



Chara in Clearwater Lake on September 26, 2022

---

## **Starry Stonewort Searches for Clearwater Lake, Wright County, Minnesota, 2022**

---

Survey Dates:

1<sup>st</sup> Search: Aug 8, 2<sup>nd</sup> Search Sept 26, and Oct 14, 2022

Prepared for:  
Clearwater Lake Property Owners



Prepared by:  
Steve McComas,  
Jo Stuckert, and  
Connor McComas  
Blue Water Science,  
St. Paul, MN

**December 16, 2022**

# Starry Stonewort Searches for Clearwater Lake, Wright County, Minnesota, 2022

**Summary of the 2022 searches:** Three staff from Blue Water Science, surveyed 6 boat accesses on August 8, 2022 (Figure 1). A combination of rake sampling (425 rake samples) and scuba diving (a total of 5.5 search hours) were conducted (Table 1). No starry stonewort was observed at any location.

On September 26, 2022 two staff from Blue Water Science surveyed 6 boat accesses. A combination scuba diving and snorkeling was (a total of 4.0 search hours) conducted (Table 1). No starry stonewort was observed at any lake access location.

At the conclusion of 2022 growing season, no starry stonewort at major lake access areas had been observed.

**Table 1. Individual site data for the starry stonewort searches in 2022.**

	Representative Rake Sampling and Diving	Starry Stonewort (SSW)	Aquatic Plant Notes	Bottom Conditions
<b>August 8, 2022</b>				
1. Black Pool Access	56 rake samples 60 minutes of diving	No SSW found	EWM fragments present, wild rice and Mare's tail present, NWM present	Mostly silty sand, some scattered rocks
2. Bob's Bay Access	43 rake samples 90 minutes of diving	No SSW found	Coontail dominant, Purple loosestrife present, Filamentous algae common	Organic sediments and silty sand
3. Highway 24 Private Access	61 rake samples 50 minutes of diving	No SSW found	Coontail abundant, chara common.	Mostly sand with some gravel
4. Clearwater Forest Access	44 rake samples 40 minutes of diving	No SSW found	Water celery and milfoil present. No chara is shallow water, turbid water	Organic sediments with some silty sand
5. Maple Hills West Access	60 rake samples 60 minutes of diving	No SSW found	Abundant plant growth, no milfoil, chara abundant	Shallow landing, silty sand
6. Clearwater East Access (Kilbury)	60 rake samples 30 minutes of diving	No SSW found	NWM abundant, extensive chara beds. Clear water	sandy changing to silty-sand
<b>September 26, 2022 and October 14, 2022</b>				
1. Black Pool Access	30 minutes of diving	No SSW found	Turbid water, NWM and EWM present, some chara	turbid water, silty
2. Bob's Bay Access	50 minutes of diving	No SSW found	limited plant growth, limited habitat for SSW, heavy filamentous algae	Sand, gravel, cobble in landing area, mucky outside landing area
3. Highway 24 Private Access	30 minutes of diving	No SSW found	Chara present, diverse plant community	Deep water, wind driven turbidity
4. Clearwater Forest Access	45 minutes of diving	No SSW found	CLP in 2-3', chara present	sand/gravel around landing area. Transitions to silt
5. Maple Hills West Access	40 minutes of diving	No SSW found	Abundant plant growth, good diversity	shallow access
6. Clearwater East Access (Kilbury)	45 minutes of diving	No SSW found	Abundant and dense chara. Suitable habitat for SSW	shallow access

## Search Locations in 2022

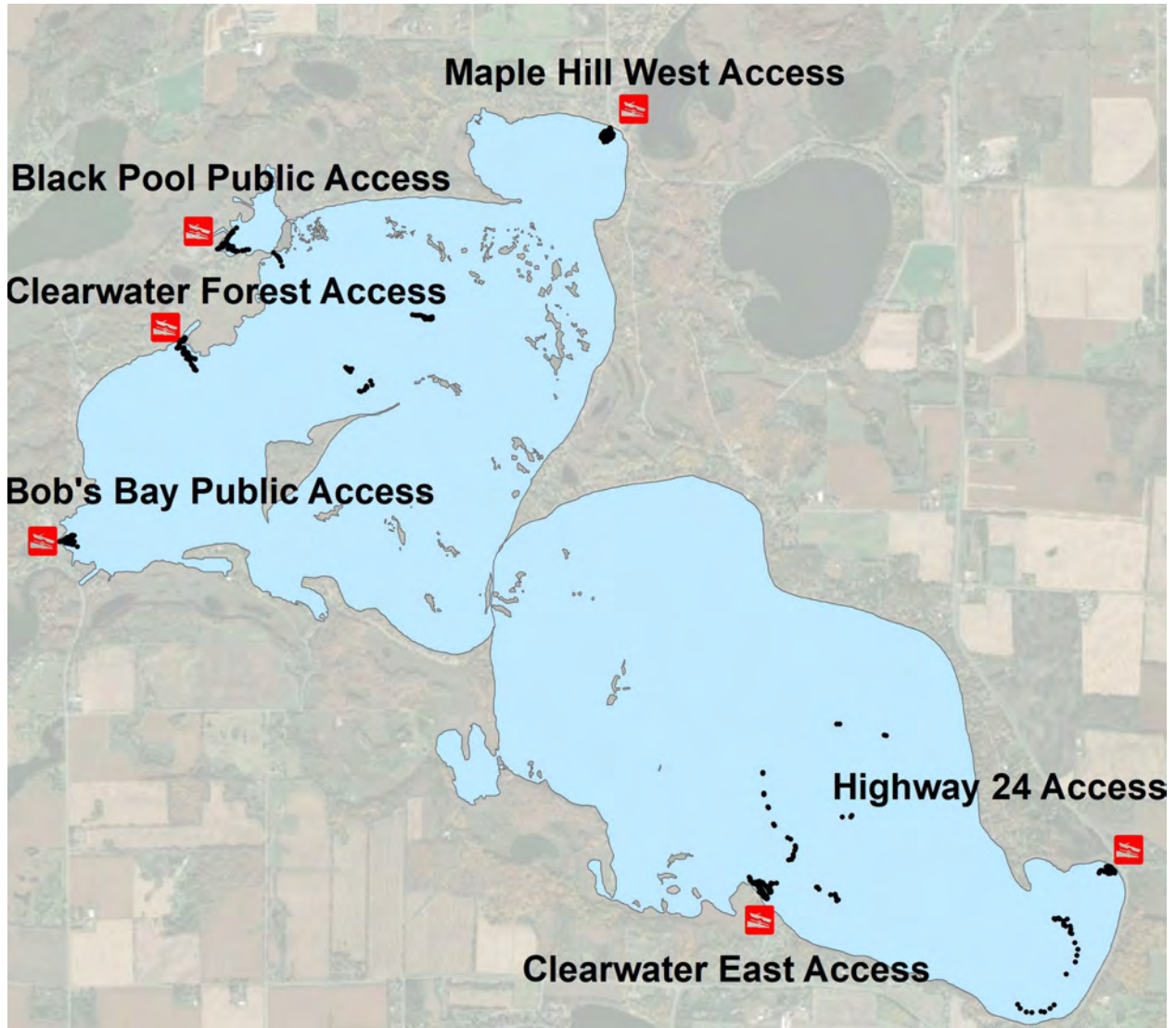


Figure 1. Location of the access search sites.

## 2022 Representative Conditions in Clearwater Lake



Bobs Bay Public Access



Clearwater Forest Access



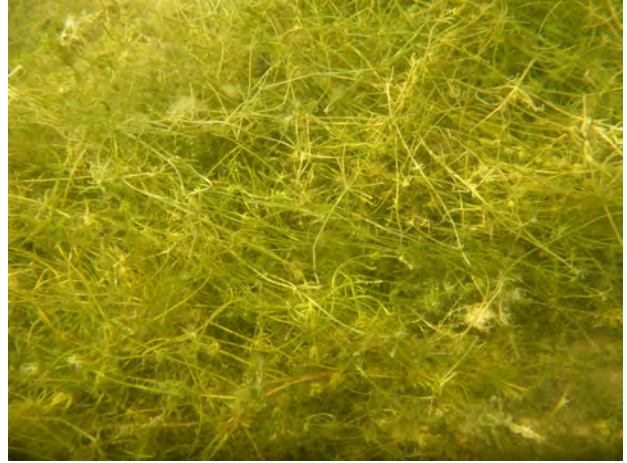
Black Pool Public Access



(Mare's tail)



Maple Hill West Access



Highway 24 Access



Clearwater East Access



# Survey Areas for August 8, 2022

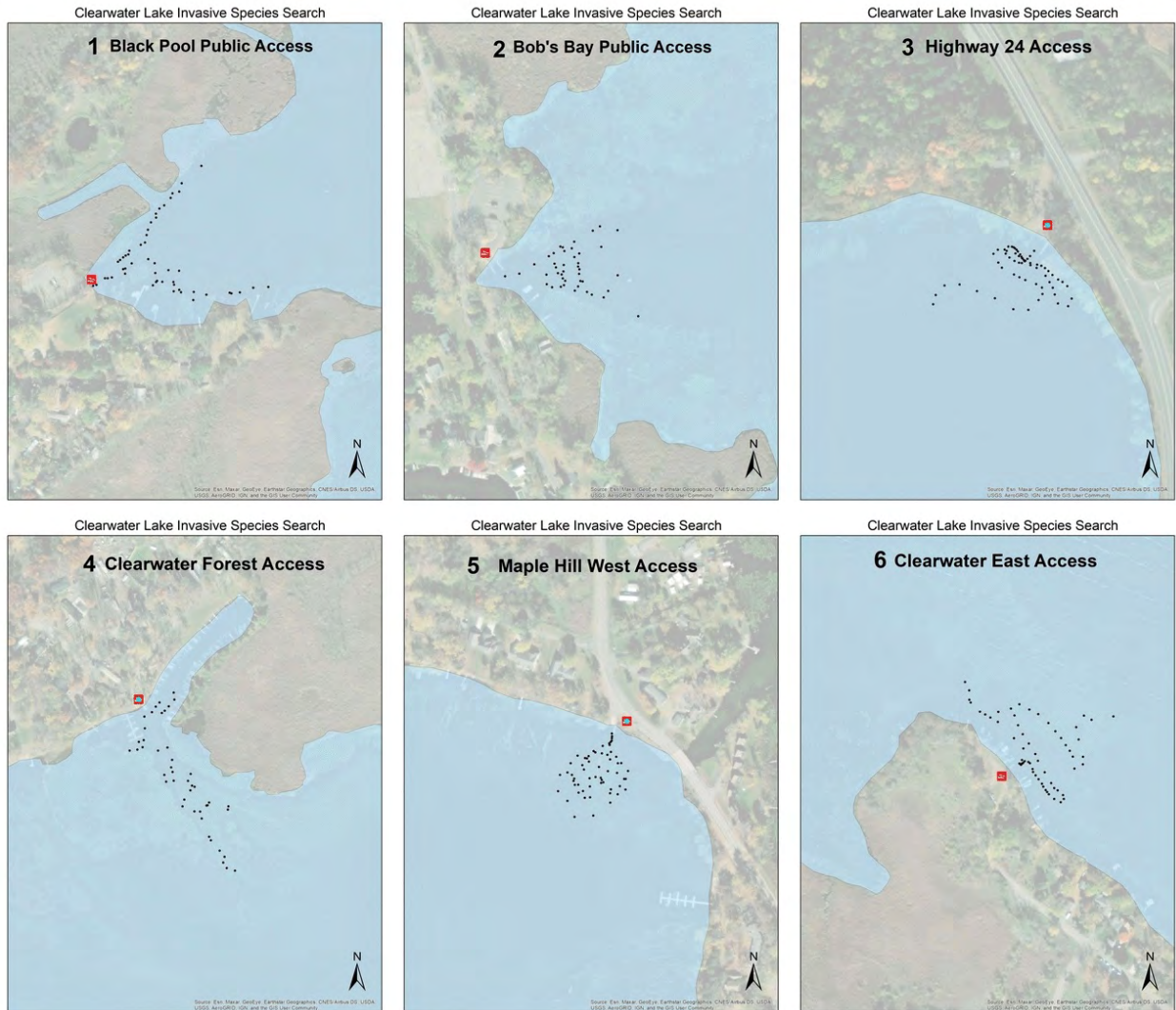


Figure 2. Survey areas for August 8, 2022 (dots on maps 1-6 indicate rake sample locations).

**Notes:**

1. Black Pool: Middle of the landing area deep, milfoil present, coontail common by cattails, white lilies and spatterdock common by wild rice and cattails, wild rice common in front of houses, cattails on one side of landing, no starry stonewort, zebra mussels present but rare.
2. Bob's Bay: Checked out to 16 feet of water depth, coontail dominant, abundant growth, white lilies and spatterdock by shorelines, filamentous algae abundant, no starry stonewort, zebra mussels present but sparse, adults and open shells present.
3. Highway 24: Milfoil common, coontail abundant, chara common, no starry stonewort, zebra mussels present on plants and rock.
4. Clearwater Forest: Shallow channel, milfoil common, white lilies and spatterdock by shorelines, water celery common, chara common but patchy, stringy pondweed common, filamentous algae abundant, no starry stonewort, no zebra mussels observed.
5. Maple Hill: Shallow landing, heavy plant growth, coontail present, chara common throughout landing, stringy pondweed common, whitestem pondweed present, no starry stonewort, zebra mussels present but scarce, turbid water conditions.
6. Clearwater East: Chara abundant by shore, stringy pondweed common further from shore, coontail common, milfoil present, no starry stonewort, zebra mussels common.

## Survey Areas for September 26 and October 14, 2022

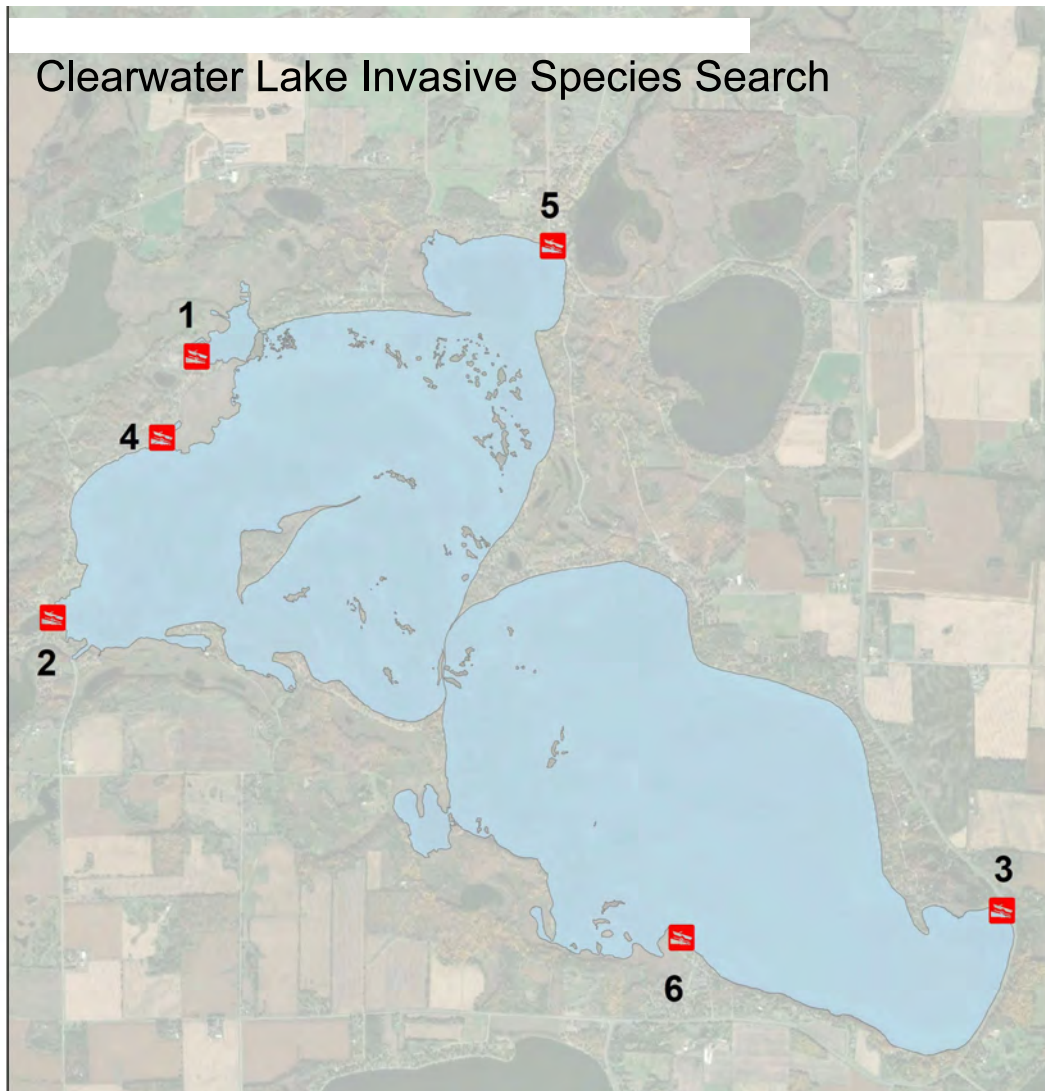


Figure 3. Dive and snorkel areas for September 26, 2022 (red markings on map indicate boat launch locations).

### Notes:

1. Black Pool: clearish water, poor SSW habitat, wild rice and lilies dying back, chara rare.
2. Bob's Bay: limited SSW habitat, sand, turbid water, gravel/cobble in landing area, few zebra mussels.
3. Highway 24: deep, clear water, chara present, zebra mussels on dock post only otherwise zebra mussels are rare, good SSW habitat, good plant diversity.
4. Clearwater Forest: limited SSW habitat - silty silt, sand/gravel by apron, no zebra mussels observed, chara present, turbid water.
5. Maple Hill: shallow/weedy, chara abundant, plant diversity good, zebra mussels rare, soft calcareous sediments, clear water, no EWM.
6. Clearwater East: shallow, chara abundant - meadows, best SSW habitat, zebra mussels rare on a rock, NWM abundant.

# 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). [left] 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 2022. 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 2022. If SSW is found a rapid response plan has a number of steps (Table 2).

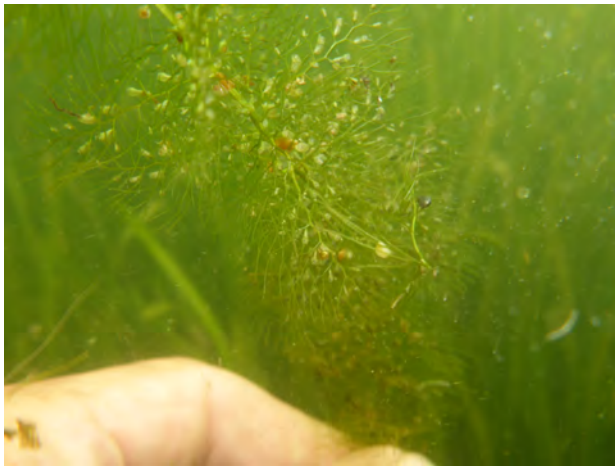
**Table 2. Tasks and assignments for an early detection and rapid response program for Clearwater Lake, Wright County, Minnesota.**

	Clearwater Lake Property Owners	Volunteers	Stearns and Wright Counties	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.**

## 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**



**Curlyleaf pondweed**



**Mare's tail**