Chara in Clearwater Lake on August 2, 2017

Starry Stonewort Searches for Clearwater Lake, Wright County, Minnesota, 2017

Survey Dates: August 2 and October 9, 2017

Prepared for:
Clearwater Lake Property Owners

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Summary of the 2017 searches: Volunteer searchers from the Clearwater Lake Property Owners and 3 staff from Blue Water Science, surveyed 3 boat accesses on August 2, 2017 (Figure 1), and spent a total of 20 search hours (Table 1). No starry stonewort was observed at any location.

On October 9, 2017, two staff from Blue Water Science surveyed 3 boat accesses and spent 8 hours of search time (Table 1). No starry stonewort was observed at any location.

Table 1. Individual site data for the starry stonewort searches in 2017.

	Representative Rake Sampling and Diving	Starry Stonewort (SSW)	Chara	Bottom Conditions
August 2, 2017				
1. Waterfront Grill Access	34 rake samples 40 minutes of diving	No SSW found	Light densities	Mostly silty sand
2. Bob's Bay Access	34 rake samples 40 minutes of diving	No SSW found	Light densities	Organic sediments and silty sand
3. Highway 24 Private Access	29 rake samples 40 minutes of diving	No SSW found	Light to moderate densities	Mostly sand with some gravel
October 9, 2017				
1. Black Pool Access	33 rake samples 40 minutes of diving	No SSW found	Light growth	Organic sediments and sand
2. Bob's Bay Access	34 rake samples 35 minutes of diving	No SSW found	Light growth	Organic sediments with some sand
3. Highway 24 Private Access	33 rake samples 30 minutes of diving	No SSW found	Present at light to moderate densities	Mostly sand with some gravel

Figure 1. Location of the search sites.

Survey Areas for August 2, 2017

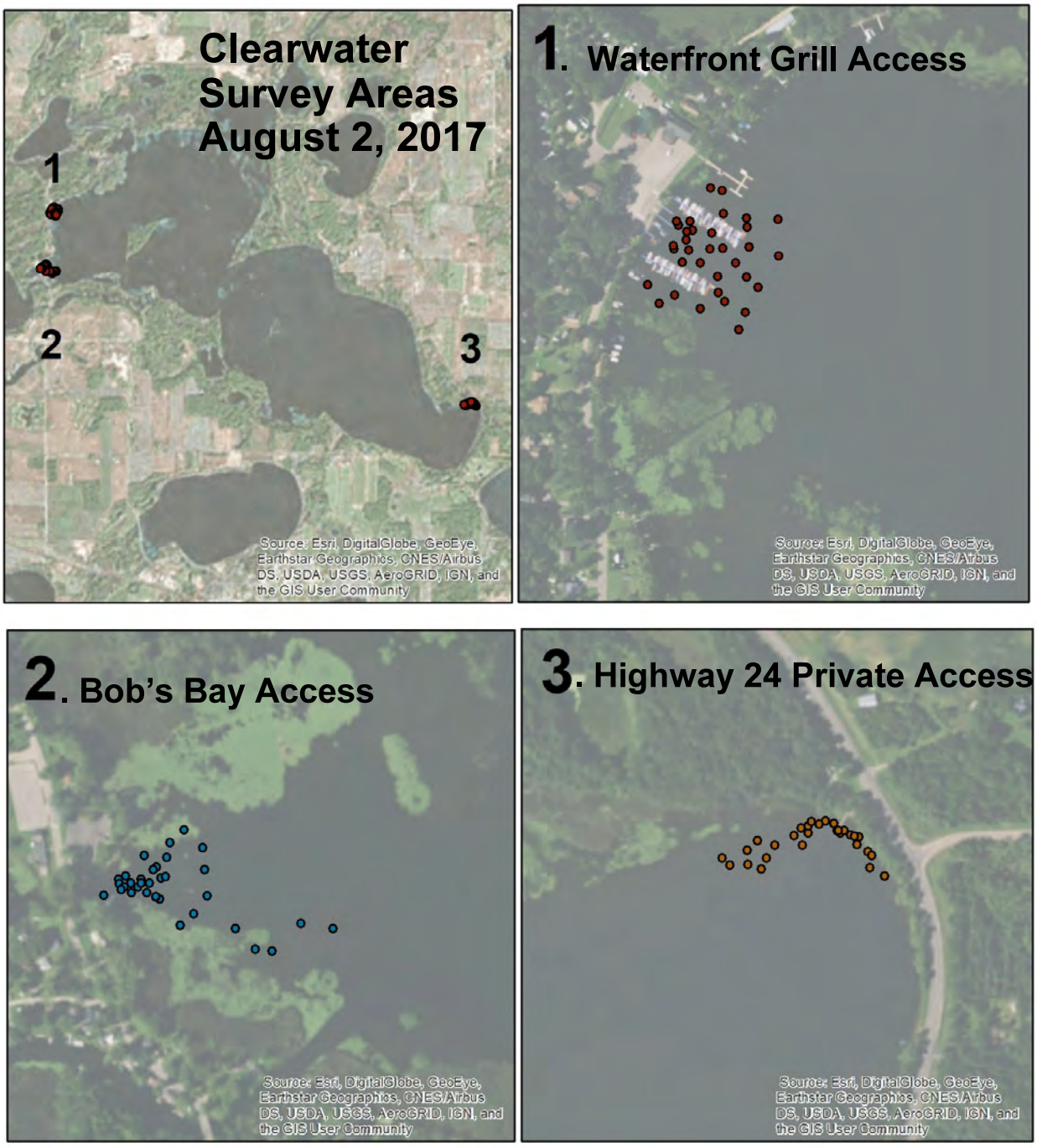


Figure 2. Survey areas for August 2, 2017 (dots on maps 1, 2, and 3 indicate rake sample locations).

Survey Areas for October 9, 2017

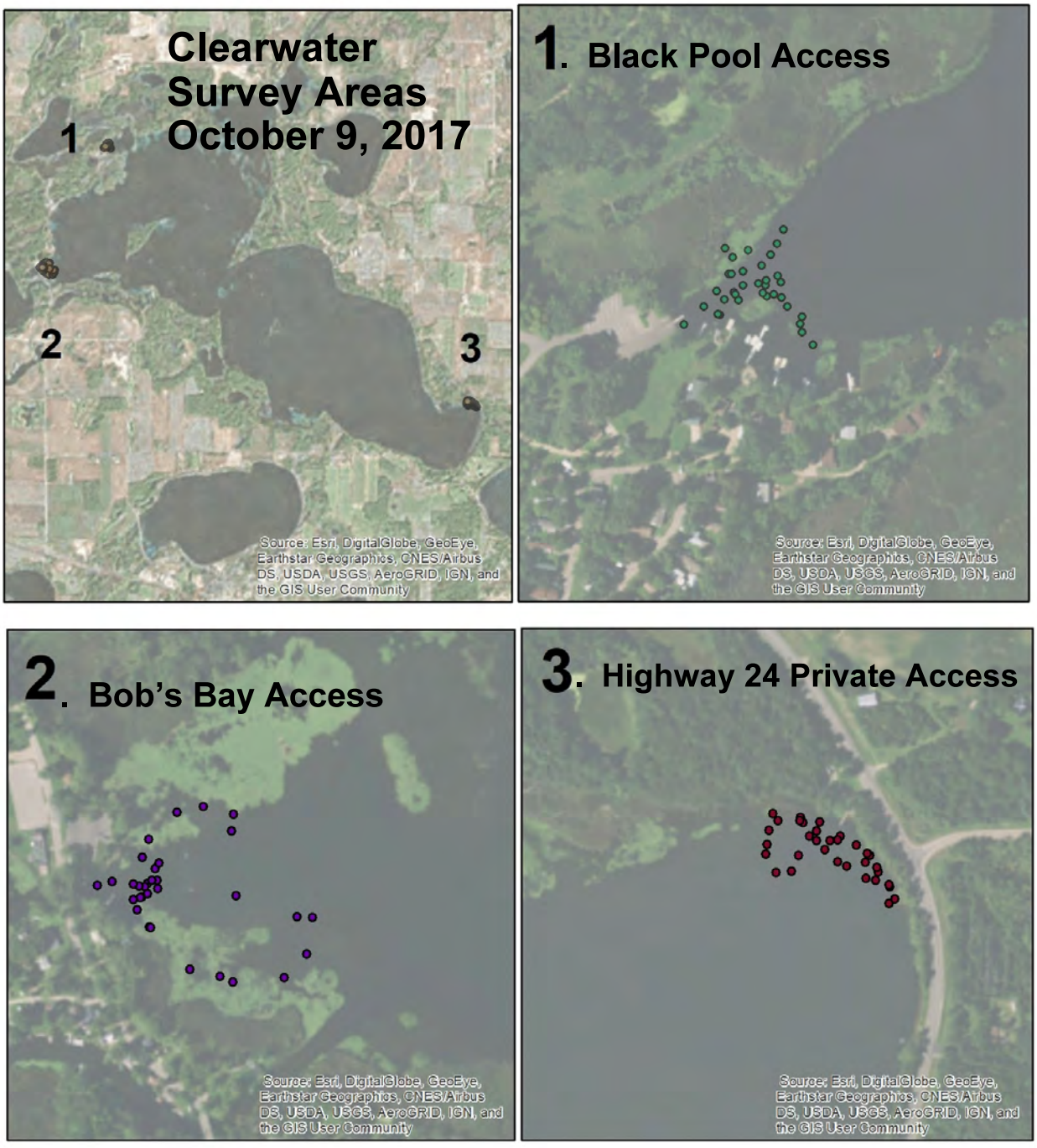
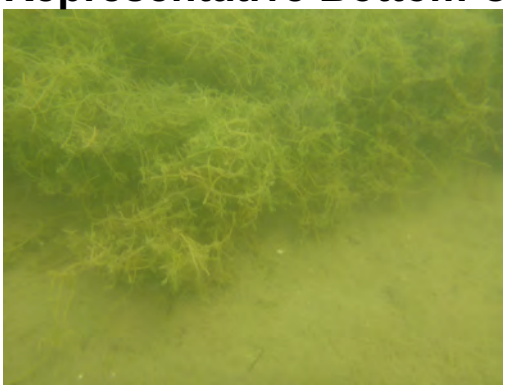
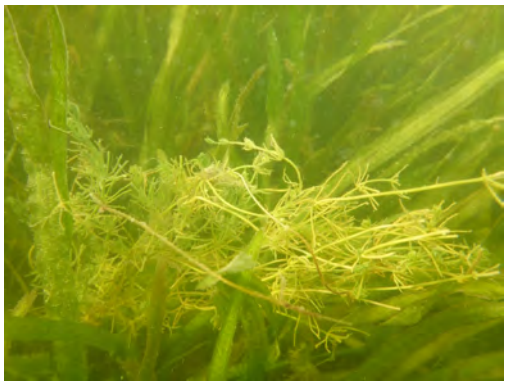
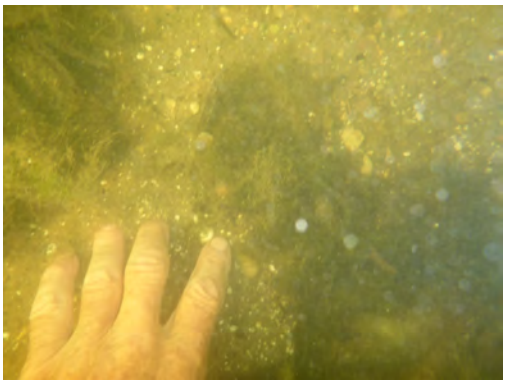


Figure 3. Survey areas for October 9, 2017 (dots on maps 1, 2, and 3 indicate rake sample locations).

Representative Bottom Conditions at the 4 Search Areas

Waterfront Grill Access (underwater video https://www.youtube.com/watch?v=90moSfgomZo)




Bob's Bay Access (underwater video https://www.youtube.com/watch?v=cgXfEhZkd58)


Black Pool Access


Highway 24 Private Access (underwater video at https://www.youtube.com/watch?v=je2rVWtO2zA)

Starry Stonewort Identification Tips

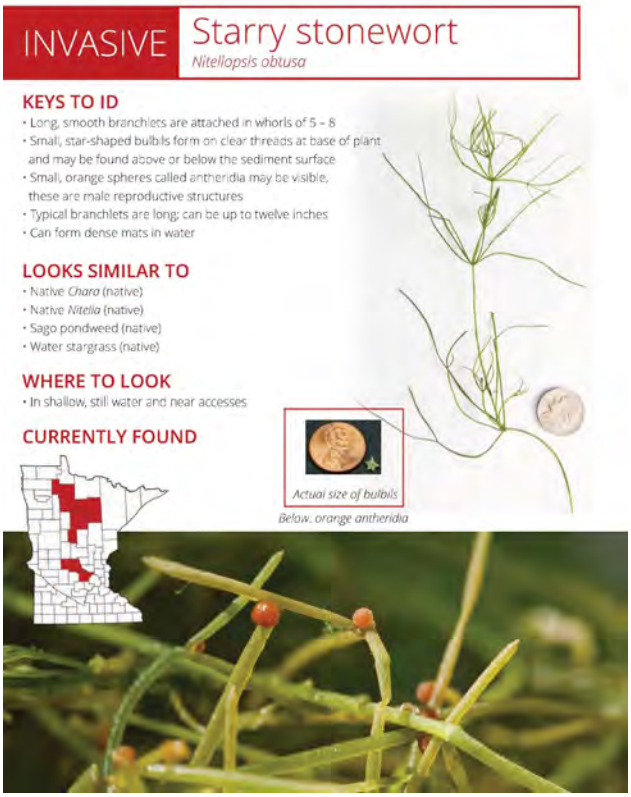


Figure 4. [left] Starry stonewort identification page from the University of Minnesota Aquatic Invasive Species Research Center (MAISRC). [left] Starry stonewort from Lake Koronis on July 31, 2017.

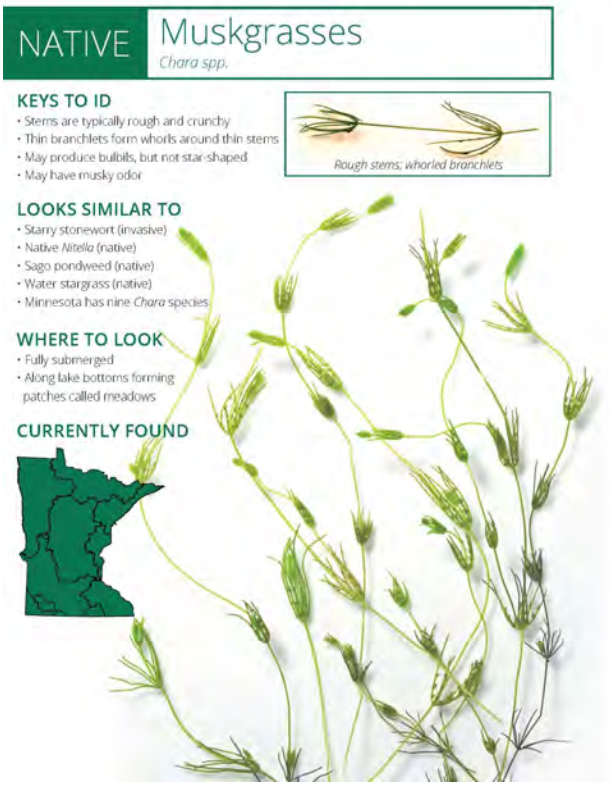


Figure 5. [left] Chara identification page from the MAISRC.
[right] Starry stonewort looks a lot like some growth forms of chara. Starry stonewort was not observed in Clearwater Lake in 2017. The photo is chara from Clearwater Lake.

Rapid Response Plan for Starry Stonewort

Starry stonewort (SSW) has not been found in Clearwater Lake at the end of 2017. If SSW is found a rapid response plan has a number of steps (Table 2).

Table 2. Tasks and assignments for an early detection and rapid response program for Clearwater Lake, Wright County, Minnesota.

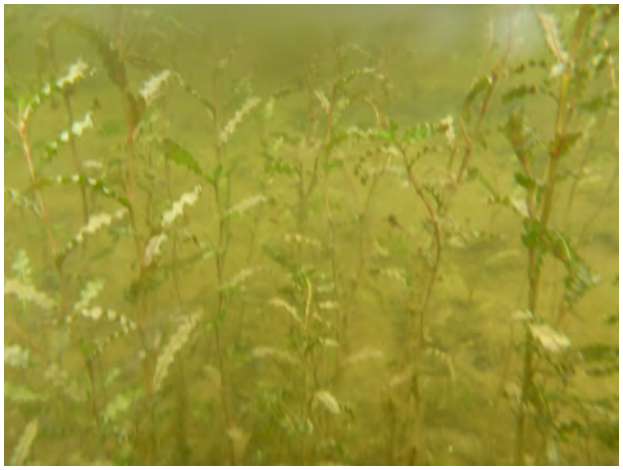
	Clearwater Lake Property Owners	Volunteers	Wright County	MnDNR	Others	Treatment Contractor	BWS
1. Early Detection							
1.1. Create website information.	X						
1.2. Designate contact person.	X						
1.3. Conduct training session for volunteer searchers.	Jun	Jun					Jun
1.4. Conduct monthly targeted searches (Apr-Oct).	X						X
1.5. Press release if SSW is found.	X			X			
2. Rapid Response Assessment							
2.1. Conduct an initial exploratory search after the first report of a starry stonewort observation.				X			X
2.2. Organize and train lake resident searchers for a full search effort.	X						X
2.3. Conduct an expanded targeted search with diving (if needed).	X	X		X			X
3. Rapid Response Action							
3.1. Meet to determine treatment options.	X		X	X	X	X	X
3.2. Close public access, if necessary.	X		X	X	X		
3.3. Treat area with copper sulfate.						X	
3.4. Evaluate treatment.				X			X
3.5. Report all findings and results.	X			X			X

Figure 6. Rapid response assessment for zebra mussels in Christmas Lake in 2014. Some of the same approaches are used for starry stonewort.

Other AIS Species Observed in Clearwater Lake in 2017

Curlyleaf Pondweed and Eurasian Watermilfoil Conditions in Clearwater Lake

Curlyleaf Pondweed in August, 2017.



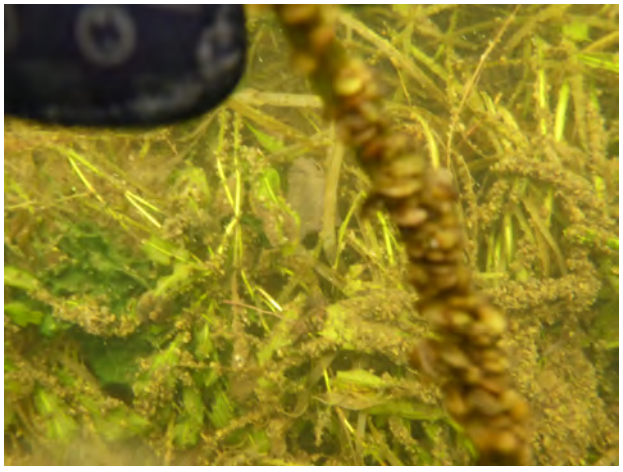
Curlyleaf pondweed in October in 2017.

Eurasian watermilfoil in August 2017.

Eurasian watermilfoil in August 2017.

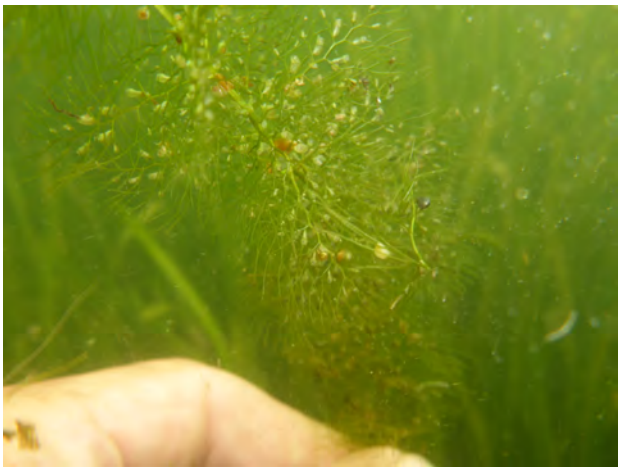
Zebra Mussel Conditions in Clearwater Lake

August Conditions: Adult zebra mussels were found to be dying back at the Highway 24 access area.



October Conditions: Juvenile zebra mussels were abundant and attached to aquatic plants at Highway 24 access. Zebra mussels were not observed at the other search areas.

Representative Aquatic Plants in Clearwater Lake in August

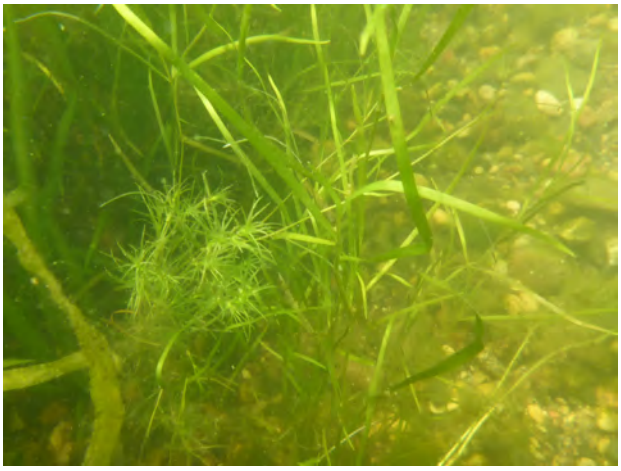


Bladderwort

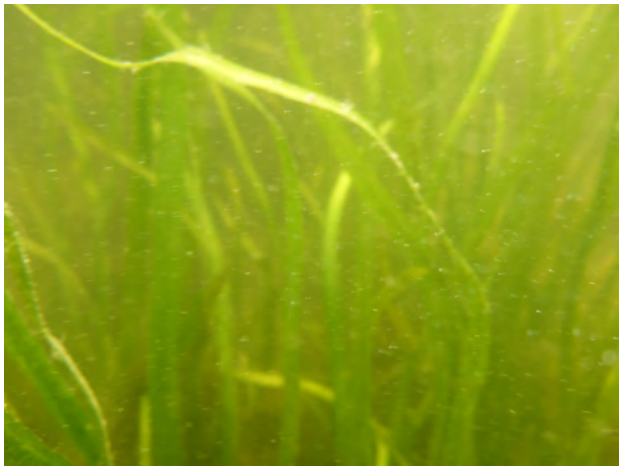
Chara

Coontail

Elodea



Naiads and water celery



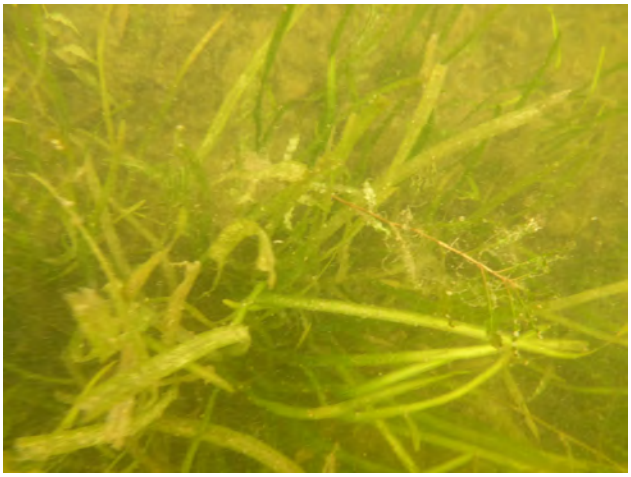
Water celery

Representative Aquatic Plants in Clearwater Lake in October

Water lilies

Coontail

Northern watermilfoil



Water celery