



Theme 2, Project 2.2

Conserving Aquatic Ecosystem Services through the Emulation of Natural Disturbance Paradigm for Sustainable Forest Management



Jordan, Musetta-Lambert, PhD Student

University of Guelph
jmusetta@uoguelph.ca

Project team

Dave Kreuzweiser, Canadian Forest Service, Natural Resources Canada, Co-investigator

Irena Creed, Western University, Collaborator

John Richardson, University of British Columbia (Collaborator)

Karen Kidd, University of New Brunswick (Collaborator)

Scott Capell, Canadian Forest Service, Natural Resources Canada (Technician)

Dylan Bowes, University of Guelph (Technician) Dr. John Bailey, Ontario Ministry of the Environment and Climate Change, Supervisor

Paul Sibley, University of Guelph, Supervisor

Abstract

Currently, it is unknown how forest management activities influence aquatic ecosystem services (AES) provided by streams. An emerging paradigm in forest management proposes the application of emulation of natural disturbance (END) principles to forested watersheds, based on the premise that natural disturbance is an integral part of sustaining healthy forests and retaining natural variation in forest condition, in-stream ecological processes, and biodiversity; all of which underpin many AES. The primary goal of this research is to advance understanding of how landscape disturbance influences riparian forest condition, eco-hydrological processes, and further explore organic matter decomposition and associated invertebrate communities as disturbance bio-indicators. The primary objectives of this project are to: 1) measure proposed bio-indicators across forest catchments with disturbance histories including logged with riparian buffers, forest-fire, and not-recently disturbed (at least 50 years) watersheds within the White River forest management area to see if there are significant differences at broad geographic scales and persisting after a ~10-20 year recovery time; 2) conduct landscape and stream-level habitat analyses to determine how landscape condition is affected by logging in comparison to natural fire disturbance; 3) interpret results within context of END and whether forest management change can be a means of sustaining AES.

Keywords: Boreal forest, organic matter processing, aquatic invertebrates, riparian forest, emulation of natural disturbance, forest fires, logging

Geographic Location: White River Forest Management Area, Ontario, Canada

How does your project link to Canadian aquatic ecosystem services?

This research aims to help identify risks and recovery rates of aquatic ecosystem services (AES) to forest catchment disturbance, and to understand how applying emulation of natural disturbance principles to forest management

planning could help sustain AES. Natural disturbance processes support AES through the retention of natural variation in riparian forest condition, in-stream ecological processes, and biodiversity.