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Mountain Pine Beetle Ecology Program Quicknote #6
Phenology Project

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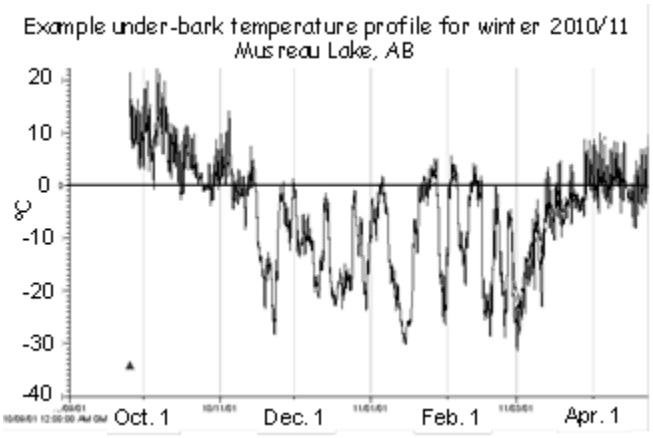
January 2012: Determining the threat of mountain pine beetle range expansion: The impact of phenology and survival and the potential for spread

The limit of mountain pine beetle's (MPB) historic range in northern Canada was south of 56° N and west of the Rocky Mountains. In the last decade, MPB breeched the Continental Divide and invaded north-central Alberta (AB). The beetle also spread northward, being detected at 59° N and within 100 km of the Territorial borders. MPB is exposed to different weather patterns and climate in its new expanded range; climate change also adds a layer of complexity for the future. Such abiotic factors are major drivers behind the distribution and abundance of this eruptive forest insect.

In the summer of 2010, we established a total of 18 research sites in 3 regions (s. BC, nw. BC and n. AB) to assess the effects of local and regional temperatures on MPB development and survival. Because recent research indicates potential geographic differences in beetle-tree interactions that could affect MPB's eruptive potential and spread rate, we also investigated beetle reproductive success. *Our overall objective* is to provide the biological knowledge and improve decision-making tools to support the development of sound management strategies and practices for MPB in Canada.

For trees attacked in 2010 and 2011, we measured under-bark temperatures and sampled insect development and survival over the typical one-year life cycle of the beetle. Ambient temperature stations were also installed at research sites and in advance of the beetle front in western Saskatchewan. Attack characteristics and beetle productivity are also being

recorded for sample trees. Sampling has been completed on trees attacked in 2010 and is continuing on trees attacked in 2011. We are currently analyzing data from year .1



To compliment the on-going field study, common garden experiments are planned to assess geographic or population differences in beetle development time and fitness. In addition to expanding our knowledge of factors driving beetle success in the new range and climate, this work will generate empirical data that can be used to improve decision-support tools, such as population and spread models.

The field study is scheduled to end in the fall of 2012.

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