

Project Name | Square Lake Moratorium Monitoring**Date** | 1-31-2017**To / Contact info** | CMSCWD Board of Managers**Cc / Contact info** | Jim Shaver, District Administrator**From / Contact info** | Meghan Funke, PhD**Regarding** | January 24, 2017 Square MOU Final Recommendations meeting with DNR

On January 24, 2017, Jim Shaver (CMSCWD Administrator), Dr. Meghan Funke (EOR limnologist), and Dr. Leif Hembre (Hamline University biologist) met with Brad Parsons (Central Region Fisheries Manager), T.J. DeBates (East Metro Area Fisheries Supervisor), and Dr. Heidi Rantala (Fisheries Section limnologist) to discuss the DNR final stocking recommendations based on the three-year moratorium monitoring and analysis report submitted to DNR by Dr. Hembre on behalf of the CMSCWD. The purpose of this meeting was to discuss the third party review of Dr. Hembre's final report by Dr. Kyle Zimmer (St. Thomas University shallow lake biologist), the decision by the MDNR Central Region Fisheries on whether to continue the trout stocking suspension in Square Lake, and to define further actions by both parties.

DNR provided the third party review by Dr. Zimmer to Dr. Hembre, Jim Shaver, and Dr. Funke at the January 24, 2017 meeting. It was Dr. Zimmer's professional opinion that the overall trends in means (averages) of the response variables in years when trout were stocked versus years when they were not stocked support the conclusions of the report: when trout are not stocked the abundance of large-bodied *Daphnia* increased, phytoplankton decreased, water clarity increased, and total phosphorus decreased. Dr. Zimmer had some reservations about the use of ANOVA to test for statistically significant effects of trout and month interactions on *Daphnia*, phytoplankton, water clarity, and phosphorus, but that these reservations did not change his opinion to agree with the overall conclusions of the report. Dr. Zimmer's review letter is attached to this memo.

At the January 24, 2017 meeting, DNR relayed the following concerns with Dr. Hembre's report:

1. Using individual replicate samples, instead of the average of replicates, in determining the statistical degrees of freedom.
2. The lack of decreasing the significance level as the number of factors compared increases. That is to say, testing the effects of stocking trout on *Daphnia* abundance could be considered significant at $\alpha < 5\%$, but testing the effects of month and trout stocking on *Daphnia* abundance could only be considered significant at $\alpha < 1\%$.
3. The lack of a reference lake.
4. The compounding effects of the high bluegill population in Square Lake, which also eat *Daphnia*.

Dr. Rantala and Jodie Hirsch from DNR offered to meet with Dr. Hembre on February 7 to discuss DNR's statistical concerns with his report.

DNR cited the following rationale for their decision to stock 3,000 Rainbow Trout yearlings to Square Lake in spring:

1. DNR receives 25-50 calls per year from trout fisherman
2. Rainbow Trout stocking is the most cost efficient type of stocking

3. The number of yearlings to be stocked in Square Lake is less than in the past
4. The stocked trout will be in the lake for a shorter period before being harvested by stocking in spring versus the fall
5. The number of trout stocked per acre in Square Lake (15/acre) is less than other trout lakes: Long Lake (88/acre), Holland (27/acre in 2016), and Cenaiko (147/acre in 2016)

DNR indicated they are committed to evaluating the effects of the spring stocking on Square Lake. DNR also indicated they would continue the monitoring program established by Dr. Hembre and would pursue bioenergetics modeling of Square Lake to determine how many zooplankton the stocked trout can eat based on the average length of time trout remain in the lake, and the subsequent effects on water quality.

Jim Shaver encouraged DNR meet with the CMSCWD Board of Managers to explain their stocking decision. In addition, Jim Shaver cautioned the DNR to carefully consider how they will publicize their decision to stock in spring, considering that Dr. Hembre's report and Dr. Zimmer's review both support the moratorium monitoring results indicate trout stocking have a negative impact on water quality in Square Lake.

Below is a brief summary of the outcome of each deliverable outlined in the November 16, 2012 Memorandum of Understanding between the Minnesota Department of Natural Resources, Central Region Fisheries and the Carnelian-Marine-St. Croix Watershed District regarding the temporary suspension of trout stocking in Square Lake:

1. *Monitoring data will be evaluated on an annual basis by the CMSCWD, and an annual summary memo of the monitoring data will be provided to the MDNR by the CMSCWD.*

Interim memos were submitted by Dr. Hembre to MDNR following the 2013 and 2014 monitoring seasons.

2. *A final report, including a preliminary recommendation of whether to continue the trout stocking suspension for the benefit of the water quality in Square Lake, will be completed by the CMSCWD by June 2016.*

A final report was submitted by Dr. Hembre to MDNR on June 30, 2016 concluding that all three years of monitoring data (2013-2015) supported nearly all of the expected changes in the zooplankton community composition and trophic state indicators expected as a result of suspending the stocking of rainbow trout in Square Lake. The preliminary final report conclusions were presented to MDNR by Dr. Hembre on April 21, 2016, and to the CMSCWD Board of Managers by Dr. Meghan Funke on June 8, 2016. Based on the report conclusions, a cover letter was included with the final report submitted to DNR on June 30, 2016 stating that a motion was approved by the Board of Managers on June 8, 2016 to support that DNR continue the trout stocking suspension for the benefit of the water quality in Square Lake based on the findings from the 2013-2015 moratorium monitoring.

3. *The final report will be reviewed by an impartial, scientific expert in limnology from a local institution of higher education and research to provide a third party recommendation to the MDNR Central Region Fisheries by December 1, 2016.*

Dr. Kyle Zimmer, a shallow lake biologist at St. Thomas University, reviewed Dr. Hembre's final report and summarized his conclusions in a letter to Brad Parsons dated November 2, 2016. This letter was provided to Dr. Hembre, Jim Shaver, and Dr. Funke at the January 24, 2017 meeting with DNR. The letter is included as an attachment to this memo.

4. *A decision will be made by the MDNR Central Region Fisheries by January 1, 2017 as to whether to continue the trout stocking suspension in Square Lake.*

DNR's decision was to stock 3,000 Rainbow Trout yearlings to Square Lake in spring, equivalent to 15 trout per acre, with no restrictions (usual bag limit of 5).

5. *An amendment to this agreement will be developed by the MDNR and the CMSCWD after January 1, 2017 to define further actions required by the parties according to the outcome of Deliverable 4.*

It was unclear from the January 24, 2017 meeting whether an amendment to the agreement would be developed by MDNR and CMSCWD.