IMPACT OF FUEL REDUCTION BURNING ON CARBON BALANCE IN VICTORIA'S FORESTS

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Background and Study Objectives

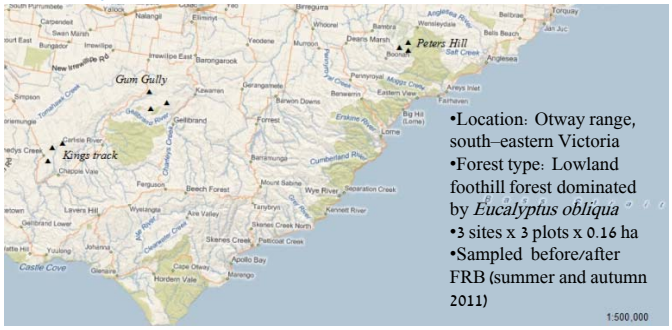
Regular fuel reduction burning (FRB) is essential to reduce the risk of mega-fires in forests near population centres and important assets such as water catchments.

Currently there is scant information in the literature to calculate FRB impacts on net CO_2 release from forests to the atmosphere during burning or in the years and decades afterwards

This project is measuring fire effects on organic carbon of forest soil, litter, understorey and overstorey to describe forest carbon stock changes as a basis for predicting and mitigating through management the overall impacts of FRB on CO_2 release to the atmosphere.

This information is crucial to better enable end-user agencies to predict the consequences of FRB on net CO_2 release from burnt forests over a range of timescales after burning and to adopt techniques to minimize CO_2 release to the atmosphere

Study area



- Location: Otway range, south–eastern Victoria
- Forest type: Lowland foothill forest dominated by *Eucalyptus obliqua*
- 3 sites x 3 plots x 0.16 ha
- Sampled before/after FRB (summer and autumn 2011)

Preliminary Results

- Significant increase in canopy openness (FRB, P<0.0001; Site, P=0.007)
- No significant changes in amount of elevated fuel after FRB
- Significant loss of bark (FRB, P=0.007; Site, P=0.005)
- Redistribution of C in surface fuel (36% loss of C in litter and 20% gain of C in humus)

Table 1. General information about study sites

	Peters Hill	Gum Gully	Kings Track
Av. elevation, m	310	266	192
Annual rainfall, mm	625	1016	1016
Annual temperature, °C	19	17	17
Total trees, d≥20 cm	109	124	148
Dominant species, %	*E.obliqua* (42); *E.radiata* (39); *E.globulus* (10)	*E.obliqua* (95); *E.radiata* (5)	*E.obliqua* (77); *E.cypellocarpa* (3)
Mean DBH, cm	40.7	43.9	43.2
Mean dom. height, m	14.6	23.6	24.7
Mean BA, m^2ha^{-1}	34.7	41.7	39.0
Years since last fire	28	27	26
Date of burn	4 March 2011	26 February 2011	28 February 2011

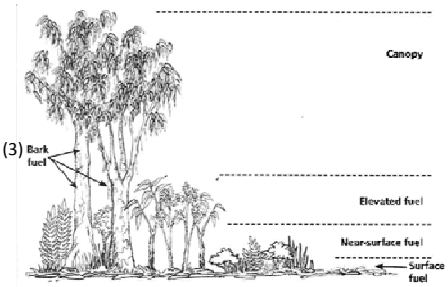


Fig. 1. Fuel layers and bark from Overall Fuel Hazard Assessment Guide, 4th ed. Hines *et al* 2010

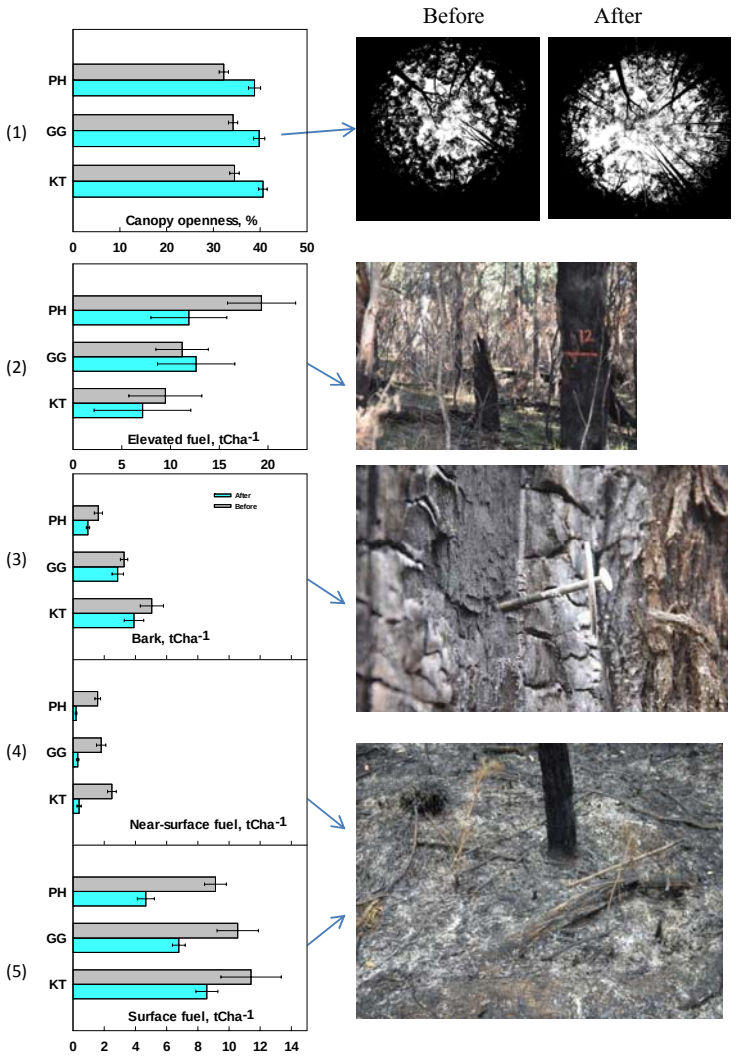


Fig. 2. Fuel before ( ) and after ( ) FRB in study sites Peters Hill (PH), Kings track (KT) and Gum Gully (GG) (by layers from Fig 1)