Kangaroo Lake, Door County Wisconsin
(Waterbody Identification Code #98600)
Sensitive Area Designation Report

Date of survey: August 18, 2003
Number of sensitive areas: 6

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General Lake Information:

Kangaroo Lake is a shallow, hardwater, 1,123–acre lake located in Door County, Wisconsin. Maximum depth is 12 feet and the average depth is 6 feet. Water level is controlled on this drainage lake by a dam on the southeast end.

Kangaroo Lake is divided into two distinct basins by the CTH E causeway, which was created in the late 1800's. The smaller north basin is approximately 300 acres in size and acts as the headwaters for the lake. It is clear and quite shallow (approx. 3-4 feet) contains a variety of open water and wetland species of plants, is surrounded by undisturbed forests, and the shoreline remains undeveloped with only walk-in access available. Peil Creek drains into the north basin through an extensive maze of vegetative islands providing clean, cool water to Kangaroo Lake. Water flows from the north basin to the south basin through four culverts, which run beneath the causeway.

The larger south basin is approximately 800 acres in size and is characterized by turbid water, lack of diversified native aquatic vegetation complicated by the presence of Eurasian water-milfoil (*Myriophyllum spicatum*), significant shoreline development, and considerable recreational use.

A sensitive area designation survey was conducted on the north basin of Kangaroo Lake in 1996 and is included as Appendix A. A sensitive area designation survey on the entire larger southern end was completed in the summer of 2003. This report describes the results of that survey.

The Kangaroo Lake Association has designated portions of the lake's south end as a slow-no-wake zone to protect the few remaining bulrushes (*Schoenoplectus sp*., formerly known as *Scirpus*) that exist there from the detrimental effects of motorboats. The Kangaroo Lake Association has also setup a voluntary slow-no-wake zone extending 500

feet from the lake's shore into open water. This zone is intended to slow the spread of Eurasian water-milfoil and to protect the lake's silty bottom from resuspension.

With cost-share assistance from the Department of Natural Resources, the Kangaroo Lake Association recently sponsored the development of a comprehensive lake management plan for Kangaroo Lake. The study assessed the lakes' watershed, water quality, aquatic plant community, and shoreline condition and then developed lake management, protection, and enhancement alternatives and recommendations.

Introduction:

A sensitive area designation survey was conducted on August 18, 2003 using the Wisconsin Department of Natural Resources guidelines for conducting and implementing sensitive areas. The purpose of the sensitive area designation survey is to identify areas within and around the shoreline of the lake that provide unique and/or critical ecological habitat or have historical, geologic, or archaeological significance. This sensitive area survey can provide lake organizations, shoreline property owners, county zoning officials, Department of Natural Resources personnel and other users with specific information that can be used for planning, decision making, and for educational efforts.

What is a Sensitive Area Designation?

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 buffers.

Following is a list of potential ways sensitive area designations could be used:

- To inform and educate the public of potential impacts to the aquatic ecosystem from shoreline alteration
- By managers to guide permitting processes of aquatic plant management, water regulations, fisheries management, wildlife management and local zoning activities
- By local lake organizations to help guide lake use and management activities
- As a foundation for further research or study
- As a complement to local land-use planning activities
- To provide information to potential shoreland buyers and existing shoreland owners
- As baseline data for various resource management decisions
- To provide education to the public about the benefits of protecting and restoring aquatic life habitat.

The Sensitive Area Designations:

Six sites on Kangaroo Lake were designated as sensitive areas and are delineated on the map in Figure 1. Table 1 contains the area location descriptions of each sensitive area. Table 2 lists the aquatic plant species identified at each sensitive area site.

Table 1. Kangaroo Lake Sensitive Area Location Descriptions

Sensitive Area 1
Area between shoreline and a line between points:

Point	Latitude	Longitude
1	45º 1’ 4.05535”N	87º 9’ 50.10772”W
	TO	
2	45º 1’ 3.06422”N	87º 9’ 16.5933”W

Sensitive Area 2
Area between shoreline and lines directly east from shoreline and between points:

Point	Latitude	Longitude
1	45º 1’ 44.47999”N	87º 9’ 57.28861”W
	TO	
2	45º 1’ 31.69795”N	87º 9’ 52.31937”W

Sensitive Area 3
Area between shoreline and lines between points:

Point	Latitude	Longitude
1	45º 2’ 34.00899”N	87º 9’ 15.63077”W
	TO	
2	45º 2’ 32.23831”N	87º 9’ 15.71862”W
	TO	
3	45º 2’ 27.1369”N	87º 9’ 6.36458”W

Sensitive Area 4
Area extending out 100-feet from island shoreline.

Sensitive Area 5
Area between 5-foot and 3-foot depths contours with north and south extents between points:

Point	Latitude	Longitude
1	45º 2’ 29.9375”N	87º 9’ 53.46926”W
	TO	
2	45º 2’ 23.73309”N	87º 9’ 53.90425”W

Sensitive Area 6
Creek along lake access road from Elm Point Road and extending between shoreline and lines between points:

Point	Latitude	Longitude
1	45º 2’ 42.02516”N	87º 9’ 26.1634”W
	TO	
2	45º 2’40.79179”N	87º 9’ 28.02987”W
	TO	
3	45º 2’ 38.15779”N	87º 9’ 24.73283”W
	TO	
4	45º 2’ 40.44231”N	87º 9’ 21.25741”W

Table 2. Kangaroo Lake Aquatic Plant Occurrences

Sensitive Area	Scientific	Common	Community
1			
	Chara sp.	Muskgrasses	Submergent
	Utricularia vulgaris	Common bladderwort	Submergent
	Najas flexilis	Slender naiad	Submergent
	Potamogeton illinoensis	Illinois pondweed	Submergent
	Schoenoplectus sp.[1]	Bulrushes	Emergent
	Scirpus pungens [2]	Three-square	Emergent
	Nuphar variegata	Spatterdock	Floating Leaf
2			
	Chara sp.	Muskgrasses	Submergent
	Utricularia vulgaris	Common bladderwort	Submergent
	Najas flexilis	Slender naiad	Submergent
	Potamogeton illinoensis	Illinois pondweed	Submergent
	Schoenoplectus sp.	Bulrushes	Emergent
3			
	Chara sp.	Muskgrasses	Submergent
	Utricularia vulgaris	Common bladderwort	Submergent
	Najas flexilis	Slender naiad	Submergent
	Potamogeton illinoensis	Illinois pondweed	Submergent
	Myriophyllum sibiricum	Northern water milfoil	Submergent
	Potamogeton pectinatus	Sago pondweed	Submergent
	Potamogeton natans	Floating-leaf pondweed	Submergent
	Potamogeton gramineus	Variable pondweed	Submergent
	Eleocharis acicularis	Needle spikerush	Emergent
	Eleocharis palustris	Creeping spikerush	Emergent
	Equisetum fluviatile	Water horsetail	Emergent
	Iris versicolor	Northern blue flag	Emergent
	Schoenoplectus sp.	Bulrushes	Emergent
	Typha latifolia	Broad-leaved cattail	Emergent
	Nuphar variegata	Spatterdock	Floating Leaf
4			
	Chara sp.	Muskgrasses	Submergent
	Utricularia vulgaris	Common bladderwort	Submergent
	Najas flexilis	Slender naiad	Submergent
	Potamogeton illinoensis	Illinois pondweed	Submergent
	Potamogeton pectinatus	Sago pondweed	Submergent
	Schoenoplectus sp.	Bulrushes	Emergent
5			
	Chara sp.	Muskgrasses	Submergent
	Utricularia vulgaris	Common bladderwort	Submergent
	Najas flexilis	Slender naiad	Submergent
	Potamogeton illinoensis	Illinois pondweed	Submergent
	Potamogeton pectinatus	Sago pondweed	Submergent
	Potamogeton richardsonii	Clasping-leaf pondweed	Submergent
	Myriophyllum sibiricum	Northern water milfoil	Submergent
6			
	Chara sp.	Muskgrasses	Submergent
	Utricularia vulgaris	Common bladderwort	Submergent
	Najas flexilis	Slender naiad	Submergent
	Potamogeton illinoensis	Illinois pondweed	Submergent
	Schoenoplectus sp.	Bulrushes	Emergent
	Eleocharis acicularis	Needle spikerush	Emergent
	Scirpus pungens	Three-square	Emergent

[1] formerly know as *scirpus* [2] formerly know as *americanus*

Resource Value of Sensitive Area 1:

This site is located on the southern shore of the lake. It includes the entire area inside the buoys which is a slow-no-wake area out to approximately 5 feet deep which is about 700 feet from the shoreline out into open water.

Figure 2.

The primary reasons for this site to be selected were the fishery values, wildlife values (and associated wetland habitat), water quality, and natural scenic beauty. This area has a diverse aquatic plant community that can provide important habitat for fish and wildlife. These plants provide important spawning, nursery, and cover area for fish and invertebrates. The aquatic vegetation provides excellent habitat for the production of macroinvertebrates (aquatic insects), which is an essential part of the food chain. The emergent bulrush stands are highly valuable in aquatic communities. The standing dead stalks are primary spawning habitat for northern pike and perch in the early spring. These species do not spawn on beds like bass and other panfish but spawn by broadcasting their eggs on standing material such as old stems, aquatic plants, or fallen timber. Without this material, spawning will not be successful. This same area could be a spawning site for smallmouth bass in late spring. Another benefit these plants have is due to the leaves

having extensive spongy tissue and air space. This makes them great nesting material for ducks, shorebirds, and muskrats. Nests made of these buoyant leaves float up and down with changing water levels. The exposed woody debris provides roosting and hunting areas for birds as well as basking areas for reptiles and amphibians. The site also offers a physical buffer that protects water quality by anchoring and stabilizing sediments and protecting shorelines from wave erosion. The adjacent wetland provides excellent habitat for a variety of furbearers, birds, amphibians, and reptiles. During the blooming of the lilies this site is very colorful and adds a great deal of beauty to the lake.

Management Recommendation:

- Do not remove coarse woody cover in both the water and in the shoreland areas
- Monitor for the presence of exotic invasive species on a regular basis
- Do not remove native plants by physical, mechanical, or chemical means
- Eliminate all motorboat use inside the buoy area.
- Create an open water wildlife refuge within the buoyed area.

Resource Value of Sensitive Area 2:

This site is located on the southwest shore starting at the access site owned by the Retreat going north along the shore for approximately 1400 feet. The site averages approximately 200 feet out into the water from shore. The site follows the contiguous undisturbed shoreline and consists of a variety of near-shore terrestrial and shoreline vegetation. This site is unique in that it is an undeveloped shoreline that is not adjacent to a wetland.

Figure 3. Sensitive Area 2

This site was selected because of the wildlife values, natural shoreland, and natural scenic beauty found at this location. A diverse, minimally disturbed near-shore terrestrial plant community provides for a variety of wildlife species. Birds, reptiles, and furbearers all use this site for shelter, nesting, and feeding areas. Wildlife will concentrate in this area as well due to the emergent rushes. The bulrushes provide food and cover for wildlife such as waterfowl and furbearers. Macroinvertebrates such as dragonflies and damselflies will use the emergent vegetation to crawl out of the water during metamorphosis (as they change to adults). Natural looking shorelands like this provide aesthetic value that is otherwise very limited.

Management Recommendations:

- Protect the near-shore terrestrial vegetation for shoreland and upland wildlife and aesthetic benefits.
- Protect the emergent bulrushes
- Do not remove coarse woody cover in both the water and in the shoreland areas

Resource Value of Sensitive Area 3:

This site is on the northeast side of the lake. It consists of the entire bay area and follows the north shore approximately 250 feet. The shoreline in this area has little or no development.

Figure 4. Sensitive Area 3

The primary reasons for site selection include aquatic plant diversity, fishery values, wildlife values (and associated wetland habitat), and natural scenic beauty. The aquatic plants provide vital habitat for fish and wildlife. The vegetation provides important spawning areas for northern pike and largemouth bass. The site is used as a fish nursery and for feeding and cover for other fish and wildlife. Forage species such as minnows and suckers also utilize this area. The aquatic vegetation provides excellent habitat for the production of macroinvertebrates. Thousands of microscopic crustaceans can live on muskgrass (*Chara sp*) providing an important food source for young fish and waterfowl. The wetland complex provides excellent habitat for furbearers such as muskrat and mink. These species will take advantage of the proximity of the wetland to the lake as a place to rear young and feed. Taller trees along the fringe can be used by perching raptors such as

Bald Eagle or Osprey. Both species depend on fish for food and their presence always seems to impress the people who utilize the lake. In addition to large birds, songbirds use this area for nesting and cover. Other lesser known species of salamanders depend on these types of wetlands to complete their life cycle. This minimally disturbed bay provides a peaceful oasis from the main lake. The large forested wetland adjacent to the lake provides for a natural setting on an otherwise developed lake.

Management Recommendation:

- Protect existing aquatic plant growth. Do not remove native plants by physical, mechanical, or chemical means
- Protect the adjacent wetlands
- Minimize boat traffic in bay area

Resource Value of Sensitive Area 4:

This site covers the entire perimeter of the 15-acre Echo Island from shore out 100 feet. The site consists of a variety of upland and near-shore plant species.

Figure 5. Sensitive Area 4

The primary reasons for the site to be selected are the natural scenic beauty and natural shoreland found at this location. The shoreline and upland areas are relatively un-impacted except for two homes on the south end of the island. Because so much of the lake is developed, the near-shore areas on this island not only provide natural scenic beauty for lake residents and lake users, but also fish and wildlife values. The shrubs/brush, fallen timber, overhanging vegetation, rubble/gravel areas, and submergent and emergent plant species present at this site are important habitat components to the lake ecosystem. Many species use these areas for one or more of their functional needs.

Management Recommendation:

- Maintain and protect entire shoreland around the island
- Minimize disturbance and structures within the littoral zone
- Protect snag trees and large trees on the island

Resource Value of Sensitive Area 5:

This site is on the west side of the lake and north of the boat landing at Kangaroo Beach Road. The site is out from shore in water three to five feet deep. The site is a sand shoal that drops off fast and has a high diversity of submerged aquatic plants.

The primary reason for site selection was aquatic plant diversity. Submerged aquatic vegetation provides important habitat for all life stages of fish and feeding areas for wildlife. Aquatic plants provide excellent habitat for the production of macroinvertebrates that are food for several fish species, amphibians, reptiles, birds, and larger insects. The root network of aquatic vegetation holds the bottom sediments in place to help prevent wave action and boat wakes from stirring up the sediment and making the water murky. This diverse aquatic plant community just off shore is unique on Kangaroo Lake and provides critical habitat for fish, macroinvertebrates, and other aquatic organisms. Because so much of the littoral zone is disturbed on Kangaroo Lake, small areas like this are important to the overall health of the lake ecosystem.

Management Recommendation:

- Monitor for the presence of exotic invasive species on a regular basis
- Do not remove native aquatic vegetation by physical, mechanical, or chemical means
- Minimize motorboat traffic in this area

Resource Value of Sensitive Area 6:

This site is located on the northeast side of the lake at North Cote Drive. It is comprised of the shoreline out to approximately 250 feet from shore and includes the creek mouth and wetland area just upstream from the creek mouth on the north side of North Cote Drive. Back from the shore a short distance, the unnamed creek forms a large pool filling much of the lot extending to Elm Point Road. A large population of yellow water

crowfoot (*Ranunculas flabellaris*) and various orchids among other unusual plants occupy this wetland. The Hine's Emerald Dragonfly occurs in the wetland along CTH E and with the proximity of this site to CTH E, it is assumed that this pool is also probable habitat. The creek is an important component of the overall watershed. It drains the wetland area east of Elm Point Road and wetland north of CTH E.

Figure 6. Sensitive Area 6

The primary reasons for site selection was wildlife habitat (and associated wetlands), and natural scenic beauty. Three-square rush (*Scirpus pungens*) is present on the gravelly shore as well as in the water surrounding the area. Bulrushes are also present in the water. Macroinvertebrates such as dragonflies and damselflies will use the emergent vegetation to crawl out of the water during metamorphosis. The wetland complex provides excellent habitat for furbearers such as muskrat and mink. These species will take advantage of the proximity of the wetland to the lake as a place to rear young and feed. The site also offers a physical buffer that protects water quality by anchoring and stabilizing sediments and protecting shorelands from wave erosion.

Management Recommendation:

- Protect the adjacent wetland
- Do not remove native aquatic vegetation by physical, mechanical, or chemical means - especially the emergent species

Whole Lake Management Recommendations:

Resource managers made several recommendations on a whole lake basis.

1. Maintain as much of naturally felled woody debris as possible.
2. Restore shoreland buffers and discourage sea walls and riprap on developed sites.
3. Remove hard shoreline structures and restore natural shorelines to enhance wildlife and fish species.
4. Protect nearshore habitats that have important fisheries values.
5. Educate landowners about the importance of a healthy lakeshore buffer.
6. Protect terrestrial vegetation within 75 feet of the shore.
7. Manage and prevent the spread of Eurasian water-milfoil and other invasive exotic species.
8. Reduce entire tree removal for viewing purposes; try to trim choice limbs.
9. Protect adjacent wetlands and spring areas from development pressures.
10. Encourage periodic water level manipulation.
11. Minimize lawn fertilization to prevent excess nutrient loading to the lake.
12. Properly maintain septic systems to protect water quality.
13. Obey all slow no-wake areas.
14. Restrict manual raking to floating mats of vegetation and leave rooted plants in place.

Conclusions:

Kangaroo Lake is a beautiful lake that deserves special attention. It is truly a unique setting in Door County due in part to the tracts of undeveloped shoreline, bulrush stands, island, and adjacent wetlands. Six sensitive areas were designated on the lake because they contribute to the uniqueness of the lake as a whole. These areas also provide essential functions that make the lake what it is. Special care should be taken to protect these areas and other areas on the lake from further disturbance. Restoring disturbed shorelines and shoreland buffers to a more natural state would be even more desirable to aquatic life and wildlife. The slow no-wake speed restriction within the buoys on the south end of the lake, combined with the voluntary slow-no-wake zone extending 500 feet from the lake's shore into open water, should help decrease shoreline erosion and protect the lake's silty bottom from resuspension. Lakes are one of the state's most valuable resources and without proper protection, the water quality will quickly deteriorate resulting in a loss of aesthetic beauty and degradation of fish and wildlife habitat. All lake ecosystems are sensitive to change and human impacts. It is critical that we protect and restore these valuable resources.

Appendix A. Kangaroo Lake Sensitive Area Designation Report, North Lobe