

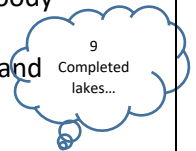
Status Overview
Oconto County Lakes Project
Multi - Year Program of 60 “Public Access Lakes”

Overall Project: Within the first through the fourth sets of grants, **27 Lakes** are being studied. In subsequent grants additional study lakes will be submitted (Groups of 6-9 lakes) until all 60 lakes with public access facilities are completed. Each lake will have an individual **Lake Management Plan (LMP)** developed (some smaller lakes may be grouped with others), and the County will have an **Operational Strategy & Plan** completed and adopted to help County staff members in achieving an overall goal of **“Having the Healthiest Waters in Wisconsin.”** Summary reports and plans are available for the first 15 lakes on the Oconto Land Conservation Department’s Website located <https://goo.gl/DGUvLz>

Goal 1. Develop a scientific understanding of nearshore and shoreland habitat of the 60 lakes.

Activity. Understand the state of the shorelands through inventory of the study lakes. Inventories will be conducted during summer or early fall of the year. The newly developed WDNR shoreland inventory methodology will be used to assess shoreland vegetation, erosion, preferred flow, structures, and in-lake woody habitat and diversity of aquatic vegetation.

All research is completed for: Bear, Leigh, Machickanee, Maiden, Munger, Oconto Falls, Paya, Rost and Waubee Lakes.



<u>Waterbody:</u>	<u>Shoreland Survey</u>	<u>Coarse Woody Habitat Survey</u>	<u>Aquatic Plant Survey</u>
• Anderson	June 22, 2017	June 22, 2017	August 18, 2015
• Bass	June 14, 2017	July 6, 2017	August 2, 2017
• Boot	June 14, 2017	July 6, 2017	August 3, 2017
• Grindle	July 28, 2017	July 27, 2017	July 27, 2017
• John	July-Aug 2017	July-Aug 2017	June 19, 2015
• Ranch	July 26, 2017	July 26, 2017	July 26, 2017
• Green	May 31, 2018	May 31, 2018	May 31, 2019
• Shay	August 1, 2018	August 1, 2018	August 1, 2018
• Star	July 18, 2018	July 18, 2018	July 19, 2018
• Ucil	July 31, 2018	July 31, 2018	July 31, 2018
• Underwood	July 26, 2018	July 26, 2018	July 26, 2018
• Wescott	May 23, 2018	May 23, 2018	May 23, 2018
• Cooley	July 24, 2019	July 24, 2019	July 24, 2019
• Bear Paw	July 18, 2019	July 18, 2019	July 18, 2019
• Nelligan	July 3, 2019	July 3, 2019	July 3, 2019
• Pecor	July 25, 2019	July 25, 2019	July 25, 2019
• White	August 7, 2019	August 7, 2019	August 7, 2019
• White Potato	June 5, 2019	June 5, 2019	June 5, 2019

Deliverable/Outcomes. Spatial data will be displayed on maps and data will be summarized in tables and graphs. This information will be interpreted in *mini-reports* (written for a citizen audience) developed for each lake. A *summary report* will be developed for comparison of results from *all study lakes*. These results will be used in the development of LMPs (Lake Management Plans).

Goal 2. Develop a scientific understanding of aquatic plants and AIS (Aquatic Invasive Species) in the lakes and develop new bathymetric maps.

Activity. Characterize the aquatic plant community in each lake using WDNR point-intercept methodology along with visual observations. Sample grids will be obtained from WDNR. During summer months, the WDNR lake biologist will inventory lakes and collect data for new bathymetric maps. Data will be collected electronically and provided to UWSP for processing and generation of summary statistics and maps of key attributes and species for inclusion in the reports.

All research completed for: Bear, Leigh, Machickanee, Maiden, Munger, Oconto Falls, Paya, Rost and Waubee Lakes.

<u>Waterbody:</u>	<u>Data collection/generation of Bathymetric map</u>
• Anderson	July 2017
• Bass	August 2, 2017
• Boot	August 3, 2017
• Grindle	July 28, 2017
• John	2017
• <u>Ranch</u>	<u>July 26, 2017</u>
• Green	Summer 2018
• Shay	Summer 2018
• Star	Summer 2018
• Ucil	Summer 2018
• Underwood	Summer 2018
• <u>Wescott</u>	<u>Summer 2018</u>
• Cooley	July 24 2019
• Bear Paw	July 18, 2019
• Nelligan	July 3, 2019
• Pecor	July 25, 2019
• White	August 7, 2019
• White potato	September 2018

Deliverable/Outcomes. Spatial data will be displayed on maps and data will be summarized in tables or graphs. This information will be interpreted in a *mini-report developed for each lake*. Bathymetric maps will be developed for each lake. A summary report will be developed for comparison of results from all study lakes.

Goal 3. Develop a scientific understanding of lake water quality and its relationship to land use.

Activity 1. Characterize the water quality and sources of pollutants in the lakes. This effort will include the collection of integrated samples from the deep holes of each lake **between June and mid-September** for evaluation of nutrients and algal response and comparison to P criteria. **DACT, a measure of the mobile herbicide atrazine, will be analyzed in June or early July samples.** Once during **spring and fall overturn**, integrated samples will be collected from each lake for evaluation of nutrients, groundwater inputs, minerals, color, and alkalinity. During each winter, the extent of oxygen depletion and hypolimnion in the lakes will be assessed by measuring temperature and dissolved oxygen profiles. LDO meters will be purchased for use by County staff and volunteers. WISCALM protocol will be used for sample acquisition and timing. Sample preparation and shipping will follow QC procedures required for analysis at state-certified labs. Overturn samples (10 total) will be analyzed for alkalinity, ammonium, calcium and total hardness, chloride, color, nitrate+nitrite (N), ammonium, potassium, reactive P, sodium, sulfate, total Kjeldahl nitrogen, and total P. WDNR will collect 3 summer samples from each lake (15 TP and Chl a) and UWSP will collect 1 summer sample from each lake (5 TP, Chl a, DACT). In Year 2, UWSP will collect all of the samples (summer 2017 25 TP & Chl a, 5 DACT). WDNR samples will be analyzed by the SLH (not grant funded), and UWSP samples will be analyzed by UWSP's WEAL. County staff will take winter temperature/DO measurements.

All research completed for: Bear, Leigh, Machickanee, Maiden, Munger, Oconto Falls, Paya, Rost and Waubee Lakes.

Waterbody:	4 Samples Taken June-September	1 Winter Sample to be taken
• Anderson	2017 Complete; 2 nd readings 2018	February 2018 Complete
• Bass	2017 Complete; 2 nd readings 2018	February 2018 Complete
• Boot	2017 Complete; 2 nd readings 2018	February 2018 Complete
• Grindle	2017 Complete; 2 nd readings 2018	February 2018 Complete
• John	2017 Complete; 2 nd readings 2018	February 2018 Complete
• Ranch	2017 Complete; 2 nd readings 2018	February 2018 Complete
• Green	2019 First Samples taken -June	February 2019
• Shay	2019 First Samples taken -June	February 2019
• Star	2019 First Samples taken -June	February 2019
• Ucil	2019 First Samples taken -June	February 2019
• Underwood	2019 First Samples taken -June	February 2019
• Wescott	2019 First Samples taken -June	February 2019
• Cooley	June 2020	February 2020
• Bear Paw	June 2020	February 2020
• Nelligan	June 2020	February 2020
• Pecor	June 2020	February 2020
• White	June 2020	February 2020
• White Potato	June 2020	February 2020

Deliverable/Outcomes. Water quality data will be summarized for each lake by season and parameter. Profiles will be graphed. Results will be compared with important thresholds such as the Wisconsin P criteria. Data will be interpreted and included in the mini-reports for each lake as well as the summary report for the group of lakes.

Activity 2. Estimate the areas that are contributing groundwater to the lakes based on a GFlow Model. In areas with porous substrate, the groundwater contributing areas are not coincident to a lake's surface water watershed, so a different approach needs to be taken. Groundwater can contribute a large amount of the water to the lakes and can carry with it minerals and pollutants. Therefore, understanding the groundwater contributing areas can be an important part of lake management. To understand groundwater contributions to the lakes, this information will be used with land use data in the lake nutrient models. The USGS, WGNHS and U.S. Forest Service are currently developing a groundwater flow model using GFlow for the Nicolet National Forest. We will use the base model they have developed to develop models around the Oconto County lakes. GIS and topographic maps will be used to develop refined stream elevations that will be added to the USGS/WGNHS base GFlow Model. Particle tracking will be used to identify contributing areas.

All research completed for: Bear, Leigh, Machickanee, Maiden, Munger, Oconto Falls, Paya, Rost and Waubee Lakes.

<u>Waterbody:</u>	<u>GFlow Model</u>	<u>Nutrient Model</u>
• Anderson	Summer 2018	Winter 2019
• Bass	Summer 2018	Winter 2019
• Boot	Summer 2018	Winter 2019
• Grindle	Summer 2018	Winter 2019
• John	Summer 2018	Winter 2019
• Ranch	Summer 2018	Winter 2019
• Green	Summer 2018	Winter 2020
• Shay	Summer 2018	Winter 2020
• Star	Summer 2018	Winter 2020
• Ucil	Summer 2018	Winter 2020
• Underwood	Summer 2018	Winter 2020
• Wescott	Summer 2018	Winter 2020
• Cooley	Summer 2019	Winter 2021
• Bear Paw	Summer 2019	Winter 2021
• Nelligan	Summer 2019	Winter 2021
• Pecor	Summer 2019	Winter 2021
• White	Summer 2019	Winter 2021
• White Potato	Summer 2019	Winter 2021

Deliverable/Outcomes. Groundwater contributing areas and surface watersheds for the lakes as GIS shapefiles and maps to be included in the mini-reports and the summary report.

Activity 3. Nutrient models will be developed to characterize the sources of nutrients to the lakes. Ultimately, this information will inform strategies to reduce nutrients to the lakes, which will be done by the County and during the development of the LMPs in Phase 2. Surface runoff/phosphorus loading based on export rates for different land uses. Surface watersheds will be delineated using Wisconsin Surface Water Viewer and GIS with 30 meter DEMs. We will explore the characterization of the surface hydrology of the watersheds using WDNR EVAAL modeling. Land management in the watersheds will be based on USGS land cover and aerial photographs. Inlake phosphorus concentrations will be simulated using mass balance/steady-state models combining annual average phosphorus loads, hydrologic budgets and in-lake sedimentation.

All research completed for: Bear, Leigh, Machickanee, Maiden, Munger, Oconto Falls, Paya, Rost and Waubee Lakes.

Deliverable/Outcomes Graphs of the results and a brief interpretation will be included in the mini-reports and summary reports for this project.

Goal 4. Assess the capacity of groups and lakefront property owners to implement management strategies. When needed, work towards building capacity.

Activity 1. Meet your Scientist/Capacity Building Events. Provides an opportunity for scientists and lakefront property owners, elected officials, and others to learn about current issues/concerns on a lake, learn about the project, and assess the capacity for lake partners to plan and implement actions. Follow-up gatherings may be planned. Predominantly during the summer; however, some capacity building activities may be ongoing throughout the project. For efficiency, multiple gatherings for different lakes will occur on a given day. Ideally, this would occur during the first year of study of the lake groups. We will meet to discuss the project and learn about lake-specific issues. Scientists, UW-Extension, and county staff will facilitate these sessions. Capacity evaluation will be conducted and strategies will be developed to address lakes in need of capacity building. Measures will be taken to enhance capacity. **Multiple meetings have been held for:** Bear, Leigh, Machickanee, Maiden, Munger, Oconto Falls, Paya, Rost and Waubee Lakes.

Deliverable/Outcomes. These meetings are intended as a first step in relationship building between the study team, local stakeholders, and local groups associated with each lake. Information shared during the meetings and important considerations or issues generated at these meetings will be collected and summarized. Additional needs for capacity development will be identified.

<u>Waterbody:</u>	<u>Meet Your Scientist/ Public Meetings</u>	<u>Planning Meetings</u>	<u>Final Lake Plan</u>
• Anderson	August 12, 2017	Summer 2019	Fall 2019
• Bass	June 17, 2017	Summer 2019	Fall 2019
• Boot	June 17, 2017	Summer 2019	Fall 2019
• Grindle	July 15, 2017	Summer 2019	Fall 2019
• John	August 12, 2017	Summer 2019	Fall 2019
• Ranch	July 15, 2017	Summer 2019	Fall 2019
• Green	June 22, 2018	Summer 2020	Fall 2020
• Shay	June 23, 2018	Summer 2020	Fall 2020
• Star	June 22, 2018	Summer 2020	Fall 2020
• Ucil	June 23, 2018	Summer 2020	Fall 2020
• Underwood	June 23, 2018	Summer 2020	Fall 2020
• Wescott	June 23, 2018	Summer 2020	Fall 2020
• Cooley	June 14-15, 2019	Summer 2021	Fall 2021
• Bear Paw	June 14-15, 2019	Summer 2021	Fall 2021
• Nelligan	June 14-15, 2019	Summer 2021	Fall 2021
• Pecor	June 14-15, 2019	Summer 2021	Fall 2021
• White	June 14-15, 2019	Summer 2021	Fall 2021
• White Potato	June 14-15, 2019	Summer 2020	Fall 2021

*These planning meetings will begin once researched information on the waterbodies have been compiled.

Goal 5. Develop a scientific understanding of the social setting associated with the lakes in Oconto County.

Activity. Conduct a *Socioeconomic Community Survey*. Priority is being given to understanding the decision-making context for lake management in Oconto County that will influence the successful implementation of lake management efforts. To support this process during the first years of the project, a scientific sample of 400+ community members will be asked to participate in a community wide survey used to gather data on attitudes toward lakes, relative importance of water management activities, and economic impact of water-related recreation and associated tourism activities. A stratified random sample representing key community stakeholder groups (rural, suburban, and urban) will be developed.

Deliverable/Outcomes. The result of the *socioeconomic community survey* has been compiled into a report highlighting the key findings that have aided the development of the lake first management plans. The report was presented as part of a small group workshop to disseminate results to key project partners and develop key social objectives for the lake management plans, make recommendations for the lake property owner surveys, and develop a narrative version of the survey results to be shared with the public including county board supervisors.

Completed:

1. **County-wide survey complete:** 400 Respondents, Results presented to County Board on ***January 18, 2018***. Copies available to the public.
2. **Presentations:** given to Oconto County Land Conservation Committee and Waterways – Citizen Advisory Committee (W-CAC) in ***December 2017 and January 2018***.
3. **Operational Strategy & Plan Document created:** developed, presented to County Board and ***adopted January 2018***.
4. **Individual property lake surveys** are available for the first **27** lakes beginning ***July 2018***. Go online to fill surveys out.

For more information on the Oconto County Lakes Project, contact:

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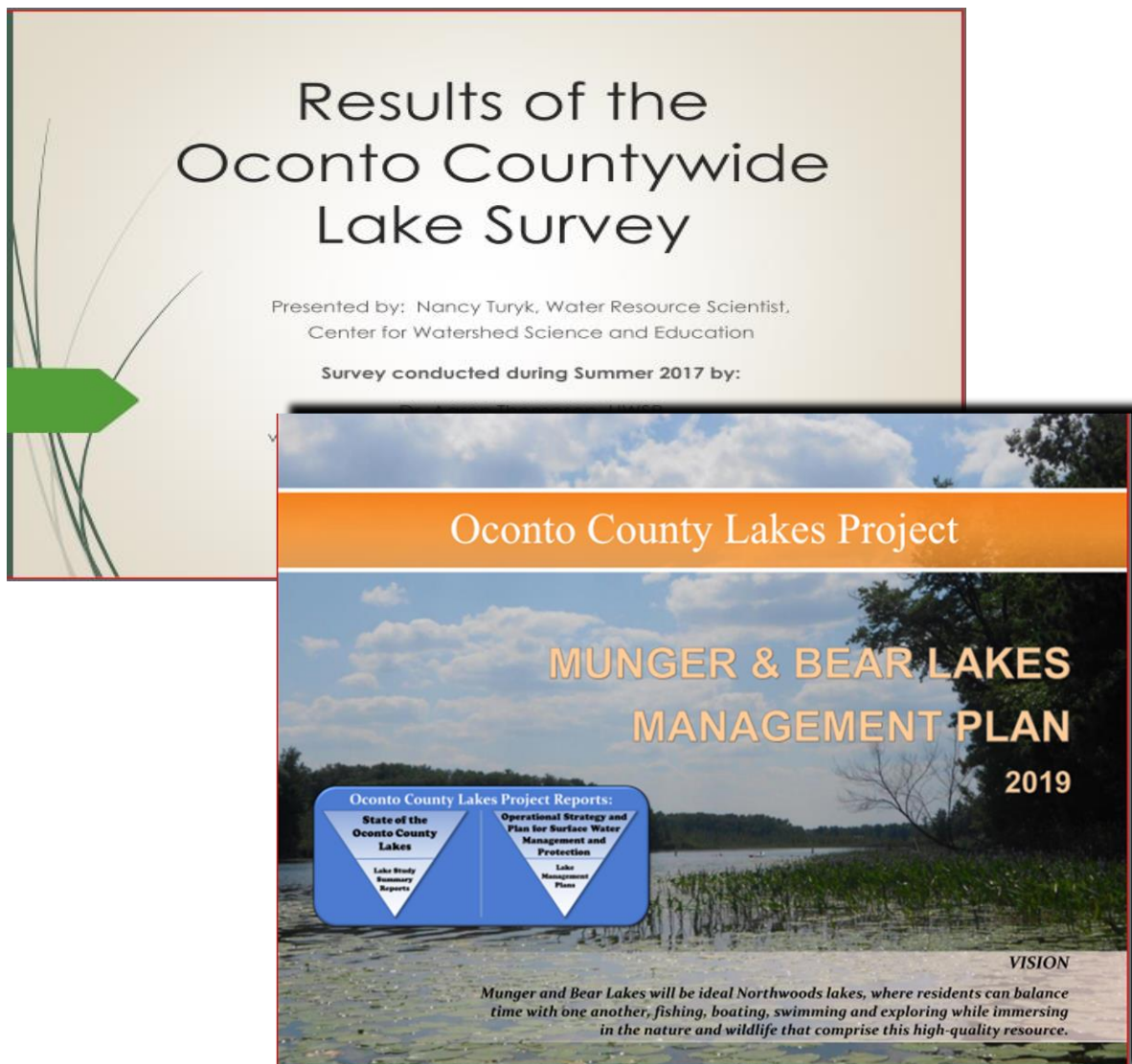
For these documents:

1. *Operational Strategy
and Plan for Surface Water Management and Protection-*

2. *County-wide Lake Survey Results-*

3. *Individual Lake Summary Reports & Plans-*

4. *Individual Lake Surveys*



Operational Strategy and Plan for Surface Water Management and Protection in Oconto County

2018



ABSTRACT

This strategy and plan is designed to provide guidance on the county and its partner's roles in maintaining healthy waterbodies throughout the county. Deliberate management and protection of the lake and rivers is necessary to maintain them in a healthy and desirable state. Impacts to the waterbodies may originate in their watershed or on the shorelands. Cumulatively, a number of activities on the landscape can contribute to objectionable impacts to these waterways; however, there are ways to reduce or even eliminate many of these impacts.

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Oconto County Lakes Survey



University of Wisconsin-Stevens Point
College of Natural Resources



We're asking for your help! This survey, which we expect should take about 20 minutes to complete, is an important step to help in the development of new management plans for lakes in your community. Please share your experiences with and priorities for area lakes, along with some demographic information to help us understand who responded. The survey is being conducted as a partnership between UW-Stevens Point, UW-Extension, Oconto County Lakes & Waterways Association, and the Oconto County Land Conservation Department -- so please contribute to this effort by completing the survey and returning it in the enclosed envelope!

Here are a few important notes about this study:

- Remember all results will be kept confidential, we're just looking for your important perspective about how to better manage Oconto County lakes and their surrounding watersheds.
- All responses will be treated as anonymous and records used to contact respondents containing identifying information will be destroyed prior to the research team reviewing data.
- Please skip any questions that make you feel uncomfortable or that you don't know how to answer.
- We do not anticipate any potential for risk or harm due to participation in this study; however, if you have any complaints about your treatment as a participant in this study please contact Dr. Debbie Palmer, IRB Chair at (715) 346-3953, e-mail at dbpalmer@uwsp.edu, or mail at University of Wisconsin-Stevens Point, Science Building D240, Stevens Point Wisconsin 54481.

While your participation is voluntary your input can help bring local voices into these important efforts to enhance lakes in Oconto County! If you have any questions or comments about this project you may contact us using the information provided below:

Thank you for your time and we're looking forward to hearing from you!

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Survey Results
December 14, 2017

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