

2011

Tree Lake Management Plan



Tree Lake Management Planning Committee

1/2011

Tree Lake Management Plan was updated by the Tree Lake Association in January 2011

A special thanks to all those who helped to create the Tree Lake Management Plan and provided the necessary data in the Portage County Lake Study.

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Introduction

Tree Lake is situated in the northeast corner of Portage County, Wisconsin. Tree Lake is valued by those who use and enjoy the lake for its good water quality, natural beauty, peace and tranquility, quality fishing, and recreational opportunities.

In 2007, the Tree Lake Association partnered with UW-Stevens Point to develop a lake management plan. The purpose of this plan was to learn about Tree Lake, identify factors important to Tree Lake residents & users, and develop goals, objectives, and associated actions to protect and improve the lake. The Tree Lake Management Planning Team consisted of Tree Lake Association members that were assisted by Portage County staff including the County Conservationist and Parks Director, the Wisconsin Department of Natural Resources Lake Management and Fisheries staff, and staff from the University of Wisconsin-Stevens Point Center for Watershed Science and Education.

A survey was sent to Association members to obtain their opinions about Tree Lake. Survey results were used throughout the planning process.

The purpose of this plan was to learn about Tree Lake, identify factors important to Tree Lake residents & users, and develop goals, objectives, and associated actions to protect and improve Tree Lake for future generations.

Background Information

Background information on Tree Lake is taken from the Tree Lake section of the Portage County Lake Study. The complete document can be found at:

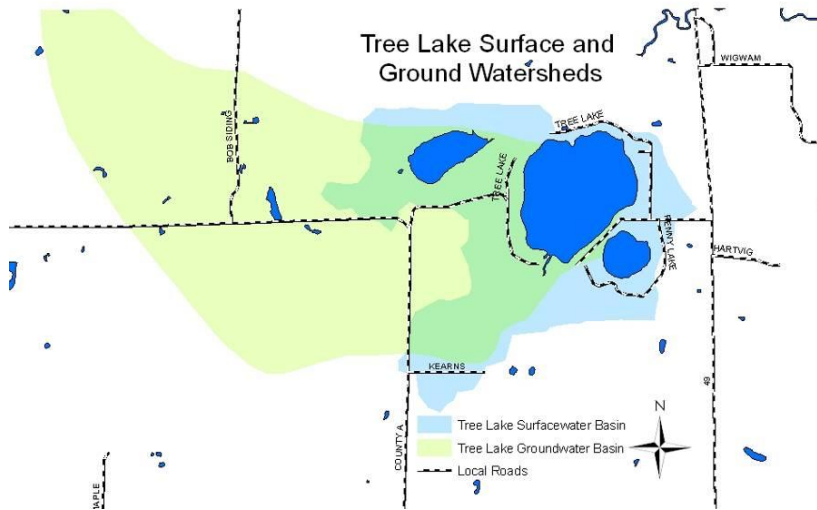
<http://www.co.portage.wi.us/Planning&Zoning/PCL/Main%20Page/Main%20Page.shtm>

Tree Lake is a drainage lake with hard water, covering 71.3 acres and has a maximum depth of 34 feet. Tree Lake has two inlets. The smallest flows are from Mud Lake and enter on the northwest side of Tree Lake. The other, Klondike Creek, is a cold water stream that provides good habitat for brook trout. Portage County has a small county park on the northeast side of the lake and a public access on the southwest side.

Watershed

Tree Lake's surface watershed, an area of land where water from precipitation drains from higher elevations towards Tree Lake, is approximately 2,524 acres, one of the largest in Portage County, WI. Relatively flat land with little topography allows for the watershed's northern boundaries to extend into Marathon County. Dominate land uses within the watershed are split between agriculture and forested wetlands. Forests, grasslands, and wetlands are other major land uses within the watershed.

A ground watershed is similar to a surface watershed, except that it is an area of land where the groundwater, instead of surface water, drains to Tree Lake. Often surface water watersheds and ground watersheds do not cover the same areas, which is the case in Tree Lake. Tree Lake's ground watershed is 825 acres and lies entirely within Portage County. Dominate land use within the ground watershed are forested lands followed by non-irrigated agriculture. Land uses within the ground watershed shifted from non-irrigated cropland to irrigated cropland between 1968 and 1990. During this same time, forestland has increased and shrub vegetation has declined, giving rise to residential and transportation development.



Sensitive Areas

The sensitive areas on Tree Lake are defined by areas immediately around the lakeshore that would be significantly impacted by most disturbances or development. Two sensitive areas were identified on Tree Lake. The first was a long, finger-like wetland extending from the southern shore of the lake and heading southwest. These wetlands are important due to their ability to serve as filters of pollutants, provide varied habitat wildlife and birds, and store floodwaters. The second were the steep slopes lining the western banks of the lake. These steep areas are extremely susceptible to erosion and runoff to the lake if disturbed (See Appendix A).

Critical Habitat Areas

Four areas of critical habitat were identified by the Wisconsin DNR in their 2008 Tree Lake Critical Habitat Survey. Each critical habitat

designation (CHD) is chosen for different reasons. See Appendix B for locations for each of the four CHD areas on Tree Lake.

CHD 1 was designated as critical habitat for the emergent and floating leaf vegetation found in this area. This type of vegetation provides good cover for fish, while still allowing them to move between and below the plants.

CHD 2 had a diverse aquatic plant community, including a bog. The aquatic plant species found in this area are good for fish and wildlife habitat. This habitat includes healthy bulrush beds and good landward vegetation. CHD 3 was also identified because of good habitat and bulrush beds.

CHD 4 was identified because it has good natural shoreline and aquatic vegetation. However, this site is a particularly good candidate for improvement by adding additional woody habitat.

Shorelands

Seventy-eight percent of Tree Lake's shoreline is considered disturbed. Of that, 3.2% is considered to be low disturbance, areas where the shoreline is vegetated except for pier access; 11% is considered to be moderate disturbance, areas where there may be a mowed lawn but there is still an intact overstory; and the remaining 63.5% is considered to be highly disturbed, which are areas with a beach rip-rap, seawall, or where the shore is mowed to the waterline (See Appendix C).

The remaining 22% of the shoreline is broken into different vegetation types. Black Spruce and Tamarack wetlands cover 15.1% the shoreline, Alder is the predominant vegetation type for 1.2% and the remaining 6.1% is simply termed vegetated (See Appendix C).

The large areas of disturbed shoreline surrounding Tree Lake are cause for concern due to the lack of habitat and the lack of runoff control. Runoff, or excess water, coming off hard surfaces such as roofs, driveways, patios, and compacted soils enter Tree Lake and can carry a variety of pollutants in the water. Negative impacts on a lake due to runoff include: excess nutrients (such as phosphorus) in the lake, which can cause algae blooms and excessive plant growth and an increased amount of sediment in the lake, which can lead to cloudy or turbid water, sediment burying fish spawning areas and other critical habitat, and sediment transporting additional pollutants such as debris and toxics.

Issues related with runoff were identified by survey respondents as the most pressing water quality issues in Tree Lake. However, 56% of respondents have not installed stormwater control methods on their properties and 40% of the respondents mowed 70% or more of their lawns. There is some understanding of the benefits of shoreline vegetation because 61% of respondents agreed that removal of native shoreline increases shoreline erosion and 50% agreed that vegetative buffers help reduce runoff, however more informational opportunities may be needed as 72% of respondents said that they would like more information about shoreline vegetation and its impact on water quality.

Aquatic Plants

According to R. Freckmann, there were **37** species of aquatic macrophytes, or aquatic plants that have been identified in Tree Lake or wet areas of the adjacent shore. This is below average compared to the other Portage County lakes. (This plant survey did not include the wetlands along the northwestern shore and along Klondike Creek to the southeast of the lake)

The Wisconsin Department of Natural Resources Aquatic Plant Survey of Tree Lake identified *Vallisneria americana*, or American Wild Celery, as the dominant plant species within the plant community, especially within the 1.5 ft to 10 ft. depth zone. *Ceratophyllum demersum*, Coontail, and *Najas flexilis*, nodding water nymph, were identified as sub-dominant species.

Tree Lake's aquatic plant community is comprised of plant species that are fairly typical of hard water lakes. However, Curly Leaf Pondweed and Reed Canary-Grass are two invasive species that have also been found at Tree Lake. Currently these plants are located in small patches throughout the lake and are not exhibiting signs of excessive growth (See Appendix D). Lake residents and users should monitor these plant communities for changes in growth and for other aquatic invasive species that may be present, as they have been found in nearby lakes.

According to a survey of lake residents and users 56% of respondents agreed that native aquatic plants contribute to better water quality. However, a vast majority of respondents (87%) felt that the amount of aquatic plant growth was at best excessive and only 24% of respondents agreed that native aquatic plants add scenic beauty.

Water Quality

Water quality assessment of a lake involves a number of measures including temperature, dissolved oxygen, water chemistry, chlorophyll *a*, and algae. Each of these measures plays a part in the lakes overall water quality.

The temperature in Tree Lake follows the mixed and stratified cycles typical of many Wisconsin lakes. Temperatures in Tree Lake are generally stratified during the summer and winter months and mixed from top to bottom during the spring and fall. Due to the typical

stratification and mixing of the lake, dissolved oxygen concentrations within Tree Lake are able to support a variety of fish and aquatic biota.

Water clarity is a measure of how deep light can penetrate the water. It is an aesthetic measure and is related to the depth that rooted aquatic plants can grow. Overall, water clarity in Tree Lake is considered fair, however it is considered below average when compared to other Portage County lakes. Tree Lake is currently experiencing better water clarity than it has had historically, with the best water clarity in the month of September and poorest in May. These fluctuations throughout the summer are normal as algae and aquatic plant populations and sedimentation increase and decrease. Disturbance of sediment by wind or boating activity can also influence the water clarity in shallow areas of the lake.

A variety of water chemistry measurements were used to characterize the water quality in Tree Lake. Nutrients (phosphorus and nitrogen) are important measures of water quality in lakes because they are used for growth by algae and aquatic plants. Total phosphorus (TP) levels in Tree Lake ranged from 13 to 43 mg/L and were variable throughout the year, however when these were averaged by season levels were relatively low. Nitrogen concentrations are quite high in Tree Lake and are consistently above concentrations needed for excessive algae growth.

The algal community when considered relative to the chlorophyll, phosphorus, and nitrogen values for Tree Lake presents a picture of a very mesotrophic lake. The 33 genera of algae identified during the sample periods were relatively common and none of the dominant genera in the sample counts are associated with toxins or health issues. The water clarity in Tree Lake was generally good during all algal sampling periods and this seems to conflict with the high chlorophyll

values, heavy algal densities, and water chemistry data. However, this is not uncommon in stratified lakes such as Tree Lake (B. Bell).

Chloride levels, and to a lesser degree sodium and potassium levels, are commonly used as an indicator of how strongly a lake is being impacted by human activity. Potassium levels in Tree Lake are low but chloride and sodium levels are somewhat elevated. Although these nutrients are not detrimental to the aquatic eco-system, they indicate that sources of contaminants such as road salt, fertilizer, animal waste, and/or septic system effluent may be entering the lake from either surface runoff or via groundwater.

Atrazine, an herbicide, was found in low concentrations in the lake water (0.11 and <0.05 ppb). The presence of Atrazine indicates that other agri-chemicals may also be entering Tree Lake.

Survey respondents felt that the water quality in Tree Lake had either stayed the same or declined over the years. Aquatic plants and algae were identified as the two major water quality issues facing Tree Lake. Approximately half of the respondents felt that fertilizers were responsible for the decrease in water quality while roughly 30% felt that septic systems, livestock agriculture, herbicides, development or heavy recreational use were the causes for the decline.

Phosphorus

Phosphorus is an element that is essential to most living organisms in trace amounts, including plants. Sources of phosphorus can include naturally occurring phosphorus in soils & wetlands, small amounts in groundwater, agricultural runoff, urban runoff, domestic and industrial sewage, septic systems, and animal waste.

Phosphorus is the “limiting nutrient” in Tree Lake. Biological growth responds to phosphorus due to its relative short supply with respect to other substances necessary for growth. However, increases of just a small amount of phosphorus results in increased growth rates and abundance, especially in aquatic plants and algae.

Phosphorus concentrations in Tree Lake are variable throughout the year. Average total phosphorus (TP) for 2002-2003 was 23.4 ug/L, which falls below the WDNR proposed criteria value of 30 ug/L. Spring averages for total phosphorus (TP) were 26.3 ug/L, summer averages for TP were 22.1 ug/L, fall averages for TP were 30.0 ug/L, and winter averages for TP were 20.7 ug/L. However, readings as high as 43 ug/L were taken during the summer. Concentrations over 30 ug/L can contribute to or cause algae blooms in the lake. Although the average concentrations are below problem thresholds, they are slowly increasing over time and individual readings during fall and spring turnover exceeded 30 ug/L. It is important to reduce phosphorus before it reaches problem levels.

The importance of managing phosphorus in the Tree Lake watershed is key to protecting the lake itself. Watershed activities that increase the

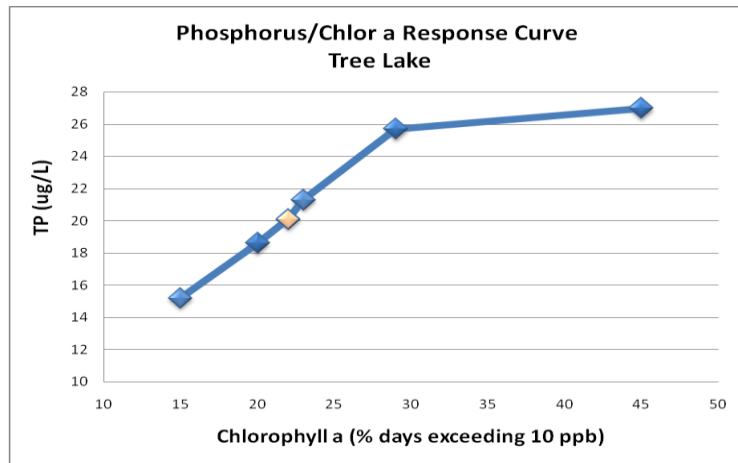
input of phosphorus to the lake include removing native vegetation (trees, bushes, and grasses), mowing grass and planting crops up to the water’s edge, and increasing the amount of impervious surfaces. Phosphorus inputs to Tree Lake can be controlled through the use of Best Management Practices (BMP’s) that minimize the movement of phosphorus to the lake.

The phosphorus response graph below shows how different land management strategies and hence phosphorus concentrations may affect the frequency of algae blooms (chlorophyll a) in Tree Lake. The current conditions in Tree Lake are highlighted. The frequency of blooms can be decreased by the implementation of best management practices on the current landscape. Conversely, changes in land uses and/or land use practices may readily increase the frequency of algae blooms that occur between May and September.

Recreation

According to survey results the top three recreational activities on Tree Lake are fishing, enjoying scenery, and solitude. Other popular activities are enjoying wildlife, walking, motor boating, and swimming. While enjoying Tree Lake, approximately 43% of users said that there were moderate disturbances, sometimes noise and activities disturb the user on the lake.

Fishing is the most popular recreational activity on Tree Lake. The majority of survey respondents ranked fishing on Tree Lake as average to fair, with Bluegill, Crappies, and Northern Pike being the primary fish caught. However, the majority of respondents also noted a decline in the quality of fishing.



Aquatic Plants

Healthy native aquatic plant communities are an essential part of a lake ecosystem. Fish and other aquatic and terrestrial life depend on aquatic plants for habitat, food, and spawning areas. Aquatic plants also provide protection for a lake by preventing the establishment of invasive aquatic species and protecting sediment from wind and boating disturbance. Tree Lake residents and lake users value native aquatic vegetation for these benefits. In a citizen survey of Tree Lake residents and users, respondents indicated interest in learning more about native aquatic vegetation and their benefits. A healthy community of aquatic plants within Tree Lake will be maintained through information opportunities and sustainable lake management practices.

Goal: Maintain the diversity and quality of native aquatic plants and prevent invasive aquatic species through the sustainable management of aquatic plants for fish and wildlife habitat and to protect water quality. This goal will be achieved when aquatic plant surveys indicate that the 2-5 foot zone of the lake is a least 80% vegetated for two consecutive surveys.

Objective 1: Provide diverse informational opportunities for landowners to learn about aquatic plants, current laws, and expectations for lake type.

Actions	Lead person/group	Start/end dates	Resources
Continue to provide informational materials about aquatic plants and current laws in welcome packets that are distributed to any new landowners	Lake Association	Ongoing	UWSP Watershed Center, UWEX Lakes, WDNR
Host a presentation or education event.	Lake Association	Ongoing	WSP Watershed Center, UWEX Lakes, WDNR
Continue to host informational materials on website	Lake Association and Webpage designer	Ongoing	WSP Watershed Center, UWEX Lakes, WDNR
Continue citizen monitoring of aquatic vegetation	Lake Association and Volunteer Group	Ongoing	WDNR, Golden Sands RC&D
Continue to add additional volunteers for monitoring of aquatic vegetation	Lake Association	Ongoing	
Contract with the DNR or other professional to conduct an aquatic plant survey once every three years or more.	Lake Association	Ongoing	WDNR UWSP

Objective 2: Utilize a plan for the sustainable management of aquatic vegetation.

Actions	Lead person/group	Start/end dates	Resources
Follow actions outlined in the aquatic plant management plan	Lake Association	Ongoing	WDNR UWSP
Annually review results of the previous year management and monitoring results to determine the management strategies for the next year	Lake Association	Annually	UWSP Watershed Center UWEX Lakes WDNR

Objective 3: To monitor and prevent infestation of new aquatic invasive species into Tree Lake.

Action	Lead person/group	Start/end dates	Resources
Continue education about invasive species through newsletters, website, and meetings.	Lake Association, newsletter editor, and webpage designer	Ongoing	Portage County Invasive Species Coordinator (Paul Skawinski), UWEX Lakes, WDNR
Continue Clean boat, Clean Water program, especially during busy weekends	Lake Association and Clean Boats, Clean Waters committee	Ongoing	Clean Boats, Clean Water Program Coordinator, Portage County Invasive Species Coordinator (Paul Skawinski)
Work with Lake Helen and Collins Lake on Clean Boats, Clean Waters programs to try and make the best use of volunteer time			Lake Helen P&R District Collins Lake UWSP UWEX Lakes
Add "It's the law" to the boat landing sign	Portage County Park Dept.	2011	Portage County Parks Dept.
Formalize and maintain core citizen group that monitors for invasive species	Lake Association and monitoring volunteers	Ongoing	WDNR Wisconsin Action Volunteer (WAV) monitoring program, UWSP (Nancy Turyk)
Review and update rapid response plan annually	Lake Association	Annually	Portage County Invasive Species Coordinator (Paul Skawinski, DNR)

Fisheries

Fish communities are an important part of any healthy lake ecosystem and are a source of pleasure for many. According to survey respondents fishing is the most popular activity on Tree Lake. Respondents also felt that fishing on Tree Lake is currently average or fair, but that quality has declined. These users feel that the fisheries of Tree Lake need quality habitat, vegetative cover, and good water quality in order to improve fisheries in Tree Lake.

Goal: Improve the size and quality of the fishery through sustainable management practices

Objective 1: Determine the composition of the fisheries in Tree Lake

Actions	Lead person/group	Start/end dates	Resources
Hire UWSP or WDNR to conduct a fish survey on Tree Lake	Lake Association	2011	WDNR UWSP
Work with the local area fisheries manager to develop protocol for local fisherman to collect and record their own catch data that could be used to help determine fisheries goals	Lake Association	2011	WDNR

Objective 2: Work with the DNR to determine lake specific fisheries goals.

Actions	Lead person/group	Start/end dates	Resources
Work with the DNR to develop management goals	Lake Association	2011	WDNR
Post the size and catch limit for fish at the boat landing	Lake Association	2011	<u>DNR</u>

Objective 3: Increase shallow water fish habitat in Tree Lake by 10% by 2012.

Actions	Lead person/group	Start/end dates	Resources
Continue to educate about woody habitat in lake, recommend that it is left in place.	Lake Association	Ongoing	UWSP Watershed Center, UWEX Lakes, WDNR
Protect and enhance Spawning habitat by protecting submerged plant beds through information and education	Lake Association	Ongoing	UWSP Watershed Center, UWEX Lakes, WDNR
Implement aquatic plant management plan	Lake Association	Ongoing	

Shoreland Goals

Shoreline areas, on land and into the shallow water, provide essential habitat for fish and wildlife that live in or near Tree Lake. Overdeveloped shorelands can't support the fish, wildlife, and clean water that are important to the users and residents of Tree Lake. The majority of survey respondents realize that the removal of native shoreland plants increased erosion and the presence of vegetative buffers reduced runoff and removed sediments. Therefore, residents may be willing to restore buffers and protect shoreland plants.

Goals: Create, restore, and protect healthy, stable shoreland habitats near and around Tree Lake. This goal will be achieved when 96% of the shoreline is vegetated.

Objective 1: Decrease the total amount of disturbed shoreline to 55% by 2012

Action	Lead person/group	Start/end dates	Resources
Continue to provide information about the benefits of natural shorelines	Lake Association	Ongoing	UWSP Watershed Center, UWEX Lakes, WDNR, Local Lake Groups,
Host a shoreline restoration workshop	Lake Association	2011	Master Gardners, Local Lake Groups,UWSP
Provide information about the updated rules for shoreland zoning	Lake association	After the county adopts the new shoreland zoning ordinance	Portage County Planning and Zoning
Participate in Portage County shoreline restoration program/opportunities	Lake Association and Volunteer homeowners	2011	Portage County Land Cons Dept
Continue to provide information and education about the benefits of identifying and limiting disturbances to prevent erosion and direct runoff in steep shore areas.	Lake Association	Ongoing	
Hire a consultant to conduct a shoreline plant/habitat survey as a follow up to the Portage County Lakes Study and every two or three years.	Lake Association	2011and Every two to three years after.	UWSP Watershed Center, UWEX Lakes, WDNR, Portage County Land Cons Dept, consultant
As restorations are completed host a tour or walk to highlight these, also a write a newsletter article to share this information	Lake Association	2011	WDNR, Portage County Land Cons Dept, UWSP
Have a representative from Portage County Land Conservation Dept. come to a meeting and talk about how to prevent runoff on your property	Lake Association	2011	Portage County Land Cons Dept

Critical Habitat

Critical habitat sites are sensitive and fragile areas that support wildlife habitat, provide mechanisms that protect water quality, and harbor quality plant communities. Protection of these areas within Tree Lake are important because they exemplify the character and qualities of the lake and ensure the long-term health of Tree Lake.

Goal: Protect areas of critical habitat

Objective 1: Protect current areas of critical habitat identified in the Wisconsin DNR Critical Habitat Report.

Actions	Lead person/group	Start/end dates	Resources
Review critical habitat report (with a professional) at an annual meeting to understand what is in it and why	Lake Association	2011	WDNR – Patrick Sorge
Shoreland restoration needed at CHD 3 – identified in DNR Critical Habitat Report	Lake Association	2011	WDNR, Nursery stock
Encourage woody habitat (tree drop) at CHD 4– identified in DNR Critical Habitat Report or other areas.	Lake Association	2011	WDNR
Continue protect Sensitive areas identified in Portage County Lake Study	Lake Association	Ongoing	UWSP Watershed Center, WDNR
Work with county to create woody habitat on county property and encourage the County Park to continue leaving current woody debris	Portage County Parks Dept.	2011	Portage County Parks Dept.

Water Quality

Tree Lake is host to a wide variety of plants, insects, fish, amphibians, and a variety of other animals that all depend on good water quality in the Lake. The majority of residents on Tree Lake felt that the water quality in Tree Lake was good or fair, but that it declined over the years. Data shows that while water quality has improved slightly from historic levels, there are still concerns over high phosphorus and nitrogen levels in the lake. Although the average concentrations (presented earlier in the plan) are less than the proposed DNR phosphorus standards, concentrations in Tree Lake are often well above this level and therefore; reduction is recommended. Protecting and improving water quality goals will be met through increasing infiltration and reducing runoff to the lake, which will help to reduce phosphorus and nitrogen inputs and concentrations in the lake. Reducing phosphorus and nitrogen in the lake will limit algae blooms and improve water clarity.

Goal: Improve water quality and clarity. This goal will be achieved when monitoring indicates that median summer (5 samples/summer) total phosphorus levels are 20 ug/L for 3 consecutive years and NO₂+NO₃-N concentrations are less than 0.3 mg/L during spring over turn.

Objective 1: Provide diverse informational opportunities for residents and users of Tree Lake to learn about practices that improve water quality in Tree Lake.

Action	Lead person/group	Start/end dates	Resources
Continue to maintain citizen water quality monitoring program. Add spring and fall overturn sampling.	Lake Association and Volunteer Monitors	Ongoing	WDNR Wisconsin Action Volunteers (WAV) monitoring Program, UWSP (Nancy Turyk)
Continue information and education about eliminating and/or significantly reducing fertilizer use on lawns and agricultural land around the lake and about the phosphorus fertilizer ban	Lake Association	Ongoing	Portage County Land Cons Dept
Provide information and education about testing your septic system	Lake Association	2011	Portage County Planning and Zoning
Approach the county to require all septics to be regulated (no grandfathering)	Lake Association	2011	Portage County Planning and Zoning
Explore holding a drinking water program for lake residents	Lake Association	2011	UWSP Water and Environmental Analysis Lab UWSP Groundwater Center

Objective 2: Reduce phosphorus and nitrogen inputs to Tree Lake from near shore and watershed land use practices.

Actions	Lead person/group	Start/end dates	Resources
Restore natural shoreline s and/or install vegetative buffers on properties around Tree Lake	Lake Association and Volunteer homeowners	Through 2012	UWSP Watershed Center, UWEX, DNR, Portage County
Continue to provide information and education about the benefits of identifying and limiting disturbances to prevent erosion and direct runoff in steep shore areas.	Lake Association	Ongoing	Portage County Land Cons Dept
Install rain gardens between homes and the lake to reduce runoff.	Lake Association and Volunteer homeowners	2011	Portage County Land Cons Dept Department has technical expertise for developing plans.
Continue to provide information and education to people about the values of native vegetation near the lake.	Lake Association	Ongoing	Portage County Land Cons Dept Identify demonstration Sites. Other lakes with sites Mirror Lake, Jordan. Park, Collins Lake, Springville Pond.
Work with the Portage County Conservation Department to reduce phosphorus from other lands in the watershed such as agricultural land and the County Park through the use of water quality based Best Management Practices.	Lake Association with the assistance of the County Land Conservation Dept., and County Parks Dept.	Ongoing	Portage County Land Cons Dept
Provide lake residents with the information for ordering rain barrels from Golden Sands RC&D, to prevent runoff from properties	Lake Association	2011	Golden Sands RC&D

Recreation

Tree Lake users and residents enjoy many different recreational opportunities. Based on survey results, the most popular recreational activities on Tree Lake are fishing, enjoying scenery, and solitude. Recreational needs and uses on the lake will likely continue to increase as populations and development in the area increase. It is important to provide safe recreational opportunities while still protecting water quality and lake habitats and minimizing conflicts between uses.

Goal: Maintain and enhance activities on Tree Lake that allow all users to enjoy the lake.

Objective 1: Maintain and develop new activities on Tree Lake that encourage different uses of the Lake and promote a sense of community.

Action	Lead person/group	Start/end dates	Resources
Continue to provide information and education about current no-wake rule on Tree lake	Lake Association	Ongoing	WDNR
Develop a courtesy code that can be distributed to lake users that explains the no-wake status of the lake	Lake Association	2011	UWSP
Continue to hold an annual Tree Lake Association Meeting	Lake Association	2009 and annually	UWEX Lakes Program

Communication

Many of the goals outlined in this plan are focused on disseminating information to lake and watershed residents and lake users, ultimately to help them make informed decisions that will result in a healthy ecosystem in Tree Lake that is enjoyed by many people. There is no single best way to distribute information to those that enjoy and/or affect Tree Lake so the planning committee has identified a variety of options to communicate with one another and in the community. Working together on common values will help to achieve the goals that have been outlined in this plan.

Action	Lead person/group	Start/end dates	Resources
Explore the benefits of a Tree Lake Association versus a Lake District	Lake Association	Ongoing	UWEX Lakes Program
Continue to put together informational welcome packets for all new Tree Lake Residents	Lake Association	Ongoing	UWEX, UWSP Watershed Center, WDNR,
Share the Portage County Lakes Informational Directory with all lake landowners	Lake Association	Ongoing	UWSP
Continue to host a Tree Lake informational website	Lake Association	Ongoing	
Have lake association members attend the Wisconsin Lakes convention annually	Lake Association		UWEX Lakes, WDNR, UWSP
Work with the County Clerk to identify any landowners that move to Tree Lake and share information with them	Lake Association	Ongoing	Portage County Clerk
Send information to the Town on a regular basis	Lake Association	Ongoing	Town of Alban
Present plan to the town and ask for them to officially adopt the Tree Lake Management Plan	Lake Association	2011	Town of Alban
Work with the town of Alban to host an annual town lakes meeting	Lake Association	Annually	Town of Alban, Collins Lake Helen
Explore having a representative on the parks commission	Lake Association	Ongoing	Portage County Parks Dept
Encourage the county to support lake management	Lake Association	Ongoing	Portage County

Updates and Revisions

Goal: Keep the information and resources within the Tree Lake Management Plan current and up to date.

Action	Lead person/group	Start/end dates	Resources
Annually review the Tree Lake Management Plan and update the plan with new or revised areas of concern, action items, dates, lead person/group, and resources	Lake Association	Annually in November	Portage County, University,

Understanding and planning for how our actions affect others is a key step in battling to protect and conserve Tree Lake as a valuable natural resource. We would like to thank you for taking the time to read through this plan, which is a sign of your dedication to these efforts.

We would also like to thank all those that participated in the planning process and gave freely of their time and expertise in order to create this plan.

If you wish to find additional or updated information about Tree Lake, an electronic version of this document, or information on the Tree Lake Association please visit: www.treelake.net63.net



Tree Lake Invasive Species Rapid Response Plan (2009)

Survey/Monitor

1. **Learn to survey/monitor the lake** from:

Water Resources Management Specialist

Wisconsin Dept. of Natural Resources
Scott Provost
473 Griffith Ave.
Wisconsin Rapids, WI, 54494
Phone: 715-421-7881
E-Mail: Scott.provost@wisconsin.gov

Portage County Aquatic Invasive Species (AIS) Coordinator

Golden Sands RC& D
Paul Skawinski
1462 Strongs Ave.
Stevens Point, WI 54481
Phone: 715-343-6278
E-Mail: skawinsp@co.portage.wi.us

2. **Survey the Lake monthly/seasonally/annually**

What to Do When You Find a Suspected Invasive Species

1. **Collect Specimens or Take Pictures**

- Collect, press and dry a complete sample. This method is best because a plant expert can then examine the specimen

Or--

- Collect a fresh sample. Enclose in a plastic bag with a moist paper towel and refrigerate.

Or--

- Take detailed photos (digital or film) and send them by mail or email.

Regardless of method used, provide as much information as possible. Try to include flowers, seeds or fruit, buds, full leaves, stems roots and other distinctive features. In photos, place a coin, pencil or ruler for scale. Deliver or send specimen ASAP.

Note Location

(Provide one or more of the following)

- Latitude & Longitude
- UTM (Universal Transverse Mercator) coordinates
- County, Township, Range, Section, Part-section
- Precise written site description, noting nearest city & road names, landmarks, local topography

If possible, give the exact geographic location using a GPS (global positioning system) unit, topographic map, or the Wisconsin Gazetteer map book. If using a map, include a photocopy with a dot showing the plant's location. You can use TopoZone.com to find the precise location on a digital topographic map. Click the cursor on the exact collection site and note the coordinates (choose UTM or Latitude/Longitude).

2. **To Positively I.D. the species send or bring specimen and additional information:**

- Collection date & county
- Your name, address, phone, email
- Exact location (Latitude/Longitude or UTM preferred, or Township/Range/Section)
- Plant name (common or scientific)
- Land ownership (if known)
- Population description (estimate number of plants, area covered)
- Habitat type(s) where found (forest, field, prairie, wetland, open water)

Send or bring specimen to:

Portage County AIS Coordinator

Golden Sands RC& D
Paul Skawinski
1462 Strongs Ave.
Stevens Point, WI 54481
Phone: 715-343-6214
E-Mail : skawinsp@co.portage.wi.us

UW-Stevens Point Herbarium

301 Daniel O. Trainer Natural Resources
Building
Stevens Point, WI 54481
Phone: 715-346-4248
E-Mail: ejudziew@uwsp.edu

Wisconsin Dept. Natural Resources

Invasive Plant Education, Early Detection,
and Mapping Specialist
Brendon Panke
WI Dept. of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921
Phone: (608) 267-7438
E-Mail: invasiveplants@mailplus.wisc.edu

3. **Once a positive I.D. has been made** it is important that all people listed below are immediately notified with the positive identification of an invasive species. These will include

Lake Association President

Contact: Michael Omernik
Address: 3121 Tommy's Turnpike Plover, WI 54467
Telephone: 715-341-9036
E-mail: mike@accounting-offices.com

Wisconsin Department of Natural Resources

Water Resources Management Specialist
Scott Provost
Address: 473 Griffith Ave. Wisconsin Rapids, WI, 54494
Phone: 715-421-7881
E-Mail: Scott.provost@wisconsin.gov
Who will contact them: Lake Association President

Portage County AIS Coordinator

Golden Sands RC& D
Paul Skawinski
Address: 1462 Strongs Ave. Stevens Point, WI 54481
Phone: 715-343-6214
E-Mail : skawinsp@co.portage.wi.us
Who will contact them: Lake Association President

Portage County Parks

Gary Speckman
Address: 1903 County Hwy Y
Phone: 716-346-1433
E-Mail: speckmag@co.portage.wi.us
Who will contact them: Lake Association President

The town in which the waterbody is situated

Town of: Alban

Contact: Mike Zdroik

Phone: (715)-677-3873

Who will contact them: Lake Association President

The Lake District Commissioners will decide if and when the following should be contacted:

Lake Residents, newspapers, and notices at the access points to Tree Lake.

Literature Cited

Fassbender, R.L., and L.M. Nelson. 1971. Surface Water Resources of Portage County.

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Turyk, N, R. Bell, R. Cook, T. Ginnett, R. Crunkilton, L. Markham, P. McGinley, B. Shaw, and E. Wild. 2006.

Final report to Portage County and Wisconsin DNR. <http://www.co.portage.wi.us/plzo/lakes.html>

Wisconsin Department of Natural Resources. 2005. The Aquatic Plant Community of Tree Lake, Portage County, Wisconsin 2004.

Wisconsin Department of Natural Resources West-Central Region Eau Claire, WI

Glossary

Algae:

One-celled (phytoplankton) or multicellular plants either suspended in water (Plankton) or attached to rocks and other substrates (periphyton). Their abundance, as measured by the amount of chlorophyll a (green pigment) in an open water sample, is commonly used to classify the trophic status of a lake. Numerous species occur. Algae are an essential part of the lake ecosystem and provides the food base for most lake organisms, including fish. Phytoplankton populations vary widely from day to day, as life cycles are short.

Atrazine:

A widely used herbicide.

Blue-Green Algae:

Algae that are often associated with problem blooms in lakes. Some produce chemicals toxic to other organisms, including humans. They often form floating scum as they die. Many can fix nitrogen (N₂) from the air to provide their own nutrient.

Calcium (Ca⁺⁺):

The most abundant cation found in Wisconsin lakes. Its abundance is related to the presence of calcium-bearing minerals in the lake watershed. Reported as milligrams per liter (mg/l) as calcium carbonate (CaCO₃), or milligrams per liter as calcium ion (Ca⁺⁺).

Chloride (Cl⁻):

Chlorine in the chloride ion (Cl⁻) form has very different properties from chlorine gas (Cl₂), which is used for disinfecting.

The chloride ion (Cl⁻) in lake water is commonly considered an indicator of human activity. Agricultural chemicals, human and animal wastes, and road salt are the major sources of chloride in lake water.

Chlorophyll a:

Green pigment present in all plant life and necessary for photosynthesis. The amount present in lake water depends on the amount of algae and is therefore used as a common indicator of algae and water quality.

Clarity:

see "Secchi disc."

Color:

Measured in color units that relate to a standard. A yellow-brown natural color is associated with lakes or rivers receiving wetland drainage. The average color value for Wisconsin lakes is 39 units, with the color of state lakes ranging from zero to 320 units. Color also affects light penetration and therefore the depth at which plants can grow.

Concentration units:

express the amount of a chemical dissolved in water. The most common ways chemical data is expressed is in milligrams per liter (mg/l) and micrograms per liter (ug/l). One milligram per liter is equal to one part per million (ppm). To convert micrograms per liter (ug/l) to milligrams per liter (mg/l), divide by 1000 (e.g. 30 ug/l = 0.03 mg/l). To convert milligrams per liter (mg/l) to micrograms per liter (ug/l), multiply by 1000 (e.g. 0.5 mg/l = 500 ug/l). Microequivalents per liter (ueq/l) is also sometimes used, especially for alkalinity; it is calculated by

dividing the weight of the compound by 1000 and then dividing that number into the milligrams per liter.

Cyanobacteria:

See "Blue-Green Algae"

Dissolved Oxygen:

The amount of oxygen dissolved or carried in the water.

Drainage Basin:

The total land area that drains towards a lake.

Drainage lakes:

Lakes fed primarily by streams and with outlets into streams or rivers. They are more subject to surface runoff problems but generally have shorter residence times than seepage lakes. Watershed protection is usually needed to manage lake water quality.

Emergent:

A plant rooted in shallow water and having most of its vegetative growth above water.

Eutrophication:

The process by which lakes and streams are enriched by nutrients, and the resulting increase in plant and algae. The extent to which this process has occurred is reflected in a lake's trophic classification: oligotrophic (nutrient poor), mesotrophic (moderately productive), and eutrophic (very productive and fertile).

Groundwater drainage lake:

Often referred to a spring-fed lake, has large amounts of groundwater as its source, and a surface outlet. Areas of high groundwater inflow may be visible as springs or sand boils. Groundwater drainage lakes often have intermediate retention times with water quality dependent on groundwater quality.

Hardness:

The quantity of multivalent cations (cations with more than one +), primarily calcium (Ca⁺⁺) and magnesium (Mg⁺⁺) in the water expressed as milligrams per liter of CaCO₃. Amount of hardness relates to the presence of soluble minerals, especially limestone, in the lake watershed.

Intermittent:

Coming and going at intervals, not continuous.

Macrophytes:

see "Rooted aquatic plants."

Marl:

White to gray accumulation on lake bottoms caused by precipitation of calcium carbonate (CaCO₃) in hard water lakes. Marl may contain many snail and clam shells, which are also calcium carbonate. While it gradually fills in lakes, marl also precipitates phosphorus, resulting in low algae populations and good water clarity. In the past, marl was recovered and used to lime agricultural fields.

Mesotrophic:

A lake with an intermediate level of productivity. Commonly a clear water lakes and ponds with beds of submerged aquatic

plants and medium levels of nutrients. See also “eutrophication”.

Nitrate (NO₃-):

An inorganic form of nitrogen important for plant growth. Nitrate often contaminates groundwater when water originates from manure, fertilized fields, lawns or septic systems. High levels of nitrate-nitrogen (over 10 mg/L) are dangerous to infants and expectant mothers. A concentration of nitrate-nitrogen (NO₃-N) plus ammonium-nitrogen (NH₄-N) of 0.3 mg/L in spring will support summer algae blooms if enough phosphorus is present.

Oligotrophic:

Lakes with low productivity, the result of low nutrients. Often these lakes have very clear waters with lots of oxygen and little vegetative growth. See also “eutrophication”.

Overturn:

Fall cooling and spring warming of surface water increases density, and gradually makes temperature and density uniform from top to bottom. This allows wind and wave action to mix the entire lake. Mixing allows bottom waters to contact the atmosphere, raising the water's oxygen content. However, warming may occur too rapidly in the spring for mixing to be effective, especially in small sheltered kettle lakes.

Phosphorus:

Key nutrient influencing plant growth in more than 80% of Wisconsin lakes. Soluble reactive phosphorus is the amount of

phosphorus in solution that is available to plants. Total phosphorus includes the amount of phosphorus in solution (reactive) and in particulate form.

Rooted Aquatic Plants: (macrophytes)

Refers to higher (multi-celled) plants growing in or near water. Macrophytes are beneficial to lakes because they produce oxygen and provide substrate for fish habitat and aquatic insects. Overabundance of such plants, especially problem species, is related to shallow water depth and high nutrient levels.

Secchi Disc (Secchi Disk):

An 8-inch diameter plate with alternating quadrants painted black and white that is used to measure water clarity (light penetration). The disc is lowered into water until it disappears from view. It is then raised until just visible. An average of the two depths, taken from the shaded side of the boat, is recorded as the Secchi disc reading. For best results, the readings should be taken on sunny, calm days.

Sedimentation:

Materials are deposited after settling out of the water.

Stratification:

The layering of water due to differences in density. Water's greatest density occurs at 39 Deg.F (4 Deg.C). As water warms during the summer, it remains near the surface while colder water remains near the bottom. Wind mixing determines the thickness of the warm surface water layer (epilimnion), which usually extends to a depth of about 20 ft. The narrow transition

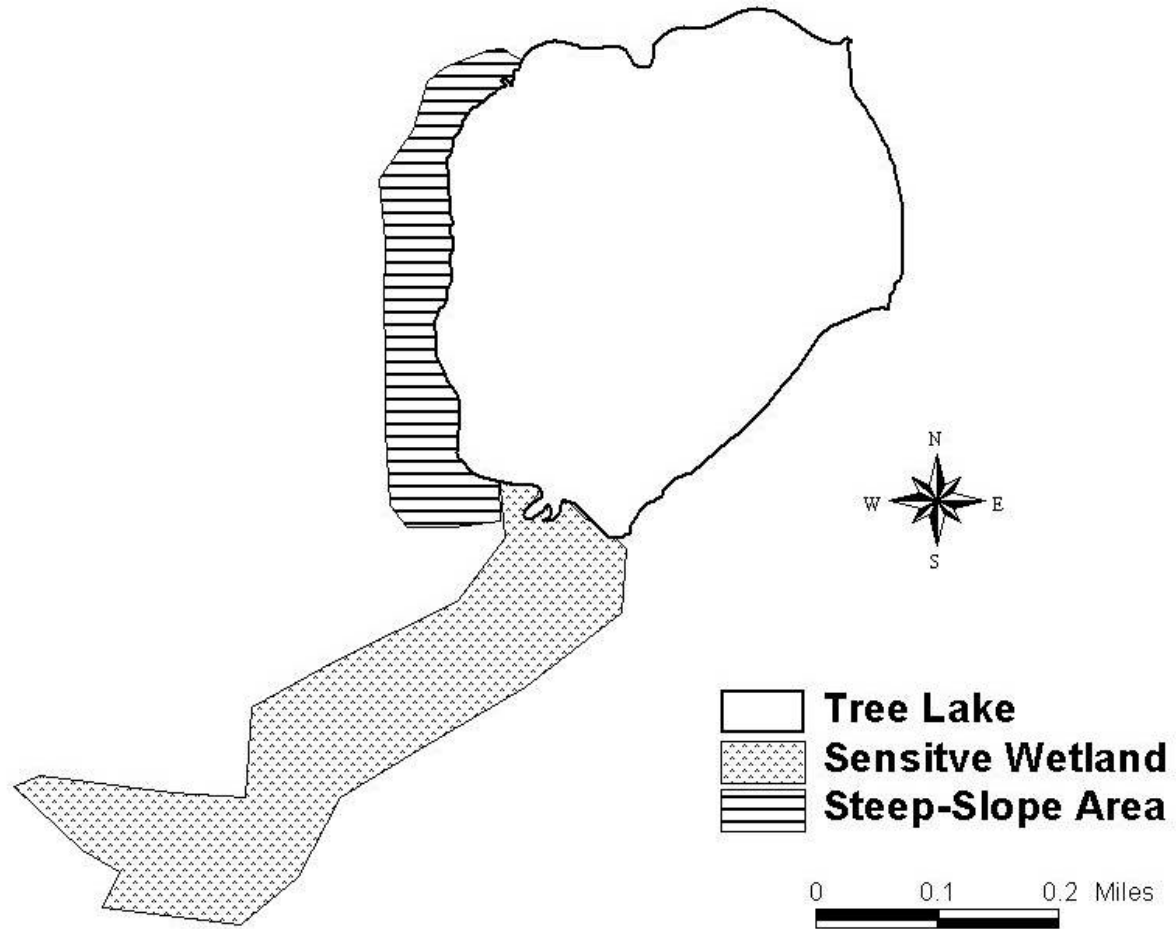
zone between the epilimnion and cold bottom water (hypolimnion) is called the metalimnion or thermocline.

Watershed:

See "drainage Basin

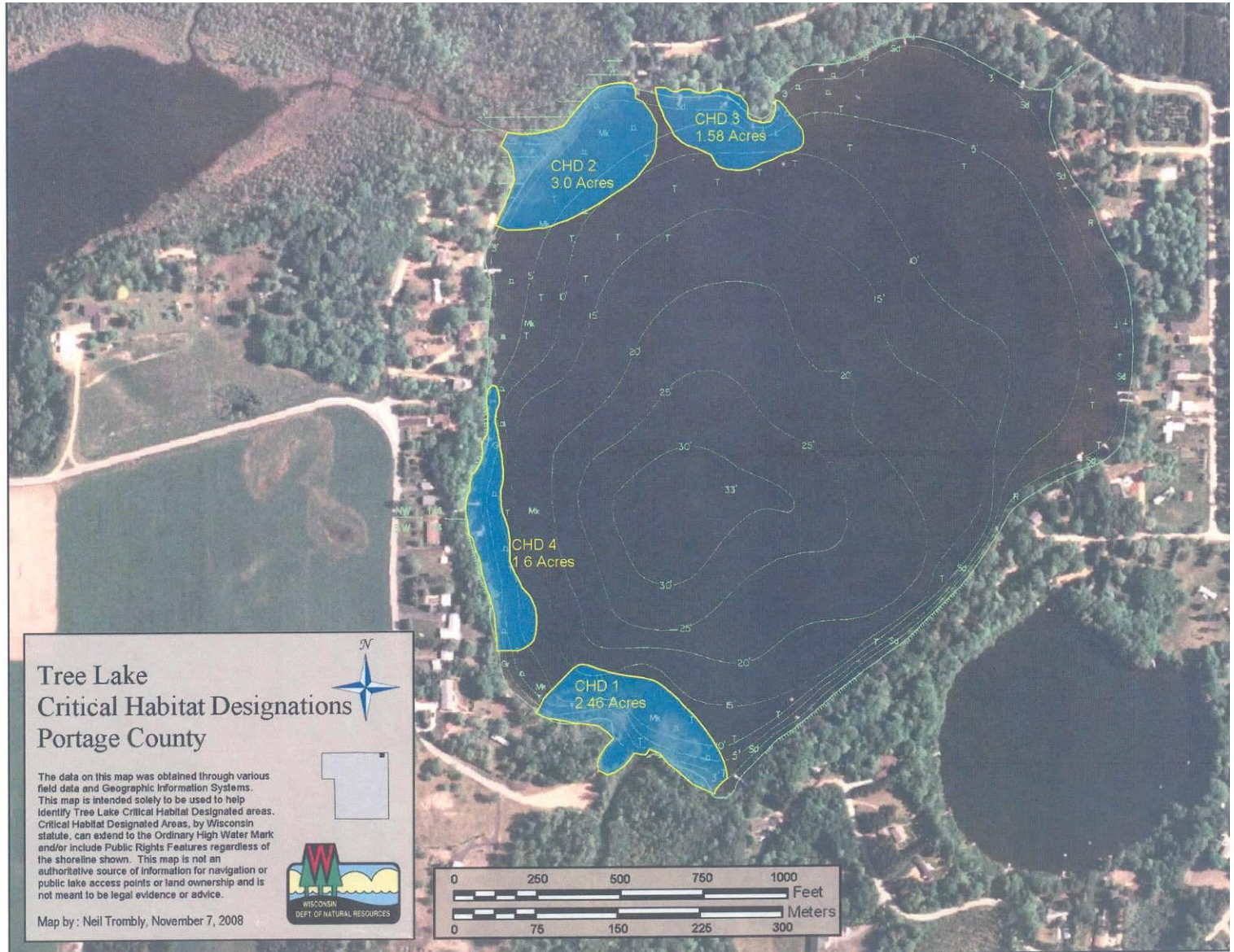
Appendix A

Tree Lake Sensitive Areas



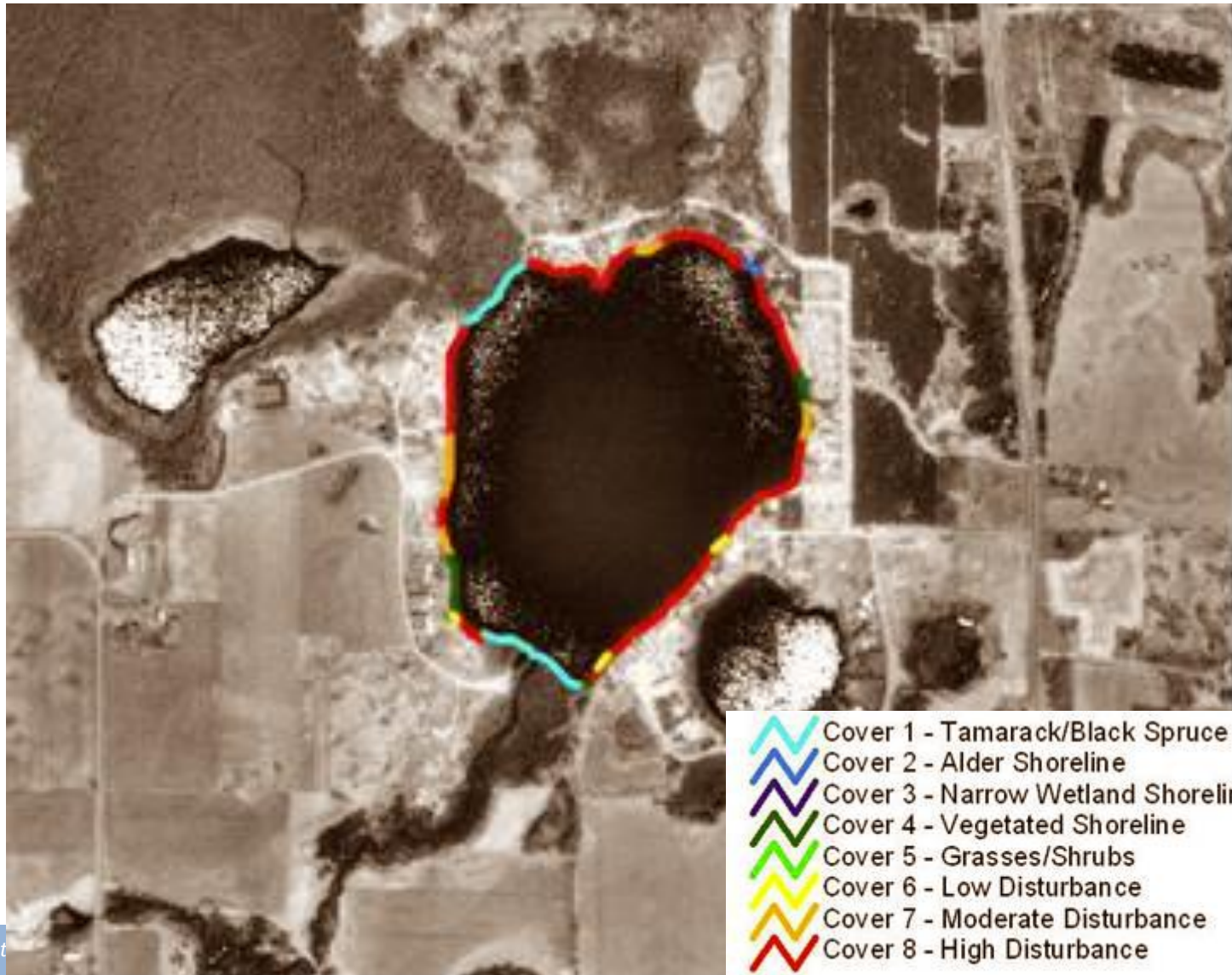
Appendix B

Tree Lake Critical Habitat Areas (UWSP)



Appendix C

Tree Lake Shoreline



Appendix D

Curly Leaf Pondweed in Tree Lake

