Hand Pulling Starry Stonewort (*Nitellopsis obtusa*) in Grand Lake, Stearns County, Minnesota

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Captain's log-
Stardate 08.05.2017 a volunteer member of the Starry Trek enterprise is about to discover an alien species in a system known as Grand lake...

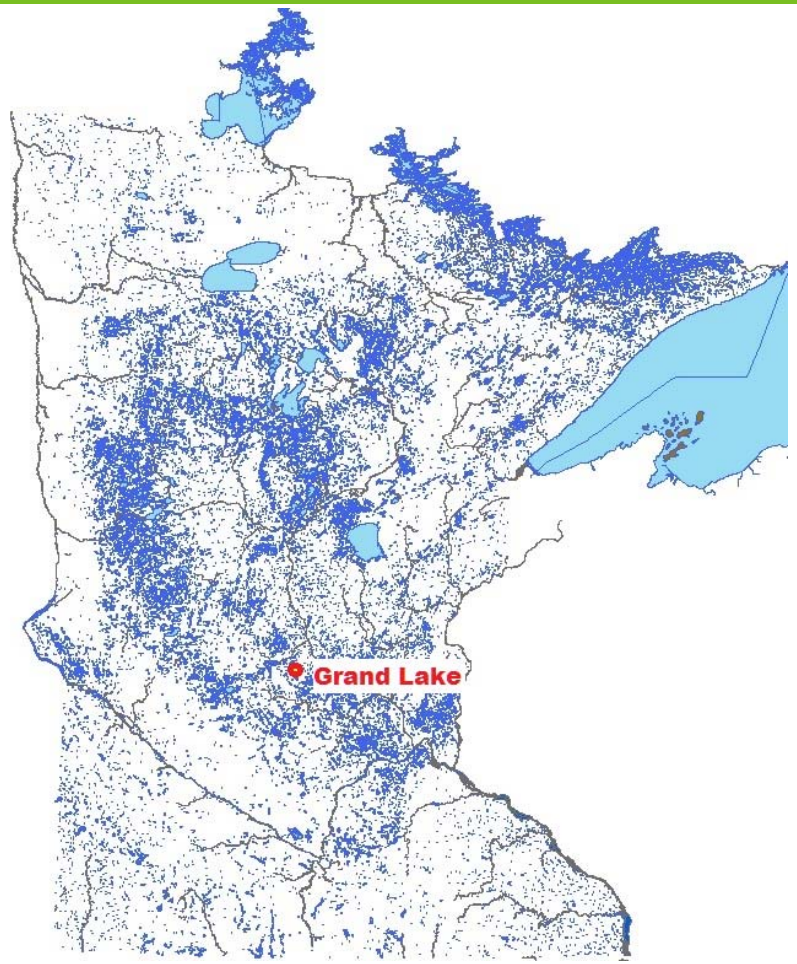
image: www.freeimages.co.uk

Starry Trek 2017

Discovery of *Nitellopsis* from volunteer effort during the August 2017 UMN-Extension's **"Starry Trek"**

Entire sample the volunteer found at Grand Lake

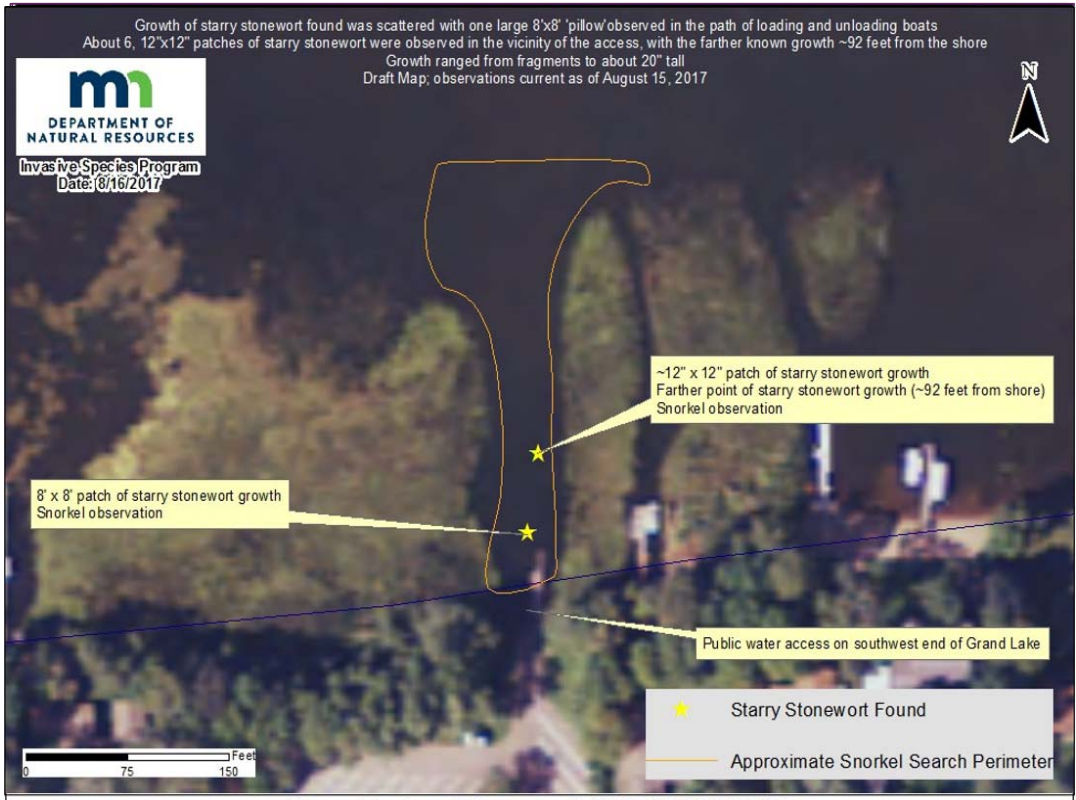
Grand Lake, Stearns County



Response- Grand Lake

Response effort after Starry Trek:

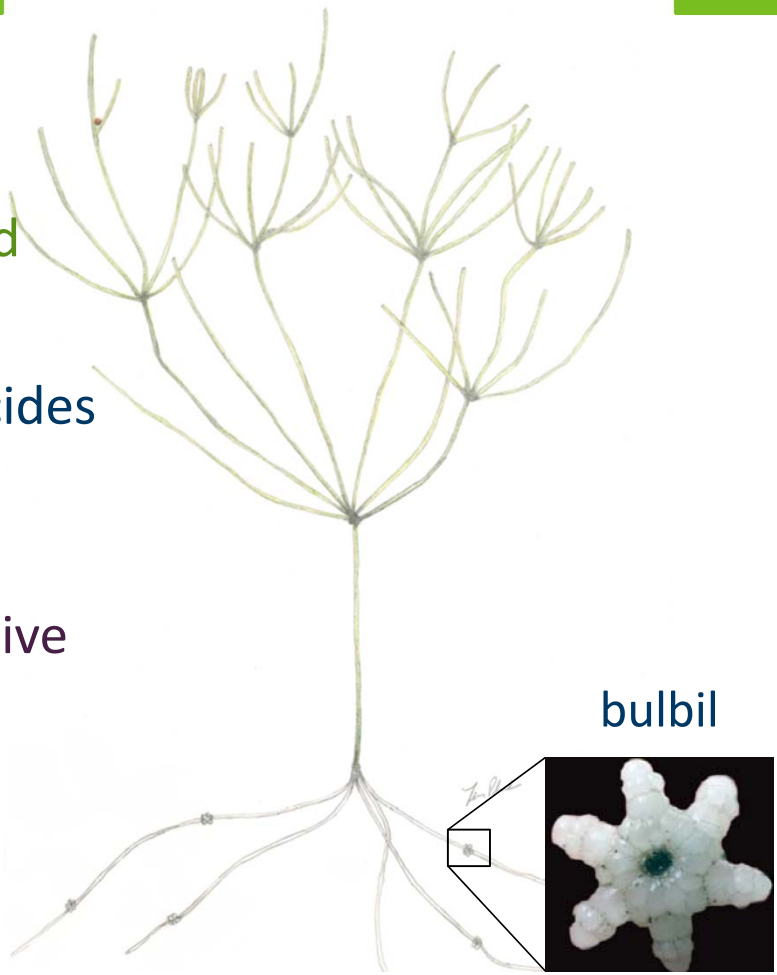
- Immediate DNR response following report
- Few plants found during initial response and follow-up searches
- Manual removal suggested as an aggressive technique for small plots
- Partner with Lake Group members on an action plan
- Coordination of staff and implement the plan for removal



Grand Lake, Stearns; DOW #73005500
Starry Stonewort Snorkel Search August 8, 2017

Why hand pull starry stonewort?

- Pesticide treatments of starry stonewort result in limited or no reduction in frequency of occurrence and are not selective
- Bulbil persistence in sediment likely reason why pesticides have limited effect
- Hand removal of small populations of other invasive plants have shown significant reductions (also a selective technique)
- The important opportunity to learn and adapt this removal technique for starry stonewort



bulbil

Grand Lake Partners

GLID (Grand Lake Improvement District) & Grand Lake Area Association

- Built good partnership and support
- Inform and educate residents

DNR Parks and Trails

- Worked on temporary access closure
- Worked with DNR AIS staff to place barriers in 2017

DNR Invasive Species/Watercraft Inspection Program

- Multi-level support from interns and Compliance Officers at access during removal
- Educate onlookers
- Reroute incoming watercrafts to alternate launch
- Completed searches and removal
- Coordinated project

Manual Removal Project- Grand Lake

- Limited density and distribution of *Nitellopsis*
- Water clarity – ok for diving
  (average secchi= 5.6 feet)
- Water depth- average 3-4 feet at site
  (good for snorkeling)
- Most AIS Specialists are certified divers
- *Nitellopsis* does not float (curse and blessing)
- Substrate was not too clayey
  *important because clay binds the bulbils tight and clouds the water quickly

Hand-Pulling Techniques

Single Plants

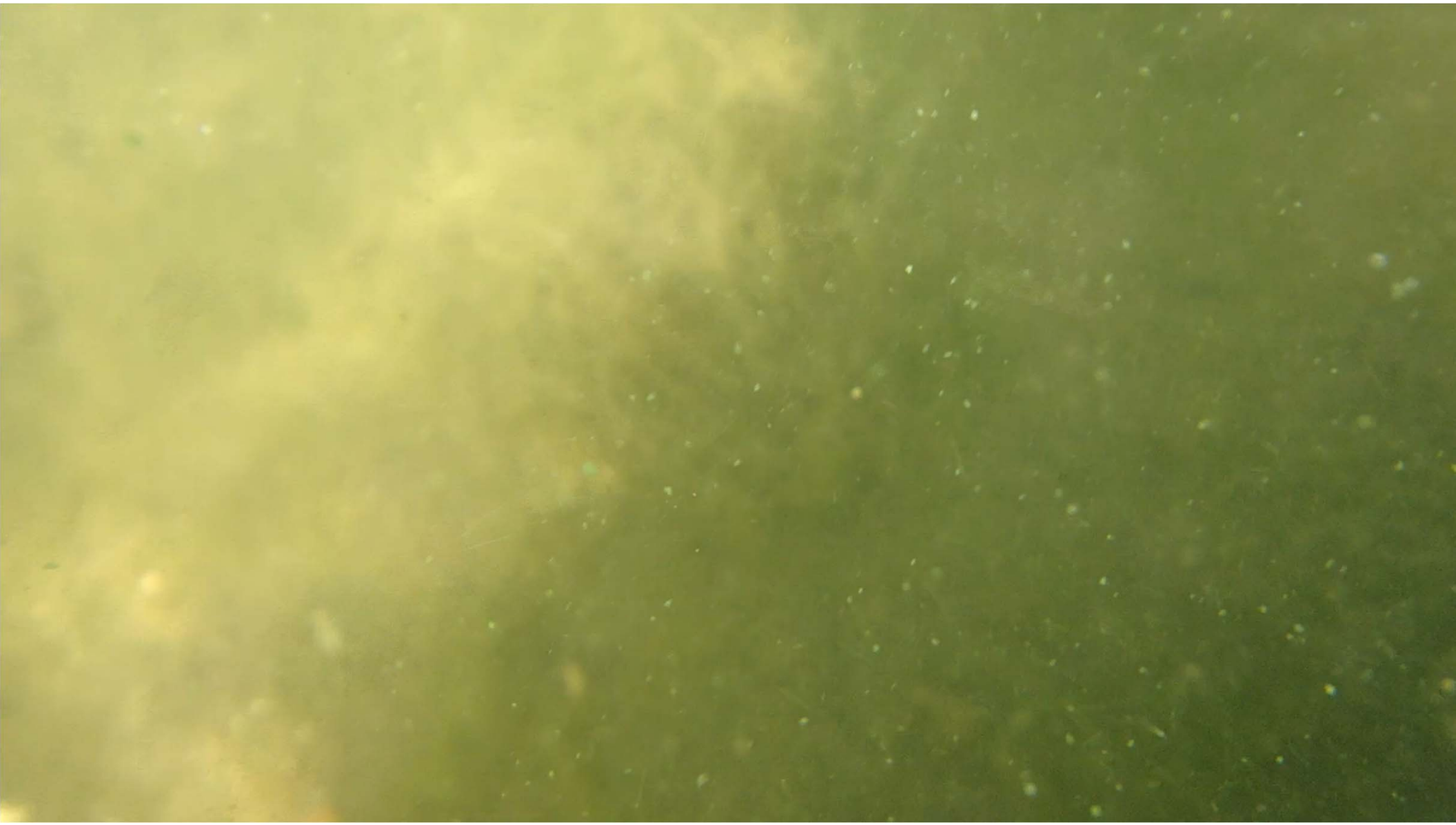
- Grab sediment along with plant
  - Removing bulbils along with plant is the key to success
  - Bulbils connected on weak rhizoids- be gentle ☺ take your time & remove all material around the base of plant

Meadows/Beds

- Able to "Roll up" meadows of starry stonewort
  - Rhizoids create network of biomass

The muck needs to be ideal for these techniques

"As MUCK would have it…"



Removal Efforts

Underwater picture of *Nitellopsis* in Grand Lake

Picture of *Nitellopsis* infested area after the removal effort

2017 & 2018 Efforts

2017 - 3 dives

- 1st Dive – Aug 23
  - 3 staff SCUBA diving, 2 staff snorkeling
  - 2-4 staff transport bags to shore and drain water
  - WIP staff to educate public and direct traffic
  - Barrier/curtain was placed by Parks & Trails
- 2nd Dive – Aug 24
  - 3 staff snorkeling
- 3rd Dive – Sept 22
  - 2 staff snorkeling

2017 & 2018 Efforts

2018 – 3 dives

- 1st Dive – June 26
  - 3 SCUBA divers
  - 3 staff transporting bags and dewatering
- 2nd Dive – July 26
  - 3 SCUBA divers, 1 snorkeler
  - 4 staff transporting bags and dewatering
- 3rd Dive – Sept 11
  - 2 snorkelers
  - 1 staff for support

Results

2017 Results

Pre-treatment- 8’ x 8’ area of moderately dense starry stonewort + clumps + many single plants

Removed:

- 1st: 10-12 seed bags
- 2nd: 2-3 seed bags
- 3rd: 3 plants and some fragments

2018 Results

Pre treatment- Many single plants + few clumps

Removed:

- 1st: 4-6 seed bags
- 2nd: 2 seed bags
- 3rd: <1 seed bag

Seed bags are only filled about ¼ of capacity for safe handling

Lessons Learned

- Bulbils can be successfully removed dependent upon environmental factors (water clarity, muck composition)
- Starry stonewort takes more time and patience to manually remove versus other aquatic plants (paying attention to rhizoids and bulbils)
- May take more than one removal effort per year (we are suggesting a minimum of 2 efforts)
- Choose nice weather days, if possible (be aware of wind and warmth- and sunny days help with visibility)
- Next hand pulling opportunity should involve quantifying removed biomass to track progress
- Early Detection is crucial for any AIS management success and essential for manual removal techniques to be efficient & effective

(Good job, Starry Trekkers!!)

Next Steps for Grand Lake Partners

Continue to:

- hand pull and evaluate reductions
- monitor the lake for any other areas of infestation
- inform the public about the project
- monitor the access

Thanks to all of the partners and participants:

Grand Lake Area Association
Grand Lake Improvement District
AIS Consulting Services, LLC
DNR Park and Trails

2017 Grand Lake Response & Removal DNR Team

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Thank you!