Legend Lake (Menominee County, Wisconsin)
Sensitive Area Survey Report

Date of Survey: July 30, 2002 Number of Sensitive Areas: 9

Site Evaluators:

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General Lake Information:

Legend Lake in Menominee County has a surface area of 1,230 acres and a maximum depth of 70 feet. The lake is approximately seven miles long from western tip to eastern tip. Legend Lake is an impoundment made of eight groundwater drainage lakes. Six basins are connected by Linzy Creek, which flows east to the South Branch of the Oconto River. The two western most basins drain to the Wolf River via a small creek. A watershed divide occurs within Legend Lake. (Shaw, Houston, Provost, Troge & Weber, 1995)

Numerous species of wildlife inhabit shoreland areas. Standing dead and dying trees (snags) on the uplands provide habitat for various species of birds and insects, including bald eagles, bats, woodpeckers and songbirds. Several species of mammals and birds use cavities in trees for den sites. Salamanders, small mammals and invertebrates use downed and rotting logs for protection, feeding and breeding sites. Down trees in or at the water's edge (woody cover) are especially valuable for resting and feeding areas. Aquatic and wetland vegetation present at or near the waters' edge provides critical habitat for small mammals, amphibians, reptiles, birds and fish at all life stages.

Legend Lake provides 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.

Legend Lake demonstrates good plant diversity with approximately 23 species present. This diversity is above average in comparison with other lakes in northeast Wisconsin. Plant densities vary depending on recreational use and the area of harvester operation. 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 your

aquatic plant manager, Crystal Olson (715) 526-4220 before conducting any aquatic plant control in Legend Lake.

There are five boat landings on Legend Lake, along with several walk-in access points. Several beach clubs, owned and maintained by the Legend Lake Property Owners Association, exist to provide off-lake property owners access points and recreational areas.

Introduction:

The survey was conducted on July 30, 2002 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 local 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.

Nine sites on Legend Lake contain critical habitat and were designated as sensitive areas (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 two species of exotic plants were documented. Purple Loosestrife was observed in two locations along the shorelines, including one sensitive area, the Medicine Hat Beach Club site. Management options include pulling of plants by hand and chemical treatment with herbicides such as Rodeo. Menominee County has been active in preventing the spread by documenting locations and removing the plants. Opportunities exist for the Legend Lake Protection & Rehabilitation District and Legend Lake Property Owners to be actively involved in the control of Purple Loosestrife. (contact your local DNR aquatic plant manager, Crystal Olson, (715) 526-4220, or the Menominee County conservationist, Jeremy Johnson (715) 799-5710,) Curly-leaf pondweed is another exotic plant observed in several locations throughout the lake. Cleaning all plant material from watercraft before moving to other parts of the lake can prevent the spread of this plant.

After the survey was conducted, the exotic plant Eurasian Watermilfoil was discovered within Legend Lake. Eurasian Watermilfoil is present in numerous bodies of water in the Legend Lake area, including Shawano Lake, Loon Lake, Lulu Lake, Koonz & Beaulieau Lakes and the Wolf River below the Keshena Falls dam. 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. A plan to eradicate and control the spread of Eurasian Watermilfoil within Legend Lake should be developed immediately.

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, or Menominee county conservationist, Jeremy Johnson, (715) 799-5710 or Menominee Tribal Environmental Services, Doug Cox (715) 799-4937 to learn more shoreland restoration.

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 aquatic vegetation. Allow mechanical harvesting of vegetation only in navigation channels. No mechanical harvesting in or near beds of Eurasian Watermilfoil. No chemical treatment of aquatic vegetation. Limit manual removal of aquatic vegetation to no more than 30 feet along the shoreline per property.
4. Dredging is not necessary at any location in the Legend Lake system.
5. Remove any oversized docks and minimize all structures in the littoral zone.
6. Bioengineering or other soft engineering techniques should be used in place of rock riprap or seawalls.
7. 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.
8. Do not remove coarse woody cover both in the water and in the shoreland zone.
9. 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 and Eurasian Watermilfoil by removing all plant material from watercraft before moving to other parts of the lake.
10. Maintain septic systems properly to prevent water quality problems.
11. Obey all slow no-wake areas.
12. Continue current zoning regulations in Conservancy areas and limit any development.
13. Eliminate disturbance of the bank for construction of beach areas. In addition, cease all land disturbances within 50 feet of the ordinary high water mark.

Resource Value of Site 1
Medicine Hat Beach Club Channel

This site is located in the channel adjacent to the Medicine Hat Beach Club. The site is approximately 2,040 feet long with an average water depth of approximately 4-5 feet. Primary reasons for site selection were aquatic vegetation, terrestrial vegetation and natural scenic beauty. Terrestrial plants including white pines, paper birch, oaks, maple and various species of shrubs and grasses act as a vegetative buffer, taking up nutrients before they reach the water, thus reducing nuisance algae blooms. Sediments are composed of mainly sand and muck. The shoreland buffer type is comprised of the

herbaceous layer (25-50%), shrub layer (50-75%), tree layer (50-75%), and lawn (1-25%). The lawn exist where the Legend Lake Property Owners Association has provided access to common docking sites for off-shore property owners. Coarse woody cover was estimated at 3-6 pieces/30 meters of shoreline. The Natural Scenic Beauty rating, herein referenced to as NSB, was average, with minimal human influence.

Observed on this site were several species of panfish, including bluegills. This site offers several important habitat components for fish including large woody cover, emergent, submerged, floating-leaf vegetation and over-hanging vegetation. Centrarchids (sunfish family), Esocids (northern pike) and forage species utilize this area for spawning, rearing, feeding and protective cover.

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.

This site also offers several important wildlife habitat components for a variety of species. Furbearers including muskrats and beavers utilize this area for feeding. Upland wildlife including deer, several species of birds including ducks, geese, songbirds and herons use this area for feeding, breeding, cover and nesting. Emergent vegetation, floating leaf vegetation, shrubs/brush and snag trees were all present on this site and offer habitat.

Aquatic vegetation was one of the primary reasons for site selection based on the diversity present. The existence of native plants at this site protects against the likelihood of exotic species. Also, the existing vegetation provides protection against shoreline erosion and plant fragmentation. (See Table 1.)

Management Recommendations:

1. Restore native plant species in the upland area to prevent spread of Purple Loosestrife.
2. Post "Exotic Alert" signs at shared access points along the beach club property.
3. Create and protect shoreline/bank vegetation buffers.
4. Protect emergent aquatic plants to prevent erosion and nutrient runoff.
5. Do not remove coarse woody cover both in the water and in the shoreland area.
6. Limit aquatic plant removal to navigation channels. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
7. Minimize shoreland disturbance.

Resource Value of Site 2
Blue Heron & Sundance

This site is located in Spring Lake and begins west of where the Main Channel enters Spring Lake. The site continues around in a clock-wise fashion along the west end of Spring Lake and forms an area consisting of approximately 25 acres. Primary reasons

for site selection include fishery, aquatic vegetation, wildlife values, terrestrial vegetation, NSB and water quality. Sediments are composed of sand, clay and muck. The shoreland buffer type is 50% wetland and 50% wooded. The layers of the shoreland buffer are herbaceous (25-50%), shrub (25-50%), and trees (50-75%). The wetland type within the littoral zone and shoreland buffer is a deep marsh composed of cattail, yellow water lilies, wild rice and a shallow marsh composed of soft stem bulrush, arrowhead and pickerelweed. Large woody cover is common and averages 3-6 pieces/30 meters of shoreline. The NSB rating of this site is outstanding with no human influence and unique aesthetics.

Fisheries values were outstanding on this site. Species present include Esocids (northern pike), Centrarchids (sunfish family), perch, large mouth bass and forage species. This site offers a spawning, nursery, feeding and protective cover area. Important habitat components include emergent vegetation, submergent vegetation, floating leaf vegetation and over-hanging vegetation. This site is most likely the prime fisheries site within Legend Lake based upon the habitat present.

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 habitat is also excellent on this site. Furbearers utilizing this area include muskrats and beavers. Squirrels, opossums, raccoons, and fox are also present. Several species of birds including ducks, geese, songbirds and shorebirds such as herons and kingfishers utilize this area for shelter/cover, nesting and feeding areas. A snow egret was also observed feeding at this site. Deer utilize the upland areas for all life activities. Amphibians and reptiles depend on this site for cover, breeding and nesting. Important habitat components of this site include emergent vegetation, floating leaf vegetation, shrubs/brush and snag trees.

Water quality was another reason for site selection. This area includes an inlet and the dense plant beds allow for nutrients to settle out, thus preventing nuisance algae blooms in other parts of the lake. The terrestrial vegetation on the upland also allows for nutrient filtration and prevents runoff. In addition, one-half of the shoreland and upland buffer area is zoned conservancy (CV-1), adding to the protection of the site.

Aquatic vegetation diversity and density are exceptional at this site. This site has the highest diversity of any plant community within Legend Lake. The existence of native plants at this site protects against the likelihood of exotic species. Also, the existing vegetation provides protection against shoreline erosion and plant fragmentation. (See Table 2.)

Management Recommendations:

1. Protect upland buffer areas and restore disturbed/developed shorelines.
2. Post "Exotic Alert" signs at walk-in access near inlet.
3. Protect emergent vegetation to prevent erosion and nutrient runoff.
4. Do not remove coarse woody cover in both the water and in the shoreland areas.
5. Limit aquatic plant removal to one navigation channel, i.e. the width of the mechanical harvester. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
6. Minimize shoreland disturbance.
7. Establish a slow no-wake buffer zone in entire sensitive area.
8. No dredging should be allowed at this site at any time.

Resource Value of Site 3
Peshtigo Lake

This site is located with Peshtigo Lake, in the southwest corner of the basin. The site is approximately 508 feet long. Primary reasons for site selection include fishery values, aquatic vegetation, natural scenic beauty, wildlife values and terrestrial vegetation. Sediments are composed mainly of sand and muck. The shoreland buffer type is 5% wetland and 95% wooded. The buffer consists of the herbaceous layer (1-25%), shrub layer (51-75%), and the tree layer (76%-100%). Terrestrial vegetation includes paper birch, maple and oak trees. The wetland type within the littoral zone is characterized as a deep marsh with cattail, yellow water lilies and a shallow marsh with soft stem bulrush and arrowhead. Coarse woody cover was estimated at 3-6 pieces/30 meters of shoreline. The NSB rating is outstanding with no human influence and unique aesthetics.

Fishery values were one of the primary reasons for site selection. Species present include largemouth bass, Centrachrids (sunfish family), perch, and forage fish. This site provides spawning, nursery and feeding areas, as well as protective cover for all species present. Habitat components at this site include large woody cover, emergent, submerged, floating leaf and over-hanging vegetation.

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 habitat is also excellent on this site. This site is excellent habitat for muskrats. Several species of birds including ducks, geese, songbirds and shorebirds such as herons utilize this area for shelter/cover, nesting and feeding areas. Deer utilize the upland areas for all life activities. Amphibians and reptiles depend on this site for cover, breeding and nesting. Important habitat components of this site include emergent vegetation, floating leaf vegetation, shrubs/brush and snag trees.

Water quality was another reason for site selection. The terrestrial vegetation on the upland allows for nutrient filtration and prevents runoff. The dense plant beds help to stabilize the sediments and reduce nutrient recycling and the likelihood of algae blooms.

Aquatic vegetation was another primary reason for site selection. The existence of native plants at this site protects against the likelihood of exotic species. Also, the existing vegetation provides protection against shoreline erosion and plant fragmentation. (See Table 3.)

Management Recommendations:

1. Protect upland buffer areas and restore disturbed/developed shorelines.
2. Protect emergent vegetation to prevent erosion and nutrient runoff.
3. Do not remove coarse woody cover in both the water and in the shoreland areas.
4. Limit aquatic plant removal to one navigation channel, i.e. the width of the mechanical harvester. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
5. Minimize shoreland disturbance.
6. Establish a slow no-wake buffer zone in entire sensitive area.
7. No dredging should be allowed at this site at any time.

Resource Value of Site 4
Peshtigo Island

This site consists of the island located within Peshtigo Lake. The island and the associated buffer total approximately 48 acres in size. Primary reason for site selection was wildlife values. Secondary reasons include fishery value, aquatic vegetation, natural scenic beauty, terrestrial vegetation and water quality. Terrestrial vegetation included many wetland type trees such as tag alder, tamarack and black spruce. Other species present included white pines and aspens. Sediments consisted of sand and muck. The shoreland buffer type is 50% wetland and 50% wooded. The layers of the buffer include herbaceous (1-25%), shrub (50-75%) and tree (76%-100%). The wetland types include deep marsh with cattails and yellow water lilies, shallow marsh with soft stem bulrush and arrowhead, shrub carr with willows and shrubs and bog with tamarack and leatherleaf. Large woody cover was estimated as common with 3-6/30 meters of shoreline. The NSB rating was outstanding with no human influence and unique aesthetics.

Wildlife values on this site are exceptional. In general, islands provide excellent habitat for many species of wildlife. Many species including waterfowl and reptiles use islands as breeding and nesting sites to escape predators such as raccoons and skunks. Several broods of ducks were observed on this site during the survey. Species present include beavers, muskrats, ducks, songbirds, blue herons, kingfishers, frog/toads, salamanders and turtles. Several painted turtles were observed sunning themselves on logs in the littoral zone. This site provides shelter/cover, nesting areas and feeding areas for all species listed. Important habitat components present at this site include emergent and floating leaf vegetation, shrubs/brush and snag trees.

Fishery values were another reason for site selection. Species present include Esocids (northern pike), largemouth bass, Centrarchids (sunfish family), perch, and forage fish. Other species of fish use this site for spawning, nursery and feeding areas, as well as protective cover for all species present. Habitat components at this site include large woody cover, emergent, submerged, floating leaf and over-hanging vegetation.

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.

Water quality was another reason for site selection. This area includes an inlet and the dense plant beds allow for nutrients to settle out, thus preventing nuisance algae blooms in other parts of the lake. The existing vegetation provides protection against shoreline erosion of the island. (See Table 4.)

Management Recommendations:

1. Strictly enforce no-wake zone
2. Limit aquatic plant removal to one navigation channel. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
3. No chemical control of aquatic vegetation.
4. Protect emergent vegetation to prevent erosion and nutrient runoff and to provide habitat for spawning northern pike.
5. Do not remove coarse woody cover in both the water and in the shoreland areas.
6. Minimize shoreland disturbance.
7. No dredging should be allowed at this site at any time.

Resource Value of Site 5
Red Cloud Channel

This site is located within the channel leading to the Red Cloud subdivision. The site includes the entire channel, beginning at the entrance from Big Blacksmith Lake. The total length is approximately 2,887 feet. Primary reasons for site selection were fishery values, aquatic vegetation, natural scenic beauty, wildlife, terrestrial vegetation and water quality. The shoreland buffer type is 20% wetlands, located to the east of the channel and 80% wooded buffer. The herbaceous layer comprises (1-25%), the shrub layer (25-50%), and the tree layer (51-75%). The wetland consists of a deep marsh, including cattails, yellow water lilies and a shallow marsh including bulrush and arrowhead. The estimate of large woody cover is present at 1-2-pieces/30 meters of shoreline. The NSB rating was good, with no human influence. Shoreland areas within this site are zoned conservancy and no development is allowed. The west side of the channel is currently zoned to prevent development. This zoning makes this site unique as the vast majority of the remaining lake is developed.

Fisheries values were one of the primary reasons for site selection. Species present included Esocids (northern pike), largemouth bass, Centrachrids (sunfish family) and

forage fish. All species use this area for spawning, nurseries, feeding and protective cover. The wetlands located east of the channel will provide excellent habitat for northern pike and largemouth bass. Important habitat components include emergent, submergent, floating leaf and over-hanging vegetation.

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.

Water quality was another reason for site selection. The terrestrial vegetation on the upland allows for nutrient filtration and prevents runoff. The dense plant beds help to stabilize the sediments and reduce nutrient recycling and the likelihood of algae blooms. The wetlands located to the east of the channel provide a stabilization site for nutrients and sediments.

This site also offers several important wildlife habitat components for a variety of species. Furbearers including muskrats and beavers utilize this area for feeding. Upland wildlife including deer, several species of birds including ducks, geese, songbirds, herons, amphibians and reptiles use this area for feeding, breeding, cover and nesting. Emergent vegetation and floating leaf vegetation were present on this site and offer habitat.

Aquatic vegetation was one of the primary reasons for site selection based on the diversity present. The existence of native plants at this site protects against the likelihood of exotic species. Also, the existing vegetation provides protection against shoreline erosion and plant fragmentation. (See Table 5.)

Management Recommendations:

1. Strictly enforce no-wake zone
2. Limit aquatic plant removal to one navigation channel. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
3. No chemical control of aquatic vegetation.
4. Protect emergent vegetation to prevent erosion and nutrient runoff and to provide habitat for spawning northern pike.
5. Do not remove coarse woody cover in both the water and in the shoreland areas.
6. Minimize shoreland disturbance.
7. No dredging should be allowed at this site at any time.
8. Current zoning standards of Conservancy should be maintained.

Resource Value of Site 6 &7
Islands within Big Blacksmith Lake

This site includes both islands located with Big Blacksmith Lake. One island, approximately 2 acres in size, lies on the west end of the basin, near the channel to Little Blacksmith Lake. The second island, approximately 3.5 acres in size, is located at the

east end of Big Blacksmith Lake. The total acreage for the islands includes a buffer area. Both islands were chosen for wildlife values and natural scenic beauty. The shoreland buffer types on both islands were 100% wooded. The tree layer is comprised of trees (76-100%). Large woody cover is estimated as common with 3-6 pieces/30 meters of shoreline. The NSB was rated at outstanding with no human influence and unique aesthetics.

Wildlife values on this site are exceptional. In general, islands provide excellent habitat for many species of wildlife. Many species including waterfowl and reptiles use islands as breeding and nesting sites to escape predators such as raccoons and skunks. Species present include beavers, muskrats, ducks, songbirds, blue herons, kingfishers, frog/toads, salamanders and turtles. Raptors such as bald eagles and ospreys may use islands are perch sites while feeding. This site provides shelter/cover, nesting areas and feeding areas for all species listed. Important habitat components present at this site include emergent and floating leaf vegetation, shrubs/brush and snag trees.

Large woody cover, emergent and submergent vegetation provides valuable habitat for species present. Northern pike, largemouth bass, centrachrids, perch, suckers and forage fish are all present. These islands provide spawning, nursery, feeding and protective cover areas for fish present.

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 aquatic vegetation was not one of the primary reasons for site selection, the community is still diverse and abundant. (See Table 6.)

Management Recommendations:
1. Strictly enforce no-wake zone
2. Limit aquatic plant removal to one navigation channel. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
3. No chemical control of aquatic vegetation.
4. Do not remove coarse woody cover in both the water and in the shoreland areas.
5. Minimize shoreland disturbance.
6. No dredging should be allowed at this site at any time.

Resource Value of Site 8
White Eagle Channel

This site is located within the channel adjacent to the White Eagle subdivision. The site includes the entire channel is approximately 3,000 feet. Primary reasons for site selection were fishery values, aquatic vegetation, natural scenic beauty, wildlife, terrestrial vegetation and water quality. The shoreland buffer type is 10% wetlands located adjacent to the inlet creek, and 80% wooded buffer. The herbaceous layer comprises (1-

25%), the shrub layer (25-50%), and the tree layer (51-75%). The wetland consists of a deep marsh, including cattails, yellow water lilies and a shallow marsh including bulrush and arrowhead. The estimate of large woody cover is present at 1-2-pieces/30 meters of shoreline. The NSB rating was outstanding with no human influence and unique aesthetics. The majority of the shoreline is zoned tribal recreational so no future development is anticipated.

Fisheries values were one of the primary reasons for site selection. Species present included Esocids (northern pike), largemouth bass, Centrachrids (sunfish family and forage fish. All species use this area for spawning, nurseries, feeding and protective cover. The wetlands and inlet creek located east of the channel will provide excellent habitat for northern pike. This area should be seasonally protected to enhance northern pike. Important habitat components include large woody cover, emergent, submergent, floating leaf and over-hanging vegetation.

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.

Water quality was another reason for site selection. The terrestrial vegetation on the upland allows for nutrient filtration and prevents runoff. The dense plant beds help to stabilize the sediments and reduce nutrient recycling and the likelihood of algae blooms.

This site also offers several important wildlife habitat components for a variety of species. Furbearers including muskrats and beavers utilize this area for feeding. Upland wildlife including deer, several species of birds including ducks, geese, songbirds, herons, amphibians and reptiles use this area for feeding, breeding, cover and nesting. Shrubs/brush, snag trees, emergent, floating leaf and over-hanging vegetation is present on this site and offer habitat.

Aquatic vegetation was one of the primary reasons for site selection based on the diversity present. The existence of native plants at this site protects against the likelihood of exotic species. Also, the existing vegetation provides protection against shoreline erosion and plant fragmentation. (See Table 7.)

Management Recommendations:

1. Strictly enforce no-wake zone
2. Limit aquatic plant removal to one navigation channel. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
3. No chemical control of aquatic vegetation.
4. Protect emergent vegetation to prevent erosion and nutrient runoff and to provide habitat for spawning northern pike.
5. Do not remove coarse woody cover in both the water and in the shoreland areas.
6. Minimize shoreland disturbance.
7. No dredging should be allowed at this site at any time.

8. Current zoning standards of Conservancy/Tribal Recreational should be maintained.

Resource Value of Site 8
Chief Waukechon Channel

This site is located within the channel adjacent to the Chief Waukechon subdivision. The site includes the entire channel is approximately 3,900 feet. Primary reasons for site selection were fishery values, aquatic vegetation, natural scenic beauty, wildlife, and terrestrial vegetation. The shoreland buffer type is 100% wooded. The herbaceous layer comprises (26-50%), the shrub layer (26-50%), and the tree layer (76-100%). The estimate of large woody cover is present at 1-2-pieces/30 meters of shoreline. The NSB rating was outstanding with no human influence and unique aesthetics. Shoreland areas within this site are zoned conservancy and no development is allowed. This zoning makes this site unique as the vast majority of the remaining lake is developed.

Fisheries values were one of the primary reasons for site selection. Species present include largemouth bass, centrachrids, suckers and minnows. All species use this area for spawning, nurseries, feeding and protective cover. Important habitat components include large woody cover, emergent, submergent, floating leaf and over-hanging vegetation.

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.

This site also offers several important wildlife habitat components for a variety of species. Furbearers including muskrats and beavers utilize this area for feeding. Upland wildlife including deer, several species of birds including ducks, geese, songbirds, herons, amphibians and reptiles use this area for feeding, breeding, cover and nesting. Shrubs/brush, snag trees, emergent, floating leaf and over-hanging vegetation is present on this site and offer habitat.

Aquatic vegetation was one of the primary reasons for site selection. The existence of native plants at this site protects against the likelihood of exotic species. Also, the existing vegetation provides protection against shoreline erosion and plant fragmentation. (See Table 8.)

Management Recommendations:

1. Strictly enforce no-wake zone
2. Limit aquatic plant removal to one navigation channel. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
3. No chemical control of aquatic vegetation.
4. Protect emergent vegetation to prevent erosion and nutrient runoff and to provide habitat for spawning northern pike.
5. Do not remove coarse woody cover in both the water and in the shoreland areas.
6. Minimize shoreland disturbance.
7. No dredging should be allowed at this site at any time.
8. Current zoning standards of Conservancy should be maintained.

Resource Value of Site 9
Horseshoe Island

This site consists of Horseshoe Island and an associated buffer totaling approximately 17 acres. Primary reasons for site selection include fishery values, aquatic vegetation, natural scenic beauty, wildlife values, terrestrial vegetation and water quality. The sediment consisted of sand and muck. The shoreland buffer type is wetlands (75%) and wooded (25%). The herbaceous, shrub and tree layer account for 25-50% each. The wetland type is deep marsh with cattails and yellow water lily and shallow marsh with bulrush and arrowhead. The interior portion of the wetland is mixed with bog and hardwood swamp. Large woody cover is present at 1-2/30 meters of shoreline. The NSB rating is outstanding with no human influence and unique aesthetics.

Fisheries values are outstanding on this site. This site provides spawning, nursery, feeding and protective cover areas for Esocids (northern pike), largemouth bass, Centrarchids (sunfish family), perch and forage fish. Important habitat components include large woody cover, emergent, submergent, floating leaf and over-hanging vegetation.

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 also excellent on this site. As stated before, islands are important areas for waterfowl, amphibians and reptiles to escape predators such as raccoons and skunks. Horseshoe Island has several snag trees that provide perch sites for raptors such as eagles and osprey. During the site survey, one adult and two juvenile bald eagles were observed on this site. Human disturbance should be minimized on this site to not disturb the bald eagles.

Aquatic vegetation was very dense and diverse at this site. The shape of the island allows for a complex community of terrestrial vegetation, wetland and true aquatic vegetation. (See Table 9.)

Management Recommendations:

1. Strictly enforce no-wake zone.
2. Limit aquatic plant removal to one navigation channel. Protect all existing plant communities to prevent the spread of Eurasian Watermilfoil.
3. No chemical control of aquatic vegetation.
4. Protect emergent vegetation to prevent erosion of the island.
5. Do not remove coarse woody cover in both the water and in the shoreland areas.
6. Minimize shoreland disturbance.
7. No dredging should be allowed at this site at any time.
8. Post educational signs to promote good lake stewardship.
9. Create a permanent fish refuge to promote habitat protection.

Conclusion

In conclusion, nine sensitive areas were designated on Legend Lake. 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.

Table 1

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus (bul-rush) Carex (sedge)			
Herbs Verbena (blue vervain)			
Shrubs Alnus (tag alder)			
Emergents Sagittaria (arrowhead) Pontederia (pickerelweed) Typha (cattail) Sparganium (bur-reed)			
Floating Leaf Brasenia (watershield)	**Floating Leaf** Nymphaea (white water lily)		**Floating Leaf** Nuphar (yellow pond lily & spatterdock)
Potamogetons P. pectinatus (sago) P. robbinsii (fern) P. zosteriformis (flat-stem)			
		Submergents Elodea (waterweed) Ceratophyllum (coontail)	
	Algae Filamentous	**Algae** Chara (muskgrass)	
Exotics Lythrum (purple loosestrife) P. crispus (curly-leaf)			

Table 2

PRESENT	COMMON	ABUNDANT	DOMINANT
		Sedges Scirpus (bul-rush) Carex (sedge) Eleocharis (spike-rush)	
		Rushes Juncus (rush)	
		Herbs Verbena (blue vervain) Iris (blue flag iris)	
	Shrubs Alnus (tag alder)	**Shrubs** Salix (willow) Cornus (dogwood)	
	Emergents Zizania (wild-rice)	**Emergents** Sagittaria (arrowhead) Pontederia (pickerelweed) Typha (cattail) Sparganium (bur-reed)	
			Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)
Submergents Bidens (water marigold) Ranunculus (crowfoot) Myriophyllum (Nor. Watermilfoil) Zosterella (water stargrass)	**Submergents** Najas (bushy pondweed)	**Submergents** Elodea (waterweed) Ceratophyllum (coontail) Utricularia (bladderwort) Vallisneria (water celery)	
Potamogetons P. epihydrun (ribbon-leaf)		**Potamogetons** P. pectinatus (sago) P. robbinsii (fern) P. zosteriformis (flat-stem) P. richardsonii (clasping-leaf)	
		Submergents Elodea (waterweed) Ceratophyllum (coontail)	
Algae Nitella (stonewort)	**Algae** Chara (muskgrass)		

Table 3

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus (bul-rush) Carex (sedge)			
Herbs Verbena (blue vervain)			
		Shrubs Alnus (tag alder) Cornus (dogwood)	
Emergents Typha (cattail) Sparganium (bur-reed)	**Emergents** Sagittaria (arrowhead) Pontederia (pickerelweed)		
			Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)
Submergents Myriophyllum (Nor. Watermilfoil)	**Submergents** Utricularia (bladderwort) Vallisneria (water celery) Najas (bushy pondweed)	**Submergents** Elodea (waterweed) Ceratophyllum (coontail)	
Potamogetons P. epihydrus (ribbon-leaf) P. pectinatus (sago) P. robbinsii (fern) P. zosteriformis (flat-stem) P. richardsonii (clasping-leaf)			
Algae Filamentous	**Algae** Chara (muskgrass)		

Table 4

PRESENT	COMMON	ABUNDANT	DOMINANT
Ferns Osmunda (cinnamon fern) Onoclea (sensitive fern)			
	Sedges Scirpus (bul-rush) Carex (sedge)		
Herbs Verbena (blue vervain) Iris (blue flag iris) Caltha (marsh marigold)			
		Shrubs Alnus (tag alder) Cornus (dogwood) Salix (willow)	
	Emergents Sagittaria (arrowhead) Pontederia (pickerelweed)	**Emergents** Typha (cattail) Sparganium (bur-reed)	
		Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)	
Submergents Elodea (waterweed) Ceratophyllum (coontail) Utricularia (bladderwort)	**Submergents** Myriophyllum (nor watermilfoil) Vallisneria (water celery) Najas (bushy pondweed)		
Potamogetons P. epihydrus (ribbon-leaf) P. pectinatus (sago) P. robbinsii (fern) P. zosteriformis (flat-stem) P. richardsonii (clasping-leaf)			
Algae Filamentous Chara (muskgrass)			

Table 5

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus (bul-rush) Carex (sedge) Eleocharis (spike-rush			
Herbs Verbena (blue vervain) Iris (blue flag iris) Caltha (marsh marigold)			
Shrubs Alnus (tag alder) Cornus (dogwood) Salix (willow)			
Emergents Sparganium (bur-reed)	**Emergents** Sagittaria (arrowhead) Pontederia (pickerelweed) Typha (cattail)		
		Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)	
Submergents Elodea (waterweed) Ceratophyllum (coontail) Utricularia (bladderwort) Vallisneria (water celery) Najas (bushy pondweed) Ranunculus (crowfoot)			
Potamogetons P. robbinsii (fern) P. zosteriformis (flat-stem) P. richardsonii (clasping-leaf) P. amplifolius (large-leaf)			
Algae Filamentous Chara (muskgrass)			

Table 6

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus (bul-rush)			
Shrubs Salix (willow)			
Emergents Sagittaria (arrowhead) Pontederia (pickerelweed) Typha (cattail) Sparganium (bur-reed)			
Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)			
Submergents Elodea (waterweed) Ceratophyllum (coontail)	**Submergents** Najas (bushy pondweed) Vallisneria (water celery) Myriophyllum (nor watermilfoil)		
Potamogetons P. pectinatus (sago) P. zosteriformis (flat-stem) P. richardsonii (clasping-leaf)			
Algae Nitella (stonewort)	**Algae** Chara (muskgrass)		

Table 7

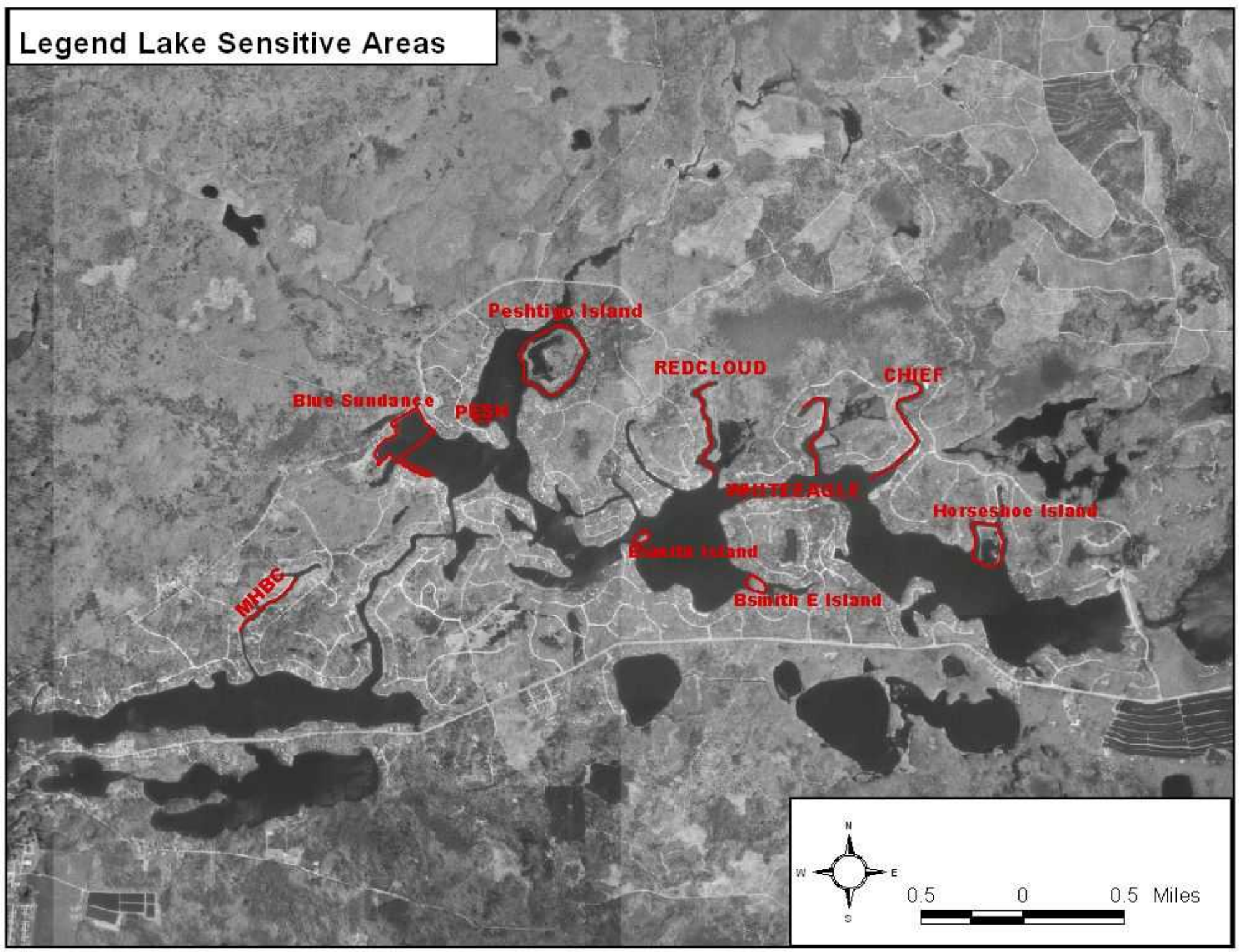
PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus (bul-rush) Carex (sedge) Eleocharis (spike-rush)			
Herbs Verbena (blue vervain) Iris (blue flag iris) Caltha (marsh marigold)			
Shrubs Alnus (tag alder) Cornus (dogwood) Salix (willow)			
Emergents Sparganium (bur-reed)	**Emergents** Sagittaria (arrowhead) Pontederia (pickerelweed) Typha (cattail)		
		Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)	
Submergents Elodea (waterweed) Ceratophyllum (coontail) Utricularia (bladderwort) Vallisneria (water celery) Najas (bushy pondweed) Ranunculus (crowfoot)			
Potamogetons P. robbinsii (fern) P. zosteriformis (flat-stem) P. richardsonii (clasping-leaf) P. amplifolius (large-leaf)			
Algae Filamentous Chara (muskgrass)			

Table 8

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus (bul-rush) Carex (sedge) Eleocharis (spike-rush)			
Herbs Verbena (blue vervain)			
Shrubs Alnus (tag alder) Cornus (dogwood) Salix (willow)			
Emergents Sparganium (bur-reed)	**Emergents** Sagittaria (arrowhead) Pontederia (pickerelweed) Typha (cattail)		
		Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)	
Submergents Elodea (waterweed) Ceratophyllum (coontail) Utricularia (bladderwort) Vallisneria (water celery) Najas (bushy pondweed) Ranunculus (crowfoot)			
Potamogetons P. robbinsii (fern) P. zosteriformis (flat-stem) P. richardsonii (clasping-leaf) P. pectinatus (sago)			
Algae Filamentous Chara (muskgrass)			

Table 9

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus (bul-rush) Carex (sedge) Juncus (rush)			
Herbs Verbena (blue vervain) Caltha (marsh marigold)			
		Shrubs Alnus (tag alder) Cornus (dogwood) Salix (willow)	
			Emergents Sagittaria (arrowhead) Pontederia (pickerelweed) Typha (cattail) Sparganium (bur-reed)
		Floating Leaf Nuphar (yellow pond lily & spatterdock) Brasenia (watershield) Nymphaea (white water lily)	
Submergents Elodea (waterweed) Ceratophyllum (coontail) Utricularia (bladderwort) Ranunculus (crowfoot) Myriophyllum (Nor. Watermilfoil)		**Submergents** Vallisneria (water celery) Najas (bushy pondweed)	
Potamogetons P. amplifolius (large-leaf) P. richardsonii (clasping-leaf)	**Potamogetons** P. pectinatus (sago)	**Potamogetons** P. natans (floating-leaf) P. zosteriformis (flat-stem) P. robbinsii (fern)	
Algae Nitella (stonewort)		**Algae** Chara (muskgrass)	


Legend Lake Sensitive Areas
Peshtigo Island
REDCLOUD
CHIEF
Blue Sundance
PESH
Horseshoe Island
MHBC
Bsmith E Island
N
W
E
S
0.5
0
0.5 Miles