

In the wake of the ash borer: collaborative ecological restoration and erosion mitigation in Oakville's Taplow Creek

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Watercourse construction projects in urban areas are often motivated by channel erosion posing a threat to human infrastructure (e.g. buildings, parking lots, recreational trails, rear yards, roads, etc.). These projects provide an opportunity for inter-disciplinary collaboration: engineers and fluvial geomorphologists contribute to hydrologic, hydraulic, and morphological elements of the design while ecologists provide insights on aquatic and terrestrial habitat features, flora and fauna, species-at-risk, and restoration measures. More recently, loss of ash trees (*Fraxinus* spp.) within riparian zones has provided further opportunities for collaboration between disciplines. In Southern Ontario, the spread of the emerald ash borer (*Agrilus planipennis*) has resulted in major changes to many urban woodlands. In woodlands previously dominated by ash trees, loss of the canopy has allowed non-native invasive species such as European buckthorn (*Rhamnus cathartica*), Manitoba maple (*Acer negundo*), and garlic mustard (*Alliaria petiolata*) to flourish. In areas where creek erosion mitigation is planned, there is an opportunity to also design for restoration of aquatic and terrestrial ecosystems and encourage native woodland regeneration.

One example of such an opportunity is a reach of Taplow Creek in the Town of Oakville. This reach was identified during the Town's regular creek inventories as an area where erosion posed a threat to private property at the top of the valley. As well, the woodland within creek valley had recently lost the majority of its mature trees to the emerald ash borer, and European buckthorn was thriving. Through the Environmental Assessment process, the preferred design was identified to mitigate the erosion risk while promoting restoration of the woodland ecosystem. This design used localized channel realignment to protect the valley slope from further erosion. Ecological disturbance associated with the channel works provided an opportunity to control invasive species and promote regeneration of a functional native woodland on valley slopes and in the floodplain, in collaboration with the Town's Forestry Department. Ecological enhancements were also possible through the installation of a bat box and the inclusion of pocket wetlands in the old channel bed. The wetlands contribute direct habitat to frogs, toads, mammals, and insects while enhancing fish habitat through provision of allochthonous inputs.

Biography

Anna Howes is a professional engineer with Aquafor Beech Limited and has a master of science in water resources engineering from the University of Guelph. Anna specializes in the connections between river engineering and fluvial geomorphology.

Ash Baron is an ecologist with Aquafor Beech Limited and has a bachelor of Environment and Resource Studies and a Certificate of Excellence in Ecological

Restoration and Rehabilitation from the University of Waterloo. Ash's primary interests and expertise are in the fields of terrestrial ecology and restoration.