Prescribed fire as a tool for land management and bushfire risk mitigation in southern Australia

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Ignition with drip torches

Outline

- Definition and terminology
- Time since fire and fire intensity
- Contribution of prescribed fire to mitigating impacts of unplanned fire
  - local scale
  - landscape scale
- Relationship between planned and unplanned fire
- Other methods for managing fuel to mitigate impact
- Factors affecting implementation

What is prescribed fire?

Prescribed burning is the deliberate and lawful application of fire under specified environmental conditions at a time, intensity and rate of spread required to achieve planned resource management objectives

Synonyms: prescribed fire, planned fire, controlled burning

Specific cases:

- Hazard reduction (particularly New South Wales), fuel reduction burning
- Regeneration burning following timber harvesting
- '*Burning-off*' – often associated with farm activities

Why are fuel load and structure important?

Fire intensity

$$I = w\ r\ H$$

where ***w* = fuel consumed**

r = rate of spread

H = heat yield

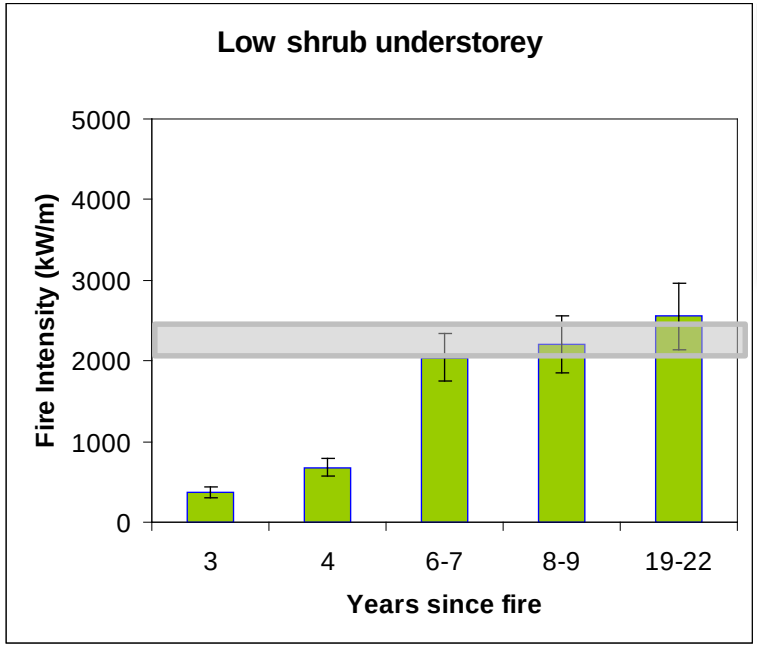
Fire intensity relates directly to:

- Difficulty of fire suppression
- Flame dimensions
- Thermal impact on soil and vegetation

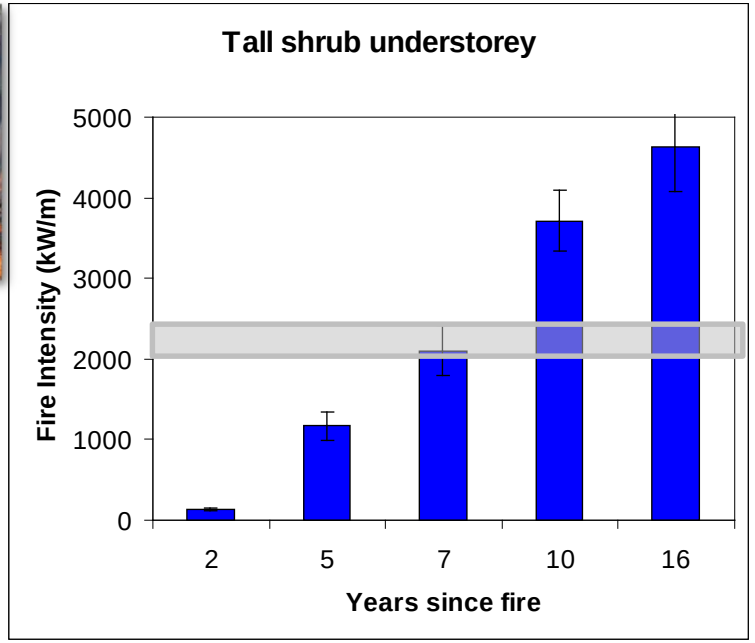
Mild fire in open forest burning in surface fuel of leaf litter

Fire intensity in relation to time since last fire

Jarrah forest, High fire danger, dry summer conditions



Data from Project Vesta experimental fires
McCaw 2013
For Ecol Mgt 294



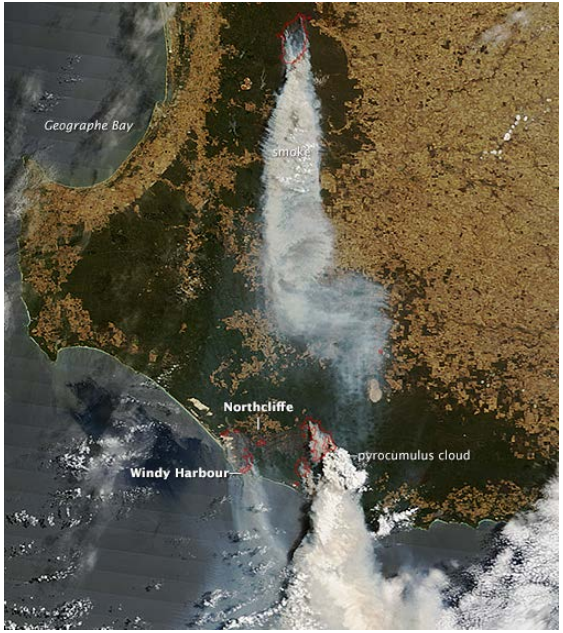
Contribution of prescribed fire to mitigating impacts of unplanned fire

Local scale

- Increased likelihood of containing fires at a small size
- Safer conditions for firefighters working in younger fuels
- In the case of multiple ignitions (eg lightning storms) resources can be prioritised to fires having the greatest potential for damage

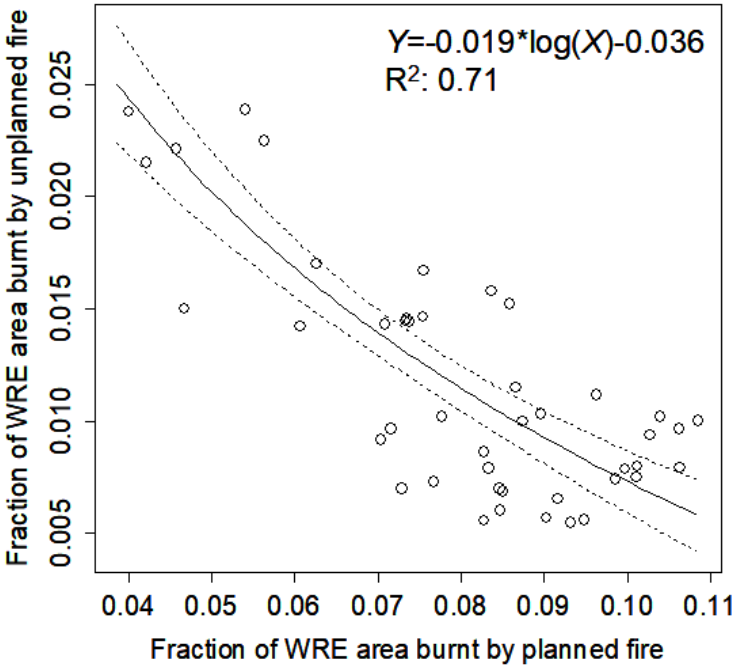
Contribution of prescribed fire to mitigating impacts of unplanned fire

Landscape scale



- Areas burnt by prescribed fire within previous 3 years may be effective as a barrier to fire spread if sufficiently large in size for conditions of High fire danger or less
- Young fuels provide secure anchor points for fire suppression operations
- Fires in young fuels less likely to burn intensely at night
- Reduced severity of impact on soils, vegetation, water resources and fauna

Planned and unplanned fire: *an inverse relationship*



Analysis of 50 years of fire data for the Warren Region (WRE) south-west WA

Boer et al (2009)
Long-term impacts of prescribed burning on regional extent and incidence of wildfires
For Ecol Mgt 259

Other methods for managing fuels to mitigate bushfire risk

- Mechanical techniques can be used to modify the quantity and structure of fuel to reduce potential fire intensity
- Scrubrolling in shrubland (left) followed by burning
- Slashing, around critical infrastructure
- Most suited to vegetation that is not prone to fire propagation by spotting
- Narrow buffer strips may act as a barrier to fire spread but o not reduce potential fire intensity at a broader scale

Implementation

- Risk
- Organisational factors
- Attitudes to prescribed burning
- Measuring performance