

10 PRESCRIBED BURNING IN FORESTS WASTES MONEY



FACTS ABOUT PRESCRIBED BURNING AND WILDFIRE IN SOUTH-WEST FORESTS

The Department of Biodiversity, Conservation and Attractions' (DBCA's) prescribed burning regime in the south-west forest regions is based on false economics. Prescribed burning strategies range between two quite different alternatives:

1. **'landscape treatments'**, which maintain a burnt patchwork generally over the entire forest region so that wildfires will be easier to suppress, in moderate conditions, when they reach a recently-burnt area with low fuel load
2. **'wildland-urban interface (WUI) treatments'**, which reduce fuel loads in areas close to the assets requiring protection.

Landscape treatments are cheaper per hectare due to large burn areas. WUI treatments, carried out closer to the infrastructure requiring protection, are more expensive due to the care required.

Florece *et al.*¹ computer-modelled these two strategies and their potential effect on wildfire occurrence at different rates of annual adoption (0%, 5%, 10%, 15% and 20% burnt) in DBCA-managed land in the South West Forest Region (1 880 000 ha; as defined by Florece *et al.*) and calculated the cost for each scenario. Florece *et al.*'s costs included:

- the prescribed burning cost
- the wildfire suppression cost
- the wildfire damage cost to urban areas, plantations, agriculture, mining and ecosystems.

The total costs of each scenario were compared to

determine the most cost-effective prescribed burning regime. Florece *et al.* showed that landscape treatment at 15% adoption rate was the most cost effective regime **when the cost of ecosystem damage from the prescribed burning was ignored**. This is similar to DBCA's current practice.

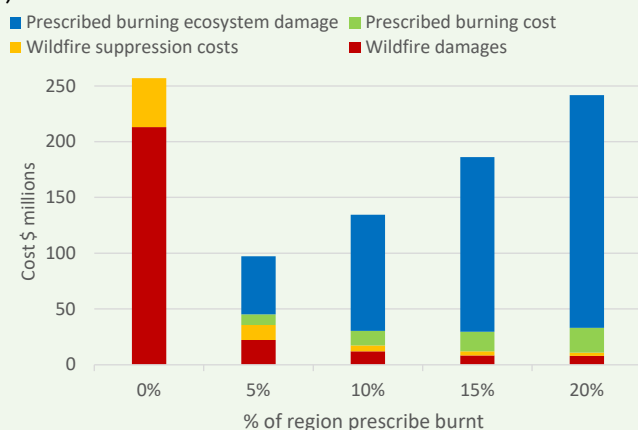
However, many prescribed burns are very damaging to ecosystems², and the damage caused by burning large forest areas remote from infrastructure cannot be ignored (see Fact Sheet 3).



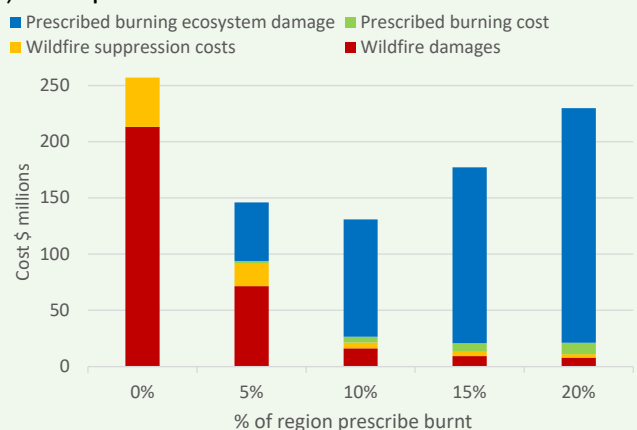
In the Perup prescribed burn, March 2021, 22% of burn area had complete loss of green material.
Source: Kingsley Dixon.

Forests provide myriad ecosystem services that are essential to human survival and wellbeing. The figures below show Florece *et al.*'s estimated costs for each scenario (in red, orange and green), and the costs of the ecosystem damage from prescribed burning (blue), taken to be the loss of an ecosystem service: *atmospheric regulation by temperate forests* (from Taye *et al.*³; and adjusted to the same Australian dollar value as Florece *et al.*'s study; \$1320 /ha/year). This damage cost is an underestimation as it does not include other ecosystem services related to biodiversity conservation and water catchments.

1) Wildland-urban interface treatment



2) Landscape treatment



Costs from Florece *et al.*'s study of different adoption rates of prescribed burning 1) close to assets requiring protection (wildland-urban interface treatment) and 2) further from assets requiring protection (landscape treatment), and estimated cost of prescribed burning ecosystem damages.

Including the prescribed burning damage cost for loss of atmospheric regulation results in the most cost-effective scenario being to burn the smallest of the areas considered (5%) close to the assets requiring protection. As the prescribed burning ecosystem damage cost has been underestimated, it is likely that the most cost-effective scenario would be to burn even less of the WUI area. This analysis demonstrates that, for the greatest economic benefit, prescribed burning or other bushfire mitigation strategies should be done close to the assets requiring protection not in remote areas.

As most ignitions occur close to human habitations it is also sensible to concentrate wildfire risk mitigation in the WUI to reduce the chances of these ignitions turning into large wildfires¹.

Other studies^{4,5,6} deduced that prescribed burning treatments close to the settlements and other assets requiring protection achieve a greater reduction in damage and risk to houses and assets than treatments remote from infrastructure (as currently favoured by DBCA). In eight of the 11 areas in Penman *et al.*'s study⁶ of prescribed burning cost effectiveness, 'do nothing' was the most cost-effective approach.

All the studies reinforce the finding that taking preventative action close to the assets needing protection is most beneficial, and burning in conservation areas is a waste of money.

Campbell *et al.*⁷ deduced that the effectiveness of DBCA's current prescribed burning regime in reducing subsequent wildfire area has been small (leverage of 50:1; that is, needing to burn 50 ha in order to prevent 1 ha of wildfire; see Fact Sheet 2). So, over the six years to 2022/23, the average annual area burnt of 179 049 ha would have prevented on average 3600 ha of wildfire. The average annual cost of the prescribed burning was \$52.4 million⁸. It may be cheaper to tackle wildfires as they occur, rather than continuing the current ineffective prescribed burning regime. Suppressing 3600 ha of wildfire would cost about \$4.2 million (at cost of \$1170/ha¹).

Prescribed burning far from the assets requiring protection should cease, and treatments should be undertaken close to the infrastructure and settlements requiring protection as this is the more effective strategy. Although increased forest flammability in the medium term may require a greater fire suppression effort, the costs in the longer term will be less.

The benefits of this strategy, besides benefitting the forest ecosystem, are increased ecosystem services: e.g. atmospheric regulation and oxygen production, fewer human health and water quality impacts and less greenhouse gas emission.

The costs here do not include the multi-million dollar annual health costs attributed to smoke from prescribed burns or the economic losses it causes to honey and wine producers and the tourism industry.

Conclusions

DBCA appears to put no value on the ecology and biodiversity of the south-west forest regions when planning prescribed burning regimes.

DBCA burns large areas remote from the assets requiring protection because this is the cheapest possible burning regime.

This approach is having little effect on subsequent wildfire area, and causing immeasurable ecological damage **so it wastes taxpayer resources, money that could be better spent elsewhere.**

The most effective way to reduce wildfire risk and damage is to reduce fuel loads close to the assets requiring protection, NOT in remote areas.

References

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- 2 Bradshaw SD, Dixon KW, Lambers H, Cross AT, Bailey J & Hopper SD. (2018) Understanding the long-term impact of prescribed burning in Mediterranean-climate biodiversity hotspots, with a focus on south-western Australia. *International Journal of Wildland Fire*, 27, 643–657 <https://doi.org/10.1071/WF18067>
- 3 Taye FA, Folkersen MV, Fleming CM, Buckwell A, Mackey B, Diwakar KC, Le D, Hasan S & Saint Ange C (2021) The economic values of global forest ecosystem services: A meta-analysis. *Ecological Economics* Volume 189, November 2021, 107145.
- 4 Gibson FL & Pannell DJ (2014) Integrated Economic Assessment of Fire Risk Assessment Strategies: Case Studies in Central Otago, New Zealand, Mount Lofty Region, South Australia. *Final Report for the Integrated Assessment of Prescribed Burning Project, Bushfire Cooperative Research Centre.*
- 5 Florec V & Pannell DJ (2016) Economic assessment of bushfire risk management options in Western Australia: case studies in the Perth Hills and in the south-west of Western Australia. *Report prepared for the State Emergency Management Committee Secretariat.*
- 6 Penman TD, Clarke H, Cirulis B, Boer MM, Price OF & Bradstock RA (2020) Cost-Effective Prescribed Burning Solutions Vary Between Landscapes in Eastern Australia. *Front. For. Glob. Change* 3:79. <https://doi.org/10.3389/ffgc.2020.00079>
- 7 Campbell, T, Bradshaw, SD, Dixon, KW & Zylstra, P (2022) Wildfire risk management across diverse bioregions in a changing climate. *Geomatics, Natural Hazards and Risk*, 13:1, 2405-2424. <https://doi.org/10.1080/19475705.2022.2119891>
- 8 Department of Biodiversity, Conservation and Attractions Annual Reports (2017/18 to 2022/23 inclusive).

A new approach to wildfire risk management is needed.

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