

LAKE EDUCATION AND PLANNING SERVICES, LLC

# UPPER AND LOWER VERMILLION LAKES BARRON COUNTY

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2021 MANAGEMENT SUMMARY REPORT  
WBIC: 2098800 & 2098200

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VERMILLION LAKES ASSOCIATION

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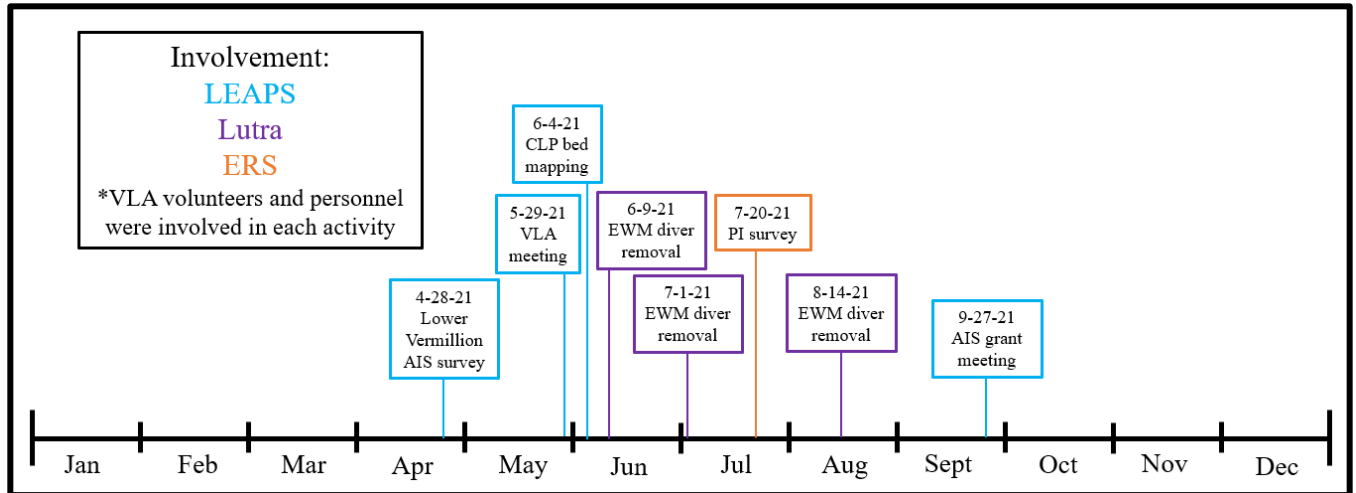
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## INTRODUCTION

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This report discusses lake management activities completed by the Vermillion Lakes Association (VLA) and Lake Education and Planning Services (LEAPS) throughout 2021. The following actions were completed by LEAPS to assist the VLA in aquatic plant management and lake stewardship education.



**Figure 1. Timeline of 2021 management events involving LEAPS and other hired contractors in Upper and Lower Vermillion Lakes**

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## DETERMINING VLA GRANT ELIGIBILITY

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In April and May of 2021, the VLA with some assistance from LEAPS went through the process of once again determining if the VLA is eligible for WDNR grants through the Surface Water grant program. Lo and behold, the VLA was determined eligible and a letter from the WDNR confirming this status was received on May 27, 2021.

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## AIS EDUCATION EVENTS, CBCW, AND NEWSLETTERS

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On May 29<sup>th</sup>, the VLA held its annual Breakfast Meeting and AIS education event. During this event AIS materials were handed out to participants. An update related to AIS management was completed. Volunteers also assisted with diver removal efforts, learning more about EWM – how to identify it, and how to remove it from the lake.

The VLA applied for and received a CBCW grant in 2021. Paid watercraft inspectors put in 244 hours at the public landing off 9<sup>th</sup> Street; checked 104 boats, and spoke to 174 people.

The VLA published three newsletters in 2021 – Spring, Summer, and Fall.

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## 2021 EWM & CLP MANAGEMENT

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The VLA participated in EWM management in 2021 as approved by the Wisconsin Department of Natural Resources (WDNR). The group, as recommended by the WDNR and LEAPS implemented diver removal of EWM as the primary management tool. The proposed areas for diving were delineated spring surveys conducted by LEAPS and preemptive visual searches of the littoral zone. On 6/9/21, 7/1/21, and 8/14/21, Lutra LLC, assisted by volunteers and LEAPS, worked on diving and removing the 6 most dense areas of EWM (Figure 2). On 7/20/21, ERS performed a Point Intercept survey on Lower Vermillion and found EWM present in high densities in multiple small areas (Figure 3).

On Upper Vermillion, LEAPS performed a bed mapping survey of Curly Leaf Pondweed (CLP) on 6/4/21. The lake was found to have dense beds of CLP mixed with native vegetation (rake fullness (RF) of 3) in the north bay and the two southern bays (Figure 4). Circling nearly the entire lake except on the western edge, dense CLP with a RF of 2-3 excluded most native plants (Figure 4). The inner edge of the CLP beds were fairly consistent with a regular CLP RF of 1-2 (Figure 4).



Diver removal of EWM on Lower Vermillion Lake

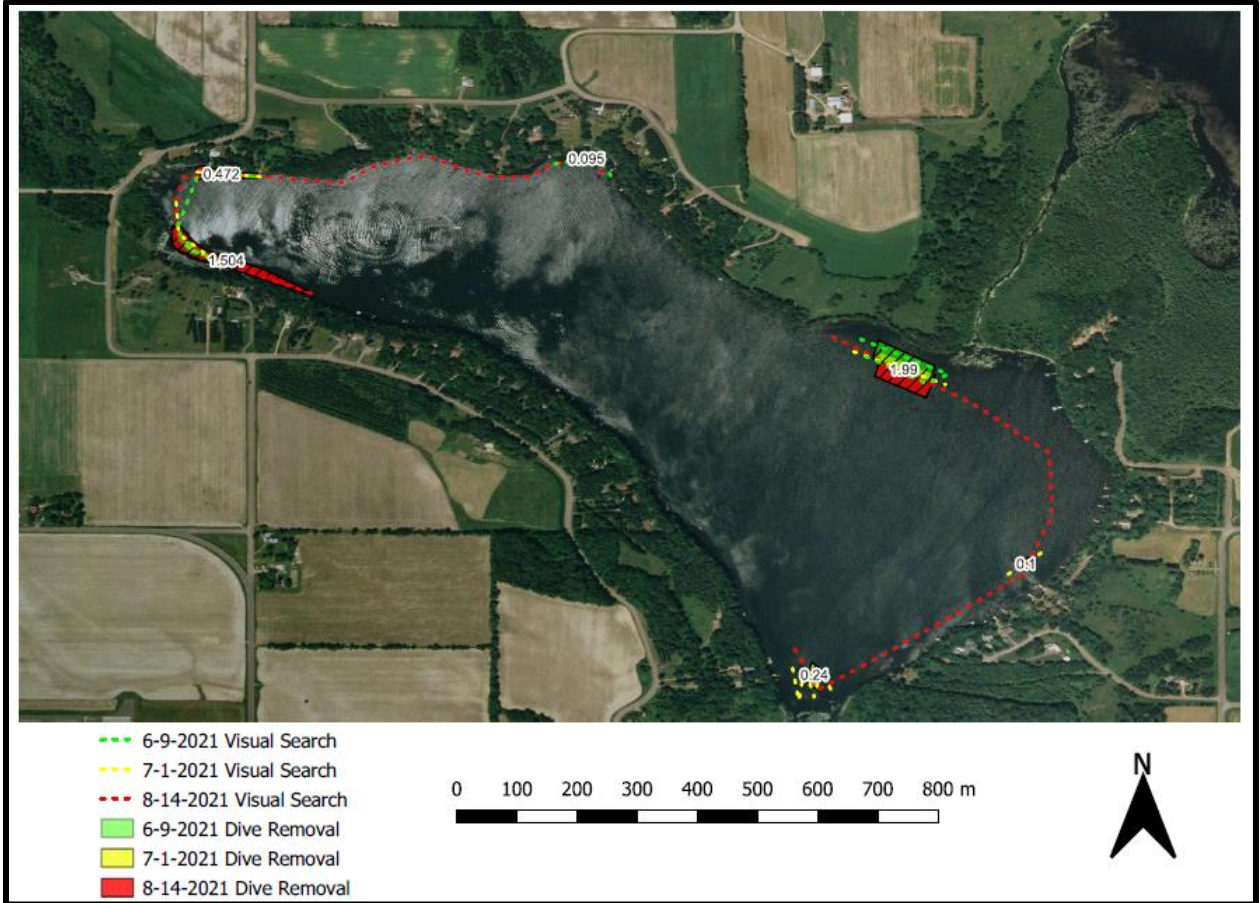


Figure 2. 2021 Lower Vermillion EWM diver removal areas

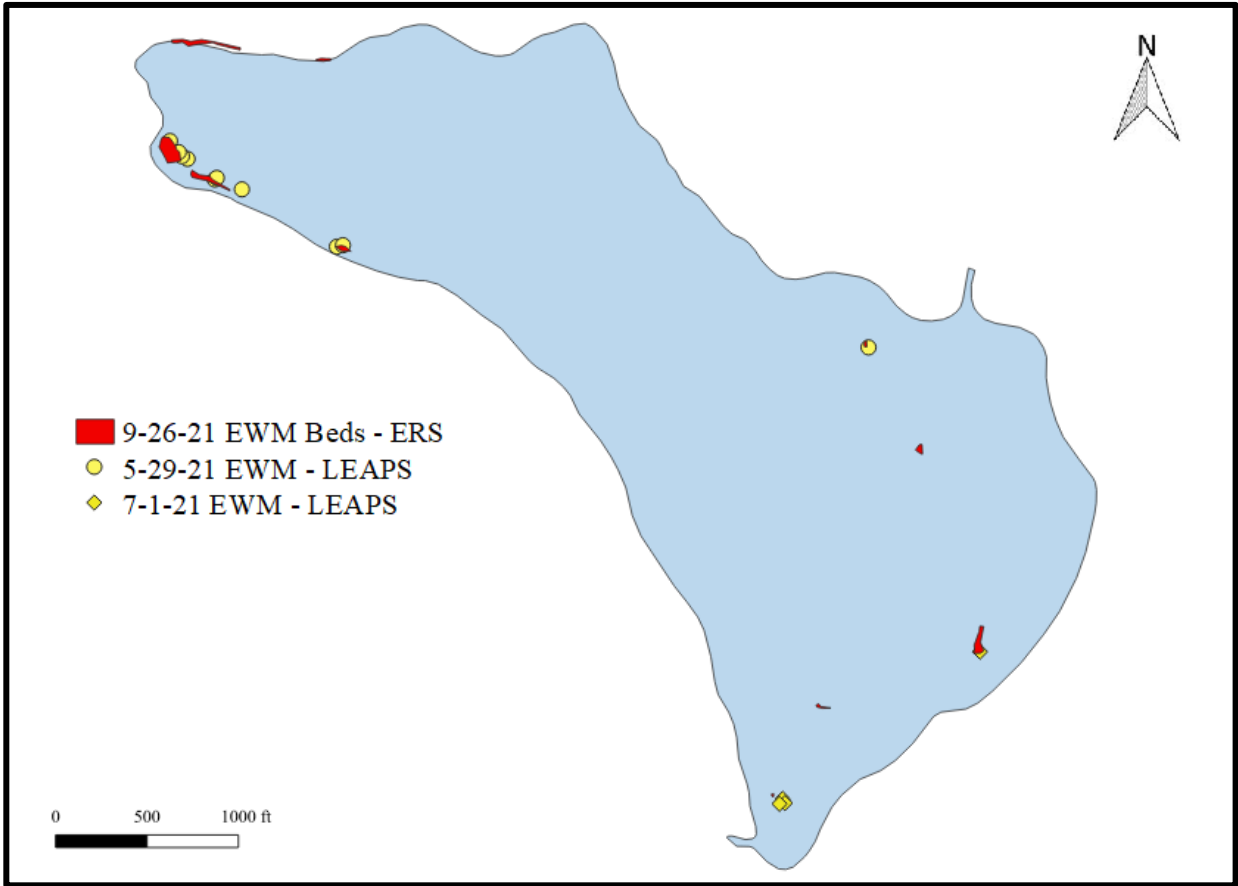
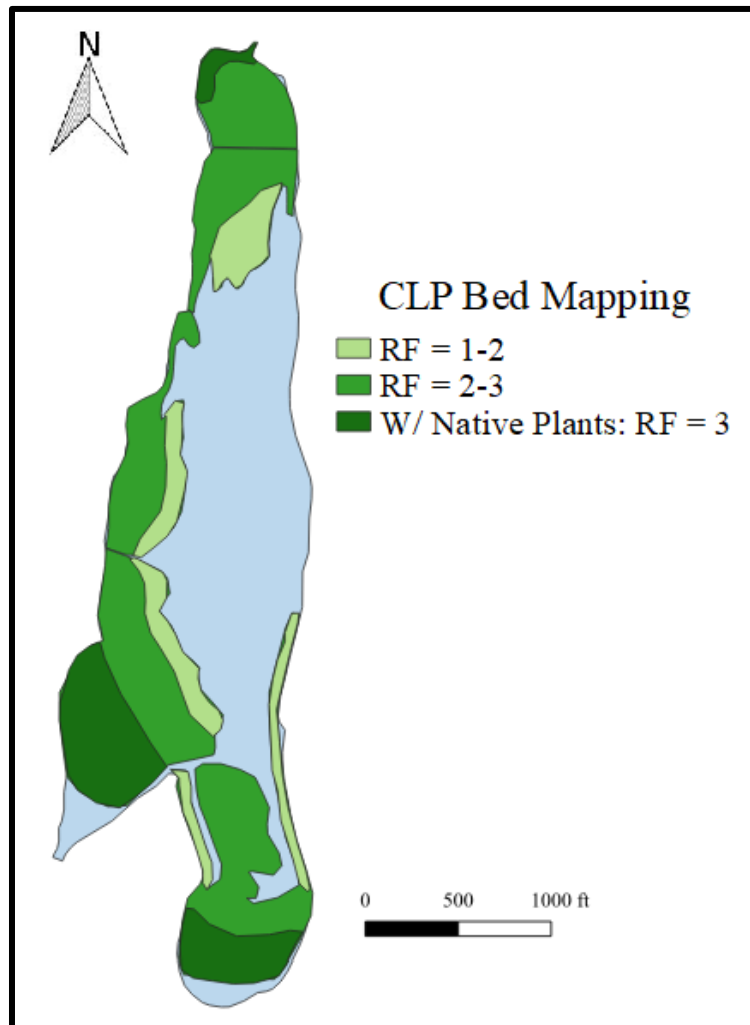


Figure 3. 2021 Lower Vermillion Lake EWM



**Figure 4. 2021 Upper Vermillion CLP bed mapping**

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**UPDATE OF THE EXISTING AQUATIC PLANT MANAGEMENT PLAN FOR LOWER VERMILLION LAKE**

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As a part of a WDNR small-scale AIS population control grant awarded to the VLA in 2021, LEAPS will be updating the existing Aquatic Plant Management (APM) Plan. This process was started in 2021 with the completion of a whole-lake, point-intercept, aquatic plant survey in both the spring and the summer. Final reports from ERS, the aquatic plant survey specialist contracted to complete the survey have not been received yet. In 2022, using the PI plant survey data and other data, LEAPS will complete the update.

Management planning in 2022 for both CLP and EWM will follow existing guidelines in the existing APM Plan, but also incorporate changes that are expected to be added to the APM Plan in its update.

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## 2021 CITIZEN LAKE MONITORING

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Water quality data was collected by volunteers in 2021 from the deep hole site on Lower Vermillion Lake (Station ID: 033185). Total phosphorus (TP) samples were collected on five dates in Lower Vermillion Lake and averaged 22.6 ug/L (Table 1). Chlorophyll samples were also collected five times in Lower Vermillion Lake, averaging 7.3 ug/L (Table 1). Secchi disk readings were taken eleven times in Lower Vermillion Lake and averaged 8.6 feet (Table 1). These results gave Lower Vermillion an average Trophic Status Index (TSI) score of 49.1, classifying the lake as mesotrophic (Table 1). Mesotrophic lakes are characterized by moderate water clarity with occasional oxygen depletion in the bottom waters. These conditions accurately describe Lower Vermillion Lake in 2021.

Water quality data was collected by volunteers in 2021 from the center site on Upper Vermillion Lake (Station ID: 033195). Total phosphorus (TP) samples were collected on two dates in Upper Vermillion Lake and averaged 147 ug/L (Table 2). Chlorophyll samples were also collected twice in Upper Vermillion Lake, averaging 49.8 ug/L (Table 2). A Secchi disk reading was taken once in Upper Vermillion Lake and was 2 feet (Table 2). These results gave Upper Vermillion an average Trophic Status Index (TSI) score of 66.2, classifying the lake as eutrophic (Table 2). Eutrophic lakes are characterized by lower water clarity and possible algal blooms with extensive plant growth. These conditions accurately describe Upper Vermillion Lake in 2021.

LEAPS supports the collection of these data and uses it to inform management decisions and educate VLA members and lake users about the lake.

**Table 1. 2021 Lower Vermillion Lake water quality data**

Sample Date	TP (ug/L)	Chl- <i>a</i> (ug/L)	Secchi (ft)	
05/05/21	23.3	-	7.3	
05/26/21	-	-	9.3	
06/11/21	-	-	14.0	
06/27/21	17.6	4.0	9.8	
07/13/21	-	-	10.8	
07/28/21	13.9	4.9	10.8	
08/18/21	-	-	6.5	
08/24/21	-	9.5	6.0	
09/15/21	23.2	11.8	4.5	
10/01/21	-	-	6.8	
10/11/21	22.6	6.5	9.0	
<b>Average</b>	<b>20.1</b>	<b>7.3</b>	<b>8.6</b>	
<b>Average TSI</b>	<b>51.4</b>	<b>49.2</b>	<b>46.7</b>	<b>= 49.1</b>

**Table 2. 2021 Upper Vermillion Lake water quality data**

Sample Date	TP (ug/L)	Chl- <i>a</i> (ug/L)	Secchi (ft)	
7/26/21	165	59.5	-	
8/30/21	129	40.0	2	
<b>Average</b>	<b>147</b>	<b>49.8</b>	<b>2</b>	
<b>Average TSI</b>	<b>67.0</b>	<b>64.5</b>	<b>67.0</b>	<b>= 66.2</b>



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## 2022 CLP AND EWM MANAGEMENT PLANNING

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### CLP

As in 2021, in 2022 there will be no direct management of CLP in either lake. However, CLP bedmapping is expected to be completed in 2022. CLP bedmapping on Lower Vermillion Lake will be completed by ERS; and CLP bedmapping on Upper Vermillion Lake will be completed by LEAPS.

### EWM

Based on the results of diver removal, various summer surveys, and the fall EWM bedmapping survey it appears that EWM in Lower Vermillion Lake is more widespread than has been previously thought. However, most of that EWM remains close to the bottom of the lake, rarely visible at the surface. This was confirmed by multiple divers who spent time under the water. In deeper water (8-12 feet) EWM gets adequate sunlight to grow early in the season, but worsening water clarity prevents more aggressive growth later in the season. At that point, EWM remains rooted and alive in deep water, just with not enough growth energy to reach the surface or a point where it is visible at the surface.

Because of this finding, a WDNR AIS small-scale population control grant was submitted in November 2021 to support chemical management of EWM in 2022. The VLA also continues to work under a small-scale AIS population control grant awarded in 2021 that extends through the end of 2022. Unfortunately, that particular grant only covers the cost of physical/diver removal of EWM. The new control grant was to be used to complete chemical management. However, the grant was not awarded, primarily due to apparent confusion on the part of the reviewers and rankers about how the new grant was different from the existing grant.

In addition, because it was divers who identified the EWM, a good map of the extent of the expanded areas of EWM was not able to be accurately drawn. Diver removal efforts in 2022 will remedy this situation by tethering a waterproof GPS unit to the diver, so that a path is generated that reflects where the diver went under water. With this data, a better map should be able to be drawn.

Despite not receiving additional grant funding for chemical management of EWM in 2022, a chemical treatment proposal has been completed that includes several larger beds (>1.0 acres) in the west side of the lake adjacent to the public landing where liquid 2,4-D will be used; and multiple smaller areas in the east and southeast areas of the lake where it is suggested that ProcellaCOR be used. Using liquid 2,4-D on areas larger >1.0 acres is already approved in the existing APM Plan. Use of ProcellaCOR on smaller areas will be recommended in the new APM Plan. The preliminary treatment plan includes six smaller areas in the east basin and southeast corner of the lake ranging in size from 0.18 to 0.59 acres in size and total 2.06 acres. It also includes two areas >1.0 acres in the west basin totaling 3.44 acres. Together, the proposed treatment plan includes 5.5 acres of chemically treated EWM.

A WDNR chemical application permit will be completed for these treatment areas. If all or a portion of this permit is approved, the cost of herbicide application will be covered by the VLA. Diver removal will also be used again in 2022 to remove isolated plants or small beds of EWM. As previously mentioned, divers will also be used to try and map the extent of the EWM that remains at the bottom of the lake for future management planning and implementation. Diver activities are covered under the existing AIS population control grant.