

Old Taylor Lake (Waupaca, Co.) Sensitive Area Survey Report

Date of Survey: July 23, 2003 & August 6, 2003

Number of Sensitive Areas: 4

Site Evaluators:

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General Lake Information:

Old Taylor Lake is located in Waupaca County, near the City of Waupaca. The lake totals approximately 30 acres with a maximum depth of 17 feet. Old Taylor Lake is essentially land locked except for a small inlet stream that drains a nearby marsh and shallow pond. There is no outlet. Old Taylor Lake consists of two distinct basins connected by a wide channel. Both basins are about 15 feet deep but the largest basin to the west contains a more extensive littoral zone. Sand, gravel, and detritus are the major littoral bottom types. The seepage fed water is clear and soft. One unimproved boat landing located on the northeast shore provides access. (Surface Water Resources of Waupaca County) The shoreline totals approximately 1.6 miles. The 1997 Old Taylor Lake Management plan states there are 22 homes around the lake and a private campground with 113 sites also located on the lake. Old Taylor Lake has a history of dramatic water level fluctuations. The majority of the inputs to the lake are springs, fed by groundwater. When the groundwater tables are low, the water level of Old Taylor Lake is affected. During the last 4-5 years Old Taylor Lake has been severely affected by low water levels. Low water in combination with abundant aquatic plants have led to management efforts focusing on aquatic plants and the continuing use of an aeration system to prevent fish kills. The Old Taylor Lake Advancement Association was formed in 1995 and is still active.

Prior to installation of an aeration system, Old Taylor Lake supported a limited sportfishery due to a long history of chronic winterkills. The department documented 7 winterkills during a 10-year span (1968-1979). Black bullheads appeared to be the only species present at that time. In 1998, the Old Taylor Lake Association installed an aeration system, which negated this condition. Shortly thereafter, the department stocked largemouth bass and yellow perch. In conjunction, the lake association has stocked several species of native fish. Although a fisheries survey has not been conducted, conversations with local anglers suggest that the sportfishery has dramatically improved since installation of the aerator.

Old Taylor Lake provides excellent wildlife habitat, particularly for shorebirds, waterfowl, amphibians and reptiles. During the two site visits species observed included

sandhill cranes, green herons, great blue herons and redheaded woodpeckers. The emergent wetland area west of the boat landing contained a nesting pair of sandhill cranes. During the August site visit, dragonflies and damselflies were actively laying eggs and the number and variety of species present was outstanding. The wildlife species utilizing Old Taylor Lake seems to benefit from the low water levels. The emergent vegetation and abundant aquatic plants provide a variety of values including nesting and cover sites and food sources. From a wildlife standpoint, Old Taylor Lake is rich in species and diversity.

Good plant diversity exists within Old Taylor Lake with approximately 22 species present. The aquatic plant community is dominated by floating leaf and emergent species including watershield, white and yellow water lilies and bulrush. During 2003 the aquatic plant growth was extremely abundant. This abundance is a combination of shallow water lake system with rich organic sediments and low water levels for the past 4-5 years. Past aquatic plant management has included individual and large-scale herbicide treatments and mechanical harvesting. Aquatic plant management permits are required for chemical, mechanical and manual harvesting of aquatic plants. A permit is not required for manual removal of plants in a 30-foot wide zone along the shoreline per property. Please contact aquatic plant manager, Crystal Olson (715) 526-4220 before conducting any aquatic plant control in Old Taylor Lake.

Introduction:

The survey was conducted on July 23 and August 6, 2003 using the Wisconsin Department of Natural Resources protocol guidelines for conducting and implementing sensitive area surveys. The purpose of the survey is to identify areas within the lake that have unique characteristics based on their aquatic plant community, fish and wildlife use. Sensitive area designations provide lake organizations, shoreline property owners, county zoning officials, tribal environmental services, tribal government, DNR personnel and other interested individuals with specific management recommendations to protect and improve the health of the lake.

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

Old Taylor Lake in general is a unique resource providing valuable wildlife, water quality and aesthetics benefits. Although plagued by low water levels in recent years, Old Taylor Lake still provides numerous recreational opportunities. The entire lake should be maintained at its current development level, minimizing any further human impacts. In addition to the entire lake’s uniqueness, four sights in Old Taylor Lake containing critical habitat 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 one exotic species of plant was observed, purple loosestrife. Purple loosestrife is an emergent wetland plant with purple flowers. Heights can reach from 3 to 7 feet. Thick stands of purple loosestrife crowd out native plants and reduce food, shelter, and nesting sites for wildlife, birds, turtles and frogs. Purple loosestrife is easily spread by seeds. Control options include insects, herbicides and manual pulling.

Potamogeton crispus (Curly-leaf pondweed) and eurasian watermilfoil (EWM) were not documented during the survey. However, these species on exotic plants are found in several nearby lakes including the Waupaca Chain O'Lakes. Curly-leaf pondweed is a unique plant that is very well adapted to Wisconsin climate. It can grow under the ice while most plants are dormant, but by mid-July the plant is dying back when other aquatic plants are reaching their peak. The life cycle of curly-leaf is triggered by changes in water temperature. In May, warmer water stimulates plant growth of the spring foliage. Beginning in July, curly-leaf pondweed goes into late summer dormancy and the foliage begins to break down. Prior to the foliage dying, turions or seeds are produced. These turions lay dormant until the water begins to cool in September. When the water temperature falls to about 75°F, the turions germinate to produce winter foliage and the cycle begins again. Due to this unique life cycle, curly-leaf causes nuisance problems during all times of the year. The midsummer die-off can release nutrients into the water column and is available for algal growth and other plants. The effects of EWM include crowding out native plants, impacting wildlife and fish habitat and reducing recreational

value of a waterway. EWM is easily spread by fragmentation, mostly caused by human activities such as boating and swimming.

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.

Shoreland Management

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

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

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

Whole Lake Management Recommendations:

Resource managers made several recommendations on a whole lake basis.

1. Eliminate or reduce chemicals and fertilizers on lawns. Phosphorus-free fertilizers should be used if fertilization is necessary.
2. Restore shoreland buffers on developed sites with small viewing and access corridors.
3. Protect communities and stands of native aquatic vegetation to prevent the establishment of exotic species. Develop an aquatic plant management plan to determine the best management options for Old Taylor Lake.
4. Remove any oversized docks and minimize all structures in the littoral zone.
5. Bioengineering or other soft engineering techniques should be used in place of rock riprap or seawalls.
6. Eliminate the placement of sand below the ordinary high water mark. Placing fill material below the ordinary high water mark violates Chapter 30.12, Wisconsin State Statute. Eliminate the placement of sand in the shoreland zone. The placement of sand in the shoreland zone eliminates the vital shoreland buffer areas and eventually runs off into the lake, destroying the littoral zone habitat.

7. Eliminate disturbance of exposed lakebed. Any activity below the Ordinary High Water Mark is regulated by Chapter 30. Disturbing the exposed lakebed destroys important aquatic habitat and can have serious impacts on water quality.
8. Do not remove coarse woody cover both in the water and in the shoreland zone.
9. Prevent the establishment of exotic species such as Eurasian Watermilfoil and zebra mussels by posting signs and education. Prevent the spread and establishment of Curly-leaf pondweed, Eurasian Watermilfoil and Purple Loosestrife by removing all plant material from watercraft before moving to other parts of the lake. Actively engage in activities to control purple loosestrife. Contact Crystal Olson, (715) 526-4220 for more information.
10. Post maps of all sensitive areas at all boat landings.

Resource Value of Site #1

This site is located along the eastern shoreline of the lake. The site is approximately 2,000 feet long and consists of an area totaling approximately 6 acres. The average water depth at the time of the survey was 1-2 feet. Primary reasons for site selection included fishery, aquatic vegetation, wildlife and natural scenic beauty values. The shoreland buffer type in this area is 50% wetland and 50% wooded. The bottom type is mostly muck and silt. The shoreland buffer consists of shrubs (51-75%) and trees (51-75%). Large woody cover is estimated as present with 1-2 pieces/30 meters of shoreline. The Natural Scenic Beauty rating, herein referenced to as NSB, was outstanding, with no human disturbance and unique aesthetics.

Fishery values were one of the reasons for site selection. This site offers important habitat components for fish including emergent, submergent and floating-leaf vegetation. Esocids (northern pike), Large-mouth bass, Centrachids (sunfish family), Perch, suckers and minnows utilize this site for all life activities. These activities include spawning, nursery, and feeding and protective cover. The vegetation present provides the necessary habitat.

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

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

Aquatic vegetation was a third reason for site selection. This site offers a variety of types of aquatic vegetation including wet edge plants, emergents, submergents and floating-leaf species. (See Table 1). The strong density of native plants protects against the spread of purple loosestrife, which was found in this site.

Management Recommendations:

1. Maintain, protect and preserve the undeveloped shoreline.
2. Limit aquatic plant removal to navigation channels.
3. Protect emergent aquatic plants to prevent erosion.
4. Do not remove coarse woody debris on the shoreline or in the water.

Resource Value of Site #2

This site is located at the north end of the lake and encompasses the large bay found here. The site is approximately 1468 feet long, totaling an area of 3.7 acres. The primary reasons for site selection included fishery, wildlife and aquatic vegetation values. The average water depth at the time of survey was 1-2 feet. The substrate is composed of silt and muck. The shoreland buffer type is 100% wooded. The shoreland consists of a shrub layer (1-25%) and trees (76-100%). The wetland type adjacent to the shoreline is emergent/wet meadow. Large woody cover is estimated as present with 1-2 pieces/30meters of shoreline. The NSB is rated as outstanding, no human influence, unique aesthetics.

Fishery values were one the primary reasons for site selection. All species present in Old Taylor Lake utilize this area for all life activities. The large woody cover and varying types of aquatic vegetation offer a suitable habitat for all species. This site is also located near the aerator and therefore, may be a seasonal fish refuge.

Wildlife values were the second reason for site selection. Species observed during the site visit included green herons, great blue herons, sand hill cranes and a variety of dragonflies and damselflies. Due to its undeveloped nature, wildlife species will utilize this site for all life activities. Important habitat components include emergent, floating-leaf vegetation and snag trees.

Aquatic vegetation was the third reason for site selection. The variety of emergent, submergent and floating-leaf vegetation offers value to both fish and wildlife species. (See Table 2). The strong presence of native emergent plants will help prevent the spread of purple loosestrife.

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.

Management Recommendations:

1. Remove only exotic species of plants, such as purple loosestrife. Do not remove emergent vegetation in the littoral zone.
2. Maintain undeveloped shorelines.
3. Aquatic plant removal should be limited to navigation lanes.
4. Maintain aeration operation.

Resource Value of Site #3

This site is located in the southeast corner of Old Taylor Lake. The site is approximately 400 feet long, totaling an area of roughly 1.5 acres. Primary reasons for site selection included fisheries and aquatic vegetation values. The average water depth at the time of the survey was 2-3 feet. The bottom substrate is silt and muck. The shoreland buffer type is 60% wooded and 40% developed. The shoreland consists of shrubs (26-50%) and trees (51-75%). The large woody cover is estimated as common with 3-6 pieces/ 30 meters of shoreline. The NSB is rated as poor, moderate human disturbance.

Fisheries values were one of the reasons for site selection. All species present in Old Taylor Lake utilize this site for all life activities. The emergent, floating-leaf and over-hanging vegetation and large woody cover provide essential habitat components for all fish. Due to the plant density this area is likely the prime area for centrachids and largemouth bass reproduction.

The aquatic vegetation present presents a diverse community including wet edge, emergent, submergent and floating-leaf plants. (See Table 3) The density of the aquatic plants is less in this area, providing more edge area for fish species. The recreational value of this area is higher than other parts of the lake due to the mobility of watercraft.

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.

Management Recommendations:

1. Limit aquatic vegetation removal to only navigation lanes.
2. Maintain and re-establish shoreland buffers in areas where they have been removed.
3. Eliminate the maintenance of beach areas. Eliminate the placement of sand below the ordinary high water mark.
4. Minimize shoreland structures to prevent littoral zone disturbance.
5. No mechanical harvesting in this area due to the relative low density of aquatic plants.

Resource Value of Site #4

This site is located west of the boat landing. The site at the time of survey was a shallow water wetland. During higher water, this site would be an emergent plant dominated littoral zone. The total acreage of the site is approximately 7.5 acres. The shoreland buffer type is 100% wetland below the high water mark and 100% wooded above the high water mark. The wetland area is dominated by herbaceous plant species. The NSB was rated as average, with minimal human disturbance.

Similar to Site #2-the wildlife values of this site were outstanding. Species observed during the site visits included green heron, great blue heron, nesting sand hill cranes, redheaded woodpeckers and a variety of reptiles and amphibians. The variety of wildlife species is attributed to the undeveloped and undisturbed nature of this shoreland wetland.

The vegetation present was a second reason for site selection. Depending on water levels, a vast variety of species can be found in this site including wet edge plants like tag alders and willows and emergents, such as arrowhead. (See Table 4) Purple loosestrife was also observed in this site in several locations. This is of particular concern due to the variety of plant species currently found here and the potential for purple loosestrife to crowd out these native plants.

Fisheries values were not a factor in site selection during the survey due to the low water. However, in higher water the extensive littoral zone will provide spawning habitat for a variety of species.

Management Recommendations:

1. Actively engage in purple loosestrife control.
2. Minimize all human disturbance to the area.
3. Maintain area in undeveloped, undisturbed condition.

Conclusion

In conclusion, four sites within Old Taylor Lake were designated as sensitive areas. This report identified important areas of habitat and management recommendations for each site. Lakes are one of the state's most valuable resources and without proper protection the water quality of our lakes will quickly deteriorate, resulting in degradation of fish and wildlife habitat. All lake ecosystems are sensitive to change and man's impact. It is critical that we protect and restore these valuable resources.

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