

# Lake Puckaway Aquatic Plant Management Planning

## Phase I: Create One-Year Aquatic Plant Management Strategy

Onterra, LLC will assist the Lake Puckaway Protection & Rehabilitation District (LPPRD) with the creation of a one-year management strategy to control nuisance native and non-native aquatic plants for the benefit of navigation in Lake Puckaway. This will not be an Aquatic Invasive Species (AIS) control strategy. The strategy will likely utilize mechanical harvesting and may also include limited herbicide use.

### ***Planning Meeting – January/February 2022***

- Onterra staff will meet with the LPPRD and WDNR to develop a generalized map showing the areas of the lake where nuisance native and non-native plants occur.
- Onterra will combine that information with previously collected plant data and bathymetry.
- Onterra will create a draft aquatic plant management strategy for 2021, likely utilizing some mechanical harvesting and some herbicide treatments.

### ***LPPRD and WDNR Draft Plan Review – February 2022***

- The draft one-year strategy would be provided to the LPPRD and WDNR within three weeks of the planning meeting.
- The LPPRD would review the strategy to assure that the anticipated needs of its members would be met.
- The WDNR would review the strategy to assure that it would meet permitting requirements.
- Minor changes to plan would be made by Onterra within 10 business days – major alteration to the strategy would be made within 3 weeks.

### ***Bidding Assistance***

- Upon finalization of the strategy, Onterra would provide assistance to the LPPRD in preparing bid request documents for the control methods included within the strategy.
  - Onterra's assistance would include specific requirements of contractor equipment and procedures, treatment maps, and strategy timing.
  - Onterra would also include a short-list of contractors that have worked well with our prescribed treatment strategies in the central region of the state. Considering 2022 will be used as a trial year, and Onterra will be monitoring the treatment results, it is important that the control actions are completed as prescribed by the strategy.
- Onterra will supply spatial data to each of the contractors upon selection by the LPPRD.

### ***Control Action Permitting***

- The selected contractor for each control action will be responsible for obtaining WDNR permits for their respective action.

### ***Treatment Monitoring***

- Onterra will complete two surveys in association with the 2022 strategy implementation.
  - Pretreatment survey – completed one to two weeks before strategy implementation.
  - Post-treatment survey – completed several weeks after strategy implementation.
- Onterra will create an email narrative and appropriate mapping to relay the results of the two surveys to the LPPRD.

## ***Project Cost – One-Year Aquatic Plant Management Strategy Development (Phase I)***

<b>Onterra Task</b>	<b>Estimate</b>
Project Communications	\$745.00
Planning Meeting & Preparation	\$1,485.00
Draft and Final APM Strategy Creation	\$1,105.00
Bidding Assistance	\$895.00
2022 Control Action Monitoring	\$3,250.00
Travel (Mileage @ 0.58/mi)	\$330.00
<b>Project Total</b>	<b>\$7,810.00</b>

### **Phase II: Create Updated Aquatic Plant Management Plan**

Onterra, LLC will assist the Lake Puckaway Lake Protection & Rehabilitation District (LPPRD) with the creation of an updated aquatic plant management plan to address nuisance native and non-native aquatic plants for the benefit of navigation in Lake Puckaway. The strategy will likely utilize mechanical harvesting and may also include limited herbicide use. The results of the monitoring of the one-year strategy will be key in developing the extended plan.

**Please note:** The costs of components marked with an “\*” will be partially covered by the Phase II Lake Protection Grant submitted by Ducks Unlimited, if the application is successful. DU included \$13,500 within the grant budget for these tasks.

#### ***Whole Lake Point-Intercept Survey – July 2022\****

- Point-intercept survey would be completed following WDNR protocol.
- Point-spacing: 155 meters, Total Points: 872
- Results would be comparable with data collected in 2005, 2014, 2015, and 2020.

#### ***Sub-Point-Intercept Survey – July 2022\****

- Point-intercept survey completed over Area of Potential Impact (AOPI).
- Point -spacing: 95 meters, Total Points: 160.
- Will stand as additional pre-restoration data and be directly comparable with data collected in 2022 and following the completion of the dredge bank.

#### ***Floating-Leaf and Emergent Aquatic Plant Community Mapping – August 2022***

- Floating-leaf and emergent aquatic plant communities will be mapped with sub-meter GPS.
- Dominant species composition will be recorded for each mapped community.
- The results will be directly comparable with the results from the 2015 survey completed as a part of the management planning project.

#### ***Water Quality Monitoring\****

- Water quality would be monitored at two sites:
  - West Basin Deep-Hole (Station ID: 243039)
  - East Basin Mid Site (Station ID: 243056)
- Secchi disk transparency would be recorded within the AOPI during each sample collection at the West and East Basin sites.
- All samples would be analyzed by the Wisconsin State Lab of Hygiene as indicated in Table 1

**Table 1. Water Quality Sample Parameters and Timing**

Parameter	Spring	June	July	August	Sept	Fall
	S	S	S	S	S	S
Total Phosphorus	●	●	●	●	●	●
Total Nitrogen	●	●	●	●	●	●
Chlorophyll- <i>a</i>	●	●	●	●	●	●
Total Susp. Solids	●		●			●

Furthermore, during each sampling event, Secchi disk transparency would be recorded at all three sites and a temperature and dissolved oxygen profile would be completed in the east and west basins.

**Planning Meeting – December 2022**

- Onterra staff will meet with the LPPRD and WDNR to discuss changes to the one-year strategy that would provide better navigation access to Lake Puckaway.
- Onterra will combine that information with current aquatic plant data.
- Onterra will create a draft aquatic plant management plan for implementation by the LPPRD, likely utilizing some mechanical harvesting and some herbicide treatments.

**LPPRD and WDNR Draft Plan Review – January 2023**

- The draft aquatic plant management plan would be provided to the LPPRD and WDNR within four weeks of the planning meeting.
- The LPPRD would review the plan to assure that the anticipated needs of its members would be met.
- The WDNR would review the plan to assure that it would meet permitting requirements.
- Minor changes to plan would be made by Onterra within 10 business days – major alteration to the strategy would be made within 3 weeks.

**Project Cost – Updated Aquatic Plant Management Plan**

Onterra Task	Cost
Project Administration & Communications	\$750.00
Point-Intercept Survey - Full*	\$9,035.00
Sub-Point-Intercept Survey - Area of Potential Impact*	\$1,420.00
Floating-Leaf & Emergent Community Mapping	\$3,835.00
Water Quality Assessment*	\$2,900.00
Data Analysis & Plan Development- Winter 2022/2023	\$4,130.00
Sample Shipping*	\$90.00
Travel (Lodging, Incidentals, & Mileage @ /mi)	\$1,740.00
<b>Total Onterra Tasks</b>	<b>\$23,900.00</b>
Other Costs	Estimate
WI State Laboratory of Hygiene Fees - 2 Sites*	\$1,194.00
<b>Total Other Costs</b>	<b>\$1,194.00</b>
<b>Total Project Cost</b>	<b>\$25,094.00</b>

*\*A portion of these components could be covered by the DU Phase II Grant, if funded.*

**Please Note:** Onterra, LLC does not provide annual nuisance native survey services aimed at guiding a lake group’s annual nuisance plant control; therefore, following this project, the LPPRD should plan to complete informal boat surveys throughout the growing season to check on treatment effectiveness and note areas where control may be needed or not needed in the future. Relying on an herbicide application company to provide this service is not recommended.