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**Lac Courte Oreilles &
Little Lac Courte Oreilles
2019 Aquatic Plant
Survey Report**

Prepared for:
Courte Oreilles Lakes Association

Prepared by:

A handwritten signature in black ink, appearing to read "James Scharl", written in a cursive style.

James Scharl



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INTRODUCTION / SUMMARY

The Courte Oreilles Lakes Association (COLA) is a State recognized lake association responsible for the management of Lac Courte Oreilles Lakes. Management activities include; aquatic invasive species (AIS), with the species of particular concern being curly-leaf (*Potamogeton crispus* – CLP) and Myriophyllum spicatum (*Eurasian water-milfoil* – EWM) on Lac Courte Oreilles and Little Lac Courte Oreilles (Lakes). Wisconsin Lake & Pond Resource, LLC (WLPR) was contacted by COLA to provide an aquatic plant survey focusing on AIS for each lake. WLPR furnished all labor, materials, tools and equipment necessary to perform all operations in connection with the full aquatic plant survey of the Lakes. This report provides a summary of observations and conclusions of the 2019 surveys and recommendations for the management of AIS for the upcoming 2020 season.

This Aquatic Plant Survey Report was produced as part of the aquatic plant management activities for the Lakes and COLA. The goal of the project was to document the location, density, and size of stands of invasive aquatic plant growth for management.



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Background

Lac Courte Oreilles is a 5,139-acre lake located in the Towns of Bass Lake and Sand Lake, Sawyer County, Wisconsin near the City of Hayward. Lac Courte Oreilles has a maximum depth of 90 feet and a mean depth of 33 feet. Little Lac Courte Oreilles is a 221-acre lake located in the Town of Bass Lake, Sawyer County, Wisconsin with a maximum depth of 46 feet and mean depth of 12 feet. COLA is an active lake association that has been managing aquatic plants on the Lakes through surveys and chemical treatments.

Both lakes have populations of AIS, notably curly-leaf pondweed and Eurasian water-milfoil. Curly-leaf pondweed was first confirmed in Lac Courte Oreilles in 2005 and has been managed primarily by chemical treatment since 2009. Eurasian water-milfoil was first identified in Little LCO in 2015 and LCO in 2017 with only occasional small-scale management taking place.

2019 Aquatic Invasive Species Mapping Surveys

A pre-treatment AIS survey was completed as a modified point-intercept survey on May 22-23, 2019 within Musky, Stucky, and Barbertown Bays. A visual meander survey of Little Lac Courte Oreilles was completed at the same time. Minimal locations of AIS were found at this time.

As the spring progressed increased locations of CLP were noted by COLA members, especially within Musky Bay. This prompted concern over a need to re-survey the lake prior to the natural die-off of CLP to more accurately map the amount of growth present in 2019. A meander survey using visual and rake samples was performed by WLPR on July 11-12, 2019 only in locations of known AIS. The goal of this survey was to document and verify locations of AIS growth only for potential management in 2020. A complete assessment of the native aquatic plant community was not complete at this time. However, whole-lake point intercept surveys were completed on both lakes in 2018. Please see [Lac Courte Oreilles & Little Lac Courte Oreilles 2018 Aquatic Plant Survey](#) for a complete discussion of the entire aquatic plant communities of the lakes.

Survey Results - Eurasian Water-milfoil

All locations of known or potential populations of EWM were mapped on July 11-12, 2019 in Lac Courte Oreilles and Little Lac Courte Oreilles. Survey locations were chosen based on the location of EWM identified on past surveys, such as the 2018 whole lake surveys, or past reporting of known locations by COLA, the WDNR, and other entities. Figures 1.1-1.8 depict the locations of EWM identified at this time.

Eurasian water-milfoil is a fast-growing invasive species that disrupts native aquatic plant communities and impacts recreational use of a lake. EWM was first identified in Lac Courte Oreilles in 2017 in the bay with the Grindstone Lake inlet near the public boat launch. Since then, it was identified in other locations spread throughout the lake and included a 0.5-acre area in the western basin that was treated in both 2018 and 2019. A population of EWM was first identified in Little Lac Courte Oreilles in 2015 during a whole-lake survey.

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The 2019 survey identified EWM in six primary locations within Lac Courte Oreilles:

1. **Western Basin – Figure 1.2:** First identified in 2018 during the whole-lake survey this location is on top of a small sand/gravel hump surrounded by deep water and is nearly monotypic and reaches the surface. Management in 2018 with an herbicide application did not control this location. This location of EWM may be a primary source of infestation to new area of LCO.
2. **Ashland Point – Figure 1.3:** First identified in late 2017 and verified during the 2018 whole-lake survey. EWM located here is found in a small bed of scattered clumps and intermixed with native species.
3. **Whitefish Inlet – Figure 1.4:** First identified in 2018, this location is adjacent to the Whitefish Lake inlet. Whitefish Lake is likely the source of infestation with EWM first identified in 2008. This location is adjacent to a steep-dropping lake bottom and located in a narrow band of water from 10-14 feet deep.
4. **Grindstone Inlet – Figure 1.5:** First identified in 2017 as the initial location of EWM infestation in Lac Courte Oreilles. Only a few scattered plants were located during the 2018 whole-lake survey. In 2019 EWM has become more prevalent and spread out, but is not a dominant species and still mixed within the native plants.
5. **Stucky bay – Figure 1.6:** EWM in Stucky Bay is a new infestation in Lac Courte Oreilles and found for the first time in 2019 during the July survey. EWM plants are primarily located in shallow water and adjacent to the agricultural channel/inlet, similar to where CLP has been historically located.
6. **Barbertown bay – Figure 1.7:** A single plant of EWM was located and hand-pulled during the spring, 2018 AIS survey in the shallow, norther part of the bay. In 2019, a single location was located and also hand pulled.

| Location | ID | Figure | Acres | Avg. Depth | Volume (ac-ft) |
|------------------|-----|--------|-------------|------------|----------------|
| West hump | A | 1.2 | 0.5 | 11 | 6.5 |
| Ashland Pt | B | 1.3 | 0.50 | 10 | 5 |
| Whitefish Inlet | C | 1.4 | 0.50 | 12 | 6 |
| Grindstone Inlet | D | 1.5 | 4.00 | 7 | 28 |
| Stucky Bay | E | 1.6 | 1.00 | 4 | 4 |
| TOTAL | --- | | 6.50 | --- | 43 |

Locations of EWM within Little Lac Courte Oreilles (Figure 1.8) were similar to those mapped and treated in 2018. Three individual polygons were located on the eastern shore.

| Area | Acres | Avg. Depth | Volume (ac-ft) |
|--------------|-------------|------------|----------------|
| A | 0.55 | 8 | 4.4 |
| B | 0.40 | 6 | 2.4 |
| C | 0.35 | 5 | 1.75 |
| TOTAL | 1.30 | --- | 8.55 |

Management Recommendations – Eurasian water-milfoil

Control of EWM is a priority on both Lakes to prevent it's from spreading further within and to protect nearby lakes by preventing it's spread out of the Lac Courte Oreilles lakes. The 2019 survey was focused on known locations of EWM or potential EWM. Due to time constraints, large areas of the lake were not surveyed and may harbor additional populations of EWM outside those mapped. Further surveying should be a priority to assess the remainder of Lac Courte Oreilles for EWM.

Current populations of EWM may be a challenge to manage due to the natural morphology of the lakes. In shallow locations of limited growth hand pulling is control method, such as within Barbertown Bay. For larger populations use of a targeted herbicide application should be used.

For an aquatic herbicide application to be successful it must have adequate application rates and contact times at these rates for the chosen active ingredient. For EWM, the primary active ingredient used in Wisconsin is 2,4-D, which requires a moderate contact time of one day or more, even at maximum label rates of 4.0 PPM. However, in both lakes EWM locations are adjacent to large areas of deep water which limit contact time as the products freely diffuse off site. This decreases adequate contact time to hours.

2,4-D was used on populations of EWM in both lakes in 2018 and provided only minimal control at best. The contact time was simply not enough due to the smaller size of the sites, which limits total product allowed to applied.

For EWM management for the rest of 2019 and into 2020, we recommend the following course of action:

1. Complete mapping of EWM throughout Lac Courte Oreilles

- a. Meander survey and GPS mapping of the rest of the littoral zone – 2019
The initial 2019 survey included only areas of know AIS. EWM is likely to exist outside these locations within the Lake. To ensure control of EWM and limit its spread the rest of the lake should be surveyed and mapped.
- b. Collaborative monitoring by lake users to identify populations of EWM – 2019-2020
Create and maintain an open-space electronic database to log new locations of AIS found by lake residents, COLA members, or other interested parties.

2. Control EWM populations through direct management

- a. Hand pull small populations in shallow water - 2019-2020
Locations where EWM is in shallow water and not a dominant species can be easily hand-pulled for control. These include areas in Stucky Bay, Barbertown Bay, and any new locations found. Care must be made to remove all roots and plant material from the lake.
- b. Herbicide management of larger populations of EWM – 2020
Larger populations of EWM should be controlled with a systemic herbicide that can provide adequate contact time for extended control. Based on 2018 results and the natural lake morphology use of products with the active ingredient 2,4-D only is not



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recommended. Any application should be completed during periods of calm weather to increase contact time as much as possible. Recommended products and rates are as follows:

Primary recommendation: ProcellaCOR - active ingredient floraspiraxifen-benzyl. ProcellaCOR is a newly developed systemic herbicide first released in 2018 and created with a focus on management of small-scale populations of EWM. ProcellaCOR requires limited contact time to be successful. Applications rates of 3-5 PDU/ac-ft, or more in deeper water, should be used. All rates should be verified with the product manufacturer prior to application.

Secondary recommendation: Aquastrike, active ingredients endothall and diquat. Aquastrike has been successfully used throughout Wisconsin to control populations of EWM. Aquastrike combines a systemic active ingredient (endothall) with a fast-acting contact (diquat) to control target plants. Due to the lakes' morphology application rates should be near the maximum allowed at 1.625 gallons/ac-ft.

Secondary recommendation: Active ingredient diquat - multiple trade names. Diquat is a fast-acting contact herbicide that can provide control of EWM. However, many product labels limit application to a maximum rate of 2 gallons per surface acre, regardless of depth. In deeper water diquat alone is not enough to control EWM.

Secondary recommendation: Combination of 2,4-D and Aquathol (active ingredient endothall). This combination has been used throughout Wisconsin to control EWM. The combination of two active ingredients provides multiple modes of action and added control in locations of limited contact time. Applications rates of each active vary based on site conditions, but are generally from 1.5-3.0 PPM 2,4-D and 2.0-4.0 PPM endothall.



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Survey Results – Curly-leaf Pondweed

Curly-leaf pondweed is a unique species in Wisconsin. Plants of CLP often start growing from seed-like structures called turions late in the year around October or November, overwinter under ice cover as small plants, begin growing again once the ice leaves, and die off early in mid-summer. The early growth of CLP allows it to capitalize in the spring as many natives have not yet emerged.

Spring of 2019 included a late ice-out date and was unseasonably cold and wet. The initial survey for AIS on the lakes in May, 2019 identified minimal CLP. However, a large growth of CLP was noted by COLA members and prompted a second survey completed in July 11-12, 2019. The cool, wet spring suppressed growth of native aquatic plant species throughout Wisconsin. Decreased competition allowed CLP turions that would have normally remained dormant to grow and cause a late, second growth of CLP. This condition was noted on multiple lakes in Wisconsin in 2019.

All locations of known or potential populations of CLP were mapped on July 11-12, 2019 in Lac Courte Oreilles and Little Lac Courte Oreilles. Survey locations were chosen based on the location of CLP identified on past surveys, such as the 2018 whole lake surveys, or past reporting of known locations by COLA, the WDNR, and other entities. Figures 2.1-2.7 depict the locations of CLP identified at this time.

The 2019 survey identified CLP in four primary locations within Lac Courte Oreilles:

1. **Eastern Basin – Figure 2.2:** These locations are primarily near-shore and in shallow water. Locations A and B are within a man-made trench of 2-3 ft deep that accumulates organic matter in an area that is normally shallower and sandier. Curly-leaf plants here are highly scattered and easily hand-pulled. Location C is also near-shore, but extends off shore following a sand bar.
2. **Barbertown Bay – Figure 2.3:** Barbertown Bay has had a varying population of CLP since 2010. Curly-leaf pondweed is typically in shallower water along the northern shore. However, in 2019 the CLP was extended southwest into deeper water (8-10 ft). This location appears to have had a secondary spring growth.
3. **Stucky Bay– Figure 2.4:** Like other locations of CLP in Lac Courte Oreilles, the population in Stucky Bay has been present since 2010 and may include areas of the adjacent agricultural channel. Plants found here were in shallow water, near the channel inlet, and spread out.
4. **Musky Bay – Figures 2.5-2.6:** Musky bay has been the primary CLP control site in Lac Courte Oreilles with up to 90+ acres of growth present in the past. Past growth has built up a considerable bank of turions within the sediment here. Large scale control has brought the population down significantly with only minimal management necessary in 2018.

However, the population of CLP unexpectedly grew significantly in 2019. Though there is a high frequency of CLP present in Musky Bay, the overall density is low. Many



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plants were seen growing in clumps scattered 20+ feet apart. Many of these locations were lumped together to form larger areas for future management.

| Location | ID | Figure | Acres | Avg. Depth | Volume (ac-ft) |
|--------------------------|-----|---------|-------------|------------|----------------|
| East Shore | A | 2.2 | 0.36 | 2 | 0.72 |
| East Shore | B | 2.2 | 0.64 | 2 | 1.28 |
| East Shore | C | 2.2 | 1.6 | 4 | 6.4 |
| Barbertown Bay | D | 2.3 | 4 | 5.5 | 22 |
| Stucky Bay | E | 2.4 | 1.2 | 4.5 | 5.4 |
| Musky Bay | F | 2.5-6 | 1.25 | 4.5 | 5.625 |
| Musky Bay | G | 2.5-2.6 | 1.25 | 5 | 6.25 |
| Musky Bay | H | 2.5-2.6 | 44.3 | 2.5 | 110.75 |
| Musky Bay | I | 2.5-2.6 | 4.6 | 3 | 13.8 |
| TOTAL - Musky Bay | --- | --- | 51.4 | --- | 136.425 |
| TOTAL | --- | --- | 59.2 | --- | --- |

Locations of CLP within Little Lac Courte Oreilles (Figure 2.7) were highly scattered and consisted of only a few plants. All locations were within shallow water and should be hand pulled for control.

Management Recommendations – Curly-leaf Pondweed

Control of CLP is a priority on both Lakes to prevent it’s from spreading further and impacting the native aquatic plant community, especially in Musky Bay. Current populations of CLP are within historically known areas. A varied approach for management is recommended for control of CLP within the lakes. In areas of shallow water, such as A & B in Figure 2.2, hand pulling is successful and should be continued. Larger areas should be managed with an early-season targeted herbicide application. The active ingredient endothall has proven to be successful in CLP control in Lac Courte Oreilles and should be used for future management.

For CLP management for the rest of 2019 and into 2020, we recommend the following course of action:

1. **Continue mapping of CLP throughout Lac Courte Oreilles**
 - a. Collaborative monitoring by lake users to identify populations of CLP – 2019-2020
Create and maintain an open-space electronic database to log new locations of AIS found by lake residents, COLA members, or other interested parties.
2. **Control CLP populations through direct management**
 - a. Hand pull small populations in shallow water - 2019-2020
Locations where CLP is in shallow water and not a dominant species can be easily hand-pulled for control. These include areas in Little Lac Courte Oreilles and eastern basin of Lac Courte Oreilles (Figure 2.2). Care must be made to remove all roots and plant material from the lake.



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b. Herbicide management of larger populations of CLP – 2020

Larger populations of EWM should be controlled with a systemic herbicide that can provide adequate contact time for extended control. Based on 2018 results and the natural lake morphology use of products with the active ingredient 2,4-D only is not recommended. Any application should be completed during periods of calm weather to increase contact time as much as possible. Recommended products and rates are as follows:

Large-scale recommendation – Musky Bay: Aquathol K, active ingredient endothall, and whole-bay rate of 0.65-0.70 PPM. Aquathol K contains endothall, a systemic herbicide that has proven extremely successful for CLP control throughout Wisconsin and within Lac Courte Oreilles. Because of the proximity of many small clumps of CLP within Musky Bay these areas should be combined to form larger treatment polygons (Figures 2.5 & 2.6). Additionally, due to the size and spread of CLP within Musky Bay, the application should be dosed on a whole-bay volume.

This practice was used successfully in the past in Musky Bay and will ensure adequate contact time for CLP control. A more accurate bathymetric map and volume were created using collected data to achieve better dosing (Figure 2.6). The water volume of Musky Bay was calculated at 1081 ac-ft. Use of Aquathol K at recommended whole-bay rates does not require a water-use restriction for irrigation and will limit impact to adjacent cranberry operations.

Small-scale recommendation – Barbertown & Stucky Bays: Aquathol K at 3 PPM. Aquastrike has been successfully used throughout Wisconsin to control populations of EWM. Aquastrike combines a systemic active ingredient (endothall) with a fast-acting contact (diquat) to control target plants. Due to the lakes' morphology application rates should be near the maximum allowed at 1.625 gallons/ac-ft.

Lac Courte Oreilles Lakes Association should continue to be involved in some type of aquatic plant management program to help manage invasive aquatic plant growth. AIS are extremely opportunistic plants and can grow to nuisance levels in a very short period of time. Continued management should occur to ensure that the health, aesthetic and recreational value of the lake is not degraded.

With COLA's continued commitment to ensuring that the health, aesthetic and recreational values of Lac Courte Oreilles are preserved, with active aquatic plant management, the quantity of exotic species found on Lac Courte Oreilles will be appropriately controlled. Wisconsin Lake & Pond Resource appreciates working for COLA this past season and we look forward to working with you on future projects. Please feel free to contact us if you have any questions regarding the 2013 aquatic plant surveys or with any additional concerns or needs for 2020.



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Appendix A

Figures



Eurasian Water-milfoil Locations

Lac Courte Oreilles, Saywer County

Surveyed: July 11-12, 2019

Figure 1.1



EWM Location A - West Hump

Lac Courte Oreilles, Saywer County, WI

Surveyed: July 11-12, 2019

Figure 1.2



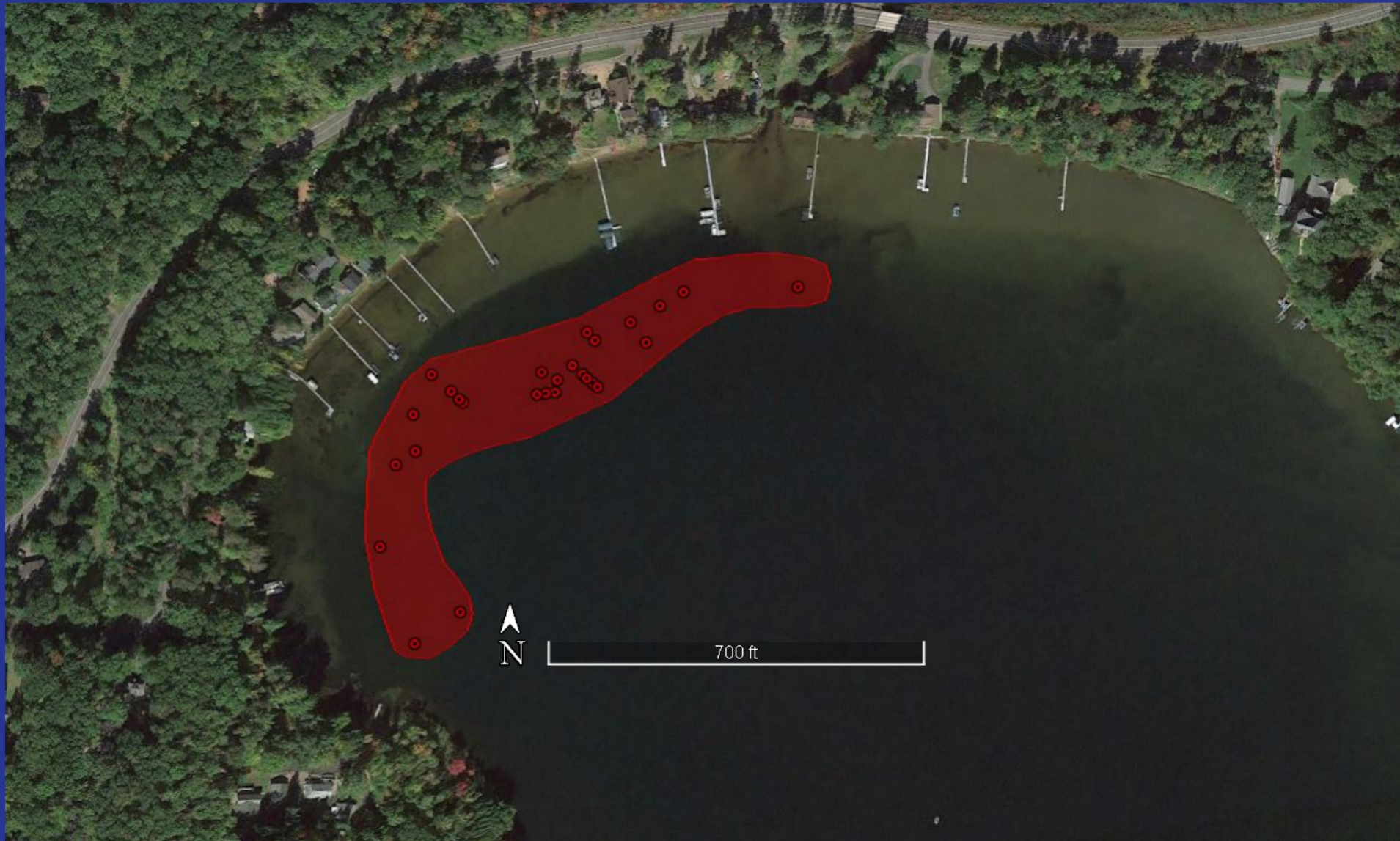


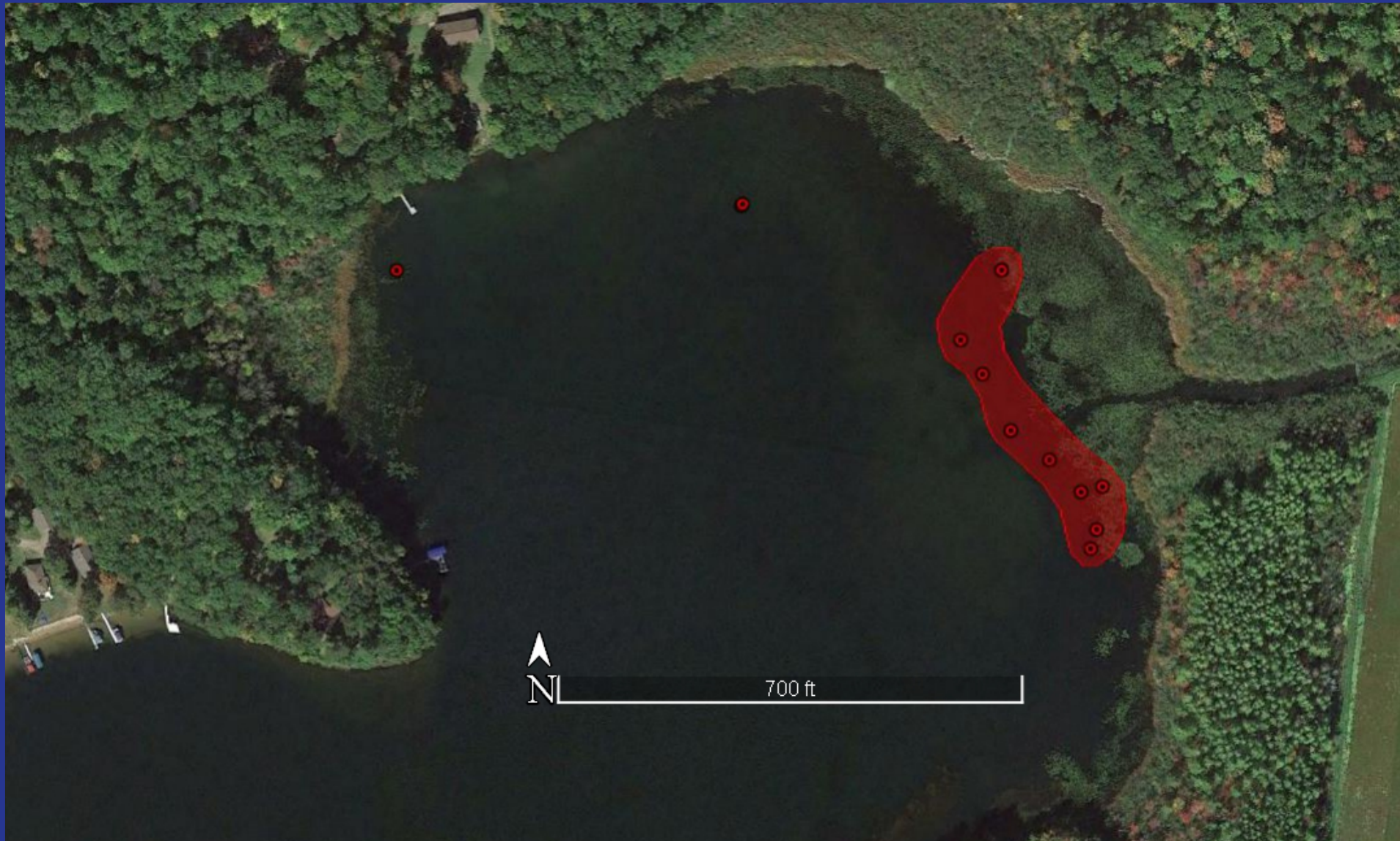
EWM Location C - Whitefish Inlet

Lac Courte Oreilles, Saywer County

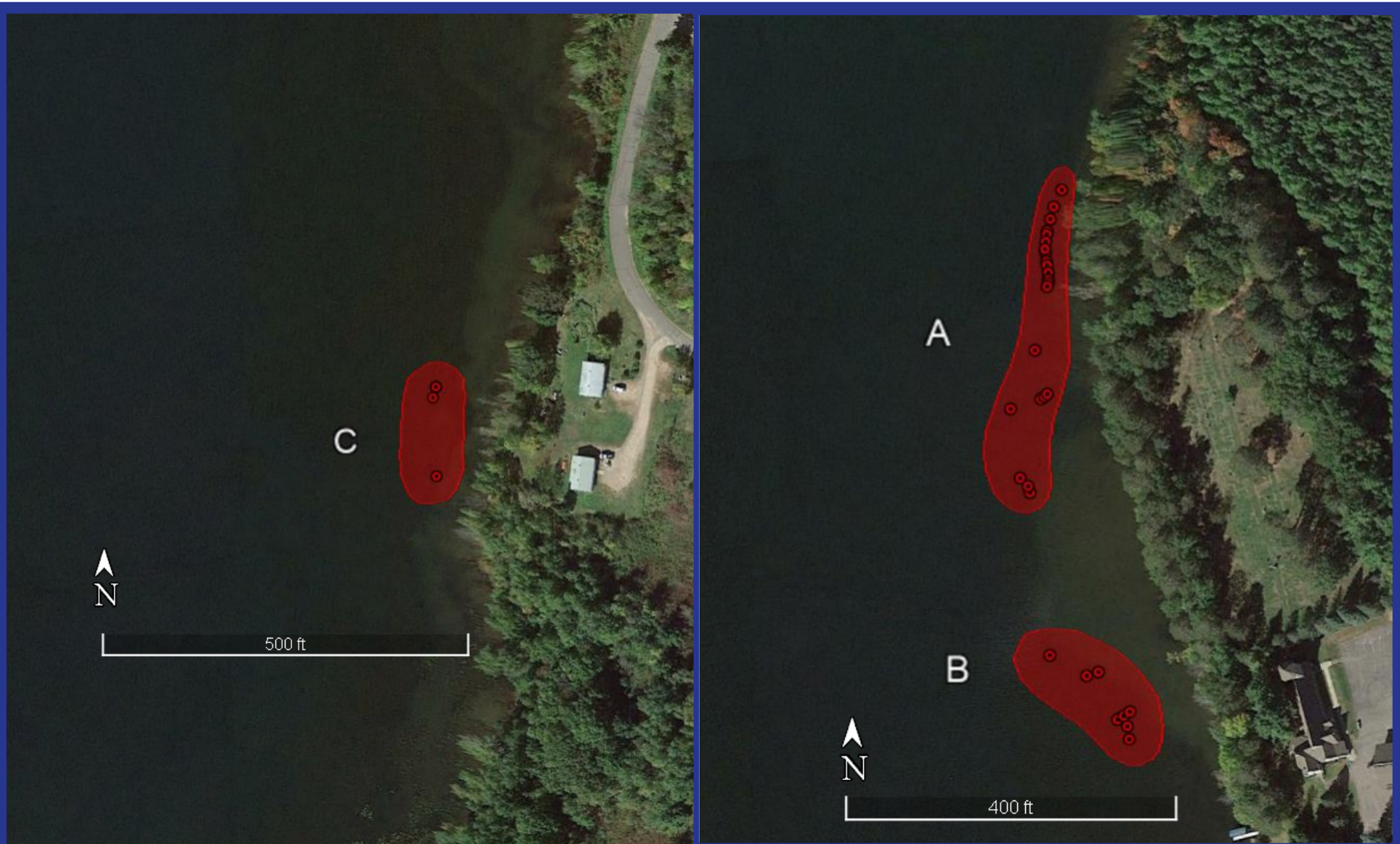
Surveyed: July 11-12, 2019

Figure 1.4









Eurasian Water-milfoil Locations

Little Lac Courte Oreilles, Sawyer County

Surveyed: July 11-12, 2019

Figure 1.8


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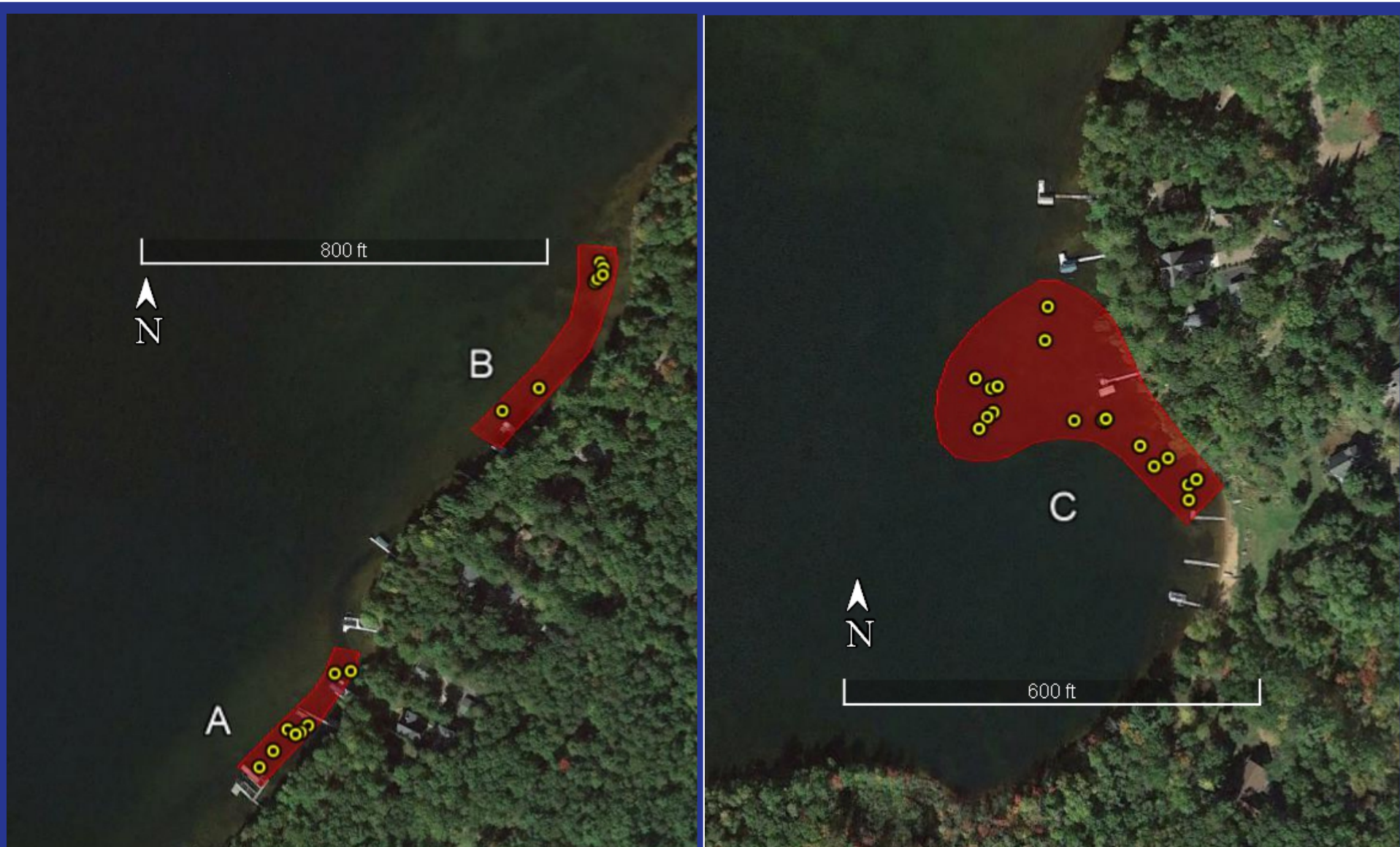


Curly-leaf Pondweed Locations

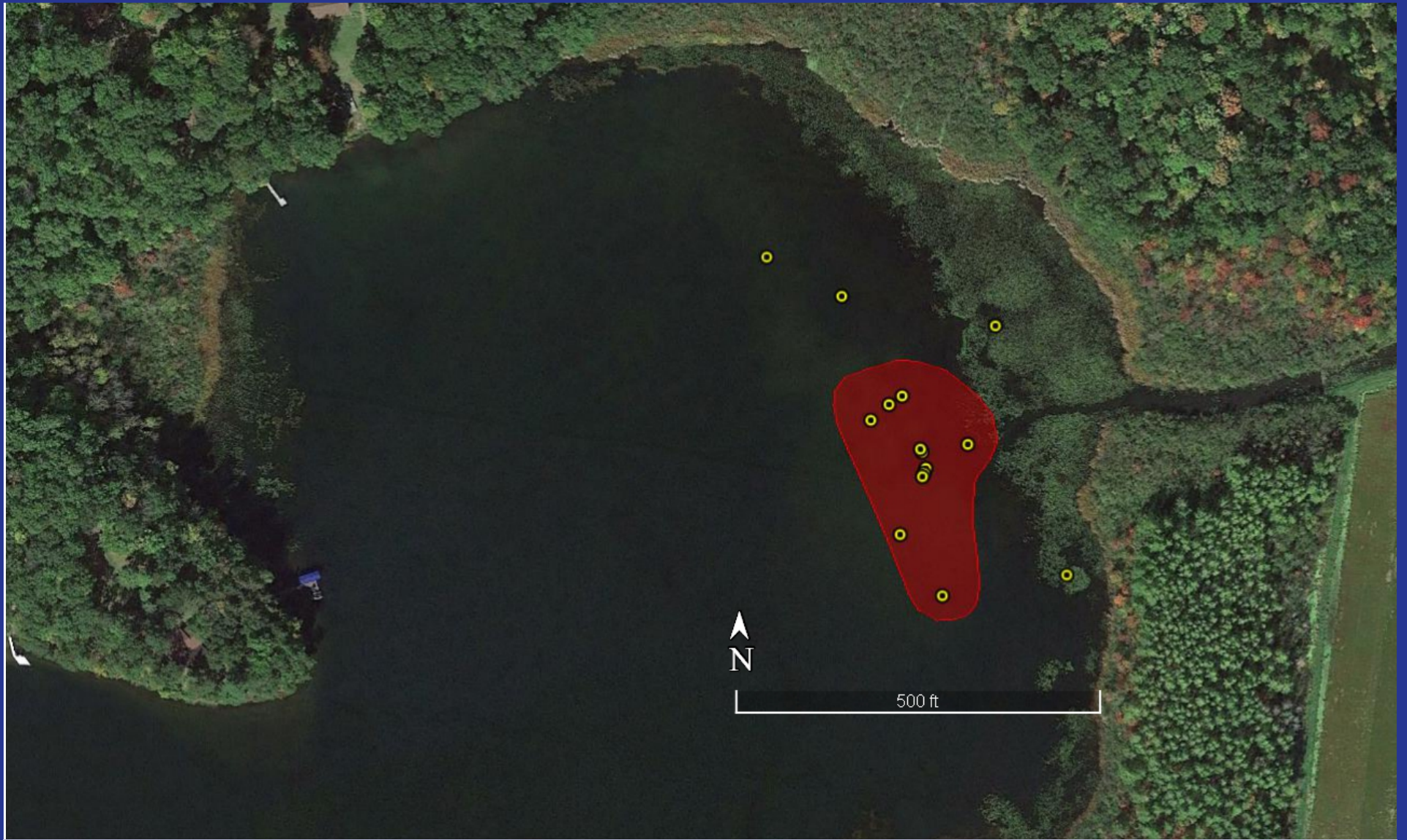
Lac Courte Oreilles, Saywer County

Surveyed: July 11-12, 2019

Figure 2.1





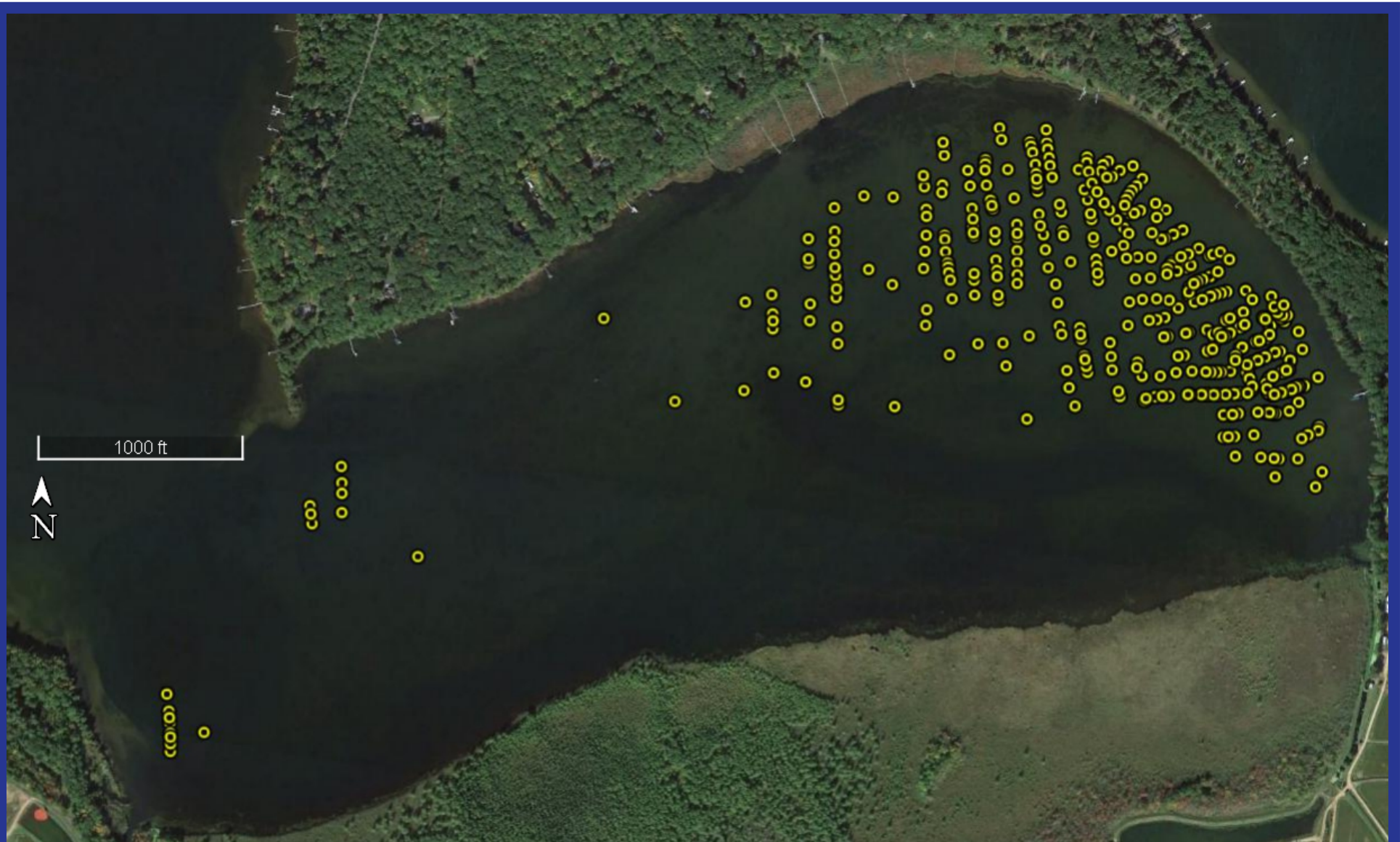


CLP Location E - Stucky Bay

Lac Courte Oreilles, Saywer County

Surveyed: July 11-12, 2019

Figure 2.4

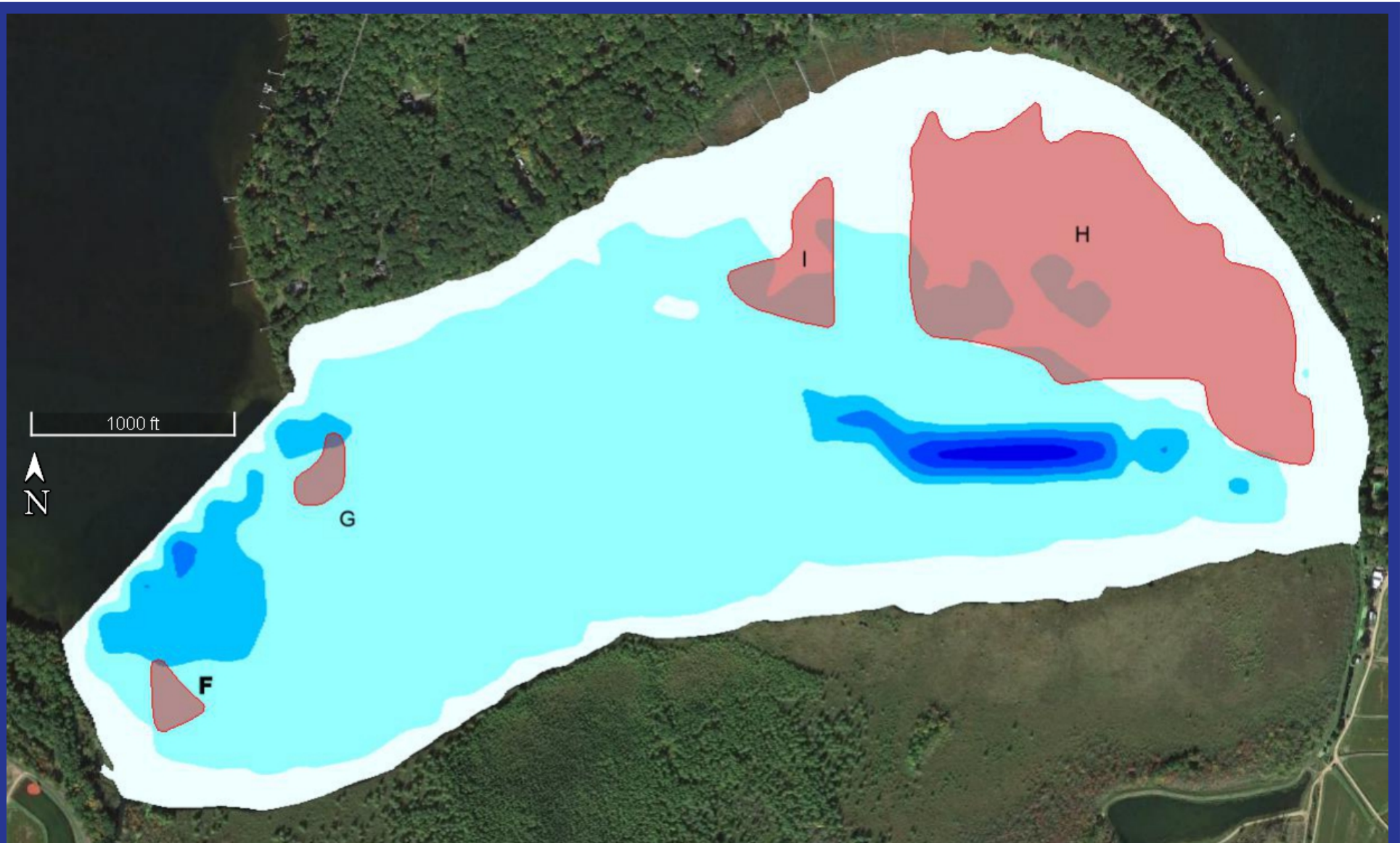


Individual CLP Locations - Musky Bay

Lac Courte Oreilles, Saywer County

Surveyed: July 11-12, 2019

Figure 2.5

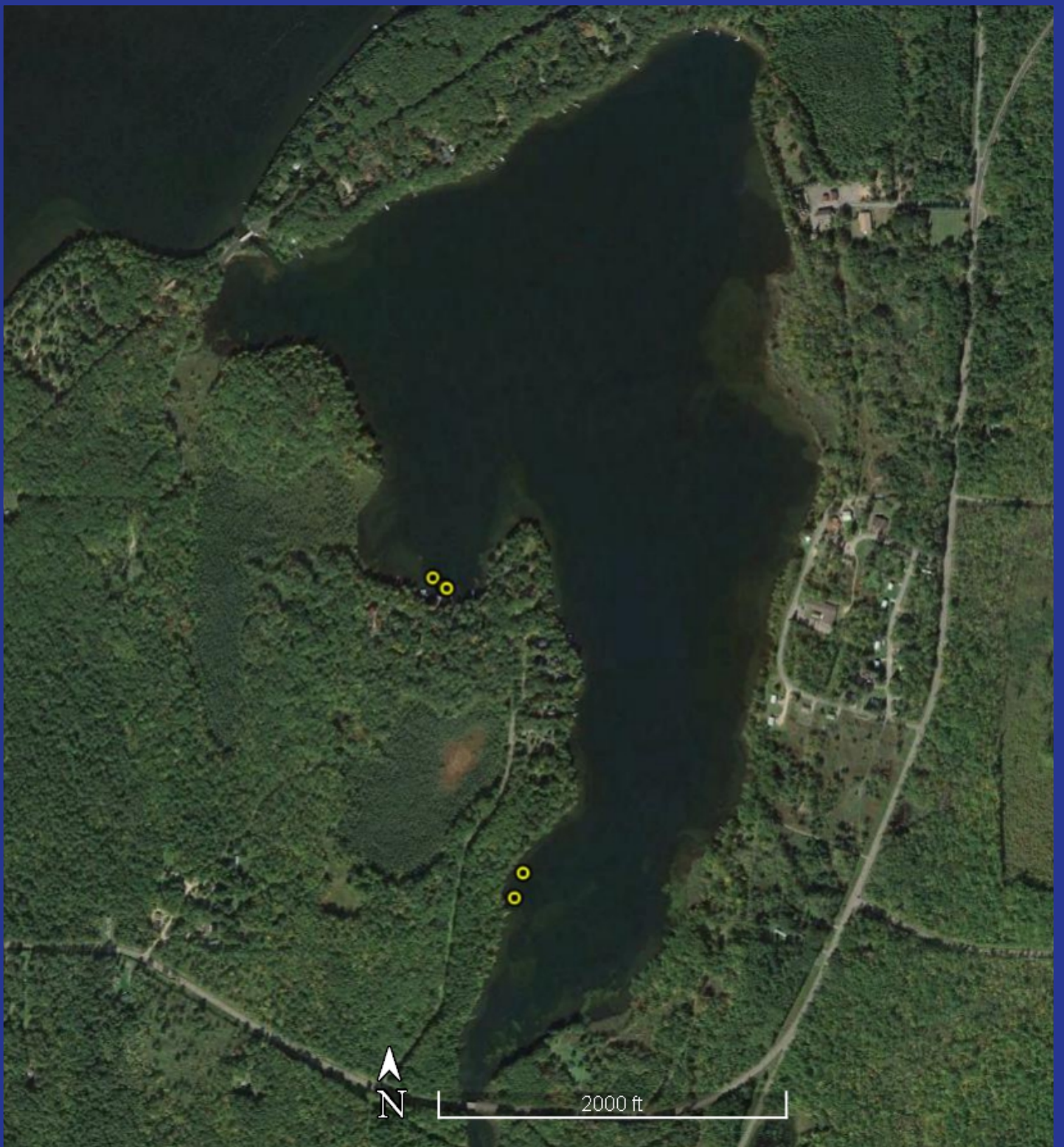


CLP Locations F-I - Musky Bay

Lac Courte Oreilles, Saywer County

Surveyed: July 11-12, 2019

Figure 2.6



Curly-leaf Pondweed Locations