

Connecting the Dots: Natural Channel Restoration Based on Communal Approaches to Urban Drainage

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Credit Valley Conservation is using a holistic approach to restoring a degraded natural channel in the Southdown District of Mississauga, Ontario. The Southdown District includes five watersheds that drain directly to Lake Ontario; the focus of this study is the Clearview Creek watershed. Clearview Creek is an urbanized catchment with a history of realignment, hardening and alteration since the 1970s. In addition to the direct impacts to the channel's form and function, channel alterations have also created barriers to fish passage to and from Lake Ontario.

The objectives of this project are to design a resilient natural channel system that will improve stream processes and restore functionality based on existing and future flows using resilient, flexible design concepts which consider the dynamic nature associated with upland hydrologic control implementation.

CVC is marrying in-stream flow targets with realistically-achievable source controls on upland contributing areas. The in-stream portion of the study focuses on the conceptual redesign of a degraded segment of Clearview Creek and the identification of additional priority restoration opportunities within the stream corridor. In-stream targets are being used to inform the design process and also dictate the extent of urban hydrologic restoration required in the tablelands to achieve these targets. The phase of the project that focuses on the upland hydrology consists of a pilot project which tests the feasibility of realizing true communal (multi-property) low impact drainage through the processes and mechanisms included within the Drainage Act, a 183 year-old piece of Provincial legislation unique to the Province of Ontario. Three conceptual aggregated low impact development (LID) stormwater management systems are being designed and quantified in terms of their cost and anticipated flood control, infiltration and water quality benefit. While the scope of the upland component of the project does not include complete restoration to a pre-development condition, this pilot project will be used to inform the development of realistically-achievable LID retrofit uptake targets. Ultimately, the upland initiatives will inform the overall natural channel design based on feasible improvements to the timing, volume, rate and quality of environmental flows to be received by the stream systems in the Southdown District, including Clearview Creek.

Biography

Shannon Malloy is an Integrated Water Management Specialist at Credit Valley Conservation. Her focus is piloting green infrastructure and low impact development implementation projects with the purpose of identifying tools, mechanisms and developing guidance for the implementation of nature-based stormwater management infrastructure. Shannon has made significant contributions to the monitoring, implementation and knowledge transfer components of CVC's low impact development program.

Karen Chisholme, Senior Coordinator – Aquatic Restoration at Credit Valley Conservation, is an aquatic restoration project manager whose reputation as an “integrator” of disciplines and open, plain-language communication style are a ‘recipe for success’ to finding innovative design solutions. Along with her restoration projects, Ms. Chisholme leads CVC's restoration monitoring program.