

Flammability dynamics in the Australian Alps

Zylstra, P. (2018) Flammability dynamics in the Australian Alps. *Austral Ecol.* DOI: 10.1111/aec.12594. <http://onlinelibrary.wiley.com/doi/10.1111/aec.12594/full>

Overview

A new study in the journal *Austral Ecology* provides the most comprehensive analysis ever performed for the full fire history of forests in the Australian Alps. The study provides an evidence base for fire management in the Alps that is based on observed reality rather than theoretical concepts.

Main findings

Throughout the period for which fires have been consistently mapped across the Australian Alps National Parks, they have been smaller and less severe in long-unburnt forests. This is consistent across the five broad forest formations that cover the Alps (Figure 1).

Quick facts

Q. What are the implications for fire management?

A. It is widely assumed that more frequent fire makes forests less flammable. This study demonstrates that the opposite is true for the Alps. Whether through climate change or direct action, more fire makes the Alps more likely to burn, potentially locking them into a *landscape trap*, where fires accelerate in frequency until vulnerable ecosystems collapse.

Q. Why is this study different to previous analyses?

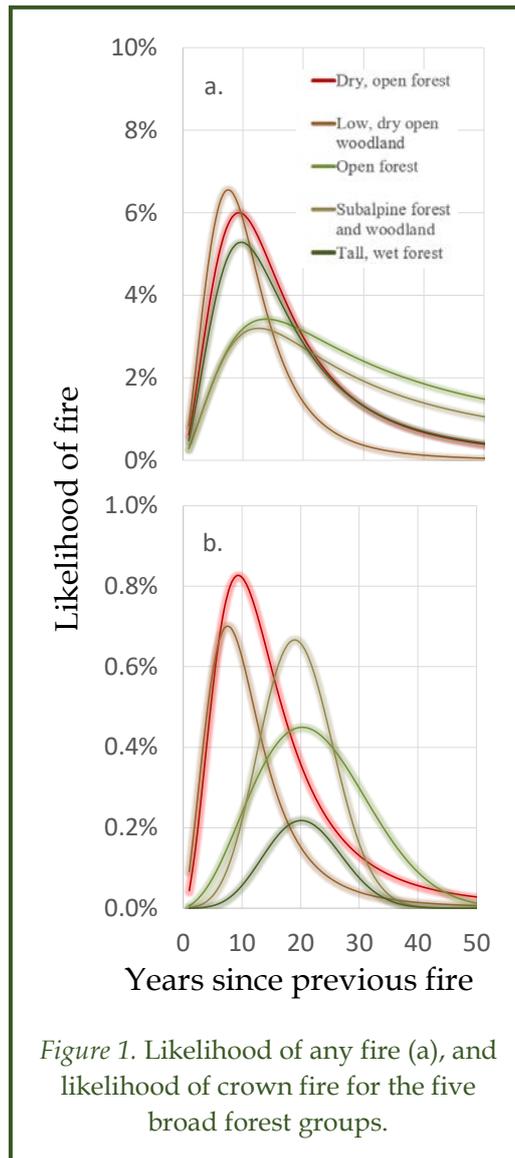
A. Previous work has looked at selected case studies, the flammability of forests at certain ages, or used weaker tools that have been unable to provide statistical strength. This study examined every mapped interaction of fire, across all ages, using a much more powerful approach. Unlike most previous studies, this work has also been independently peer-reviewed to ensure accuracy and remove bias.

Q. How confident can we be in the findings?

A. In contrast to case studies that look at the influence of one burnt patch on the spread of a fire, this study measured 36 million points from 58 years of mapped history over 1.5 million hectares. The central findings have 99.99% confidence, meaning that there is a 1/10,000 possibility they are coincidental.

Q. What questions remain?

A. This study examined the average effect only, so it is possible that the timing or severity of fire may have differing effects. Future dynamics may also differ as climate change alters forest growth patterns.



Forest summaries

| Details | Typical canopy species | Formations EVC Groups | Indicative structure |
|---|---|---|---|
| Tall Wet Forest | | | |
| Fire unlikely for 3 years after fire, then forests highly flammable until about 21 years old. Forests older than this are 8.3 times less likely to burn than younger forests, and the least flammable places in the mountains. During 2003, crown fire was extremely rare in mature forest. | <i>Eucalyptus delegatensis</i> , <i>E. regnans</i> , <i>E. dalrympleana</i> , <i>E. pauciflora</i> , <i>E. fastigata</i> | Ash eucalypt forests, Rainforests Wet or damp forests, Rainforests |  |
| Open Forest | | | |
| Fire unlikely for 6 years after fire, then forests flammable until 28 years old. Forests older than this are 1.5 times less likely to burn than younger forest. During 2003, crown fire was uncommon in mature forest. | <i>Eucalyptus dalrympleana</i> , <i>E. robertsonii</i> subsp. <i>robertsonii</i> , <i>E. macrorhyncha</i> , <i>E. bridgesiana</i> , <i>E. pauciflora</i> , <i>E. viminalis</i> , <i>E. rubida</i> subsp. <i>rubida</i> , <i>E. aggregata</i> , <i>E. stellulata</i> | Moist eucalypt forests, Montane tableland forests, Swamp forests/sedgeland Montane shrublands, grasslands, or woodlands |  |
| Subalpine Forest and Woodland | | | |
| The least likely forest to burn on average, although one of three forests most prone to crown fire in 2003, most frequently around 20 years old. Forests unlikely to burn for 6 years after fire, then flammable until 25 years old. Forests older than this are 2.3 times less likely to burn than younger forest. | <i>Eucalyptus debeuzevillei</i> , <i>Eucalyptus niphophila</i> , <i>Eucalyptus pauciflora</i> | Subalpine low forests Subalpine shrublands, grasslands or woodlands |  |
| Dry Open Forest | | | |
| One of two forests most likely to burn, and one of three most prone to crown fire in 2003, most frequently around 10 years old. Unlikely to burn for 3 years after fire, then flammable until 19 years old. Forests older than this are 2.6 times less likely to burn than younger forest. | <i>E. macrorhyncha</i> , <i>E. rossii</i> , <i>E. dives</i> , <i>E. mannifera</i> | Grass/shrub forests Dry forests |  |
| Low, Dry Open Woodland | | | |
| One of two forests most likely to burn, and one of three most prone to crown fire in 2003, at any age. Unlikely to burn for 2 years after fire, then flammable until 14 years old. Forests older than this are 2.0 times less likely to burn than younger forest. | <i>Eucalyptus blakelyi</i> , <i>E. melliodora</i> , <i>E. bridgesiana</i> , <i>E. albens</i> , <i>E. polyanthemos</i> subsp. <i>polyanthemos</i> , <i>Callitris glaucophylla</i> | Grassy woodlands/grasslands Lower slopes or hills woodlands |  |