

**Designation of Sensitive Areas  
Loon Lake, Chippewa County**

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

# Sensitive Area Designation Loon Lake, Chippewa County

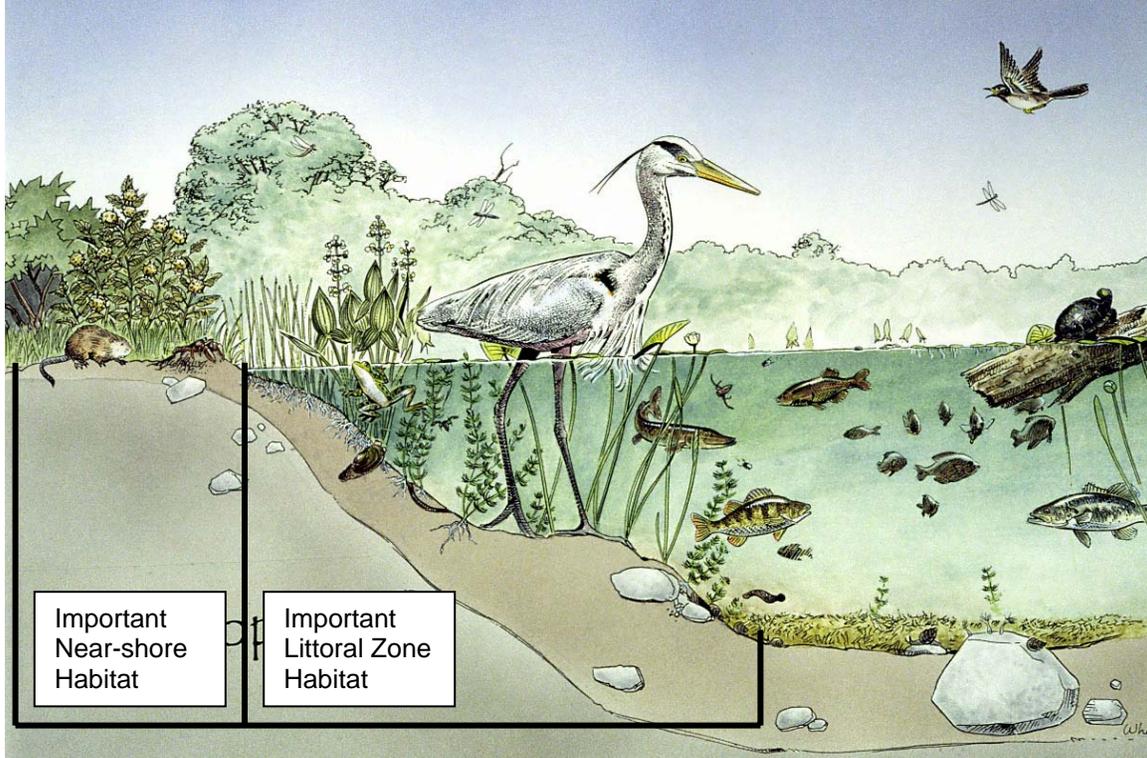
## I. INTRODUCTION

Designation of sensitive 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. Sensitive areas are dependent on 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 sensitive 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 Sensitive Area Study was conducted August 26 and October 4, 2004 on Loon Lake, Chippewa County.

The study team included:

Joe Kurz, DNR Fish Biologist

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Loon Lake is a 125-acre lake with a maximum depth of 8 ft and an average depth of 5 ft. Loon Lake is a shallow water resource, a mesotrophic lake with good water quality and fair water clarity.

As a shallow water resource, the plant community is key to preserving the water quality. Shallow lakes in Wisconsin generally exist in one of two states: clear-water, plant-dominated systems or turbid, plant-poor systems. Once a shallow water lake is shifted from a clear-water, plant-dominated system to a turbid, plant-poor system, it is nearly impossible to bring it back to the clear phase. The loss of the plant community would allow wind events to stir up lake sediments and nutrients to be consumed by an increasing algae population. Since Loon Lake is dominated by sensitive aquatic plant species, the loss of the plant community could easily happen.

The aquatic plant community is characterized by very high quality, excellent species diversity and very high sensitivity to disturbance. Loon Lake is very close to an undisturbed condition. Its Floristic Quality Index is one of the highest recorded in the state, indicating few lakes are closer to an undisturbed condition. Six Species of Special Concern were found in within the 33-species-plant community of Loon Lake.

The aquatic plant community colonized the entire littoral zone to the maximum depth of the lake. The 0-1.5ft depth zone supported the greatest amount of aquatic plant growth.

## **II. THE SENSITIVE AREAS**

The reasons for selection of each sensitive area are important, as this is what drives the selection process, their importance to the whole lake community.

All sites were selected because of their: importance for fish habitat, importance for wildlife habitat, importance for protecting water quality, the natural buffer of terrestrial vegetation, the high quality aquatic plant communities they supported and for their outstanding, natural scenic beauty (Figure 2).

All of the sensitive areas that were selected have the potential to be used for educational purposes; they provide visual and sound buffers, buffers against the

invasion of non-native species and areas of beauty for lake residents and visitors.

### **Common Attributes for All the Sensitive Areas**

#### **Water Quality**

The vegetation at all of the sites provides important water quality protections. The plants provide a nutrient buffer by absorbing nutrients thus reducing algae growth. The plants provide a physical buffer that protects the shoreline against wave erosion. Aquatic plants provide sediment stabilization, their roots anchoring the sediments and preventing resuspension by boat motors and waves and the resulting turbidity. They provide a biological buffer that reduces the chance of invasion by exotic species. Boat traffic in shallow lakes like Loon Lake is a concern due to the motor impacts on the sediment that can in turn impact water quality. Research on the mixing depths of boat motors have shown that a 50 hp motor will mix and resuspend sediment to a depth of 15 ft. (Wagner 1990). With a maximum depth of only 8 feet, the entire lake bed of Loon Lake would be susceptible to impacts by a 50 hp motor. Water quality studies conducted before and after high boating-use weekends showed a sharp decrease in water clarity and a sharp increase in water column phosphorus with boating activity (Asplund 1997).

#### **Fish Habitat**

All of the sensitive areas provide important fish and aquatic life habitat. The sensitive areas are the areas in the lake that are most important for the fish community. The submergent and floating-leaf plant beds, emergent vegetation and large woody cover provide spring spawning sites, summer, fall and winter nursery areas, feeding sites and protective cover for northern pike, large-mouth bass, bluegill, pumpkinseed, crappie and bullhead. No exotic fish and crayfish have been found in this lake.

#### **Wildlife Habitat**

All of the sensitive areas provide very important wildlife habitat. The emergent vegetation, floating-leaf vegetation, shoreline shrubs, snag trees and fallen logs are the key habitat structure at these sites. Some values are unique to a sensitive area and some habitat values are shared by all the sensitive areas. All of the sites provide shelter, cover, nesting and feeding areas for upland wildlife, beaver, muskrat, ducks, songbirds, eagles, frogs, toads, salamanders, turtles, snakes and possibly osprey. All sites provide shelter, cover and feeding areas for otter, mink, loons and geese. All of the sites provide nesting sites for wood ducks.

### **Sensitive Area Loon 1 – South Bay**

This sensitive area is the approximately 27-acre south bay. The bay includes deep marsh wetlands and supports important near-shore terrestrial habitat composed of mostly hardwood forest with some shrub and herbaceous cover (Figure 2). About 10% of the shoreline is wetland. The sediment is composed of sand, silt and detritus. Large woody cover that is present on the east shore and common on the west shore provides important fish and wildlife habitat structure (Figure 3, 4).

#### **The Plant Community:**

Emergent vegetation, arrowhead, pickerelweed and Torrey's bulrush, protect the shoreline and provide important food sources, cover and fish spawning habitat.

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

A very diverse submerged plant community provide many important habitat components for the fish and wildlife community ( Table 1). Water bulrush is present, slender water naiad and three species of bladderwort are common Robbin's spikerush and purple bladderwort are dominant at this site. Small rosette species colonize the bottom, anchoring the sediments, dwarf watermilfoil, the small brown-fruited rush and creeping spikerush are present and pipewort is abundant at this site. The pondweed family, which is an important food source for waterfowl and fish, is represented by a small pondweed (*Potamogeton bicupulatus*) and is common at this site.

Four of the plant species at this site are special concern species because of their rarity and sensitivity to disturbance: *Eleocharis robbinsii* (Robbin's spikerush), *Myriophyllum farwellii* (Farwell's watermilfoil), *Scirpus torreyi* (Torrey's bulrush), *Utricularia geminiscapa* (twin-stemmed bladderwort) and *U. purpurea* (purple bladderwort). Special Concern Species are species with which there some suspected concern about their lack of abundance or distribution, but not yet proved. The main purpose of this designation is to focus attention on these species before they become threatened or endangered.

#### **Wildlife Habitat**

In addition to the habitat values found at all the sites, this site also provides nesting areas for otters and mink.

### **Recommendations for Area 1**

- 1) Do not remove fallen trees along shoreline that provide fish and wildlife habitat.
- 2) Maintain current protection of fish and wildlife habitat.
- 3) Do not alter the littoral zone except for improvement of spawning habitat.
- 4) Maintain snag trees on shore for cavity nesting and perch sites.
- 5) Maintain the current buffer width for wildlife corridor.
- 6) Maintain white pines for potential eagle and osprey nest sites.
- 7) Designate slow no-wake in shallow areas less than 4 feet.

- 8) Protect emergent vegetation.
- 9) Minimize removal of any shoreline or aquatic vegetation. Allow removal of a maximum corridor width of 30 feet.
- 10) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a buffer for water quality protection.
- 11) No permitting for shoreline erosion control needed.
- 12) No bank grading.
- 13) No permit approval for pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 14) No dredging or lake bed removal or modifications.
- 15) Minimize pier size and placement; permit required for placement.
- 16) No boat ramp placement.
- 17) Permit required for recreational floating devices.

## **Sensitive Area Loon 2 – East Bay**

This sensitive area encompasses approximately 30 acres of the east bay. The sediment is sand, silt, gravel and detritus.

The bay includes deep marsh habitat, shallow marsh habitat and bog wetlands that support near-shore terrestrial, shoreline and shallow water habitats (Figure 3, 5). The shoreline is a mixture of wooded cover, shrub growth, herbaceous growth and small areas of lawn. About 20% of the shoreline is wetland. Large woody cover that is an important structural component of fish and wildlife habitat is present along most of the shore, but abundant along the peninsula shoreline. The gravel and rock substrate provide additional benefits for fish spawning.

### **The Plant Community:**

Shoreline and emergent vegetation that includes Canada bluejoint grass, spikerush, wild rice, wool grass, sedge and three-way sedge, provide wildlife cover and food sources, protect the shoreline and provide spawning habitat. Torrey's bulrush and arrowhead are common and pickerelweed is dominant.

Floating leaf-species, such as white water lily, watershield and water smartweed, provide cover and food sources. White water lily dominates the floating-leaf community.

A very diverse submergent plant community provides a diverse habitat (Table 2). Four species of bladderwort are common to dominant. Water bulrush is also dominant and slender water-nymph is common. The pondweed family is likely the most important producer of habitat and is represented here by floating-leaf pondweed, Oake's pondweed and the small *Potamogeton bicupulatus*.

Small rosette species protect the lake bottom and anchor the sediment. Arrowhead rosettes, dwarf watermilfoil and pipewort are common. Quillwort, the small brown-fruited rush, waterwort and dwarf hyssop also colonize the lake bed.

Three of the plant species at this site are special concern species because of their rarity and sensitivity to disturbance: *Scirpus torreyi* (Torrey's bulrush), *Utricularia geminiscapa* (twin-stemmed bladderwort) and *U. purpurea* (purple bladderwort).

### **Wildlife Habitat**

In addition to the habitat values found at all the sites, this site also provides nesting areas for loon.

## **Recommendations for Area 2**

- 1) Do not remove fallen trees along shoreline that provide fish and wildlife habitat.
- 2) Maintain current protection of fish and wildlife habitat.
- 3) Do not alter the littoral zone except for improvement of spawning habitat.
- 4) Maintain snag trees on the shore for cavity nesting and perch sites.
- 5) Maintain the current buffer width for wildlife corridor.
- 6) Maintain mature white pines for potential eagle and osprey nest sites.
- 7) Require revegetation of shoreline buffer at developed sites for wildlife habitat and water quality protection.
- 8) Designate slow no-wake in shallow areas less than 4 feet.

- 9) Protect emergent vegetation.
- 10) Minimize removal of any shoreline or aquatic vegetation. Allow removal of a maximum corridor width of 30 feet.
- 11) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a buffer for water quality protection.
- 12) No chemical use on lawns.
- 13) Two shoreline developments are in compliance with zoning ordinances, another is not due to excess clearing of vegetation along the shore and a structure on the shore. The property needs to be brought into compliance with shoreland zoning standards.
- 14) No permitting for shoreline erosion control needed.
- 15) No bank grading, pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 16) No dredging or lake bed removal or modifications.
- 17) Minimize pier size and placement; permit required for placement.
- 18) No boat ramp placement.
- 19) Permit required for recreational floating devices.

### **Sensitive Area Loon 3 – Northwest Bay**

This sensitive area encompasses approximately 10 acres of the northwest bay. It includes deep marsh and shallow marsh habitats that support important near-shore terrestrial habitat, shoreline habitat and shallow water habitat (Figure 3, 6). The sediment is sand, silt, gravel and rock. The shoreline at this sensitive area is composed of much shrub cover and some wooded and herbaceous growth with a small area of developed lawn. About 50% of the shoreline is wetland. Large woody cover from fallen trees is present in the shallow water along most of the shoreline and abundant toward the west portion of the area. This woody cover provides important habitat for fish cover and wildlife resting areas. Areas of large rock and boulder are important for fish spawning.

Due to groundwater flows in the area of Loon Lake (Wisconsin State Hydrology maps), this bay is a groundwater source area. It is important to protect this water source to Loon Lake.

### **The Plant Community:**

The extensive marshland along the shore is protecting the water quality and providing excellent wildlife habitat. This marsh wetland is composed of bluejoint grass, cattails, sedges, spikerushes, bulrushes and arrowhead.

Floating-leaf vegetation, white water lilies, yellow pond lilies and watershield, are common and dampen wave action and provide important fish habitat.

Small rosette species colonize the lake bottom, anchoring the substrate. These submerged rosette species include pipewort, dwarf watermilfoil, waterwort and rosettes of arrowhead.

The pondweed family is an important food source for fish and waterfowl and is represented at this site by the small *Potamogeton bicupulatus*.

A diverse submergent plant community provides many fish and wildlife benefits. Purple bladderwort is dominant in this zone and two other bladderwort species occur at this site. Spiny hornwort occurs in the deeper water. Slender water-nymph, Farwell's watermilfoil and water bulrush are all common at this site.

Three of the plant species at this site are special concern species because of their rarity and sensitivity to disturbance: *Ceratophyllum echinatum* (spiny hornwort), *Myriophyllum farwellii* (Farwell's watermilfoil) and *Utricularia. purpurea* (purple bladderwort).

### **Water Quality**

Maintaining the integrity of this sensitive area is especially important for protecting the water quality of Loon Lake as this site contains springs that provide water flow to the lake.

### **Wildlife Habitat**

In addition to the habitat values found at all the sites, this site also provides nesting areas for otters, mink, loons and geese.

### **Recommendations for Area 3**

- 1) Do not remove fallen trees along shoreline that provide fish and wildlife habitat.
- 2) Maintain current protection of fish and wildlife habitat.
- 3) Do not alter the littoral zone except for improvement of spawning habitat.
- 4) Maintain snag trees for cavity nesting and perch sites.
- 5) Maintain the current buffer width for wildlife corridor.
- 6) Maintain white pines for potential eagle and osprey nest sites.
- 7) Require revegetation of shoreline buffer at developed sites for wildlife habitat.
- 8) Designate slow no-wake in shallow areas less than 4 feet.
- 9) Protect emergent vegetation.
- 20) Minimize removal of any shoreline or aquatic vegetation. Allow removal of a maximum corridor width of 30 feet.
- 10) Maintain the aquatic vegetation in an undisturbed condition for wildlife habitat, fish cover and as a buffer for water quality protection and the prevention of curly-leaf pondweed invasion.
- 11) No chemical use on lawns.
- 12) Property within sensitive area needs to be brought into compliance with shoreline zoning standards.
- 13) No permitting for shoreline erosion control needed.
- 14) No bank grading.
- 15) No permit approval for pea gravel beds or sand blankets, except for DNR fishery or wildlife approved projects.
- 16) No dredging or lake bed removal or modifications.
- 17) Minimize pier size and placement; permit required for placement.
- 18) No boat ramp placement.
- 19) Permit required for recreational floating devices.