

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.



The study will use experimental simulation of MPB attack using individual tree herbicide application to simulate variable intensity MPB attack at the stand scale using a before-after; treatment-control study design. The research is being conducted in mature (110 yr. old), pure

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.