



Chinese Mystery Snail with Zebra Mussels Attached in Clearwater Lake on July 10, 2020

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## Starry Stonewort Searches for Clearwater Lake, Wright County, Minnesota, 2020

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Survey Dates: July 10 and September 30, 2020

Prepared for:  
Clearwater Lake Property Owners



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January 2021

# Starry Stonewort Searches for Clearwater Lake, Wright County, Minnesota, 2020

**Summary of the 2020 searches:** Two staff from Blue Water Science, surveyed 4 boat accesses on July 10, 2020 (Figure 1). A combination of rake sampling (205 rake samples) and scuba diving (a total of 3.2 search hours) were conducted (Table 1). No starry stonewort was observed at any location.

On September 30, 2020 three staff from Blue Water Science surveyed 4 boat accesses. A combination of rake sampling (164 rake samples) and scuba diving (a total of 3.3 search hours) were conducted (Table 1). No starry stonewort was observed at any location.

At the conclusion of 2020 growing season, no starry stonewort at major lake access areas had been observed.

**Table 1. Individual site data for the starry stonewort searches in 2020.**

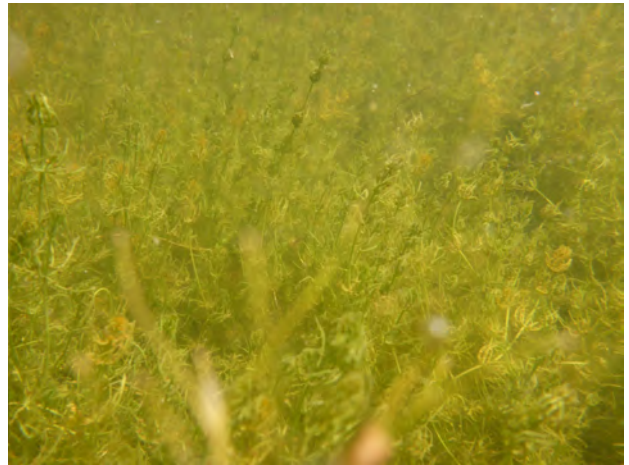
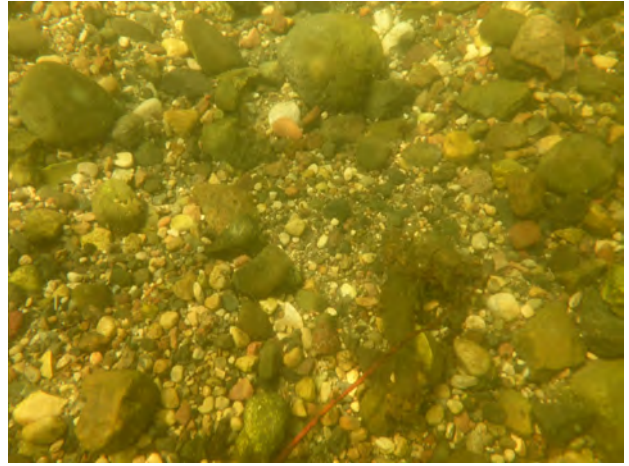
|                              | Representative Rake Sampling and Diving | Starry Stonewort (SSW) | Aquatic Plant Notes                              | Bottom Conditions                      |
|------------------------------|---|------------------------|--|--|
| <b>July 10, 2020</b>         |   |                        |  |  |
| 1. Black Pool Access         | 42 rake samples<br>45 minutes of diving | No SSW found           | Wild rice present                                | Mostly silty sand                      |
| 2. Bob's Bay Access          | 64 rake samples<br>60 minutes of diving | No SSW found           | Coontail dominant out to 16 feet                 | Organic sediments and silty sand       |
| 3. Highway 24 Private Access | 35 rake samples<br>30 minutes of diving | No SSW found           | Buttercup at the surface                         | Mostly sand with some gravel           |
| 4. Clearwater Forest Access  | 64 rake samples<br>55 minutes of diving | No SSW found           | Fries pondweed and string pondweed are abundant. | Organic sediments with some silty sand |
| <b>September 30, 2020</b>    |   |                        |  |  |
| 1. Black Pool Access         | 42 rake samples<br>30 minutes of diving | No SSW found           | Water celery common                              | Organic sediments and sand             |
| 2. Bob's Bay Access          | 52 rake samples<br>90 minutes of diving | No SSW found           | Coontail abundant                                | Organic sediments with some sand       |
| 3. Highway 24 Private Access | 24 rake samples<br>30 minutes of diving | No SSW found           | Chara present at moderate density                | Mostly sand with some gravel           |
| 4. Clearwater Forest Access  | 46 rake samples<br>45 minutes of diving | No SSW found           | Water lilies abundant                            | Organic sediments with some silty sand |

## Search Locations in 2020



**Figure 1. Location of the access search sites.**

## 2020 Representative Conditions in Clearwater Lake





# Survey Areas for July 10, 2020

## Clearwater Lake Starry Stonewort Search Sites July 10, 2020



**No Starry Stonewort Observed on July 10, 2020**

UTM NAD 1983  
Blue Water Science

Figure 2. Survey areas for July 10, 2020 (dots on maps 1, 2, 3, and 4 indicate rake sample locations).

# Survey Areas for September 30, 2020

## Clearwater Lake Starry Stonewort Search Sites September 30, 2020



**No Starry Stonewort Observed on September 30, 2020**

UTM NAD 1983  
Blue Water Science

Figure 3. Survey areas for September 30, 2020 (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 2020. 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 2020. 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



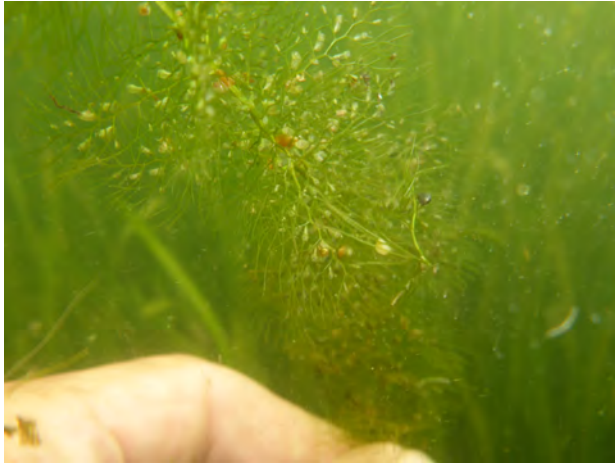
**July Conditions: Adult zebra mussels were found growing on aquatic plants at the access areas.**



**September Conditions: Zebra mussels were found attached to aquatic plants and also growing on submerged substrate in Clearwater Lake in 2020.**



## 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**