

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
AQUATIC INVASIVE SPECIES GRANT PROGRAM

Application Overview Materials

*Shawano Lake AIS Control and
Prevention Project – Phase 1: Trial
EWM Treatment*

Prepared for the

*Shawano Area
Waterways Management, Inc.*

February 1, 2014

Onterra, LLC
Lake Management Planning

INTRODUCTION

Shawano Area Waterways Management, Inc. (SAWM) was created over a decade ago by members of the Shawano Lake Property Owners Association. SAWM currently works to manage the lake by sponsoring many of the studies described below, participating in recent planning processes, owning, operating, and maintaining the harvesting equipment used on the lake, and initiating the permitting and application of herbicide treatments. SAWM also participates in and supports the county Clean Boats Clean Waters program as well as the Shawano County Lakes Fair held during the fall of 2012.

The lake and its watershed have been studied since 1991 when the Shawano Lake Property Owners Association was awarded the first of many WDNR Grants. This was the first phase in a three-phase management planning project assessing the lake's water quality, watershed, aquatic plants, and stakeholder perceptions. In 2003, the second of the lake's multi-phase assessment projects began with watershed tributary and in-lake water quality monitoring; aquatic plant assessments; and capacity building and management planning exercises. These studies were completed in 2006. More intense studies of the lake's nutrient budget were led by the UW-Stevens Point Center for Watershed Science and Education and discussed, along with applicable management actions, in a final report produced in 2008. In 2009, results of the studies described above were used to create the Shawano Lake Watershed Strategic Management Plan and the Shawano Lake Aquatic Plant Management Plan.

SAWM has been conducting aquatic plant control on Shawano Lake as outlined in the 2009 Aquatic Plant Management Plan, including limited use of an association-owned harvester and nuisance herbicide applications by an association-employed applicator. After three years of implementing the plan's recommendations, the WDNR requested a more precise plan that gives comprehensive guidance on controlling exotics, in addition to the natives, using both chemical and harvesting techniques. SAWM would also like to discover ways to protecting the native aquatic plant community by controlling exotics on a lake-wide scale.

During the winter of 2012-2103, SAWM contracted with Onterra to develop an updated Aquatic Plant Management Plan that addresses the following issues:

1. Updated actions for the control of nuisance levels of native and non-native aquatic plants. These actions would likely include the use of hand-harvesting, mechanical harvesting, and herbicide applications aimed at assuring recreational accessibility of the lake while minimizing impacts to native habitat.
2. Management alternatives for reducing non-native plant species within Shawano Lake on a lake-wide basis with the intention of restoring native aquatic plant habitat. These actions may include mechanical harvesting of specific species, early-season herbicide treatments, and/or water level drawdown. Likely, in tandem with this outcome, nuisance aquatic plant control would be completed as described above.

PROBLEM IDENTIFICATION

Eurasian water milfoil (EWM, *Myriophyllum spicatum*) and curly leaf pondweed (CLP, *Potamogeton crispus*) are aquatic invasive species (AIS) both known to exist within Shawano Lake. It is not known when CLP was first introduced to Shawano Lake, but studies conducted in 1993 documented its presence indicating it has been present in Shawano Lake for at least 20 years. EWM was officially documented in Shawano Lake in 1994, though studies conducted prior to 1994 indicated its presence in the lake.

In 2010, samples of EWM were sent to the Annis Water Resources Institute at Grand Valley State University in Michigan to determine if the EWM in Shawano Lake was of hybrid origin; a cross between EWM and the indigenous northern water milfoil (*M. sibiricum*). Hybrid water milfoil presents some complications for management as research is indicating that certain strains may have higher tolerance to aquatic herbicides. The specimens processed in 2010 from Shawano Lake were confirmed as hybrid water milfoil. In 2013, another milfoil specimen from Shawano Lake was sent in for DNA analysis, and the results indicated it was pure-strain EWM. These results indicate that there are likely populations of both hybrid water milfoil and pure-strain EWM in Shawano Lake.

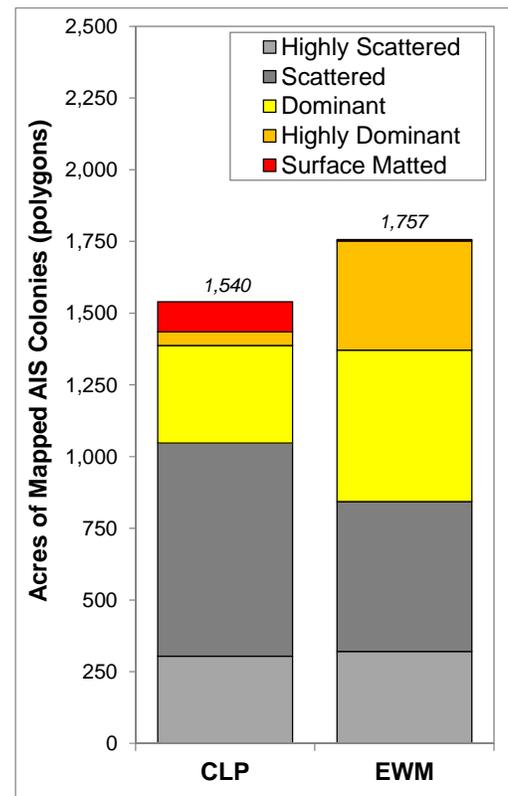


Figure 1. Acres of CLP & EWM colonies (polygons) mapped in June and September 2013 in Shawano Lake.

Onterra ecologists mapped areas of EWM and CLP in Shawano Lake during the Early-Season Aquatic Invasive Species Survey, and later revisited these areas in September 2013 to refine the EWM mapping as necessary (Figure 1, Map 1). The majority of the CLP acreage (68%) was of lower density categories (*scattered* and *highly scattered*), while the majority of the EWM acreage (52%) were comprised of *dominant*, *highly dominant*, and *surface matted*. During the whole-lake point-intercept survey conducted during the summer of 2013, EWM was found to contain a littoral frequency of occurrence of 17.4%.

During the Aquatic Plant Management (APM) Planning project, the SAWM Planning Committee decided to focus their management attention away from attempting to control the population of CLP within Shawano Lake. During the meetings with this group, several CLP control strategies were discussed, all of which were cost prohibitive and unclear as to whether control objectives would be met. Overviews of these discussions are included within the draft APM document (December 2013) that is projected to be formally finalized in April 2014.

At this time, it appears that a whole-lake herbicide treatment would be the most appropriate method for targeting the EWM population within Shawano Lake. While implemented on many lakes throughout the state, whole-lake treatment strategies remain experimental in nature and have not been conducted on a lake in Wisconsin the size of Shawano Lake. Lake managers and SAWM Planning Committee

members discussed several implementation challenges of a whole-lake treatment that require information before implementation of a whole-lake strategy is warranted: logistical feasibility, efficacy concerns, uncertainty in ecological response, financial constraints, and ability to gain sociological backing (i.e. stakeholder support) (Figure 2).

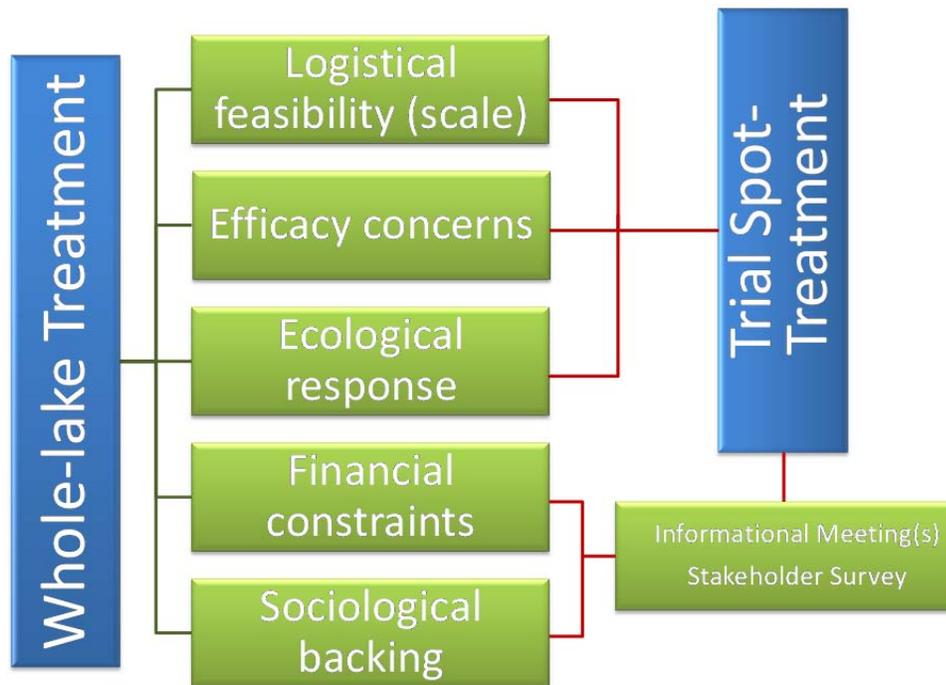


Figure 2. Flow chart addressing concerns of implementing a whole-lake treatment on Shawano Lake.

PROJECT GOALS

It has been proposed that conducting a smaller scale trial 2,4-D treatment on Shawano Lake would directly address aspects of the logistical feasibility, efficacy concerns, and ecological response. Proper monitoring of a trial treatment would produce sound data on the management action that can be presented to the general public through a distributed written report and potentially several informational meetings. Along with conveying this information to the public, additional awareness campaigns, including an anonymous, written stakeholder survey, could be conducted to understand the broader wishes of the Shawano Lake user group. If the trial treatment satisfactorily addresses the first three implementation challenges listed above, a positive feedback loop of sociological backing (stakeholder support) resulting in additional financial contributions (e.g. individual, municipal, business, agency, etc.) for implementation of a whole-lake treatment strategy may occur. If the trial treatment does not adequately address these implementation challenges, a modified experimental approach may be warranted until the desired goals are met.

PROJECT OUTLINE & TIMELINE

Figure 3 provides an approximate timeline for completion of the tasks. The schedule needs to be flexible to accommodate for weather, scheduling conflicts, etc., but it provides a general indication of the dates for completing the proposed components. The proposed project includes project components up to, but not including, the implementation of a whole-lake treatment (up to dashed line).

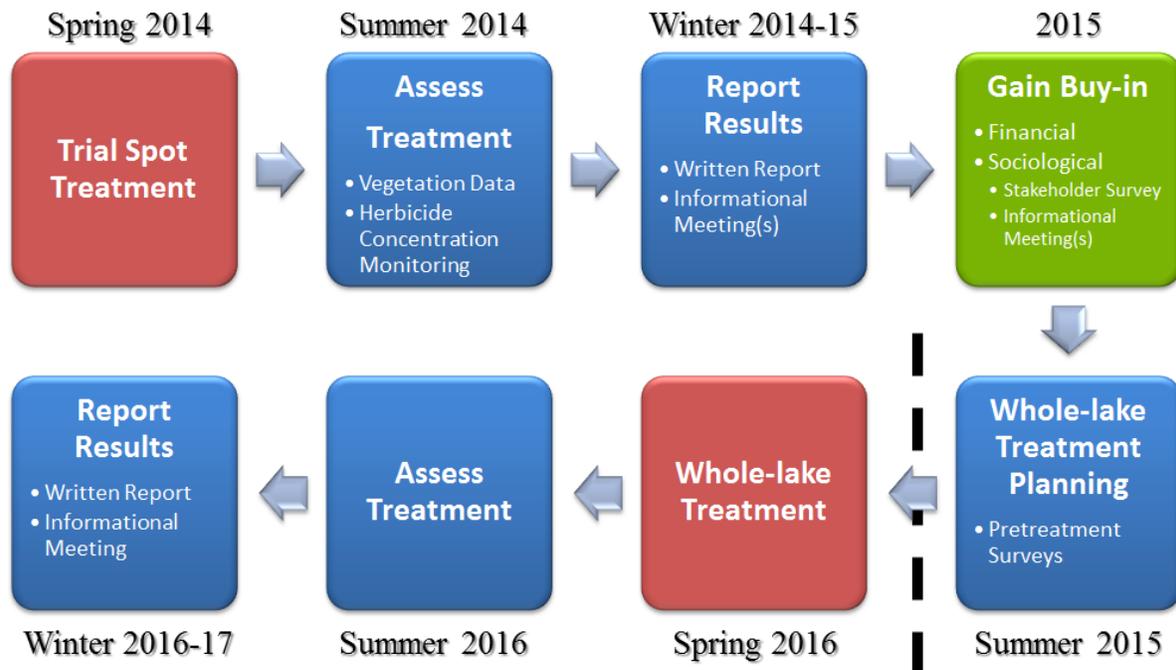


Figure 3. Flow chart outlining tentative project timeline.

Table 1 outlines the ecological study components within the proposed AIS-Established Population Control Grant, and Table 2 outlines the propose sociological/public participation components of the project.

Table 1. Brief Overview of the Ecological Study Components within the AIS-EPC (February 2014) Grant for Shawano Lake

Ecological Study Components
<p>Aquatic Plant Studies</p> <ul style="list-style-type: none"> Pretreatment Confirmation Survey – Early Spring 2014 Pretreatment Sub-sample Point-Intercept Survey – Early Spring 2014 Early-Season AIS Survey – June 2014 EWM Peak-Biomass Survey – Late Summer 2014 Post Treatment Sub-sample Point-Intercept Survey – Late Summer 2014 EWM Peak-Biomass Survey – Late Summer 2015 (or later) Full Point-Intercept Survey – Late Summer 2015 (or later)
<p>Bio-Acoustic Surveys – During Pretreatment Survey & EWM Peak-Biomass Survey</p> <ul style="list-style-type: none"> Provide depth and volume for development of dosing calculation Provide aquatic plant biomass for monitoring of treatment results
<p>Herbicide Concentration Monitoring</p> <ul style="list-style-type: none"> Volunteer-Based with professional training – Treatment through ~36 days after treatment US Army Corps of Engineers analysis at no charge Important in understanding how herbicide will degrade and dissipate within lake

Table 2. Brief Overview of the Sociological and Public Participation Components within the AIS-EPC (February 2014) Grant for Shawano Lake

Sociological and Public Participation Components

Kick-off Meeting – Prior to Spring 2014 Trial Treatment

Public information meeting to introduce project & educate stakeholders regarding AIS control

News Release – October/November 2014

Release would contain information regarding project and results of 2014 trial treatment

Potentially, this would lead to interview-based article by newspaper

Article would end by stating SAWM will be developing an AIS management plan in 2015

New Release – Spring 2015

This release would, if applicable, disclose that a whole-lake treatment is being considered

Expected benefits and potential risks would be discussed

Project costs would be outlined

Public information meeting discussed below would be announced

Public Information Meeting – June/July 2015

Duplicate meetings would be held; one during a weekday evening and one on a weekend

Presentation content would include:

Benefits and risks of utilizing herbicides on spot and whole-lake treatment levels

Proposed treatment plan for Shawano Lake during 2016 (or later)

Importance and contents of written stakeholder survey (see below)

Stakeholder Survey – July/August 2015

Onterra provides base survey and assists lake group with customization

Survey must be approved by WDNR sociologist before it is disbursed

Survey would have a return date in late summer 2015

Contractor would be used to tally survey results, Onterra will complete analysis

News Release – February 2016

Release would contain information regarding proposed control in spring 2016

Early spring public information meeting would be announced

Public Information Meeting – Early Spring 2016 (or later)

Meeting would layout plan for AIS control in 2016 (or later)

Committee-Level Meetings

Six committee-level meetings are contained within the project budget

Additional meetings can be included in the budget if SAWM sees the need

Proposed meeting timeline:

Prior to or following Project Kick-off Meeting

Following completion of 2014 Treatment Report (see below)

Early spring 2015

Summer 2015, prior to Public Information Meeting

Late summer 2015, after stakeholder survey results are tallied and analyzed

Fall 2015 (or later) to finalize AIS-EPC Grant project funding whole-lake treatment

Partnerships

SAWM has financially partnered with the Town of Washington, Town of Westcott, Village of Cecil, Town of Richmond, and City of Shawano. SAWM also partners with Shawano County regarding the power wash station.

Clean Boats Clean Waters Program

Shawano Lake is an extremely popular destination by recreationists and anglers, making the lake vulnerable to new infestations of exotic species. The intent of the boat inspections is not only to prevent additional invasives from entering the lake through its public access points, but also to prevent the infestation of other waterways with invasives that originated in Shawano Lake. The goal of this effort is to cover the landings during the busiest times in order to maximize contact with lake users, spreading the word about the negative impacts of AIS on lakes and educating people about how they are the primary vector of its spread.

Currently public boat landing on Shawano Lake are monitored through training provided by the Clean Boats Clean Waters (CBCW) program. The majority of past effort was conducted by paid limited term employees through Oconto County. SAWM will be applying for a stream-lined CBCW WDNR Grant to ensure at least 200 hours of watercraft inspections occur in 2014.

Boat Decontamination

Dovetailing with the watercraft inspections, the Shawano County Park recently installed and currently maintains two boat washing stations, offered to lake visitors free of charge (Photo 1). Boat owners are encouraged to power wash their watercrafts prior to entering the lake, limiting Shawano Lake's exposure to new AIS. Boats should also be power washed after visiting Shawano Lake, to ensure the AIS from Shawano Lake are not exposed to other lakes.



Photo 1. Boat wash station on Shawano Lake

Shoreland Restoration Demonstration

One of the most vulnerable areas of a lake's watershed is the immediate shoreland zone (approximately from the water's edge to at least 35 feet shoreland). When a lake's shoreland is developed, the increased impervious surface, removal of natural vegetation, and other human practices can severely increase pollutant loads to the lake while degrading important habitat. Limiting these anthropogenic (man-made) effects on the lake is important in maintaining the quality of the lake's water and habitat. Along with this, the immediate shoreland area is often one of the easiest areas to restore.

SAWM has entered a partnership with Shawano County to construct shoreland restoration demonstration sites on private lands. Two preliminary sites have been proposed (Whispering Pines Retreat Center and a private residence). Scot Frank, Shawano County Conservationist, will be leading the effort with assistance from SAWM as appropriate.

Volunteer AIS Surveillance Monitoring

In lakes without AIS, early detection of pioneer colonies commonly leads to successful control and in cases of very small infestations, possibly even eradication. Even in lakes where these plants occur, monitoring for new colonies is essential to successful control.

Multiple SAWM members have been trained to be active Stream Monitors on the waters leading to and from Shawano Lake. These same members would be trained by a WDNR associate (David Zelinger) on AIS monitoring strategies, particularly new AIS located within these stream corridors. Data would be collected on the grant-funded GPS unit and input all records into the online SWIMS database in accordance with CLMN protocols. This would include surveys where aquatic invasive species were not identified.

Improved Management Actions – Maintain Navigability around Shawano Lake

SAWM understands the importance of native aquatic vegetation on Shawano Lake. However, nuisance aquatic plant conditions exist in certain parts of the lake, caused by both non-native and native vegetation. In order to alleviate navigation impediments caused by the vegetation, herbicide applications by an association-employed applicator have been conducted in 2012 and prior within these areas.

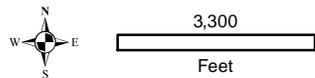
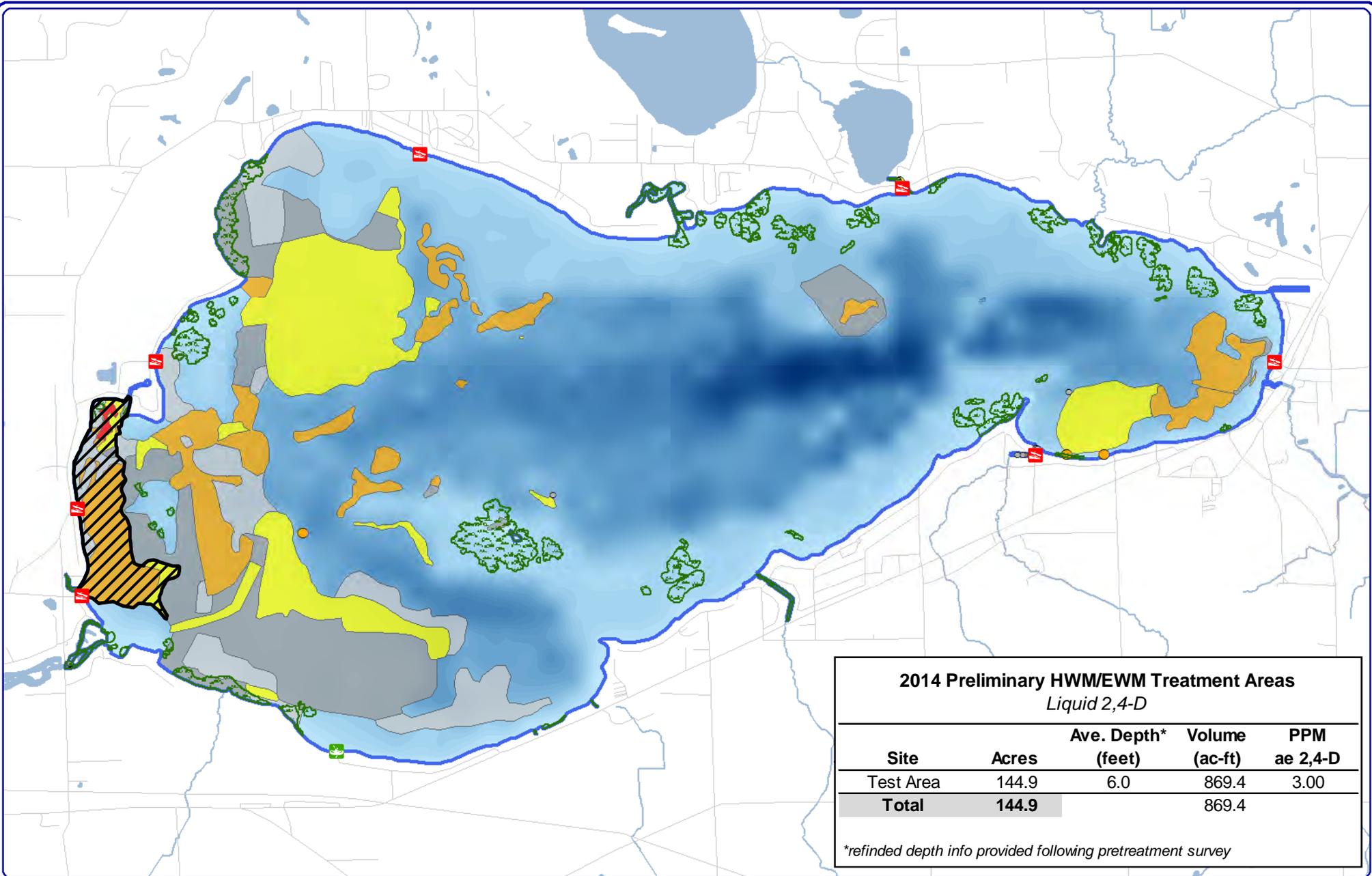
Management Goal #3 within the Shawano Lake Aquatic Plant Management Plan outlines a refined strategy for maintaining navigability on Shawano Lake. The proposed project would implement a change in management strategies that will provide additional protection to the aquatic plant community of Shawano Lake. Moving forward, an onboard hand-held GPS (grant-funded) will be used by the association-employed applicator during the herbicide application to ensure proper dosing and herbicide coverage, provide proper records of where the activities took place, and to allow lake managers and stakeholders to create and modify treatment lanes prior to implementation. Basemaps of the application areas shown on Map2 will be loaded onto the GPS unit prior to the herbicide application. This will also allow fisheries and resource managers to update the position of the navigation lanes prior to the treatment if conflicts arise.

PROJECT DELIVERABLES

Annual Report

During the winter months of 2014/2015, a report documenting the results of the 2014 trial treatment would be provided to SAWM. This report would include comparisons of the 1) pre- and post treatment EWM mapping surveys (qualitative data), 2) aquatic plant point-intercept sub-sample and sub-set analysis (quantitative data), and 3) herbicide concentration monitoring results.

The report would also include a discussion regarding the 2015 stakeholder involvement components and steps that will be taken towards conducting a whole-lake herbicide treatment in 2015 or beyond. All reports would be presented in electronic format via email.



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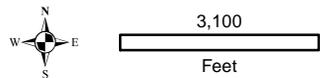
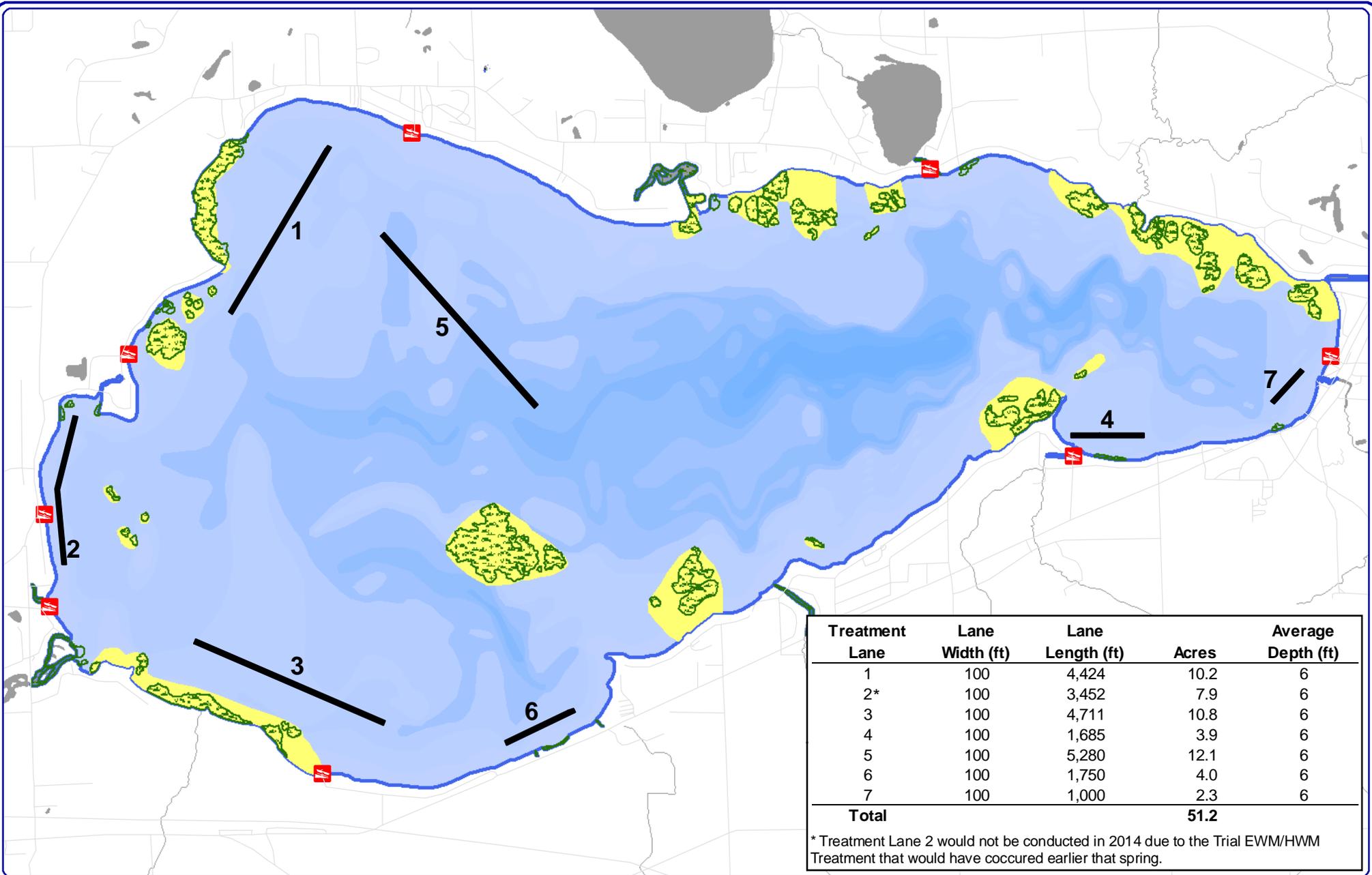
Sources:
 Roads and Hydro: WDNR
 Bathymetry: Onterra, 2013
 Map Date: November 1, 2013
 Filename: Map7_Shawano_EWMPB_June13.mxd



- Legend**
- Eurasian water milfoil (June 2013, refined Sept 2013)**
- Large EWM Community**
- Highly Scattered
 - Scattered
 - Dominant
 - Highly Dominant
 - Surface Matting
- Small EWM Community**
- Single or Few Plants
 - Clumps of Plants
 - Small Plant Colony

- Floating-leaf and/or Emergent Plant Community
- 2014 Proposed EWM/HWM Trial Treatment Area

Map 1
 Shawano Lake
 Shawano County, Wisconsin
**2014 Proposed EWM
 Control Strategy v1**



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Sources:
 Roads and Hydro: WDNR
 Aquatic Plants: Onterra, 2013
 Sensitive Areas: WDNR, 2003
 Nuisance Lanes: Digitized by Onterra
 from WDNR permit records
 Map Date: December 2, 2013
 Filename: Map8_Shawano_NuisanceControl.mxd



Project Location in Wisconsin

Legend

- Nuisance Navigation Treatment Lane
- Public Access
- Floating-leaf and/or Emergent Plant Community
- WDNR Sensitive Area

Map 2

Shawano Lake
 Shawano County, Wisconsin

**Nuisance Navigation
 Herbicide Lanes**