Waterford Waterway Management District

Agenda

Tuesday December 8th, 2020 at 6 PM

This meeting will be held in person and online using Zoom

1. Call to Order
2. Review and act on Claims
3. Aquatic Plant Management Items:
    a. Review and consideration of possible purchasing of equipment for weed treatment on the waterway-Eco Harvester
    b. Review and consideration of Aquatic Invasive Species survey completed for spring actions on the waterway
4. Public Comments
5. Adjournement

Those interested may listen and observe at:
Topic: Waterford Waterway Management District Monthly Meeting
Date/Time: December 8th at 6 PM Central Time (US and Canada)

Join Zoom Meeting
Alex Abendschein is inviting you to a scheduled Zoom meeting.

Topic: WWMD November Meeting
Time: December 8th at 6 PM Central Time (US and Canada)

Join Zoom Meeting
https://zoom.us/j/99727760090?pwd=WUVKekRQV0duU2Y1V0NwSTFYQ0xPUT09

Meeting ID: 940 1367 6306
Passcode: 471654

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Waterford Waterway Management District

Agenda/Minutes

Tuesday December 8th, 2020 at 6 PM

This meeting will be held in person and online using Zoom

1. Call to Order - 6 PM; Present: Greg Horeth, Bill McCormick, Scott Uhler, Margaret Shoptaw, Alex Abendschein, Grant Horn.; Absent: Dan Schultz
2. Review and act on Claims - Margaret motion; Grant seconded; V 6-0 to approve.
3. Aquatic Plant Management Items:
    a. Review and consideration of possible purchasing of equipment for weed treatment on the waterway-Eco Harvester
    --Scott Motion; Alex seconded
    --Schedule of Special Meeting with riparian owners in January of 2021 to ask for their approval to purchase an Eco-Harvester.
    ***Note: This would allocate the money but the direction of purchase or hiring a contractor would still be open for the board to decide.
    --Vote 6-0 to approve.
    b. Review and consideration of Aquatic Invasive Species survey completed for spring actions on the waterway
    --Bill Motion; Scott seconded; Greg amended with Bill's approval
    --AIS treatment for EWM on Lake Buena in 2021, based on recommendations by Wisconsin Lakes and Ponds and Onterra.
    --Vote 6-0 to approve.
4. Public Comments
5. Adjournement - 8:5[illegible] PM.

DRAFT

Those interested may listen and observe at:
Topic: Waterford Waterway Management District Monthly Meeting
Date/Time: December 8th at 6 PM Central Time (US and Canada)

Join Zoom Meeting
Alex Abendschein is inviting you to a scheduled Zoom meeting.

Topic: WWMD November Meeting
Time: December 8th at 6 PM Central Time (US and Canada)

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https://zoom.us/j/99727760090?pwd=WUVKekRQV0duU2Y1V0NwSTFYQ0xPUT09

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Waterford Waterway Management District
Claims Report
All Transactions

Type	Date	Num	Name	Memo	Split	Open Balance
Bill	11/22/2020		Margaret Shoptaw	QuickBooks Pro Plus 2021	Office Supplies	-199.99
Bill	11/22/2020		Gregory Horeth	Quickbooks Pro Plus 2021	-SPLIT-	-209.99
Total						**-409.98**

Eco-Harvester Questions/Concerns:

December 6, 2020

Questions from some commissioners along with my replies in the color red:

1. **I am guessing there is a good reason we're not doing this but I feel I should ask and not make any assumptions: Did we try to borrow or rent an Eco-Harvester from another waterway in order to do the demo for the DNR?** Bill – There are three EH on Wisconsin waterways and one of them is 5-years old and does not have all the recent up-dates and features. All three are on lakes that are approximately a 5-6-hour drive away. To answer your question we did not reach out to any of them to see if we can borrow or rent an existing unit, the reason for not doing this is in my opinion we only have one shot at gaining approval from the DNR and I feel its best that we have the most recent unit out on our waterway with the owner of Silver Lake who is also the inventor of the EH driving it and performing the demonstration as he will be in the best position to answer any questions from the DNR as well as demonstrate any features of the unit that the DNR may want to see. It's also important to point out that the other lake associations who have an EH do not operate it in the same fashion as we plan to operate ours. For example, one association only uses it as a skimmer harvesting weeds with the 4-inch rollers 6"-12" below the water's surface, another association only harvests in 6'-10' of water and on our waterway will be running it mainly in shallow water.
2. **How will we know if the Eco-Harvester is succeeding at the level we need it to? By that I mean, we have planned to quit doing navigation herbicide treatments and DASH. Have we considered a method for measuring whether the Eco-Harvester is keeping up this summer or do we plan to "eyeball it" and see how many complaints/compliments we get?** Bill – Great question and one that is really hard to predict. Capacity of the EH is 4.5 cubic yards or approximately 2,000 lbs. of weeds it can carry in its bed or bunk. We know it won't pull 100% of the weeds it encounters, however a fair expectation is that it will pull at least 50%-75% of the weeds it encounters, the demonstration will give us a better perspective of how fast and how efficient the unit will be. Your also correct we will need to eyeball and even perhaps in the shallow bays swim out after harvesting to examine the effectiveness. In benchmarking other associations, we have learned that the number of loads is reduced each year when harvesting over the same areas as the previous years, so this tells me that the EH is having a positive effect on knocking down the amount of weeds year after year.
3. **A corollary to the previous question: Do we have a backup plan if the Eco-Harvester can't keep up or breaks down? Are we planning to permit for the other types of treatments in case we end up needing to supplement?** Bill – Yes, we have a contingency plan to keep some funds for DASH and herbicide treatments, just in case the EH is too slow or not as efficient as hoped. In talking with other associations, they have not experienced a major breakdown of their Eco-Harvesters, so we do not anticipate any issues with breakdown. Spare parts are readily available from a Farm & Fleet or hydraulic distributor. We will be obtaining dual permitting in these areas with the ability to use DASH, herbicides or the EH.
4. **The cost to demonstrate this machine from the manufacturer seems high.** Bill – I feel this is a fair cost as the manufacturer will have to drive the unit down from Waupaca, WI approximately a 2-2.5-hour drive one way, then unload it and spend time on our waterway to demonstrate it to the DNR as well as our board. The manufacturers business is made to order, in other words they don't have demo units on hand, so the manufacturer is trying to accommodate our request and

the need to demonstrate the unit on our waterway with the DNR, they are typically not in the business of demonstrating their machines especially away from their factory, so I can understand the charges.

5. **Would it be possible to take Craig Helker to a lake in Wisconsin with the EH already in use for the demonstration? Not sure if he needs to see it on our waterway, or if it would be a valid test, because our waterway is unique.** Craig Helker feels our waterway is unique and he wants to see the demonstration performed on our waterways. It's my understanding that we have tried to get him to go with us to another waterway, however he has pushed back on this.
6. **Or, would it be possible to pay someone who already owns an EH to bring it to our waterway and rent it for a day for the demo?** Bill – Yes, this could be possible, however the other lake associations that I've talked with do not harvest in the same way that we plan to on our waterway and with the manufacturer/owner of Silver Mist who is also the guy who engineered the equipment, performing the demonstration for us I'm confident that we have an expert performing the demo and that should help if and when Craig Helker has questions or wants to better understand certain features during the demonstration. It will also be critical that the person performing the demonstration know how to use the unit in shallow water. One of Craigs concerns is something called turbidity, so it will be critical that we do not disturb the bottom with the pinch rollers or collector drum.
7. **I see you are assuming that Eco-Harvester can replace navigational herbicidal treatments, 50% of the AIS herbicidal treatments, and DASH. How did you determine that? Have you modeled the amount of time the Eco-Harvester would be working, it's speed, dumping time, etc. and confirmed we could actually successfully harvest that much acreage?** Bill – I've been told that the navigational lanes account for 42.8 acres and the DASH accounts for 11.2 acres so around 54 acres being targeted by the Eco-Harvester (EH) plus whatever we can cover for the AIS areas. You are certainly right to question its efficiency and unfortunately how fast we can harvest is all dependent upon a number of conditions, such as location of the unload point to where the EH is harvesting. Under a full load 4.5 cubic yards or around 2,000 lbs the EH will likely travel at a speed of around 1-2 MPH we determined that when its empty it travels around 10-MPH. We are planning to order our EH to have a newer upgraded Honda motor that according to the manufacturer is a new feature for 2021 and will add approximately 15% more torque to turn the paddle wheels. The other unknown condition is how dense the weeds are in the area being harvested, upon research I'm told that it can take up to 30 minutes to fill the bunk on the harvester or it can take only 7-minutes, so it's really hard to say at this point. What I've done is to leave some money in the budget for DASH and herbicidal treatments, however I'm betting that we will need to have two EH's working on the water, so the tab that shows the contractor model in support of the WWMD owning its own EH, will likely be the best solution for us in the long run. It's not uncommon for lakes in our area to be operating two or three (Little Muskego Lake) or even up to six weed cutters (Pewaukee Lake) all summer.
8. **Historically a lot of our AIS treatments are done in April but we're assuming the Eco-Harvester doesn't get into the water until June, will that be an issue?** Bill – I'll have to investigate this further as to when is the recommended time for the AIS treatments, I'm also in the process of

trying to get a better cost analysis prepared for just how much cost we will have to treat the five areas for AIS. Once I have a better understanding of both the timing and the costs I can then up-date the ROI for the EH and better account for those costs. My hope is the EH becomes something that we can use to perhaps eliminate or greatly reduce the need for herbicide treatments.

ECO-HARVESTER ESTIMATED COSTS VS APM ESTIMATED BUDGETS (First Draft: 11/14/20)

Eco-Harvester Cost and Budget Projections				
(Based on 16 weeks of use/yr)	Year 1	Year 2	Year 3	Year 4
Equipment Costs				
Harvester	$ 84,499.00			
Harvester Trailer	$ 7,238.00			
Dump Trialer	$ 9,000.00			
Demo for the DNR	$ 4,200.00			
4WD Truck	$ 15,000.00			
Lowrance Depth finder with down/side imaging	$ 3,594.00			
Operating Costs				
Fuel (Eco-Harvester at $2.75/gal)	$ 1,320.00	$ 1,360.00	$ 1,400.00	$ 1,442.00
Permitting	$ 330.00	$ 300.00	$ -	$ -
Management, Payroll & Work Comp. ($2,167.20 for payroll taxes and work comp ins.)	$ 5,167.00	$ 5,252.00	$ 5,336.00	$ 5,421.00
Misc.	$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00
Fuel (Truck at $2.75/gal)	$ 1,320.00	$ 1,360.00	$ 1,400.00	$ 1,442.00
Weed Disposal Site	$ -	$ -	$ -	$ -
Labor (2-people per day, figuring 8-hours per day for 3-months (64-days))	$ 15,360.00	$ 16,384.00	$ 17,408.00	$ 18,432.00
Insurance	$ 3,000.00	$ 3,090.00	$ 3,183.00	$ 3,278.00
Storage (Free)	$ -	$ -	$ -	$ -
Maintenance(16 hrs.@$20/hr.)	$ 320.00	$ 320.00	$ 330.00	$ 340.00
Insurance for the truck	$ 700.00	$ 700.00	$ 700.00	$ 700.00
Parts (one year warranty)	$ -	$ 2,000.00	$ 2,000.00	$ 2,000.00
Totals	**$ 153,048.00**	**$ 32,766.00**	**$ 33,757.00**	**$35,055.00**

	APM Projected Budget w/o Eco-Harvester)			
	10/20-9/21	10/21-9/22	10/22-9/23	10/23-9/24
AIS (EWM)Treatment	$75,000.00	$ 77,250.00	$ 79,567.00	$ 44,740.00
Navigation Ln Treatment	$32,000.00	$ 32,960.00	$ 33,950.00	$ 35,000.00
DASH	$40,000.00	$ 41,200.00	$ 42,436.00	$ 43,710.00
Mech. Harvest Cutting	$20,000.00	$ 20,600.00	$ 21,218.00	$ 22,511.00
AIS Permits	$4,000.00	$ 4,120.00	$ 4,245.00	$ 4,372.00
Flowering Rush	$0.00	$ 7,000.00	$ 7,210.00	$ 7,649.00
Prof. Consulting	$8,000.00	$ 8,240.00	$ 8,487.00	$ 8,742.00
Contingency	$ 10,000.00	$ 5,000.00	$ 3,000.00	$ 10,000.00
Totals	**$ 189,000.00**	**$ 196,370.00**	**$ 200,113.00**	**$ 176,724.00**

APM Projected Budget w/ Eco-Harvester)				
	10/20-9/21	10/21-9/22	10/22-9/23	10/23-9/24
AIS (EWM) Treatment	$ 37,500.00	$ 38,625.00	$ 39,784.00	22,370.00
Navigation Ln Treatment	$ 16,000.00			
DASH	$ 12,000.00			
Mech. Harvest Cutter*	$ 20,000.00	$ 20,600.00	$ 21,218.00	22,511.00
Mech. Harvest Eco	$153,048.00	$ 32,766.00	$ 33,757.00	35,055.00
Flowering Rush	$ -	$ 7,000.00	$ 7,210.00	7,649.00
Prof. Consulting	$ 8,000.00	$ 8,240.00	$ 8,487.00	8,742.00
Contingency	$ 5,000.00	$ 5,000.00	$ 3,000.00	10,000.00
Totals	**$ -**	**$251,548.00**	**$ 112,231.00**	**$ 113,456.00**	**$ 106,327.00**
Budget Est. W/O Eco-Harvester =		$189,000.00	$ 196,370.00	$ 200,113.00	176,724.00
ROI Totals =		($62,548.00)	$84,139.00	$86,657.00	$ 70,397.00

Payback = 24 months.

NOTES
Years 2-4 adjusted @ +3% /yr
Eco replaces 50% AIS (EWM) treatment
Eco replaces DASH & Nav. Ln. Treatment w/ Herbicide
Permitting NR109/3-5 yrs.
Storage/Maintenace provided by Bolton Farms (Burlington)
Approved WDNR dump site provided by Greil Farms (Waterford)
This assumes Rick Mueller has agreed to manage the work crews and be the main operator
Operation based on 5 da./wk.
Launch Site provided by Tom Hincz, Bill McCormick by Island view bay.
Off load sites to be staggard around the waterway system (one on Tichigan Lake, one on Buena Lake, one on Concervancy Bay, one near Elm Island and one at the south end of the Fox River)
Truck to pull the trailer is provided by volunteer

ECO-HARVESTER ESTIMATED COSTS VS APM ESTIMATED BUDGETS (First Draft: 11/14/20)

Eco-Harvester Cost and Budget Projections				
(Based on 16 weeks of use/yr)	Year 1	Year 2	Year 3	Year 4
Equipment Costs				
Harvester	$ 84,499.00			
Harvester Trailer	$ 7,238.00			
Dump Trialer	$ 9,000.00			
Demo for the DNR	$ 4,200.00			
4WD Truck	$ 15,000.00			
Lowrance depth finder with down/side imaging	$ 3,594.00			
Operating Costs				
Fuel (Eco-Harvester at $2.75/gal)	$ 1,320.00	$ 1,360.00	$ 1,400.00	$ 1,442.00
Permitting	$ 330.00	$ 300.00	$ -	$ -
Supervision and Payroll & Work Comp.	$ 5,167.00	$ 5,252.00	$ 5,336.00	$ 5,421.00
Misc.	$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00
Fuel (Truck at $2.75/gal)	$ 1,320.00	$ 1,360.00	$ 1,400.00	$ 1,442.00
Weed Disposal Site	$ -	$ -	$ -	$ -
Labor	$ 15,360.00	$ 16,384.00	$ 17,408.00	$18,432.00
Insurance	$ 3,000.00	$ 3,090.00	$ 3,183.00	$ 3,278.00
Storage (Free)	$ -	$ -	$ -	$ -
Maintenance(16 hrs.@$20/hr.)	$ 320.00	$ 320.00	$ 330.00	$ 340.00
Insurance for truck	$ 700.00	$ 700.00	$ 700.00	$ 700.00
Parts (one year warranty)	$ -	$ 2,000.00	$ 2,000.00	$ 2,000.00
Totals	**$ 153,048.00**	**$ 32,766.00**	**$ 33,757.00**	**$35,055.00**

NOTES
Years 2-4 adjusted @ +3% /yr
Eco replaces 50% AIS (EWM) treatment
Eco replaces DASH & Nav. Ln. Treatment w/ Herbicide
Permitting NR109/3-5 yrs.
Storage/Maintenace provided by Bolton Farms (Burlington)
Approved WDNR dump site provided by Greil Farms (Waterford)

Operation based on 5 da./wk.
Launch Site provided by Tom Hincz, Bill McCormick by Island view bay.
Off load sites to be staggard around the waterway system (one on Tichigan Lake, one on Buena Lake, one on Concervancy Bay, one near Elm Island and one at th[illegible]nd of the Fox Riv[illegible]

APM Projected Budget w/o Eco-Harvester)

	10/20-9/21	10/21-9/22	10/22-9/23	10/23-9/24
AIS (EWM)Treatment	$75,000.00	$ 77,250.00	$ 79,567.00	$ 80,000.00
Navigation Ln Treatment	$32,000.00	$ 32,960.00	$ 33,950.00	$ 35,000.00
DASH	$40,000.00	$ 41,200.00	$ 42,436.00	$ 43,710.00
Mech. Harvest Cutting	$20,000.00	$ 20,600.00	$ 21,218.00	$ 22,511.00
AIS Permits	$4,000.00	$ 4,120.00	$ 4,245.00	$ 4,372.00
Flowering Rush	$0.00	$ 7,000.00	$ 7,210.00	$ 7,649.00
Prof. Consulting	$8,000.00	$ 8,240.00	$ 8,487.00	$ 8,742.00
Contingency	$ 10,000.00	$ 5,000.00	$ 3,000.00	$ 10,000.00
Totals	**$ 189,000.00**	**$ 196,370.00**	**$ 200,113.00**	**$ 211,984.00**

APM Projected Budget w/ Eco-Harvester and third party contractor operating an Eco-Harvester in year two

	10/20-9/21	10/21-9/22	10/22-9/23	10/23-9/24
AIS (EWM) Treatment	$ 37,500.00	$ -	$ -	0.00
Navigation Ln Treatment	$ 16,000.00			
DASH	$ 12,000.00			
Mech. Harvest Cutter*	$ 20,000.00	$ 20,600.00	$ 21,218.00	22,511.00
Mech. Harvest Eco	$ 80,000.00	$ 233,048.00	$ 112,766.00	93,757.00
Flowering Rush	$ -	$ 7,000.00	$ 7,210.00	7,649.00
Prof. Consulting	$ 8,000.00	$ 8,240.00	$ 8,487.00	8,742.00
Contingency	$ 5,000.00	$ 5,000.00	$ 3,000.00	10,000.00
Totals	**$ -**	**$178,500.00**	**$ 273,888.00**	**$ 152,681.00**	**$ 142,659.00**
Budget Est w/o Eco-Harveter =		$189,000.00	$ 196,370.00	$ 200,113.00	$ 211,984.00
ROI Totals =		$10,500.00	($77,518.00)	$47,432.00	$69,325.00

Payback is still in 24 months.

NOTE: Its very likely t[illegible]due to the harvest speed and process using an Eco-Harvester that we will need to hire who operates an Eco-Harvester. This would give us two EH's operating all season.
$4[illegible]d for an estimated 200 hours @ $200/hour to do approx. 30 acres of navigational lanes and minor AIS harvesting,
[illegible]ld sign up to a three year contract with the third party contractor with the assurance of 200-hours of contracted services.

ECO-HARVESTER ESTIMATED COSTS VS APM ESTIMATED BUDGETS (First Draft: 9/20/19)

Eco-Harvester Cost and Budget Projections				
(Based on 12 weeks of use/yr)	Year 1	Year 2	Year 3	Year 4
Equipment Costs				
Harvester	$ 84,500.00			
Harvester Trailer	$ 6,500.00			
Dump Trialer	$ 9,000.00			
Delivery	$ -			
Training	$ -			
Operating Costs				
Fuel (Eco-Harvester at $2.75/gal)	$ 1,320.00	$ 1,360.00	$ 1,400.00	$ 1,442.00
Permitting	$ 330.00	$ 300.00	$ -	$ -
Contingency	$ 3,000.00	$ 7,000.00	$ 7,000.00	$ 7,000.00
Misc.	$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00
Fuel (Truck at $2.75/gal)	$ 1,320.00	$ 1,360.00	$ 1,400.00	$ 1,442.00
Weed Disposal Site	$ -	$ -	$ -	$ -
Labor	$ -	$ -	$ -	$ -
Insurance	$ 3,000.00	$ 3,090.00	$ 3,183.00	$ 3,278.00
Storage (Free)	$ -	$ -	$ -	$ -
Maintenance(16 hrs.@$20/hr.)	$ 320.00	$ 320.00	$ 330.00	$ 340.00
Parts (one year warranty)	$ -	$ 2,000.00	$ 2,000.00	$ 2,000.00
Totals	**$ 111,290.00**	**$ 17,430.00**	**$ 17,313.00**	**$17,502.00**

	APM Projected Budget w/o Eco-Harvester)			
	10/19-9/20	10/20-9/21	10/21-9/22	10/22-9/23
AIS Treatment	$ 39,800.00	$ 40,944.00	$ 42,224.00	$ 43,491.00
Navigation Ln Treatment	$ 40,000.00	$ 41,200.00	$ 42,436.00	$ 43,709.00
DASH	$ 50,000.00	$ 51,500.00	$ 53,045.00	$ 54,636.00
Mech. Harvest Cutting	$ 20,000.00	$ 20,600.00	$ 21,218.00	$ 21,855.00
Mech. Harvest Eco	$ 20,000.00	$ 20,600.00	$ 21,218.00	$ 21,855.00
Flowering Rush	$ 7,000.00	$ 7,210.00	$ 7,426.00	$ 7,649.00
Prof. Consulting	$ 1,000.00	$ 1,030.00	$ 1,061.00	$ 1,093.00
Drawdown	$ 12,000.00	$ 12,360.00	$ 12,731.00	$ 13,113.00
Totals	**$ 189,800.00**	**$ 195,444.00**	**$ 201,359.00**	**$ 207,401.00**

APM Projected Budget w/ Eco-Harvester)				
	10/19-9/20	10/20-9/21	10/21-9/22	10/22-9/23
AIS Treatment	$ 29,800.00	$ 30,694.00	$ 31,615.00	$ 32,563.00
Navigation Ln Treatment				
DASH				
Mech. Harvest Cutter*	$ 20,000.00	$ 20,600.00	$ 21,218.00	$ 21,855.00
Mech. Harvest Eco	$ 111,290.00	$ 17,430.00	$ 17,313.00	$ 17,502.00
Flowering Rush	$ 7,000.00	$ 7,210.00	$ 7,426.00	$ 7,649.00
Prof. Consulting	$ 1,000.00	$ 1,030.00	$ 1,061.00	$ 1,093.00
Drawdown	$ 12,000.00	$ 12,360.00	$ 12,731.00	$ 13,113.00
Totals	**$ 181,090.00**	**$ 89,324.00**	**$ 91,364.00**	**$ 93,775.00**
Eco w/ Cutter Option*	$ 181,090.00	$ 60,324.00	$ 62,134.00	$ 63,998.00

NOTE: As an alternative to purchase, the estimated cost, if we could find a contractor who operates an Eco-Harvester, would be $51,000 for an estimated 200 hours @ $250/acre to do approx. 60 acres of navigational lanes and minor AIS harvesting, up to 3 seperate harvestings/season, inclusive of permitting and travel time costs.

IT HAS BEEN DETERMINED NONE EXIST WITHIN THE STATES OF WI, IL, MN

NOTES
Years 2-4 adjusted @ +3% /yr
Eco replaces 25% AIS treatment
Eco replaces DASH & Nav. Ln. Treatment w/ Herbicide
Permitting NR109/3-5 yrs.
Storage/Maintenace provided by Bolton Farms (Burlington)
Approved WDNR dump site provided by Greil Farms (Waterford)
Volunteer Labor arranged and managed by Dan Alvey
Operation based on 5 da./wk.
Launch Site provided by Tom Hincz
Off load sites to be staggard around the waterway system (one on Tichigan Lake, one on Buena Lake, one on Loncervancy Bay, one near Elm Island and one at the south end of the Fox River)
*With the Cutter Option, it is possible to save another $20,000/year as a replacement for contract weed cutting on Tichigan Lake.

Wisconsin Lake & Pond Resource LLC
"Providing Professional Resources for Management of Your Lake or Pond"

Professional Pond Management Products and Services
Aquatic Herbicide and Algaecide Applications
Lake Management Planning and Services
Pond Design and Development

November 13, 2020

Waterford Waterway Management District
Aquatic Plant Management Committee

Re: 2020 Aquatic Plant Survey and Report, Waterford Waterway, Racine County, Wisconsin

Dear WWMD Board members:

In response to your request for aquatic plant management and surveying, Wisconsin Lake & Pond Resource, LLC (WLPR) visited the Waterford Waterway on multiple occasions in 2020. The purpose of these visits was to manage populations of aquatic invasive species (AIS), dense nuisance vegetation, and document the condition and spread of AIS, specifically Eurasian water-milfoil, to assess the need for future management.

Background Information

Waterford Waterway is an 1132-acre impoundment of the Fox River located in the Town of Waterford, Racine County, Wisconsin. The Waterway includes Tichigan Lake, the Fox River, and various shallow backwater areas of the reservoir, which has a maximum depth of 63 feet and mean depth of 6.3 feet. The Waterford Waterway Management District (WWMD) is an active lake district that has been managing aquatic plants on the waterway through chemical treatments, mechanical harvesting, and hand pulling. Two AIS, curly-leaf pondweed (CLP) and Eurasian water-milfoil (EWM), are present in the waterway.

Both CLP & EWM have been treated on the Waterway over the past decade. During recent surveys curly-leaf pondweed has primarily been found at low levels not requiring management. Eurasian water-milfoil has grown to nuisance levels and required management. Control of EWM has focused on the use of aquatic herbicides and ranged from spot treatment of areas 5.0 acres or less to whole-lake dosing. The most recent AIS management was completed in 2020 to 5.3 acres of the lake. Areas of native aquatic plant species also cause a direct navigational nuisance and are targeted for control in select areas throughout the season.

A copy of the WDNR approved permit and treatment records are included in Attachment A. To plan for 2020 management, a follow-up aquatic plant survey was completed on October 9, 2020 by Wisconsin Lake & Pond Resource.

Toll Free: 866-208-0724
www.wisconsinlpr.com

N7828 Town Hall Rd.
Eldorado, WI 54932
Phone: (920) 872-2032
Fax: (920) 872-2036

Wisconsin Lake & Pond Resource LLC
"Providing Professional Resources for Management of Your Lake or Pond"

Professional Pond Management Products and Services
Aquatic Herbicide and Algaecide Applications
Lake Management Planning and Services
Pond Design and Development

2020 Aquatic Plant Survey

WLPR conducted the 2020 survey using a meander method to select areas that of the waterway for the presence of AIS, primarily EWM (Table 1). Each location was fully assessed with rake throws and visual observations to verify the presence of EWM. All EWM, were recorded on a GPS for mapping (Figures 1-5). Areas chosen for the survey were based on the following primary parameters:

- past growth of dense EWM
- current growth of dense EWM as noted during 2020 site visits
- secluded bays or lakes able to managed on their own while offering adequate contact time for chosen products.
- Areas with primarily developed shoreline

Table 1: AIS Survey Locations

ID	Name	Figure #
A	Tichigan Lake	2
B	Island View Bay	3
C	Buena Lake	4
D	Fowler Bay	5
E	Elm Island Bay	5
F	Waterford Lake	5

Populations of Eurasian water-milfoil undoubtably exist outside the areas surveyed in 2020 but were not surveyed. Areas that do have dense EWM growth are much more sporadic in these areas. Reduced contact time and large areas of natural, undeveloped shoreline (Conservancy Bay) make meaningful reduction of target AIS unlikely.

The 2020 survey identified E/HWM growing at various densities and distribution in the target survey locations. Overall, 194.95 acres of EWM were identified in 2020 (Table 2, Figures 2-5). A breakdown of the EWM present by location is as follows:

Table 2: E/HWM Acres by Location

ID	Name	Acres	Priority
A	Tichigan Lake	94.5	1
B	Island View Bay	16.3	5
C	Buena Lake	53.6	2
D	Fowler Bay	9.1	6
E	Elm Island Bay	16.55	3
F	Waterford Lake	4.9	4
Total		**194.95**	---

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- **Tichigan Lake – Figure 2**: EWM was found around nearly the entire perimeter and often at high densities. Growth was primarily noted in depth of 2-10 feet and occasionally topped out in dense mats. Control of EWM here is the highest priority of the areas surveyed due to the large infestation and high use of the lake by all Waterway residents.
- **Island View Bay – Figure 3**: EWM was present, but sparse and often at low densities or individual stems or clumps of plants. Aquatic vegetation does present a navigational nuisance in Island View Bay which is worsened by the shallow water depth. However, the primary nuisance causing species was noted as common waterweed and coontail in 2020. The current density and distribution of EWM in the Bay does not require specific, directed management at this time
- **Buena Lake – Figure 4**: EWM has been noted as dense stands in the Buena Lake the past couple seasons and confirmed during the 2020 survey. Overall, density and spread of EWM was highest in the northern 2/3rds of Buena Lake and tended to lessen in the southern portion. EWM is the primary nuisance causing species present and active management is a priority for control. Populations of curly-leaf pondweed, also an AIS, are also dense at times early in the growing season here as well.
- **Fowler Bay – Figure 5**: Populations of EWM in Fowler Bay were extremely sporadic and low in density. Similar to Island View Bay, native species like coontail and the overall shallow water depths are the primary navigational concern here. Targeted control of EWM in not necessary at this time.
- Elm Island Bay – Figure 5: Elm Island had to main populations of EWM. The western population nearest the Fox River was very sporadic with only scattered stems present at low density. Control of EWM is not necessary for this portion of the Bay. In the easter part of Elm Island Bay, however, EWM was much more common and in locally dense, monotypic stands. EWM has been managed at whole-bay populations in the past.
- **Waterford Lake – Figure 5:** Waterford Lake's EWM has seen targeted, whole-bay control efforts in the past that are periodically necessary. Earlier in 2020, the population of EWM was dense and reaching the surface. Nuisance control was taken during summer, 2020 site visits which helped reduce the density of EWM present. However, the frequency of EWM within Waterford Lake is still high. Targeted control of EWM may be necessary in the near future.

NEXT STEPS

Current DNR recommendations for control of AIS include the use of an integrated pest management approach, or IPM. The use of IPM includes changing methods of control, including but not limited to: varying herbicide active ingredients, mechanical harvesting, hand or suction harvesting, and no-action. Past and current surveys and management for the Waterway have shown that EWM can occupy large colonies and require management up to whole-lake or bay dosing.

The spread of EWM in Waterford Waterway recorded in 2020 varies from dense colonies (Tichigan Lake) to only sporadic, low densities occurrences (Fowler Bay). It is our recommendation to conduct EWM management within the surveyed areas on a periodic basis and only once it reaches levels to be dosed on a whole lake or bay application. This will allow for the best control and allow

for recovery of the bay and cost savings for the District during non-targeted years. In addition, by targeting the areas of EWM in Tichigan Lake proper the population of EWM can be brought down to more a more manageable size with a goal to maintain it at small-scale populations of 5-10 acres total or less.

Past control efforts have focused on the use of 2,4-D, alone or in combination with a second active ingredient, with diminished results. Increasing research has shown that tolerance of 2,4-D by heavily managed EWM is a likely occurrence. Continued use of 2,4-D in the Waterford Waterway is likely to have limited results due to expected tolerance of the strain of EWM present.

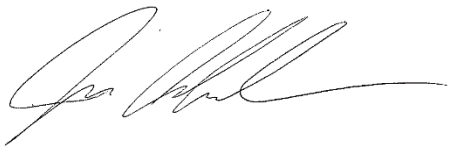
It is recommended that management use an active ingredient that works quickly, is selective to limit non-target species impacts, and offers excellent long-term control. For this reason, we recommend the use of ProcellaCOR EC, active ingredient florpyrauxifen-benzyl. ProcellaCOR EC has shown to be extremely effective against EWM, including tough to control strains, and works very quickly with limited non-target impacts. In addition, a product performance guarantee is offered by SePro, the manufacturers of ProcellaCOR EC. The performance guarantee states the SePro warrants that EWM will be controlled for three growing seasons from the application and will not reach nuisance levels in any contiguous, 1-acre area.

WWMD is recommended to treat the bays for EWM control on a rotational basis as necessary and following the priority listed in Table 3. Specific application rates would be obtained in continued project planning with SePro to achieve desired EWM management results.

If you have any questions, require any additional information, or would like a formal proposal on any of the above management options please contact us directly as follows:

Jim Scharl: (920) 872-2032 or jim@wisconsinlpr.com

Respectfully,



Attachment A: 2020 WDNR Permit & Treatment Records

DRAFT

Toll Free: 866-208-0724
www.wisconsinlpr.com

N7828 Town Hall Rd.
Eldorado, WI 54932
Phone: (920) 872-2032
Fax: (920) 872-2036

Aquatic Plant Management

NOTE: Missing or incomplete fields are highlighted at the bottom of each page. You may save, close and return to your draft permit as often as necessary to complete your application. If there are no updates in 90 days, your draft is deleted

This Application has been Signed and Submitted by: i:0#.f|wamsmembership|jscharl signed on 2020-03-27T09:58:41

Site or Project Name:	Waterford Waterway - 2020 management The permit application will be saved automatically with this name
Activity	Chemical Control Application
Eligibility: (All questions must be no for it to be considered a private pond.)	Is there more than one property owner? ◉ Yes ○ No Will there be uncontrolled surface water discharge? ◉ Yes ○ No Does the water body have public access? ◉ Yes ○ No

Enter previous years permit information below to import Contact Information (Optional)

Permit ID #:

Business Certification Number:

3200-004 Chemical Aquatic Control Application

NOTE: To be considered a private pond, a waterbody must meet all of the following requirements:

1. Confined to one property owner.
2. The pond has no uncontrolled surface water discharge.
3. No public access.

Upon submittal of your permit application, a **non-refundable $20 permit processing fee will be charged**. Additional acreage fees will be refunded if the permit request is denied or if no treatment occurs.

3200-004 Chemical Aquatic Plant Control Application

- Annually complete all pages on Form 3200-004 for chemical plant management applications. Complete form 3200-004a for large scale treatments(exceeds 10.0 acres in size or 10% of the area of the water body that is 10 feet or less in depth) as required by NR107.04(3).
  - Form 3200-004 is competed electronically through this system.
  - Form 3200-004a must be completed outside the system and uploaded to the attachments section. Please refer to this link for a copy of this form: http://dnr.wi.gov/files/pdf/forms/3200/3200-004A.pdf
- Attach a map that shows the treatment location(s), treatment dimensions and riparian landowners. If requesting WPDES coverage, attach a water body map that shows surface outflow and receiving waters.
- For a large-scale treatment, attach evidence that a public notice has been published in a regional / local newspaper and if required that a public informational meeting has been conducted as defined in NR107.04(3).
- Pay fee online.
- Sign and Submit form.
- A signed permit application certifies to the Department that a copy of the application has been provided to any affected property owner's association/district and to landowners adjacent to treatment area.

Contact Information

Applicant or Pond Owner Information (Select Applicant Role)

○ Private Individual ○ Contractor ◉ Lake Organization (Specify): WWMD

Organization	Waterford Waterway Management District
Last Name:	
First Name:	
Mailing Address:	415 N Milwaukee St
City:	Waterford
State:	WI
Zip Code:	53185
Email:	cbuchaklian@gmail.com
Phone Number: (xxx-xxx-xxxx)	262-957-0437
Alternative Phone Number: (xxx-xxx-xxxx)	

Waterbody Address

Last Name:	LLC
First Name:	Wisconsin Lake & Pond
Street Address:	415 N Milwaukee St
City:	Waterford
State:	WI
Zip Code:	53185
Email:	
Phone Number: (xxx-xxx-xxxx)	
Alternative Phone Number: (xxx-xxx-xxxx)	

Applicator

Name of Applicator Firm:	Wisconsin Lake & Pond Resource, LLC
Applicator Certification #:	77803, 104226
Business Location License #:	93-015182-012226
Restricted Use Pesticide #:	
Address:	N7828 Town Hall Rd
City:	Eldorad
State:	WI

Zip:	54932
County:	Fond du Lac
Email:	jim@wisconsinlpr.com
Phone Number: (xxx-xxx-xxxx)	920-872-2032

Adjacent Riparian Property Owners or Other Individuals Sponsoring Removal

Individuals and organizations (e.g. Lake District, Lake Association, Property Owners Association, County Department of Recreation), sponsoring removal.

☑ Uploaded riparian owners to attachment tab

Name	Address	Phone	Email Address

Site Information - Complete

Water Body to be Treated

Lake Property Owners Association or Lake District Representative :	Chad Buchaklian ☐ None
Water Body Name:	Waterford Waterway / Michigan Lake / Fox River
County:	Racine
Latitude:	42.76631
Longitude:	-88.213547
Section:	23
Township:	04
Range:	19
Direction:	◉ E ○ W
Lake Surface Area:	1,132 acres
Estimated Surface area that is 10ft or less	900 acres

Proposed Treatment Area

Area(s) Proposed for Control:

Treatment Length		Treatment Width			Estimated Acreage		Average Depth		Calculated Volume	
0	ft. x	0	ft.	÷ 43,560 ft.^{2} =	42.08	ac	3	ft =	126.24	ac-ft
0	ft. x	0	ft.	÷ 43,560 ft.^{2} =	7.92	ac	4	ft =	31.68	ac-ft
				Estimated Acreage Grand Total	50.00	ac		Calculated Volume Grand Total	157.92	ac-ft

Is the area with in or adjacent to a sensitive area designated by the Department of Natural Resources.

○ Yes ◉ No

If the estimated acreage is greater than 10 acres, or is greater than 10 percent of the estimated area 10 feet or less in depth in Section II, complete and attach Form 3200-004A, Large-Scale Treatment Worksheet.

Chemical Aquatic Plant Control Information - Form 3200-004 (R 2/17)

Notice: Use of this form is required by the Department for any application filed pursuant to s. 281.17(2), Wis. Stats., and Chapters NR 107, 200 and 205, Wis. Adm. Code. This permit application is required to request coverage for pollutant discharge into waters of the state. Personally identifiable information on this form may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Is this permit being requested in accordance with an approved Aquatic Plant Management Plan?

◉ *Yes* ○ *No*

Treatment Type:

◉ *Lake* ○ *Pond* ○ *Wetland* ○ *Marina* ○ *Other*

Goal of Aquatic Plant Control:

- ☑ Maintain navigation channel
- ☑ Maintain boat landing and carry in access
- ☐ Improve fish habitat
- ☐ Maintain swimming area
- ☑ Control of invasive exotics
- ☐ Other

Nuisance Caused By:

- ☑ Algae
- ☐ Emergent water plants (majority of leaves & stems growing above water surface, e.g. cattail, bulrushes)
- ☐ Floating water plants (majority of leaves floating on water surface, e.g., water lilies, duckweed)
- ☑ Submerged water plants (leaves & stems below surface, flowering parts may be exposed: milfoil, coontail)
- ☐ Other

List Target Plants

☑ Algae	☐ Flowering Rush	☐ Purple Loosestrife
☐ Common/Glossy Buckthorn	☐ Hybrid Cattail	☐ Reed Canary Grass
☑ Coontail	☑ Hybrid Watermilfoil	☐ Reed Manna Grass
☑ Curly-Leaf Pondweed	☐ Japanese Knotweed	☐ Starry Stonewort
☐ Duckweed	☐ Naiad	☐ Yellow Floating Heart
☑ Elodea	☐ Narrow-Leaf Cattail	☐ Yellow Iris
☑ Eurasian Watermilfoil	☐ Phragmites	☐ Pondweed

Other Target Plants:

Note: Different plants require different chemicals for effective treatment. Do not purchase chemical before identifying plants.

Chemical Control

Full Trade Name of Proposed Chemical(s)

Select Chemical Name: AquaStrike

Select Chemical Name: Aquathol K Aquatic Herbicide

Select Chemical Name: Captain Liquid Copper Algaecide

Select Chemical Name: Clipper SC Aquatic Herbicide

Select Chemical Name: Tribune Herbicide

Select Chemical Name: Weedar 64 Broadleaf Herbicide

Other (not listed above) Other:

Have the proposed chemicals been permitted in a prior year on the proposed site?
◉ *All* ○ *Some* ○ *None*

Method of Application: Injection

What were the results of the treatment?
All have been used in the past for successful control

NOTE: Chemical fact sheets for aquatic pesticides used in Wisconsin are available from the Department of Natural Resources upon request.

Alternatives to Chemical Control:	Feasible?	If NO, Why Not?
1. Mechanical harvesting	◉ Yes ○ No	
2. Manual removal	○ Yes ◉ No	too large an area
3. Sediment screens/covers	○ Yes ○ No	non-target ecosystem damage
4. Dredging	○ Yes ◉ No	not feasible
5. Lake drawdown	○ Yes ◉ No	currently not approved by district members
6. Nutrient controls in watershed	○ Yes ◉ No	not feasible
7. Other:	○ Yes ○ No	

Note: If proposed treatment involves multiple properties, consider feasibility of EACH alternative for EACH property owner.

Will surface water outflow and/or overflow be controlled to prevent chemical loss?
○ *Yes* ◉ *No*

Is the treatment area greater than 5% of surface area?
○ *Yes* ◉ *No*

WPDES Permit Request

Is WPDES coverage being requested? Refer to http://dnr.wi.gov/topic/wastewater/aquaticpesticides.html for more information

- ○ *Yes - complete section VII with signature.*

- ◉ *No*
  - ◉ *Already have WPDES*
  - ○ *WPDES coverage not needed*

Required Attachments and Supplemental Information

Upload Required Attachments (15 MB per file limit) - Help reduce file size and trouble shoot file uploads

* indicates completion of this item is required

Note: To add additional attachments using the down arrow icon. To replace an existing file, use the 'Click here to attach file ' link. To remove additional items, select the item and press CNTRL Delete.

Riparian Owners	File Attachment	WWMD_mailing_list_2020.pdf
Public Notice	File Attachment	WWMD_permit_legal_publication_confirmation_2020.pdf
Large Scale Worksheet	File Attachment	
Site Map	File Attachment	Waterford_AlTreat_2020_DRAFTMAP.pdf
Site Map	File Attachment	Waterford_AlTX_2020_DRAFTMAP.pdf

Fee Calculation

Chemical Control Application

1. s. NR 107.11(1), Wis. Adm. Code lists the conditions under which the permit fee is limited to the $20 minimum charge.
2. s. NR 107.11(4), Wis. Adm. Code, lists the uses that are exempt from permit requirements.
3. s. NR 107.04(2), Wis. Adm. Code, provides for a refund of acreage fees if the permit is denied or if no treatment occurs.

If Proposed treatment is over 0.25, calculate acreage fee: (round up to nearest whole acre, to maximum of 50 acres)	50.00
acres X $25 per acre = $	$1,250.00
If proposed treatment is less than 0.25 acre, acreage fee is $0	
Basic Permit Fee (non-refundable)	$20.00
Total Fee	$1,270

Payment Information

Invoice Number:	WP-00022750
Payment Confirmation Number:	WS2WT3004511564
Amount Paid:	$1,270

Sign and Submit

Applicant Responsibilities and Certification

1 The applicant has prepared a detailed map which shows the length, width and average depth of each area proposed for the control of rooted vegetation and the surface area in acres or square feet for each proposed algae treatment.

2 The applicant understands that the Department of Natural Resources may require supervision of any aquatic plant management project involving chemicals. Under s.NR 107.07 Wis. Adm. Code, supervision may include inspection of the proposed treatment area, chemicals and application equipment before, during or after treatment. The applicant is required to notify the regional office 4 working days in advance of each anticipated treatment with the date, time, location and size of treatment unless the Department waives this requirement. Do you request the Department to waive the advance notification requirement?

○ Yes ◉ No

3 The applicant agrees to comply with all terms or conditions of this permit, if issued, as well as all provisions of Chapter NR 107, Wis. Adm. Code. The required application fee is attached.

4 The applicant will provide a copy of the current application to any affected property owners' association inland Lake District and, in the case of chemical applications for rooted aquatic plants, to all owners of property riparian or adjacent to the treatment area. The applicant has also provided a copy of the current chemical fact sheet for the chemicals proposed for use to any affected property owner's association or inland Lake District.

5 Conditions related to invasive species movement. The applicant and operator agree to the following methods required under s.NR 109.05(2), Wis. Adm. Code for controlling, transporting and disposing of aquatic plants and animals, and moving water:

- Aquatic plants and animals shall be removed and water drained from all equipment as required by s.30.07, Wis. Stats., and ss. NR 19.055 and 40.07, Wis. Adm. Code.
- Operator shall comply with the most recent Department-approved 'Boat, Gear, and Equipment Decontamination and Disinfection Protocol', Manual Code #9183.1, available at http://dnr.wi.gov/topic/invasives/disinfection.html

All portions of this permit, map and accompanying cover letter must be in possession of the chemical applicator at the time of treatment. During treatment all provisions of Chapter NR 107 107.07 and NR 107.08, Wis. Adm. Code, must be complied with, as well as the specific conditions contained in the permit cover letter.

I hereby certify that the above information is true and correct and that copies of the application have been provided to the appropriate parties name in Section II and that the conditions of the permit will be adhered to. All portions of this permit, map and accompanying cover letter must be in possession of the applicant or their agent at time of plant removal. During plant removal activities, all provisions of applicable Wisconsin Administrative Rules must be complied with, as well as the specific conditions contained in the permit cover letter.

Steps to Complete the signature process

IMPORTANT: All email correspondence will be sent to the address associated with your WAMS ID).

1. Read and Accept the Responsibilities and Certification
2. Press the Initiate Signature Process button
3. Open the confirmation email for a one time confirmation code and instructions to complete the signature process.

You will receive a final acknowledgement email upon completing these steps .

☑ Check if you are signing as Agent for Applicant.

i:0#.f|wamsmembership|jscharl signed on 2020-03-27T09...

☑ I hereby certify that the above information is true and correct and that copies of this submittal have been provided to the appropriate parties named in the contact section and that the conditions of the permit and pesticide use will be adhered to.

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R 11/16) Page 1 of 2

Notice: Completion of this form is a condition of the permit and provides records required by WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22). The Department may not issue you future permits unless you complete and submit this form. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Submit this form: **(1) immediately if any unusual circumstances occurred during treatment**
(2) as soon after treatment as possible, no later than 30 days
(3) by October 1 if no treatment occurred

Completion of this form along with the permit satisfies the requirements of WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22).

General Permit Information

Permit Number	Water body Name (including ponds, e.g., Smith Pond)
SE-2020-52-6937	Waterford Waterway / Tichigan Lake / Fox River
County: Racine	Permit Holder Name (Customer Name): Waterford Waterway Management Distri

Permit Holder Address	City	State	Zip Code
415 N Milwaukee St	Waterford	WI	53185

Treatment Information

Treatment Date (mm/dd/yyyy)	Starting Time (24:00 hour)	Ending Time (24:00 hour)	Water Temp		Ambient Air Temp	
5/15/2020	09:15	11:30	57	☐ C ☑ F	60	☐ C ☑ F

Wind Speed (mph)	Wind Direction	Expected Duration of Chemical Residuals
0-3	West	7 day

Adverse Conditions Noted (i.e., dead fish, spawning fish, algae bloom, etc.)

If adverse conditions noted, indicate corrective actions taken

Comments

DRAFT

Onsite Supervision Present?	If Yes, Supervisor Name :
No	

Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)

Private boat launch

☑ Herbicide Treatment and Water Use Restrictions Signs Posted In Accordance With NR 107?

Applicator shall provide each customer with a free copy of each pesticide label used (if requested)

Applicator Information

Individual or Business Name	Telephone xxx -xxx-xxxx
Wisconsin Lake & Pond Resource, LLC	920-872-2032 x

Street Address: N7828 Town Hall Rd

City	State	ZIP Code
Eldorad	WI	54932

Individuals Making Pesticide Application

Last Name	First	Certification #
Scharl	James	Cert: 77803, Lic:224355

Zickert	Cory	Cert: 41446, Lic: 144976

Name of Person Completing Form

James Scharl

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R 11/16)

Date: 5/15/2020

Treatment Site and Chemical Information

Site No	Property Name	Address / Fire No	Treated acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
A-19	Tichigan Lake	Tichigan Lake	5.30	5.30	☐	42.7663	-88.2135

Herbicide Name	EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)
Aquathol K Aquatic Herbicide	70506-176	36.75	gallons	3.61 ppm
Weedar 64 Broadleaf Herbicide	71368-1	16.75	gallons	1.48 ppm

Other (not listed above) Other:

Site No	Property Name	Address / Fire No	Treated acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
AIS ...	Conservancy ...	Conservancy Bay	1.00	1.00	☐	42.7663	-88.2135

Herbicide Name	EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)
Captain Liquid Copper Algaecide	67690-9		gallons	0.111 ppm
Clipper SC Aquatic Herbicide	71368-114	0.25	gallons	0.125 ppm
Tribune Herbicide	100-1390	1	gallons	0.245 ppm

Other (not listed above) Other:

Aquatics at Treatment Site: TS=Target Species SP= Species Present

TS	SP		Site(s)	TS	SP		Site(s)	TS	SP		Site(s)
☐	☐	Cattail		☐	☐	Flat-Stem Pondweed		☐	☐	Richardson Pondweed	
☐	☑	Chara	all	☐	☐	Floating-Leaf Pondweed		☐	☐	Robbins Pondweed	
☐	☑	Coontail	all	☐	☐	Illinois Pondweed		☐	☐	Sago Pondweed	
☑	☐	Curly-Leaf Pondweed	all	☐	☐	Large-Leaf Pondweed		☐	☐	Watershield	
☐	☐	Duckweed		☐	☐	Northern Milfoil		☐	☐	White Water Lily	
☐	☑	Elodea	all	☐	☐	Phragmites		☐	☐	Wild Celery	
☑	☐	Eurasion /hybrid Milfoil	AIS	☐	☐	Planktonic Algae		☐	☐	White-Stem Pondweed	
☐	☑	Filamentous Algae	all	☐	☐	Purple Loosestrife		☐	☐		

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Notice: Completion of this form is a condition of the permit and provides records required by WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22). The Department may not issue you future permits unless you complete and submit this form. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Submit this form: (1) immediately if any unusual circumstances occurred during treatment
(2) as soon after treatment as possible, no later than 30 days
(3) by October 1 if no treatment occurred

Completion of this form along with the permit satisfies the requirements of WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22).

Permit Number	Water body Name (including ponds, e.g., Smith Pond)
SE-2020-52-6937	Waterford Waterway / Tichigan Lake / Fox River
County: Racine	Permit Holder Name (Customer Name): Waterford Waterway Management District

Permit Holder Address	City	State	Zip Code
415 N Milwaukee St	Waterford	WI	53185

Treatment Information

Treatment Date (mm/dd/yyyy)	Starting Time (24:00 hour)	Ending Time (24:00 hour)	Water Temp		Ambient Air Temp	
6/3/2020	08:45	17:45	72	☐ C ☑ F	70	☐ C ☑ F

Wind Speed (mph)	Wind Direction	Expected Duration of Chemical Residuals
3-5	North West	5 days

Adverse Conditions Noted (i.e., dead fish, spawning fish, algae bloom, etc.)

If adverse conditions noted, indicate corrective actions taken

Comments

Onsite Supervision by DATCP and/or DNR Staff: ○ Yes ◉ No — If Yes, Supervisor Name :

Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)

private boat launch

Water User Restriction

☐ No Restrictions ☐ Consuming Fish ☑ Pet/Livestock Water ☑ Irrigation (Crop)
☐ Swimming ☑ Drinking Water ☑ Irrigation Other: _____

☑ Herbicide Treatment and Water Use Restrictions Signs Posted In Accordance With NR 107 and ATCP 29.22?

Applicator shall provide each customer with a free copy of each pesticide label used (if requested)

Applicator Information

Individual or Business Name	Telephone xxx -xxx-xxxx
Wisconsin Lake & Pond Resource, LLC	920-872-2032 x

Street Address
N7828 Town Hall Rd

City	State	ZIP Code
Eldorad0	WI	54932

Individuals Making or Supervising Pesticide Application

Last Name	First	Certification #	License #
scharl	james	77803	224355
sabel	tyler	509-T	491499

Name of Person Completing Form

James Scharl

Date: 6/3/2020

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Site No	Property Name	Address / Fire No	Treated acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
Nav	Lanes	n/a	26.60	42.08	☐	42.7663	-88.2135

Herbicide Name	EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)
Captain Liquid Copper Algaecide	67690-9	24	gallons	0.111 ppm
Clipper SC Aquatic Herbicide	71368-114	6	gallons	0.125 ppm
Tribune Herbicide	100-1390	24	gallons	0.245 ppm

Other (not listed above) Other:

TS	SP		Site(s)	TS	SP		Site(s)	TS	SP		Site(s)
☐	☐	Cattail		☐	☐	Flat-Stem Pondweed		☐	☐	Richardson Pondweed	
☐	☑	Chara		☐	☐	Floating-Leaf Pondweed		☐	☐	Robbins Pondweed	
☑	☐	Coontail		☐	☐	Illinois Pondweed		☐	☐	Sago Pondweed	
☑	☐	Curly-Leaf Pondweed		☐	☐	Large-Leaf Pondweed		☐	☐	Watershield	
☐	☑	Duckweed		☐	☐	Northern Milfoil		☐	☑	White Water Lily	
☑	☐	Elodea		☐	☐	Phragmites		☐	☐	Wild Celery	
☑	☐	Eurasion /hybrid Milfoil		☐	☐	Planktonic Algae		☐	☐	White-Stem Pondweed	
☐	☑	Filamentous Algae		☐	☐	Purple Loosestrife		☐	☐		

Required Attachments and Supplemental Information

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Site Map File Attachment

Treatment Plan File Attachment

Fee Calculation

Chemical Treatment Record

No additional payment required for submitting treatment records.

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Notice: Completion of this form is a condition of the permit and provides records required by WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22). The Department may not issue you future permits unless you complete and submit this form. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Submit this form: (1) immediately if any unusual circumstances occurred during treatment
(2) as soon after treatment as possible, no later than 30 days
(3) by October 1 if no treatment occurred

Completion of this form along with the permit satisfies the requirements of WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22).

Permit Number	Water body Name (including ponds, e.g., Smith Pond)
SE-2020-52-6937	Waterford Waterway / TIchigan Lake / Fox River
County: Racine	Permit Holder Name (Customer Name): Waterford Waterway Management District

Permit Holder Address	City	State	Zip Code
415 N Milwaukee St	Waterford	WI	53185

Treatment Information

Treatment Date (mm/dd/yyyy)	Starting Time (24:00 hour)	Ending Time (24:00 hour)	Water Temp		Ambient Air Temp	
6/4/2020	10:30	14:30	78	☐ C ☑ F	80	☐ C ☑ F

Wind Speed (mph)	Wind Direction	Expected Duration of Chemical Residuals
4-7	North	5 days

Adverse Conditions Noted (i.e., dead fish, spawning fish, algae bloom, etc.)

If adverse conditions noted, indicate corrective actions taken

Comments

Onsite Supervision by DATCP and/or DNR Staff: ○ Yes ◉ No — If Yes, Supervisor Name :

Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)

Water User Restriction

☐ No Restrictions ☐ Consuming Fish ☑ Pet/Livestock Water ☑ Irrigation (Crop)
☐ Swimming ☑ Drinking Water ☑ Irrigation Other: _____

☑ Herbicide Treatment and Water Use Restrictions Signs Posted In Accordance With NR 107 and ATCP 29.22?

Applicator shall provide each customer with a free copy of each pesticide label used (if requested)

Applicator Information

Individual or Business Name	Telephone xxx -xxx-xxxx
Wisconsin Lake & Pond Resource, LLC	920-872-2032 x

Street Address		
N7828 Town Hall Rd		
City	**State**	**ZIP Code**
Eldorad	WI	54932

Individuals Making or Supervising Pesticide Application	Last Name	First	Certification #	License #
	Scharl	James	77803	224355

Name of Person Completing Form: James Scharl

Date: 6/4/2020

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Site No	Property Name	Address / Fire No	Treated acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
lan...	n/a	n/a	6.60	42.80	☐	42.7663	-88.2135

Herbicide Name	EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)
Captain Liquid Copper Algaecide	67690-9	5	gallons	0.111 ppm
Clipper SC Aquatic Herbicide	71368-114	1.25	gallons	0.125 ppm
Tribune Herbicide	100-1390	5	gallons	0.245 ppm

Other (not listed above) Other:

TS	SP		Site(s)	TS	SP		Site(s)	TS	SP		Site(s)
☐	☐	Cattail		☐	☐	Flat-Stem Pondweed		☐	☐	Richardson Pondweed	
☐	☑	Chara		☐	☐	Floating-Leaf Pondweed		☐	☐	Robbins Pondweed	
☑	☐	Coontail		☐	☐	Illinois Pondweed		☐	☐	Sago Pondweed	
☑	☐	Curly-Leaf Pondweed		☐	☐	Large-Leaf Pondweed		☐	☐	Watershield	
☐	☑	Duckweed		☐	☐	Northern Milfoil		☐	☑	White Water Lily	
☑	☐	Elodea		☐	☐	Phragmites		☐	☐	Wild Celery	
☑	☐	Eurasion /hybrid Milfoil		☐	☐	Planktonic Algae		☐	☐	White-Stem Pondweed	
☐	☑	Filamentous Algae		☐	☐	Purple Loosestrife		☐	☐		

Required Attachments and Supplemental Information

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Site Map File Attachment

Treatment Plan File Attachment

Fee Calculation

Chemical Treatment Record

No additional payment required for submitting treatment records.

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Notice: Completion of this form is a condition of the permit and provides records required by WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22). The Department may not issue you future permits unless you complete and submit this form. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law [ss. 19.31-19.39, Wis. Stats.].

Submit this form: (1) immediately if any unusual circumstances occurred during treatment
(2) as soon after treatment as possible, no later than 30 days
(3) by October 1 if no treatment occurred

Completion of this form along with the permit satisfies the requirements of WDNR (NR 107) and DATCP (ATCP 29.21 and 29.22).

Permit Number	Water body Name (including ponds, e.g., Smith Pond)
SE-2020-52-6937	Waterford Waterway / Fox River/ Tichigan Lake
County: Racine	Permit Holder Name (Customer Name): Waterford Waterway Management District

Permit Holder Address	City	State	Zip Code
415 N Milwaukee St	Waterford	WI	53185

Treatment Information

Treatment Date (mm/dd/yyyy)	Starting Time (24:00 hour)	Ending Time (24:00 hour)	Water Temp		Ambient Air Temp	
7/1/2020	09:00	16:00	81	☐ C ☑ F	86	☐ C ☑ F

Wind Speed (mph)	Wind Direction	Expected Duration of Chemical Residuals
3-5	South West	5 days

Adverse Conditions Noted (i.e., dead fish, spawning fish, algae bloom, etc.)

If adverse conditions noted, indicate corrective actions taken

Comments

Onsite Supervision by DATCP and/or DNR Staff: ○ Yes ◉ No — If Yes, Supervisor Name :

Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)

Water User Restriction

☐ No Restrictions ☐ Consuming Fish ☑ Pet/Livestock Water ☑ Irrigation (Crop)
☐ Swimming ☑ Drinking Water ☑ Irrigation Other: _____

☑ Herbicide Treatment and Water Use Restrictions Signs Posted In Accordance With NR 107 and ATCP 29.22?

Applicator shall provide each customer with a free copy of each pesticide label used (if requested)

Applicator Information

Individual or Business Name	Telephone xxx -xxx-xxxx
Wisconsin Lake & Pond Resource, LLC	920-872-2032 x

Street Address: N7828 Town Hall Rd

City	State	ZIP Code
Eldorad	WI	54932

Individuals Making or Supervising Pesticide Application

Last Name	First	Certification #	License #
scharl	james	77803	224355
schmitz	jayden	102975	323324

Name of Person Completing Form

James Scharl

Date: 7/1/2020

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Site No	Property Name	Address / Fire No	Treated acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
lan...	n/a	n/a	20.60	42.80	☐	42.7663	-88.2135

Herbicide Name	EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)
Captain Liquid Copper Algaecide	67690-9	17	gallons	0.111 ppm
Clipper SC Aquatic Herbicide	71368-114	4.25	gallons	0.125 ppm
Tribune Herbicide	100-1390	17	gallons	0.245 ppm

Other (not listed above) Other:

TS	SP		Site(s)	TS	SP		Site(s)	TS	SP		Site(s)
☐	☐	Cattail		☐	☐	Flat-Stem Pondweed		☐	☐	Richardson Pondweed	
☐	☑	Chara		☐	☐	Floating-Leaf Pondweed		☐	☐	Robbins Pondweed	
☑	☐	Coontail		☐	☐	Illinois Pondweed		☐	☐	Sago Pondweed	
☑	☐	Curly-Leaf Pondweed		☐	☐	Large-Leaf Pondweed		☐	☐	Watershield	
☐	☑	Duckweed		☐	☐	Northern Milfoil		☐	☑	White Water Lily	
☑	☐	Elodea		☐	☐	Phragmites		☐	☐	Wild Celery	
☑	☐	Eurasion /hybrid Milfoil		☐	☐	Planktonic Algae		☐	☐	White-Stem Pondweed	
☐	☑	Filamentous Algae		☐	☐	Purple Loosestrife		☐	☐		

Required Attachments and Supplemental Information

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Site Map File Attachment

Treatment Plan File Attachment

Fee Calculation

Chemical Treatment Record

No additional payment required for submitting treatment records.

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

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Submit this form: (1) immediately if any unusual circumstances occurred during treatment
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Permit Number	Water body Name (including ponds, e.g., Smith Pond)
SE-2020-52-6937	Waterford Waterway - tichigan lake / fox river
County: Racine	Permit Holder Name (Customer Name): Waterford Waterway Management District

Permit Holder Address	City	State	Zip Code
415 N Milwaukee St	Waterford	WI	53185

Treatment Information

Treatment Date (mm/dd/yyyy)	Starting Time (24:00 hour)	Ending Time (24:00 hour)	Water Temp	☐ C ☑ F	Ambient Air Temp	☐ C ☑ F
8/3/2020	09:30	15:45	77		70	

Wind Speed (mph)	Wind Direction	Expected Duration of Chemical Residuals
5-10	North East	5 days

Adverse Conditions Noted (i.e., dead fish, spawning fish, algae bloom, etc.)

If adverse conditions noted, indicate corrective actions taken

Comments

Onsite Supervision by DATCP and/or DNR Staff: ○ Yes ◉ No — If Yes, Supervisor Name :

Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)

private boat launch

Water User Restriction

☐ No Restrictions ☐ Consuming Fish ☑ Pet/Livestock Water ☑ Irrigation (Crop)
☐ Swimming ☑ Drinking Water ☑ Irrigation Other: _____

☑ Herbicide Treatment and Water Use Restrictions Signs Posted In Accordance With NR 107 and ATCP 29.22?

Applicator shall provide each customer with a free copy of each pesticide label used (if requested)

Applicator Information

Individual or Business Name	Telephone xxx -xxx-xxxx
Wisconsin Lake & Pond Resource, LLC	920-872-2032 x

Street Address: N7828 Town Hall Rd

City	State	ZIP Code
Eldorad	WI	54932

Individuals Making or Supervising Pesticide Application

Last Name	First	Certification #	License #
scharl	james	77803	224355
sabel	tyler	509-T	491499

Name of Person Completing Form

James Scharl

Date: 8/3/2020

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Site No	Property Name	Address / Fire No	Treated acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
La...	varies	N/A	14.10	42.80	☐	42.7663	-88.2135

Herbicide Name	EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)
Captain Liquid Copper Algaecide	67690-9	12.5	gallons	0.111 ppm
Clipper SC Aquatic Herbicide	71368-114	3.125	gallons	0.125 ppm
Tribune Herbicide	100-1390	12.5	gallons	0.245 ppm

Other (not listed above) Other:

TS	SP		Site(s)	TS	SP		Site(s)	TS	SP		Site(s)
☐	☐	Cattail		☐	☑	Flat-Stem Pondweed		☐	☐	Richardson Pondweed	
☐	☑	Chara		☐	☐	Floating-Leaf Pondweed		☐	☐	Robbins Pondweed	
☑	☐	Coontail		☐	☐	Illinois Pondweed		☐	☐	Sago Pondweed	
☑	☐	Curly-Leaf Pondweed		☐	☐	Leafy Pondweed		☐	☐	Watershield	
☐	☑	Duckweed		☐	☐	Northern Milfoil		☐	☑	White Water Lily	
☑	☐	Elodea		☐	☐	Phragmites		☐	☐	Wild Celery	
☑	☐	Eurasion /hybrid Milfoil		☐	☐	Planktonic Algae		☐	☐	White-Stem Pondweed	
☐	☑	Filamentous Algae		☐	☐	Purple Loosestrife		☐	☐		

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Treatment Plan File Attachment

Fee Calculation

Chemical Treatment Record

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State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Aquatic Plant Management Herbicide Treatment Record

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Permit Number	Water body Name (including ponds, e.g., Smith Pond)
SE-2020-52-6937	Waterford Waterway - Tichigan Lake / Fox River
County: Racine	Permit Holder Name (Customer Name): Waterford Waterway Management District

Permit Holder Address	City	State	Zip Code
415 N Milwaukee St	Waterford	WI	53185

Treatment Information

Treatment Date (mm/dd/yyyy)	Starting Time (24:00 hour)	Ending Time (24:00 hour)	Water Temp		Ambient Air Temp	
9/2/2020	09:00	15:30	76	☐ C ☑ F	80	☐ C ☑ F

Wind Speed (mph)	Wind Direction	Expected Duration of Chemical Residuals
5	West	5 days

Adverse Conditions Noted (i.e., dead fish, spawning fish, algae bloom, etc.)

If adverse conditions noted, indicate corrective actions taken

Comments

Onsite Supervision by DATCP and/or DNR Staff: ○ Yes ◉ No — If Yes, Supervisor Name :

Mixing and Loading Site Location (if other than business site or from prepackaged retail container or applied with equipment with a total capacity of not more than 5 gallons liquid or 50 pounds dry)

Water User Restriction

☐ No Restrictions ☐ Consuming Fish ☑ Pet/Livestock Water ☑ Irrigation (Crop)
☐ Swimming ☑ Drinking Water ☑ Irrigation Other: _____

☑ Herbicide Treatment and Water Use Restrictions Signs Posted In Accordance With NR 107 and ATCP 29.22?

Applicator shall provide each customer with a free copy of each pesticide label used (if requested)

Applicator Information

Individual or Business Name	Telephone xxx -xxx-xxxx
Wisconsin Lake & Pond Resource, LLC	920-872-2032 x

Street Address
N7828 Town Hall Rd

City	State	ZIP Code
Eldorad	WI	54932

Individuals Making or Supervising Pesticide Application

Last Name	First	Certification #	License #
scharl	james	77803	224355
lorge	nicholas	105360	471821

Name of Person Completing Form

James Scharl

Date: 9/2/2020

Aquatic Plant Management Herbicide Treatment Record

Form 3200-111 (R4/20)

Site No	Property Name	Address / Fire No	Treated acreage	Permitted Acreage	Sensitive Area?	Latitude	Longitude
La...	varies	varies	12.10	42.80	☐	42.7663	-88.2135

Herbicide Name	EPA Reg. No.	Amount Applied	Units	Application Concentration Rate (mg/l = ppm)
Captain Liquid Copper Algaecide	67690-9	10	gallons	0.111 ppm
Clipper SC Aquatic Herbicide	71368-114	2.5	gallons	0.125 ppm
Tribune Herbicide	100-1390	10	gallons	0.245 ppm

Other (not listed above) Other:

TS	SP		Site(s)	TS	SP		Site(s)	TS	SP		Site(s)
☐	☐	Cattail		☐	☑	Flat-Stem Pondweed		☐	☐	Richardson Pondweed	
☐	☑	Chara		☐	☐	Floating-Leaf Pondweed		☐	☐	Robbins Pondweed	
☑	☐	Coontail		☐	☐	Illinois Pondweed		☐	☐	Sago Pondweed	
☑	☐	Curly-Leaf Pondweed		☐	☐	Leafy Pondweed		☐	☐	Watershield	
☐	☑	Duckweed		☐	☐	Northern Milfoil		☐	☑	White Water Lily	
☑	☐	Elodea		☐	☐	Phragmites		☐	☐	Wild Celery	
☑	☐	Eurasion /hybrid Milfoil		☐	☐	Planktonic Algae		☐	☐	White-Stem Pondweed	
☐	☑	Filamentous Algae		☐	☐	Purple Loosestrife		☐	☐		

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Site Map File Attachment

Treatment Plan File Attachment

Fee Calculation

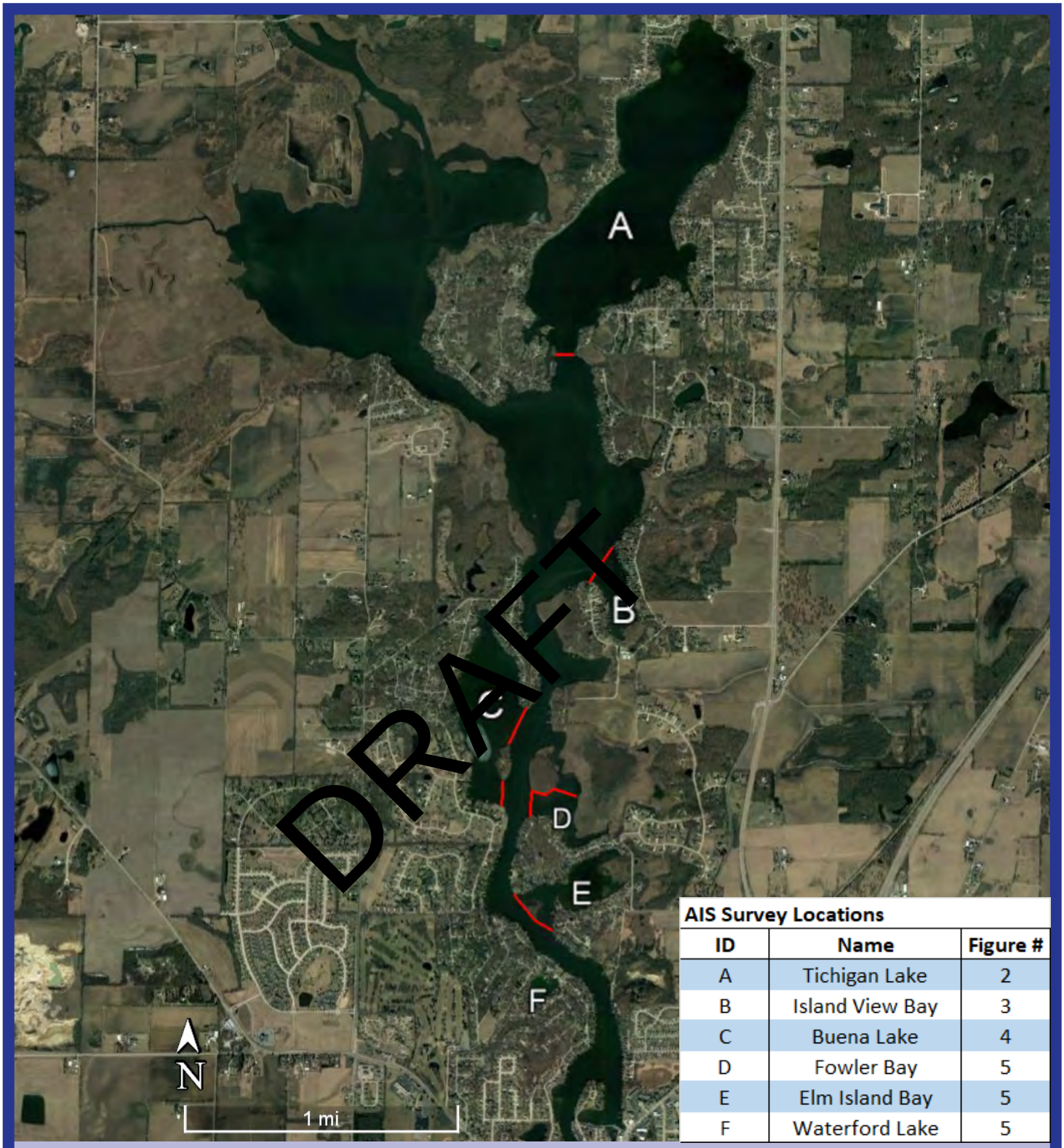
Chemical Treatment Record

No additional payment required for submitting treatment records.

Attachment B: Figures

Toll Free: 866-208-0724
www.wisconsinlpr.com

N7828 Town Hall Rd.
Eldorado, WI 54932
Phone: (920) 872-2032
Fax: (920) 872-2036



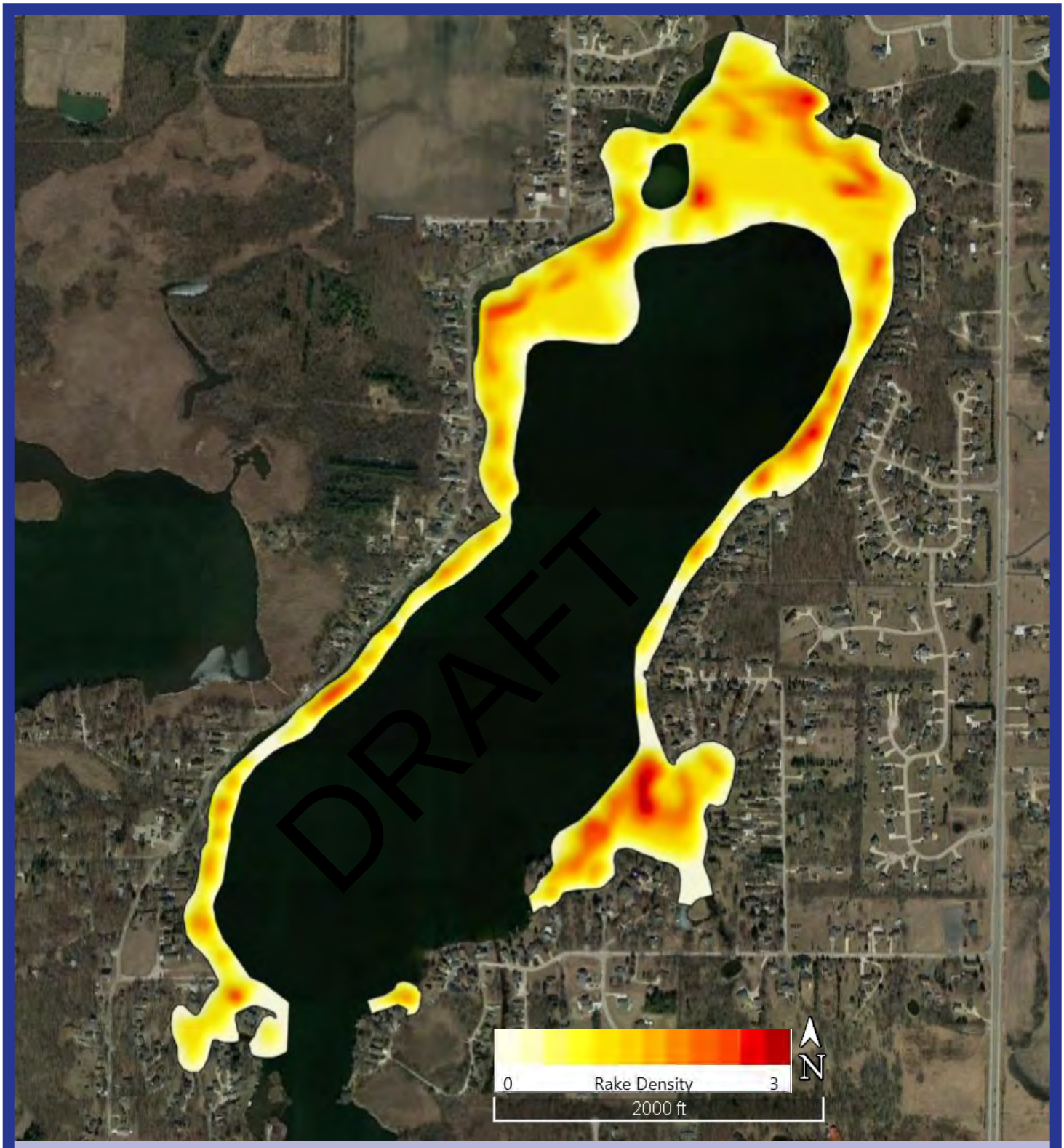
AIS Survey Locations		
ID	Name	Figure #
A	Tichigan Lake	2
B	Island View Bay	3
C	Buena Lake	4
D	Fowler Bay	5
E	Elm Island Bay	5
F	Waterford Lake	5

Waterford Waterway - AIS Survey Locations

Locations outside those indicated here were not directly surveyed for presence of AIS

Wisconsin Lake & Pond Resource LLC
"Providing Professional Resources for Management of Your Lake or Pond"
www.WisconsinLPR.com (920) 872-2032

Waterford Waterway, Racine Co.
Surveyed: October 9, 20202
Figure 1

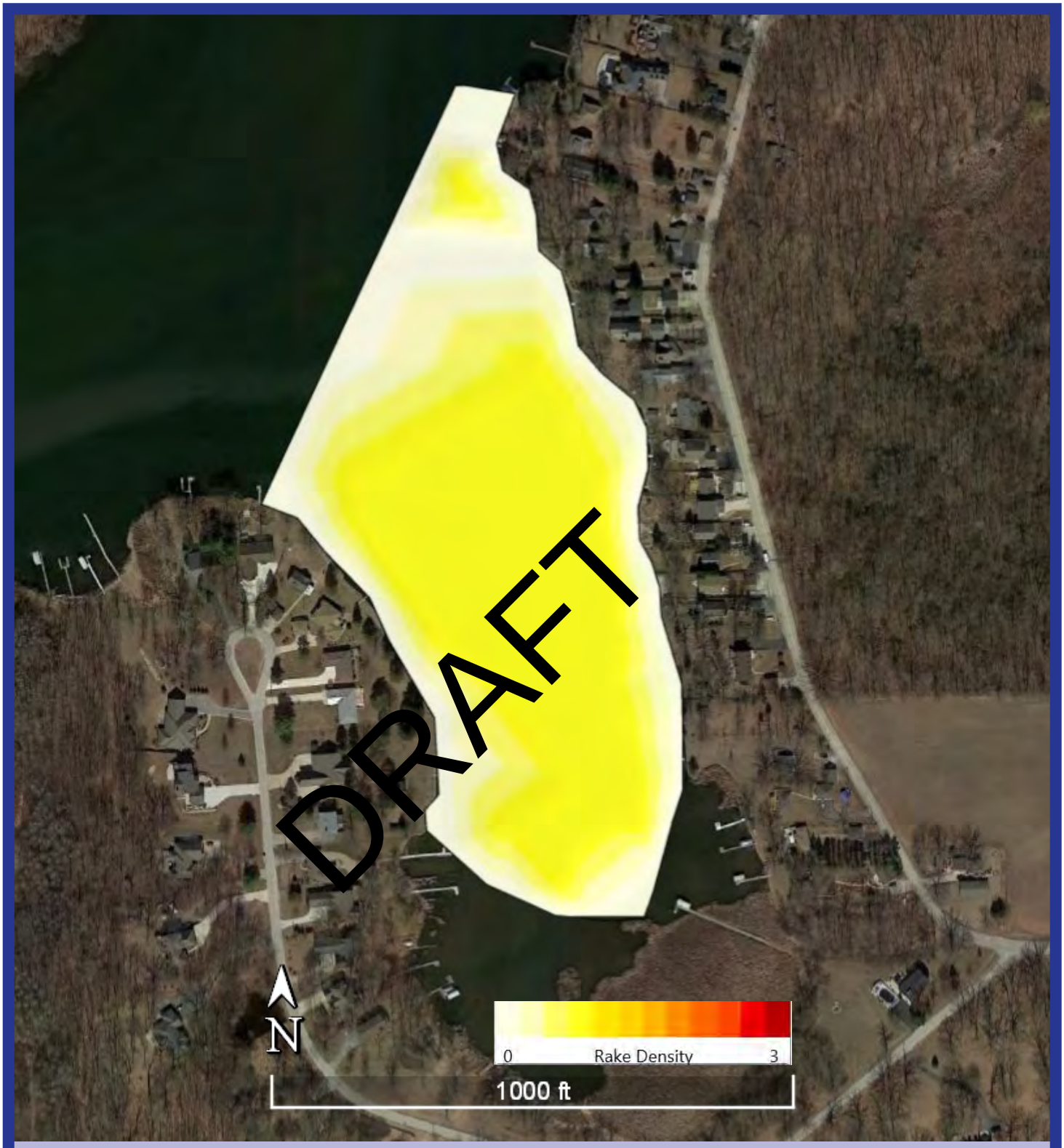


Tichigan Lake - Eurasian Watermilfoil Locations

Locations outside those indicated here were not directly surveyed for presence of AIS

Wisconsin Lake & Pond Resource LLC
"Providing Professional Resources for Management of Your Lake or Pond"
www.WisconsinLPR.com (920) 872-2032

Waterford Waterway, Racine Co.
Surveyed: October 9, 20202
Figure 2

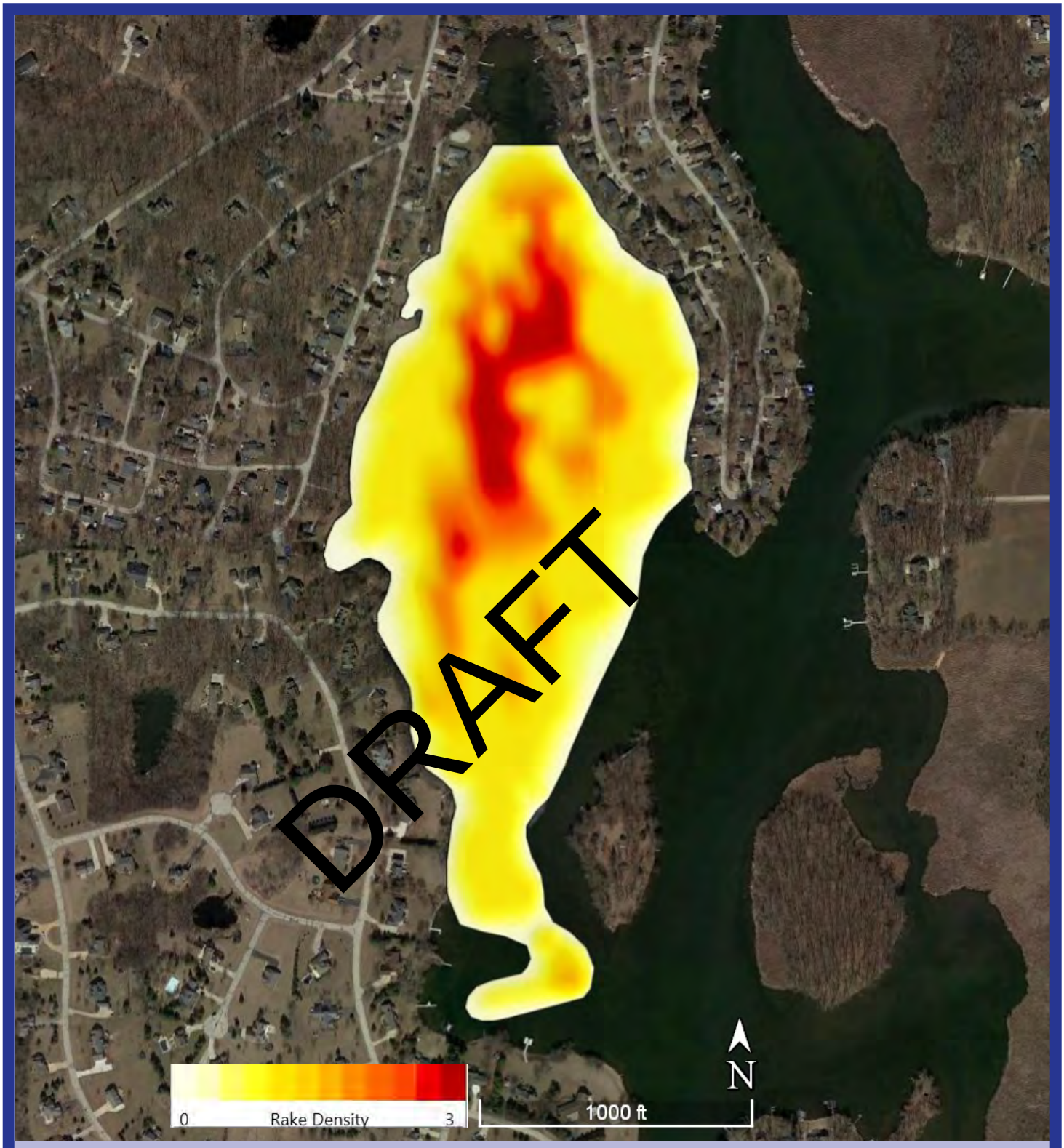


Island View Bay - Eurasian Watermilfoil Locations

Locations outside those indicated here were not directly surveyed for presence of AIS

Wisconsin Lake & Pond Resource LLC
"Providing Professional Resources for Management of Your Lake or Pond"
www.WisconsinLPR.com (920) 872-2032

Waterford Waterway, Racine Co.
Surveyed: October 9, 20202
Figure 3

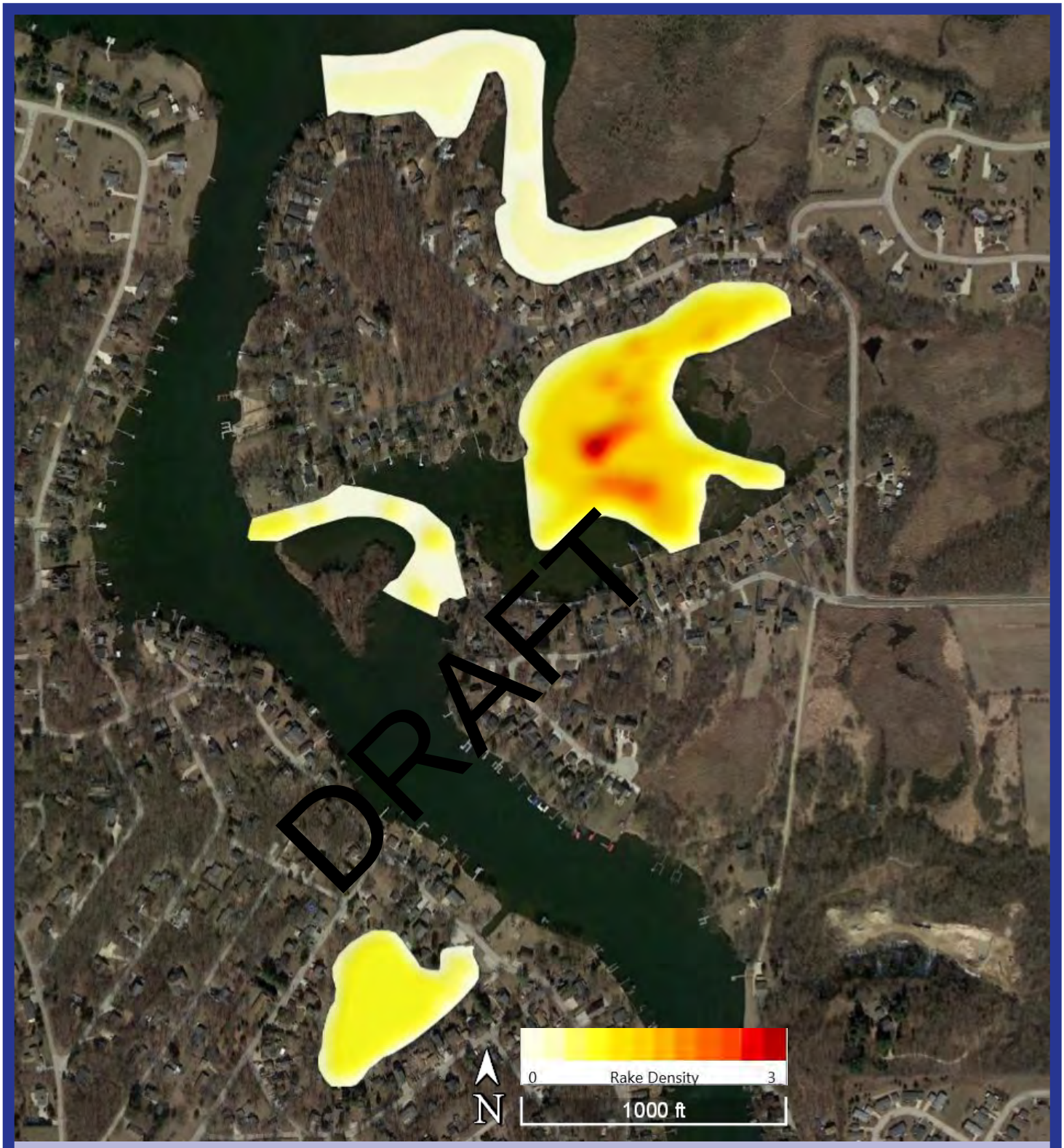


Buena Lake - Eurasian Watermilfoil Locations

Locations outside those indicated here were not directly surveyed for presence of AIS

Wisconsin Lake & Pond Resource LLC
"Providing Professional Resources for Management of Your Lake or Pond"
www.WisconsinLPR.com (920) 872-2032

Waterford Waterway, Racine Co.
Surveyed: October 9, 20202
Figure 4



Fowler Bay, Elm Island Bay, & Waterford Lake Eurasian Watermilfoil Locations

Wisconsin Lake & Pond Resource LLC
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Waterford Waterway, Racine Co.
Surveyed: October 9, 20202
Figure 5

AQUATIC PLANT SURVEY RESULTS

To survey the aquatic plant community of Buena Lake, a subset of 66 sampling locations from the Waterford Waterway whole-lake point-intercept survey (63-meter spacing) were used. Point-intercept surveys were completed on Buena Lake on August 13, 2012 by the Wisconsin Department of Natural Resources (WDNR), and August 27, 2018 and August 26, 2019 by Onterra.

The frequency of occurrence of all aquatic plants (both native and non-native species) in Buena Lake, or the percentage of sampling locations containing aquatic plants, increased from 41% in 2012 to 86% and 89% in 2018 and 2019, respectively (Figures 1 and 2). This represents a statistically valid (Chi-Square $\alpha = 0.05$) increase in vegetation occurrence of 110-120% between the 2012 and 2018/19 surveys.

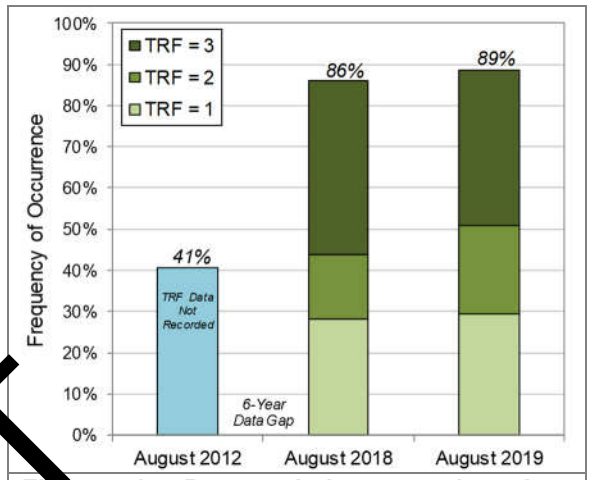

Figure 1. Buena Lake aquatic plant frequency of occurrence and total rake fullness (TRF) ratings. Note: TRF ratings not recorded in 2012.

Total rake fullness (TRF) ratings, a measure of aquatic plant abundance on the sampling rake, was not recorded during the 2012 survey. In 2018 and 2019, approximately 58% and 59% of the sampling locations had a TRF rating of 2 or 3, respectively, indicating high aquatic plant biomass in Buena Lake in both years (Figures 1 and 2). During the 2012 point-intercept survey on Buena Lake, aquatic plants were primarily found in shallower, near-shore areas of the lake, while the deeper areas lacked vegetation (Figure 2). In 2018 and 2019, aquatic plant growth was abundant across all depths, even in the deepest areas of 4-5 feet.

One of the main reasons for conducting another point-intercept survey on Buena Lake in 2019 was to reassess the non-native plant populations of Eurasian watermilfoil (*Myriophyllum spicatum*; EWM) and curly-leaf pondweed (*Potamogeton crispus*; CLP), as members of the Waterford Waterway Management District raised concerns that populations these species may have increased in Buena Lake. In 2012, EWM had a frequency of occurrence of 12%, and in 2018 its occurrence was relatively similar at 8% (Figures 3 and 4). However, in 2019, the frequency of occurrence of EWM had increased markedly to 62%, a statistically valid increase in occurrence of 675% when compared to 2018. Despite the increase in EWM occurrence in 2019, the number of sampling locations containing native vegetation remained the same as that recorded in 2018 (Figure 3).

Long-term aquatic plant data collected by the WDNR and Onterra on lakes across Wisconsin show that EWM populations have the capacity to fluctuate widely in occurrence from year to year. While it is not known what conditions favored the rapid expansion of the EWM population in Buena Lake in 2019, it is not unprecedented. While the occurrence of EWM was high in Buena Lake in 2019, this is not an indication that its occurrence will remain high in future years. Large declines in EWM occurrence have been recorded on other Wisconsin lakes despite no management actions occurring. Variation in EWM occurrence from year to year appears to be the norm in most unmanaged populations that have been assessed over time.

A point-intercept survey was also completed on Buena Lake on June 24, 2019 to assess the lake's population of CLP when it was at or near its peak growth. Unlike most aquatic plants, CLP reaches its peak growth early in the summer before naturally senescing (dying back) by early July. The June 2019 survey found that Buena Lake also supports a relatively large CLP population, with 23% of the sampling locations containing CLP (Figure 5). While the CLP population is relatively high early in the summer, the population dies back quickly by early July and was not attributing to excessive aquatic plant growth in Buena Lake like coontail, common waterweed, and EWM. Comparison of the June 2019 CLP data to the August datasets is not appropriate as most of the CLP population had already senesced by these late-summer surveys.

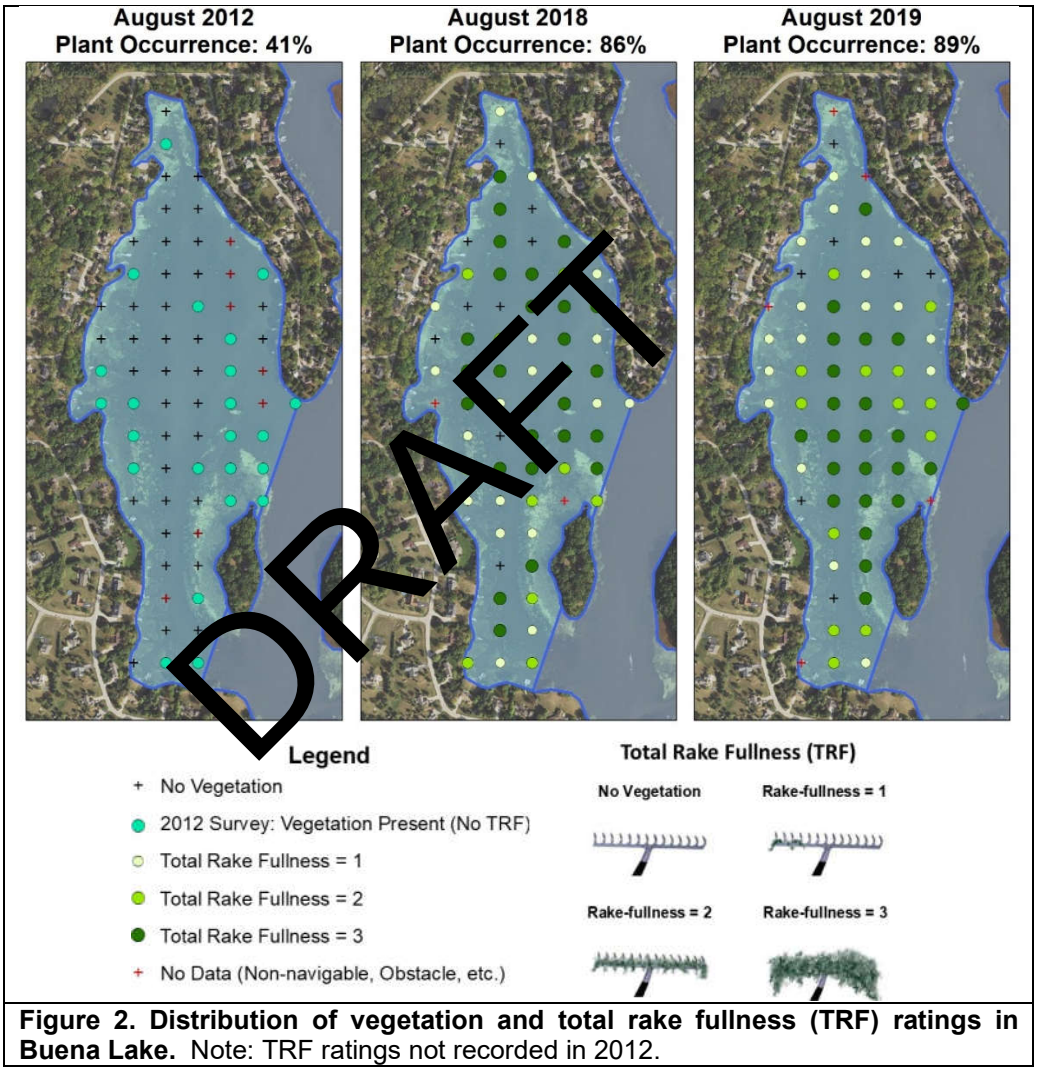

Figure 2. Distribution of vegetation and total rake fullness (TRF) ratings in Buena Lake. Note: TRF ratings not recorded in 2012.

Unlike EWM, the dominant native aquatic plants in Buena Lake, coontail and common waterweed, had similar frequencies of occurrence in August 2018 and 2019 (Figure 6). However, the occurrences of coontail and common waterweed were approximately 165% and 800% higher, respectively, in 2018 and 2019 when compared to their occurrences in 2012. The occurrences of the free-floating species lesser duckweed and watermeal species (spp.) increased by 150% and 63% between August 2018 and 2019, respectively. Colonies of duckweed and watermeal tend to form within quiet water areas created when submersed plants mat on the water's surface, and the increased occurrence of these free-floating species

in 2019 may be an indication that there was more surface matting by submersed plants when compared to 2018. Like EWM, long-term studies of plant communities in lakes in Wisconsin reveal that the occurrence of native species are often dynamic from year to year and over longer periods of time.

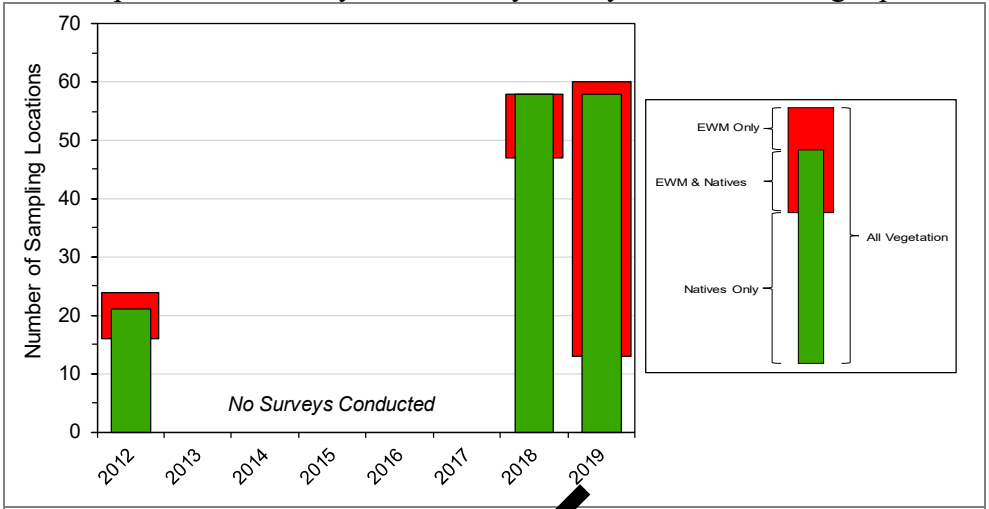

Figure 3. Buena Lake EWM frequency of occurrence and rake fullness (RF) ratings.

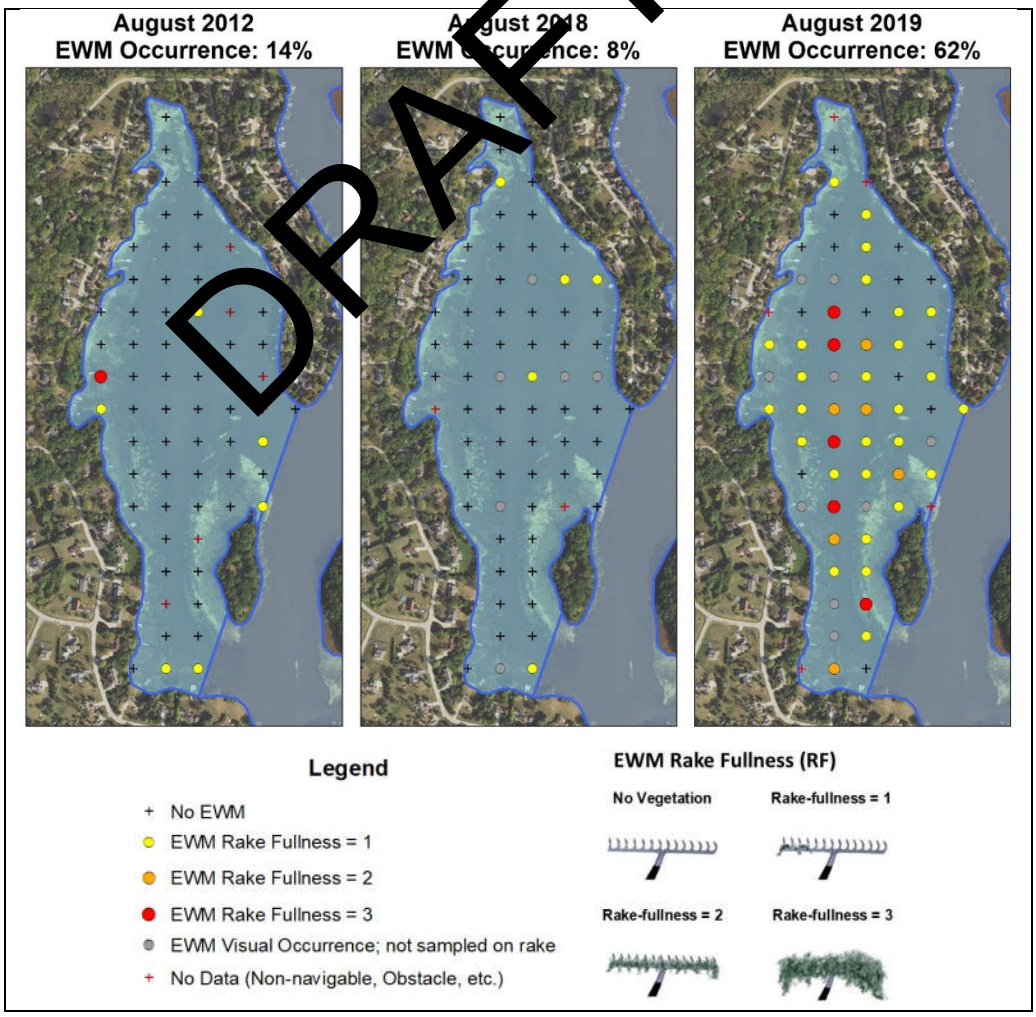

Figure 4. Distribution and rake fullness (RF) ratings of EWM in Buena Lake.

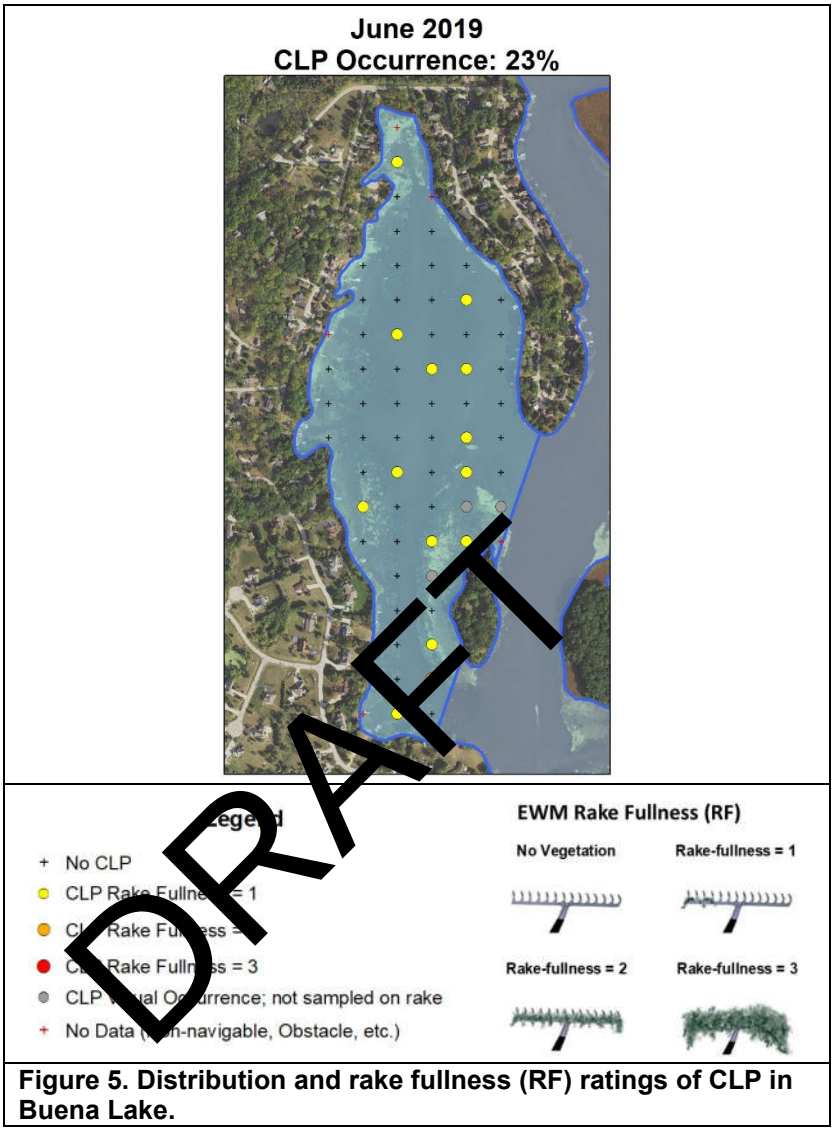

Figure 5. Distribution and rake fullness (RF) ratings of CLP in Buena Lake.

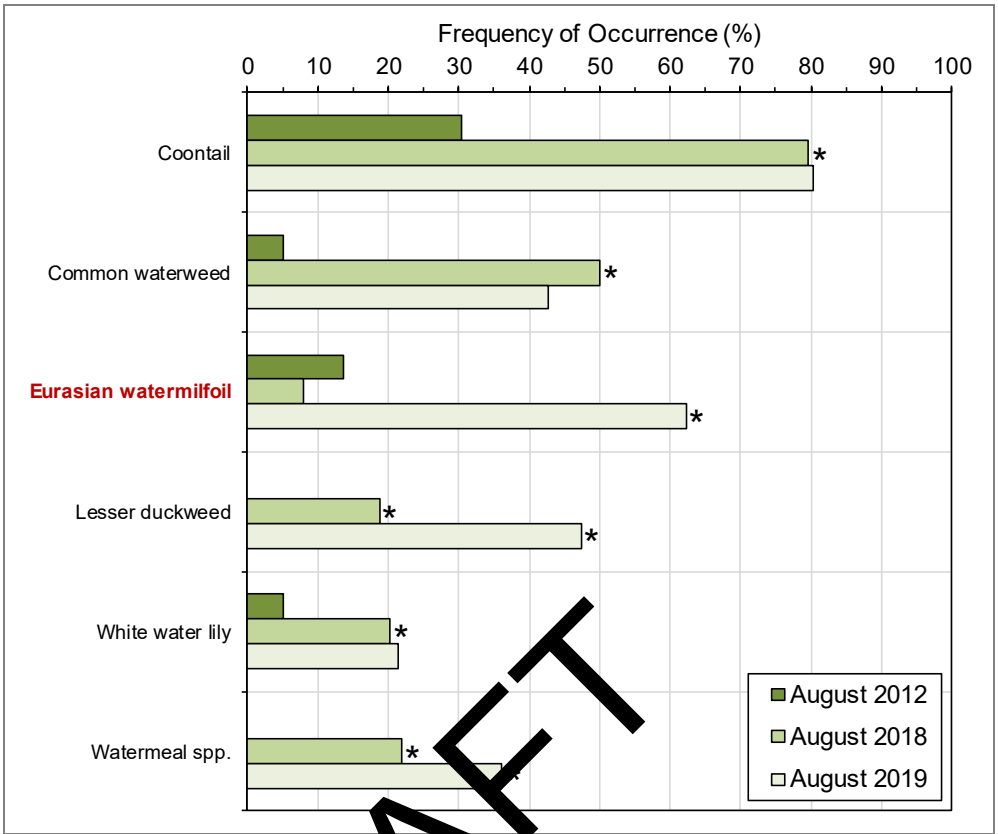

Figure 6. Buena Lake frequencies of occurrence of dominant aquatic plant species. * = statistically valid change in occurrence from previous survey (Chi-Square α = 0.05).

CONCLUSIONS AND DISCUSSION

In 2019, the WWMD believed that populations of aquatic invasive plants had increased in Buena Lake. To quantitatively assess their populations, early- and late-summer point-intercept surveys were completed in Buena Lake in 2019. While historical early-summer point-intercept data are not available to compare changes in the CLP population over time, the June 2019 point-intercept data indicate that Buena Lake supports a relatively large CLP population with a frequency of occurrence of 23%. However, most of the population naturally dies back by early July and the CLP population is not to be a contributor to the nuisance levels of aquatic plant growth observed in Buena Lake throughout the growing season; therefore, treatment of CLP, other than in established navigation lanes, is not recommended.

The August 2019 point-intercept survey data collected from Buena Lake indicated that EWM had increased significantly since 2018. Eurasian watermilfoil increased in occurrence from 8% in 2018 to 62% in 2019, an increase of 675%. In 2019, coontail and common waterweed were the most frequently encountered native aquatic plant species, and along with EWM, were contributing to the surface-matted vegetation growth causing nuisance conditions in Buena Lake.

The point-intercept survey data from Buena Lake indicate that aquatic plant abundance can be highly variable from year to year. While EWM increased markedly in Buena Lake in 2019, it cannot be said if this large population will be maintained in years to come or if the population will decline naturally. Data

from other lakes in Wisconsin indicate that EWM has the capacity to fluctuate widely in occurrence from year to year, including exhibiting large declines despite no management action (e.g., herbicide treatment) occurring.

While the initial reaction to this large increase in EWM may be to conduct a basin-wide herbicide treatment on Buena Lake in 2020, a few considerations need to be taken into account. First, the adequate herbicide concentration and exposure time required to cause EWM mortality may be difficult to achieve in Buena Lake given the higher rate of water exchange with the Fox River. Failing to achieve the necessary concentration and exposure time would injure the EWM plants, resulting in seasonal and not long-term control. Second, if the necessary concentration and exposure time are attained and the EWM population is successfully controlled, the remaining native plant populations of coontail and common waterweed would still create the surface-matted nuisance conditions in Buena Lake making navigation difficult. The WWMD would still need to employ their herbicide application strategy to create navigational lanes in Buena Lake. And third, it is possible that the EWM population may decline naturally on its own as discussed previously.

Within the *Waterford Waterway Comprehensive Management Plan* currently in its final development, the WWMD will consider utilizing winter water level drawdown as a management tool to control EWM within the Waterford Waterway if the EWM population reaches or exceeds a system-wide littoral frequency of occurrence of 30%. The system-wide point-intercept survey completed in 2018 revealed EWM had a littoral frequency of occurrence of approximately 11%. Given the increase in EWM occurrence documented in Buena Lake in 2019, it is possible the EWM population increased system-wide.

To determine if EWM has increased system-wide, it is recommended that the WWMD consider conducting another system-wide point-intercept survey in 2020. If the system-wide littoral frequency of occurrence of EWM is 30% or greater, the WWMD could consider implementing a winter water level drawdown in 2020/21. Or given EWM populations can be highly variable over time, the WWMD could elect to conduct another system-wide point-intercept survey in 2021 to see if high levels of EWM are maintained for multiple years or if the population declines naturally on its own. If the EWM population remains high in 2021, the WWMD could consider conducting a winter water level drawdown in 2021/22.