

3.7 – The roles of habitat change and fragmentation in determining community composition

Objectives

The major goal of this work is to understand the cumulative effects of habitat alteration and fragmentation on stream fish communities. Most aquatic ecosystems are undergoing environmental change which alters the spatio-temporal characteristics of their habitats. These effects are large in urban areas as land-cover is currently being transformed from forest to agriculture and urban development which alters the conditions of habitats, and road density is increasing which increases landscape fragmentation.

Major Findings

Land-cover change has a larger impact on alpha diversity likely because it alters the environmental characteristics of the habitat patch, altering which species can persist there. Fragmentation has a larger effect on beta diversity likely because it affects metapopulation/metacommunity dynamics.

Major implications for management and future policies

Work modelling aquatic connectivity in five watersheds in the Greater Toronto Region is being used by the Toronto and Region Conservation Authority (TRCA) to update their guideline for wildlife crossing structures in valley and stream corridors. Together we developed two planning tools to prioritize areas and design wildlife crossing structures. We also held two end user workshops to solicit feedback and train end users on the use of these tools, ensuring the tools are useful, informative, and easy to use.

