

Ecosystem Resilience

Strategic bushfire risk management

Strategic bushfire risk management aims to reduce bushfire risk whilst maintaining resilient ecosystems.



Ecosystem Resilience

Fire has been a prominent feature in the Australian landscape for thousands of years and has played a fundamental role in the evolution of Victoria's biodiversity. Ecosystem resilience is the capacity of an ecosystem to absorb natural and management-imposed fire but, due to this evolution, still retain its basic structure — the abundance and composition of its species, the functions of its vegetation and its types of vegetation — over time. Research has shown that ecosystem resilience can be maintained and improved by:

- applying fire regimes appropriate to the species that exist within an area
- having a diverse fire history within the landscape
- managing to maximise biodiversity

The ecological risk is that inappropriate fire regimes can have negative impacts on biodiversity. Forest Fire Management Victoria (FFMVic) has developed fire management zones that acknowledge this ecological risk and allow it to be assessed with regards to planned burning. Once ecological risk assessments are undertaken we can predict the best planned burning regime for ecosystem resilience. FFMVic and our research partners have developed three key measures to help achieve this.



1. Tolerable Fire Interval (TFI)

Tolerable Fire Intervals are the recommended minimum and maximum periods between fires for a particular vegetation community. These are calculated from the life history characteristics of plant species in that vegetation community, and guide how frequent fires should be in the future to allow persistence of all flora species at the site. TFI is presently the best understood and researched measure, or surrogate, of ecosystem resilience. FFMVic use TFIs to aid decision making around when and where to conduct planned burning across the landscape.

2. Geometric Mean Abundance (GMA)

The Geometric Mean Abundance (GMA) of species is a measure of the biodiversity and health of an ecosystem of connected vegetation. Once calculated, GMA can also be used to track biodiversity trends and changes in habitat suitability under strategic bushfire risk management regimes.

3. Growth-Stage Structure

Fauna species exhibit a range of responses to fire, based on their habitat preferences and requirements. Species may prefer recently burnt, long unburnt or in between, dependent on the habitat attributes that are important to them. We term these different time-since-fire habitats as “growth-stages” moving from juvenile to old (Figure 1). Using GMA, we can estimate the best mix of growth-stages (termed the growth-stage structure) across the landscape that maximises biodiversity (Figure 2).



FFMVic has determined that TFI will be the initial and interim measure for Ecosystem Resilience as GMA and Vegetation Growth Stage Structure are developed further.

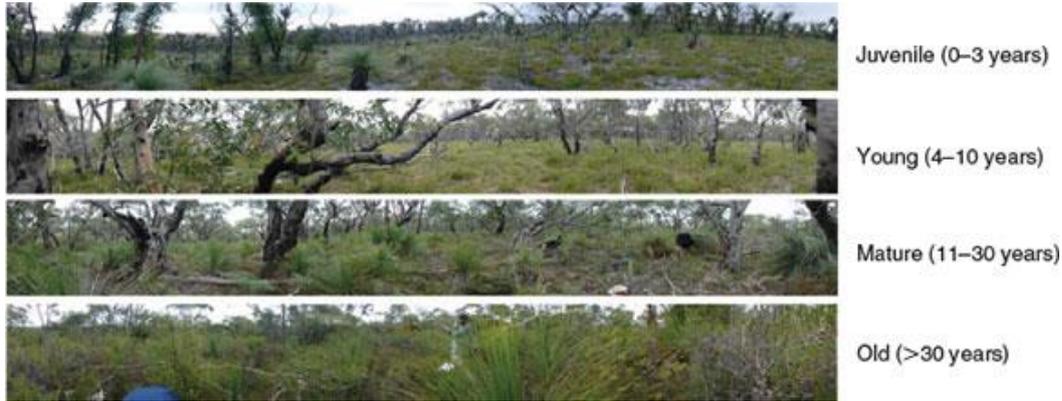


Figure 1: The four growth-stages used by FFMVic, showing habitat change with time-since-fire.

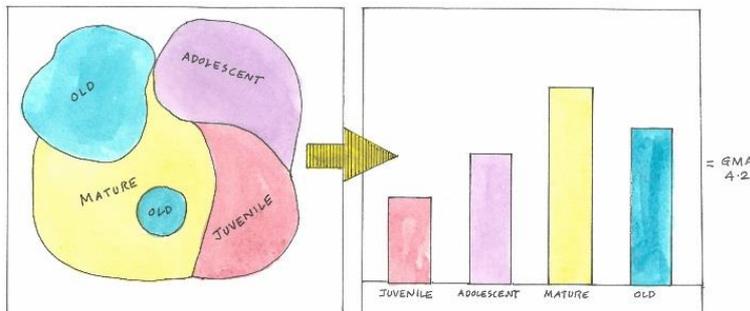


Figure 2: Example of a growth-stage structure across the landscape.

Threatened species

In Central Victoria, nearly 10% of flora, 20% of fauna and eight ecological communities are listed as threatened under the state's *Flora and Fauna Guarantee (FFG) Act 1988* and/or the *Commonwealth's Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. Both Acts require FFMVic to ensure our activities (including planned burning) do not have a significant impact

on threatened species and communities. We use a combination of species records, and species habitat distribution models to assess if threatened species requirements need to be considered within an area.

Balancing our approach

FFMVic recognise there is a trade-off between reducing bushfire risk to life and property and maintaining ecosystem resilience. We conduct an ecological risk assessment in combination with our bushfire risk modelling to determine the best fire regime that achieves both core objectives.

© The State of Victoria Department of Environment, Land, Water and Planning 2017



This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning (DELWP) logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

ISBN 978-1-76047-749-3 (print)

ISBN 978-1-76047-750-9 (pdf/online)

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Accessibility

If you would like to receive this publication in an alternative format, please telephone the DELWP Customer Service Centre on 136186, email customer.service@delwp.vic.gov.au or via the National Relay Service on 133 677 www.relayservice.com.au. This document is also available on the internet at www.delwp.vic.gov.au.