

Designation of Critical Habitat Areas Pike Lake, Marathon County



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

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Critical Habitat Area Designation Pike Lake, Marathon 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.

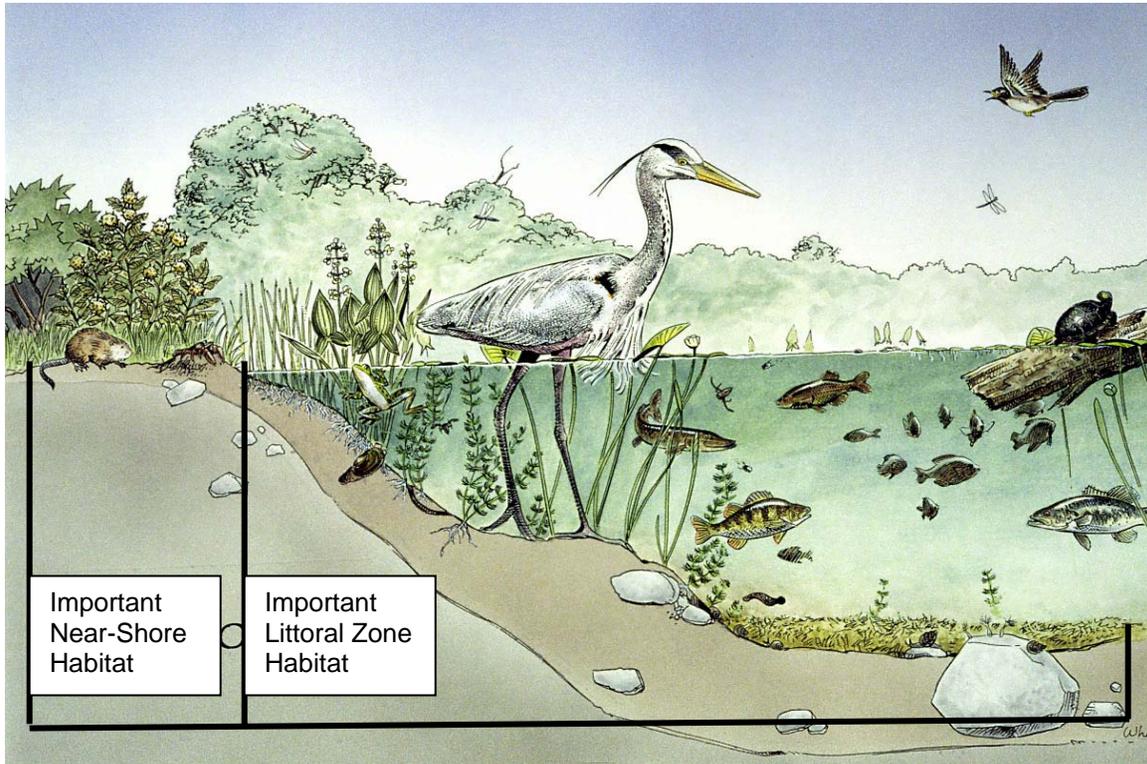


Figure 1. Location of important near-shore and littoral zone habitat.

A Critical Habitat Area Study was conducted October 5, 2006 on Pike Lake, Marathon County. The designations were based on aquatic plant data collected during July 1996, June 1999 and 2002 and August 2006; water quality data collected multiple times per year during 1986-2006 and previous fish surveys

The study team included:

- Tom Meronek, DNR Fish Biologist
- Deborah Konkell, DNR, Aquatic Plant Specialist
- Buzz Sorge, DNR Lakes Manager
- Rick Weide, DNR Wildlife Biologist
- Keith Patrick, DNR Water Management Specialist
- Amy Lesik-Marcon, DNR Water Resource Specialist

Pike Lake is a mesotrophic, hardwater lake with fair-to-good water quality and poor clarity. Filamentous algae is common. Both filamentous and planktonic algae have decreased since 1986, but water clarity has decreased also.

The aquatic plant community in Pike Lake is characterized by very good species diversity, high quality, impacted by above average amount of disturbance and abundant frequency but low density of plant growth. Aquatic plants are distributed throughout the lake, up to a maximum rooting depth of 10.5 feet. The

depth zone of most abundant plant growth in 2006 was the 0-1.5ft depth zone.

In 2006, the dominant species was muskgrass (*Chara* spp), exhibiting a growth from of above average density in Pike Lake. Muskgrass occurred at more than half of the sites and dominated the 1.5-10ft depth zones. Illinois pondweed (*Potamogeton illinoensis*) was sub-dominant, occurring at half of the sites.

II. THE CRITICAL HABITAT AREAS

The reasons for selection of each Critical Habitat Area are important, as this is what drives the selection process, their importance to the whole lake community. The reasons for selection are unique to each site (Figure 2).

All Critical Habitat Areas were geo-referenced.

Attributes Common to All the Critical Habitat Areas

Water Quality

The vegetation at all of the sites provides important water quality protections. Each site provides unique attribute to water quality protection.

Wildlife Habitat

Many Critical Habitat Areas provide very important wildlife habitat.

Fish Habitat

The designation of Critical Habitat Areas helps to preserve important fish habitat in a lake. The Critical Habitat Areas possess various attributes (submergent, floating-leaf, emergent and overhanging vegetation, gravel substrates and large woody cover) that have the potential to provide spawning areas, feeding areas, cover and/or nursery areas during various seasons. All of the Critical Habitat Areas provide:

- 1) spring spawning for northern pike, large-mouth bass, yellow perch, black crappie and white sucker
- 2) summer spawning for bluegill, pumpkinseed and black bullhead
- 3) spring nursery areas for walleye, northern pike, largemouth bass, black crappie and white suckers
- 4) summer nursery areas for walleye, northern pike, largemouth bass, bluegill, pumpkinseed, yellow perch, black crappie, black bullheads and white suckers
- 5) fall nursery areas for walleye, bluegill, pumpkinseed, yellow perch, black crappie and black bullheads
- 6) winter nursery areas for bluegill and pumpkinseed
- 7) feeding areas and protective cover for walleye, largemouth bass, bluegill, pumpkinseed, yellow perch, black crappie, black bullheads and white suckers

Critical Habitat Area Pike 1 – Island and South Outlet

This Critical Habitat Area includes approximately 15-acres in the shallow south bay outlet, around the island, from the Ordinary High Water Mark, out to the maximum rooting depth of 10 feet (Figure 2). This site was selected primarily for its high quality and diverse aquatic plant community. The bay includes deep marsh wetlands and shallow marsh wetlands and supports important shoreline habitat and littoral zone habitat composed of herbaceous wetlands (20%) forest growth with some shrub understory (20%) and many developed properties with lawns (60%) (Figure 3, 4).

The sediment is composed of rubble, sand, silt and organic muck. The scenic beauty here is likely the best on the lake and unique on this lake. Fallen trees are present at the undeveloped sites for fish and wildlife habitat. This site also has good potential for use as an educational opportunity.

The Plant Community:

This site supports 25 species of aquatic plants.

Emergent vegetation: cattail, water horsetail, arrowhead, pickerelweed and bulrush, protect the shoreline and provide important food sources, cover and fish spawning habitat.

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

A very diverse submerged plant community at this site provides many important habitat components for the fish and wildlife community (Table 1). Slender naiad, water buttercup, flat-leaf bladderwort and small bladderwort are present. Water stargrass is common; northern watermilfoil and waterweed are abundant; coontail is dominant. Macrophytic algae, stonewort and muskgrass, are found here. A turf-forming species (needle spikerush) colonizes the bottom, anchoring the sediments. The pondweed family, which is likely the most important group for habitat and food source for waterfowl and fish, is represented by an abundance of Illinois pondweed with small pondweed clasping-leaf pondweed, sago pondweed and flat-stem pondweed 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 are given to native plants found only in areas of high quality, of which many are Endangered, Threatened or Special Concern Species (Nichols 1998).



Figure 3. Critical Habitat Area1: Island, looking southwest and looking south.

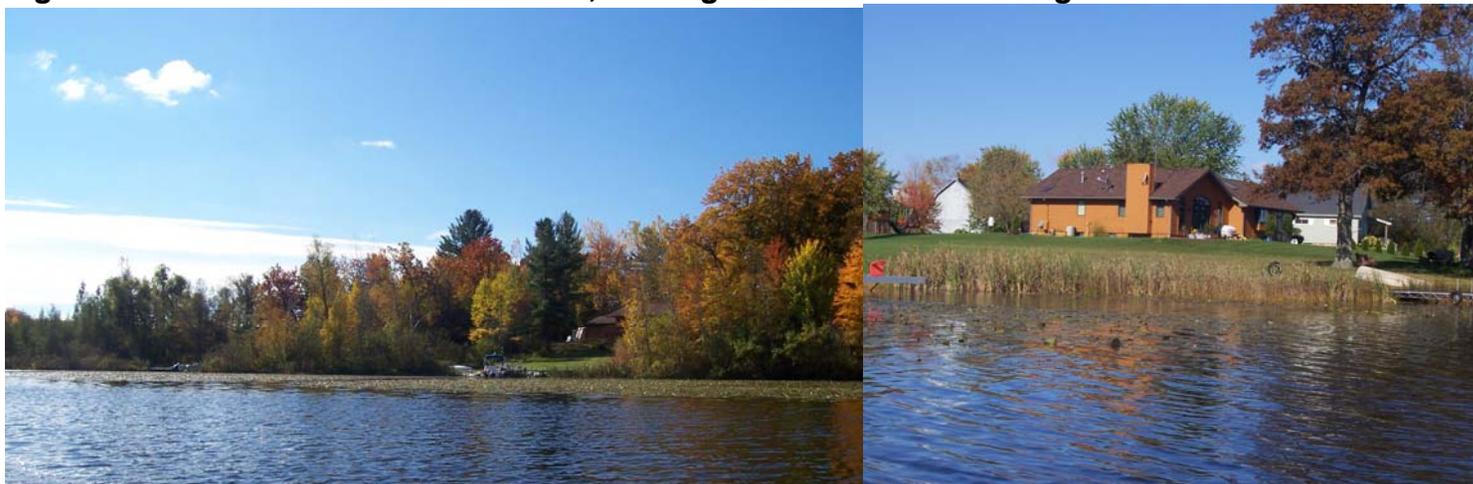


Figure 4. Critical Habitat Area 1, shore behind the island and on north boundary of area.

Table 1. Wildlife and Fish Uses of Aquatic Plants in Pike Lake Critical Habitat Area 1

Aquatic Plants	Fish	Water Fowl	Shore Birds	Upland Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Ceratophyllum demersum</i>	F, I, C, S	F, I, C			F		
<i>Chara</i> sp.	F*, S	F*, I*					
<i>Eleocharis acicularis</i>	S	F			F		
<i>Elodea canadensis</i>	C, I	F, I					
<i>Myriophyllum sibiricum</i>	S*, I*	F					
<i>Najas flexilis</i>	F, C	F*	F				
<i>Nitella</i> sp.		F, I*					
<i>Potamogeton illinoensis</i>	C	F	F		F	F	F
<i>Potamogeton pectinatus</i>	F, C	F*					
<i>Potamogeton pusillus</i>	F, I, S*, C	F*(All)			F*	F	F
<i>Potamogeton richardsonii</i>	F, I, C	F					
<i>Potamogeton zosteriformis</i>	F, C	F					
<i>Ranunculus longirostris</i>	F	F		F			
<i>Utricularia gibba</i>	F, C, I*	I*			F		
<i>Zosterella dubia</i>	F, C, S	F					
<u>Floating-leaf Plants</u>							
<i>Lemna minor</i>	F	F*, I	F	F	F	F	
<i>Nuphar variegata</i>	F, C, I	F, I	F		F*	F	F*

Aquatic Plants	Fish	Water Fowl	Shore Birds	Upland Birds	Muskrat	Beaver	Deer
<i>Nymphaea odorata</i>	F, C	F	F		F	F	F
<i>Spirodela polyrhiza</i>	F	F		F			
<u>Emergent Plants</u>							
<i>Equisetum fluviatile</i>		F		F	F		
<i>Pontederia cordata</i>	F, C	F			F		
<i>Sagittaria cristata</i>					F	F	
<i>Scirpus validus</i>	F, C, I	F*	F	F	F		
<i>Typha latifolia</i>	F, I	F, C	F, C		F*, C*	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 Critical Habitat Area 1.

Species		Coefficient of Conservatism
<i>Pontederia cordata</i>	Pickerelweed	9
<i>Utricularia gibba</i>	Small bladderwort	9
<i>Utricularia intermedia</i>	Flat-leaf bladderwort	9

Wildlife Habitat

The emergent vegetation, floating-leaf vegetation and shoreline shrubs and brush at this site provide important wildlife habitat. This site provides:

- 1) probable habitat for furbearers
- 2) shelter, cover and feeding areas for mallard ducks, coots, great blue herons
- 3) shelter and cover for frogs, toads and salamanders

Fish Habitat

The habitat and cover at this site provide for all life stages of the fish community.

- 1) Spring, summer and fall nursery areas, feeding areas and protective cover for walleye and black crappie
- 2) Spring spawning, spring and summer nursery areas, feeding areas and protective cover for northern pike, large-mouth bass and white sucker
- 3) summer spawning, summer, fall and winter nursery areas, feeding areas and protective cover for bluegill and pumpkinseed
- 4) summer spawning, fall and winter nursery areas, feeding areas and protective cover for black and yellow bullheads
- 5) spring spawning sites, year-round nursery areas, feeding areas and cover for yellow perch

Recommendations for 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.
- 2) Maintain the current wildlife habitat
- 3) Compliance issues may occur at this site, there are no shoreline buffers at many properties with lawns maintained to the shoreline. Properties need to be brought within compliance.
- 4) Natural vegetation buffers are needed on several shoreline properties to protect against shoreline erosion and protect water quality.
- 5) Use no lawn care products.
- 6) No permit approval for rip-rap or retaining walls, use vegetative restorations.
- 7) No bank grading.

Recommendations for the aquatic habitat below the Ordinary High Water Mark

- 8) 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.
- 9) Maintain the current wildlife habitat

- 10) Protect emergent vegetation.
- 11) Designate slow no-wake behind the island.
- 12) No permit approval for pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 13) No dredging or lake bed removal or modifications.
- 14) Pier placement by permit only to minimize number of piers and their size and their disturbance; require light-penetrating pier material such as metal grating.
- 15) No boat ramp placement.
- 16) No recreational floating devices.

Critical Habitat Area Pike 2 – West Shore

This Critical Habitat Area encompasses more than 2000-ft of shoreline (approximately 18 acres) from the Ordinary High Water Mark, out to the maximum rooting depth of 11 feet (Figure 2). This site was selected due to its quality aquatic plant community, its natural scenic beauty, its value for wildlife habitat and its value for fishery habitat. The sediment is sand, organic muck and silt.

The site includes deep marsh wetland and shallow marsh wetlands that support important shoreline habitat and shallow water habitat (Figure 5, 6). The shoreline composed of some wooded cover with an understory of shrub (40%), a small amount of grassy cover (20%) and development with lawns (40%). Large woody cover that is an important structural component of fish and wildlife habitat is absent and appears to have been removed from the shore.

The Plant Community:

The aquatic plant community at this site supports 19 species of plants.

Emergent vegetation (pickerelweed, cattails, bur-reed and bul-rush) provide wildlife cover and food sources, protect the shoreline and provide important fish and wildlife habitat.

Floating leaf-species, yellow pond lily, lesser duckweed and commonly occurring white water lily, provide cover and food sources.

A diverse submergent plant community provides a diverse habitat and many habitat values (Table 3). Coontail is abundant; waterweed and northern watermilfoil are common; water buttercup and water stargrass are present. Macrophytic algae, stonewort and muskgrass, are found here. The pondweed family is likely the most important producer of habitat and is represented here by an abundance of Illinois pondweed, commonly-occurring flat-stem pondweed, white-stem pondweed, small pondweed, clasping-leaf pondweed and the non-native curly-leaf pondweed.

One sensitive species, pickerelweed, occurred at this site. The species sensitivity is measured by its Coefficient of Conservatism. 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 rare species (Nichols 1998).



Figure 5. Critical Habitat Area 2, south end and north end



Figure 6. Heron in emergent beds and nearly 200 coot at point.

Table 3. Wildlife and Fish Uses of Aquatic Plants in Pike Lake Critical Habitat Area 2

Aquatic Plants	Fish	Water Fowl	Shore Birds	Upland Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Ceratophyllum demersum</i>	F, I, C, S	F, I, C			F		
<i>Chara</i> sp.	F*, S	F*, I*					
<i>Elodea canadensis</i>	C, I	F, I					
<i>Myriophyllum sibiricum</i>	S*, I*	F					
<i>Nitella</i> sp.		F, I*					
<i>Potamogeton illinoensis</i>	C	F	F		F	F	F
<i>Potamogeton pusillus</i>	F, I, S*, C	F*(All)			F*	F	F
<i>Potamogeton praelongus</i>	F, C	F					
<i>Potamogeton richardsonii</i>	F, I, C	F					
<i>Potamogeton zosteriformis</i>	F, C	F					
<i>Ranunculus longirostris</i>	F	F		F			
<i>Zosterella dubia</i>	F, C, S	F					
<u>Floating-leaf Plants</u>							
<i>Lemna minor</i>	F	F*, I	F	F	F	F	
<i>Nuphar variegata</i>	F, C, I	F, I	F		F*	F	F*
<i>Nymphaea odorata</i>	F, C	F	F		F	F	F

Aquatic Plants	Fish	Water Fowl	Shore Birds	Upland Birds	Muskrat	Beaver	Deer
<u>Emergent Plants</u>							
<i>Pontederia cordata</i>	F, C	F			F		
<i>Scirpus validus</i>	F, C, I	F*	F	F	F		
<i>Sparganium eurycarpum</i>	I	F(Seeds), C	F, C		F		F*
<i>Typha latifolia</i>	F, I	F, C	F, C		F*, C*	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

Wildlife Habitat

The emergent vegetation, floating-leaf vegetation and shoreline shrubs and brush at this site provide important wildlife habitat. This site provides:

- 1) probable habitat for furbearers
- 2) feeding areas for coots
- 3) shelter, cover, nesting areas and feeding areas for frogs and toads
- 4) shelter, cover and nesting areas for salamanders

Fish Habitat

The habitat and cover at this site provide for all life stages of the fish community.

- 1) Spring spawning areas, spring, summer and fall nursery areas, feeding areas and protective cover for walleye and crappie
- 2) Spring spawning, spring and summer nursery areas, feeding areas and protective cover for northern pike and white sucker
- 3) spring spawning sites, year-round nursery areas, feeding areas and cover for large-mouth bass and yellow perch
- 4) summer spawning, summer, fall and winter nursery areas, feeding areas and protective cover for bluegill and pumpkinseed
- 6) summer spawning, summer and fall nursery areas, feeding areas and protective cover for black and yellow bullheads

Water Quality

The vegetation at this Critical Habitat Area provides important water quality protections.

- 1) Beds of emergents at the shore 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) The aquatic vegetation provides a biological buffer that reduces the chance of invasion by exotic species.

Recommendations for Area 2

Recommendations for the terrestrial shoreline buffer:

- 1) Maintain the current wildlife habitat
- 2) Zoning compliance issues may exist at this site. Lawns are currently being mowed to the water line.
- 3) No use of lawn care products at the site.
- 4) Shoreline and bank vegetative buffers need to be restored to protect against erosion and maintain water quality via nutrient filtration.
- 5) Currently, much of stormwater run-off goes directly to lake. Place stormwater management projects, such as rain gardens on properties.
- 6) No permit approvals for rip-rap and retaining walls, bank protection should be through restoration of natural vegetation buffers.
- 7) No bank grading.

Recommendations for the aquatic habitat below the Ordinary High Water Mark

- 8) 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. Remove a maximum of one 30-ft corridor, perpendicular to the shore, at each property. Permits required for any vegetation removal.
- 9) Maintain the current wildlife habitat
- 10) Protect emergent vegetation.
- 11) No permit approval for pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 12) No dredging or lake bed removal or modifications.
- 13) No additional piers to be permitted.
- 14) No boat ramp placement.
- 15) No recreational floating devices.

Critical Habitat Area Pike 3 – North Shore Reef

This Critical Habitat Area encompasses approximately 12 acres on the northeast shore, extending from the Ordinary High Water Mark, out to the maximum rooting depth of 12 feet (Figure 2). This site was selected because of its value for the fish community and supports important shallow water habitat (Figure 7, 8). The sediment is a mixture of gravel, sand, silt and organic muck. The shoreline at this Critical Habitat Area is entirely developed, dominated by manicured lawn.

Large woody cover from fallen trees is absent from this site. It appears that this important habitat for fish cover and wildlife has been removed.

The Plant Community:

This site supports 11 species of aquatic plants.

Floating-leaf vegetation, yellow pond lilies, dampen wave action and provide important fish habitat.

A submergent plant community provides many fish and wildlife benefits (Table 5). Coontail is abundant at this site; northern watermilfoil is common; water stargrass and slender naiad occur here also. The macrophytic algae, muskgrass, is abundant here. The pondweed family is an important food source for fish and waterfowl and is represented at this site by an abundance of flat-stem pondweed, the commonly-occurring Illinois pondweed and small pondweed and clasping-leaf pondweed.



Figure 7. Critical Habitat Area 3, view to west and view to east



Figure 8. Critical Habitat 3, close up of middle portion.

Table 4. Wildlife and Fish Uses of Aquatic Plants in Pike Lake Critical Habitat Area 3

Aquatic Plants	Fish	Water Fowl	Shore Birds	Upland Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Ceratophyllum demersum</i>	F, I, C, S	F, I, C			F		
<i>Chara</i> sp.	F*, S	F*, I*					
<i>Myriophyllum sibiricum</i>	S*, I*	F					
<i>Najas flexilis</i>	F, C	F*	F				
<i>Potamogeton illinoensis</i>	C	F	F		F	F	F
<i>Potamogeton pusillus</i>	F, I, S*, C	F*(All)			F*	F	F
<i>Potamogeton richardsonii</i>	F, I, C	F					
<i>Potamogeton zosteriformis</i>	F, C	F					
<i>Zosterella dubia</i>	F, C, S	F					
<u>Floating-leaf Plants</u>							
<i>Nuphar variegata</i>	F, C, I	F, I	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

Fish Habitat

The habitat and cover at this site provide for all life stages of the fish community.

- 1) spring spawning sites, year-round nursery areas, feeding areas and cover for walleye
- 2) Spring spawning and spring and summer nursery areas for northern pike
- 3) Spring spawning, spring and summer nursery areas, feeding areas and protective cover for large-mouth bass and white sucker
- 4) summer spawning, summer, fall and winter nursery areas, feeding areas and protective cover for bluegill and pumpkinseed
- 5) Spring spawning areas, summer and fall nursery areas, feeding areas and protective cover for yellow perch and black bullheads
- 6) Spring spawning areas, spring, summer and fall nursery areas, feeding areas and protective cover for black crappie
- 7) summer spawning, summer and fall nursery areas, feeding areas and protective cover for black bullheads

Recommendations for Site 3

Recommendations for the terrestrial shoreline buffer:

- 1) Create shoreline buffers of natural vegetation for water quality protection, to prevent erosion and filter nutrients
- 2) Do not use lawn care products on properties
- 3) Currently, much of stormwater run-off goes directly to lake. Place stormwater management projects, such as rain gardens on properties. No permit approval for rip-rap or, retaining walls. Site needs natural vegetation buffers.
- 4) No bank grading.

Recommendations for the aquatic habitat below the Ordinary High Water Mark

- 5) 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.
- 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 additional pier placement.
- 9) No boat ramp placement.
- 10) No recreational floating devices.