

# 13 TREE FALLS



## FACTS ABOUT PRESCRIBED BURNING AND WILDFIRE IN SOUTH-WEST FORESTS

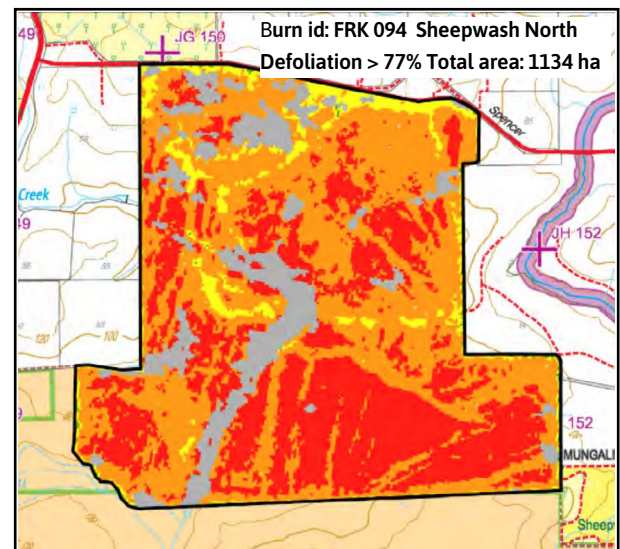
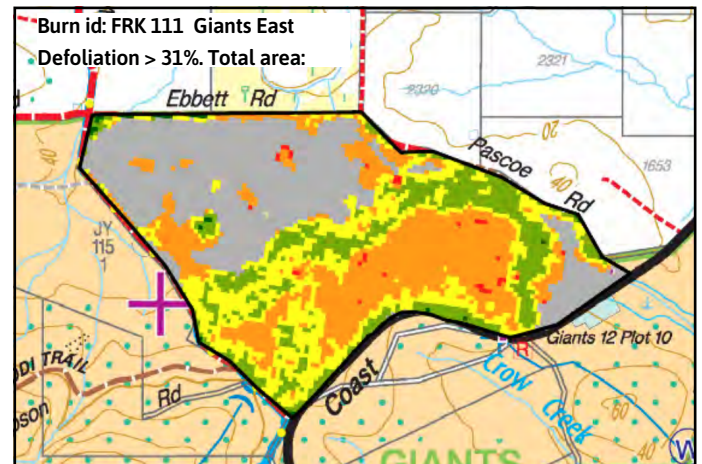
It has long been known that prescribed burning increases tree-fall rates in south-west forests.<sup>1,2</sup> But they are not factored in when considering the costs of the prescribed burning program.

Most of the 2024-25 prescribed burns in the Frankland and Donnelly districts had crown defoliation more than three times DBCA's specified criterion of 10%. (see Fact Sheet 12).<sup>3</sup> The prescribed burns had similar or worse severities than the two wildfires in the same districts, making a mockery of DBCA's claim that its prescribed burning saves the environment from the worse impacts of wildfire.

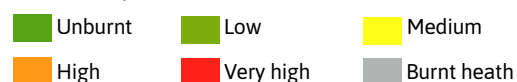
DBCA does not routinely monitor tree-fall rates following prescribe burns, but citizen scientists concerned about the large numbers did so following some burns in the Frankland District. Luscombe-Pedro observed a tree-fall rate of 2.14 trees/ha in Giants East, and another citizen deduced an even higher rate following the Sheepwash North prescribed burn.<sup>4</sup>

The devastation from the Giants East burn in tingle forest in December 2024 was so great that it received national news coverage. Subsequently, DBCA did its own survey and deduced a tree-fall rate lower than Luscombe-Pedro's.<sup>5</sup>

Despite the few data points, it is clear that more severe burns lead to greater numbers of tree falls, which means future prescribed burns are likely to have even worse impacts as they are likely to be even hotter and more severe due to the warming and drying climate.



Burn severity:



DBCA burn severity maps for Giants East (December 2024) and Sheepwash North (December 2024) prescribed burns.



Fallen tingle tree following Giants East prescribed burn Source: Luscombe Pedro.<sup>4</sup>



Broken tree following Giants East prescribed burn, Source: Luscombe Pedro.<sup>4</sup>

## Impacts of tree falls

Increased tree falls will change the forest structure with the loss of older, bigger trees, creating forest with a greater proportion of smaller trees. This will lead to loss of habitat for arboreal mammals and birds, particularly those that need nesting hollows, e.g. the three threatened black cockatoo species.<sup>6</sup>

As old growth forest uses less water than re-growth and 'younger' forest, the juvenilisation of the forest will increase the forest water use and reduce runoff into water catchment dams. Macfarlane & Silberstein estimated annual water use by overstorey trees in jarrah forest was ~200 mm/year in old-growth and ~420 mm/year in regrowth forest (17% and 35% of annual rainfall, respectively).<sup>7</sup>

Macfarlane & Silberstein also commented that forests evolve to optimise carbon gain per unit water use. The greater basal area of old-growth forest and lesser water use complicates the assessment of relative carbon sequestration rates of old and young forest. Though, the ability of old-growth forest to sequester more carbon than regrowth forest has been observed by other researchers.<sup>8,9</sup>

Trees naturally senesce and die, so there is a 'natural' tree-fall rate. Tree falls at rates above the 'natural' rate contribute to the ecosystem damage discussed above as the large, old trees lost are not replaced for many decades or centuries. Due to the current and future hotter and drier conditions, it is likely that some species, e.g. tingle and karri will never regrow.

Potential greenhouse gas (GHG) emissions from tree falls above the background 'natural' rate (i.e. emissions from the decay or subsequent burning of the fallen tree) should be considered as net emissions and included in Western Australia's (WA's) annual GHG emission accounts.

Assuming a tree-fall rate similar to that observed by DBCA following the Giants East burn, of 1.25 trees/ha, and a background fall rate of 0.5 trees/ha (from the Trial Tingle Burn, January 1997) over the whole 2024-25 prescribed burn area gives a conservative estimated number of tree falls of about 87 000.<sup>5,1</sup> Using allometric equations to calculate tree biomass and the shadow carbon price, the total emissions and offset cost can be calculated:<sup>10,11,12</sup>

Area burnt (ha)	115 962
Tree fall rate above 'natural' (trees/ha)	0.75
Number of fallen trees	87 000
CO <sub>2</sub> -e emissions per tree (tonnes/tree)	15
Total CO <sub>2</sub> -e emissions (M tonnes)	1.3
Per cent WA's annual emissions <sup>13</sup>	1.5%
Carbon price (\$/tonne)	70
Offset cost (A\$ millions)	91

This huge offset cost, A\$91 million, is a measure of the climate cost of the increased tree falls from DBCA's prescribed burning.

Burning of peatlands adds further to net GHG emissions and the climate impacts of DBCA's prescribed burning program.

### Tree falls above the 'natural' background rate:

- Cause loss of habitat, particularly nesting hollows
- Reduce the forest's ability to sequester carbon
- Contribute large net GHG emissions.
- 'Juvenilise' the forest leading to greater water use and less runoff to water catchment dams.

### References

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