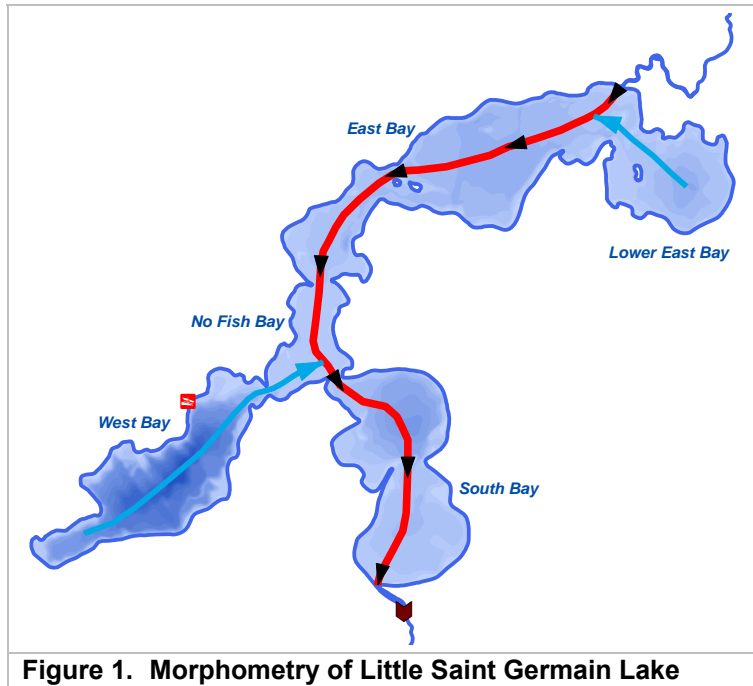


## INTRODUCTION

Little Saint Germain Lake, Vilas County, is a 980-acre lake comprised of two main drainage lakes (Lower East Bay, East Bay, No Fish Bay, and South Bay) that are fed via Muskellunge Creek, and a seepage lake (West Bay) which is groundwater fed and flows from the west-southwest. Water flows out of South Bay via Little Saint Germain Lake into the nearby Wisconsin River (Figure 1). Water levels in the lake are artificially maintained approximately 5.0 feet higher than its natural level by a dam that is maintained by the Wisconsin Valley Improvement Company (WVIC). The WVIC utilizes Little Saint Germain Lake as a storage reservoir, where each winter it releases approximately 1.5 feet of water for use in hydroelectric power generation downstream on the Wisconsin River.



## Historic AIS Management

The non-native, invasive plant curly-leaf pondweed (*Potamogeton crispus*; CLP) was first documented in No Fish Bay in 2000, while fragments of Eurasian water milfoil (*Myriophyllum spicatum*; EWM) were first discovered floating near the boat landing in West Bay in the spring of 2003. Management actions aimed at reducing lake-wide levels of CLP and EWM have been conducted on Little Saint Germain Lake since 2003. Since its discovery, the LSGLPRD has been active in managing this invasive plant through a combination of localized herbicide spot treatments and manual hand-removal. Based upon the low quantities of CLP located during the 2016 survey, it is believed that the turion bank on Little Saint Germain has been considerably reduced during the past decade of active management.

In 2005, the Little Saint Germain Lake Protection and Rehabilitation District (LSGLPRD) successfully applied for a Wisconsin Department of Natural Resources (WDNR) Aquatic Invasive Species (AIS) Grant to aid in the control of CLP and EWM within the lake. After the grant was awarded, Onterra was contracted to locate and map both populations, develop treatment strategies, and monitor those treatments. This five-year control project ended in 2008, and based upon the results of this project, the WDNR requested that the LSGLPRD complete an updated aquatic plant management plan before lake management actions involving chemical treatments or harvesting activities commenced in 2009.

The updated aquatic plant management plan was finalized in 2010, and included a number of management goals, of which one was to control aquatic invasive species within Little Saint Germain Lake. In 2009, the LSGLPRD successfully applied for another WDNR AIS Control

Grant to continue management of the lake's CLP and EWM populations from 2009-2012. In 2012, the final year of the grant-funded project, the LSGLPRD had remaining unused funds, so the grant was extended into 2013. The 2013 Final Report details the results of this five-year project, which included the results of the CLP and EWM control actions that took place from 2009-2013.

The EWM and CLP control program on Little Saint Germain Lake made great strides since 2007, particularly after 2010-2011 when volumetric herbicide dosing was adopted. The EWM and CLP population within Little Saint Germain Lake was at a low level in 2016 and no herbicide treatments were proposed for 2017 although professional hand-harvesting was implemented on a few select areas.

Hand-harvesting control methods may pose a challenge on Little Saint Germain due to low water clarity and plethora of native plants in the targeted areas. For this reason, the LSGLPRD decided to conduct a trial program in 2017. While volunteer efforts have their role in the management of many lakes, the LSGLPRD decided that hiring a third-party firm to conduct these efforts would be appropriate for a pilot program. This would insure they would have an appropriate amount of effort (i.e. person-hours). Traditional hand-harvesting consists of a trained snorkelers or divers to swim to the bottom of the lake and extract an individual EWM plant, roots and all. The plants are transported to the surface one at a time, or are put in a mesh bag underwater until brought to the surface. While on the surface, the plants are placed onto a transport boat until disposal.

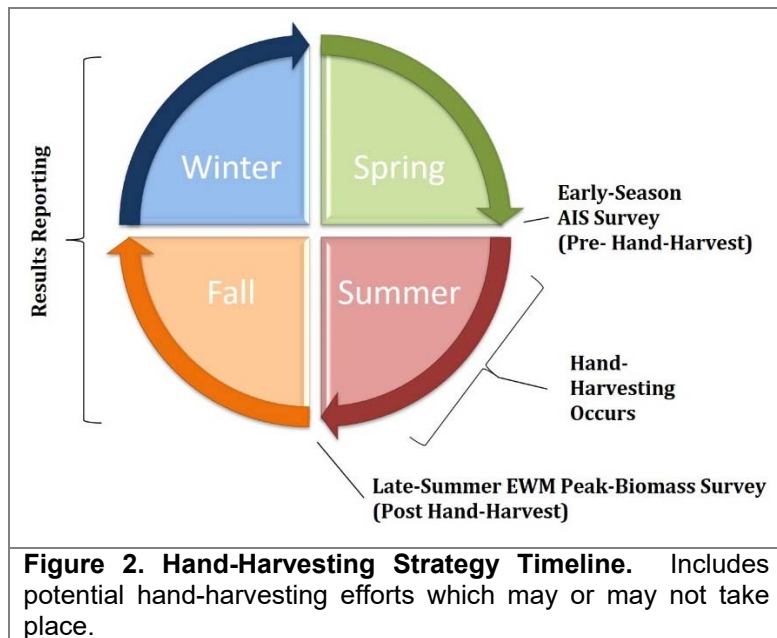
Where water clarity is high and target plants are growing in deeper water, a Diver Assisted Suction Harvesting (DASH) program is generally recommended. During this process a scuba diver manually extracts the plant (roots and all) and then feeds the removed plants into vacuum tube that transports the plant to a bin on a boat. They do not, however, simply vacuum the plants up, as that would also take in large amounts of sediment and would be considered suction dredging (requires elaborate permitting). A mechanical harvesting permit from the WDNR is needed (fee of \$30 per acre) to use the DASH system. The DASH system is said to be more efficient, as the diver does not have to go to the surface to hand the pulled plants to someone on a boat. The DASH system also is theorized to cause less fragmentation, as the plants are immediately transported to the surface using the vacuum hose. However, the costs of conducting hand-harvesting with one of these firms is more expensive than just hiring trained divers and/or snorkelers.

The professional hand-harvesting actions undertaken in 2017 in Little Saint Germain Lake yielded mixed results in controlling the EWM within the targeted locations. The hand-harvesting in West Bay was more effective, likely due to better water clarity for the divers to operate in as well as being conducted a little earlier in the growing season before native vegetation amassed large amounts of biomass and interfered with the control measures.

The LSGLPRD incorporated the lessons learned from their history of AIS management into an updated *Comprehensive Management Plan* (Feb2019). This report discusses the AIS monitoring and control activities that took place during 2018 including an evaluation of the professional hand-harvesting efforts.

## MONITORING METHODOLOGIES

A set of EWM mapping surveys were used within this project to coordinate and qualitatively monitor the hand-harvesting efforts (Figure 2). The first monitoring event on Little Saint Germain Lake in 2018 was the Early Season Aquatic Invasive Species Survey (ESAIS). This late-spring/early-summer survey provides an early look at the lake to help guide the hand-harvesting management to occur on the system. Following the hand-harvesting, Onterra ecologists completed the Late-Summer EWM Peak-Biomass Survey, the results of which serve as a post-harvesting assessment of the hand-removal efforts. The hand-removal program would be considered successful if the density of EWM within the targeted areas was found to have decreased from the ESAIS Survey to the Late-Summer Peak-Biomass Survey.



### EARLY SEASON AQUATIC INVASIVE SPECIES SURVEY (ESAIS) (PRE-HAND HARVESTING)

Onterra ecologists completed the Early-Season AIS Survey on June 18 & 20, 2018. The EWM/CLP population was mapped by using either 1) point-based or 2) area-based methodologies. Large colonies >40 feet in diameter are mapped using polygons (areas) and were qualitatively attributed a density rating based upon a five-tiered scale from *Highly Scattered* to *Surface Matting*. Point-based techniques were applied to EWM/CLP locations that were considered as *Small Plant Colonies* (<40 feet in diameter), *Clumps of Plants*, or *Single or Few Plants*.

While EWM is usually not at its peak growth at this time of year, the water is typically clearer during the early summer allowing for more effective viewing of submersed plants, and EWM is often growing higher in the water column than many of the native aquatic plants at that time of year. The locations of EWM occurrences located during early summer are provided to professionals or volunteers to aid in their hand-removal efforts. Curly-leaf pondweed (*Potamogeton crispus*; CLP) is at or near its peak growth in early summer before naturally senescing (dying back) in mid-summer, making early summer the most probable time to locate this species.

During the ESAIS survey, the field crews noted excellent conditions with sunny skies and light winds. The CLP population was determined to be relatively low in the lake with isolated occurrences consisting of either *small plant colonies*, *clumps of plants* or *single or few plants* (Map 1). No CLP was located within the West Bay of the lake during the survey. The survey crew

noted several floating CLP fragments in other areas of the lake. Many of the floating fragments were short-statured and “stemmy” in appearance, which may be reflective of plants in an early growth stage. Water clarity outside of West Bay was reduced at times of the survey as indicated by a secchi disk reading of 1.9 feet. It is possible that some short CLP plants went undetected in areas of the lake where visibility was reduced. The CLP that was located in the South Bay of the lake appeared to be closer to the peak-growth stage of the plant characterized by robust plants readily visible from the surface by the survey boat.

The EWM population was mapped during the ESAIS survey primarily for the purpose of finalizing the hand-harvesting strategy for 2019. Most of the EWM population was at the surface of the water column at the time of the ESAIS survey, allowing for easier mapping by the crew. The survey found EWM to be fairly widespread with several colonized areas in the western basin as well as elsewhere in the lake. Based on the results of the ESAIS survey, the final EWM hand-harvesting strategy was determined and included targeting three sites in the west bay of the lake totaling 4.92 acres (Map 2). Onterra provided the spatial data from this survey to the professional hand-harvesting firm to aid the control efforts.

## HAND-HARVESTING MANAGEMENT ACTIONS

The LSGLPRD contracted with Aquatic Plant Management, LLC (APM) to conduct professional hand-harvesting of EWM in 2018. APM utilizes a DASH setup to compliment traditional harvesting methods. The DASH methodology allows divers to extract the target plants and feed them into a suction hose for delivery on board the harvesting vessel. DASH is thought to be more efficient in removing target plants than divers alone and is believed to limit fragmentation during the harvesting process. APM conducted hand-harvesting activities on nine days between July 13 and August 3, 2018 and removed approximately 640.5 cubic feet of EWM. The majority of the removal efforts were conducted in site A-18 (Table 1). Dense native vegetation hindered DASH removal efforts in shallower portions of site A-18 and led to APM and the LSGLPRD restructuring the removal efforts to include more time conducting traditional removal techniques (no DASH) instead. Additional details of the professional hand-harvesting efforts are included within APM’s summary report (Appendix A).

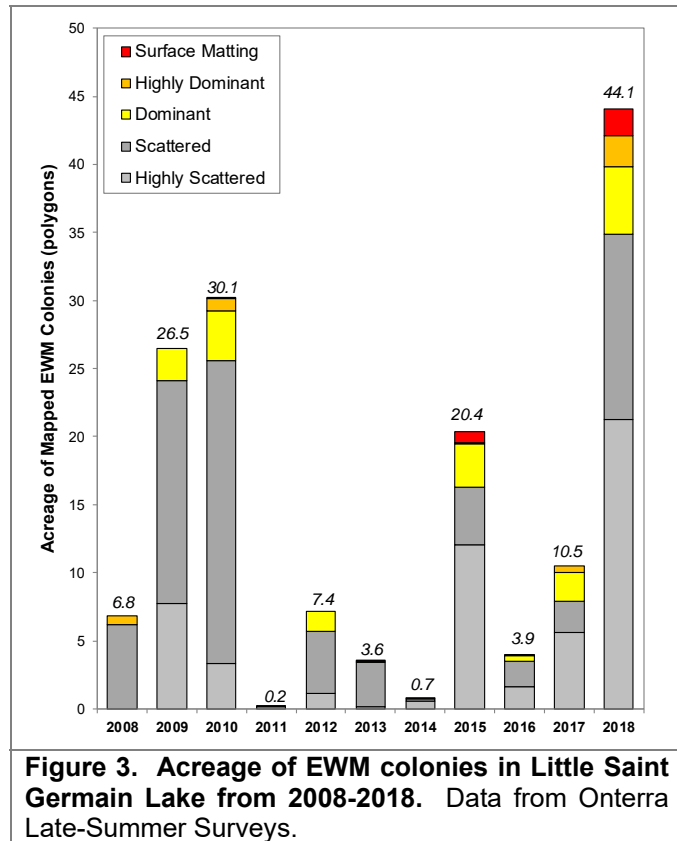
**Table 1. Little Saint Germain Lake, 2018 professional hand-harvesting activities.** Site locations displayed on Map 1. Table created from APM, LLC dive summary report (Appendix).

<b>DASH</b>		<b>Traditional Hand-Harvest</b>	
<b>A-18</b>		<b>A-18</b>	
Time Underwater (Hrs)	34.97	Time Underwater (Hrs)	17.04
Estimated EWM Removed (Cubic Feet)	398.5	Estimated EWM Removed (Cubic Feet)	127
<b>B-18</b>			
Time Underwater (Hrs)	11.18		
Estimated EWM Removed (Cubic Feet)	97		
<b>C-18</b>			
Time Underwater (Hrs)	1.42		
Estimated EWM Removed (Cubic Feet)	18		

## LATE-SUMMER EWM PEAK-BIOMASS SURVEY RESULTS (POST HAND HARVESTING)

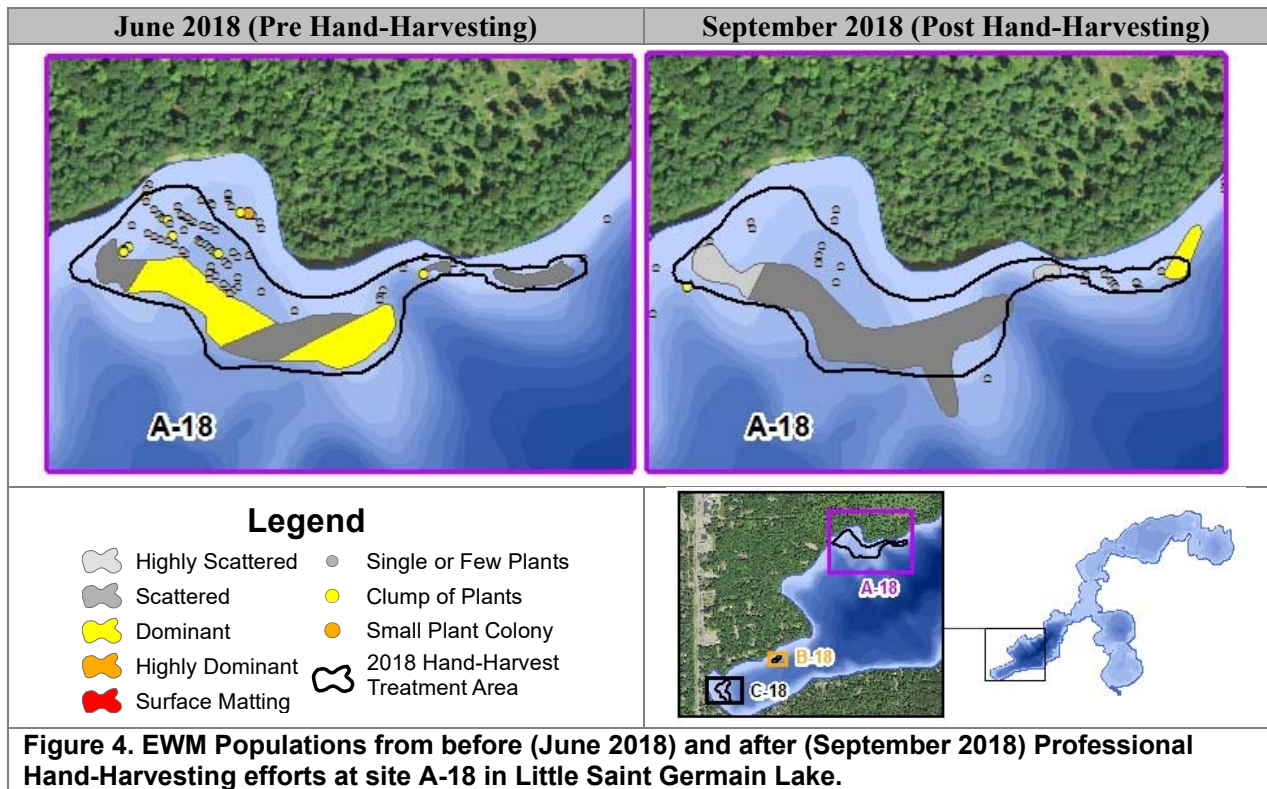
The Late-Summer EWM Peak-Biomass Survey was conducted on September 11, 2018 to qualitatively assess the hand harvesting efforts as well as to understand the peak growth (peak-biomass) of the EWM population throughout the lake and to determine an appropriate control strategy for the following year. These populations were mapped by using the same methodology described above during the ESAIS survey. Conditions during the late-summer survey were favorable with sunny skies and light westerly winds.

The 2018 late-summer EWM peak-biomass survey indicated that the EWM population expanded in many areas of the lake compared to 2017. The results of the survey are displayed on Maps 3-6. A total of 44.1 acres of colonized EWM was mapped during the 2018 survey compared to 10.5 acres in 2017. Total acreage of EWM in 2018 is higher than any survey dating back to 2008 (Figure 4). Of the 44.1 acres of colonized EWM present in 2018, the majority (34.8 acres) consists of colonies that were of either a scattered or highly scattered density. These areas likely do not directly impact the ecosystem function of the lake or typically cause nuisance conditions. However, areas mapped as dominant or greater in density, which included approximately 9.3 acres in 2018, are more likely to cause localized nuisance conditions.

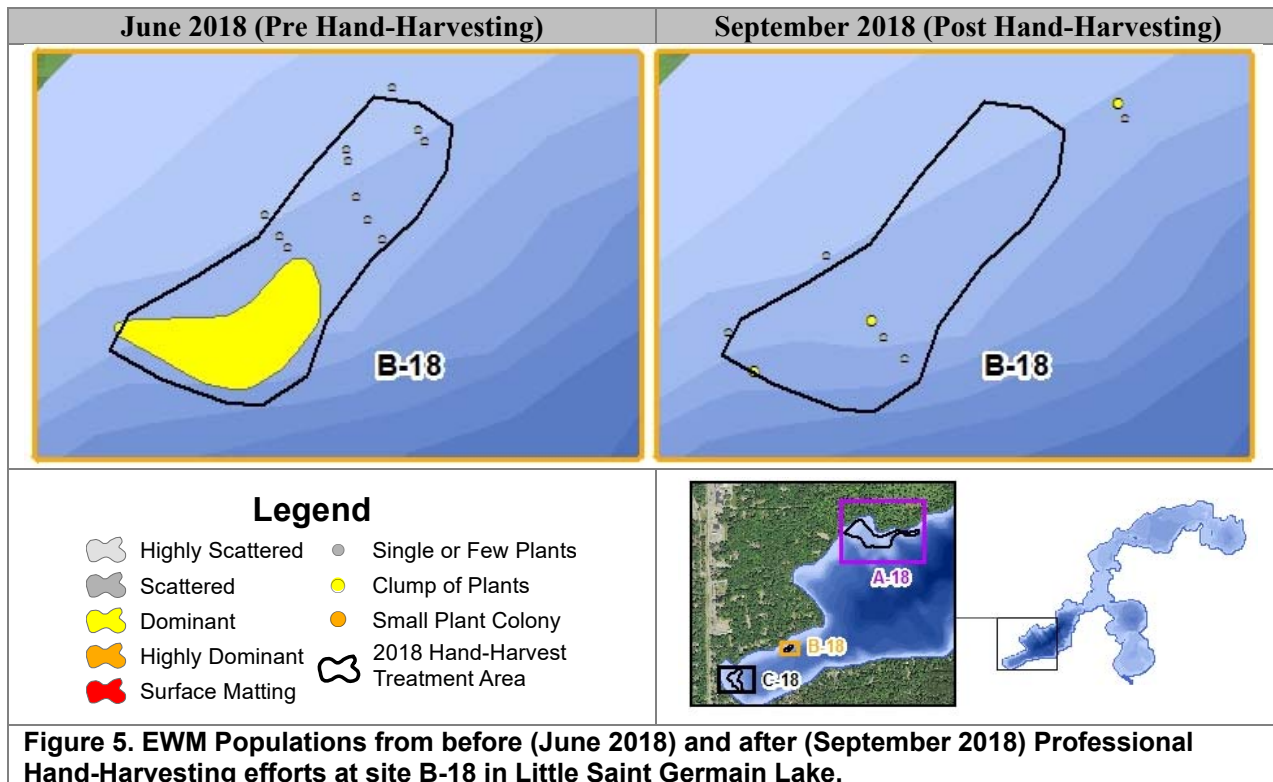


The sites that were targeted for professional harvesting are highlighted in Figures 4 & 5 where the left frame shows the pre-harvesting EWM population mapped in June 2018 and the right frame show the post-harvesting EWM population mapped in September 2018.

**Site A-18:** Site A received the most harvesting effort of the three sites during 2018. The ESAIS survey conducted in June revealed both *dominant* (.94 acres total) and *scattered* (.61 acres total) colonies of EWM. Multiple *clumps* and *single plants* were also mapped. Between DASH and traditional hand-harvesting methods, approximately 52 hours were spent harvesting EWM within the site (Table 1). Approximately 524.5 cubic feet of EWM had been removed when harvesting efforts concluded (Table 1). The EWM peak biomass survey completed in September mapped areas of *highly scattered* (.24 acres total) and *scattered* colonies (1.34 acres total). A small area of *dominant* EWM ( $\approx$  .05 acres) at the far east end of the permit area, as well as multiple *single plants*, were also mapped. Overall, site A-18 exhibited a slight decrease in density after hand-harvesting efforts.



**Site B-18:** During the 2018 ESAIS survey, site B-18 contained an area of *dominant* EWM (.10 acres). Approximately 11 hours were spent using DASH within the site, removing 97 cubic feet of EWM (Table 1). In September, two *clumps* and two *single or few plant* points were mapped during the EWM peak biomass survey.



**Site C-18:** Due to time constraints following the removal efforts in the other sites, site C-18 received less than 1.5 hours of hand harvesting efforts, with approximately 18 cubic feet of EWM harvested in 2018 (Table 1). Before harvesting efforts, site C-18 contained a large *dominant* colony of EWM. Also present was an area of *highly scattered* and *scattered* EWM. With little efforts devoted to harvesting the site in 2018, the late-summer survey found the EWM population to have increased in density since the previous survey with an area of *highly dominant* plants.

## CONCLUSIONS AND DISCUSSION

The CLP population in 2018 was found to be very low in Little Saint Germain Lake with no areas requiring area-based mapping techniques. Populations of CLP can vary from year to year based on environmental factors and continued monitoring of this species is important going forward to help understand if populations increase to levels that warrant consideration for active management.

The professional hand-harvesting efforts showed mixed results in 2018. In site A-18 where the majority of the efforts took place, a substantial amount of EWM remained present in the area during the late-summer survey, although at a reduced density. This demonstrates that harvesting actions resulted in seasonal control within the site where the population was lowered during part or most of the growing season before rebounding by the time of the late-summer survey. More complete control appeared to have been achieved in harvesting site B-18 where a *dominant* colony was reduced to a few *single plants* or *clumps of plants*. Minimal harvesting efforts were directed at site C-18 and the EWM population increased somewhat in both size and density over the course of the season.

The role of hand-harvesting as a tool to manage EWM population in Little Saint Germain Lake continues to be evaluated. Professional harvesting efforts in 2017-2018 showed that seasonal control is attainable with large amounts of effort; however, longer term reductions in EWM populations that extend beyond one growing season has not been demonstrated.

## 2019 AIS Management Strategy Development

The LSGLPRD is in the final stages of completing an update to their comprehensive lake management plan. Within the planning process, the LSGLPRD has developed a goal along with specific management actions within the implementation plan of the report related to AIS management on the lake:

### **Management Goal 1: Control Existing and Prevent Further Aquatic Invasive Species Infestations within Little Saint Germain Lake**

<b>Management Action:</b>	Continue Clean Boats Clean Waters watercraft inspections
<b>Management Action:</b>	Coordinate volunteer monitoring of AIS
<b>Management Action:</b>	Coordinate annual professional monitoring of AIS, particularly EWM and CLP
<b>Management Action:</b>	Conduct EWM Population Control on Little Saint Germain using Hand-Harvesting and Herbicide Spot Treatments
<b>Management Action:</b>	Conduct CLP Population Control on Little Saint Germain Herbicide Spot Treatments
<b>Management Action:</b>	Coordinate Periodic Quantitative Vegetation Monitoring

Following the guidance developed in the management plan, a preliminary AIS management strategy can be developed for 2019 based on the population of EWM and CLP that were mapped in surveys completed during 2018.

The CLP management strategy for the LSGLPRD has evolved into a strategy to maintain the currently low population. The difficulty of any maintenance strategy is to balance a level of CLP population tolerance while not allowing the population to return to pre-management levels.

To assist in the logistics and planning of CLP to be targeted for herbicide control, the LSGLPRD would use the following guidelines (trigger):

- All areas targeted the previous year would be considered for treatment and included within each year's conditional permit application. Based upon the pretreatment survey, these areas may be reduced or removed.
- Areas of colonized CLP where a sufficiently large treatment area can be constructed to hold concentration and exposure times (preference to *dominant* or greater densities and treatment sites greater than 10-acres). In order to reach the appropriate concentration and exposure time requirements for endothall to effectively kill CLP, sites that are more likely to reach appropriate concentration and exposure times of larger size, broader shape, and in protected parts of the lake. Even in some cases where larger treatment areas can be constructed, their narrow shape or exposed location within a lake may result in insufficient herbicide concentrations and exposure times for long-term control.

Based on relatively low CLP population observed in 2018, no areas meet the pre-determined trigger to consider the implementation of herbicide control in 2019.

The following triggers were developed within the management planning process for EWM management in Little Saint Germain Lake:

### **Herbicide Spot Treatment**

If the following trigger is met, the LSGLPRD would initiate the collection of pretreatment and planning data necessary to conduct the treatment:

colonized (polygons) areas of EWM, with preference to areas of *dominant* or greater densities, that a size/shape/location where management is anticipated to be effective.

Once the trigger has been met and the pretreatment data is collected, the LSGLPRD will review the information in the context of the most current science as it relates to improving the efficacy and minimizing collateral impacts of the control actions.

It is believed that EWM colonies that meet this trigger are too large and dense to be effectively and efficiently controlled using hand-harvesting techniques. It is likely that these areas may be small (3-5 acres) and would need to be conducted with herbicides that require short exposure times (diquat, floryprauxifen-benzyl [ProcellaCOR™]) or herbicide combinations (diquat/endothall, 2,4-D/endothall, etc.). If large areas and/or sites in protected parts of the lake are to be targeted with an herbicide spot treatment, more traditional systemic herbicides like 2,4-D may be appropriate. If populations exceed spot-treatment thresholds, large-scale (whole-basin) herbicide strategies may be given consideration as was adopted in Lower East Bay during 2014.



Several EWM colonies mapped in late-summer 2018 meet the pre-determined trigger for considering herbicide spot-treatments in the lake (Table 2, Maps 3 - 6). These sites were presented to the LSGLPRD in early 2019 to gauge if the process of “considering” a treatment should take place. If the LSGLPRD opted to move forward with considering spot herbicide treatments for 2019, consultation with the WDNR would have taken place at that time.

**Table 2. Sites meeting the trigger for considering herbicide spot-treatment in 2019 in Little Saint Germain Lake.**

2019 Potential EWM Treatment Areas				
Site	Location	Acres	Depth (ft)	Volume (acre-feet)
A-19	West Bay	9.9	6.0	59.6
B-19	West Bay	2.7	6.0	16.2
C-19	West Bay	5.4	6.0	32.2
D-19	South Bay	6.0	7.0	42.3
E-19	East Bay	4.9	3.5	17.1
<b>Totals:</b>		<b>28.9</b>		

Following a period of review, the LSGLPRD has elected not to pursue an herbicide control program in 2019 for various reasons that include a lack of pretreatment sub-sample point-intercept data that would assist in evaluating the efficacy and native plant selectivity of the action. Of the five sites that initially met the trigger for considering spot-treatments, the LSGLPRD elected to target two sites (B-19 & D-19) with a professional hand-harvesting control strategy in 2019 rather than herbicide management. The other three sites will be monitored in 2019 and if they show signs of EWM expansion, will again be considered for an herbicide control strategy in 2020. The LSGLPRD intend to hold a vote during the summer of 2019 whether or not to consider herbicide spot-treatments at sites A-19 and D-19 in spring of 2020 using the accepted best management practices available at the time. This would trigger the collection of sub-sample point-intercept data within the potential areas during the late-summer of 2019 to serve as a pretreatment dataset.

**Hand-Harvesting**

Based on the EWM management strategy outlined in the management planning project, many areas of the lake could be considered for hand-harvesting actions in 2019. The generally clearer water conditions in West Bay have shown to be more conducive to hand-harvesting methods than other areas of Little Saint Germain Lake. However, any areas in the lake where EWM control is desired, but where herbicide treatments or other control actions are not feasible, may be appropriate for hand-harvesting efforts. The LSGLPRD will prioritize areas of hand-harvesting depending on the overall EWM population, available resources, and strategic location of the EWM populations that meet this criterion.

The LSGLPRD has elected to contract for 9-10 days of professional hand-harvesting efforts in 2019 using DASH. As mentioned above, sites B-19 and C-19 in West Bay will be the primary hand-harvesting sites in 2019 (Map 3). These sites were prioritized by the LSGLPRD based on their relatively high visibility and high-use location in the lake. Through these harvesting efforts, the LSGLPRD is hoping to achieve at least seasonal EWM population suppression in 2019. Future

considerations will be made for targeting additional sites in 2020 including an area of EWM growing in a thin but at times very dense, strip along the northern end of South Bay.

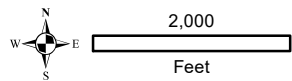
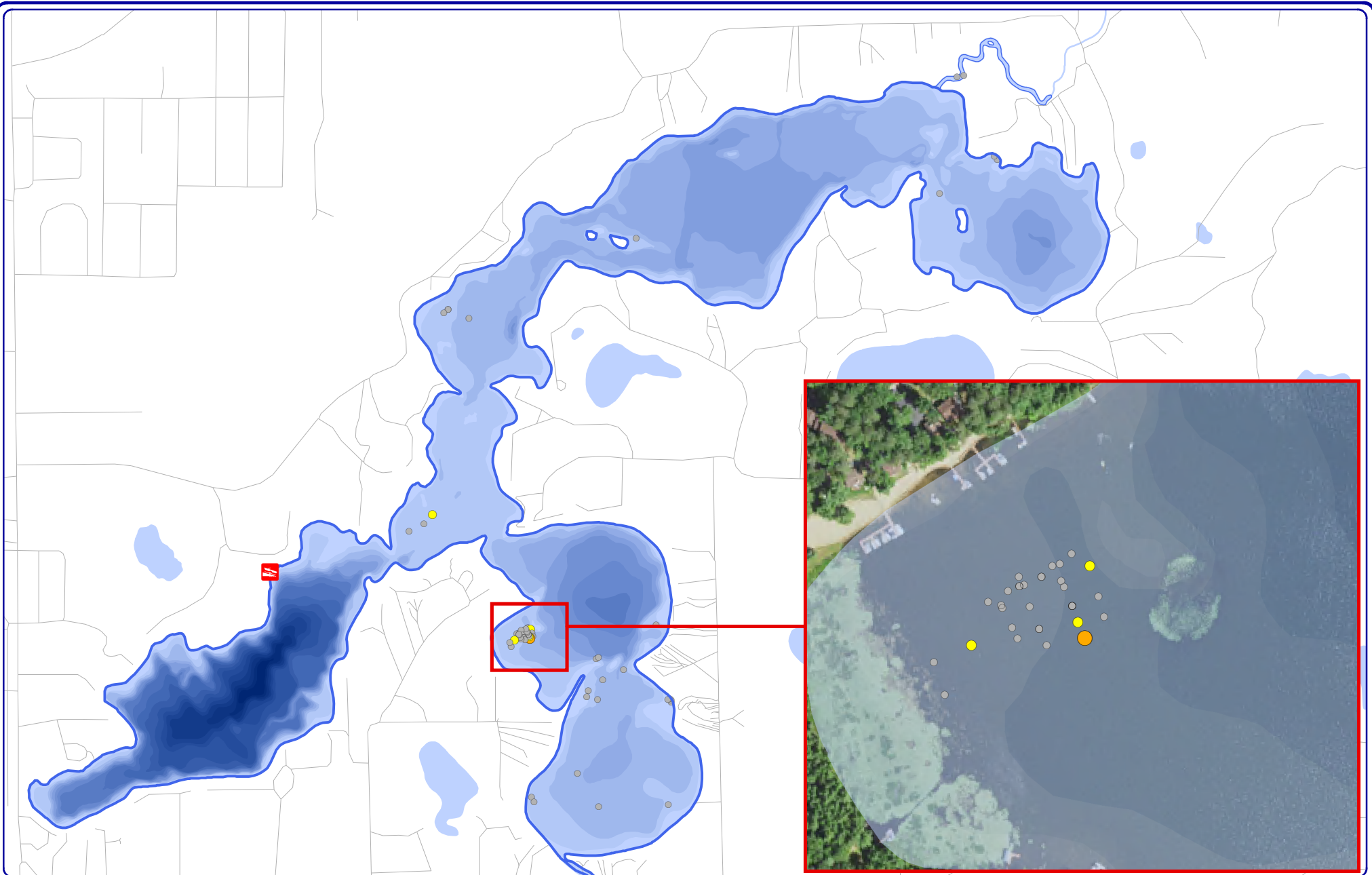
Onterra will conduct a focused ESAIS survey in late-spring/early summer to survey the EWM population in select areas of the lake and will be used to finalize the hand-harvesting strategy. The survey will focus on 1) all proposed hand-harvesting sites, 2) areas that met the herbicide spot treatment threshold based upon the 2018 Late-Season EWM Mapping Survey, and 3) potential areas of mechanical harvesting (see next sub-section). Curly-leaf pondweed will be surveyed throughout the entire lake during the ESAIS survey. A late-summer 2019 EWM peak-biomass survey will be completed towards the end of the growing season to evaluate the active management that occurred on the lake and will aid in developing a management strategy for the following year.

### **Mechanical Harvesting**

The LSGLPRD supports the reasonable and environmentally sound actions to facilitate navigability on Little Saint Germain Lake. These actions target nuisance levels of aquatic plants in order to benefit watercraft navigation patterns. In some years, nuisance aquatic plant conditions exist in certain parts of the lake, caused largely by native vegetation such as southern naiad (*Najas guadalupensis*), common waterweed (*Elodea canadensis*), and coontail (*Ceratophyllum demersum*). Current management of nuisance levels of native aquatic plants occurs on portions of Little Saint Germain Lake using contracted mechanical harvesting services. The areas of Little Saint Germain Lake requiring mechanical harvesting change annually, so the LSGLPRD initially proposed four main areas in the system for harvesting. Two areas in South Bay and one area in No Fish Bay are directed toward assisting riparian access to the lake. Another harvesting area allows navigation access between No Fish Bay and the southern part of East Bay, which has become inundated with southern naiad in recent years. Each year previous to the growing season, the LSLPRD applies for a mechanical harvesting permit from the WDNR. When submergent species are the target plant, the threshold (trigger) for harvesting set by the LSGLPRD is when the plants reach the surface and have aggregated masses of coontail, southern naiad, common waterweed, and other non-rooted plant species forming a mat. In some years, nuisance conditions do not manifest and mechanical harvesting does not take place.

The LSGLPRD would visit the need for each of the riparian access lanes to be harvested on an annual basis. As a condition of the permit, no areas of significant AIS can be within the mechanical harvest areas to avoid increasing spreading potential. If areas of significant EWM are observed within the potential harvesting areas during the Early Season AIS (ESAIS) Survey, the EWM population in these areas would be documented. Curly-leaf pondweed populations would be delineated during this survey. The data from the ESAIS Survey would be overlaid on the Mechanical Harvesting Map. Colonies of EWM located during the ESAIS Survey would either be targeted for professionally-based hand-harvesting prior to mechanical harvesting, or these areas would be avoided for mechanical harvesting through an updated map and strategy. In areas where large colonies of CLP are located, mechanical harvesting would not occur until after the week of Independence Day, when CLP populations would have mostly senesced (died back) for the year.

The contracted mechanical harvesting firm would utilize GPS technology to ensure mechanical harvesting occurs as designed for that year. Each year, updated spatial data would be provided to the chosen mechanical harvesting firm. If documentation of cutting (i.e. GPS tracklog) is required by the WDNR, it would be the responsibility of the mechanical harvesting firm to forward that information on as appropriate.



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Sources:  
 Roads and Hydro: WDNR  
 Aquatic Plants: Onterra, 2018  
 Map Date: June 25, 2018 JLW  
 File Name: LSG\_CLP\_June18.mxd



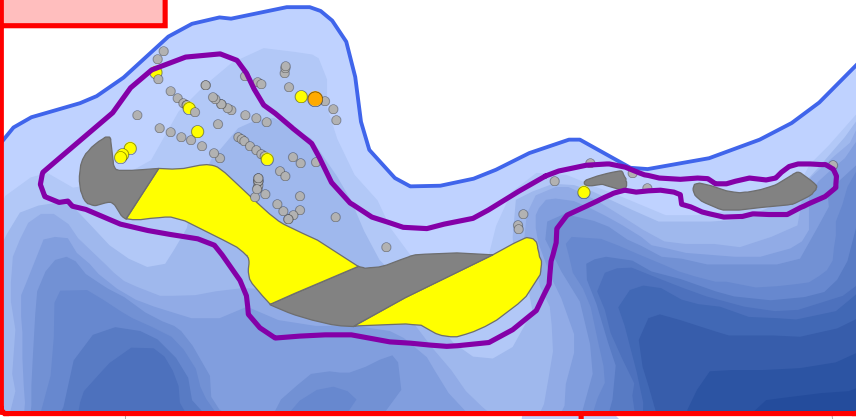
### Legend

- |  |                                  |  |                      |
|--|----------------------------------|--|----------------------|
|  | Highly Scattered ( <i>none</i> ) |  | Single or Few Plants |
|  | Scattered ( <i>none</i> )        |  | Clump of Plants      |
|  | Dominant ( <i>none</i> )         |  | Small Plant Colony   |
|  | Highly Dominant ( <i>none</i> )  |  |                      |
|  | Surface Matting ( <i>none</i> )  |  |                      |

Map 1  
 Little Saint Germain Lake  
 Vilas County, Wisconsin

**June 2018 CLP  
 Survey Results**

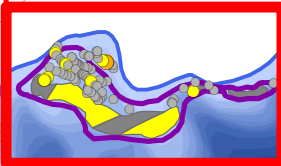
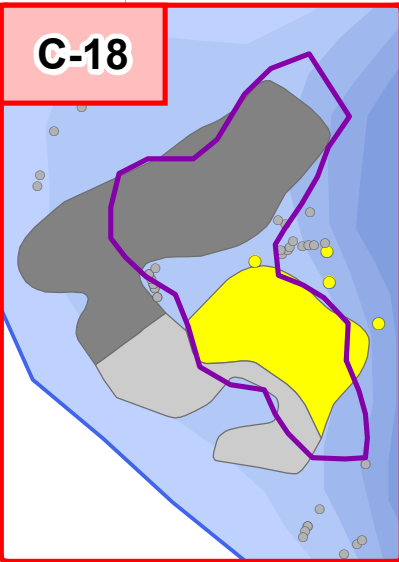
**A-18**



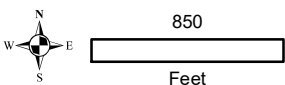
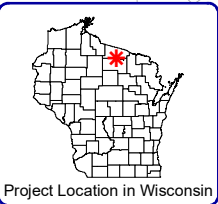
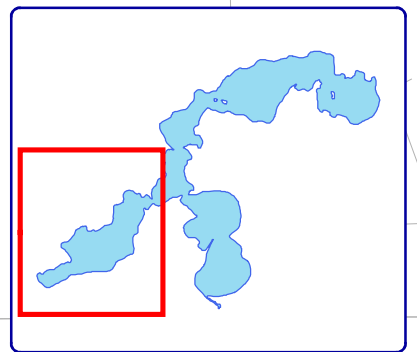
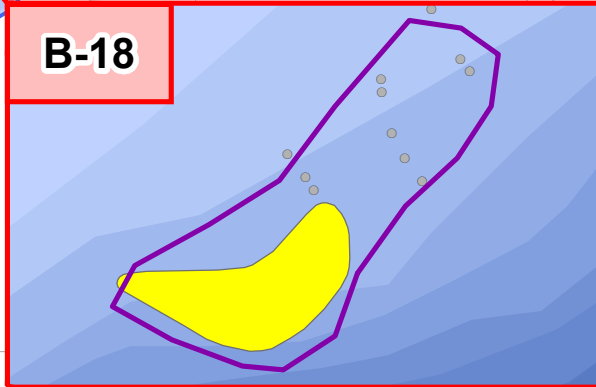
**2018 Final DASH Areas**

Site	Final Acres	Ave Depth (feet)
A-18	3.83	3.0
B-18	0.18	5.0
C-18	0.91	5.0
<b>Total</b>	<b>4.92</b>	

**C-18**



**B-18**



**Legend**

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Clumps of Plants
- Small Plant Colony
- 2018 Final DASH Site

Sources:  
 Roads and Hyrdo: WDNR  
 Bathymetry: WDNR, digitized by Onterra  
 Aquatic Plants: Onterra, 2018  
 Map Date: June 27, J.LW  
 Filename: LSG\_2018\_HandHarvest\_Prelim2.mxd

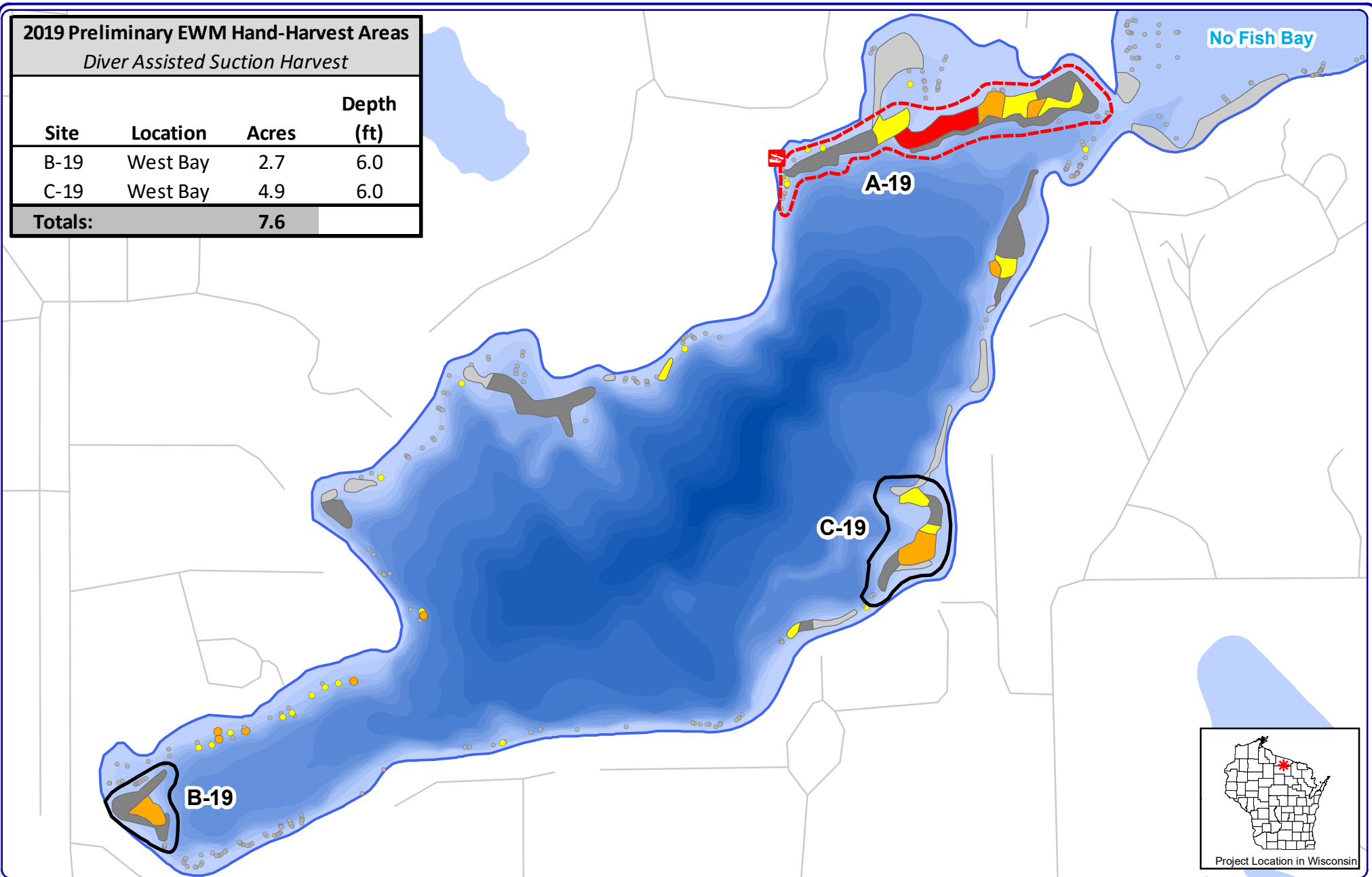
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Map 2  
 Little Saint Germain Lake  
 Vilas County, Wisconsin  
**June 2018 EWM Survey  
 Results & Final Hand-  
 Harvesting Control Strategy**

**2019 Preliminary EWM Hand-Harvest Areas**

*Diver Assisted Suction Harvest*

Site	Location	Acres	Depth (ft)
B-19	West Bay	2.7	6.0
C-19	West Bay	4.9	6.0
<b>Totals:</b>		<b>7.6</b>	

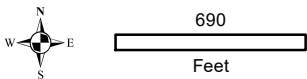
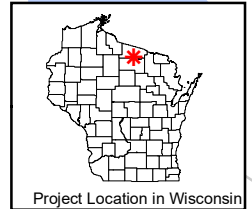


No Fish Bay

A-19

C-19

B-19



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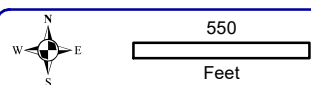
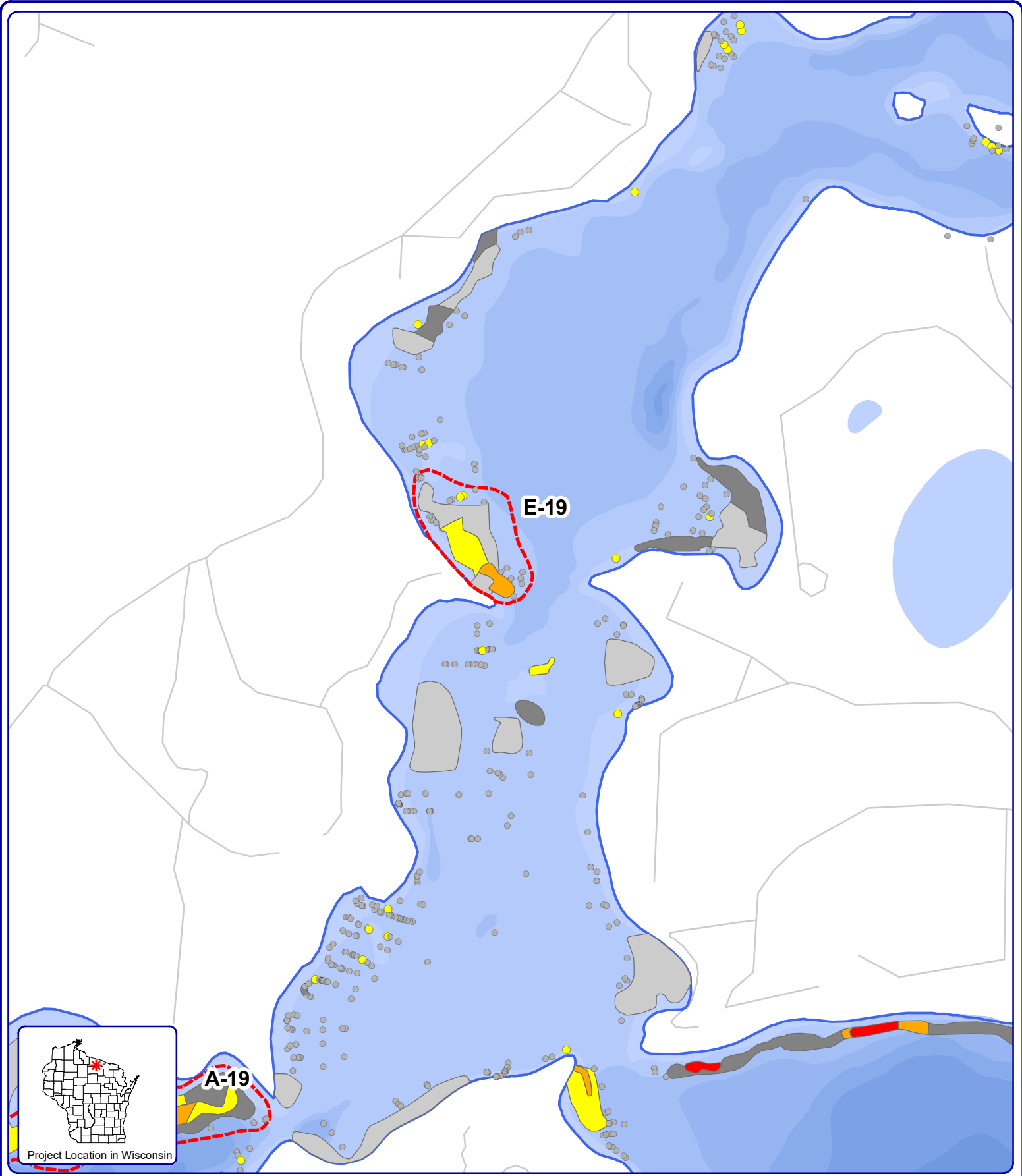
Sources:  
 Roads and Hydro: WDNR  
 Bathymetry: WDNR, digitized by Onterra  
 Aquatic Plants: Onterra, 2018  
 Map Date: February 8, 2019 AMS

**Legend**

**September 2018 EWM Survey Results**

- Highly Scattered
- Scattered
- Dominant
- Highly Dominant
- Surface Matting
- Single or Few Plants
- Clump of Plants
- Small Plant Colony
- Initially Considered Herbicide Treatment Locations
- Preliminary 2019 Hand-Harvesting Work Sites

**Map 3**  
 LSG: West Bay  
 Vilas County, Wisconsin  
**2018 EWM Survey Results  
 & Preliminary 2019 Hand-Harvesting Strategy**



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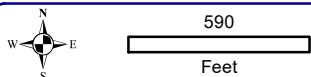
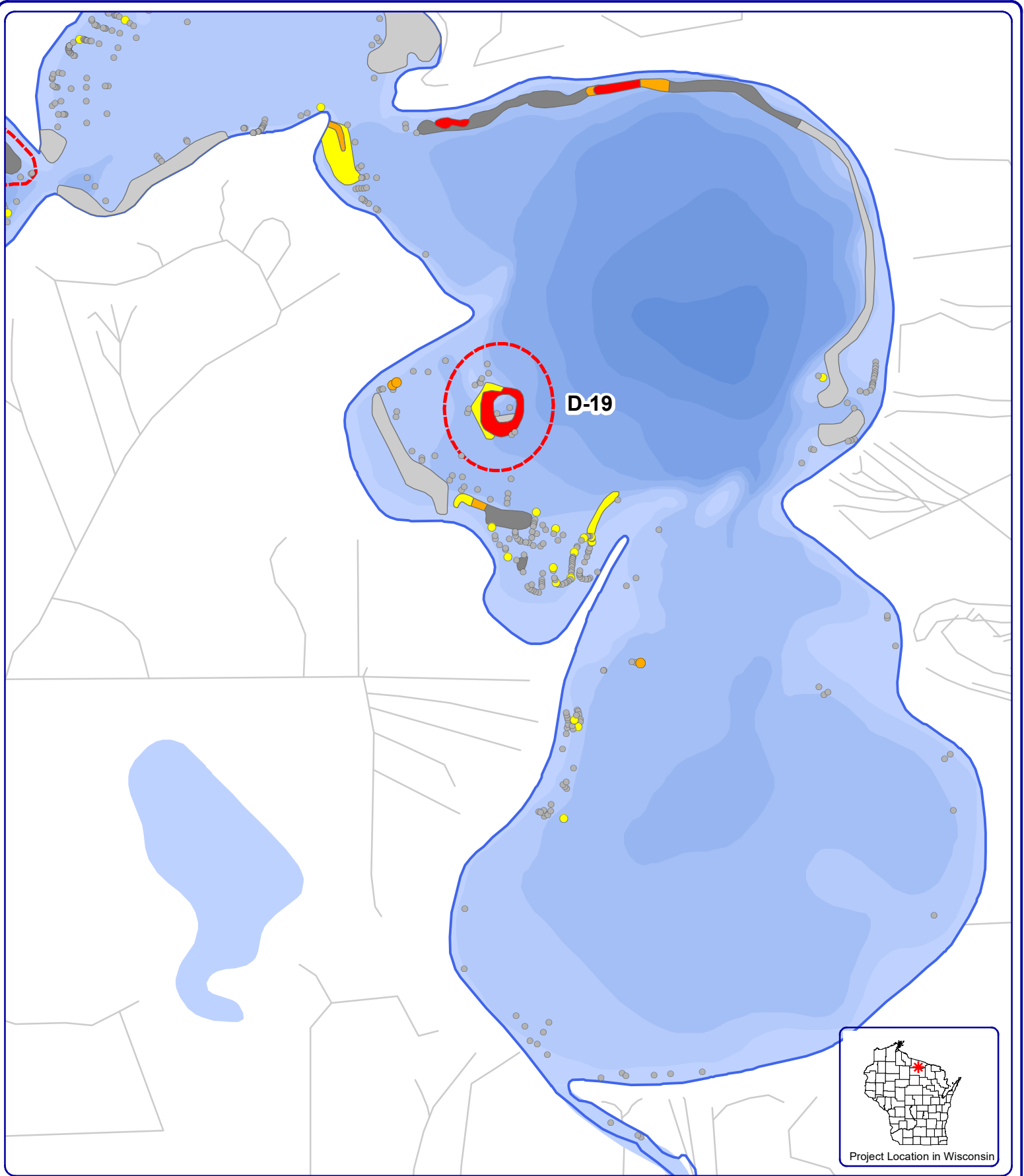
Sources:  
 Roads and Hydro: WDNR  
 Bathymetry: WDNR, digitized by Onterra  
 Aquatic Plants: Onterra, 2018  
 Map Date: January 23, 2019 AMS

**Legend**

- |  |                  |  |  |
|--|------------------|--|--|
|  | Highly Scattered |  | Single or Few Plants                               |
|  | Scattered        |  | Clump of Plants                                    |
|  | Dominant         |  | Small Plant Colony                                 |
|  | Highly Dominant  |  | Initially Considered Herbicide Treatment Locations |
|  | Surface Matting  |  |  |

Map 4  
 LSG:No Fish/S. East Bay  
 Vilas County, Wisconsin

**September 2018  
 EWM Survey Results**



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 Lake Management Planning  
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 De Pere, WI 54115  
 920.338.8860  
 www.onterra-eco.com

Sources:  
 Roads and Hydro: WDNR  
 Bathymetry: WDNR, digitized by Onterra  
 Aquatic Plants: Onterra, 2018  
 Map Date: January 23, 2019 AMS

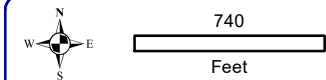
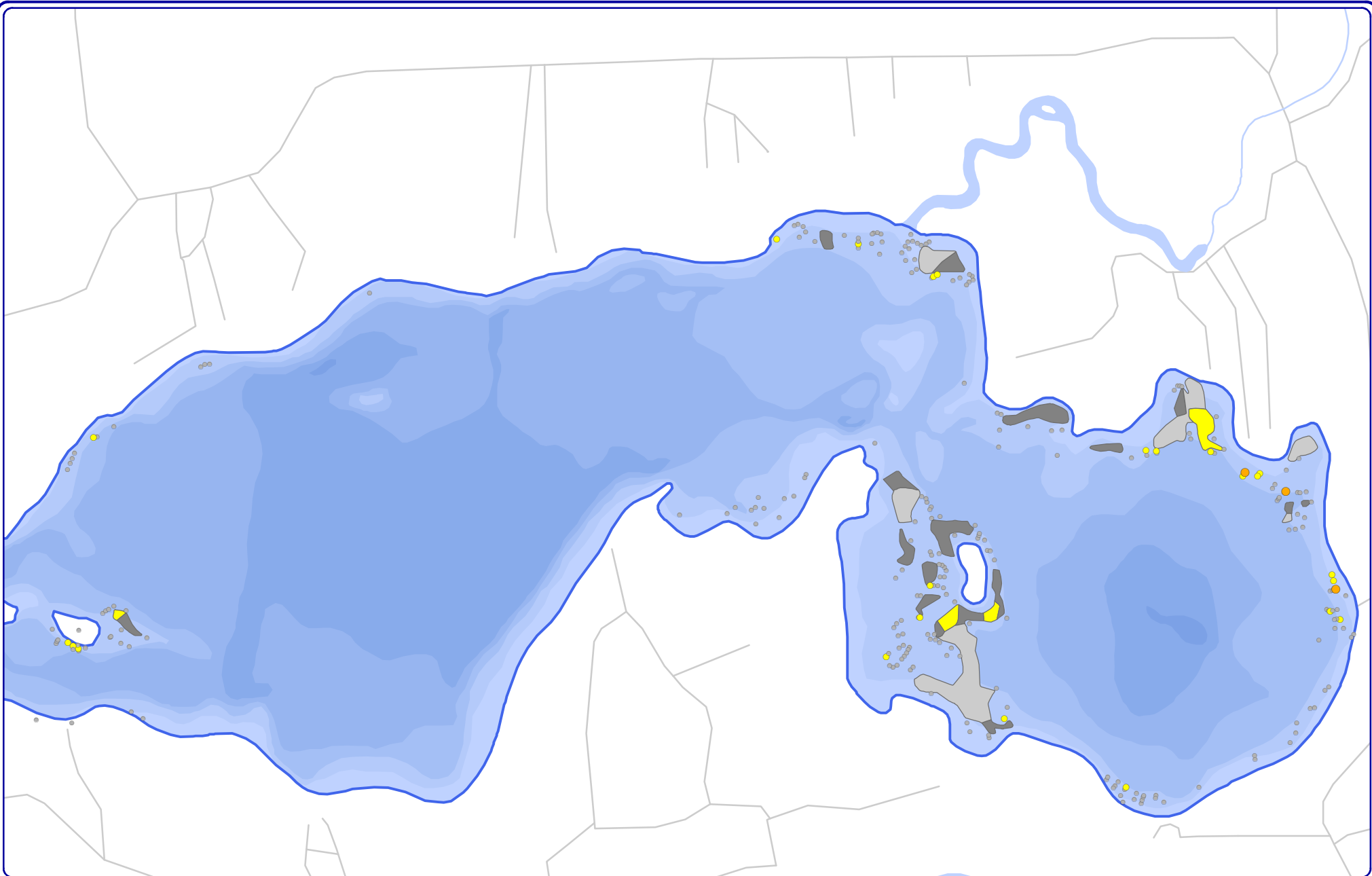
**Legend**

- |  |                  |  |  |
|--|------------------|--|--|
|  | Highly Scattered |  | Single or Few Plants                               |
|  | Scattered        |  | Clump of Plants                                    |
|  | Dominant         |  | Small Plant Colony                                 |
|  | Highly Dominant  |  | Initially Considered Herbicide Treatment Locations |
|  | Surface Matting  |  |  |

**Map 5**

**LSG: South Bay**  
 Vilas County, Wisconsin

**September 2018  
 EWM Survey Results**



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 www.onterra-eco.com

Sources:  
 Roads and Hydro: WDNR  
 Bathymetry: WDNR, digitized by Onterra  
 Aquatic Plants: Onterra, 2018  
 Map Date: January 22, 2019 AMS



- Legend**  
**September 2018 EWM Survey Results**
- Highly Scattered
  - Scattered
  - Dominant
  - Highly Dominant
  - Surface Matting
  - Single or Few Plants
  - Clump of Plants
  - Small Plant Colony

**Map 6**  
**LSG: E. East Bay**  
 Vilas County, Wisconsin  
**September 2018**  
**EWM Survey Results**