

THE NECESSITY OF REPEATED PRESCRIBED FIRE APPLICATIONS IN MOUNTAIN PINE BEETLE–AFFECTED STANDS

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ABSTRACT

The province of British Columbia is currently experiencing an unprecedented epidemic of bark beetles attacking primarily lodgepole pine. It is estimated that by the time the epidemic has run its course 90% of the mature volume of lodgepole pine will have been killed. In terms of area affected, the epidemic is likely to impact 14–17 million ha (35–43 million acres) in British Columbia and an unknown area in Alberta. Initial estimates of damage recovery (timber salvage) from the province were set at 10%; this has now been reduced to approximately 4%. Some of the shift in recovery is due to the poor economic situation in North America, some due to accessibility, and some to issues surrounding natural recovery of the forest. Regardless of the issues affecting recovery, a significant amount of area is either currently facing a substantial fuel hazard or will be facing one in the not too distant future. How to deal with extensive landscapes of dead lodgepole pine before a wildfire occurs is the focus of considerable discussion. Recently, Parks Canada has embarked on a program of aggressive, proactive landscape-scale prescribed burning from primarily an ecological restoration perspective (protection of public and private values-at-risk has been a secondary goal). In some cases small-scale salvage of green and dead lodgepole pine has preceded the burns and in others strategic fuel breaks have been developed that involved large-scale thinning and tree removal. For the most part, however, due to access and Parks' policy, the fuels are only managed with fire. Once going down this path, the managers are tied to the management unit through a number of prescribed fire iterations until fuels and forest structure approach something close to RONV or whatever desired future condition the site is being managed for. An example of this comes from the 2008 Mitchell Ridge Prescribed Burn in Kootenay National Park. This 4,000-ha (10,000-acre) unit is predominantly lodgepole pine and has seen significant mountain pine beetle infestations in the early 1980s and again starting in approximately 2005. The earlier epidemic in the 1980s resulted in pockets of high pine mortality; these areas have since experienced very high levels of surface fuel buildup. Within the 4,000-ha unit surface fuel loading ranged from a high of 110 Mg/ha (48.8 tons/acre) in 20-year-old beetle-affected stands to a low of 24 Mg/ha (10.7 tons/acre) in stands currently under attack. The burn, carried out on 31 May 2008, resulted in 45% large-fuel consumption on the older beetle-attacked sites and only 19% on the current attack sites. The burn also resulted in 100% mortality of lodgepole pine over approximately 50% of the burn area. Fuel succession analysis using Fuel Management Analyst Plus and FOFEM suggests that short-term fuel loading is going to increase substantially over pre-burn levels, leading to a significant burn-severity hazard. These same models were used to develop burn prescriptions intended to gradually reduce large-fuel loading over a series of burns. Considering the scale of the problem in B.C. and the lack of opportunity to physically remove the fuel from the site, we believe this is the best option open to managers.

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