

Boreal Wildfires and Landscape Diversity

The FRI ND Program recently extended its natural wildfire sampling to include another 77 wildfires from across the rest of Alberta, for a total sample of 129 fires across Alberta and Saskatchewan.

The results of this broad sample confirm observations from previous analyses.

Most notably, the total level of (island + matrix) remnants of western Canada boreal wildfires is quite high, averaging 43% by area. The amount of remnant area is also unrelated to disturbance event size.

For context, a minimum of 80% mortality (or 20% remnants) has been suggested by some as the threshold for “stand-replacing” fires. According to this rule, only 8% of all historical boreal & foothills wildfire events would qualify as stand-replacing. In contrast, 14% of western boreal & foothills wildfire events have at least 60% of their area as remnants (which translates to a maximum of 40% survival), which would qualify as stand-maintaining fires.

The expanded sample also confirmed that a range of residual levels is an inherent quality of boreal & foothills wildfires. For example:

- 25% of all wildfires have between 7-29% remnant area,
- 25% of all wildfires have between 29-40% remnant area,
- 25% of all wildfires have between 40-52% remnant area,
- 25% of all wildfires have between 52-99% remnant area.

One might conclude from this research that the ultimate goal of an NRV strategy is to move towards average remnant levels of 43%. These findings certainly challenge what we think we know about boreal forest disturbance dynamics as it relates to cultural disturbance activities.

However, this research also highlights a critical and undervalued aspect of an NRV – *variability*. Given the likely role of event-scale residual variability on landscape-scale heterogeneity, perhaps it is more important to create as much variability as possible than it is to match the long-term historical average of pattern X or Y. For example, imagine the impact of this huge variation in residual levels on fires of all sizes across millions of hectares and thousands of years. The resulting landscape-scale structural and compositional complexity is enormous. Any narrowing of that range may be more critical to maintaining ecological integrity than anything else.

Perhaps the most essential and effective NRV strategy is simply to generate diversity - at all scales.

Total Percentage of Wildfire Event Area as Remnants for Alberta and Saskatchewan

