BUSHFIRE FRONT

"mild fires not wild fires"

Prescribed Burning

The Facts

A Bushfire Front (WA) paper

Prescribed burning to mitigate bushfire severity is an essential component of WA's forest fire management policy. The purpose is not to prevent bushfires, but to make bushfires easier, cheaper and safer to control, and to minimise the damage that they do. Over decades it has been demonstrated that a well-managed burning program is no threat to our environment or to biodiversity.

However, prescribed burning is controversial. Some academics and environmentalists oppose the burning program. They advocate that it be curtailed or shutdown. No credible reasons are put forward to support this position. They ignore the facts.

The purpose of this paper is to present the facts about prescribed burning, as we understand them, based on intimate knowledge of the science, and decades of real-world firefighter experience. Our aim is to ensure any decisions by government about the burning program are based on this credible science and the hard-won experiences, not on theory, computer models or ideology.

Good fire - a cool prescribed burn

Bad fire - a hot bushfire in long unburnt fuel

Fact 1: *Fire is a naturally occurring factor in Western Australian forests*

Flammable vegetation and long periods of dry weather ensure that our south-west forests are inherently prone to bushfires.

Before the arrival of humans, some 60 thousand years ago, forest fires were started by lightning strikes. With the arrival of Noongar people, ignitions increased as they purposely and skilfully set cool fires. Fires were lit for a myriad of reasons, mostly during summer. Noongar ignitions and lightning strikes overlapped and ensured that the native bushland was never free of fire for very long.

Over millennia, fires were a constant and frequent part of the environment, and the forest biota (native plants, animals and fungi) evolved and adapted. They developed physical and behavioural adaptations that enabled them to co-exist with fire, and in some cases even to benefit from it, having become dependent on fire for regeneration and persistence.

Fact 2: *European settlement inserted a fire-vulnerable society into a fire-prone environment*

European settlement in 1829 brought people to Western Australia who had no familiarity with wildland fire, but instead feared it. They believed fire had no part in the natural environment, and furthermore was a threat to their lives and assets. Unlike the Noongars, who saw fire as a friend, the early Europeans saw it as enemy.

Noongars and their thousands of years of fire-lighting and fire management were soon displaced.

WA's first foresters were also imbued with the European notion that all fires were a threat and were destructive. They aimed to completely eliminate fire from the forest, and believed that this could be accomplished by prevention and suppression. However, because of lightning, arson and accidents, bushfires could not be prevented from starting. Worse, it was soon discovered, in the absence of fire, the forest fuels accumulated, making them more flammable and fires more intense and harder to control.

The outcome was the '*Big Bushfires Era*' which lasted for the first half of the 20th century. Studies (of tree rings) have shown that some of the fires during this time were the most intense experienced in almost 400 years, the lifetime of the oldest jarrah tree studied.

The '*Big Bushfires Era*' culminated in the massive fires of 1960/61, which burnt out four towns (including Dwellingup) and about 200,000 ha of forest. One of the many recommendations made by the subsequent Royal Commission was that the then-Forests Department needed to expand its prescribed burning program, as a means of mitigating future forest fires.

Fact 3: *Attempts to eliminate fire failed. A new approach was needed*

The Forests Department had adopted a policy of broad-acre prescribed burning in the mid-1950s, but a lack of resources and know-how limited how much burning could be done. During the 1960s, supported by bushfire research, the development of aerial burning, and improvements in equipment, the prescribed burning program expanded rapidly. The 1960s through to the 1990s became the '*Small Bushfires Era*'. The new approach was an integrated system, involving preparedness, mitigation and suppression, and the cornerstone of this approach was the fuel reduction prescribed burning program.

From the mid-1990s to the present, the prescribed burning program, for a variety of reasons, including opposition from environmentalists and academics, has struggled to maintain its momentum. As a result, we are currently in a second '*Big Bushfires Era*'.

Background:

What is Prescribed burning?

Prescribed burning, sometimes known as fuel reduction burning, or bushfire mitigation burning, is the deliberate application of controlled, low intensity (cool) fire under carefully chosen fuel and weather conditions. Just as a doctor prescribes a specified medication to alleviate illness, so a forester prescribes a specific sort of fire, to alleviate a wildfire.

'Inoculation' of the forest with cool, prescribed fire so as to minimise the risk of an intense 'killer' fire is analogous to inoculation of humans against infectious 'killer' diseases.

A prescribed fire reduces the quantity of flammable bushfire fuels over a defined area. A bushfire derives its energy, or 'killing power', from the weight of fuel that burns, and the rate at which it burns. Bushfire fuel is fine live and dead vegetation that naturally accumulates on or near the forest floor. Dead fuel, such as leaves, twigs, branches and bark shed from trees makes up about 90% of the fuel load in a native eucalypt forest.

Prescribed burning does not and cannot prevent bushfires from occurring. However, by reducing fire intensity, it increases ease of control.

Claims that prescribed burning is ineffective at mitigating the bushfire threat, or actually increases the bushfire threat, are not supported by historical evidence, the experience of firefighters, or bushfire science.

DBCA prescribed burning in jarrah/marri forest.

Fact 4: *Forest fuel loads increase over time*

Fuel load increases with time since the last fire to a point below which it does not decline, so long unburnt forests carry high fuel loads (Figure 1). A well-executed prescribed burn will remove up to 80% of this fuel, thereby significantly reducing the potential 'killing power' of a bushfire for the next six years. This makes bushfires less damaging to the environment and to infrastructure, less threatening to communities, and safer and easier to suppress. Because the fuel re-accumulates over time, the forests need to be burnt frequently to maintain low fuel loads over a large area.

Fact 5: *The greater the area subjected to prescribed burning, the lower the area to suffer from bushfires*

There is an inverse, non-linear relationship between the proportion of the south-west forest region that is burnt by bushfire, and the proportion burnt by prescribed fire (Figure 2). The 'turning point' is when about 7.6% of the forest is burnt by prescribed fire – the area burnt by bushfire quickly rises if the prescribed fire area falls below this level. If 8% of the forest region is burnt each year, and about 45% of the region has fuel younger than 6 years old, then the mean annual area burnt by bushfires is predicted to be only about 0.6%, or about 15,000 ha (Figure 2).

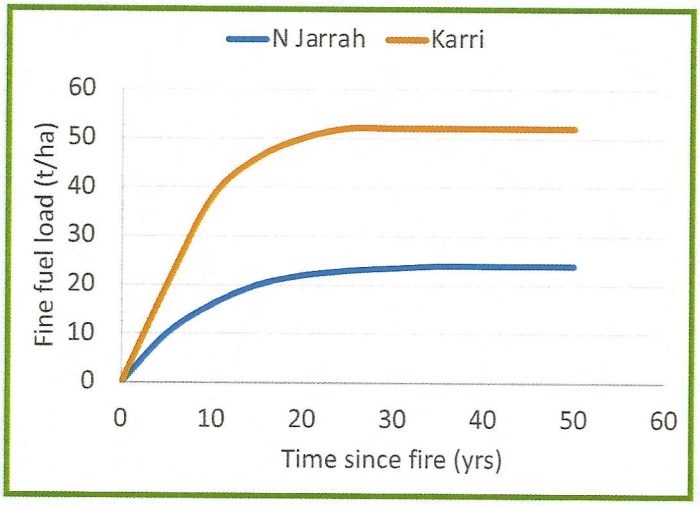

Figure 1: The graph shows how bushfire fuel load for northern jarrah forests and karri forests increase with time since the last fire. (Source: Burrows 1995; Burrows et al. 2023)

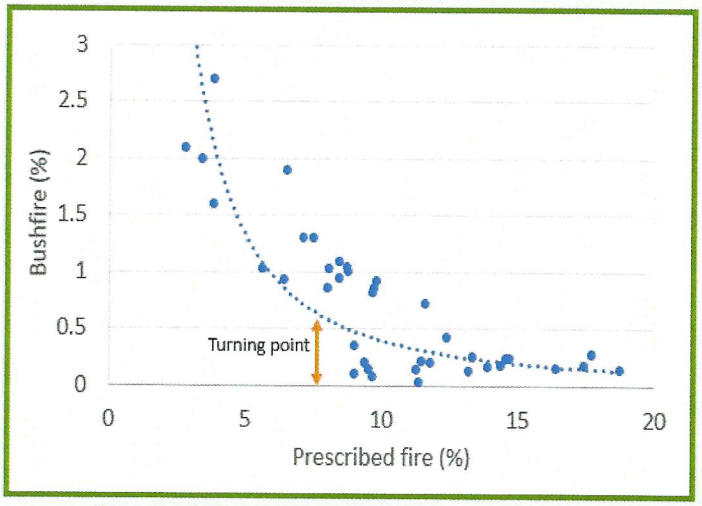

Figure 2: The graph shows how the area burnt by bushfire in the south-west forest region declines as the area burnt by prescribed fire increases. The 'turning point', or the point at which the curve changes its slope, is at about 7.6%. If the area burnt by prescribed fire each year falls below 7.6%, then the area burnt by wildfire increases rapidly.
(Source: Sneeuwjagt 2008 with updates by N. Burrows).

Fact 6: *The prescribed burning program has a huge cost/benefit*

There is a non-linear, inverse relationship between monetary cost of bushfires and the proportion of the south-west forest region burnt by prescribed burning (Figure 3). As expected, the turning point is similar to Figure 2, between 5% and 10%. The cost of bushfire control, and of post-fire recovery increase sharply when the proportion of area burnt annually by prescribed fire falls below this level (about 7.6%).

Here we are just speaking about money. There are also significant environmental costs, psychological trauma and loss of human life associated with destructive bushfires. These are also proportional to the area burnt by bushfire, which in turn are minimised by area of prescribed burning.

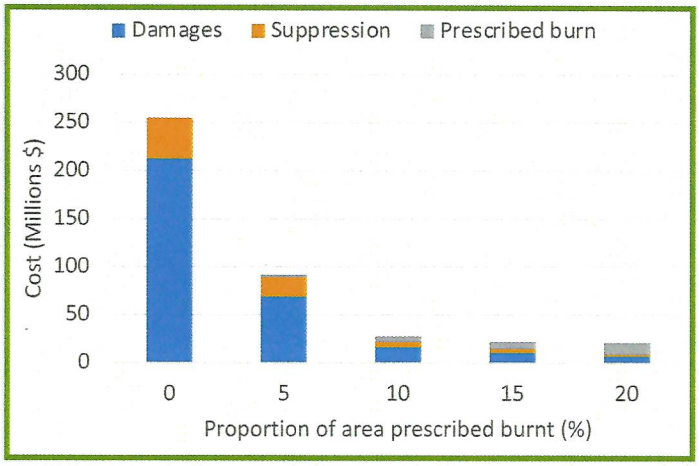

Figure 3: The bar-chart shows the average annual bushfire damages cost, suppression cost and prescribed burning cost with the annual proportion of the south-west forests burnt by prescribed fire. The turning point is between 5% and 10%. This cost graph does not include environmental damage, human trauma and loss of life. (Source: Florec 2016).

Fact 7: *Cool fire is good for forest health and landscape protection*

The low intensity fires used in prescribed burning maintain healthy forest ecosystems. After 60 years of prescribed burning, there is no scientific evidence that any forest species have become extinct, or have declined, as a result of prescribed burning. Species declines have resulted from predation by introduced predators, dieback disease, long periods of fire exclusion and large bushfires. For example, the 2015 Northcliffe fire, which burnt 98,000 ha, killed 84% of the quokka population in the fire footprint.

Conclusion

The prescribed burning program in south-west forests is not a stand-alone policy. It is part of a comprehensive and integrated bushfire management system, based on science and lived experience over the last 100 years. But it is also the most essential component of this system. If fuel reduction is not done, the bushfire control system will collapse.

Attempts by some environmentalists and academics to undermine or curtail the burning program are inhumane and irresponsible, but worse they ignore the facts. We urge everyone who is interested or concerned about this issue to read, and understand the facts, and to contact The Bushfire Front if more information is needed.

References

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www.bushfirefront.org.au

info@bushfirefront.org.au