

TOMAHAWK LAKE ASSOCIATION'S STORMWATER AND SHORELAND GIS PROJECT – AN OVERVIEW



Mike Meyer and Jim Kreitlow

Nova Ecological Services

Manitowish Waters, WI

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Introduction

The goal of the Tomahawk Lake Association (TLA) Shoreland GIS project is to encourage private and public landowners to implement shoreland best management practices in ecologically sensitive shoreland regions of Tomahawk Lake where needed. It is our working assumption that by increasing knowledge of Tomahawk Lake's valuable ecological features, we will motivate lake property owners to initiate and continue practices that conserve or restore native shoreland vegetation and minimize erosion and surface water run-off into Tomahawk Lake – thus protecting critical fish and wildlife habitat and maintaining high water quality.

Lakeshore property development and recreational use often leads to degraded fish and wildlife habitat quality as well as increased sediment and nutrient run-off which can increase weed growth and reduce water clarity. Best management practices which reduce run-off and improve habitat quality are available and can repair the impacts of development. As there are over 350 individual property owners on Tomahawk Lake, we will use the results of this project to prioritize education and outreach efforts to target landowners and shoreland areas that will benefit most from shoreland best management practices.

Under contract with TLA, Nova Ecological Services (NES) undertook 3 surveys and GIS mapping projects to accomplish this goal. GIS (Geographical Information Systems) is a computerized mapping program that permits the overlay of many sources of data on one map. First, NES conducted boat surveys along the entire Tomahawk and Mud Lake shorelines and mapped Critical Habitat - sites with high quality fish and wildlife habitat, diverse aquatic plant communities, shorelands with natural scenic beauty that are protective of water quality, and important wetland areas. Results of this work are contained in the companion report "[Getting to Know Tomahawk Lake's Special Places](#)". Second, NES conducted a boat survey on July 4th weekend to identify shoreland areas (commercial, public, and private properties) receiving concentrated human use (boating and recreation) in the shoreland areas. Ten high use areas were identified. Third, NES assessed the shoreland condition at 414 tax parcels adjacent to Tomahawk Lake during July 2019, using the draft WDNR Lake Shoreland & Shallows Habitat Monitoring Field Protocol (Hein et al. 2016). See companion report titled "[Assessing the State of Tomahawk Lake's Shoreland – 2020](#)" for results.

Results from these efforts are used in a GIS project to identify individual Tomahawk Lake properties for shoreland management education and outreach efforts including site assessments and recommendations for best management practices. We will focus our outreach and education programs on properties that have buffer conditions in need of improvement, have potential erosion and run-off issues, and are near shoreland areas of high ecological value (e.g. Critical Habitat). The project implements several mapping action steps identified in the TLA CLMP Work Plan (2016-2020) with shoreland implications and updates the Tomahawk Lake shoreland inventory.

Project Outcomes

Products from this project are being posted on the Tomahawk Lake Association web page. Information may also be posted on Facebook, YouTube, and contained in printed brochures. The purpose will be to;

- Inform the Tomahawk Lake community of the existing critical habitat features and shoreland conditions on Tomahawk Lake.
- Discuss ways to maintain or improve the lake's water quality, fisheries, wildlife, wetlands, and natural scenic beauty.
- c. Identify projects to enhance or improve shoreland and aquatic habitat through best management practices.
- d. Identify shoreland areas which would lend themselves to neighbor to neighbor shoreland restoration discussion meetings.

Why this project?

Tomahawk Lake is designated by the Wisconsin DNR as an Outstanding Resource Water (ORW) with excellent water quality, natural scenic beauty, diverse aquatic plant communities, and healthy fisheries and wildlife populations. It is a headwaters drainage lake with a very small watershed – little water enters Tomahawk Lake other from rainfall, snowmelt, groundwater,

and run-off from the shoreland surrounding it. Properly managing these shoreland areas is critical to safeguarding the high standards of Tomahawk Lake into the future.

Development on northern Wisconsin lakes can result in increased erosion and surface water run-off from the uplands along with reductions in natural vegetation in the shoreland buffer zone – these changes can allow excess nutrients and sediment to reach the lakes. Research in Wisconsin and the Upper Midwest has linked these changes to negative effects on water quality and fish, wildlife, aquatic plants and aquatic insect populations. These changes can also reduce water clarity and promote excessive weed and algae growth thus impacting property values over time. While efforts have been made to encourage lakeshore property owners to conserve and restore natural shoreland habitat and control run-off in other lakes in northern Wisconsin, successes have been spotty.

The goal of this project is to encourage private and public landowners to implement shoreland best management practices in ecologically sensitive regions of Tomahawk Lake when needed. Our assumption is that by increasing general knowledge of the ecologically important features of the lake, landowners near these sites will be encouraged to adopt Shoreland Best Management practices.

Identifying Critical Habitat on Tomahawk Lake

Nova Ecological Services (NES) mapped 39 critical habitat areas on Tomahawk Lake in 2019. These sites provide important habitat for fisheries and wildlife, others protect wetlands and water quality, and all add to the natural scenic beauty on Tomahawk Lake. NES also identified rock and rubble along shorelines and location of coarse woody habitat as these are critical habitat for a healthy fishery. The results of these surveys, along with maps and descriptions of each of the critical habitat sites can be found in the companion report [“Getting to Know Tomahawk Lake’s Special Places”](#).

Assessing the Condition of Tomahawk Lake’s Shoreland

Nova Ecological Services used the WDNR Lake Shoreland and Shallows Habitat Survey protocol to assess the condition of 414 Tomahawk lakeshore properties in 2019. During these

preliminary surveys, 38 properties were identified with potential upland and buffer gullying and channeling due to surface water run-off, 83 properties were identified with potential bank erosion, and 144 properties had apparent high levels (>40%) of manicured lawn and impervious (hard artificial) surfaces in the shoreland buffer. This project brings together this information to identify properties with apparent erosion, run-off, and/or degraded buffers that are near critical habitat sites. It is recommended that property owners request TLA sponsored on-site visits to verify the survey findings and receive information on improving their shorelines when needed. See companion report titled "[Assessing the State of Tomahawk Lake's Shoreland – 2020](#)" for results.

Recommendations for Tomahawk Lake Property Owners

- Get to know the important fish and wildlife habitat areas on Tomahawk Lake by reading the report "[Getting to Know Tomahawk Lake's Special Places](#)". Familiarize yourself with areas that are in close proximity to your property. Spend some time in these areas to learn more about the natural communities on Tomahawk Lake.
- Take the Tomahawk Lake Association Rate Your Shoreland Self-Assessment Survey to evaluate how your property is doing as related to Shoreland Best Management Practices (<https://www.tomahawklake.org/rate-your-shoreline>).
- Contact the Tomahawk Lake Association for a free on-site visit to further evaluate your property's condition and receive an individual property report and recommendations for shoreland best management improvements.
- Become familiar with the Tomahawk Lake Association's Shoreland Best Management Practices to best manage your property to safeguard fish and wildlife habitat, water quality, and natural scenic beauty of the lake we all love (<https://www.tomahawklake.org/more-shore>).