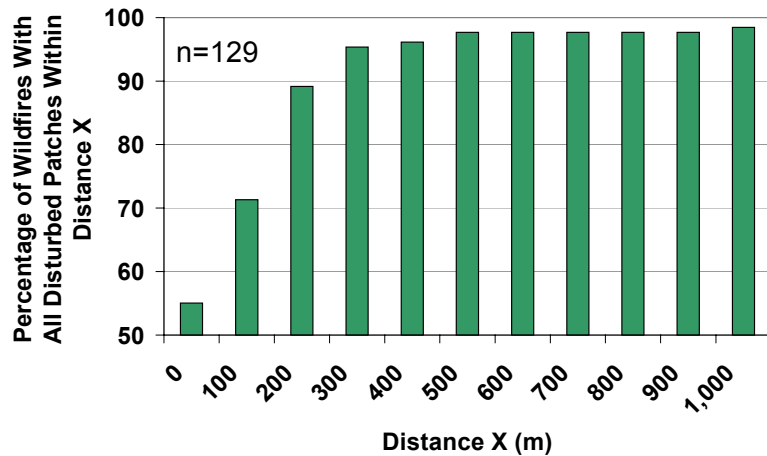


Patchy Fires and Spotty Behaviour

In the boreal forests of Alberta and Saskatchewan, only 55% of the naturally occurring wildfires create a single disturbed patch. The other 45% have two or more disturbed patches some distance from each other.

The disturbed patches of 71% of wildfires are within 100m of each other, 89% within 200m, and 94% within 300m. Ninety eight percent of the wildfires have all of their disturbed patches within 500m. Only 1.6% of all wildfires have disturbed patches further than 1,000m from the main fire.

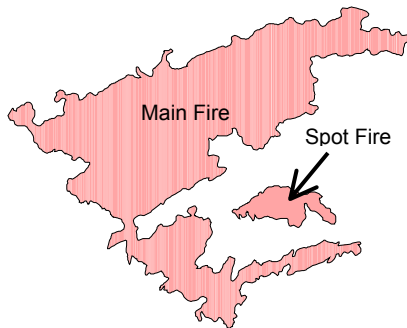
Percent of Alberta and Saskatchewan Wildfires With All Disturbed Patches Within 0-1,000m



The most likely cause of this observed spatial pattern is fire “spotting” – live fire embers that are carried via prevailing winds to ignite a new fire some distance ahead of the main fire.

These fire pattern results are consistent with what little is known about spot fire behaviour. The available evidence in the boreal forest suggests that spotting distances of 100-300m are common, and that spotting beyond 1km is rare, and associated with extreme fire behaviour.

From a process perspective, this agreement between fire behaviour and fire pattern results is revealing. Fire patterns are not the equivalent of fire spotting. In the adjacent fire outline, let’s say the ignition point of the spot fire was 500m from the main fire. After burning for another day before a fire-ending event (such as rain), the two fires are now only 100m apart. If the fire had burnt for another day, the two would likely have merged. So fire patterns do not necessarily tell us anything specific about spotting behaviour.



However, fire patterns do provide some new insight about the probably lower boundaries of spotting behaviour. For example, our data suggests that at least 45% of all historical wildfires in Alberta and Saskatchewan produced spot fires. Similarly, at least one out of every 62 (1.6%) of all historical wildfires generated spotted fires beyond 1,000m.

From a pattern perspective, these findings suggest that our understanding, language, and investigations of disturbance patterns need to go beyond individual disturbed polygons to the spatial relationship between disturbed polygons in time and space. This is particularly critical if we plan on using such knowledge to help guide cultural disturbance activities. Thus, the relative locations and spacing of harvest blocks or prescribed burns are at least as important to consider as the disturbance patterns within each of those blocks or burns (for more information on *disturbance events*, see Quicknotes #7, 10, & 22).