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APPENDIX A

Public Participation Materials

Presentation Outline

- Onterra, LLC
- Why Create a Management Plan?
- Elements of a Lake Management Planning Project
  - Data & Information
  - Planning Process

Onterra LLC Lake Management Planning

Onterra, LLC

- Founded in 2005
- Staff
  - Four full-time ecologists
  - Two full-time field technicians
  - Four summer interns
- Services
  - Science and planning
- Philosophy
  - Promote realistic planning
  - Assist, not direct

Onterra LLC Lake Management Planning

Why create a lake management plan?

- To create a better understanding of the lake's positive and negative attributes.
- To discover ways to minimize the negative attributes and maximize the positive attributes.
- To foster realistic expectations and dispel myths.
- To create a snapshot of the lake for future reference and planning.

Onterra LLC Lake Management Planning

Elements of an Effective Lake Management Planning Project

Data and Information Gathering

Environmental & Sociological

Planning Process

Brings it all together

Onterra LLC Lake Management Planning

Data and information gathering

- Study Components
  - Water Quality Analysis
  - Watershed Assessment
  - Aquatic Plant Surveys
  - Fisheries Data Integration
  - Shoreline Assessment
  - Stakeholder Survey

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Water Quality Analysis

- General water chemistry (current & historic)
  - Citizens Lake Monitoring Network
- Nutrient analysis
  - Lake trophic state (Eutrophication)
  - Limiting plant nutrient
- Supporting data for watershed modeling
- Investigation into Little Pickerel blue-green algae

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Watershed Assessment

- Delineation of drainage basin
- Modeling
  - Land cover
  - Phosphorus loading
  - Scenario development

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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early Season AIS Survey

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Non-native Aquatic Plants

Curly-leaf Pondweed

Purple loosestrife

Eurasian water milfoil

Found along Pickerel Chain Lakes shoreline to a minimal extent

Not found within Pickerel Chain Lakes

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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early Season AIS survey
  - Point-intercept survey

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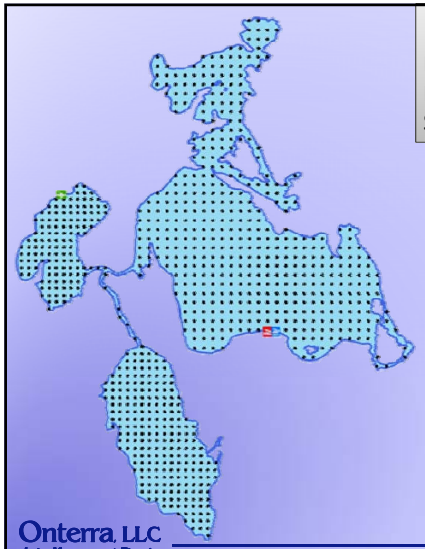

Pickerel Chain
Pickerel Lake – 477 points
Little Pickerel Lake – 133 points
Smoke Lake – 233 points

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Aquatic Plant Surveys

- Concerned with both native and non-native plants
- Multiple surveys used in assessment
  - Early Season AIS survey
  - Point-intercept survey
  - Aquatic plant community mapping

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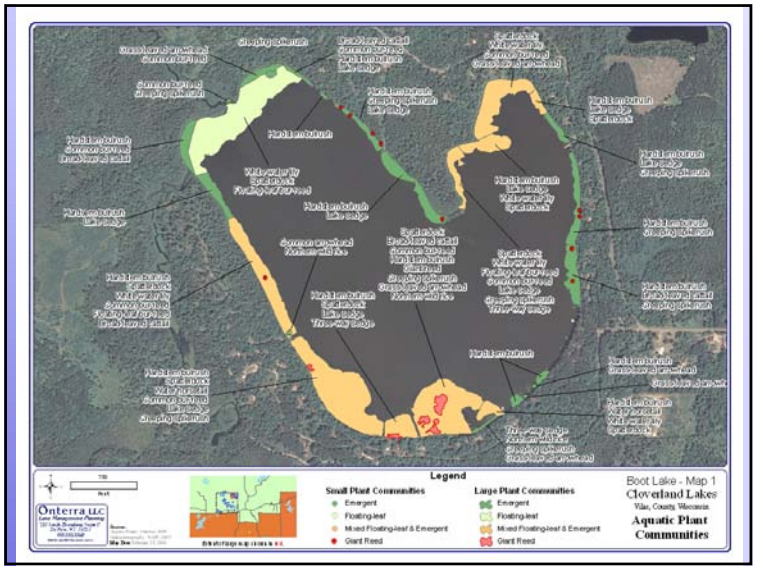
Lake Management Planning



Fisheries Data Integration

- No fish sampling completed
- Assemble data from WDNR and others
- Fish survey results summaries (if available)
- Use information in planning as applicable
  - Aeration & fish kills will be discussed

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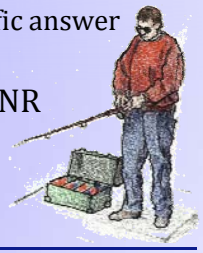
Stakeholder Survey

- Standard survey used as base
  - Planning committee potentially develops additional questions and options
  - Must not lead respondent to specific answer through a “loaded” question
- Survey must be approved by WDNR



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Shoreland Assessment

- Shoreland area is important for buffering runoff and provides valuable habitat for aquatic and terrestrial wildlife.
- Assessment ranks shoreland area from shoreline back 35 feet
- Assess shoreland development and habitat
  - Coarse woody habitat

Urbanized **Natural**

Range

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Planning Process

Planning Committee Meetings

Study Results (including a stakeholder survey)
Conclusions & Initial Recommendations
Management Goals
Management Actions
Timeframe
Facilitator(s)

Implementation Plan

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Thank You

Many of the graphics used in this presentation were supplied by:

Wisconsin Lakes Partnership

UW Extension

Wisconsin Dept. of Natural Resources

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Pickerel Chain Lakes Management Planning Project

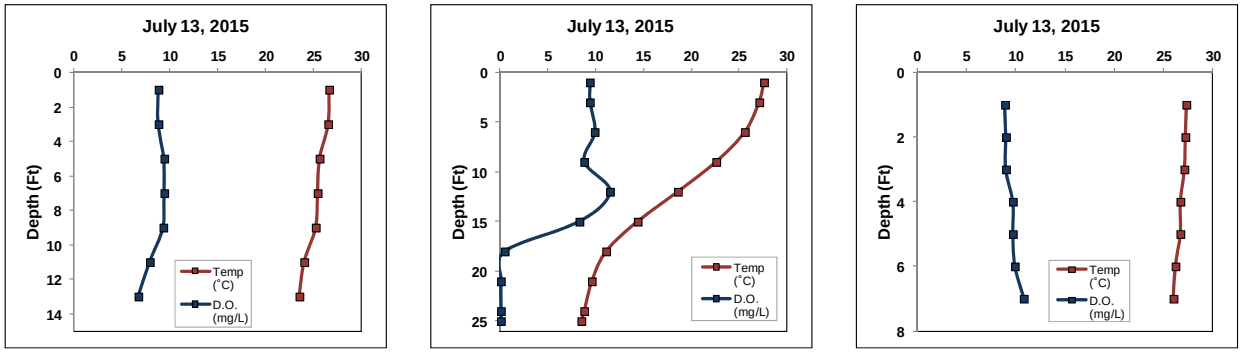
November 2015 Update
Submitted by: Dan Cibulka, Onterra, LLC

With the help of two Lake Management Planning Grants totaling over $34,000 from the Wisconsin Department of Natural Resources (WDNR), the Pickerel Chain Lakes Association (PCLA) is working to complete a lake management plan for Pickerel, Little Pickerel and Smoke Lakes. The lake management plan will contain historic and current data from the lakes as well as provide guidance for their management by integrating stakeholder perceptions and goals with what is ecologically beneficial for the ecosystem.

As described further below, numerous field studies are being carried out upon the chain lakes during 2015-2016. Because much of the data was collected within just the past few months, a full analysis has yet to be completed. This update intends to bring the PCLA and lake property owners up-to-date on the scientific studies that have occurred, provide some initial observations on the ecology of the lakes and project a rough timeline for the remaining portions of this planning project.

2015 Field Studies

In April of 2015, Onterra staff had their first glimpse of the chain lakes with a water quality sampling visit. The lake is sampled during the spring and fall to analyze water chemistry during the lake's mixing, or *turnover* events. When a lake turns over, many physical and chemical constituents (temperature, dissolved oxygen, nutrients, etc.) are mixed within the water column. This gives ecologists an idea of what the nutrient balance is within the lake and supports computer modeling efforts. Water quality samples were collected in June, July and August. These results help ecologists understand how the constituents behave if the lake *stratifies*. Stratification is when a lake develops two separate layers of water – a warmer, upper layer and a cold lower layer of water. During each water quality visit, dissolved oxygen and temperature profiles of the water column are collected.



Pickerel Lake *Little Pickerel Lake* *Smoke Lake*

Figure 1: Dissolved oxygen and temperature profiles from the Pickerel Chain Lakes, July 2015.

Figure 1 displays the temperature and oxygen profiles collected on the Pickerel Chain Lakes during a July sampling visit. Little Pickerel Lake, the deepest of the three lakes, displayed a profile indicating a fairly strong stratification taking place between 10 and 15 feet. With this lake's depth and relatively small size, the winds moving across the lake surface are unable to mix the water column. In Pickerel and Smoke Lakes, the shallow depth ratio to surface area creates a situation where winds are able to mix the lake thoroughly. This mixing process has profound effects on the lake's water chemistry, release of nutrients from the bottom sediments, and location of fish which require oxygen for survival. Dissolved oxygen will be a critical monitoring component of this project.

All aquatic plant surveys were conducted as scheduled, first with a visit to the chain on June 3, 2015 to complete the Early Season Aquatic Invasive Species (ESAIS) survey. This survey's purpose is to search the lake for invasive species that reach their peak growth during this time (curly-leaf pondweed and pale yellow iris). On July 14, Onterra ecologists visited the lakes to complete the point-intercept survey. This is a grid-based survey designed to sample aquatic plants within the lake. Additionally, it provides an opportunity to search the lake for another Wisconsin invasive plant – Eurasian water milfoil. A third aquatic plant survey, the community mapping survey, was completed that next day (July 15). The purpose of this survey is to map the floating-leaf and emergent species that are found within the lake and are typically underestimated in the point intercept survey.

Aquatic plants were found to grow to a depth of 18 feet in Little Pickerel Lake. Aquatic plants were encountered in the deepest areas of Pickerel Lake (14 feet) and Smoke Lake (8 feet). During all surveys, no aquatic invasive species were observed. Many interesting native species were observed however. Members of the Muskgrass family (*Chara* and *Nitella* spp. – Figure 2) were most prevalent in all three lakes. Muskgrass is actually a type of algae (macroalgae) that resembles a plant structure. It is often short in stature and covers the lake bottom, growing in scattered to dense mats. The muskgrass grouping is quite diverse; some are a translucent green while others can become covered in calcium carbonate, creating a gritty, white covering to the structure of the macroalgae. It is a beneficial species to a lake environment, providing structure for small fish and invertebrates while serving as a food source for waterfowl and also stabilizing bottom sediments from resupension.

Figure 2. Muskgrass. Photo by Onterra, LLC.

This fall, an Onterra crew will visit the Pickerel Chain Lakes to conduct the shoreline assessment survey. During this survey, the lake's shoreline is examined and classified into one of five development categories, based upon its level of human disturbance. Additionally, areas of ecologically important habitat are identified and counted. The results of this survey may be used to prioritize areas for shoreland or habitat restoration, if the PCLA wish to pursue this.

Remaining steps

In addition to the ecological data collected from the Pickerel Chain Lakes, sociological data will be collected from the people who use and care for the lakes. This is currently being approached in the form of a stakeholder survey, which was developed by Onterra staff and a planning committee comprised of PCLA volunteers. A postcard advertising the survey was distributed on November 2nd to all PCLA members as well as non-member riparian property owners. Data will be collected through an online survey, though a paper version of the survey will be available by request.

All project components are currently on schedule and proceeding as planned. This winter, Onterra will be sorting through the immense amount of data that has been collected. Following data analysis and report creation, Onterra staff and a PCLA planning committee will meet next spring/summer to discuss the project results and begin creation of management goals the PCLA will pursue to manage their lakes in both a recreationally enjoyable and ecologically sound manner.