

Designation of Critical Habitat Areas Wadley Lake, Marathon County



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

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Critical Habitat Area Designation Wadley 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.

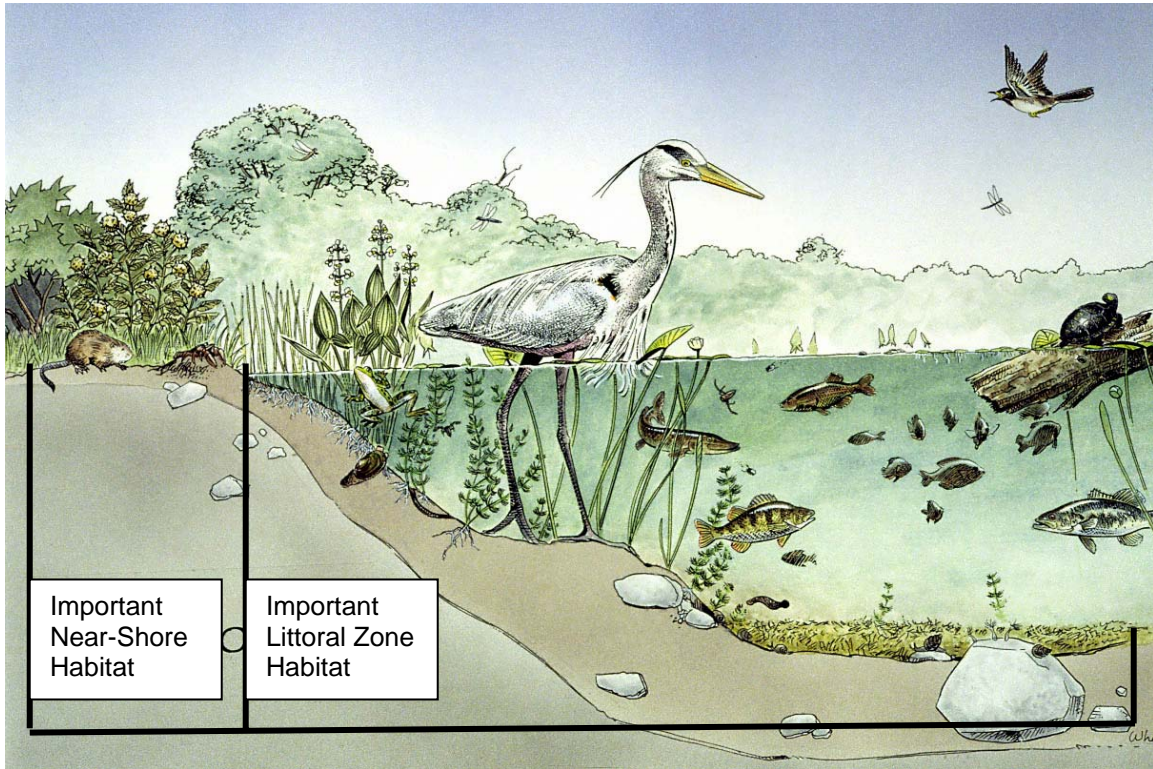


Figure 1. Location of important near-shore and littoral zone habitat.

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

A Critical Habitat Area Study was conducted October 6, 2006 on Wadley Lake, Marathon County. The designations were based on aquatic plant data collected during July 2006 and previous fish surveys

The study team included:

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Wadley Lake is a mesotrophic/oligotrophic lake with good water clarity and very good water quality. Water clarity has declined since 1999. No filamentous algae was found during the study.

Aquatic plant community colonized nearly of the littoral zone, approximately half of the total lake area, to a maximum depth of 17 feet. It was composed of species indicative of hardwater, clear water systems. The 0-1.5 ft. depth zone supported the most abundant aquatic plant growth.

Chara spp., a macrophytic algae, was the dominant species within this plant community, especially in the 0-10ft depth zones, occurring at three-quarters of the sample sites and exhibiting a dense growth form. *Najas flexilis* (slender naiad, bushy pondweed) was the sub-dominant species, occurring at more than half of the sites and abundant in the 10-20ft depth zone.

The aquatic plant community in Wadley Lake is characterized by high quality, very poor species diversity, an average tolerance to disturbance and a condition closer to an undisturbed condition than the average lake in the state and region.

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. All sites were selected because of the high quality aquatic plant communities they support and their ability to provide a buffer against the invasion and colonization of invasive/exotic plant species (Figure 2). This is critical because the lake appears to be very vulnerable to the invasion of exotic/invasive species.

All Critical Habitat Areas were geo-referenced. The water level appeared to be lower than normal during the survey year.

Attributes Common to All the Critical Habitat Areas

Wildlife Habitat

All of the Critical Habitat Areas provide wildlife habitat. Shoreline shrubs and brush are habitat structures found at all these sites. Wildlife values are unique to each Critical Habitat Area.

Fish Habitat

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

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

Critical Habitat Area Wadley 1 – Northeast Bay

This Critical Habitat Area includes approximately 6.5-acres of the northeast bay, from the Ordinary High Water Mark out to the maximum rooting depth in the bay of 5 feet (Figure 2). The bay includes shallow marsh wetlands and supports important near-shore terrestrial habitat, shoreline habitat and littoral zone habitat composed of forest growth (45%), wetland cover (45%) with some shrub cover and developed property (10%) (Figure 3).

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

The Plant Community:

This site supports 11 species of aquatic plants.

Emergent vegetation: cattails, commonly occurring bur-reed and abundant bulrush, protect the shoreline and provide important food sources, cover and fish spawning habitat.

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

The submerged plant community provides many important habitat components for the fish and wildlife community (Table 1). Chara, a macrophytic algae, is dominant. Slender naiad is abundant. The pondweed family, which is an important food source for waterfowl and fish, is represented by long-leaf pondweed, small pondweed Illinois pondweed and the commonly occurring floating-leaf pondweed.



Figure 3. Wadley Lake Critical Habitat Area 1; Northeast Bay

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

Aquatic Plants	Fish	Water Fowl	Song and Shore Birds	Upland Game Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Chara</i> sp.	F*, S	F*, I*					
<i>Najas flexilis</i>	F, C	F*(Seeds, Foliage)	F(Seeds)				
<i>Potamogeton illinoensis</i>	F, I, S*,C	F*(Seeds)	F		F*	F	F
<i>Potamogeton natans</i>	F, I, S*,C	F*(Seeds, Tubers)			F*	F	F
<i>Potamogeton nodosus</i>	F, I, S*,C	F*(Seeds)			F*	F	F
<i>Potamogeton pusillus</i>	F, I, S*,C	F*(All)			F*	F	F
<u>Floating-leaf Plants</u>							
<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>Scirpus validus</i>	F, C, I	F (Seeds)*, C	F(Seeds, Tubers), C	F (Seeds)	F	F	F
<i>Sparganium</i> spp.	I	F(Seeds), C	F, C		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**

Wildlife Habitat

The emergent vegetation, floating-leaf vegetation, shoreline shrubs and brush, snag and perch trees and fallen logs at this site provide important habitat values.

This site provides:

- 1) Potential shelter, cover and feeding areas for muskrat and mink
- 2) Potential nesting areas for ducks
- 3) Potential feeding areas for osprey
- 4) Potential shelter, cover, nesting and feeding areas for songbirds, frogs, toads and salamanders

Fish Habitat

The diversity of habitat and cover types provide for all life stages of the fish community. This site provides:

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

Water Quality

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

- 1) The plants provide a physical buffer that protects the shoreline against wave erosion.

Recommendations for Area 1

Recommendations for the terrestrial shoreline buffer:

- 1) Protect buffer of natural shoreline. Minimize removal of any shoreline vegetation. Allow removal of a maximum of 30 feet for access/viewing.
- 2) Use no lawn care products.
- 3) This site is currently in compliance with ordinances
- 4) A couple homes at this site need restoration of bank vegetation to protect the bank.
- 5) No bank grading.

Recommendations for the aquatic habitat below the Ordinary High Water Mark

- 6) 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.
- 7) Maintain vegetation to protect against erosion and nutrient inputs to the water.
- 8) Protect emergent vegetation.
- 9) Do not remove fallen trees along the shoreline, leave in water for fish and wildlife habitat.
- 10) Designate slow no-wake in the bay.

- 11) Limit authorization for pea gravel beds or sand blankets.
- 12) No dredging or lake bed removal or modifications.
- 13) No additional pier placements.
- 14) No boat ramp placement, lake has a boat landing that provides sufficient access.
- 15) No recreational floating devices.

Critical Habitat Area Wadley 2 – Southeast Bay

This Critical Habitat Area encompasses approximately 6 acres of the southeast bay and east shoreline, out to the maximum rooting depth in the bay of 15 feet (Figure 2). In addition to the diverse aquatic plant community, this site was also selected for its natural scenic beauty, valuable near-shore terrestrial vegetation, fish habitat value and wildlife value.

The site supports important near-shore terrestrial habitat and shallow water habitat and has preserved a good shoreline buffer (Figure 4). The shoreline largely wooded with a fringe of shoreline grasses (70%), a ring of exposed sand and gravel (20%) and small areas of development (5%).

The sediment is gravel, sand, silt and detritus.

Large woody cover that is an important structural component of fish and wildlife habitat is abundant at this site providing very good habitat.

The Plant Community:

The aquatic plant community at this site supports 8 species of aquatic plants.

Floating leaf-species: yellow pond lily and white water lily, provide cover and food sources.

The submergent plant community provides a diverse habitat (Table 3). Slender naiad is abundant and wild celery is present. The pondweed family is likely the most important producer of habitat and is represented here by Illinois pondweed, small pondweed and flat-stem pondweed.



Figure 4. Wadley Lake Critical Habitat Area 2: Southeast Bay.

Table 2. Wildlife Uses of Aquatic Plants in Wadley 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.	F*, S	F*, I*					
<i>Najas flexilis</i>	F, C	F*(Seeds, Foliage)	F(Seeds)				
<i>Potamogeton illinoensis</i>	F, I, S*,C	F*(Seeds)	F		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>Vallisneria americana</i>	F*, C, I, S	F*, I	F		F		
<u>Floating-leaf Plants</u>							
<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

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 scattered stands of emergent vegetation, the natural shoreline shrubs and brush and fallen logs at this site provide important habitat values. This site provides:

- 1) Probable shelter, cover and feeding areas for mink
- 2) shelter, cover and feeding areas for ducks
- 3) shelter, cover, nesting and feeding areas for songbirds
- 4) July feeding areas for loon

Fish Habitat

The diversity of habitat and cover types provide for all life stages of the fish community. This site provides:

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

Water Quality

The vegetation at this Critical Habitat Area provides important water quality protections. The shoreland buffers above the Ordinary High Water Mark have been preserved and are especially important here.

- 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) 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) Protect natural shoreline in its present state to reduce erosion and nutrient run-off to lake.
- 2) Minimize removal of any shoreline vegetation. Allow removal of a maximum 30 feet for access/viewing.
- 3) Maintain the current wildlife habitat
- 4) Maintain snag trees on shore for cavity nesting.
- 5) This site is currently in compliance with ordinances
- 6) No bank protection needed. No approval for rip-rap or retaining walls. Site has sufficient natural vegetation buffer.
- 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) Do not remove fallen trees along the shoreline, leave in water for fish and wildlife habitat.
- 12) Minimize authorization for pea gravel beds or sand blankets.
- 13) No dredging or lake bed removal or modifications.
- 14) No additional pier placement at site
- 15) No boat ramp placement. Lake has boat ramp that provides adequate access.
- 16) No recreational floating devices.

Critical Habitat Area Wadley 3 – Roadside Emergent Bed

This Critical Habitat Area encompasses approximately 850 feet of shoreline along the west shore, north of the boat landing out to the maximum rooting depth of 10 feet (Figure 2). In addition to the aquatic plant community, this site was also chosen for its wildlife and fish habitat. It includes deep marsh and shallow marsh habitats that support important shoreline habitat and shallow water habitat (Figure 5). The shoreline at this Critical Habitat Area is composed of mainly roadside development (60%), grass cover (30%) and a small amount of wooded cover (5%).

The sediment is silt and detritus. Large woody cover from fallen trees is common in the shallow water. This woody cover provides important habitat for fish cover and wildlife resting areas.

The Plant Community:

This site supports 8 species of aquatic plants.

This emergent vegetation at this site protects the shoreline and provides important food sources, cover and fish spawning habitat. The emergent community is composed of bul-rush and cattails.

Floating-leaf vegetation, commonly occurring white water lilies dampen wave action and provide important fish habitat.

The submergent plant community provides many fish and wildlife benefits (Table 5). Slender naiad is abundant at this site. The pondweed family is an important food source for fish and waterfowl and is represented at this site by white-stem pondweed, Illinois pondweed and abundant small pondweed.



Figure 5. Wadley Lake Critical Habitat Area 3: West Shore

Table 3. Wildlife Uses of Aquatic Plants in Wadley Lake Critical Habitat Area 3

Aquatic Plants	Fish	Water Fowl	Song and Shore Birds	Upland Game Birds	Muskrat	Beaver	Deer
<u>Submergent Plants</u>							
<i>Chara</i> sp.	F*, S	F*, I*					
<i>Najas flexilis</i>	F, C	F*(Seeds, Foliage)	F(Seeds)				
<i>Potamogeton illinoensis</i>	F, I, S*,C	F*(Seeds)	F		F*	F	F
<i>Potamogeton praelongus</i>	F, I, S*,C	F*(All)			F*	F	F
<i>Potamogeton pusillus</i>	F, I, S*,C	F*(All)			F*	F	F
<u>Floating-leaf Plants</u>							
<i>Nymphaea odorata</i>	F,I, S, C	F(Seeds)	F		F	F	F
<u>Emergent Plants</u>							
<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 Invertbrates, 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

Wildlife Habitat

The emergent vegetation and shoreline shrubs and brush provide a limited amount of habitat at this site. The highway near this shoreline likely limits wildlife use of this area.

Fish Habitat

The diversity of habitat and cover types provide for all life stages of the fish community. This site provides:

- 1) Year-round nursery areas, feeding areas and protective cover for northern pike
- 2) Spring spawning areas, year-round nursery areas, feeding areas and protective cover for yellow perch and black crappie
- 3) summer spawning, summer and fall nursery areas, feeding areas and protective cover for large-mouth bass and brown bullhead
- 4) summer spawning, summer, fall and winter nursery areas, feeding areas and protective cover for bluegill and pumpkinseed

Recommendations for Site 3

Recommendations for the terrestrial shoreline buffer:

- 1) Maintain narrow shoreline buffer between road and lake and do not remove any of this vegetation. This provides the primary infiltration of highway run-off. Allow buffer to widen.
- 2) Restore natural shoreline where possible along this shore for water quality protection and bank stabilization.
- 3) Maintain the current wildlife habitat
- 4) Maintain snag trees on shore for cavity nesting and perch sites.
- 5) This site is currently in compliance with ordinances.
- 6) No authorization for erosion controls such as rip-rap or retaining walls. Use 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. Permits required for any vegetation removal.
- 9) Maintain the current wildlife habitat
- 10) Protect emergent vegetation.
- 11) Do not remove fallen trees along the shoreline, leave in water for fish and wildlife habitat.
- 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) No additional pier placement
- 15) No boat ramp placement. Lake already has landing for sufficient access.
- 16) No recreational floating devices.