



Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 5B: Consider Approval of Additional Carp Survey Work in Schaper Pond
BCWMC September 20, 2018 Meeting Agenda
Date: September 12, 2018

Recommendations:

1. Perform additional carp survey work in Schaper Pond in 2018 and 2019, including implanting PIT tags in carp captured during the upcoming final 2018 survey, installing PIT antenna and station equipment at the Schaper Pond inlet and outlet, conducting another carp population survey in early summer 2019, and reporting the survey results.
2. Authorize expenditures of Schaper Pond Diversion Project CIP funds up to \$35,000 for the above additional carp survey work. (Current CIP funds remaining are approximately \$240,000.)

1.0 Background

Schaper Pond is classified by the Minnesota Department of Natural Resources as a public water wetland; it is located south of Sweeney Lake and north of Highway 55 in Golden Valley. The pond receives about 90% of its flow from the Sweeney Branch of Bassett Creek from the south (under Highway 55), and 10% of its flow from a storm water inlet (called the Railroad inlet) in the northwest lobe of the pond. The pond outlets directly to Sweeney Lake from the northeast lobe (Figure 1).

The BCWMC selected the Schaper Pond Diversion Project alternative from the [feasibility study](#). The City of Golden Valley constructed the project, which was designed to divert water, via a floating water baffle, within the pond to direct more of the water flows to the northwest part of the pond. Based on the 2011 monitoring data and modeling, it was believed that the diversion would reduce the amount of phosphorus reaching Sweeney Lake by an estimated 81 - 156 pounds per year.

The 2017 Schaper Pond effectiveness monitoring was initiated after it was confirmed that the floating barrier was secured and working properly. Figure 1 shows the water quality grab sample locations. The 2017 and 2011 sampling locations, equipment and methods were identical. When comparing the water quality in the pond and upstream of/entering the pond between 2011 and 2017, it was determined that Schaper Pond was not removing suspended solids or total phosphorus as well as it did in 2011, and during most of the monitored events, the flow-weighted pollutant concentrations are higher at the pond outlet than the combined inflows. In addition, a single longitudinal monitoring event appeared to provide a better understanding about where within the pond system the treatment effectiveness is compromised.



● Grab Sample Locations

 Feet
 150 0 150


Figure 1

**MONITORING & BAFFLE
 LOCATIONS**
 Schaper Pond Effectiveness
 Monitoring
 Bassett Creek Watershed
 Management Commission

The 2017 monitoring indicated that there were unexpected factors contributing to the results, which had not previously been assessed (carp) or might require updated information (such as the bathymetry). Consequently, at its May 2018 meeting the Commission approved additional monitoring this summer to identify the gaps in the available data and distinguish the source(s) or factors that are limiting the treatment capacity of the pond. The additional monitoring included performing longitudinal water quality monitoring and surveys of the carp and pond's bathymetry.

2.0 Preliminary results of 2018 monitoring and surveys

To date, we have completed the bathymetric survey, two of the three carp surveys and four of six longitudinal water quality monitoring events that were recommended. Preliminary results of the 2018 monitoring and surveys indicate the following:

- The 2018 bathymetric survey indicates that some sedimentation has taken place in discrete areas of the pond, but that it is unlikely that those changes have greatly altered the settling or treatment capacity in the northwest corner of the pond. For our final reporting, we intend to overlay the electronic surface mapping from the previous survey (2014) with the 2018 survey to depict the exact places in the pond where sedimentation may need to be addressed as a maintenance activity, depending on whether or not the floating baffle is retained.
- The 2018 water quality monitoring continues to confirm that pollutant concentrations are higher as the flow moves longitudinally through the pond. One out of the four water quality monitoring events showed that sediment phosphorus release could have contributed to higher phosphorus levels at the outlet, compared to the upstream sites. Otherwise, it does not appear that anoxic sediment phosphorus release is a significant source of the phosphorus that reaches the outlet when higher flows (above summer baseflow levels) are conveyed through the pond.
- The first carp survey estimated the carp population in the pond that day to be 227 individuals, with an average mass between 4 and 5 pounds. The biomass for the pond at that time was about 368 kilograms/hectare, which is nearly four times the recommended threshold for carp management. The second survey resulted in the capture of 37 carp in one hour of electrofishing. Most of the carp were captured in the deeper-water portion of the northwest lobe. Six of the 37 carp were young of year (YOY), making it very likely that successful recruitment (i.e., fish surviving to enter the fishery or a mature life stage) occurred this year, and likely within Schaper Pond (i.e., these fish likely hatched, and continue to survive, in the pond). Three of the 37 fish were recaptured from the first survey, which provides another way of assessing the population.

3.0 Recommendations for additional carp survey work

The two carp surveys completed thus far have confirmed that large numbers of carp inhabit the northwest lobe of Schaper Pond, with more than enough biomass to adversely impact water quality, including

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indications that Schaper Pond represents a place for rearing young-of-year carp. As a result, it appears that the third carp survey represents an opportunity to begin gathering the kind of data needed to make future carp management decisions, including information about carp recruitment and mobility throughout the Sweeney Branch system. To guide that decision-making, it will be important to know whether the current carp population survives and/or remains in Schaper Pond year-round or if the carp are moving back and forth between Sweeney Lake and/or upstream water bodies.

3.1 Suggestions for the third 2018 carp survey and 2019 carp monitoring

We recommended expanding the scope of the third (fall) carp survey to attach PIT (passive integrated transponder) tags to nearly all of the carp that are caught and install antenna stations at the Hwy 55 inlet and the Schaper Pond outlet to Sweeney Lake. PIT tags are attached to carp, and used in conjunction with stationary antenna (to trip a signal) and recorders, to track the movement of each fish. PIT tags provide a means to obtain representative data on the whole carp population (including YOY carp), including the upstream and downstream movement of the carp from the pond over time.

The proposed schedule assumes that Carp Solutions would complete the third 2018 carp survey and PIT tagging in September, followed by antenna station installation in October 2018. We further recommend that the BCWMC rent the PIT antenna and recording equipment through Carp Solutions and work with them to monitor and evaluate the results by the end of June 2019. The total estimated additional cost (including equipment rental and expenses) for the BCWMC Engineer and Carp Solutions to complete this effort is estimated at \$30,000. (This amount is in addition to the \$16,000 already budgeted for the 2018 monitoring and surveys.)

3.2 Reporting on 2018 and 2019 monitoring

We will compile the results of the 2018 and 2019 surveys and monitoring, and compare them with past monitoring data in a technical memorandum. The memorandum would include conclusions and recommendations for improving water quality treatment in Schaper Pond/next steps and specific options for carp management. Our estimated additional cost to report on the results of the 2018/2019 surveys and monitoring is \$5,000, including a final presentation to the Commission. (This amount is in addition to the \$5,000 already budgeted for reporting on only the 2018 findings.)