



Starry Stonewort from Pleasant Lake, Wright County, August 26, 2021

Starry Stonewort Surveys for Pleasant Lake, Wright County, Minnesota, 2021

Survey Dates:

June 18, July 22, August 26, September 14/16, and October 11, 2021

Prepared for:
Pleasant Lake Improvement
Association



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Starry Stonewort Surveys for Pleasant Lake, Wright County, Minnesota, 2021

Summary

In 2021, Blue Water Science conducted surveys for SSW on June 18, July 22, August 26, September 14/16, and October 11, 2021. SSW was observed on July 22 and August 26, 2021 survey dates (Table 1 and Figure 1). No SSW was observed in September or the last sample date in October 11, 2021. For the year, less than 0.07 pounds (28 g) of starry stonewort were removed.

Table 1. Pleasant Lake starry stonewort (SSW) surveys and treatments at the public access for 2021.

Date	Public Access SSW Surveys			Public Access Treatment (0.5 acres)
	Sites Sampled	Sites with SSW	% SSW Occurrence	
2021				
June 18	40 meander sites and diver survey	0	0%	
July 22	35 meander sites and diver survey	3	9%	1 st Handpull: 0.06 pounds (27 grams)
August 26	diver survey	1	--	1 st Treatment: August 3: 0.5 ac (Cutrine Plus liquid) 2 nd Handpull: <0.01 pounds (1 gram)
September 14	north access-diver survey	0	--	
September 16	south access-diver survey	0	--	
October 11	diver survey	0	--	

Pleasant Lake Starry Stonewort Growth in 2021

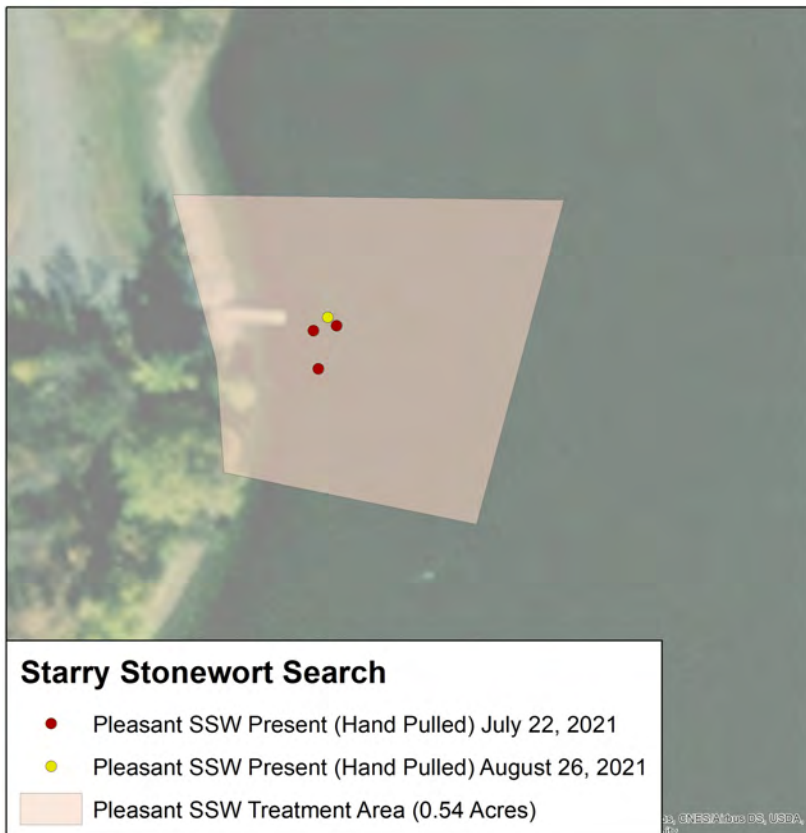


Figure 1. Location of SSW found in 2021 at the north access. SSW was observed and hand removed at 3 sites on July 22, 2021 and observed and removed at 1 site on the August 22, 2021 survey.

Overview and Methods for Starry Stonewort Surveys on Pleasant Lake, Wright County, Minnesota in 2021

Starry stonewort (SSW) is an invasive type of algae, referred to as a macro-algae that is in the same family as chara, which is a native macro-algae. SSW was first observed in Minnesota in 2015 in Lake Koronis, Stearns County.

SSW was first identified by the MnDNR in Pleasant Lake in 2018 and the Pleasant Lake Association spearheaded a SSW control program to contain SSW within the public access area. In 2018, a delineated treatment area that totaled 0.5 acres was first hand-pulled on August 31 and 6 cubic feet (96 lbs-wet weight) of SSW were removed. The 0.5 acre was then treated with a copper sulfate product on October 4, 2020.

In 2019, Blue Water Science conducted surveys and hand removal. SSW control was conducted 4 times in the 2019 growing season. Hand removal occurred first followed by a copper treatment.

In 2020, 5 SSW surveys were conducted. SSW was found only on the August 7, 2020 survey. A total of 0.4 lbs of SSW was removed by hand.

In 2021, 5 surveys were conducted on the north public access of Pleasant lake and 1 survey on the south pleasant lake public access. SSW was found at three sites on July 22, 2021 and at one site on August 26, 2021.

Sampling Methods for Treating Small SSW Infestations: In a lake setting where SSW has recently been discovered and extensive sampling surveys indicate the SSW is confined to a relatively small area, such as is the case for Pleasant Lake (Wright County), SSW density was sampled to evaluate the impacts of treatment methods on the distribution and abundance of SSW within the treatment area. Since this is a small infestation, all known SSW was to be treated and no untreated reference sites were available.

For rake surveys, sample points in the treatment areas were surveyed using random rakehead sampling for SSW. For density determinations, a rakehead with 14 tines and a width of 33 cm attached to a telescoping pole was used for sampling SSW using a short sweep (approximately a 33 cm). SSW densities were estimated on a scale from 1 to 3 with 3 being the densest (MnDNR website). Diving was also used to survey for SSW on six dates in 2021. Either snorkeling or scuba was used to search for SSW. When SSW was observed, it was removed by hand and placed in a fine-mesh bag.

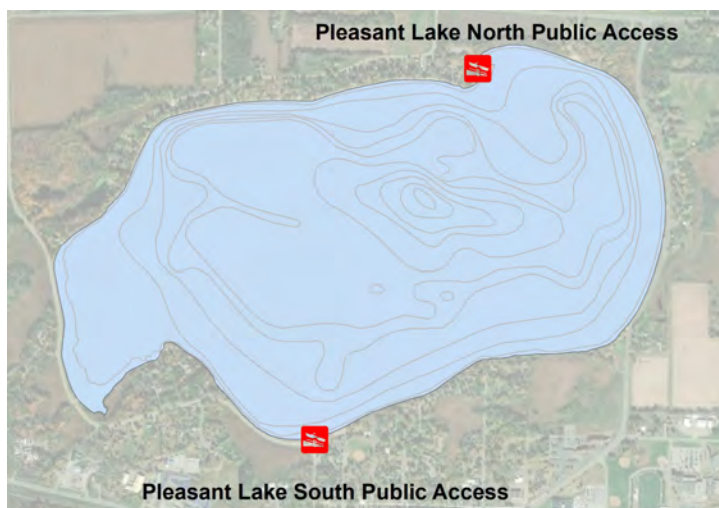


Figure 2. SSW at the north public access was first observed in 2018 and was surveyed on 6 dates in 2021. Very small quantities of SSW were found on 2 surveys. A search was also conducted at the south access. No SSW was observed.

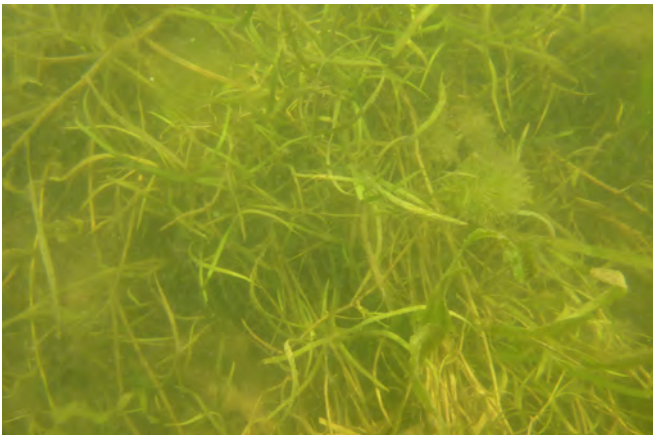
Starry Stonewort Conditions in Pleasant Lake in 2021



North access on Pleasant Lake.



South access on Pleasant Lake.



June 18, 2021 (native plants). No SSW found.



July 22, 2021. SSW found at 3 sites. A total of 0.06 lbs (27 g) of SSW was removed.



August 26, 2021. SSW found at one site. Less than one gram was removed.



September 14, 16, 2021 (natives). No SSW found in a dive survey at the north and south accesses

Pleasant Lake Starry Stonewort Meander Surveys in June and September in 2021

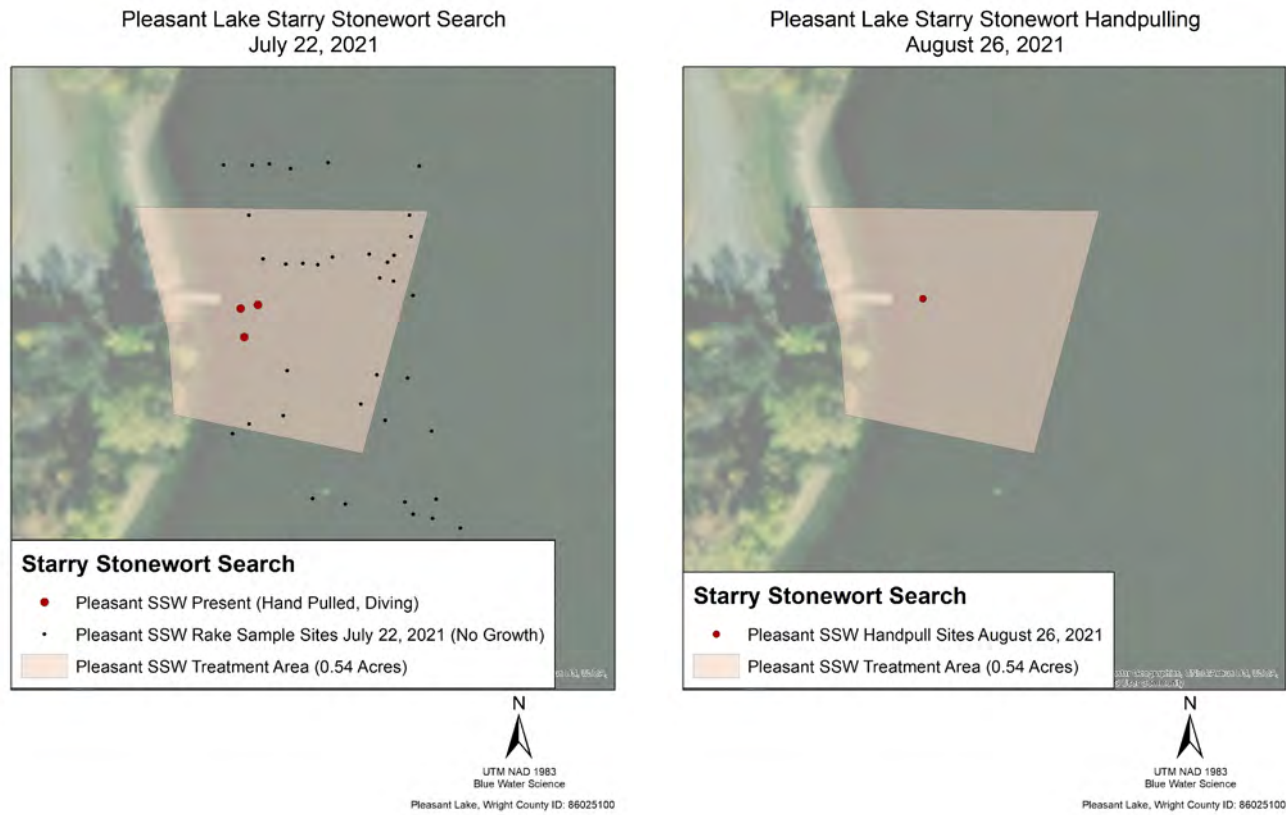


Figure 3. Meander survey results for 2 surveys, one on July 22 at the north access, the other survey on September 26, 2021 and both the north and south accesses. No SSW was observed on these 2 survey dates. Diver surveys occurred on 3 other dates.

Summary of Previous Starry Stonewort Surveys and Treatments For 2018, 2019, 2020, and 2021

Table 2. Pleasant Lake starry stonewort (SSW) surveys and treatments at the public access for 2018 through 2021.

Date	Public Access SSW Surveys			Public Access Treatment (0.5 acres)
	Sites Sampled	Sites with SSW	% SSW Occurrence	
2018				
August 8 (MnDNR)				SSW observed at the public landing by MnDNR
August 15 (MnDNR)				Full lake survey conducted by MnDNR. SSW only at public access in 2 small dense patches and 8 locations.
August 31 PI	23	1	4%	
August 31 Meandering	50	12	24%	
August 31				Hand Removal: 96 lbs (6 cubic feet)
October 4				1 st Treatment: 0.5 acres (Cutrine Plus liquid) (3.0 gallons/acre-ft)
November 1 PI	23	0	0%	
November 1 Meandering	32	1	3%	

Date	Public Access SSW Surveys			Public Access Treatment (0.5 acres)
	Sites Sampled	Sites with SSW	% SSW Occurrence	
2019				
June 5	177	(2 with bulbils)	0%	
July 1	155	11	7%	
July 1				Hand Removal: 11 lbs (4990 g)
July 2				1 st Treatment: 0.5 acres (Cutrine Plus liquid) (3.0 gallons/acre-ft)
July 24	66	3	5%	
July 24				Hand Removal: <1 g
July 31				2 nd Treatment: 0.5 acres (Cutrine Plus liquid) (3.0 gallons/acre-ft)
August 19	110	3	3%	
August 19				Hand Removal: <1 g
August 28				3 rd Treatment: 0.5 acres (Cutrine Plus liquid) (3.0 gallons/acre-ft)
September 26	75	1	1%	
September 26				Hand Removal: <1 g
September 27				4 th Treatment: 0.5 acres (Cutrine Plus liquid) (3.0 gallons/acre-ft)
October 8	41	0	0%	

Date	Public Access SSW Surveys			Public Access Treatment (0.5 acres)
	Sites Sampled	Sites with SSW	% SSW Occurrence	
2020				
June 23	80	0	0%	
July 10	diver survey	0	0%	
August 7	diver survey	10		
August 7				1 st Treatment: hand pulling, 0.4 lbs (187 g) 0.5 acres (Cutrine Plus liquid) (3.0 gallons/acre-ft)
September 14	58 (city access) 81 (county access)	0	0%	
September 30	diver survey	0	0%	

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September 14	north access-diver survey	0	--	
September 16	south access-diver survey	0	--	
October 11	diver survey	0	--	

Summary of Pleasant Lake SSW Locations for 2018, 2019, 2020, 2021

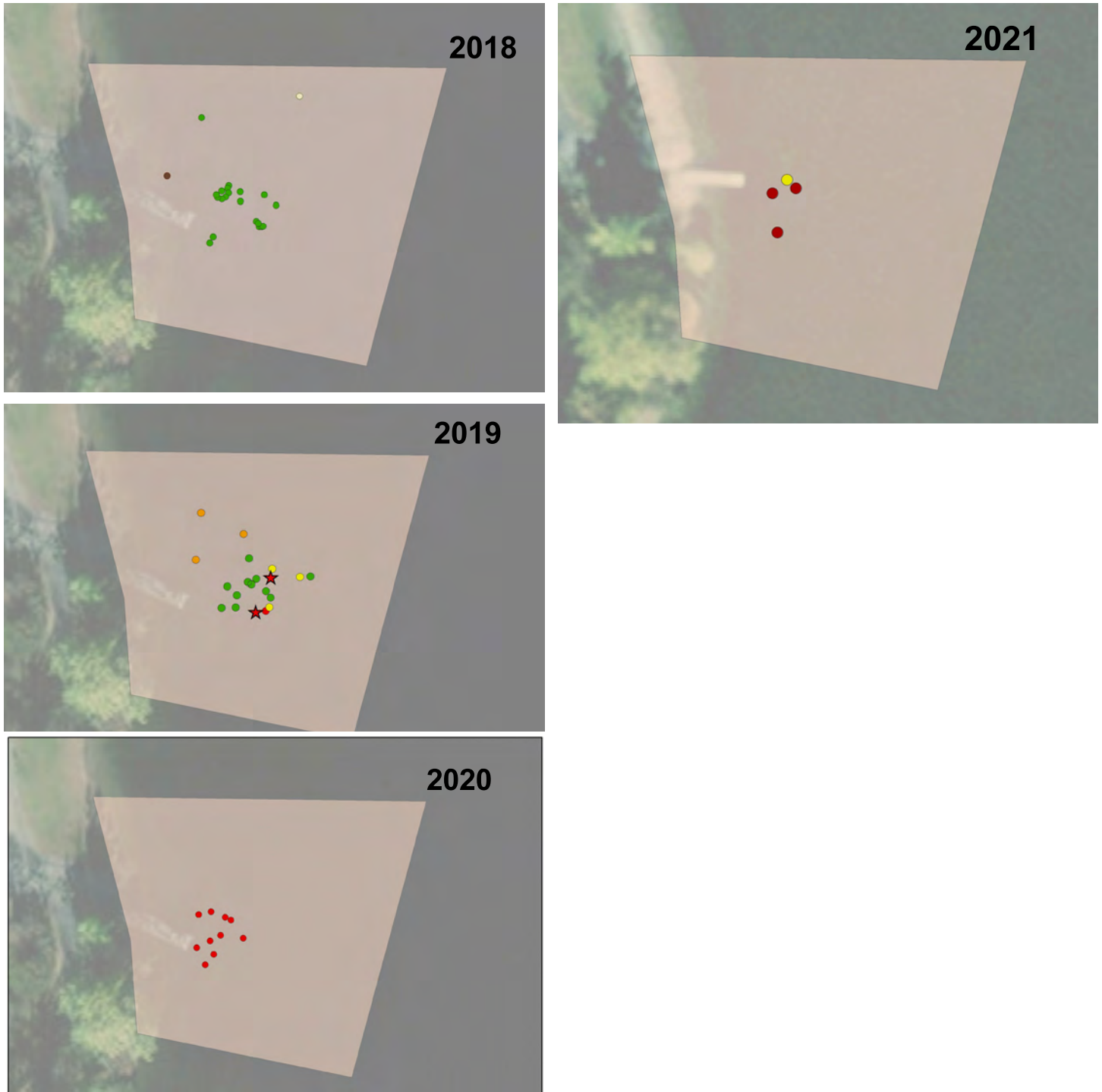


Figure 4. Locations of SSW found from all surveys at the public access treatment area in 2018 through 2021.