

## Mountain Pine Beetle Ecology Program Quicknote #5 Fire Project

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### January 2012: Mountain Pine Beetles in post-burn lodgepole pine forests

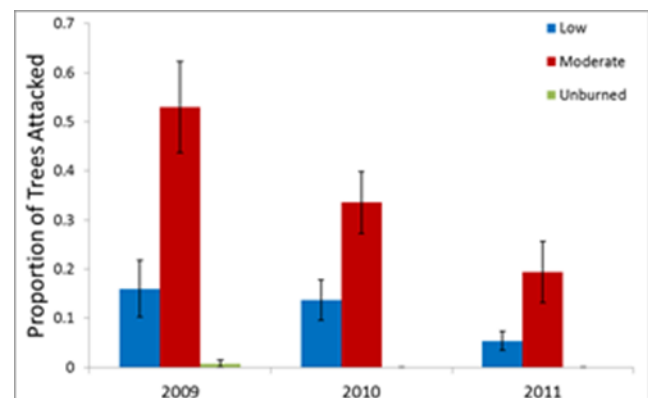
Prescribed fires are used in Alberta to remove lodgepole pine (*Pinus contorta*) as potential hosts of mountain pine beetles (*Dendroctonus ponderosae*; MPB), but partly burned, yet live—and therefore stressed—trees may be more susceptible to beetle attack. We investigate how prescribed fires influence MPB, whether burned stands are sinks or sources, and the explanations available for these responses.

We established 135 sampling plots at 3 burned and 3 adjacent unburned sites, at endemic population levels: Mt. Nestor, Saskatchewan Crossing, and the Ya Ha Tinda Ranch. Plots are divided between 3 burn injury classes, allowing us to work at multiple spatial scales. Each site receives 2 visits per year: before MPB flight in June and after new beetle colonization in September. To evaluate reasons for MPB responses, we quantify insect competitors and natural enemies using 3 types of passive traps. In the laboratory, we assess phloem nitrogen levels and perform experiments isolating the effect of phloem quality on MPB reproductive success in the 3 burn injury classes.



Preliminary results show that MPB colonized burned trees more often than unburned ones in all years post-fire (2009-2011). Trees in moderately burned plots were attacked more often than trees in lightly burned plots. However, over time, MPB populations in the burned areas decreased, and the beetles do not appear to have moved into the healthy adjacent stands. This may suggest that burned areas act as

ecological sinks. For example, see data from Mt. Nestor below.



Taken together, the elements of this research will result in management recommendations to add to decision-making tools currently used for prescribed fire practices in Alberta. The status of MPB populations in the area should be taken into account when fires are prescribed for other purposes and we hope that this project will contribute to this task. In addition, we hope to add to the understanding of a significant forest pest that affects many parts of western North America and has the potential to become invasive across central and eastern Canada.

This study is scheduled to run until 2014.

