

Supplementary Materials

Water levels within the study reach varied through the 2018 monitoring season (Supplementary Material Figure S1).



Supplementary Materials Figure S1. Looking upstream at VRW2 (a low gradient VRW) under low (top photo), intermediate (middle photo), and high (bottom photo) water level conditions. It is evident that orifice flow is the only active flow regime under low water level conditions, while orifice, gap, and over-weir flow are active simultaneously under intermediate and high-water level conditions. VRW2 under low water level conditions demonstrates the importance of embeddedness for enhancing fish passage effectiveness, while VRW2 under high water level conditions demonstrates the effect of ‘drowned conditions’.

Underwater cameras were deployed in Pools 1, 5, and 7 on June 28, 2018 (intermediate water level conditions) to capture observations of small-bodied fish species throughout the reach. Underwater cameras were deployed in areas with sufficient depth and minimal turbidity to ensure footage clarity [1]. Streams of small-bodied fish species (including Blacknose Dace, Creek Chub, and Mottled Sculpin) were observed in all underwater camera footage. In Pools 1, 5, and 7, fish were observed in low-velocity areas (or recirculation zones) exhibiting sustained swim speeds. They were most commonly observed near in-stream vegetation and rocks/boulders. Incidental observations of small-bodied fish species were also made throughout Weslie Creek during site visits (e.g., Supplementary Materials Figure S2). Small-bodied fish species were observed moving upstream through VRWs, exhibiting no signs of difficulty or obstruction.



Supplementary Materials Figure S2. Overhead photograph on June 28, 2018 (flow is right to left, yellow bar at the top of the photo is 1 m long), showing small-bodied fish resting in a recirculation zone within Pool 9, downstream of VWR8 during intermediate water level conditions.

Supplementary Materials References:

1. Davis, L.; Cockburn, J.; Villard, P.V. Deploying Action Cameras to Observe Fish in Shallow, Ice-Covered Streams. *Journal of Freshwater Ecology* **2016**, 1–6, doi:10.1080/02705060.2016.1258013.