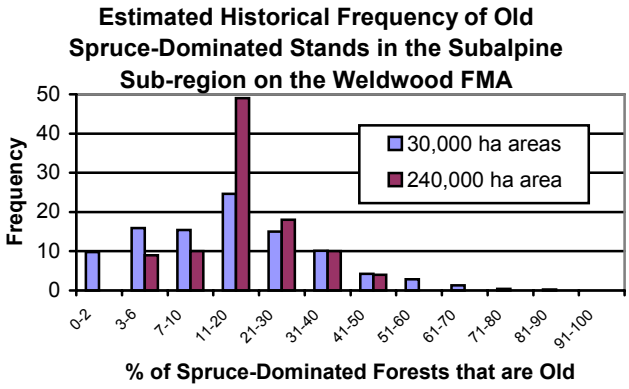
foothills model forest
a growing understanding

Natural Disturbance Program Quicknote #17

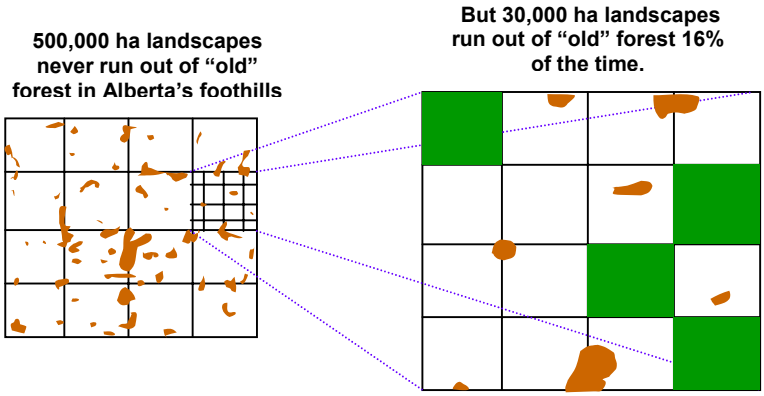
November 2002 *By: David W. Andison*

Defining Old Space

An understanding of old forest in the foothills of Alberta is incomplete without considering the question of spatial extent. From Quicknote #15 we know that old forest is highly dynamic over time. But we also know that old forest is dynamic acoss space as well. For instance, the percent of spurce-dominated old forest in the Subapline area of the Weldwood FMA range between zero and over 80% on 30,000 hectare landscapes. The same range for 240,000 hectare landscapes is about 4 to 50%. Furthermore, on 240,000 hectare landscapes there is a 50:50 chance the amount of spruce-dominated old forest is between 11-20%. This is almost twice the chances of 11-20% spruce-dominated old forest occurring on 30,000 hectare landscapes. In other words, the natural range of old forest becomes narrower and more predictable as spatial extent increases. It is not difficult to imagine that over several million hectares the historical range may be entirely within the 11-20% class.



This relationship is not surprising. Both the location and size of forest fires are highly stochastic, and we already know that very large fires can and do occur. Fires in excess of 100,000 hectares could virtually eliminate all significant patches of old forest from small landscapes for many decades. However, the chances are far less likely of one or more fires depleting old forest on much larger landscapes. In the example below, it is obvious that unless old forest patches are distributed uniformly in space, as the size of the landscape decreases, the chances increase that one or more such landscapes have no old forest. Similarly, the chances of the smaller landscapes having very large percentages of old forest also increases.



These examples demonstrate well that having uniform levels of old forest everywhere is not only unrealistic but also historically unprecedented. As old forest blinks "off" over small landscapes for extended periods, there are always other small landscapes that will be dominated by old forest. Furthermore, it is not difficult to imagine that old forest functions optimally when it occurs as a highly variable range of sizes, shapes, locations, and adjacencies. The example also shows that averages are meaningless. The fact that the average percentage of old forest for 30,000 ha landscapes is identical to that of a 240,000 ha landscape is not a particularly valuable piece of information. However, the *range* around the average is more relevant.

In summary, there is no single scale at which old forest is best represented. Robust old forest management and monitoring strategies in the Alberta foothills should thus consider several spatial scales if they are meant to emulate or compare to a "natural" template. Lastly, it is important to keep in mind that this particular pattern is not unique to old forest. Although it served well as the example here, the link between higher variability and smaller spatial extents is evident for all seral-stages.

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