Effects of Mountain Pine Beetle Attack on Hydrology and Post-attack Vegetation and Hydrologic Recovery in Lodgepole Pine forests

Alberta’s eastern slopes forests produce the bulk of usable provincial water supplies and Mountain Pine Beetle (MPB) attack represents a growing threat to these forests and this water. Predicting these impacts remains highly uncertain because information is lacking on 1) how red/grey attack (including partial and complete stand mortality) impacts the hydrology of Lodgepole Pine forests in the short-term, and 2) how surviving post-attack overstory and understory vegetation governing hydrologic recovery is likely to respond to variable intensity MPB attack. This project is aimed at developing a better understanding of these 2 key elements.

Lodgepole pine stands near Robb, AB. Twelve large replicated stand-scale plots (1.3 to 2.2 ha) will be used to produce 2 levels of simulated MPB attack (50% & 100%), and these will be compared to hydrologic & vegetation responses in small clear cuts, and untreated control stands.

Stands were instrumented in 2007/2008 with meteorological stations, hydrologic instruments (stand transpiration, rainfall interception, soil moisture, groundwater), and overstory and understory vegetation sample plots to describe the post-attack vegetation response by understory mosses, herbs, shrubs, and trees. Field measurements during this past summer focused on describing the pre-treatment stand hydrology and overstory/understory vegetation and soil conditions prior to application of the herbicide treatments (scheduled for mid-summer 2009).

The study is scheduled to run until 2012.