



Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 5B – Update on Zebra Mussels in Medicine Lake and Consider Recommendations for Next Steps
BCWMC December 21, 2017 Meeting Agenda
Date: December 13, 2017

5B. Update on Zebra Mussels in Medicine Lake and Consider Recommendations for Next Steps

1.0 Recommendations:

Consider approving the following next steps in response to Medicine Lake zebra mussel infestation:

1. Direct staff to discuss and work with Three Rivers Park District and, if deemed appropriate, apply for Hennepin County [AIS Prevention Grant](#), to help fund either a) installing a [CD3 \(Clean, Drain, Dry, Dispose\) unit](#) at the French Regional Park boat launch, or b) additional inspection hours at the park boat launch; and to include up to \$5,000 of BCWMC AIS/APM 2018 funding as a grant match. [Note: Grant application deadline is January 12, 2018 – before the January Commission meeting.]
2. Perform a “meandering” survey of zebra mussel adults to determine the extent of the infestation in the lake and use up to \$8,000 of 2018 APM/AIS funds for this work, if needed. [Note: although the survey is not required until after ice-out, coordination with agency and contractor staff will be required ahead of time.]
3. If the meandering survey finds zebra mussels in a few locations (i.e., isolated clusters), and the MnDNR and MAISRC staff agree that the lake is a candidate for a rapid response treatment, use up to \$1,500 of staff time to apply for a MnDNR treatment permit.
4. If the MnDNR issues the treatment permit, apply for a Hennepin County Rapid Response Grant (different from the AIS Prevention Grant discussed in #1 above) to pay/help pay for quarantine and treatment costs.

2.0 Background

On November 1, a resident notified MnDNR of a zebra mussel on a dock pulled from Medicine Lake. On November 2, MnDNR staff verified it was a zebra mussel; on the same day, MnDNR staff found two additional zebra mussels on two docks at two different locations on the lake (see attached map). The MnDNR estimated the three zebra mussels to range in age from one to three years (attached photo shows the three zebra mussels). If the infestation consists of three small, isolated clusters, a rapid

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response (i.e., chemical treatment in hopes of eradication) would be feasible. If the infestation is lake-wide, a rapid response treatment would not be feasible. The MnDNR's first impression is that the infestation is lake-wide.

To better understand zebra mussels (e.g., life cycle, food sources, etc.) and potential responses to the infestation, BCWMC staff met with staff from the Minnesota Aquatic Invasive Species Research Center ([MAISRC](#)), and held discussions with staff from the MnDNR, Three Rivers Park District (TRPD) and Hennepin County. If the Commission or the MnDNR decides a rapid response to the zebra mussel infestation is inappropriate, the zebra mussel population will likely continue to spread across Medicine Lake, eventually becoming problematic. In the short term (first 2 or 3 years), the water clarity of Medicine Lake could improve, due to the water filtering activity of the zebra mussels. However, after 3 years, there could be poorer water quality in the form of algal blooms (filamentous and blue-green), because zebra mussels do not feed on these types of algae, only the "good" (e.g. green) algae. Removal of the "good" types of algae from the water column enables the blue-green algae to monopolize the community. In addition, waste products excreted from the zebra mussels enrich the water with nutrients. The lack of competition for the blue-green algae and enrichment of the water column by the zebra mussels has been shown to cause severe algal blooms. Because toxin-producing blue-green algae dominate the Medicine Lake algal community each summer, increases in these algae have the potential of causing public health concerns for lake users. Current blue-green algae levels in Medicine Lake are well below the World Health Organization threshold for a moderate risk of adverse health impacts. However, increases in numbers of toxin-producing blue-green algae due to zebra mussel impacts on the algal community could push the blue-green algae numbers above this threshold. If that were to occur and subsequent algal toxin testing determined toxin levels exceeded public health thresholds, the public would be advised to have no contact with the water until the toxin levels subsided. According to MAISRC staff, zebra mussels are one of the worst aquatic invasive species, in terms of their ecological impact, as they completely "re-route" the food chain in the water body.

3.0 Potential Next Steps

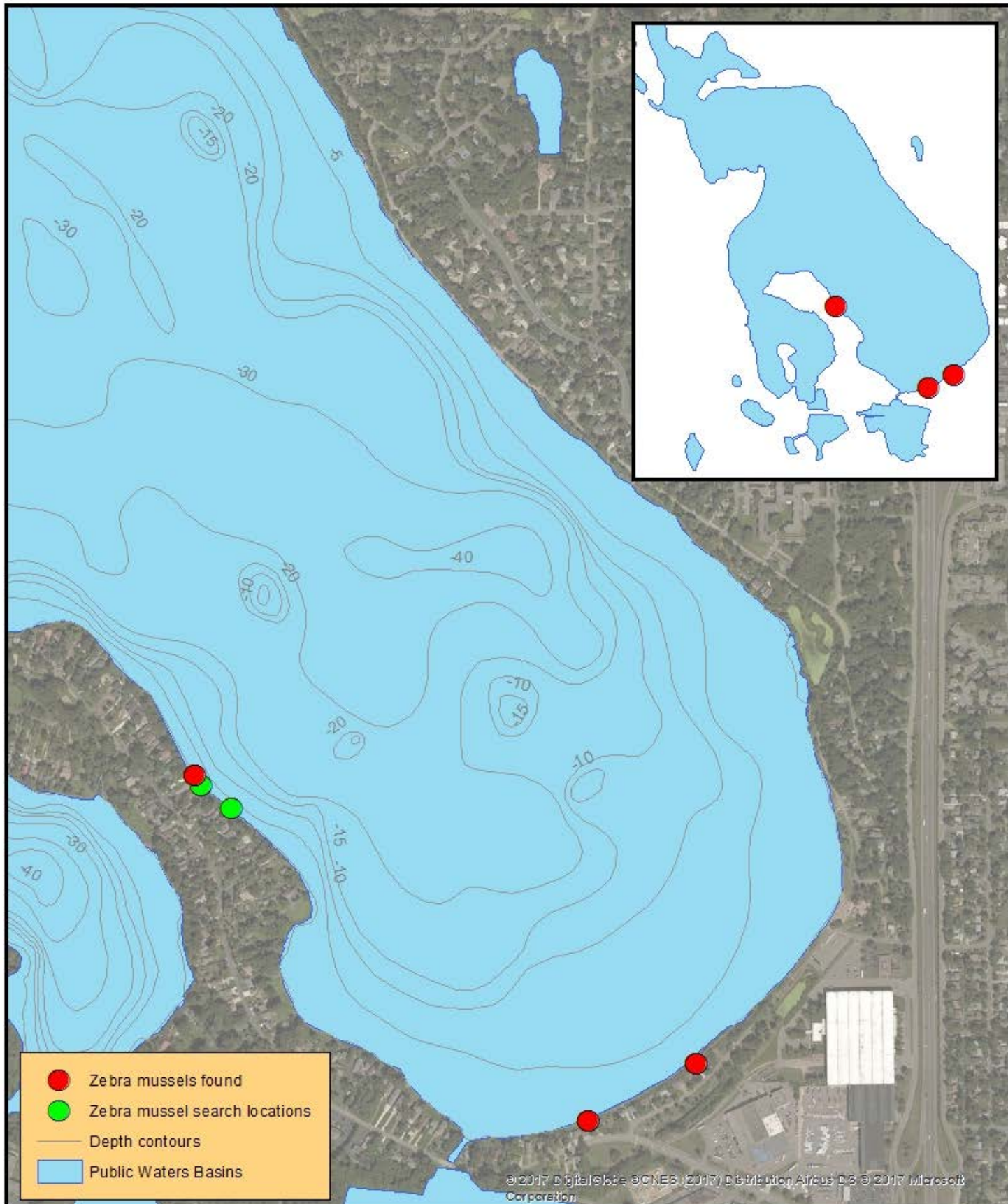
First, the BCWMC should consider applying for a Hennepin County AIS Prevention Grant to help stop the spread of AIS to other lakes. Each year since 2014, Hennepin County has received State funding for AIS prevention. The County uses much of these funds as [grants to local partners](#) for AIS research, education, and prevention activities. County staff have indicated the State funding may not be available in future years. The grant application deadline is January 12th – before the next Commission meeting. Commission staff and TRPD staff have been discussing the possibility of applying for an AIS grant to purchase a [CD3 \(Clean, Drain, Dry, Dispose\) unit](#) at the Medicine Lake launch. Although the Commission would be the grant applicant, TRPD staff would install, use, and maintain the CD3 machine – so their involvement in the grant application is critical. Staff should continue to discuss the need, timing, and applicability of the CD3 unit for Medicine Lake. Another possible use of grant funds would be to increase inspections at the Medicine Lake launch. Staff is seeking approval to continue discussions, apply for a grant if deemed appropriate, and contribute up to \$5,000 as a local match (see #1 below).

Secondly, it should be determined whether or not a rapid response to zebra mussels in Medicine Lake is feasible, which means investigating the full extent of the infestation. There are several partners to help design and implement a lake-wide survey, including TRPD, MnDNR, MAISRC, and contractors like Blue Water Science. If a rapid response is deemed feasible, there is a short window (approximately 6 weeks) between ice-out when the survey would be completed and the time a rapid response (chemical treatment) would be most effective. A permit from the MnDNR is needed to carry out a rapid response. Hennepin County has funding available for rapid response efforts which should be sought by the BCWMC if we get to this point. Staff is seeking approval to continue working with key experts and partners to design and implement a survey, apply for a MnDNR permit if needed, and seek funding for a rapid response from Hennepin County (see #2 - 4 below).

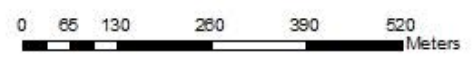
1. Direct staff to discuss and work with Three Rivers Park District and, if deemed appropriate, apply for Hennepin County [AIS Prevention Grant](#), to help fund either a) installing a [CD3 \(Clean, Drain, Dry, Dispose\) unit](#) at the French Regional Park boat launch, or b) additional inspection hours at the park boat launch. No match is required for this grant, but staff recommends including up to \$5,000 as match. The maximum grant can be \$50,000, and most grants are in the range of \$15,000 to \$25,000. The estimated cost of a CD3 unit is \$20,000. The estimated cost for additional inspection hours varies depending on the number of inspection hours. [Note: Grant application deadline is January 12, 2018 – before the January Commission meeting.]
2. Perform a “meandering” survey of zebra mussel adults to determine their locations in the lake. The MnDNR requires a meandering survey to ascertain if the lake’s zebra mussel population is isolated or widespread. The survey would include SCUBA diving in the deeper waters and snorkeling/wading in the shallower waters of the lake. There is the potential that a combination of TRPD staff, MnDNR staff and volunteers could perform the meandering survey, at no cost to the Commission (other than coordination costs). However, it is possible that a consultant (Blue Water Science) would be required to perform some or all of the meandering survey. Blue Water Science’s cost estimate to perform the entire meandering survey is \$16,000. However, we recommend the Commission authorize allocating up to \$8,000 for the survey. This assumes TRPD staff, MnDNR staff and/or volunteers perform about half of the survey work, and Blue Water Science performs the remaining work.
Schedule: As soon as possible after ice-out (April – May 2018).
3. Apply for a MnDNR treatment permit if the meandering survey finds zebra mussels in a few locations (i.e., isolated clusters), and the MnDNR and MAISRC staff agree that the lake is a candidate for a rapid response treatment. There is no permit application fee for AIS treatments, but there would be BCWMC staff time involved in applying for the permit and coordinating with MnDNR staff. The coordination cost would likely range from \$500 to \$1,500, but the actual cost will depend upon how much discussion with MnDNR staff is required to obtain the permit.
Schedule: April – May 2018

4. Apply for a Hennepin County Rapid Response Grant (different from the AIS Prevention Grant discussed in #1 above) to pay/help pay for quarantine and treatment costs if the MnDNR issues the treatment permit. We recommend that the Commission direct staff to obtain cost estimates for quarantine and treatment and bring these costs back to the Commission at a future meeting.
Schedule: April – May 2018
5. Prior to treatment, work with MAISRC staff to complete a detailed survey of the treatment areas to determine pre-treatment zebra mussel density. Although the MnDNR does not require a mussel density survey, it will help to gauge the effectiveness of the treatment. MAISRC would perform this work at no cost to the Commission.
Schedule: May 2018, prior to treatment
6. Contract with applicator to quarantine the treatment areas and perform treatment. The treatment areas must be quarantined using vinyl curtains to prevent water exchange with the rest of the lake. Zebra mussels require exposure to a lethal dose of chemical for several days. If the treatment area is not quarantined, water exchange with untreated waters would reduce the chemical dose below the lethal threshold. Surrounding the treatment area with vinyl curtains sustains the lethal dose long enough to kill the zebra mussels. The chemical used for the treatment will be a copper compound (Earthtech QZ).
Schedule: May 2018, or as soon as possible after obtaining permit and completing mussel density survey (the zebra mussel reproductive “season” begins in May and continues through mid-August)
7. Perform post-treatment survey to determine zebra mussel density (i.e., check effectiveness of treatment), working with MAISRC staff to complete the survey. Unlike pre-treatment, the MnDNR requires a post-treatment survey to monitor treatment effectiveness. MAISRC would perform this work at no cost to the Commission.
Schedule: Summer 2018 (e.g., after May 2018 treatment)
8. If the MnDNR does not permit chemical treatment of the zebra mussels because they consider the infestation too widespread to qualify for rapid response treatment, we recommend that the Commission evaluate the feasibility and cost of hand removal of zebra mussels by scuba divers in the infested areas. According to MAISRC experts, every zebra mussel removed would reduce the next year’s population by a half a million mussels. If feasible, we recommend the Commission remove the zebra mussels to prevent the serious lake-wide problems that are expected to occur if not managed.
9. Install the already-purchased zebra mussel sampling plates to achieve widespread monitoring of zebra mussels in Medicine Lake, regardless of whether a rapid response treatment occurs or not.

Medicine Lake, Hennepin County: 2017 Zebra Mussel Infestation Search



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MNDNR Invasive Species Program
Inspected on: 2 November 2017
Map Updated: 13 November 2017

Medicine Lake, Hennepin County

Date: 2 November 2017

ZEBRA MUSSELS CONFIRMED

26 mm



23 mm



14 mm

