

Why we need to manage forest fuel loads in the urban interface zone

Key Points

- A destructive bushfire does not require extreme weather conditions.
- Bushfires in high fuel loads will spread faster, be more intense and damage more bushland and property.
- Managing fuel loads will assist fire managers in suppressing bushfires that may threaten lives and property.
- Lower bushfire intensities give fire managers greater opportunities to suppress fire.
- Bushfire intensity is determined by the rate of spread of the fire, the fuel consumed and the heat yield of the burning vegetation.

Definitions

- **Fireline intensity** is the rate of energy release per unit length of fire front expressed in kilowatts per metre (kW/m).
- **Fire suppression** is the activities connected with restricting the spread of a fire following its detection and before making it safe.

Reducing fuel around your property may help protect your home from bushfire this summer.

The intensity (heat) and rate of spread of bushfire is influenced by the amount of fuel (vegetation) available to burn. If the amount of fuel around your property is reduced, a bushfire will burn more slowly and generate less intense heat. This will reduce the impact of the bushfire on life and property and assist fire managers in suppressing the bushfire.



Land managers often undertake prescribed burning because, compared to slashing or using herbicides, it is a more natural and efficient option for reducing and managing fuel.

With the correct weather conditions and planning, property owners can undertake their own prescribed burning during the winter months to reduce the risk of bushfires.

As the intensity of a bushfire increases, it is harder for fire managers to suppress the fire. This can be seen in the head fire behaviour classes table on the next page. The only option for land managers to decrease the potential fire intensity is by reducing and managing the amount of fuel available.



Table 1 shows the options available to fire managers when suppressing a fire at different levels of fire intensity and rates of spread (ROS).

A simplified calculation of fireline intensity is:

$I = w r/2$ where:

- I = fireline intensity (kW/m)
- w = dry weight of fuel consumed (tonnes/ha)
- r = forward rate of spread (m/hr).

Key

kW/m	Kilowatts per metre
m/h	Metres per hour
ROS	Rate of spread

Adapted from vegetation types within: AS 3959—2009 *Construction of buildings in bushfire prone areas.*

Likelihood of suppression

Table 1 shows why fire managers will not be able to use direct attack using fire appliances and machinery for a bushfire travelling at 400 metres per hour in Jarrah forest with an unmanaged fuel load of 20 tonnes per hectare. This fire will have an intensity of greater than 4,000 kilowatts per metre.

Under the same conditions reducing the fuel load to below 10 tonnes per hectare will restrict the potential fire intensity to below 2,000 kilowatts per metre and enable fire managers to directly attack the fire with fire appliances and machinery.

Table 1: Intensity, rate of spread, and fuel type

Headfire behaviour classes (Modified)*
Indirect attack likely to fail Intensity > 4000 kW/m (5000** kW/m) and/or ROS > 800 m/hr in forest/woodland Intensity > 8000 kW/m and/or ROS > 2000 m/hr in shrubland and/or ROS > 10,000 m/hr in grassland
Direct attack not possible/unlikely to succeed Intensity > 2000 kW/m and/or ROS > 400 m/hr in forest/woodland Intensity > 2000 kW/m and/or ROS > 1000 m/hr in shrubland Intensity > 5000 kW/m and/or ROS > 6500 m/hr in grassland
Direct machine and tanker attack possible Intensity < 2000 kW/m and/or ROS < 400 m/hr in forest/woodland Intensity < 2000 kW/m and/or ROS < 1000 m/hr in shrubland Intensity < 5000 kW/m and/or ROS < 6500 m/hr in grassland
Hand tool attack possible Intensity < 800 kW/m and/or ROS < 140 m/hr in forest/woodland and shrubland Intensity < 800 kW/m and/or ROS < 300 m/hr in grassland
Readily suppressed Intensity < 800 kW/m (350 kW/m) and/or ROS < 60 m/hr in all fuels

Note: That in the forest fuels 'Readily suppressed' and 'Indirect attack likely to fail' categories there is some variation between references.

* C. Muller, 2008, *Report on a Bush Fire Threat Analysis for Western Australia*, a report for the FESA and CALM.

**N. D. Burrows, 1984, *Describing forest fires in Western Australia A guide for fire managers. Technical paper No. 9*, Forests Department, WA.


Description of fuels

Forests: Trees 10 to 30 m high with 30–70% foliage cover, found in reliable rainfall areas and typically dominated by eucalypts.

Woodland: Trees 2–30 m high with less than 30% foliage cover dominated by eucalypts with an understorey of grasses and/or low trees to tall shrubs typically dominated by Acacia, Callitris or Casuarina species.

Shrubland: Shrubs less than 2 m high including Banksia, Acacia, Hakea and Grevillea species with greater than 30% foliage cover. Understorey can contain grasses with Acacia and Casuarina species dominant in the arid and semi-arid zones.

Grassland: All forms including hummock, tussock and pasture where shrubs and trees may be present at less than 10% foliage cover.

 **For more information contact the Environmental Protection Branch on 9395 9300, email: environment@dfes.wa.gov.au or visit www.dfes.wa.gov.au**