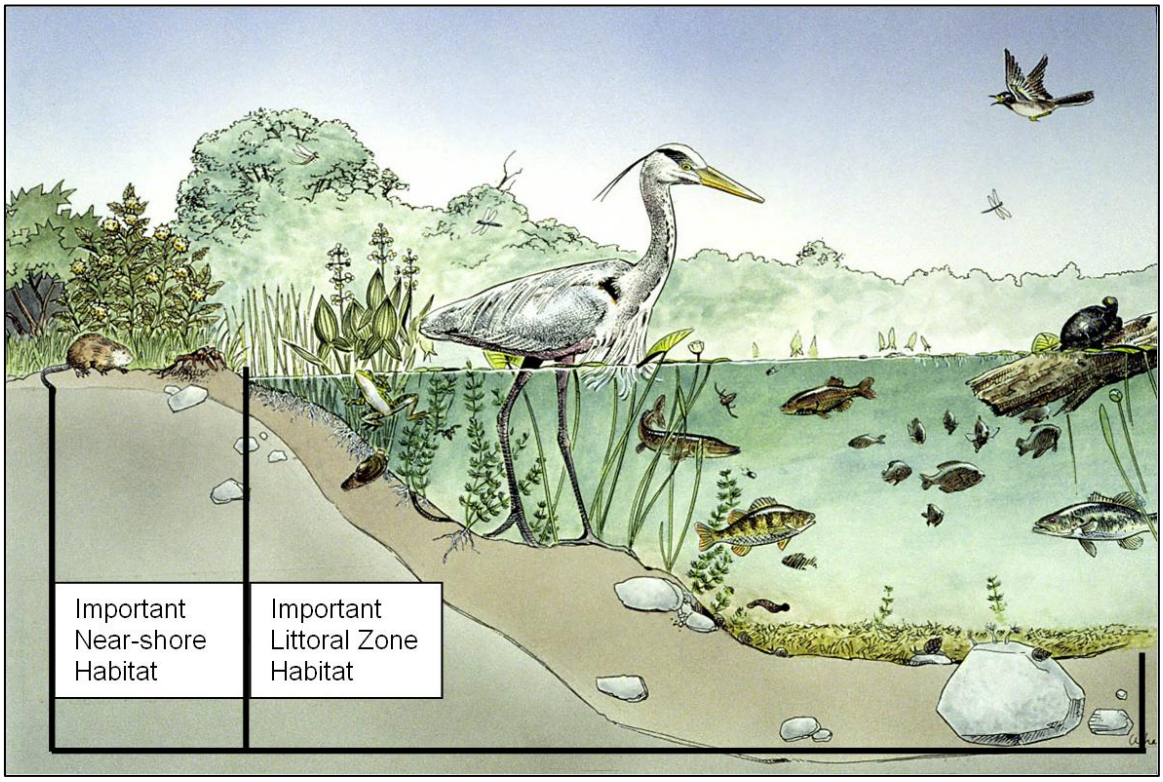

Figure 1. Location of important near-shore and littoral zone habitat.

A Critical Habitat Area Study was conducted June 16, 2008 and September 18 2008 on Thomas 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. EXECUTIVE SUMMARY:

Thomas Lake is a mesotrophic seepage lake with good-to-very good water clarity and good water quality. Filamentous algae was found at 8% of the sites in Thomas Lake in 2006.

The aquatic plant community in Thomas Lake is characterized by fair species diversity, average for lakes in the state and region.

The aquatic plant community colonized the entire littoral zone, to a maximum depth of 17.5 feet.

Eleven (11) aquatic plant species were recorded in Thomas Lake. Ceratophyllum demersum, coontail, was the most frequently occurring species, occurring at nearly three-quarters of the sample sites. Myriophyllum spicatum (Eurasian watermilfoil) was the sub-dominant species, occurring at more than half of the sites. Elodea canadensis, common waterweed, was abundant; northern watermilfoil, small pondweed and flatstem pondweed were commonly occurring.

Concerning the Number and Prevalence of Aquatic Plant Species Found

The number and prevalence of 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 the sampling was done. Different years, seasons, methodology and sampling density can all affect the number and prevalence of species found in any one survey.

Concerning 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, (OWHM). Where Public Rights Features and/or wetlands and/or public lands are involved other determinants may be involved. Most CHD areas include some shoreland below the OHWM.
2. The lakeward extent of a CHD area in deeper lakes is set by the designation team with the general expectation that it not significantly extend 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.

V. THE CRITICAL HABITAT DESIGNATED AREA

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

The site was selected because of its importance for fish and wildlife habitat and the diverse aquatic plant communities it supports (Figure 2). The plant beds provide a biological buffer, reducing the possibility that introduced non-native plant species (Eurasian watermilfoil) will maintain its long-term dominance in the lake.

The Critical Habitat Area was geo-referenced.

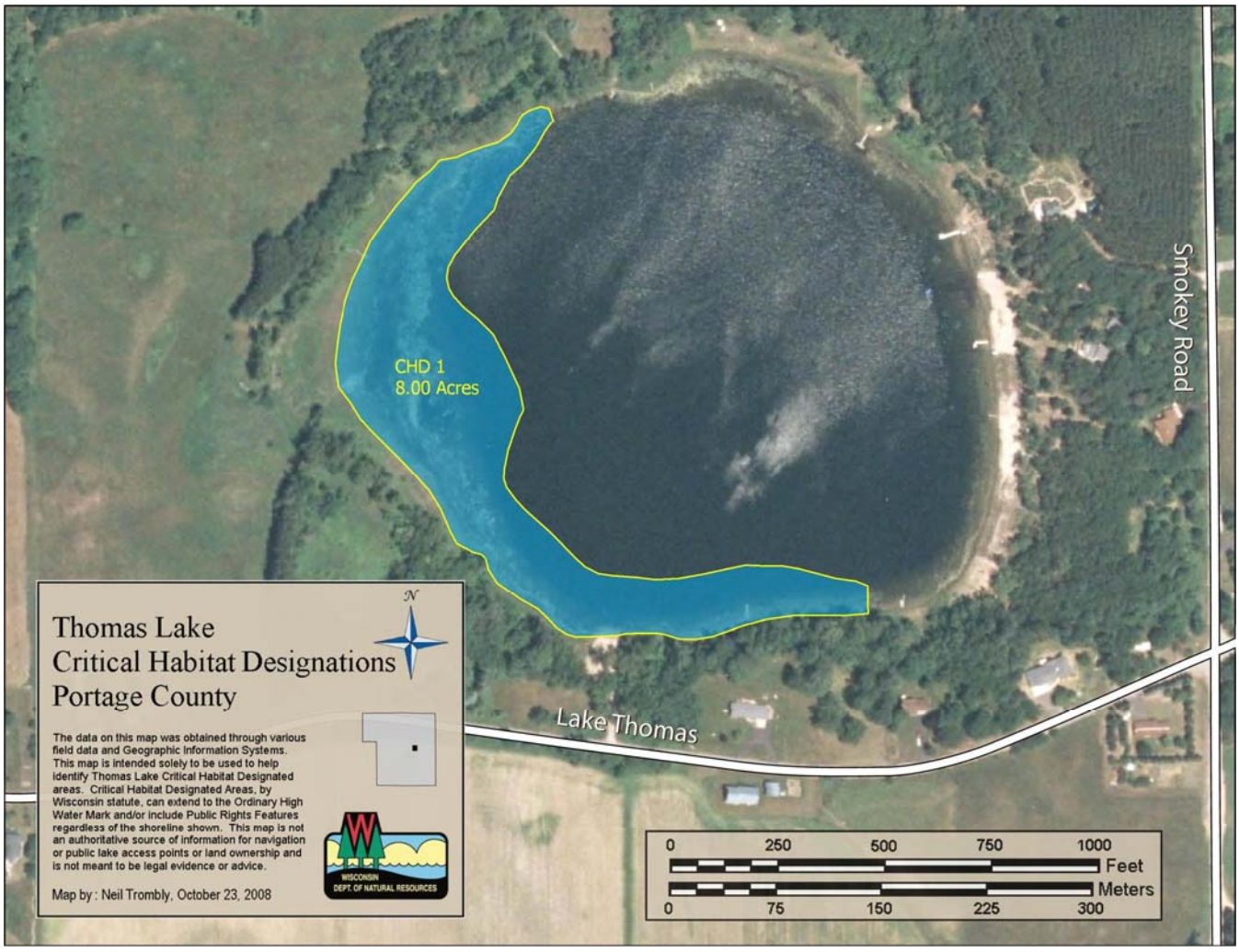

Figure 2. Location of Designated Critical Habitat on Thomas Lake.

Critical Habitat Designated Area – Thomas Lake

This 8.0 acre area was selected because of the floating-leaf and diverse submerged aquatic plant community that provides important fish and wildlife habitat and the extensive shoreline wetland. The site is located along the south and west shores, including the access point. There is an existing pier at the site, a dirt/sand boat ramp/beach and approximately 60 feet of established lawn in the shoreline buffer. There are two homes and one barn that are visible in the set-back zone. The shoreline is a mixture of shrub wetland and mixed forest.

The Plant Community:

This Critical Habitat site supports 11 species of aquatic plants found in our survey. The aquatic vegetation provide important food sources, cover and fish spawning habitat.

Floating leaf plants, white water lily, provide fish and wildlife cover and food resources.

A diverse submerged plant community provides many important habitat components for the fish and wildlife community (Table 1). Coontail is dominant; Elodea is common; northern waterfmilfoil and muskgrass are present. The pondweed family is likely the most important producer of habitat and is represented here by sago pondweed, fern-leaf pondweed, Illinois pondweed; flat stem and small pondweeds which are common. A non-native species, Euraian watermilfoil is abundant at the site.

Plant Community Effect on Water Quality

The aquatic and shoreline vegetation in the Critical Habitat Designated area(s) provide important water quality protections. The plants provide a nutrient buffer by absorbing nutrients thus reducing algae growth and also provide a physical buffer that protects the shoreline against wave erosion. The plant beds anchor the sediments and prevent sediment resuspension by boat motors and waves that would increase turbidity.

Wildlife Habitat

This site provides habitat for a diversity of wildlife. The emergent vegetation, floating-leaf vegetation, snag trees, perch trees and shoreline shrubs and brush are the critical wildlife habitat components at this site. This site provides:

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

Table 1. Wildlife and Fish Uses of Aquatic Plants at Thomas Lake Critical Habitat Area

Aquatic Plants	Fish	Water Fowl	Song and Shore Birds	Muskrat	Beaver	Deer
Submergent Plants						
Ceratophyllum demersum (coontail)	F,I*, C, S	F(Seeds*), I, C		F		
Chara sp.(Muskgrass)	F*, S	F*, I*				
Elodea canadensis (common waterweed)	C, F, I	F(Foliage) I				
Myriophyllum sibiricum (northern watermilfoil)	F*, I*, S	F(Seeds, Foliage)	F(Seeds)	F		
Myriophyllum spicatum (Eurasian watermilfoil)	F, C					
Illinois pondweed (*Potamogeton illinoensis)* [1]	F, I, S*,C	F*(Seeds)	F	F*	F	F
Sago pondweed (*Potamogeton pectinatus)*	F, I, S*,C	F*		F*	F	F
Potamogeton pusillus (small pondweed)	F, I, S*,C	F*(All)		F*	F	F
Potamogeton robbinsii (fern-leaf pondweed) [1]	F, I, S*,C	F*		F*	F	F
Potamogeton zosteriformis (flatstem pondweed)	F, I, S*,C	F*(Seeds)		F*	F	F
Floating-leaf Plants						
White water lily (*Nymphaea odorata)*	F,I, S, C	F(Seeds)	F	F	F	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

[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*."

Fish Habitat

The designation of Critical Habitat Areas helps to preserve important fish habitat in a lake. The large woody cover, emergent vegetation, submerged vegetation and floating-leaf vegetation are important fish habitat components at this site. This Critical Habitat Area provides:

1. Summer spawning areas, summer, fall and winter nursery areas, feeding areas and protective cover for large-mouth bass, bluegill and pumpkinseed.

Recommendations for the Critical Habitat Designated Area

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, especially the wetland shoreline
3. Maintain snag and cavity trees
4. Maintain and increase wildlife corridor along the shore
5. No bank grading allowed.

Recommendations for the aquatic habitat to the Ordinary High Water Mark

1. 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. Permits required for any vegetation removal.
2. Allow seasonal control of Eurasian watermilfoil
3. Protect emergent vegetation.
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. Some piers already exist in the area, new pier placement by permit only.
9. No recreational floating devices.