

**Project Name** | Brown's Creek Drone Assessment**Date** | 04/25/2024**To / Contact info** | BCWD Board of Managers**Cc / Contact info** | Karen Kill, District Administrator**From / Contact info** | Mike Majeski & Chris Long**Regarding** | Drone Flight Upstream of Manning Avenue and Downstream of Stonebridge Trail

## Background

The 2017-2026 Watershed Management Plan includes an implementation activity to conduct routine drone flights every other year along the Brown's Creek corridor to monitor beaver dams and other channel obstructions in the system. The drone flights are useful for identifying areas of bank erosion and channel obstructions and allow the District to efficiently locate obstructions and other stream-related issues along the channel in remote reaches and wetland areas that are difficult to traverse on foot, especially the wetland-dominated reaches upstream of Manning Avenue and the Brown's Creek gorge.

## Drone Assessments

A drone flight was conducted on April 4, 2024 from Manning Avenue upstream to the headwaters north of 110<sup>th</sup> Street, and also from Stonebridge Trail to the St. Croix River. Beaver dams and other obstructions were photographed using the drone, and the images were cross-referenced using Google Earth. Obstructions that appeared to be impeding streamflow were photographed and analyzed. Minor channel obstructions were observed from the drone including one active and two inactive beaver dams at the same locations identified in 2018 and 2022. No significant channel obstructions or signs of bank erosion were observed, but numerous down trees were observed in the gorge. The down trees are mostly "bridged" over the channel and are not obstructing flow at this time, and many of the down trees are providing overhead cover and instream habitat for fish and macroinvertebrates. However, the down trees will be monitored to determine if full channel obstructions begin to form which could cause flow deflection into the adjacent banks and subsequent bank erosion.

Select images taken from the drone flight are included in Appendix A and are presented in sequential order beginning at the headwaters of Brown's Creek and progressing downstream. The complete drone flight video is available at the BCWD office.

## Appendix A

Select Images from the Drone Flight Upstream of Manning Avenue and Downstream of Stonebridge Trail



**Image of the headwaters of Brown's Creek and the beginning of perennial flow**



Landowner shrub cutting and piling near Brown's Creek in the headwaters reach north of 110<sup>th</sup> St



**Driveway crossing and small foot bridge over Brown's Creek just upstream of 110<sup>th</sup> St**



Twin culverts under a trail crossing downstream of 110<sup>th</sup> St



**Location of previous large beaver dam (red line) that spanned the entire floodplain downstream of the Gateway Trail in 2018**



Wood bridge and location of old beaver dam (yellow oval) near private parcel west of 97<sup>th</sup> St. N / downstream of the Gateway Trail





Active beaver dam located approximately 900 feet upstream of Manning Avenue



Debris jam in Mendel wetland upstream Highway 96



**Example of down trees in the Brown's Creek gorge. Note the trees are spanning the creek from the top of the banks and not obstructing flow**



Down tree trunk within the creek upstream of Highway 96 in the Brown's Creek gorge



**Down trees between Highway 96 and Highway 95 near the St. Croix River**