technical memo

Subject |	Starry Stonewort Protection & Emergency Action Plan	**Date** |	11/15/2019
To / Contact info |	Vickie Schleuning, Executive Director; Bill Cook, Board Director		
Cc / Contact info |			
From / Contact info |	Jason Naber, Camilla Correll, Steve McComas, Joe Pallardy		
Regarding |	11/21/19 TAG Meeting Discussion Topic		

Background

Per the Scope of Services for the Lake Minnetonka Vegetation Management and AIS Master Plan, EOR and BWS were contracted to prepare a Starry Stonewort Protection & Emergency Action Plan as one of the first deliverables. A draft of this report was released for comment on October 11, 2019. Comments were received by the following entities/persons:

- ✓ Three Rivers Park District
- ✓ Minnehaha Creek Watershed District
- ✓ Minnesota Department of Natural Resources
- ✓ Tonka Bay Marina
- ✓ City of Greenwood
- ✓ City of Orono
- ✓ Private parties/lakeshore owners

This purpose of this memorandum is to:

1) Provide a summary of comments received with regards to the draft Starry Stonewort Protection & Emergency Action Plan developed by BWS and EOR on October 11th, 2019.
2) Provide framework for discussion on starry stonewort prevention and early detection/rapid response methods.

General Issues/Concerns from Comments Received

The LMCD received a number of comments on the draft Starry Stonewort Protection & Emergency Action Plan. All comments have been recorded and tracked in a spreadsheet so they can be addressed in a clear and transparent manner. To facilitate this process, EOR/BWS organized the comments into the following categories:

Starry Stonewort Prevention:
It should be noted that there is potential for introduction of SSW from Wisconsin lakes or lakes with undiscovered populations of SSW. Watercraft inspections have not been capable of preventing the spread of other AIS species but are part of the recommended SSW prevention strategy and the plan also notes prevention has not been 100% effective.

Pre-emptive and Early Detection Options:
Copper sulfate treatments have not eradicated SSW in other lakes despite these being recommended in the plan. It needs to be determined who/which entity is responsible for what and who will fund SSW treatments.

Roles & Responsibilities:
More dialog is needed with partnering agencies and parties prior to determining who can fulfill roles related to technical assistance, management and funding. The LMCD should be focusing its limited dollars on long-term strategies that have the potential for greater general lake-wide benefit.

Lake Use Comments:
SSW was identified by the public to be the greatest threat to the enjoyment of Lake Minnetonka.

Discussion Item: The LMCD is looking for feedback on the following recommendations related to the Starry Stonewort Protection & Emergency Action Plan. This item is on the agenda for the November 21, 2019 Technical Advisory Committee meeting.

Prevention Recommendation

A chart listing several prevention methods, the probability of a SSW prevention, and the probability of implementing the prevention method on Lake Minnetonka is shown in Table 1. **Error! Reference source not found.**.

At this time, based on available technology and economic considerations, **a feasible, 100% preventative solution** designed to prevent the introduction of SSW into Lake Minnetonka is not practical. From comments received, no clear solutions were offered that pertained to SSW prevention however, until a 100% preventative solution is identified, the LMCD should partner with the DNR to secure funding for bi-weekly surveys at priority boat accesses from May through October. The LMCD should also work with the DNR and lake representatives from the 14 SSW lakes to secure funding for additional watercraft inspections and copper sulfate treatments to reduce SSW biomass and prevent SSW transport by a boat trailer.

EOR recognizes the following deficiencies with the recommended approach:

1) Does not take into account that it is likely there are some lakes where SSW infestations have not yet been discovered and it is likely more will be infested however, this recommendation is based on information available at this time. Additionally, does not take into account SSW-infested lakes in Wisconsin or other nearby states.
2) Watercraft inspections have not been able to prevent the spread of other AIS, including EWM and zebra mussels. Data show the number of EWM, zebra mussel, and SSW infested lakes in Minnesota and Wisconsin continue to increase despite increasing boat inspections.

Currently, the sort of impacts SSW will have in terms of ecology and economics are speculative. What is known is that in Minnesota lakes in which SSW is found early such as Sylvia, Rice, Pleasant, and Grand Lakes, SSW has been successfully contained. As such, EOR and BWS have developed a rapid response action plan based on lessons learned from SSW rapid response efforts across the country. To protect Lake Minnetonka, EOR recommends that the LMCD focus on early detection and response strategies, which have the greatest opportunity for protecting Lake Minnetonka over the long run.

Table 1. Evaluated methods to prevent a SSW introduction into Lake Minnetonka. Methods 1, 2, and 3 would be the most practical and effective for implementing.

Method	Politically Acceptable	Technically Achievable	Economically Feasible	Probability of Preventing a SSW Introduction (points)	Probability of Implementation (points)	Total Score (points)
1. Bi-weekly surveys at priority boat accesses.	Yes	Yes	Yes	**High (4)**	**High (4)**	**8**
2. Extra boat inspections at priority Lake Minnetonka public accesses	Yes	Yes	Yes	**Moderate (3)**	**High (4)**	**7**
3. Conduct exit inspections on 100% of the boats on all Minnesota lakes that currently have SSW. Also, apply copper sulfate at public accesses at the 13 SSW lakes to reduce SSW biomass and prevent SSW transport by a boat trailer.	Unlikely – Who is responsible?	Yes	Yes	**High (4)**	**Moderate (3)**	**7**
4. Don't allow any boats to visit Minnetonka, use a boat club approach.	No	Unlikely	Unlikely	**High (4)**	**Very Low (0)**	**4**
5. I-LIDS: Motion detected video surveillance cameras at boat access are a potential option but rate as low priority.	Yes	Yes	Yes	**Very Low (0)**	**High (4)**	**4**
6. Inspect 100% of incoming boats.	No	No	No	**Moderate (3)**	**Very Low (0)**	**3**
7. Put all boats and trailers through a chemical bath before entering Lake Minnetonka.	Unknown	No	No	**Moderate (3)**	**Very Low (0)**	**3**
8. Develop a Preemptive Pilot Study* which incorporates the use of pre-emptive copper sulfate dosing at prioritized Lake Minnetonka public accesses every 2 to 4 weeks during the growing season. Treatments are prioritized on a launch-by-launch basis, but focus will be on t higher risk launches.	Unknown	Yes	Yes	**Low (2)**	**Very Low (0)**	**2**
9. Using e-DNA monitoring for detecting SSW (not available at this time): Currently (as of 2019) there are no kits for sampling and identifying the presence of SSW in a lake using e-DNA. However, future research efforts may result in a method for detecting a low infestation.	Yes	No	No	**Very Low (0)**	**Low (1)**	**1**

*note this is not an introduction prevention strategy. It assumes that SSW has already been introduced into Lake Minnetonka, but has not yet become fully established Initially, EOR and the LMCD recommended working with the DNR and MAISRC to develop a pilot program to attempt preemptive copper sulfate applications at priority public access points in Lake Minnetonka. Since meeting with the LMCD, EOR and BWS have determined that preemptive copper sulfate treatment at public accesses are not a viable solution for the following two reasons:

1) DNR is not likely to allow pre-emptive copper sulfate treatments due to potentially negative impacts to non-target species.

2) Copper sulfate treatments conducted on Minnesota lakes with SSW have not eradicated SSW. Therefore, if SSW was introduced to Lake Minnetonka, there is no guarantee that a preemptive copper sulfate treatment would achieve a 100% eradication rate.

Early Detection and Rapid Response Recommendation

Rapid response assessment:

After the first verified observation of starry stonewort in a Lake Minnetonka bay, contact Keegan Lund at the DNR. Work with Keegan Lund at the DNR to conduct a rapid response assessment effort within 2 to 3 days of the verified observation. Contractors, DNR, and others should conduct an initial search in the most probable locations to determine the distribution of starry stonewort. From 10 - 20 hours of surveying should be conducted for a thorough assessment. All SSW locations should be sited with GPS.

Rapid response action:

If SSW is found only within a public access area (or an area less than 20-acres) after the rapid response assessment then the rapid response action will be a containment attempt similar to those performed on other Minnesota lakes with a small infestation at the public access. LMCD staff and managers would coordinate in decisions as to what type of a rapid response action should go forward. DNR permits are necessary for treatments and meetings should be conducted prior to any eradication treatments.

Starry stonewort containment:

When the management objective is to contain SSW in a small area, aggressive treatments should be considered. Apply a copper sulfate product or a permitted algaecide product to a delineated area, wait 2 weeks and resurvey. If SSW is found, treat with algaecides again. Repeat up to 4 times during the SSW growing season from June- October.

Summary of steps for a rapid response action

1. Before the detection of an introduced species, a treatment action should be planned because the timing of rapid response to an initial observation is critical. Typically after the first detection for small areas (<20 acres), treatments can occur in 2-3 weeks.
2. After an early detection observation, meet with DNR AIS staff to discuss a protocol for actions and treatment.
3. Conduct the Rapid Response Assessment, beginning with priority accesses. If SSW is detected, move to a full search of the surrounding areas.
4. Evaluate the results of a rapid response assessment. Do results indicate conditions are suitable to contain the SSW in a small area? If a small area of SSW is identified within close proximity to a public landing, the public access in which SSW was found may be closed while treatment occurs. Boaters will be re-directed to other public accesses to minimize the ability for SSW to spread.
5. Delineate a treatment polygon based on the full search survey results. For new infestations, the treatment area has ranged from 0.6 acres up to around 20 acres.
6. Containment of SSW should be measured based on results of a rapid response assessment. With early detection, the objective is to contain SSW in a small area of infestation. Previous projects (Sylvia, Rice, Pleasant, Grand) have found aggressive multiple treatments have successfully contained SSW at the public access. Once the initial infestation has spread and is widespread (> 50 acres) treatments are reduced to just the areas with the heaviest growth. Multiple treatments over large areas are not warranted due to excessive costs and ecological damage.

7. Estimated annual costs associated with the application and monitoring are up $20,000 for a containment treatment, dependent on the treatment dimensions and frequency of treatments.

Management Options

After reviewing SSW treatment results in Michigan, Wisconsin, and Minnesota, the most cost effective treatment has been the use of **copper sulfate or an algaecide such as endothall.** Hand pulling can be considered for very limited infestations, but then a follow-up copper sulfate application should be considered. Other methods that have been attempted, but have been less effective include dredging, DASH (diver assisted suction harvesting), and drawdown. After a treatment, a post-treatment evaluation is necessary to determine the effectiveness of a containment treatment. This protocol is available from the DNR. Components will likely include a thorough search of the treatment area, and a post treatment survey of the treatment area and surrounding area. A flow chart showing a sequence of steps is shown in Figure 1.

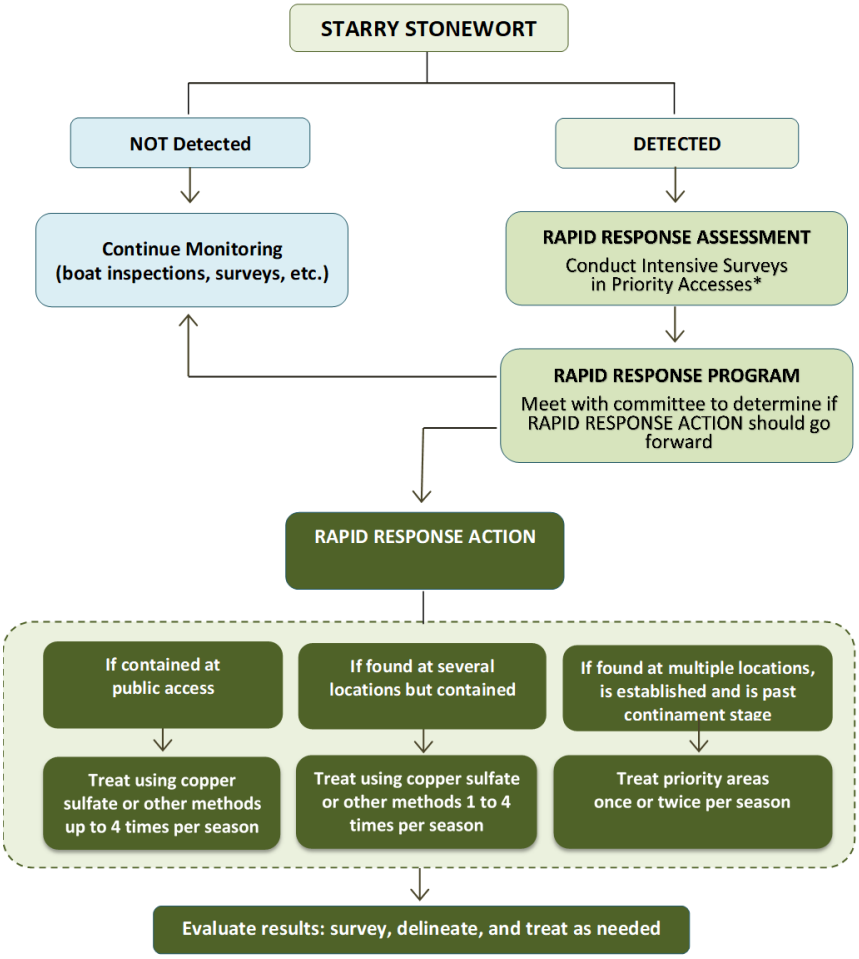

Figure 1. Starry Stonewort Rapid Response Plan Flow Chart.