

## Cloverleaf Lakes, (Shawano County) Sensitive Area Survey Report

Date of Survey: July 28, 2003

Number of Sensitive Areas: 4

### Site Evaluators:

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### **General Lake Information:**

The Cloverleaf Lakes consist of 3 interconnected lakes, Round, Grass and Pine Lake. Round Lake is approximately 26 acres, Grass Lake approximately 80 acres and Pine Lake totals approximately 208 acres. These lakes are fed primarily by groundwater flowing in an east-southeast direction. The outlet drains to the Embarras River. A dam on the outlet controls the water levels of the Cloverleaf Lakes. The maximum depth of the Round Lake is approximately 40 feet, the deepest lake of the chain. The Cloverleaf Lakes are a recreationally popular chain for fishing, boating, water skiing, bird watching and hunting. The Cloverleaf Lakes collectively are classified as mesotrophic to eutrophic. Eutrophic lakes have elevated levels of algae, nutrients and nuisance aquatic plants. Recent management of the Cloverleaf Lakes has focused on the control of Eurasian Watermilfoil, an exotic invasive plant. Eurasian Watermilfoil was first discovered in the Cloverleaf Lakes in the early 1990's. Much of the Cloverleaf Lakes are developed with residential housing. A public swimming beach, owned by the Town of Belle Plaine, can be found on Pine Lake. Grass Lake offers a public boat ramp with parking. A public fishing pier, with handicap accessibility, is located on Round Lake.

The Cloverleaf Lakes are managed in fisheries, as one body of water. It is a warmwater fishery, consisting primarily of largemouth bass, northern pike and panfish (bluegill, black crappie, yellow perch) with walleye and musky being present.

Past fish management practices were, fish surveys, fish stocking, and development of a walleye-spawning reef. The fishery has been surveyed, with nets or electrofishing equipment, about every 10 years since the mid 1940's. The lake has an average northeast Wisconsin northern pike and largemouth bass population of about 3- 5 fish per acre with no significant change over the years. Natural reproduction is sufficient in maintaining this population. Walleye fingerlings have been stocked since the late 1970's on alternate years. A population of about 1 fish per acre is maintained through this stocking program. A walleye-spawning reef was built on Pine Lake in the 1980s to hopefully establish a natural reproducing population. There is no evidence of any spawning success on the reef. Musky are present in sufficient size and number to attract a fair number of musky

anglers. The population is maintained through alternate years of stocking, with fish reaching harvestable size (40") in 7- 8 years. An abundant bluegill population is present with a good percentage of the fish over 6 inches in length. Over the years the average size of the bluegill have been increasing. The number of bluegills 8" or greater is low. The black crappie population has varied over the years, due to fluctuations in year class strengths. As of the 2000 survey 3-year-old fish dominated the crappie population. Yellow perch were never caught in high numbers during past surveys, but those caught were of average size. All fish growth rates are on par with northeast Wisconsin averages, indicating a good diverse and healthy fishery.

The present management activities of alternate years stocking of walleye and musky, along with fish surveys, should continue. Stocking of these species provides an additional angling opportunity in this primarily northern pike, largemouth bass, panfish fishery.

The Cloverleaf Lakes provide the best wildlife habitat where the shoreline is undeveloped or the shoreline buffer is intact. Much of the woody cover has been removed along developed shorelines, both in the water and on the upland. The understory or brush layer is also absent on developed shorelines. This layer provides habitat for small mammals and numerous species of birds. Management recommendations include maintaining the undeveloped shorelines and effectively restoring the developed and disturbed shorelines.

Good plant diversity exists within the Cloverleaf Lakes with approximately 23 species present. Plant densities vary depending on the extent of the littoral zone, recreational use and human disturbance. Generally speaking, the lower the recreational use, the higher the plant density and diversity. Aquatic plant management permits are required for chemical, mechanical and manual harvesting of aquatic plants. A permit is not required for manual removal of plants in a 30-foot wide zone along the shoreline per property. Please contact aquatic plant manager, Crystal Olson (715) 526-4220 before conducting any aquatic plant control in the Cloverleaf Lakes.

### **Introduction:**

The survey was conducted on July 28, 2003 using the Wisconsin Department of Natural Resources protocol guidelines for conducting and implementing sensitive area surveys. The purpose of the survey is to identify areas within the lake that have unique characteristics based on their aquatic plant community, fish and wildlife use. Sensitive area designations provide lake organizations, shoreline property owners, county zoning officials, tribal environmental services, tribal government, DNR personnel and other interested individuals with specific management recommendations to protect and improve the health of the lake.

The companion document "**Guidelines for protecting, maintaining, and understanding lake sensitive area**" (contact your DNR lakes coordinator, Crystal Olson, (715) 526-4220, for a copy) may be used for additional information to help understand lake sensitive area designations. This document contains information to help understand the factors that influence the health of the lake.

Six sights on the Cloverleaf Lakes contain critical habitat and were designated as sensitive area (see Map 1). These areas are highly recommended for additional protection.

### **Overview of Sensitive Area Designations:**

Sensitive areas are defined in Wisconsin Administrative Code NR 107.05(3)(i)(1.)- *Sensitive areas are areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or life-stage requirements, or offering water quality or erosion control benefits to the body of water.* These areas may consist of valuable aquatic/wetland vegetation, terrestrial vegetation, gravel/rubble substrate, downed woody cover and water quality buffer areas.

The purpose of determining sensitive areas in lakes is to provide a tool for the goals listed below and to provide baseline field survey data for lake management records. The main goals of a sensitive area designation include:

- Use by managers to guide permitting processes of aquatic plant management, water regulations, fisheries management, wildlife management and local zoning activities
- Use to assist in the planning of various lake management projects
- Use as a tool in aquatic habitat protection activities
- Use by local lake organizations to help guide lake use and management activities
- Use as a compliment to local land-use planning activities
- Provide a guide to potential shoreland buyers and existing shoreland owners with development and lake use issues
- Provide baseline data for various resource management decisions
- Provide an educational tool to the public about natural areas and to initiate stewardship for lake and habitat protection

### **Exotic Species**

During this survey one exotic species of plant was observed, Eurasian Watermilfoil, hereafter referred to as EWM.

EWM is the dominant plant in many areas of the lake. EWM causes a multitude of problems including obstructing navigation, limiting recreational use, aesthetic value and becomes a maintenance issue for landowners. EWM is spread mainly through plant fragments. The fragments grow new root systems and from this new plants arise.

*Potamogeton crispus* (Curly-leaf pondweed) was not documented during the survey. However, it is likely that this exotic species exists within the Cloverleaf Lakes but due to the timing of the survey was not observed. Curly-leaf pondweed is a unique plant that is very well adapted to Wisconsin climate. It can grow under the ice while most plants are dormant, but by mid-July the plant is dying back when other aquatic plants are reaching their peak. The life cycle of curly-leaf is triggered by changes in water temperature. In May, warmer water stimulates plant growth of the spring foliage. Beginning in July, curly-leaf goes into late summer dormancy and the foliage begins to break down. Prior to the foliage dying, turions or seeds are produced. These turions lay dormant until the

water begins to cool in September. When the water temperature falls to about 75°F, the turions germinate to produce winter foliage and the cycle begins again. Due to this unique life cycle, curly-leaf causes nuisance problems during all times of the year. The midsummer die-off can release nutrients into the water column and is available for algal growth and other plants.

Exotic species are spread mainly by human activities including boating, fishing, etc. Wisconsin law requires the removal of all aquatic plants and animals from watercraft and trailers before launching in water not currently infested with exotic species. Exotic plants can easily become established in areas that are disturbed and native plants are removed. Protection of native plant communities is vital to slow the spread of exotics once they are introduced into the system.

### **Special Concern, Threatened and Endangered Species**

The Cloverleaf Lakes are home to an active Bald Eagle nest. Bald eagles are listed as a species of Special Concern in Wisconsin. Special Concern species are those species about which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become threatened or endangered.

### **Shoreland Management**

Wisconsin's Shoreland Management Program, a partnership between state and local government, works to protect clean water, habitat for fish and wildlife, and natural scenic beauty. The Program establishes minimum standards for lot sizes, structural setbacks, shoreland buffers, vegetation removal and other activities within the shoreland zone. The shoreland zone includes land within 1,000 feet of lakes, 300 feet of rivers and floodplains.

A critical part of protecting our water resources is the establishment and protection of an adequate buffer. A shoreland buffer should extend from the water onto the land at least 35 to 50 feet. Recent studies have shown that many species of wildlife may require up to 500 feet of buffer for habitat. Buffers of 50 feet and more help filter pollutants from runoff associated with impervious surfaces such as driveways, rooftops, roads and fertilized lawns.

Shoreland restorations should focus on native plant communities and should include aquatic vegetation and all layers of the canopy, herbaceous, shrub and tree layers. Please contact your local DNR lake coordinator, Crystal Olson (715) 526-4220.

### **Whole Lake Management Recommendations:**

Resource managers made several recommendations on a whole lake basis.

1. Eliminate or reduce chemicals and fertilizers on lawns. Phosphorus-free fertilizers should be used if fertilization is necessary.
2. Restore shoreland buffers on developed sites with small viewing and access corridors.
3. Protect communities and stands of native aquatic vegetation. Limit removal of all native plant communities with the exception of navigation channels.

4. Remove any oversized docks and minimize all structures in the littoral zone.
5. Bioengineering or other soft engineering techniques should be used in place of rock riprap or seawalls.
6. Eliminate the placement of sand below the ordinary high water mark. Placing fill material below the ordinary high water mark violates Chapter 30.12, Wisconsin State Statute. Eliminate the placement of sand in the shoreland zone. The placement of sand in the shoreland zone eliminates the vital shoreland buffer areas and eventually runs off into the lake, destroying the littoral zone habitat.
7. Do not remove coarse woody cover both in the water and in the shoreland zone.
8. Prevent the spread and establishment of exotic species such as Eurasian Watermilfoil and zebra mussels by posting signs and education. Prevent the spread of Curly-leaf pondweed, Eurasian Watermilfoil and Purple Loosestrife by removing all plant material from watercraft before moving to other parts of the lake.
9. Obey all slow no-wake areas.
10. Establish slow no-wake area within 200 feet of any sensitive area, including emergent stands of vegetation, i.e. bulrushes and reed beds. Place buoys to alert waterway users of slow no-wake areas.
11. Post maps of all sensitive areas at all boat landings.
12. Monitor the spread of all exotic species. Establish aquatic plant management plans to prevent the spread of exotic species and to alleviate nuisance problems associated with excessive plant growth.

### **Resource Value of Site #1-Round Lake**

This site is located within Round Lake including the southwest and southeast shorelines. The site is approximately 2,213 feet long and consists of an area totaling 3 acres. The average water depth is 2-3 feet. Primary reasons for site selection included fishery, aquatic vegetation, wildlife and natural scenic beauty values. The shoreland buffer type in this area is 100% wooded. The bottom type is mixed with some gravel but mostly silt. The shoreland buffer consists of shrubs (1-25%) and trees (76-100%). Large woody cover is estimated as common with 3-6 pieces/30 meters of shoreline. The Natural Scenic Beauty rating, herein referenced to as NSB, was average, with minimal human disturbance.

Fishery values were one of the primary reasons for site selection. This site offers important habitat components for fish including emergent, submergent and floating-leaf vegetation. Esocids (northern pike and musky), Large-mouth bass, Centrachids (sunfish family), Perch, suckers and minnows utilize this site for all life activities. These activities include spawning, nursery, and feeding and protective cover. The coarse woody debris found in the water provides excellent habitat both for predator and prey species.

The substrate and aquatic vegetation present provides for excellent habitat for the production of macroinvertebrates. The invertebrates are an essential part of the food chain. They provide food for several fish species, amphibians, reptiles, birds and larger insects.

Wildlife values are high on this site, as the majority of the site is undeveloped shoreline. Species utilizing this site include deer, turkey, grouse, songbirds, beaver, otter, muskrat, mink, raccoon, ducks, geese, eagles, osprey, frogs, toads, turtles and snakes. These animals will use this area for shelter and cover, nesting and feeding. Important habitat components include emergent and floating-leaf vegetation and shrubs/brush.

Aquatic vegetation was a third reason for site selection. This site offers a variety of types of aquatic vegetation including wet edge plants, emergents, submergents and floating-leaf species. (See Table 1). The presence of native plants in this site protects against the spread of exotic species, such as EWM. The emergent vegetation helps protect against shoreline erosion.

**Management Recommendations:**

1. Maintain, protect and preserve the undeveloped shoreline.
2. Limit aquatic plant removal to exotic species.
3. Obey all slow-no wake areas.
4. Protect emergent aquatic plants to prevent erosion.
5. Do not remove coarse woody debris on the shoreline or in the water.

**Resource Value of Site #2-Round Lake**

This site is located in Round Lake on the north-northeast shore. The site is approximately 1,700 feet long, totaling an area of 1.8 acres. The primary reasons for site selection included fishery and aquatic vegetation values. The average water depth is 2-3 feet. The substrate is composed of silt and muck. The shoreland buffer type is 50% wetland and 50% developed. The shoreland consists of a herbaceous layer (1-25%) and lawns (51-75%). The wetland type adjacent to the shoreline is emergent/wet meadow. Large woody cover is estimated as common with 3-pieces/30meters of shoreline. The NSB is rated as very poor with major human disturbance.

Fishery values were one the primary reasons for site selection. All species present in the Cloverleaf Lakes utilize this area for all life activities. The large woody cover and varying types of aquatic vegetation offer a suitable habitat for all species.

Aquatic vegetation was the second reason for site selection. The variety of emergent, submergent and floating-leaf vegetation offers value to both fish and wildlife species. (See Table 2). The presence of native plants protects against the spread of exotics such as EWM and Curly-leaf pondweed.

The substrate and aquatic vegetation present provides for excellent habitat for the production of macroinvertebrates. The invertebrates are an essential part of the food chain. They provide food for several fish species, amphibians, reptiles, birds and larger insects.

Although wildlife values were not a reason for site selection, this site does offer value to several species. The species are similar to those found in Site #1 including redwing

blackbirds and green herons. The site has important components for wildlife including emergent vegetation.

**Management Recommendations:**

1. Manage site for diving waterfowl species.
2. Remove only exotic species of aquatic plants. Do not remove emergent vegetation in the littoral zone.
3. Restore shoreline buffers.
4. Minimize disturbance to site.

**Resource Value of Site #1-Grass Lake**

This site is located in Grass Lake, northeast of the culvert that adjoins Round Lake and Grass Lake. The site is approximately 723 feet long, totaling an area of roughly 1.3 acres. Primary reasons for site selection included fisheries and aquatic vegetation values. The average water depth is 2-3 feet. The bottom substrate is silt and muck. The shoreland buffer type is 70% wooded and 30% developed. The shoreland consists of shrubs (1-25%) and trees (76-100%). The large woody cover is estimated as common with 3-6 pieces/ 30 meters of shoreline. The NSB is rated as very poor with major human disturbance.

Fisheries values were one of the reasons for site selection. All species present in the Cloverleaf Lakes utilize this site for all life activities. The emergent, floating-leaf and over-hanging vegetation and large woody cover provide essential habitat components for all fish.

The substrate and aquatic vegetation present provides for excellent habitat for the production of macroinvertebrates. The invertebrates are an essential part of the food chain. They provide food for several fish species, amphibians, reptiles, birds and larger insects.

The aquatic vegetation present presents a diverse community including wet edge, emergent, submergent and floating-leaf plants. (See Table 3) The presence of native plants within this area protects against the spread of EWM. The EWM present is this site should be actively managed for to prevent against its spread.

**Management Recommendations:**

1. Limit aquatic vegetation removal to only exotic species.
2. Maintain and re-establish shoreland buffer.
3. Strictly obey slow-no wake areas to prevent plant disturbance.
4. Maintain wetland area adjacent to the shoreline to buffer and protect against runoff from Cloverleaf Lake Road.

**Resource Value of Site #2-Grass Lake**

This site is located within Grass Lake and is referred to as the mid-lake plant bed. The site is approximately 8 acres. The average water depth is 2 feet. The bottom substrate is sand and silt. There is some large woody cover present with roughly 1-2-pieces/ 30

meters. The NSB of the plant bed is good, with no visible human influence. The primary reason for site selection was the aquatic vegetation.

The majority of aquatic vegetation within this site consists of emergent plants. Emergent aquatic plants are defined as plants that have the majority of their vegetative material above the surface of the water. Examples include cattails, bulrush, blue-flag iris, bottlebrush sedge, pickerelweed and arrowhead. Emergent plants can tolerate fluctuating water levels and their dense stands can dampen shoreline waves. Emergent plants are highly valuable in aquatic communities for several reasons. The leaves have extensive spongy tissue and air spaces. This makes them great nesting material for ducks shorebirds and muskrats. Nest made of these buoyant leaves float up and down with changing water levels. The roots of emergent plants spread horizontally creating an interlocking network like a jute-backed carpet. This growth pattern is very important for stabilizing sediment. It also helps these plants withstand wave action and dissipate the force of upland runoff. Flexible reproductive strategies allow emergents to take advantage of variable conditions. When water levels are low, they reproduce from seeds that germinate on exposed mud flats. When water levels are high, they are equally successful at staking out territory with spreading roots and horizontal buried stems, called rhizomes that send up new shoots. (Through the Looking Glass, Borman, Korth, Temte, 1997)

The strong presence of emergent plants and other natives protects against the spread of EWM. EWM is found within this site in relatively high numbers. (See Table 4) Fish species as well as insects utilize the surface area and stem structure of emergent plants for reproduction and spawning. Shorebirds utilize emergent plants for feeding areas. Waterfowl use emergent vegetation for nesting and feeding sites.

**Management Recommendations:**

1. No removal of native vegetation. Removal is limited to exotic plants.
2. Establish and enforce a larger slow no-wake area around the plant bed. The slow no-wake area should include the area between the plant bed and the south shore of Grass Lake.
3. Establish a seasonal fish refuge for spawning fish species.

**Resource Value of Grass/Pine Lake  
Island Site**

This site includes the island in Grass and Pine Lake. The total length of the site is approximately 5,000 feet and 11 acres. The primary reasons for site selection include wildlife, fishery and natural scenic beauty values. The average water depth around the island is 3-4 feet. The bottom substrate consists of sand, silt and muck. The shoreland buffer type is 100% wooded. The shoreland consists of shrubs (1-25%) and trees (76-100%). The large woody cover is estimated as abundant with > 6 pieces/ 30meters of shoreline. The NSB is rated as outstanding, with no human influence and unique aesthetics.

Wildlife values were one the primary reasons for site selection. Species utilizing the island include white-tailed deer, turkey, beaver, otter, muskrat, mink, raccoon, ducks, loon, geese, song birds, great blue-heron, frog, toads, turtles and snakes. The island is also home to an active bald eagle nest. Important habitat components on the island proper include a variety of terrestrial vegetation including mature trees, snag trees, shrubs and herbaceous vegetation. Wildlife species use the island for shelter and cover, nesting and feeding areas. Waterfowl, furbearers, amphibians and reptiles that utilize the island also utilize the near-shore littoral zone. Important habitat components in the water include emergent, floating-leaf and submergent vegetation.

Fisheries values were also high on this site. All fish species in the Cloverleaf Lakes will utilize this site for all life activities. Important habitat components include large woody cover, emergent, submergent and floating-leaf and over-hanging vegetation.

The native aquatic vegetation remaining in this site is vital to prevent the further spread of EWM. The majority of the site is dominated by EWM, however a strong native population exists. (See Table 5) If native plants are restored within this area, the fishery and aquatic vegetation values will be increased.

**Management Recommendations:**

1. Maintain island in an undeveloped state.
2. Limit human disturbance and activity on the island. Bald eagles are easily disturbed by human activity.
3. Leave large woody cover both in the water and on the island.
4. Strictly enforce slow no-wake areas.
5. Establish a slow no-wake area in the channel to prevent shoreline erosion.
6. Aggressively manage EWM and reestablish native plant populations.
7. Limit aquatic plant removal to exotic species.

**Resource Value of Pine Lake  
Sunken Island**

This site is located within Pine Lake and is commonly referred to as the Sunken Island. This site was chosen for fisheries reasons. Due to the heavy development of the shoreline within Pine Lake, very little fish habitat remains. The site is approximately 5 feet in depth and contains a variety of submergent plants. This small site is one of the only areas within Pine Lake that fish will utilize for feeding and spawning. Panfish will spawn on the vegetation and gamefish will feed in this area.

**Management Recommendations:**

1. Protect area by establishing slow-no wake area.
2. Do not remove vegetation.

**Conclusion**

In conclusion, six sites within the Cloverleaf Lakes were designated as sensitive areas. This report identified important areas of habitat and management recommendations for each site. Lakes are one of the state's most valuable resources

and without proper protection the water quality of our lakes will quickly deteriorate, resulting in degradation of fish and wildlife habitat. All lake ecosystems are sensitive to change and man's impact. It is critical that we protect and restore these valuable resources.

All the data that was used to complete this report can be obtained at the Shawano DNR service center.