

FMF Natural Disturbance Program Research

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Natural Sub-regions: Are They Meaningful?

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You bet they are. Contrary to the findings from other natural disturbance studies, the Alberta ecological natural sub-regions prove to be powerful means by which to differentiate historical fire activity and patterns in the Foothills Model Forest. Recall from Quicknotes #1 that the range of long-term fire activity, or the “fire cycle”, varied by natural sub-region. These cycles are repeated for four adjacent natural sub-regions in Table 1. Also shown in Table 1 is an indication of the amount of forest that exists in large even-aged patches – a rough indication of relative fire size. Upon closer inspection, one begins to see that there are some good reasons for these differences in fire size and frequency.

Table 1. Overview of Some Characteristics of Natural Sub-Regions of the FMF

	Jasper N Park		Weldwood FMA	
	Montane	Subalpine	Lower Foothills	Upper Foothills
Area (ha)	80,000	400,000	296,000	587,000
Fire Cycle (yrs)	70-90	130-190	65-75	80-90
% Area in Patches >2,000 ha	45	66	33	76
Lightning hits/1,000 ha	17	11	58	48
Growing Degree Days	1185	903	1121	880
Mm Rain / yr	244	328	370	403
Cm Snow / yr	124	162	144	233

Table 1 tells an interesting, but logical story. Lightning hits represent the historical risk of ignition. Growing-degree-days are a rough indication of temperature conditions conducive to fire growth, and length of the fire season. The amount of rain and snow suggest how flammable the forest is. So, for example, although the Montane has low ignition probability, it has the highest number of growing degree days, and the lowest amount of precipitation. It is no wonder that despite being very linear, the Montane burns fairly often, and in fairly large patches relative to the small area (80,000 ha). On the other hand, the much larger Lower Foothills area burns even more often, but apparently in smaller bits. This can be explained by far greater lightning activity producing more fire starts, combined with much higher levels of precipitation, which would reduce the chances of any single fire from getting very large. Fire activity in the Upper Foothills and Sub-alpine sub-regions can be similarly understood through a combination of historical ignition probabilities, and fire weather indicators.

This is good news for research interpretation. Natural Sub-regions are already a part of the culture and technology of forest management on both sides of the mountains. The natural disturbance research findings fully support the use of these spatial strata for planning purposes in this part of Alberta.