Cedar Lake Carp Removal Plan

Carp (an aquatic invasive species in Minnesota) negatively affect water quality and overall ecological integrity of waterbodies by resuspending sediments and nutrients into the water column through feeding and spawning behavior, reducing the abundance of submerged aquatic vegetation, and, to a lesser extent, excretion of waste. Overabundant carp populations can bioengineer the environments they live in and dramatically change the ecology of shallow lake systems.

WSB has agreed to work collaboratively with the Cedar Lake Improvement District (CLID) to manage the common carp population in Cedar Lake. WSB staff have a combined 29 years of experience in carp research and management.

WSB staff have designed and installed several net, vertical wall, electric, and drum barriers as part of carp integrated pest management plans and drafted carp management plans for the Prior Lake Spring Lake Watershed District (Prior Lake, MN), Grand Lake St Mary Restoration Commission (Celina, OH), Minneapolis Park and Recreation Board (Minneapolis, MN), Shel Rock River Watershed District (Albert Lea, MN) and Circle Lake - Lake Improvement District (Millersburg, MN).

Background

Cedar Lake is listed as impaired for nutrients (phosphorous) by the MPCA. Excess phosphorous can lead to algae blooms and reduce or inhibit designated uses such as swimming and boating.

Results of two studies on the lake in 2016 and 2017 indicated the carp population consist of mostly older adults with minimal recruitment (but there is still some recruitment) and that carp aggregated in different areas of the lake in 2016 and 2017.

Based on this data, the CLID has requested WSB to submit a proposal to aid in further reducing the Cedar Lake carp population.

Approach and Scope

Conversations with Jeff Reidemann (commercial fisherman who seine netted Cedar Lake) and Carp Solutions Staff indicate that Cedar Lake poses significant challenges to large scale removal of carp due to dense aquatic vegetation and the presence of obstructions (mainly large rocks and boulders) in carp aggregation areas. Baited box netting was also attempted and was not successful in removing carp.

Large scale gill netting that utilizes drive sets, not dead sets, has been used on other lakes, but the presence of musky presents the risk of mortality to large musky susceptible to gill netting. Based on this, we are not proposing to utilize this gear at this time. Radio telemetry indicates that carp do not migrate out of Cedar Lake at any point and are therefore not susceptible to in-stream removal.

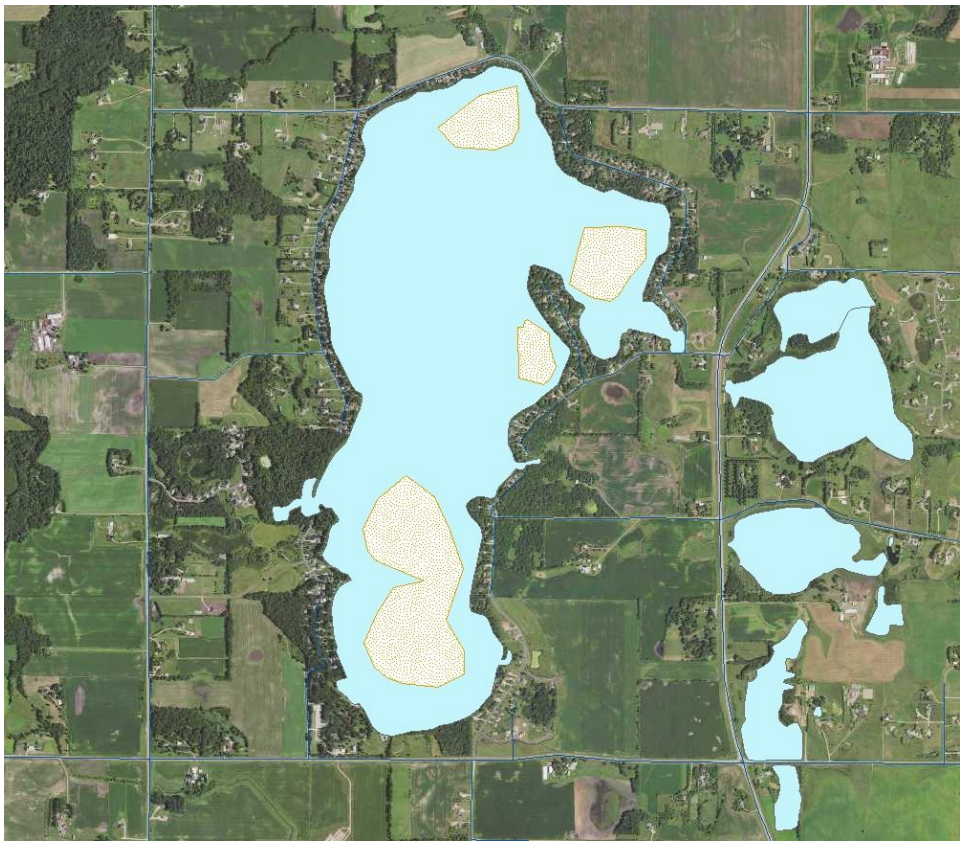
Based on this, seine netting may be the most effective method to remove carp biomass from Cedar Lake.

Using the information provided in the TMDL, conversations with commercial fishing crews, the 2017 Carp Solutions Report, and subsequent conversations with CLID members in January 2021, several tasks were identified to facilitate additional carp biomass removal within Cedar Lake.

Task 1. Complete reconnaissance of Cedar Lake carp aggregation sites identified through radio telemetry
Task 2. Acquire MN DNR scientific research permit
Task 3. Radio tag up to 12 adult carp
Task 4. Complete radio telemetry surveys
Task 5. Coordinate commercial fishing crews to complete one (1) netting attempt
Task 6. MUM deployment and removal observations
Task 7. Draft Report summarizing results of netting and recommendations for additional removals

Task 1. Complete Reconnaissance

Telemetry surveys completed between December 2016 and April 2017 identify four (4) main carp aggregation areas within Cedar Lake.



Commercial fishing crews describe the three (3) locations in the northern portion of the lake as unseinable based on obstructions that are present. The preferred seining location is in the southern 1/3 of Cedar Lake, but the effectiveness of netting this area may be impacted by woody

debris along shore and the presence of dense aquatic vegetation. To mitigate this, divers were employed to remove major obstructions.

Task 2. Acquire Permit

A MN DNR Scientific permit is required to complete surgical implants of radio tags and electrofishing surveys for the collection of adult carp for implants and other lines of data.

Task 3. Radio Tag up to 12 adult carp

Up to 12 adult carp will be collected and implanted with high frequency radio tags. We propose to utilize electrofish to capture carp for radio tagging. Radio telemetry will be imperative in determining the timing of planned removals and assessing the movement of carp during task 6.

Captured carp will be anesthetized and surgically implanted with radio tags,

Task 4. Complete Telemetry Surveys

Telemetry surveys allow us to determine when and where carp have aggregated to plan the optimal time and location for large scale removal efforts.

A recovery period will be necessary to allow radio tagged carp to resume normal behavior and safe ice to form. We anticipate survey work to begin in December 2021 and continue during winter/spring 2022.

The timing of removals will be based on the location and aggregations of radio tags observed during telemetry surveys. Surveys will consist of WSB staff walking or boating the entire basin to locate radio tag frequencies.

Task 5. Coordinate commercial fishing crews to complete one (1) netting attempt

Under this proposal, WSB will relay radio tag locations to commercial crews as we develop seasonal removal schedules based on biomass, marketability of fish, ice, weather patterns, etc.

Task 6. MUM Feasibility

The MUM utilizes underwater speakers deployed in a coordinated effort to stimulate carp to aggregate and move into an area conducive to netting. While this method is relatively new it has shown promise. The MUM was adopted from China by the United States Geological Survey (USGS) as a technique to drive Asian carp species into aggregations in areas that are conducive to seine netting. This deployment was successful in enhancing large scale Asian carp removal. WSB applied the MUM to Upper Prior Lake in the Prior Lake Spring Lake Watershed District in 2020 and 2021 to successfully move two separate aggregations of carp in separate areas of the lake during separate occasions. This movement resulted in successful carp biomass removal operations which would not have been possible without the carp aggregations being moved.

This task involves both WSB staff and 2 commercial fishermen. Information from tasks 1 and 4 would aid in determining where to set the speakers and where to direct carp to. Speakers would be activated, and fish movement observed through radio telemetry and forward-looking sonar. If carp aggregations can be moved effectively with the MUM based on observations made during this one-day feasibility effort, the MUM would then be utilized the day of the planned removal to augment and improve the success of the removal.

Task 7. Draft Report

At the conclusion of the tasks identified in this proposal, WSB will draft a report summarizing the activities and results from the tasks that have been carried out.

The report will include results of the reconnaissance efforts with maps identifying any obstructions observed, a copy of the MN DNR permit, a list of radio tag frequencies and an updated electrofishing CPUE carp biomass estimate as well as the raw data from the electrofishing effort, maps showing locations of radio tagged carp from telemetry surveys, results of the MUM feasibility, and a summary of the removal effort identifying the amount of carp biomass removed from Cedar Lake.

Task 7 will be done after all planned tasks are complete. We anticipate submitting the report in spring 2022.