

Water Celery in Clearwater Lake on July 24, 2019

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## Starry Stonewort Searches for Clearwater Lake, Wright County, Minnesota, 2019

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Survey Dates: July 24, 2019  
September 17, 2019

Prepared for:  
Clearwater Lake Property Owners



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# Starry Stonewort Searches for Clearwater Lake, Wright County, Minnesota, 2019

**Summary of the 2019 searches:** Two staff from Blue Water Science, surveyed 4 boat accesses on July 24, 2019 (Figure 1), and spent a total of 6 search hours (Table 1). No starry stonewort was observed at any location.

On September 17, 2019 two staff from Blue Water Science surveyed 4 boat accesses and spent 5.5 hours of search time (Table 1). No starry stonewort was observed at any location.

At the conclusion of 2019 growing season, no starry stonewort at major lake access areas was observed.

**Table 1. Individual site data for the starry stonewort searches in 2019.**

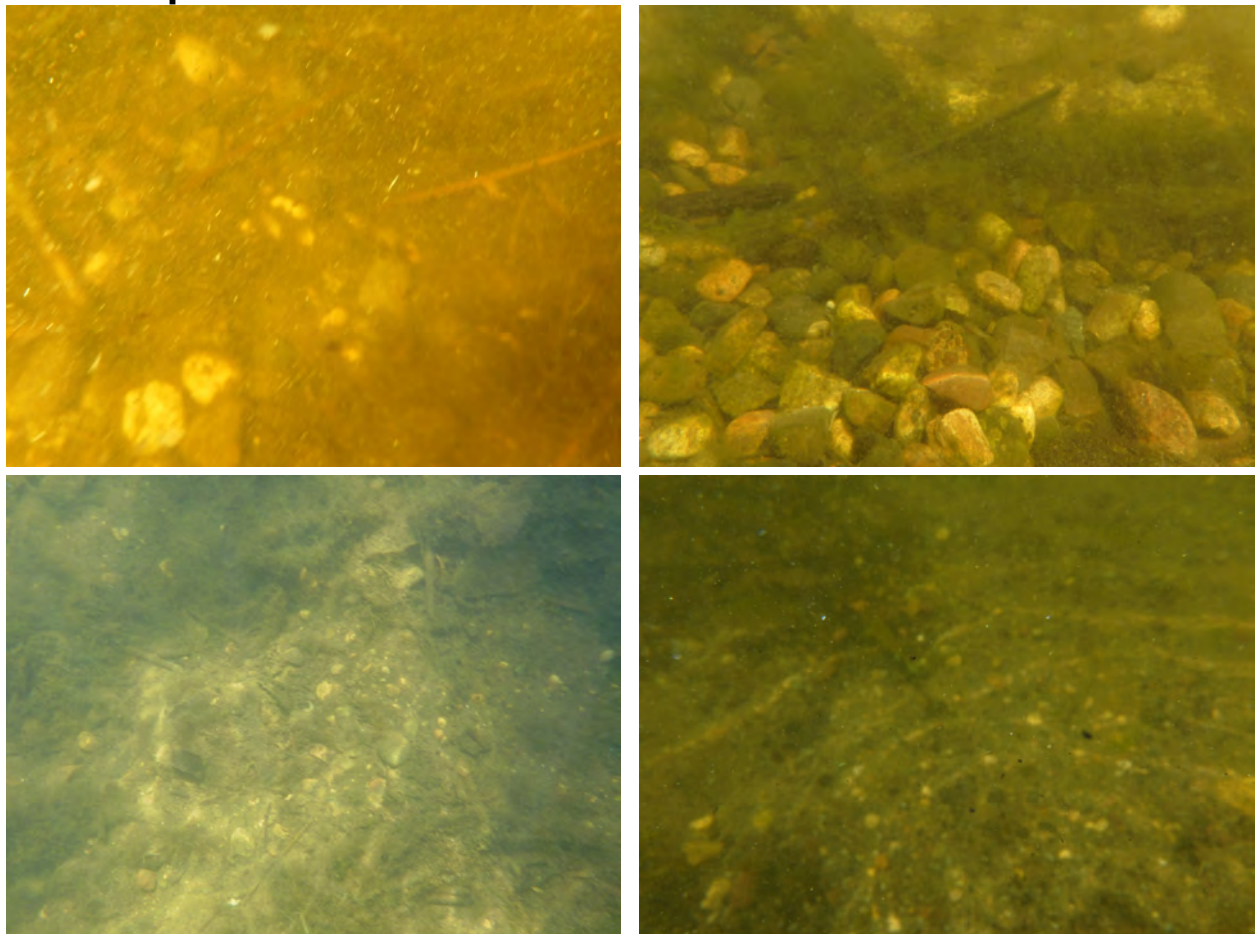
	Representative Rake Sampling and Diving	Starry Stonewort (SSW)	Chara	Bottom Conditions
<b>July 24, 2019</b>				
<b>1. Black Pool Access</b>	83 rake samples 35 minutes of diving	No SSW found	Very Light densities	Mostly silty sand
<b>2. Bob's Bay Access</b>	82 rake samples 35 minutes of diving	No SSW found	Light to moderate densities	Organic sediments and silty sand
<b>3. Highway 24 Private Access</b>	75 rake samples 40 minutes of diving	No SSW found	Moderate to heavy densities	Mostly sand with some gravel
<b>4. Clearwater Forest Access</b>	80 rake samples 30 minutes of diving	No SSW found	Light to moderate densities	Organic sediments with some silty sand
<b>September 17, 2019</b>				
<b>1. Black Pool Access</b>	51 rake samples 30 minutes of diving	No SSW found	Light density	Organic sediments and sand
<b>2. Bob's Bay Access</b>	24 rake samples 35 minutes of diving	No SSW found	Light density	Organic sediments with some sand
<b>3. Highway 24 Private Access</b>	50 rake samples 30 minutes of diving	No SSW found	Present at light to moderate densities	Mostly sand with some gravel
<b>4. Clearwater Forest Access</b>	54 rake samples 30 minutes of diving	No SSW found	Light to moderate densities	Organic sediments with some silty sand

## Search Locations in 2019



Figure 1. Location of the access search sites.

## 2019 Representative Conditions in Clearwater Lake





# Survey Areas for July 24, 2019

## Clearwater Lake Starry Stonewort Search Sites July 24, 2019

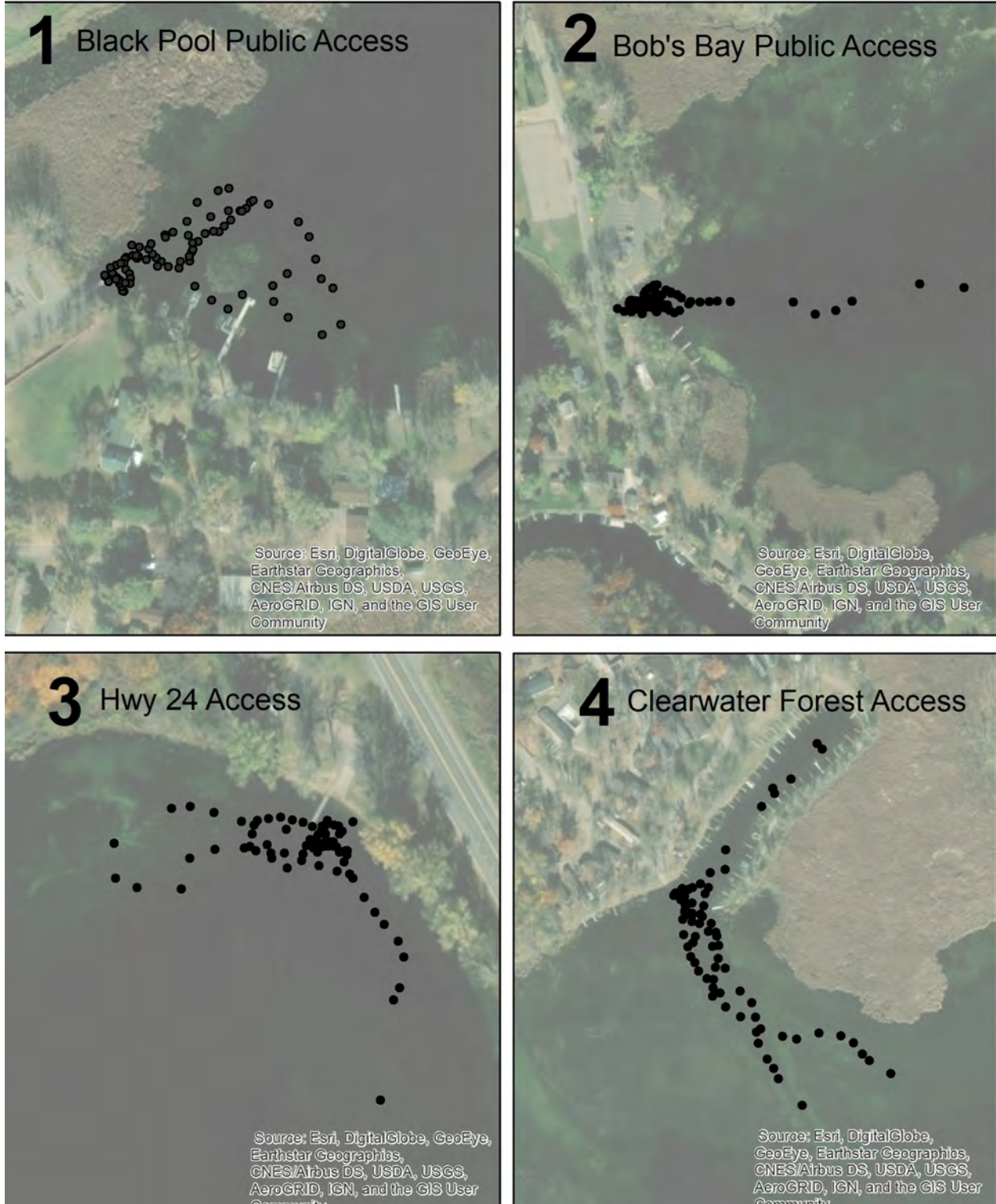


Figure 2. Survey areas for July 24, 2019 (dots on maps 1, 2, 3, and 4 indicate rake sample locations).

# Survey Areas for September 17, 2019

## Clearwater Lake Starry Stonewort Search Sites September 17, 2019

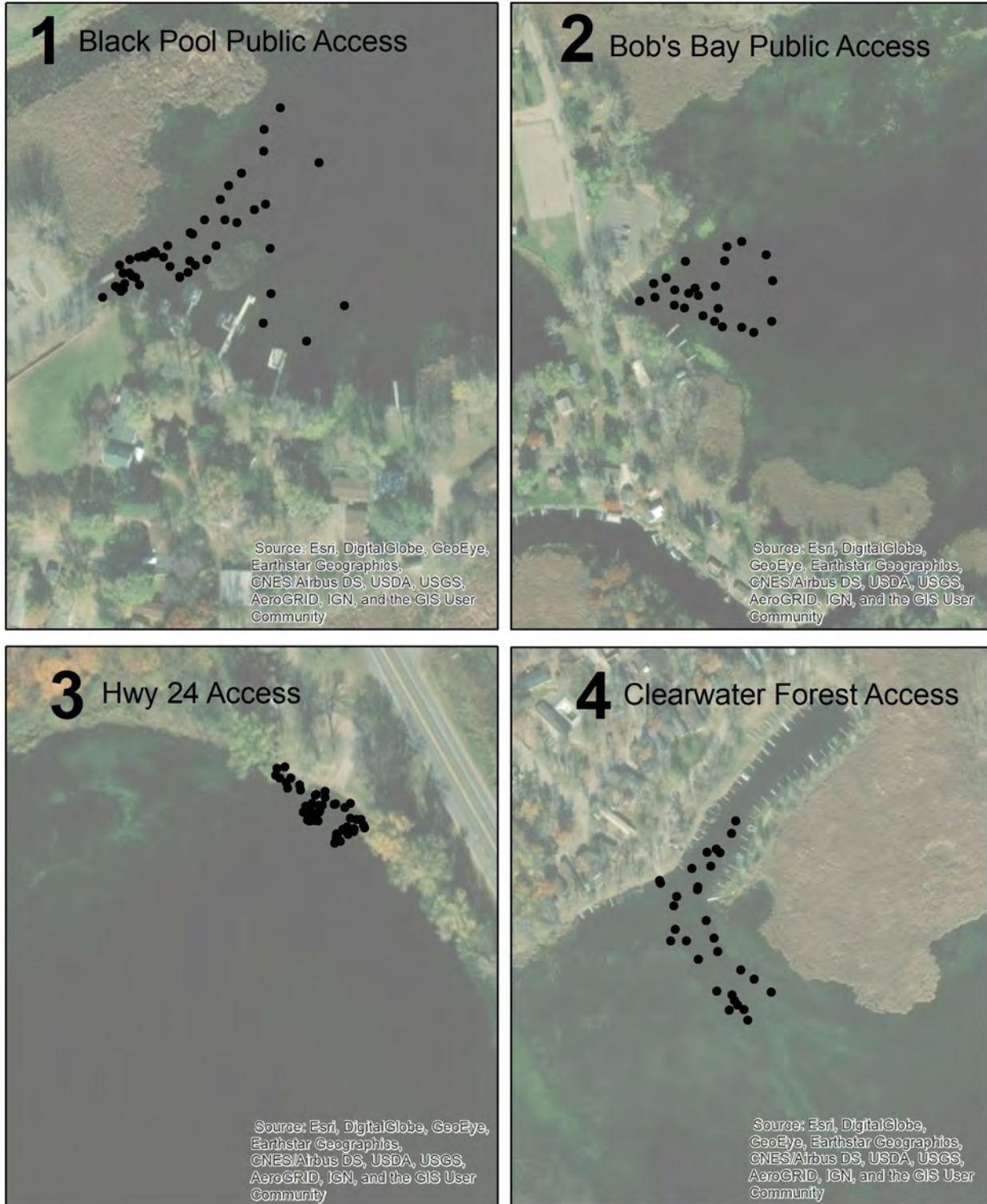


Figure 3. Survey areas for September 17, 2019 (dots on maps 1, 2, 3, and 4 indicate rake sample locations).



# Starry Stonewort Identification Tips

**INVASIVE** Starry stonewort  
*Nitellopsis obtusa*

**KEYS TO ID**

- Long, smooth branchlets are attached in whorls of 5 - 8
- Small, star-shaped bulbils form on clear threads at base of plant and may be found above or below the sediment surface
- Small, orange spheres called antheridia may be visible, these are male reproductive structures
- Typical branchlets are long; can be up to twelve inches
- Can form dense mats in water



**LOOKS SIMILAR TO**

- Native *Chara* (native)
- Native *Nitella* (native)
- Sago pondweed (native)
- Water stargrass (native)

**WHERE TO LOOK**

- In shallow, still water and near access

**CURRENTLY FOUND**

Actual size of bulbils  
Below, orange antheridia






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

**NATIVE** Muskgrasses  
*Chara spp.*

**KEYS TO ID**

- Stems are typically rough and crunchy
- Thin branchlets form whorls around thin stems
- May produce bulbils, but not star-shaped
- May have musky odor




**LOOKS SIMILAR TO**

- Starry stonewort (invasive)
- Native *Nitella* (native)
- Sago pondweed (native)
- Water stargrass (native)
- Minnesota has nine *Chara* species

**WHERE TO LOOK**

- Fully submerged
- Along lake bottoms forming patches called meadows

**CURRENTLY FOUND**

Rough stems; whorled branchlets



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 2019. 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
<b>1. Early Detection</b>							
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			
<b>2. Rapid Response Assessment</b>							
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
<b>3. Rapid Response Action</b>							
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

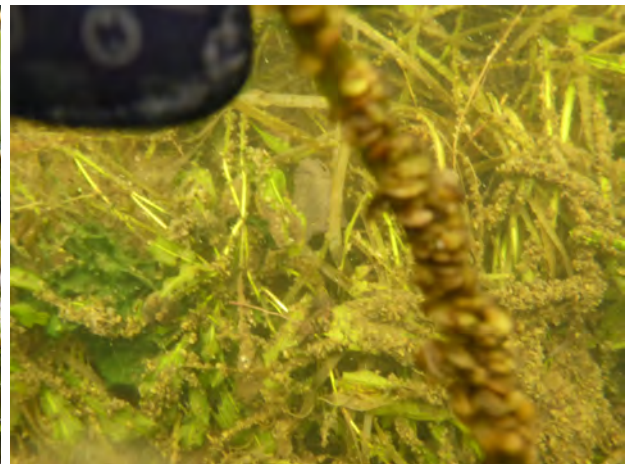


**Figure 6. Rapid response assessment for zebra mussels in Christmas Lake in 2014. Some of the same approaches are used for starry stonewort.**

## Zebra Mussel Conditions in Clearwater Lake



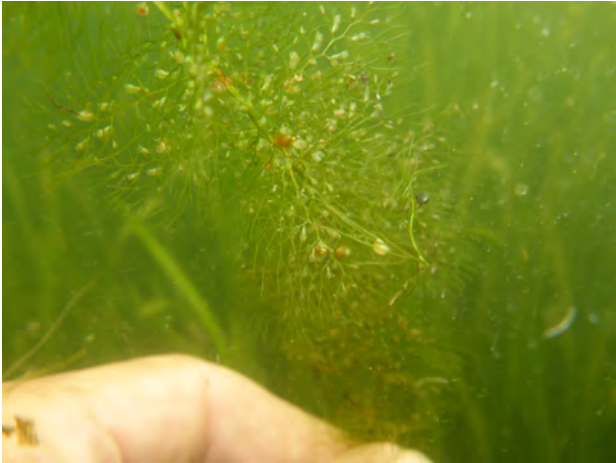
**August Conditions:** Adult zebra mussels were found to be dying back at the Highway 24 access area.



**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



**Bladderwort**



**Chara**



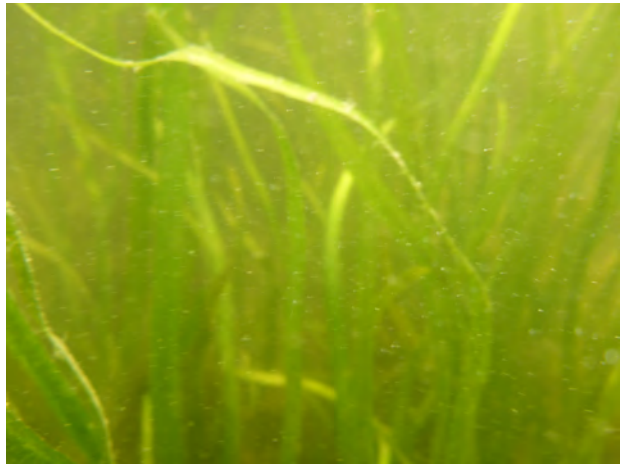
**Coontail**



**Elodea**



**Naiads and water celery**



**Water celery**

## Representative Aquatic Plants in Clearwater Lake



**Water lilies**



**Coontail**



**Northern watermilfoil**



**Water celery**