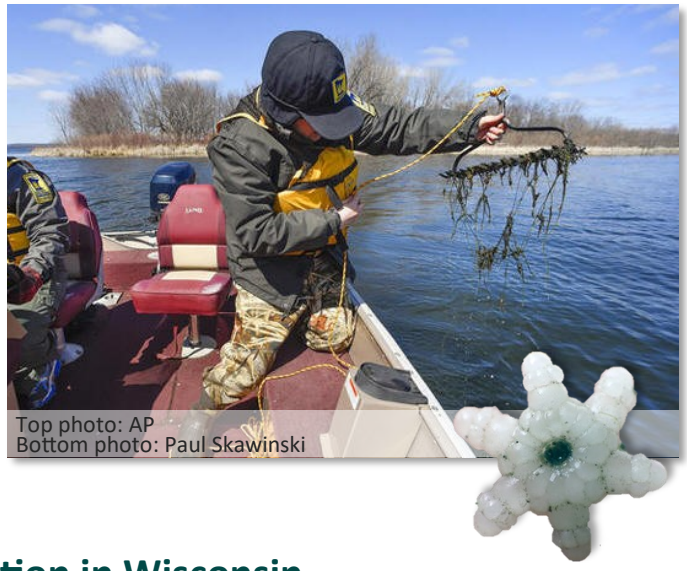
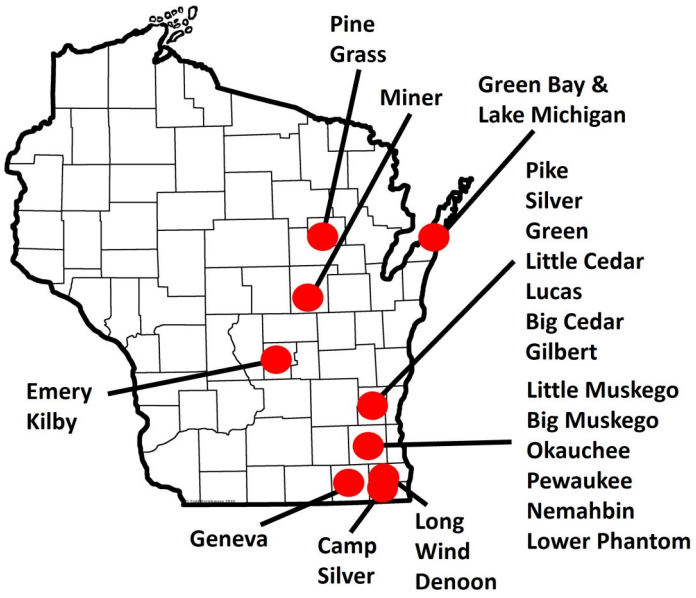
Research Factsheet

Starry Stonewort Management

The Wisconsin Department of Natural Resources has continued its efforts on understanding the distribution, ecology and management of starry stonewort (*Nitellopsis obtusa*, SSW) since this Ch. NR 40 prohibited macroalgae species was first verified in Wisconsin in September 2014. This factsheet summarizes the monitoring and evaluation efforts implemented to date which the department has collaborated on with a variety of partners (e.g., private consultants, state resource managers, lake associations, universities, federal agencies), and is intended to be shared amongst various stakeholders involved in responding to SSW.



Top photo: AP
Bottom photo: Paul Skawinski



Distribution in Wisconsin

- Starry stonewort is currently not widespread in Wisconsin. It has been verified in only 24 inland lakes (primarily in southeastern Wisconsin), as well as coastal portions of Lake Michigan and Green Bay.
- Based on the current limited distribution of this non-native species, containment and prevention of SSW is a high priority.
- The department and partners plan to continue strategically conducting aquatic invasive species (AIS) early detection monitoring on waterbodies throughout the state in order to detect and respond to new SSW populations early before they become well-established.

Steps can be taken to minimize the spread of starry stonewort.

- The majority of lakes with verified SSW populations have active Clean Boats, Clean Waters (CBCW) prevention programs to help minimize the spread of this species and other AIS to uninvaded waterbodies.
- Laboratory studies indicate that hot water steam for >30 seconds will kill SSW bulbils and prevent them from germinating. Drying or freezing bulbils for >24 hours will also prevent germination.
- Another study found that SSW was no longer viable after 2 hours of drying for single plant fragments, 24 hours for small clumps, and up to 4 days for large clumps.
- Chlorine bleach (500 ppm) with a 10 minute exposure time did not appear to completely kill bulbils.

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Management activities conducted to date have not been effective at reducing the frequency or biomass of starry stonewort

- Quantitative pre- and post-treatment monitoring and analysis of management efficacy has been conducted following a variety of management activities implemented to control SSW, such as various chemical herbicides, hand-pulling, diver assisted suction harvesting (DASH), and water level drawdown.
- Evaluation of pre- and post-treatment data compiled across several lakes which have utilized chemical control methods (i.e., primarily copper-based herbicides) have not resulted in control nor eradication of SSW, even in scenarios where chemical treatments have occurred numerous times per season or at large spatial scales.
- The implementation of a winter water level drawdown did not result in control of SSW, however the sediment never fully dried.
- Chemical management of other AIS species such as Eurasian watermilfoil and curly-leaf pondweed may also influence the within lake spread of SSW, especially when conducted at a large spatial scale.
- SSW populations in some lakes have remained at low frequencies over the past few years of monitoring, while in other lakes it has exhibited a relatively rapid increase in frequency since discovery.

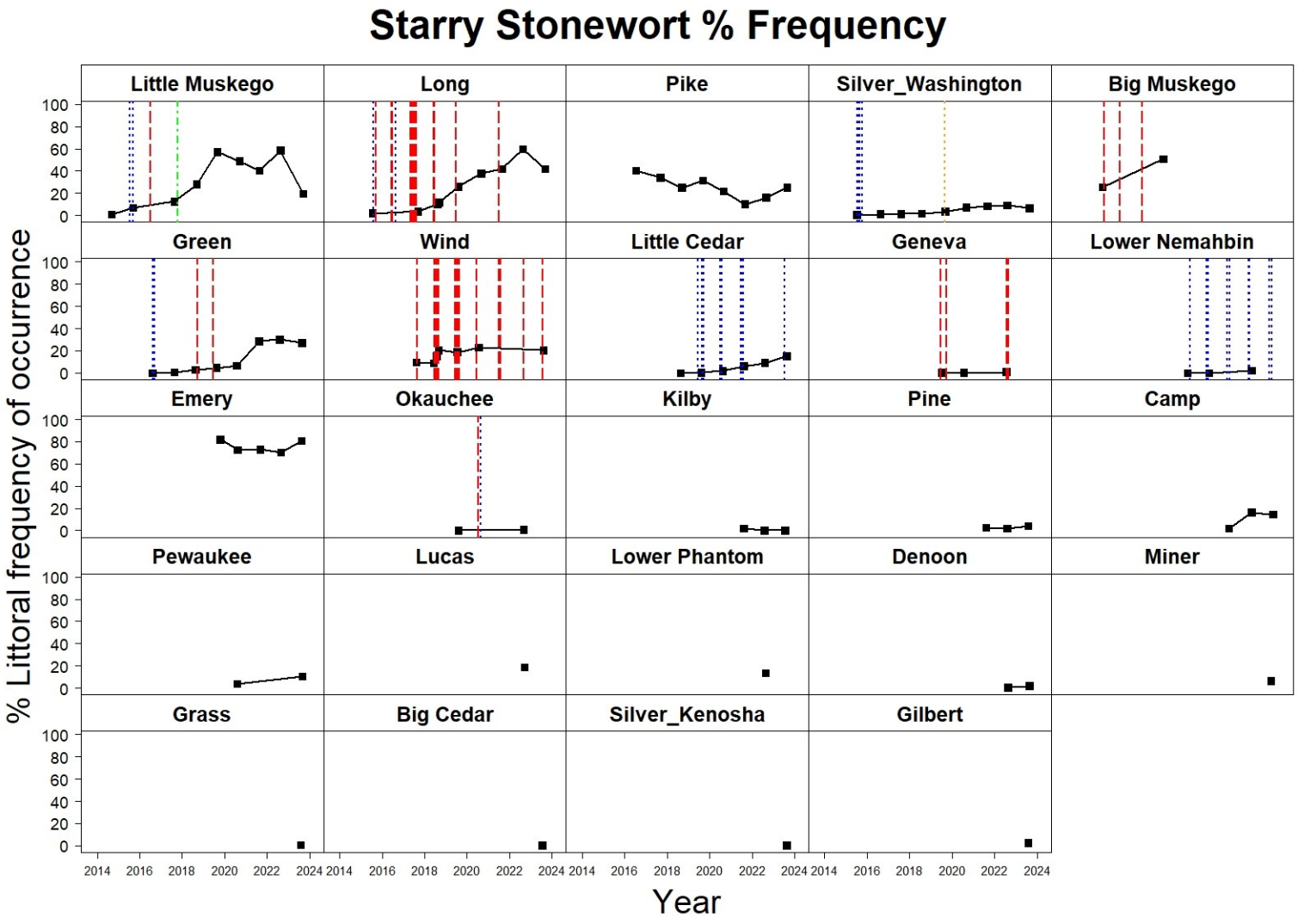

Fig. 1. Lakewide % littoral frequency of starry stonewort over time. The black squares and solid lines indicate the % of sites with starry stonewort divided by the number of sites in the lake where plants are able to grow (e.g., littoral zone). The vertical lines indicate when various management activities occurred, with the color and style of the lines indicating specific management techniques.

Additional findings on the effects of management activities on starry stonewort

- SSW plant height data collected on one lake showed modest short-term reductions in plant height following chemical treatment of some areas, however other areas chemically treated did not see reductions in height. Additionally, there was no untreated area monitored to understand natural variation in SSW bed height.
- Data on other control methods is currently being compiled in order to better understand their efficacy and selectivity. These localized management techniques are often more difficult to quantitatively evaluate given the small scale which they are typically implemented at.
- The use of barrier curtains in conjunction with chemical applications was able to keep the herbicide concentration higher and prevent dissipation away from treatment sites, however this did not result in better control of SSW.

Impact of starry stonewort on native plants has been observed to be variable.

- Data on the impact of SSW to native plant communities is currently limited. There is some evidence that SSW may negatively impact certain native plants in areas of lakes where SSW is abundant. However in other lakes with SSW, the response of native plants is more variable and mixed effects have been observed.
- Many of the chemicals and application rates used to control SSW are also labeled to have impacts on certain native plants, including muskgrasses and stoneworts (*Chara* & *Nitella* spp.), coontail, elodea, pondweeds, wild celery, naiads, and watermilfoils.

The spread of starry stonewort within lakes is variable over time

- In at least one lake where SSW has established, the frequency of this species has declined over the past few years, despite no active management actions being implemented.
- The Department will continue to collaborate with partners to conduct annual lakewide aquatic plant point-intercept (PI) surveys in SSW invaded lakes to better understand long-term impacts and evaluate management activities.

Literature Cited

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