FINAL – July 2nd, 2010

Silver Lake (Kenosha County, Wisconsin)
Integrated Sensitive Area Report

Date of Original Assessment: September 5, 2001
Dates of Point Intercept Plant Survey: June 7th and 8th, 2006
Date of Reassessment : June 25th, 2007

Number of Sensitive Areas Surveyed: 2

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General Lake Information

Silver Lake is a 464-acre lake with a maximum depth of 44 feet. The lake is centrally located in the southwest corner of Kenosha County, Township 1 North, Range 20 East, Sections 8,9,16 and 17. Silver Lake is characterized as a drainage lake, which is fed mostly by a small tributary, limited groundwater, precipitation, and runoff. A navigable stream connects the lake to the Fox River.

Silver Lake is host to a multitude of recreational uses including, but not limited to, fishing, hunting, water skiing, swimming, kayaking, canoeing, hiking and bird watching. Approximately 60 percent of the shoreline is developed. One public boating access is located on the northwestern shore of the lake and meets the requirement of "adequate public access" defined by NR 1.91(11), Wis. Adm. Code. Additionally, public walk in access is provided to the entire north shore of the lake through public owned lands (DNR and County lands). A public beach (Dewitt Park) is located on the western shore.

Overview of Sensitive Area Designation

Sensitive areas have aquatic or wetland vegetation, terrestrial vegetation, gravel or rubble lake substrate, or areas that contain large woody cover (fallen trees or logs). These areas provide water quality benefits to the lake, reduce shoreline erosion, and provide habitat necessary for seasonal and/or life stage requirements of fish, invertebrates, and wildlife. A sensitive area designation alerts interested parties (i.e., DNR personnel, county zoning personnel, lake associations, etc.) that the area contains critical habitat vital to sustaining a healthy lake ecosystem, or may feature an endangered

plant or animal. Information presented in a sensitive area report is often utilized in the process of making Chapter 30 (Wisconsin State Statutes) permit decisions.

Sensitive areas are defined in Wisconsin Administrative Code NR 107.05 (3)(i)(1) as *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*. **Department resource managers determined that two areas of Silver Lake met the criteria.**

Water Quality

Water quality data for Silver Lake was collected from 1987 to 2001 and from 2004 to 2007 by a volunteer living on Silver Lake. Data was collected on water clarity, phosphorus levels and chlorophyll a levels. Chlorophyll a is an indicator of algae production. The data collected by the volunteer indicates that the water quality of Silver Lake is quite good. The chlorophyll a levels are slightly lower than average and the total phosphorus is slightly higher than average. The aquatic plants capture much of the phosphorus, which limits algae growth and increases water clarity. However, the water clarity levels are also slightly lower expected given the chlorophyll a levels. High speed boating on the lake stirs up sand and sediment in the more shallow portions of Silver Lake, decreasing water clarity.

Fisheries

Silver Lake supports a diverse population of fish species. According to the DNR *Fish Master File*, forty-two fish species have been sampled. These species include: muskellunge, northern pike, walleye, largemouth bass, white bass, channel catfish, bluegill, pumpkinseed, green sunfish, warmouth, rock bass, yellow perch, black crappie, longnose gar, grass pickerel, bowfin, white sucker, golden shiner, blackchin shiner, emerald shiner, spotfin shiner, blacknose shiner, sand shiner, fathead minnow, bluntnose minnow, brook silverside, logperch, tadpole madtom, central mudminnow, fantail darter, iowa darter, johnny darter, common carp and brown, yellow and black bullheads. It is important to note that Silver Lake supports four State of Wisconsin special concern and one State threatened fish species. These species are the pugnose shiner, banded killifish, least darter, lake chubsucker and pugnose minnow.

The pugnose shiner is the state threatened species that has been documented in Silver Lake. Studies by Becker (1983) suggest the species relies on dense vegetation for cover and prefers large stands of *Chara* (muskgrass) for spawning between the months of May through July. Pugnose shiners feed on *Daphnia* spp. and *Chydorus* spp. (types of microscopic animals), but have been observed taking preference to, and grazing on *Chara* and *Spirogyra* (types of algae). The pugnose shiner appears to be extremely intolerant of turbidity and environmental modifications (Becker, 1983, 2000). Protection and preservation of plants is highly recommended in areas where the shiner's habitat exists.

The habitat in and around Silver Lake consists of a balance between developed and undeveloped shoreland. In 2007, no mechanical or chemical plant management took place on the lake, preserving the integrity of native aquatic plant beds. A large portion of the lake is completely natural and exhibits woody debris, emergent vegetation, overhanging vegetation and fallen timber along the lakeshore. This area not only provides crucial habitat for fish but also supports reptiles, amphibians, small and large mammals and fowl. Prime wildlife habitat exists on Silver Lake where shoreline and waterfront areas remain natural or in areas where waterfront owners have created or left "natural corridors" and "shoreline buffers" in place.

Exotic Species

Exotic species, most notably curly leaf pondweed, eurasian water milfoil, and purple loosestrife have invaded southeastern Wisconsin lakes. Boaters traveling from lake to lake often facilitate the propagation of exotic species. The introduction of exotic species into a lake ecosystem can lead to a decline in the native plant population and cause problems with nutrient loading. Also, the disturbance of lake bottoms from human activity (boating, plant harvesting, chemical treatments, etc.) enhances the colonization and/or expansion of exotic species. Two simple steps to prevent the spread of exotic species include 1) Removing aquatic plants, animals, and mud from trailers and boats before leaving the water access; and 2) Draining water from boats, motors, bilges, live wells, and bait containers before leaving the water access.

Eurasian water milfoil is present in Silver Lake. Eurasian water milfoil is one of eight milfoil species currently found in Wisconsin. It is often misidentified as one of its seven native cousins, and vice versa. In many areas within the Lakes, this non-native milfoil has established large monotypic stands that out compete many native plants. These dense beds of milfoil not only impede the growth of native plant species but also inhibit fish movement and create navigational problems for boaters.

The regenerative ability of eurasian water milfoil is another obstacle when attempting to control this species. Fragments of eurasian water milfoil detached by harvesting, boating, and other recreational activities can float to non-colonized areas of the lake or downstream to additional lakes in the drainage system and create new colonies. Therefore, when controlling eurasian water milfoil, selective chemicals and harvesting, coupled with skimming, often produces the best results. In some lakes, biological agents such as the milfoil weevil have helped suppress milfoil populations. However, the most effective "treatment" of exotic milfoil is prevention through public education.

Curly leaf pondweed is another submerged, exotic species found Silver Lake. Like eurasian water milfoil, curly-leaf often grows into large, homogenous stands. It can crowd out native vegetation, create navigational problems, and limit fish movement. Curly-leaf pondweed dies off in mid-summer, increasing nutrient availability in the water column. This often contributes to summer algal blooms and decreasing water quality.

The unusual life cycle of curly leaf pondweed makes management difficult. The plant germinates as temperatures decrease in fall. Curly leaf is highly tolerant of cold temperatures and reduced sunlight, continuing to grow under lake ice and snow cover. With ice off and increasing water temperatures in the spring, the plant produces fruit, flowers, and buds (turions). Turions are the main reproductive mechanism of curly leaf. To control the species in lakes, the plant must be combated before turions become viable. Most plant harvesters have not started cutting when curly leaf is most susceptible and a small window of opportunity exists for chemical treatment. Therefore, prevention through public education is once again very important.

Purple loosestrife, a hardy perennial native to Europe, is another exotic species common to Wisconsin. Since its introduction to North America in the early 1800s, purple loosestrife has become common in gardens and wetlands, and around lakes, rivers, and roadways. The species is highly invasive and thrives in disturbed areas. Purple loosestrife plants often outcompete native plants, resulting in the destruction of food, cover, and nesting sites for wildlife and fish. Several stands of purple loosestrife have been documented on Silver Lake.

Purple loosestrife most often spreads when seeds adhere to animals. Humans should be aware of picking up seeds on clothing and equipment when in the vicinity of the plant. Loosestrife can be controlled manually, biologically, or with a broad-leaf herbicide. Young plants can be pulled, but adult plants have large root structures and must be excavated with a garden fork. Biological control is most effective on large stands of purple loosestrife. Five different insects are known to feed on this plant. Four of those have been used as control agents in the United States. Of the five species, *Galerucella pusilla* and *G. calmariensis* are leaf-eating beetles; *Nanophyes brevis* and *N. marmoratus* are flower-eating beetles; and *Hylobius trasversovittatus* is a root-boring weevil. Only *N. brevis* has not been released in the United States (WDNR 2003). Lastly and most importantly, prevention through public education plays an important role in the management of this species.

Zebra mussels are native to the Baltic and Caspian Sea region or Eastern Europe, and were introduced to the great lakes via ballast water discharged from ocean-going vessels. These mussels attach to nearly every available surface – boats, docks, intake pipes, and are a great threat to native mussel populations. They are filter feeders, and thus eat plankton in the water column that many young fish and native mussels rely on for food. Zebra mussels begin their life cycle at a microscopic level. This stage of life stage is called a veliger. Water that is transferred from water body to water body can lead to new infestations by these veligers. Adults may also hitch a ride on aquatic plants that are transported from one body of water to another by means of boat trailers, river flow, or animal dispersion. Zebra mussels were first documented in Silver Lake in 1994.

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Shoreland Management

Wisconsin's Shoreland Management Program, a partnership between state and local governments, 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 1000 feet of lakes, 300 feet of rivers, and floodplains. Current research shows that present standards are probably inadequate for the protection of water resources. (Woodford and Meyer 2003, Garn 2002) Therefore, many communities have chosen to go beyond minimum standards to ensure protection of our natural resources. This report provides management guidelines for activities within the lake and in the immediate shoreland areas. Before any recommendations in this report are completed, please check with the Department of Natural Resources and local units of government for required approvals.

A vital step in protecting our water resources is to maintain effective vegetative buffers. A shoreland buffer should extend from the water onto the land at least 35 to 50 feet. Studies have shown that buffers less than 35 feet are not effective in reducing nutrient loading. (Wenger, 1999) Wider buffers of 50 feet or more can help provide important wildlife habitat for songbirds, turtles, frogs, and other animals, as well as filter pollutants from runoff. (Castelle 1994) In general, no mowing should occur in the buffer area, except perhaps in a viewing access corridor. The plant composition of a buffer should match the flora found in natural Wisconsin lakeshores. A buffer should include three layers - herbaceous, shrub, and tree.

In addition, citizens living around Silver Lake and the community at large should investigate other innovative ways to reduce the impacts of runoff flowing into the lake while improving critical shoreline habitat. (A. Greene 2003) This may include the use of phosphorus-free fertilizers, installing rain gardens, setting the lawnmower at a higher mower height, decreasing the area of impervious surfaces, or restoring aquatic plant communities.

Introduction

Department personnel conducted sensitive area designation surveys on Silver Lake both on September 5, 2001 and June 25th, 2007 following the Wisconsin Department of Natural Resources' sensitive area survey protocol. This study utilized an integrated team of DNR resource managers with input from multiple disciplines: water regulation and zoning, fisheries, lake biology, wildlife, and aquatic plant management. Two sites were identified on Silver Lake as containing critical habitat and were therefore designated as sensitive areas. Map 1 provides the boundaries of each sensitive area.

Department biologists observed sixteen native aquatic plant species in sensitive area #1 and seven native aquatic plant species in sensitive area #2. Two exotic aquatic plant species were observed in these sensitive areas as well. Eurasian water milfoil (*Myriophyllum spicatum*) was observed in both areas and purple loosestrife (*Lythrum*

salicaria) was observed in sensitive area #1. A plant survey was conducted on the entire lake on June 7th and June 8th, 2006 by DNR bureau of research staff. Twenty five species of native plants were documented as well as two exotic aquatic plant species. The exotic species included eurasian water milfoil (*Myriophyllum spicatum*) and curly leaf pondweed (*Potamogeton crispus*).

Whole Lake Recommendations

These recommendations apply to Silver Lake as a whole rather than a specific sensitive area.

1. Native aquatic plant beds should be protected and maintained for species diversity and to discourage invasion of exotic species.
2. Prevent the spread of exotic species through signage, education, etc. and control exotic species where established.
3. Compliance with Shoreland Zoning standards including setbacks, removal of nonconforming structures and limiting impervious surfaces.
4. Create shoreline buffers and maintain existing buffers, especially in areas not currently developed.
5. Monitor water quality for early detection of change and possible degradation.
6. Use phosphorus free lawn care to control nutrient runoff.

Resource Value of Sensitive Area #1

Sensitive Area #1 encompasses the majority of the northern most bay on Silver Lake. This area exhibits two stream inlet zones and contains a fish spawning marsh with a direct connection to the lake. The shoreline area is almost completely natural except for one boat launch and associated channel, which serves as adequate public access for the lake. The majority of the shoreline in Sensitive Area # 1 is publicly owned by the State of Wisconsin and Kenosha County, which will aid in the preservation of this area. The natural scenic beauty rating for this site is good, receiving a rating of 4 on a scale of 5.

Several attributes of water quality exist within Sensitive Area # 1, including nutrient buffer, biological and physical zones, micro-habitat, sediment stabilization and a stream inlet zone. Trees dominate the shoreland buffer, while the shrub and herbaceous plants are common. The littoral zone throughout the sensitive area exhibits good aquatic plant diversity with a combination of emergent, floating leaf and submergent aquatic plant species. Freshwater sponges have also been documented. Table 1, below, lists the aquatic plant species observed within Sensitive Area 1. The natural state and biodiversity of this site provides critical life-stage habitats for multiple fish and wildlife species.

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Table 1. Plant Species Observed in Silver Lake Sensitive Area #1			
PRESENT (0-25%)	COMMON (26-50%)	ABUNDANT (51-75%)	DOMINANT (76-100%)
Emergents *Sagittaria sp*. (arrowhead)	**Emergents** *Impatiens capensis* (jewelweed) *Scirpus* (bulrush)	**Emergents** *Iris versicolor* (blue flag iris)	**Emergents** *Typha* (cattail spp.) *Pontederia cordata* (pickerelweed)
Submergents *Elodea canadensis* (waterweed) *Utricularia sp.* (bladderwort) *Vallisneria* (wild celery) *Ruppia maritima* (widgeon grass)	**Floating Leaf** *Nuphar advena* (yellow pond lily) **Submergents** *Ceratophyllum demersum* (coontail) *Najas flexilis* (slender naiad)	**Floating Leaf** *Nymphaea odorata* (white water lily)	**Floating Leaf** *Brasenia schreberi* (watershield)
Pondweeds *Stuckenia pectinatus* (sago) *P. natans* (floating leaf pondweed) *P. richardsonii* (clasping leaf pondweed)	**Pondweeds** *P. nodosus* (long-leaf pondweed) *P. illinoensis* (illinois pondweed)		**Algae** *Chara* (muskgrass)
Exotics *Lythrum salicaria* (Purple loosestrife)		**Exotics** *Myriophyllum spicatum* (Eurasian watermilfoil),	

The marsh/stream inlet zone associated with an abundance of emergent vegetation in this area provides exceptional spawning habitat for northern pike. Muskellunge will also spawn within Sensitive Area #1, over areas with dead submergent vegetation and a muck bottom. Members of the sunfish family will utilize this area for feeding, nursery and protective cover. In areas where the sunfish species can locate sand or sand/gravel bars under the fine substrates associated with this area, they too will use this area for establishing spawning nests. Table 2 below illustrates the types of vegetation and substrates some of the more common fishes of Silver Lake will use during their different life cycles.

Table 2. Sensitive Area # 1 Plant Species and Substrates (Habitat) Utilized by Silver Lake Resident Fish Species				
Fish Species	**Spawning**	**Nursery**	**Feeding**	**Protective Cover**
Walleye	Habitat lacking	Cattail, water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	Coontail, wild celery, milfoil, sago, clasping leaf	Coontail, milfoil, sago, clasping leaf
Northern Pike	Cattail, Pickerelweed, bulrush, *Chara*	Cattail, water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	water lily, coontail, wild celery, milfoil, sago, clasping leaf	Water lily, coontail, wild celery, milfoil, sago, clasping leaf
Muskellunge	Clasping leaf	Cattail, water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	Water lily, coontail, wild celery, milfoil, sago, clasping leaf	Water lily, coontail, wild celery, milfoil, sago, clasping leaf
Largemouth Bass	Coontail, watermilfoil Sand/gravel	Cattail, water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	Water lily, coontail, wild celery, milfoil, sago, clasping leaf, woody debris	Water lily, coontail, wild celery, milfoil, sago, clasping leaf, woody debris
Rock Bass	Habitat lacking	Cattail, water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	Clasping leaf, sago, milfoil	Clasping leaf, sago, milfoil
Bluegill and Pumpkinseed	Sand/gravel	Cattail, water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	Water lily, coontail, wild celery, milfoil, sago, clasping leaf	Water lily, coontail, wild celery, milfoil, sago, clasping leaf
Black Crappie	*Chara* (muskgrass) Fine gravel and sand	Water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	Clasping leaf, sago, milfoil, woody debris	Clasping leaf, sago, milfoil, woody debris
Yellow Perch	Cattail, woody debris, coontail, milfoil, sago, clasping leaf	Water lily, *Chara*, coontail, wild celery, milfoil, sago, clasping leaf	Clasping leaf, sago, milfoil	Clasping leaf, sago, milfoil

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In comparison to the rest of Silver Lake, the natural shoreland in Sensitive Area #1 is distinctly unique, providing habitat to a variety of wildlife species. The cattail marsh and cattail fringe area fulfills all life-stage requirements for multiple songbird species, frogs and turtles. Geese, ducks and muskrat also utilize the area, primarily for feeding.

Management Recommendations for Sensitive Area # 1

1. Do not remove fallen trees along shoreline, except where navigation is impaired. If navigation is impaired by a fallen tree, cut into smaller pieces and place outside of boating lane.

2. No chemical treatment should be allowed except to target an infestation of an exotic species such as purple loosestrife, eurasian water milfoil or curly leaf pondweed. Biological controls such as the purple loosestrife beetle and the milfoil weevil should be considered where appropriate.

3. No chemical treatment of eurasian water milfoil should occur adjacent to stands of susceptible aquatic plant species such as bladderwort or northern water milfoil.

4. Maintain the "Slow, No Wake" ordinance in this area of Silver Lake. This ordinance minimizes boat motor disturbance of aquatic plants, fish and wildlife.

5. Minimize disturbance of the diverse stands of native aquatic vegetation.

6. Continue the citizen lake monitoring program.

7. Reactivate the lake association.

8. Provide seasonal protection of fish spawning habitat.

9. Minimize disturbance of herbs, shrubs and trees on the shoreline to maintain wildlife habitat.

10. Mechanical harvesting should not be permitted.

11. New piers may be considered for a permit. However, additional piers are restricted to the existing, privately owned, developed shoreline (4 lots). The number of moorings allowed will be less than listed in State Statutes 30.12 (1g) (f). The number of moorings permitted will be limited and based on the carrying capacity of the resource.

12. Limit manual harvesting to minimal swim/wading areas along the privately owned frontage. No manual harvesting should take place along the frontage of either the state or county owned property. (*Manual removal of aquatic plants in Sensitive Areas must be permitted by DNR according to Wis. Adm. Code NR 109*).

13. Shoreline stabilization should not be needed in most areas of Sensitive Area # 1. If shoreline stabilization is needed, it must be accomplished by bioengineering.

14. A DNR permit should not be issued for any of the following:
    Dredging
    Filling of wetlands
    Aquatic plant screens
    Sea Walls/Retaining Walls/Riprap
    Pea gravel/sand blankets
    Recreational floating devices
    Boat Ramps

Resource Value of Sensitive Area #2

Sensitive Area #2 is located in the southwestern corner of Silver Lake, encompasses the southwestern lobe of the southern-most bay on the lake. This area is associated with the outlet of the lake to the Fox River. The primary reason for this sites selection for a sensitive area is the presence of a healthy diverse native pondweed population in the middle of the bay. The dominant species in this area is Illinois Pondweed (*Potamogeton Illinoensis*). Sago pondweed (*Stuckenia pectinata*) and long leaf pondweed (*Potamogeton nodosus*) are commonly found. The shoreline area is almost completely developed and also includes a boat marina. As a result, the natural scenic beauty rating for this site is rated as poor (1 on a scale of 5).

Table 3. Plant Species Observed in Silver Lake Sensitive Area # 2

PRESENT (0-25%)	COMMON (26-50%)	ABUNDANT (51-75%)	DOMINANT (76-100%)
Submergents *Ceratophyllum demersum* (coontail) *Myriophyllum sibiricum* (Northern Watermilfoil)	**Submergents** *Najas flexilis* (slender naiad)	**Submergents** *Vallisneria* (wild celery)	**Algae** *Chara* (muskgrass)
Pondweeds *Potamogeton nodosus* (long-leaf) *Potamogeton gramineus* (variable pondweed)	**Pondweeds** *Stuckenia pectinatus* (sago)	**Pondweeds** *Potamogeton Illinoensis* (Illinois)	
Exotics *Myriophyllum spicatum* (Eurasian Watermilfoil)			

As mentioned above, this site was selected due to the abundance of diverse native aquatic vegetation away from the shoreline. This vegetation provides quality nursery habitat, feeding and protective cover for the majority of fish species present. Some species such as the golden shiner, yellow perch and muskellunge will utilize the submergent vegetation for spawning media. Maintenance of this site is crucial to young of the year game fish and forage fish.

Table 4. Sensitive Area #2 Plant Species and Substrates (Habitat) Utilized by Silver Lake Resident Fish Species				
Fish Species	**Spawning**	**Nursery**	**Feeding**	**Protective Cover**
Walleye	Habitat lacking	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, milfoil, sago, long leaf, Illinois
Northern Pike	Habitat lacking	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois
Muskellunge	Illinois pondweed, long leaf pondweed	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, milfoil, sago, long leaf, Illinois
Largemouth Bass	Coontail, milfoil Sand/gravel	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois
Rock Bass	Habitat lacking	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Illinois, sago, milfoil	Illinois, sago, milfoil
Bluegill and Pumpkinseed	Sand/gravel	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois
Black Crappie	*Chara* (muskgrass) Fine gravel and sand	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois	Coontail, wild celery, milfoil, sago, long leaf, Illinois
Yellow Perch	Cattail, woody debris, coontail, milfoil, sago, long leaf, Illinois	*Chara*, coontail, wild celery, milfoil, sago, long leaf, Illinois	Illinois, long leaf, sago, milfoil	Illinois, long leaf, sago, milfoil

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Management Recommendations for Sensitive Area # 2

1. Do not remove fallen trees in the bay, except where navigation is impaired. If navigation is impaired by a fallen tree, cut into smaller pieces and place outside of boating lane.

2. No chemical treatment should be allowed except to target an infestation of an exotic species such as purple loosestrife, eurasian water milfoil or curly leaf pondweed. Biological controls such as the purple loosestrife beetle and the milfoil weevil should be considered where appropriate.

3. No chemical treatment of eurasian water milfoil should occur adjacent to stands of susceptible aquatic plant species such as bladderwort or northern water milfoil.

4. Maintain the "Slow, No Wake" ordinance in this area of Silver Lake. This ordinance minimizes boat motor disturbance of aquatic plants, fish and wildlife.

5. Minimize disturbance of the diverse stands of native aquatic vegetation, especially in the middle of the bay.

6. Provide seasonal protection of fish spawning habitat in the middle of the bay.

7. Mechanical harvesting should not be permitted.

8. New piers may be considered for a permit. The number of moorings allowed will be equal to that listed in State Statutes 30.12 (1g) (f). The shoreline is already extensively developed. As a result, the number of additional moorings permitted will be limited and based on the carrying capacity of the resource.

9. Limit manual harvesting to minimal swim/wading areas along the privately owned frontage. (*Manual removal of aquatic plants in Sensitive Areas must be permitted by DNR according to Wis. Adm. Code NR 109*).

10. Any replacement of the existing shoreline stabilization practices must include an element of bioengineering such as vegetated rip rap and biologs.

11. Installation of buffer strips along the highly developed shoreline is strongly recommended.

12. A DNR permit should not be issued for any of the following:
    Dredging
    Filling of wetlands
    Aquatic plant screens
    Pea gravel/sand blankets
    Recreational floating devices

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Conclusion

Two sensitive areas were designated on Silver Lake. The majority of the lake is highly developed. The lake is heavily used for fishing and high speed boating. Forty percent of the shoreline is natural and provides habitat for fish and wildlife in a large, contiguous tract (on the north and northwest shorelines). This condition is not commonly found in Kenosha County lakes. Both the State of Wisconsin and Kenosha County own significant amounts of frontage in Sensitive Area # 1. Sensitive Area # 2 is located adjacent to a very busy marina. The water depth in the bay, as well as the "Slow, No Wake" ordinance has likely contributed to the preservation of a very healthy aquatic plant community in the middle of the bay. Both sensitive areas need to be maintained and protected in order to sustain the fishery on Silver Lake.

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