

Answer to question on notice from Mr. Primrose during Field Trip 4 April 2022

Question:

Where is all the evidence which disproves the hypothesis that frequent mild burning will eliminate slow-maturing obligate seeders.

Answer:

The evidence comes from two long term burning studies in NSW's forests at Bulls Ground on the north coast and Eden on the south coast as well as an objective analysis of the literature from across Australia.

The evidence is discussed in three papers in my submission No. 6. They are references 1, 6 and 12. An extract from the conclusion of reference 6 follows:

Contrary to the views of many modern fire ecologists, human ignitions were the dominant cause of fire in most Australian ecosystems for thousands of years (Pyne 1998; Kershaw et al. 2002; Gammage 2011; Jurskis 2011a, b). Patchy Aboriginal burning undoubtedly limited recruitment of woody plants by killing seedlings on sandstone around Sydney as it did elsewhere (Mitchell 1848, Howitt 1891, Noble 1997, Jurskis 2009). Frequent, mild, and patchy fires in sparsely shrubbed vegetation leave many established woody plants unscathed (e.g., Jurskis et al. 2003, Penman et al. 2008). Thus, recruitment after such fires is not a conservation issue as has often been suggested.

Studies of prescribed burning have confirmed that most obligate seeders are favored by frequent mild fire whilst a few common large shrubs are disadvantaged (Jurskis et al. 2003; Penman et al. 2008, 2009; Jurskis 2011 b). In the absence of frequent burning, these few shrubs have commenced to shade out many smaller and less common species within three or four years, reducing diversity (Penman et al. 2008, 2009; Jurskis 2011b).

Other studies of fuel accumulation (Birk and Bridges 1989), fire risk (Boer et al. 2009) nutrient cycling, and tree health (Turner et al. 2008) in dry eucalypt systems have shown that burning at three to six year intervals can maintain dynamic stability and ecological resilience in these systems (Jurskis 2011b). Physical records (e.g., Singh et al. 1981, Burrows et al. 1995, Ward et al. 2001, Hassell and Dodson 2003, Mooney et al. 2011: Figure 2) and historical records (Mitchell 1848, Curr 1883, Howitt 1891, Abbott 2003, Gammage 2011) support these studies of ecological processes pointing to ecosystems shaped by extensive, frequent Aboriginal burning.

Australia is fortunate in having good historical records of Aboriginal fire regimes and vegetation before they were impacted by European settlement (e.g., Pyne 1998, Gammage 2011). These show that prehistoric physical evidence cannot provide a reliable record of mild fire regimes. Even though historical records may be scant, such records should guide interpretation of physical evidence as well as interpretation of ecological studies.

*Human fires can support biodiversity by restoring and maintaining natural, open conditions that favour ancient trees, small understorey plants, and bare ground as well as the rare species that depend on them (Jurskis 2009, 2011 a, b). In eastern Australia, these include Hastings River mouse (*Pseudomys oralis*) (Tasker and Dickman 2004), the orchid *Prasophyllum correctum* (Coates et al. 2006), superb parrot (*Polytelis swainsonii*) (Manning et al. 2006), eastern brown treecreeper (*Climacteris picumnis victoriae*) (Ford et al. 2009), and broad-headed snake (Pringle et al. 2009). Informed application of human fires could also reverse declines in common species such as grasses.*

Reference 12 refers to prime example of the absurdity of the hypothesis – the myth that *Eucalyptus regnans* or mountain ash is one of these slow maturing obligate seeders supposedly threatened by frequent mild fire.

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| Mr Peter Rutherford |
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