

Day Two - Track Two

Thursday, March 22nd, 2018

11:30 a.m. – 12:00 p.m.

To Pipe or Not to Pipe – Erosion Issues and Solutions in an Urban Watercourse in Edmonton, AB

Presenter: Heather Amirault, Stantec

Biography



Heather is a Water Resources Engineer at Stantec Consulting Ltd. She specializes in the areas of stream restoration and geomorphic assessment. Her recent projects include stabilization of creek banks using wood debris toe protection in Prince Albert, SK and Souris, MB and daylighting 800 m of agricultural drain through a development site in London, ON. Heather has worked on stream restoration and assessment projects across Canada and in the United States.

Abstract

Mill Creek in the City of Edmonton is in a severely degraded state throughout Mill Creek Ravine Park, a popular public trail space. Impacts to the creek hydrology include urbanization without stormwater controls, the diversion of a nearby watercourse into Mill Creek, and the diversion of some creek flow into a by-pass tunnel midway through the study reach. Channel degradation and widening reduce high flow access to the floodplain, worsening bed erosion conditions. A study of the banks along the entire 4.5 km reach using the Bank Assessment for Non-point source Consequences of Sediment (BANCS) model indicated that bank erosion rates of up to 2.7 m/year were anticipated if the current flow regime is maintained. The study also indicated that the area downstream of the by-pass tunnel was more stable than the upstream reach which receives all the flows at the surface. For this site it was concluded that, due to the near impossibility of returning the hydrographs to 'pre-development' levels, piping a portion of the creek flows is an appropriate solution to reduce future erosion. However, a diversion tunnel is not going to eliminate the current erosion issues. Additional restoration work within the channel will be required to stabilize the creek banks for safety and to reduce erosion rates. This stabilization is recommended to be completed using a natural channel design approach that provides stable substrate, improves floodplain access, and includes a vegetated riparian area.

Learning Objectives

1. Gain an understanding of the impacts of urbanization on flow rates;
2. Gain a high-level understanding of the BANCS model for use in estimating erosion rates; and
3. Gain insight into the complexities of conflicting goals and objectives surrounding urban watercourses.