Starry Stonewort in Big Turtle Lake

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Topic overview

- Background
  - Starry stonewort *Nitellopsis obtusa*, biology/history
  - Big Turtle Lake
- Initial Discovery
- Response Strategy
- Partnerships
  - Roles and Responsibilities
- Treatment Plan
- Challenges
- Future Actions

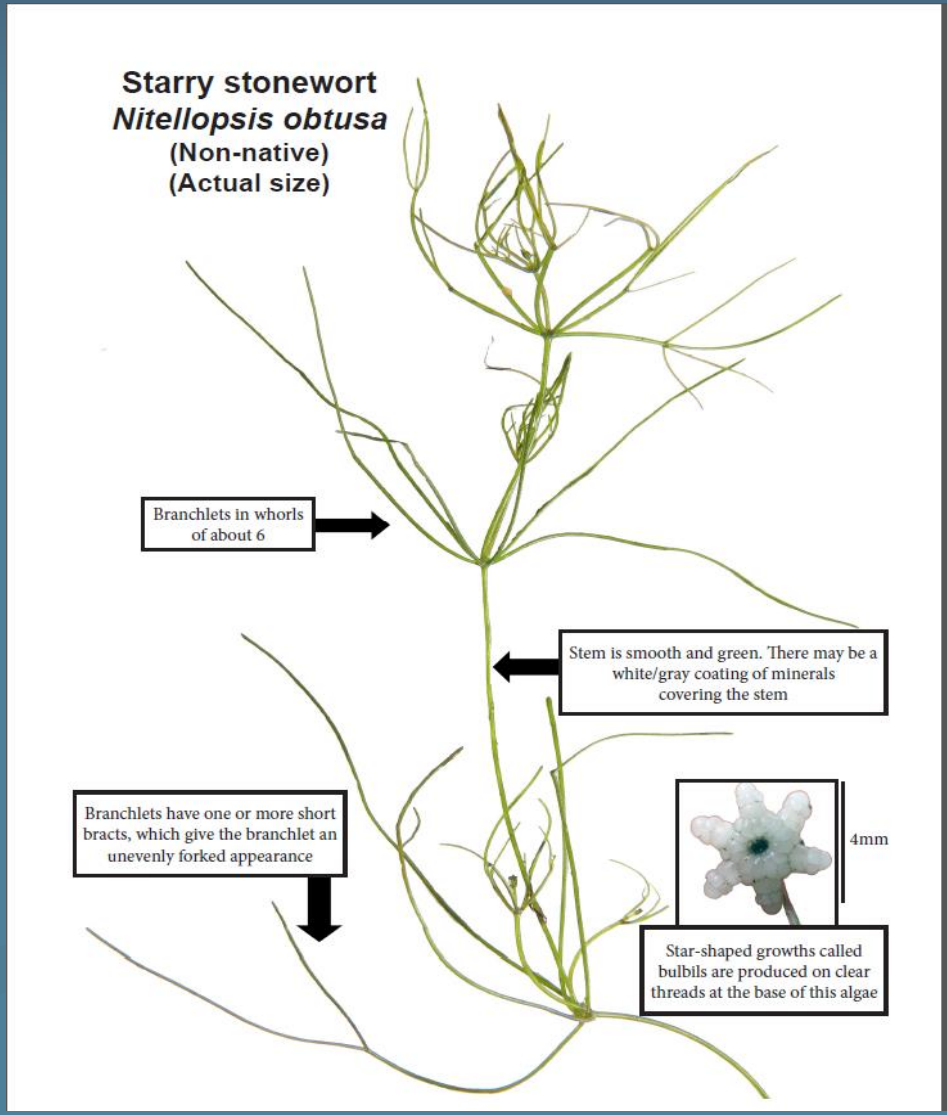
Starry stonewort
Nitellopsis obtusa

Biology:

- Native to Europe and Asia
- Large, grass-like form of algae
  - Characeae family
- Dioecous-only male starry stonewort present in US
  - No seeds are produced

Identification:

- Branchlets of 5-8 whorls, each with 1-2 long bract cells
- Appearance of the branchlet being forked
- White, star-shaped bulbils



Starry stonewort
Nitellopsis obtusa

Means of Spread:

- Unintentional transfer of bulbils and/or fragments

Impacts:

- Dense mats, at water surface
- Interfere with recreational activities
- May displace native vegetation
- Potential to impact fishing habitat

History:

- First found in US 1978 (1974)
- MI for over a decade
- WI in 2014
- Found in MN 2015

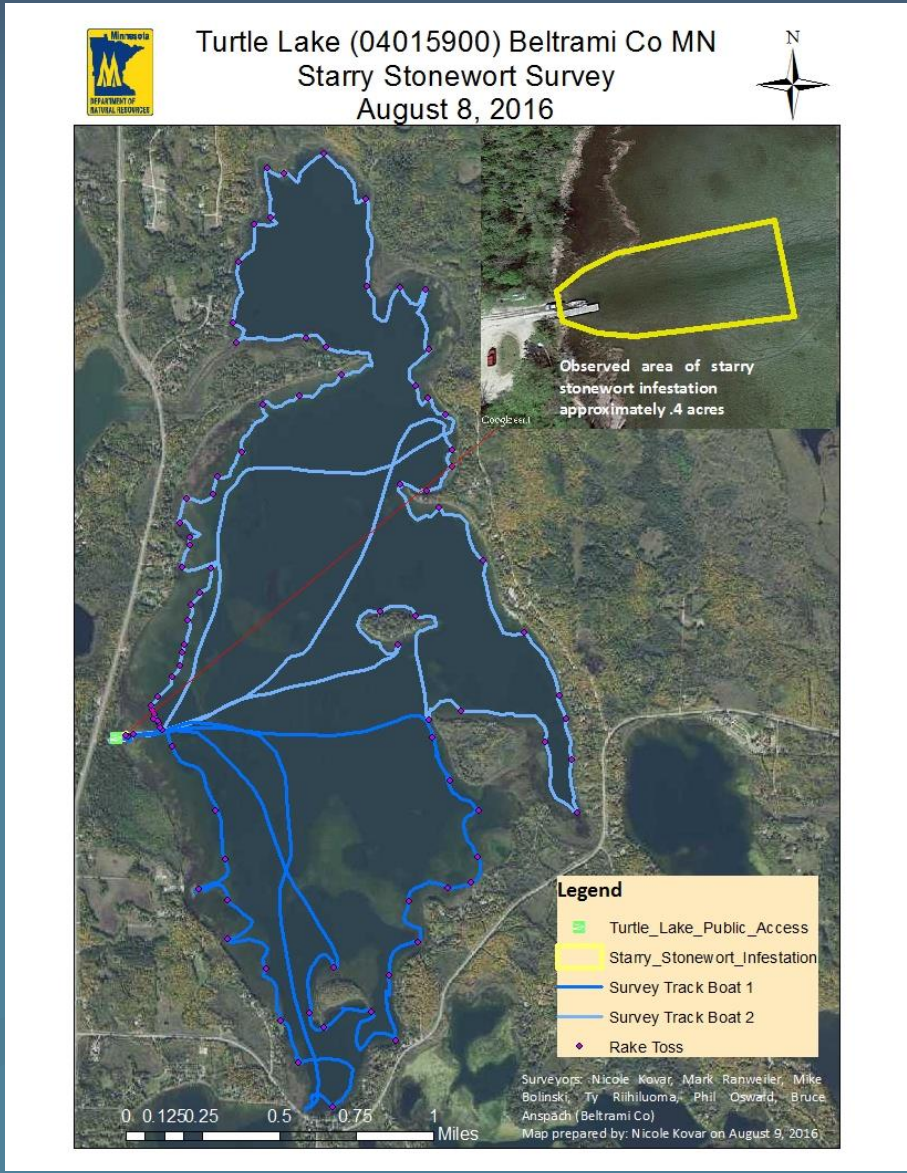
Big Turtle Lake, Beltrami County

Initial Discovery
August 5, 2016

- Initial discovery of SSW by Beltrami County staff and reported to MN DNR
- Verification received by Dr. Ken Karol of the New York Botanical Garden same day
- 185 miles away from the first known SSW infestation in Minnesota
- Importance of Early Detection Programs

Response

- Aug 8th- Lake-wide search
- Partners identified
- Aug 10th- Designation of infested waters
- Inspection hours increased to staff 7 days/week incl decon
- Treatment options researched
- Aug 15th-Public meeting held by TRWA
- An aggressive response and approach was favored
  - Heavily used access and popular fishing lake
- Continued SSW inspection around the county



Partnerships

MNDNR

Kohl's RESORT

MNDNR

Beltrami County ESD - SWCD

Turtle River Watershed Association

Contractors:

PLM Lake & Land Management Corp

Aquatic Restoration Service.com

Roles and Responsibilities

- MNDNR- EWR, FAW, PAT, LAM, lead on funding and staff to implement project, inspectors
- Beltrami County- inspectors, disposal site, continued SSW inspections, continued education and outreach
- Turtle River Watershed Association and members-valuable connection to the members of the watershed, continued education and outreach, avenue to bring stakeholders together, increase of public support for the project
- Kohl's Resort- key in the closure of the public access to prevent spread of SSW in Turtle and to other waterbodies

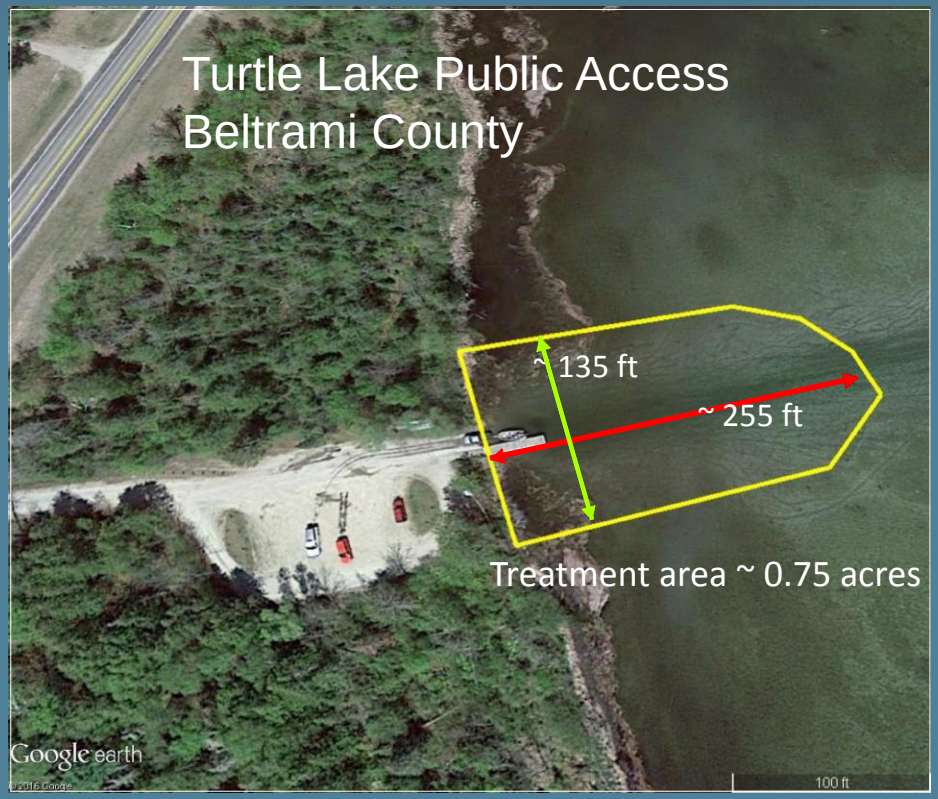
Response cont.

- Access closure was discussed, options pursued
- Aug 18th-Containment barriers first installed around the bulk of the biomass
  - More extensive survey of the area to determine boundary
- Aug 25th-Boating lane and dock removed
- Aug 26th-0.75 acre treatment plot enclosed
- Aug 26th-Access officially closed after temporary lease signed with Kohl's Resort

Treatment Plan

- Contain the infestation to the known area
- Remove as much biomass and sediment as possible (removal of settled bulbils)
  - DASH and Aqua Vac harvester options
  - Dewater on site and dispose of spoil off site in approved location
- Follow up with copper sulfate treatment
- Monitor results post treatment (pre treatment sampling points established)
- Follow up with future actions dependent on monitoring results

Treatment Plan
Suction Harvesting



- Bids requested/received, contract was granted to Aquatic Restoration Services to Aqua Vac the 0.75 acre treatment plot
- Dewatering bags had to be ordered and shipped
- Aug 27th-Contractor mobilized and pre-con mtg held
- Aug 28th-Suction harvesting commenced (expected 3-5 days to complete)

Treatment Plan
Suction Harvesting

Treatment Plan
Cu Application

- Sep 5th-Suction harvesting completed Equipment experienced mechanical difficulties
- Equipment decontaminated before leaving site
- Sep 6th-Copper sulfate applied by PLM
- Sep 9th-Silt curtain removed and access reopened

Adaptive Treatment Plan

- Sep 9th-Post treatment monitoring conducted
- Approximate 90% reduction in biomass and some bulbils remain (visual estimation)
- Suction harvesting limitations in near shore shallow areas left SSW
  - Those areas are still contained and excavation bids are being considered
- Sep 29th-Additional copper treatment with Komeen/flumioxazin combo to potentially impact remaining bulbils

Post treatment actions

- Disposal site at inactive Beltrami Co. gravel pit
- Sep 27th-Dewatering bag and contents hauled to the disposal site
- 405 estimated tons of sediment and plant matter removed
- Silt curtains moved to off-site location for decontamination

Challenges

- Past research on SSW is limited. Much is unknown about this species
- Suction harvesting can be costly and may be best used in combination with other treatment methods, limitations

  Not a complete removal of all SSW biomass
- Chemical applications have different effects in different systems on different specimens
- Much is unknown about the efficacy of different chemical formulations on SSW or the bulbils

Future Actions

- Determine need and timing of any additional chemical applications in future years
- Monitor regrowth of SSW
- Monitor native plant reestablishment
- Continue SSW inspections in other waters
- Collaborate with MAISRC and other partners on research projects to expand our knowledge of SSW and their bulbils

  Red Lk, Cass Lk, Moose Lk (R1), Lk Winni (R2), Lk Koronis, Mud Lk, Rice Lk, W Sylvia (R3)

Updates

- Oct 10th-Post Komeen/flumioxazin application monitoring conducted
- No observed physical effect on bulbils (i.e., no apparent discoloration or damage)
- Oct 24th-Shoreline areas are to be excavated to remove biomass remaining as a result of Aqua Vac limitations

Questions?

Thank you for your attention!

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