Recommendation approved as presented 1-16-25

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Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co. (Greg Wilson, P.E.)
Subject: Item 5A – Sweeney Lake Carp Update and Recommendations for Schaper Pond Effectiveness Monitoring (CIP Project SL-3)
BCWMC January 16, 2025 Meeting Agenda
Date: January 9, 2025

5A. Sweeney Lake Carp Update and Recommendations for Schaper Pond Effectiveness Monitoring (CIP Project SL-3)

Recommendations:

1. Approve a budget of up to $42,000 from the remaining Schaper Pond Diversion Project CIP funds for the 2025 Schaper Pond effectiveness monitoring.
2. Approve a budget of $12,000 from the remaining Schaper Pond Diversion Project CIP funds for carp biomass surveys in Sweeney Lake and Schaper Pond in 2026 including reporting results and recommendations for carp management.

Background

Following installation of the floating water baffle in Schaper Pond (shown on Figure 1), several investigations in 2017 and 2018 identified problems with stormwater treatment in Schaper Pond and found carp populations exceeding the 100 kg/ha threshold associated with impacts on water quality (Bajer et al., 2009). In 2019, the Commission was awarded grant funding for the Sweeney Lake Water Quality Improvement Project, which included a goal to reduce carp biomass in Sweeney Lake and Schaper Pond during the spring and summer of 2020. The carp reduction part of this project also tracked carp movement to 1) assess the likelihood that carp from Sweeney Lake could re-populate Schaper Pond, and 2) assess the need to prevent movement of juvenile and adult carp from Schaper Pond to Sweeney Lake. The Commission Engineer hired Carp Solutions, LLC as its subconsultant on this investigation (and all previous and subsequent investigations) to analyze carp impacts in the Sweeney Lake-Schaper Pond system. A 2022 carp survey and reassessment of biomass confirmed that carp populations in Schaper Pond and Sweeney Lake are still below the 100 kg/ha threshold for water quality impacts. At their meeting in January 2023, the Commission approved the Commission Engineer's recommendations and associated funds to resurvey and reassess the carp populations in the system in 2024 and perform box netting for additional carp removals, if needed.

At their January 2023 meeting, the Commission also directed the Commission Engineer to provide recommendations for future Schaper Pond effectiveness monitoring efforts, to assess the functionality of the diversion project, and to integrate that monitoring with the approved 2024 carp survey and carp removal.

Figure 1

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

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The carp survey and effectiveness monitoring efforts need to be correctly timed to minimize confounding factors and improve interpretation of the data. At their March 2023 meeting, the Commission directed the Commission Engineer to complete (screening level) Schaper Pond monitoring and complete preliminary carp survey and biomass assessments (as approved at the January 2023 Commission meeting) to determine next steps, including carp box netting during the summer of 2024.

Results of Preliminary Pond Monitoring and 2024 Carp Management

Screening level monitoring, consisting of four rounds of grab samples collected from pond sampling locations (shown in Figure 1) was completed during the late summer/early fall of 2023. While it was dry earlier in the summer, the monitored events were generally representative of typical conditions (including both dry and wet conditions), with two of the sampling events corresponding to more substantial rainfall events. Unfortunately, runoff from a home construction site in the Railroad inlet subwatershed resulted in elevated phosphorus and suspended solids concentrations in the northwest pond and outlet sample locations, which made data interpretation difficult. Golden Valley staff visited the site and confirmed that the construction contractor had the home site stabilized shortly thereafter.

Carp Solutions completed carp population surveys of Sweeney Lake on June 24th and July 10th, 2024 and of Schaper Pond on June 26th, 2024. Based on preliminary survey results, Carp Solutions estimated that the carp biomass estimates for Sweeney Lake exceed the 100 kg/ha threshold for water quality impacts (see "Summer, 2024" row in the following table), which was a significant increase over the past two assessment periods. The preliminary carp biomass estimate for Schaper Pond was approximately the same as the past two assessment periods (see following table) and well below the 100 kg/ha threshold for water quality impacts. Due to the high carp biomass in Sweeney Lake, we contracted with Carp Solutions to complete another round of baited box nets for carp removal in Sweeney Lake in 2024 and we did not perform Schaper Pond effectiveness monitoring during the summer of 2024.

Carp Population Survey	Date	Estimated Carp Biomass (kg/ha)	
		Schaper Pond	Sweeney Lake
Baseline Assessment	October, 2018	420	1,030
Following Box Net Removal	Summer, 2020	75	68
Re-assessment	Summer, 2022	44	83
Re-assessment	Summer, 2024	57	178
Following Box Net Removal	Fall, 2024	57	31

During fall 2024, Carp Solutions caught and removed 191 carp from Sweeney Lake, weighing a total of 1473 pounds, which represented an estimated 42.5% of the carp biomass in the lake. After carp removal, the estimated carp biomass density in the lake was reduced to 31 kg/ha.

As in 2020, 2024 box netting was quite successful in removing a significant portion of the carp population in Sweeney Lake. For comparison, an estimated 51.4% of the carp population was removed in 2020 with 4 pulls of 5 box nets. In 2024, Carp Solutions removed an estimated 42.5% of the carp population with 2 pulls of 4 box nets. As a result, the carp population in Sweeney Lake is well below the 100 kg/ha management threshold and should be low enough to not cause significant impacts on water quality (see table above).

Recommendations for Schaper Pond Effectiveness Monitoring

Because the 2023 monitoring results were affected by construction site runoff and did not include any continuous monitoring or automatic sampling, more-rigorous effectiveness monitoring is recommended for Schaper Pond in 2025. The recommended monitoring is consistent with monitoring completed by the Commission Engineer in 2017, including automatic sampling and flow monitoring, and sample analysis for total phosphorus (TP), total dissolved phosphorus (TDP), total suspended solids (TSS), volatile suspended solids (VSS) and particle size distributions at the Schaper outlet, Hwy 55 inlet and Railroad inlet sites to allow for detailed computations of pollutant load reductions for Schaper Pond. With the carp population below the water quality threshold and assuming no construction or other impacts from the watershed, the monitoring results will show the effectiveness of the floating water baffle diversion in Schaper Pond at reducing TP and TSS concentrations.

We recommend that the Commission budget $42,000 from the remaining Schaper Pond Diversion Project CIP funds for the Schaper Pond effectiveness monitoring during the 2025 growing season (described above). The work would include a summary memo and presentation to the Commission. After subtracting the proposed monitoring activity (above), the Schaper Pond Diversion Project CIP budget would have an expected balance of approximately $34,000.

We also recommend that Carp Solutions complete another round of biomass surveys on Schaper Pond and Sweeney Lake in 2026 to confirm that the carp density is staying below the management threshold. The estimated cost of the biomass survey would be approximately $12,000. We expect the remaining CIP budget upon completion of the effectiveness monitoring would cover the cost of the carp biomass survey. We will report results of the 2026 survey along with recommendations for additional carp removals or more long-term carp management.