SHIRE OF GINGIN
HISTORY | BEAUTY | PROSPERITY

Fuel Loading FACT SHEET

QUICK FACTS

What is Fuel Loading?

Fuel loading is the amount of vegetation in a given area such as your property. There are 3 major factors which influence fire intensity. These are temperature, wind and fuel load. Of these factors, fuel load is the only one we can influence in order to reduce our bush fire risk.

What Fuel Types are there?

Forest fuels can be divided into four different layers:

- Canopy
- Bark
- Elevated fuel, e.g. shrubs up to 2m
- Surface litter (leaf litter)

Surface litter and elevated fuel are the types that contribute most to the overall fuel hazard. Tree canopy, bark and coarser fuels (thicker than a pencil) will affect fire behaviour, but their impact is less significant.

Large logs are not readily flammable and provide good habitat for fauna. Regular fuel load assessments are encouraged to maintain fuel loads at an appropriate level.

Did you know that reducing the fuel load on your property is one of the most effective things you can do to reduce your risk in the event of a bush fire?

Why should I be concerned about reducing my fuel load?

Excessive fuel loads pose a direct threat to life and properties. Whilst fuel loading maintenance isn't required under the Shire's Fire Break Orders, it is still the responsibility of the owner and/or occupiers to manage fuel loading to reduce your bush fire risk as per the *Bush Fires Act 1954*.

In most cases this means maintaining fuel loading in natural bush areas to 8 T/Ha (or less) and implementing an Asset Protection Zone (APZ) around habitable dwellings (the latter being required under the Shire's Fire Break Orders). Further information about APZs is available from the Shire of Gingin's **Asset Protection Zone Fact Sheet**.

Shire Rangers and Fire Control Officers may refer your property to the Chief Bush Fire Control Officer (CBFCO) if they believe a fuel loading inspection needs to be undertaken. If the CBFCO calculates that the fuel loading on your property is in excess of 8 T/Ha then they will issue you with a Work Order to reduce your fuel load and you will have a set time in which to do this.

How can I reduce my fuel loading?

There are 3 main methods that can be used to reduce your fuel load which includes **Mitigation Burning**, **Vegetation Modification** and establishing an **Asset Protection Zone**.

MITIGATION BURNING

The objective of a mitigation burn is to reduce (but not totally remove) the amount of surface litter and elevated fuels. For larger lots, this is best achieved by a low intensity burn, i.e. burning in the cooler part of the day or from mid-afternoon and onwards when the dew level is increasing. The Department of Fire & Emergency Services (DFES) has recently produced a comprehensive guide to help community members with planning and conducting a burn on your property. The **Burn SMART** guide is available online via dfes.wa.gov.au/plannedburning.

Before conducting a mitigation burn, consider how the fuel load distribution, topography (fire travels uphill) and weather will affect the fire behaviour. Inappropriate burning can endanger lives, property and the environment. If conducting a mitigation burn it is important to ensure that the surface litter and elevated fuels are dry and weather conditions are appropriate to ensure minimal smoke is produced so it does not create a nuisance for neighbours. What about local fauna? Conducting a mosaic burn (where you only burn small sections at a time) allows any animals in the area enough time to move away to an unaffected area.

The Shire highly recommends that when you conduct a burn, you also contact the DFES Communications Centre on 1800 198 140 to register your burn. Giving DFES advance notification means that in the event of a 000 call about your burn, DFES will know you are undertaking a planned burn in the area and so they can factor this information in when investigating the 000 call.

All burning must abide by the conditions stipulated in the Shire of Gingin's Fire Break Orders. Alternatively, you can contact a commercial operator to undertake the burn for you for a fee. For smaller lots in residential zoned areas, it is often safer and more practical to rake up the material and take it to your nearest landfill site or to conduct a pile burn.

If conducting a pile burn, it is important to ensure that it does not create a smoke nuisance to the local community. This can be achieved by having a hot, clean burn that produces minimal smoke. Do not burn recently cut green waste or wet fuel due to recent rain. A smouldering fire is the result of incomplete combustion and will create excessive smoke.

VEGETATION MODIFICATION

Australia's bushland has evolved in response to regular burning over thousands of years but sometimes it is not always the best option to reduce fuel loads. Burning too frequently encourages weeds to grow which can cause an increased fire risk.

Modifying the vegetation is often a more economical and environmentally sustainable option. This includes, but is not limited to:

- Raking and removing fallen leaves, twigs and bark on a regular basis.
- Removing weeds by slashing, spraying or cutting.
- Selectively pruning and managing scrub so there is not a continuous fuel load for the fire to travel through.
- Removing low hanging branches (under 2m)

How can I measure my fuel load?

Divide your property into different sections (cells) based on the vegetation variation across the site. The fuel load in each cell is measured with a minimum of three samples to establish an average fuel load for the cell. Essentially you need to work out how much tonnage you have per hectare even if your property is less than a hectare in size. Calculating this is easy if you use the following 3 tables and formula below.

Surface fuel loads are determined by measuring leaf litter depth using a simple depth gauge. The gauge can be made at home using a circular 15cm cardboard disk with a ruler slotted through its centre.

Clear a small hole in the leaf litter and remove any coarse material. Place the end of the ruler on the soil surface. Gently press down on the disk (enough to hold a tennis ball under water). Read the litter depth, adjusting for any 'dead' length on the end of the ruler (if any). Use this measurement to establish litter weight per hectare (refer Table 1).

Litter Depth (mm)	5	10	15	20	25	30	35	40	45	50
Litter Weight (T/ha)	2.7	5.3	8.0	11.0	13.0	16.0	19.0	21.0	24.0	27.0

Table 1

Scrub Height (m)	Scrub Base Weight (T/ha)		
	Dense	Medium	Sparse
1.5+	7.0	5.0	4.0
1.2	5.0	4.0	3.0
0.9	3.0	3.0	2.0
0.6	3.0	2.0	1.5

◀ *Table 2*

Scrub Condition	Scrub Flammability Factor
Green/Young	1
20% Dead	2
50+ % Dead	3

▲ *Table 3*

Scrub fuel loads are determined by assessing the average height and density of the vegetation and classifying it as 'Sparse' (easy to pick any path through), 'Medium' (can pick a path through), or Dense' (difficult to walk through). Refer to Table 2 to establish the scrub base weight. Refer to Table 3 to determine the most appropriate Scrub Flammability Factor.

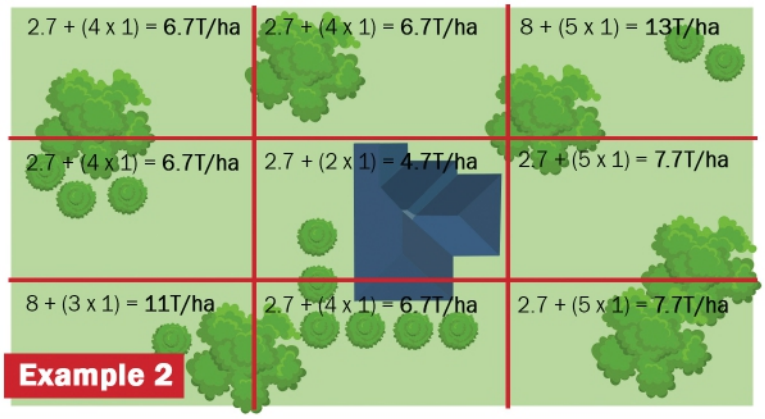
How do I calculate my total indicative fuel load?

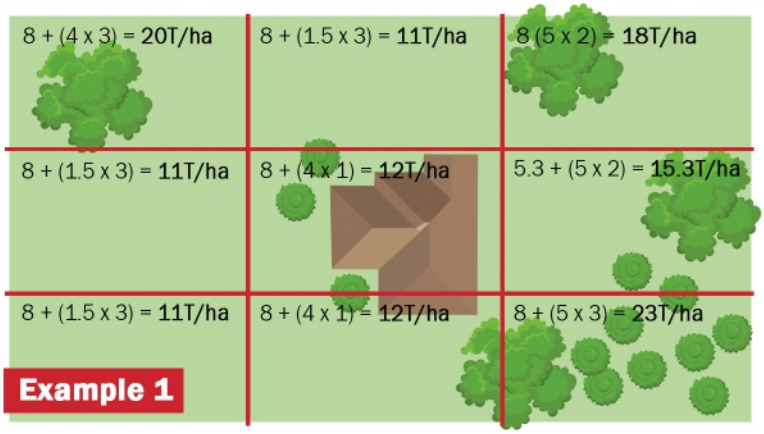
Scrub weight per hectare is calculated by multiplying the Scrub Base Weight by the Scrub Flammability Factor. The Total Indicative Fuel Load (TIFL) for any cell is calculated as:

TIFL = Litter weight + (Scrub Weight x Scrub Flammability Factor)

For example, with a leaf litter depth of 10mm (5.3 T/ha from Table 1), dense scrub with an average height of 0.9m (3.0 T/ha from Table 2) and consisting of no more than 20% dead materials (giving a scrub flammability factor of 2 from Table 3):

TIFL = 5.3T/ha + (3.0T/ha x 2) = 11.3T/ha





In Example 1 above, the 1Ha block has been divided evenly into 9 cells with a TIFL calculated for each cell. To obtain the TIFL for the entire block (being 1 Ha in size), simply add the 9 cells together and then divide by 9 to obtain the average which is **14.81T/Ha**.

Given this amount is higher than 8T/Ha, this block requires a reduction of its fuel load. Although the vegetation is sparse and there isn't much of it, there is excessive leaf litter on the ground.

By contrast in Example 2, the TIFL across the entire 1Ha block is calculated as **7.88T/Ha**. Although there are two cells that exceed 8T/Ha and overall there is more vegetation on this block, it doesn't require a reduction in its fuel load despite first appearances. This is because the vegetation is a combination of green and sparse and there is very little leaf litter.