

TAMES ROAD PLANNED BURN - IMPACT ASSESSMENT

Strathbogie Sustainable Forests Group - January 2016

Summary

Recent planned burns in Strathbogie forests have been disastrous for the health of the forest and its resident fauna. A significant proportion of the old-growth elements in the forest that have survived 150+ years of logging and fires, have been destroyed by a recent planned burn. Planned burning of the sort and at the scale undertaken by DELWP in Strathbogie forests must stop immediately and a more informed approach to bushfire mitigation needs to be developed, particularly in light of the shift to a risk-based approach to fire risk in the State.



Old-growth trees killed by the planned burn - how old was this ancient Victorian Blue Gum?

Background

On 28 March 2015, Dept. Environment, Water & Planning (DELWP) initiated a planned burn of a 521 ha section of forest in the Strathbogie Ranges, known as the Tames Rd planned burn. Following the burn, at the request of a neighbouring landholder that knew the area intimately, members of the Strathbogie Sustainable Forests Group (SSFG) inspected parts of the burn adjacent to its northern perimeter. From that inspection it was clear that at least some parts of the burn area had experienced a high intensity fire that severely scorched large areas of the tree canopy, incinerated areas of understorey vegetation to mineral earth and killed a number of the last large, mature trees in parts of the forest.

Subsequent inspection of another part of the planned burn suggested that the environmental impact of this burn may have been more widespread than initially thought.

The considerable community concern about the Tames Rd planned burn and the proposed 3000 ha Barjarg Rd burn (scheduled Autumn 2016) was expressed to DELWP's Regional Director, Hume Region, Christine Ferguson. The SSFG was then encouraged by the Regional Director to discuss its concerns with DELWP Regional Services staff. Several members of SSFG met with DELWP staff in the forest on a number of occasions to discuss the impact of the Tames Rd burn on forest environmental values. In spite of observations that the Tames Rd burn had a severe, negative impact on large, old trees in at least some parts of the burnt forest including a Special protection Zone, DELWP staff insisted that the burn was 'successful'.



Koala killed within a Special Protection Zone in the Tames Rd planned burn.

The Strathbogie Forests are home to a number of forest-dependent species that are vulnerable to the impact of planned burns: Powerful Owl, Brush-tailed Phascogale, Greater Glider, Yellow-bellied Glider, Koala. Indeed, Koalas were killed by the fire and corpses were found after the burn. Several of these species are also listed on DEWLP's Advisory list and under the FFG Act. The FFG Act also lists three Potentially Threatening Processes that planned burning contributes to:

- Inappropriate fire regimes causing disruption to sustainable ecosystem processes and resultant loss of biodiversity.
- Loss of coarse woody debris from Victorian native forests and woodlands
- Loss of hollow-bearing trees from Victorian native forests.

These environmental issues are given low priority by DELWP Regional Services staff in the context of planned burns. This Regional position is clearly at odds with comments made recently by the Minister for Environment, Land, Water & Planning, in response to the Victorian Government's change to Fuel Reduction Burning policy - adopting a risk-based approach, rather than a hectare target.

“Under the Code of Practice for Bushfire Management on Public Land, maintaining or improving the resilience of ecosystems is a core objective for the fuel management program.

“Planning for the 2015-16 fuel management program includes assessment of the ecological values - including biodiversity and the impact of fire on threatened species - and development of fuel management strategies that are appropriate to the landscape being treated, and which mitigate risks to these values.” [Minister Neville 9.11.15](#)

In light of the reluctance of DELWP Regional Services staff to accept the anecdotal evidence regarding the impact of planned burns and because an additional 6700 ha of planned burns are scheduled for the Strathbogie forests in the next three years (Hume Region FOP, DELWP), the Strathbogie Sustainable Forests Group decided to undertake detailed, on-ground surveys to quantify the impact of the Tames Rd burn on the health and survival of trees within the planned-burn area, to encourage informed decision making.

Introduction

In November and December 2015, eight months after the Tames Rd planned burn (521 ha), the Strathbogie Sustainable Forest Group conducted transect surveys in order to quantify the impact of the burn on forest health.

Large, old trees are critical ecological elements of a healthy forest, as well as being a broader surrogate for forest health and values that are difficult to assess. The large, old trees in Strathbogie forests:

- Produce numerous hollows for a range of specialized bird and mammal species: birds – e.g. tree-creepers, sittellas, owls, kingfishers, nightjars; mammals – e.g. phascogales, gliders, pygmy-possums, Antechinus.
- Take 100-150+ years to develop the large hollows needed by hollow-dependent species like the Powerful Owl, Greater Glider and Yellow-bellied Glider.
- Flower more reliably and produce more reliable flows of nectar and pollen for the numerous birds, mammals and invertebrates that rely on these resources.
- Shade the forest floor to keep the ground conditions cool and humid.
- Were alive and thriving well before Archduke Franz Ferdinand of Austria was assassinated, which precipitated the WWI and began the ANZAC legend. Large, old trees confer stability and resilience to an ecosystem that has had to cope with historic climate variability and which will be subject to increasing climate change in the decades to come.

The forest within the burn area has a history of logging and was commercially logged 40-50 years ago. Much of the forest, particularly areas of Victorian Blue Gum and Manna Gum, have regenerated as dense stands of straight-trunked, even-age trees, interspersed with remnant old-growth trees that were spared the axe and saw.

Methods

Four 50 m-wide transects (total 2100 m long) located within the boundary of the Tames Rd planned burn were surveyed in November and December 2015. This study area was 10.5 ha in size. Transect locations were selected based on vehicular access to the burn and to include a variety of fire intensities, based on DELWP's post-burn and severity map.

Transect bearings:

- Transect 1: 0395585 5914412 walking north from Gerars Tk
- Transect 2: 0395974 5914436 walking north from Gerars Tk
- Transect 3: 0396665 5914899 walking west from Dry Creek Rd
- Transect 4: 0396793 5915202 walking west from Dry Creek Rd

Teams of six-or-more people walked each transect, performing the roles of: scribe, walking the bearing, photographer, tree-measuring. The transect bearing and distance were measured using hand-held GPS units. Tree diameter was measured using tape measures. At the start of every 100 m interval on the transect, five photos were taken (one of data sheet, then north, east, south, west). All tree measurements were allocated to the 100 m intervals along the transect.

The benchmark for 'large' trees in this type of vegetation is 70 cm diameter at breast height (DBH, 1.3 m above ground, DELWP EVC 23 benchmark). All trees and stags (dead, standing trees) with a DBH greater than 70 cm were measured, identified to species or stag and assessed for fire-impact, according to these four criteria:

1. **Burnt, or not burnt by the planned-burn.** This category included all trees that showed signs of being burnt by the planned-burn. If any part of a tree was at all visibly burnt by the burn it was categorized as 'burnt'.
2. **Living, or dead at time of burn.** It was important to determine the impact of the planned-burn on forest stags. During the survey all dead trees (standing and fallen) were inspected to determine whether they were dead or alive before the burn. Where doubt arose, the tree or stag were excluded from the survey data.
3. **Killed, or not killed by burn.** If a tree showed signs of life (green leaves) it was regarded as 'living', even if its health appeared compromised by being fire affected.
4. **Standing after the burn, or felled by the burn.** This was applied to both trees and stags. Standing = trunk and larger limbs largely intact. Fallen = previously standing, now either fallen or so burnt out there is no longer useful habitat for hollow-dependent arboreal fauna. Where doubt arose, burnt, fallen trees were excluded from the survey data.

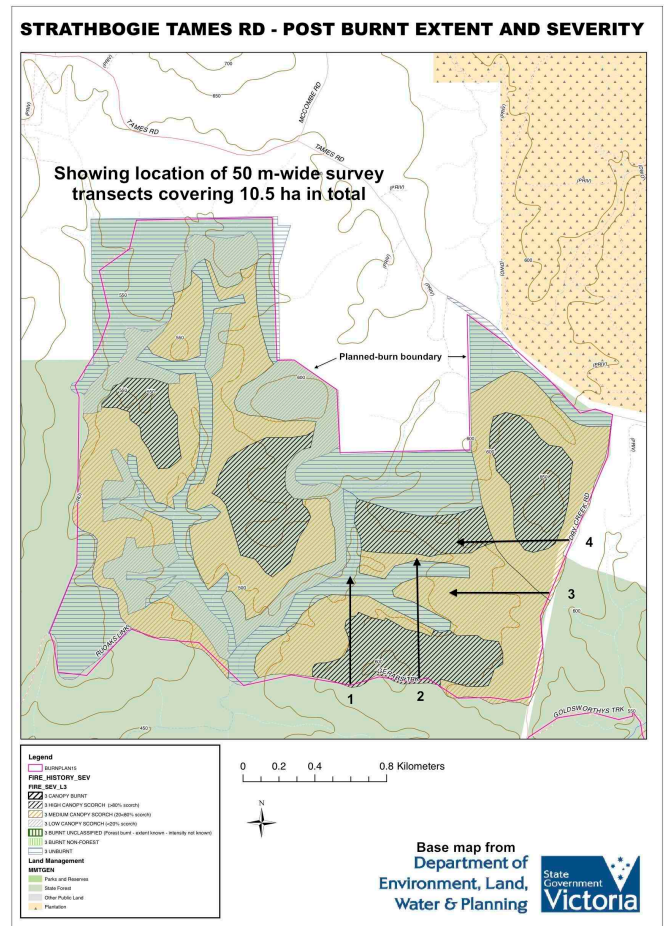


Figure 1. Strathbogrie Tames Rd – post burnt extent and severity. Location of the four transects indicated in the SE section of the burn area.

Results

A total of 273 trees with diameter ≥ 70 cm DBH were measured and assessed for planned burn impact. All measured trees were of the species - Narrow-leaf Peppermint (*Eucalyptus radiata*), Victorian Blue Gum (*E. bicostata*), Manna Gum (*E. viminalis*). In the case of stags, species was not recorded.

During analysis of the data, trees and stags were divided into two size-classes: 70-99.9 cm DBH and ≥ 100 cm DBH in order to assess potential differences in fire-impact on trees/stags of significant size i.e. ≥ 100 cm DBH.

The forest along the surveyed transects was variably impacted by the planned burn; some areas remained completely unburnt, others were significantly impacted by the burn. The data has been analysed to show the overall impact of the planned burn on the trees and stags in the study area, as well as the fire's impact on those trees actually burnt in the fire.

Stags

A total of 60 stags were recorded in the survey area; a density of 5.7/ha, roughly equal numbers in the two age classes.

Of the 60 stags, 45 showed signs of being burnt in the planned burn; roughly equal numbers in the two age-classes. Of these 45 stags, 23 (51%) were destroyed by the planned burn (Table 1).

Burnt stags 70-99.9 cm dbh	No.	%
stags standing	12	52
stags felled	11	48
Total	23	
Burnt stags 100-160 cm dbh	No.	%
stags standing	10	45
stags felled	12	55
Total	22	
Burnt stags combined 70-160 cm dbh	No.	%
stags standing	22	49
stags felled	23	51
Combined total	45	

Trees

A total of 213 trees (larger than 70 cm DBH) were recorded in the survey area; a density of 20.3/ha. Trees measuring more than 100 cm DBH in size comprised 22.5% of this total.

Of the 213 trees in the survey area, 164 were burnt by the planned burn. Most of these (128/78%) were in the 70 cm to 99.9 cm DBH size class of which 19% were killed/felled. Of the burnt trees 100 cm DBH or greater, almost half (47%) were killed/felled by the burn (Table 2).

Burnt trees 70-99.9 cm dbh	No.	%
trees alive	104	81
trees killed	13	10
trees felled	11	9
combined killed & felled	24	19
	128	
Burnt trees 100-200 cm dbh	No.	%
trees alive	19	53
trees killed	9	25
trees felled	8	22
combined killed & felled	17	47
	36	

Photographic survey fire impact

The images taken at every 100 m mark along each transect (north, east, south, west) have been collated, but not yet analysed. However, eye-balling the image-survey suggests that the actual impact of the fire on the forest varies considerably from the 'Strathbogie Tames Rd – post burnt extent and severity' map (Fig. 1). Some areas on the map marked as 'unburnt' were clearly and substantially burnt. Other areas marked as 'medium canopy scorch' contained large areas of unburnt forest.

Discussion

The impact of this ‘successful’ (according to DELWP’s assessment) planned burn on stags and trees in the survey area was devastating. It’s the impact on the stags and larger trees in the forest that gives most concern. Many parts of the burn area carried barely a trickling fire, yet this was enough to fell some of the largest and oldest trees in the forest. Our survey results show that:

- **Half (51%) of all stags (≥ 70 cm DBH) in areas affected by the burn, were destroyed by the burn.**
- **Almost half, 47%, of the largest trees in the forest (≥ 100 cm DBH) in areas affected by the burn, were killed by the burn.**
- **The four biggest trees in the survey area, by a considerable margin (between 1.5m and 1.9 m DBH), were all killed and felled by the planned burn.**

Extrapolation of these results beyond the survey area suggests that this planned burn has seriously degraded the ecological condition and resilience of this forest and likely caused significant population crashes, if not local extinctions, of several species of hollow-dependent fauna. The fact that many of the trees killed by the burn were also felled, will increase the stress on all hollow-dependent fauna in the forest.

The effect of such ‘forest management’ underlines the reason for listing the ‘loss of hollow-bearing trees’ and ‘inappropriate fire regimes’ as Potentially Threatening Processes under the FFG Act.

Moreover, our assessment of the planned burn is likely to *under-estimate* the longer-term impact. In assessing trees, we often erred on the side of caution, for example recording trees as living even if they showed signs of severe stress (leaf fall, splitting bark). The number of trees killed by the burn may well increase significantly following the intense heat and water-stress of the 2015-16 Summer. The fact that 2015 annual rainfall totals, hence lower soil moisture, for the Strathbogie Tableland were well below average going into Summer, will result in additional stress on the forest.

These results call into serious question DELWP’s program of planned burning in the Strathbogie forests. The level of tree death and loss of hollow-bearing trees is completely unacceptable and flies in the face of threatening processes listed under the Flora and Fauna Guarantee Act. To continue with the scheduled program of planned burns would be ecologically irresponsible and likely not necessary, given the Government’s shift to a risk-based planned burning target.



Listed species like the Powerful Owl still survive in the Strathbogie forest and require very large, old trees for nesting. Image D. Fraser.



With the few large, hollow-bearing trees now destroyed, this forest can no longer support Greater Gliders, Yellow-bellied Gliders or breeding Powerful Owls.

Reasons for the devastating impact of this planned burn

The forest giants that were destroyed by this planned burn had survived all manner of forest disturbance for the last 150 years of European settlement, including fire events. So why did this fire cause such apparent devastation. Though not exhaustive, the following points likely contributed to the outcome:

1. Perhaps the forest was too dry. The 2014-15 Summer was hot and dry and burning in March was considered by many locals to be too early.
2. Were the trees otherwise stressed and hyper-vulnerable? Did the Millennium Drought (2001-2009), followed by extremely wet years of 2010-11, somehow increase the vulnerability of the forest trees? Stressed trees are particularly vulnerable to fire.
3. Did the Millennium Drought result in unusually high accumulations of fuel at the base of gum-bark trees, which are particularly vulnerable to fire?
4. Were the fuel moisture assessments pre-burn accurate and representative? The varying topography over this 500 ha area likely meant fuel moisture varied as well. Fuel moisture readings around and at the base of large, old trees may vary from those in other parts of the forest.
5. It's likely that previous fires have caused similar mortality of big trees, hence the current low numbers of trees greater than 100 cm DBH throughout the forest (anecdotal observations). If

the next fires, planned or otherwise, continue this trend of destruction, the forest may effectively lose this critical ecological component.

Whilst the burn killed/felled many more trees than ‘expected’, the pattern observed is not unique in the State. There are a number of examples in recent years, that we are aware of, where ‘low intensity’ planned burns have caused significant ecological damage:

1. Phillip Island – large stands of Manna Gums and Blue Gums were killed during a planned burn in the Oswin Roberts Koala Reserve.
2. Langi Ghiran State Park– significant Manna Gum deaths from an escaped planned burn.
3. Warby Ranges – stands of large, old Blakeley’s Redgum killed during successive planned burns.
4. Mt Alexander – many large, old Messmate trees killed by planned burns.

In the absence of routine, quantitative assessment of the impact of planned burns by DELWP, the ecological impact of planned burns is very poorly understood. The importance of assessing the impact of bushfire mitigation activities was repeatedly highlighted by expert witnesses during the Black Saturday Royal Commission, but so far has not occurred. Nonetheless, it seems clear that planned burning can have devastating effects on the ecological resilience and conservation values of forests and their resident fauna. Planned burning of the sort and at the scale undertaken by DELWP in the Strathbogie Ranges must stop immediately. A better-informed approach to bushfire mitigation needs to be developed.

Images of the impact of the Tames Rd planned burn

Images and descriptions of the planned burn have been posted on-line:

Can a low intensity burn be too hot? April 20, 2015

<https://strathbogiesustainableforests.wordpress.com/2015/04/20/can-a-slow-burn-be-too-hot/>

Tames Rd, Strathbogie – another ‘fuel reduction burn’ April 29, 2015.

<https://strathbogiesustainableforests.wordpress.com/2015/04/29/tames-rd-another-fuel-reduction-burn/>

Strathbogie old growth trees – going up in flames June 5, 2015

<https://strathbogiesustainableforests.wordpress.com/2015/06/05/strathbogie-old-growth-trees-up-in-flames/>

Planned burning – an ecological disaster? Nov. 26, 2015

<https://strathbogiesustainableforests.wordpress.com/2015/11/26/planned-burn-an-ecological-disaster/>

Tames Rd planned burn – survey 2 Jan. 22, 2016

<https://strathbogiesustainableforests.wordpress.com/2016/01/22/tames-rd-planned-burn-survey-2/>

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On behalf of the Strathbogie Sustainable Forests Group
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