**From Dry to High: Brief Background Notes for Fire Ecology Fieldtrip to Namadgi National Park, Sunday 21st October 2012**

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***Background:***

Numerous fires ignited by lightning burnt across the Australian Alps in VIC, NSW and the ACT from the 8th January until the end of January 2003, with approximately 2 million hectares burnt in total across all jurisdictions over that period. Much of the area burnt was burnt in a single day and at high intensity on 18th January 2003, which is typical of these large fire events which are climate primed and weather driven. We will look at variation in plant response to different fire intensities in a number of vegetation types/plant communities, from low altitude to high altitude, focussing on eucalypt responses in particular, but also looking at understorey species as well. Below is a) a list of terms that I may use on the day and which are used extensively in the fire ecology and fire behaviour literature; b) a list of common and scientific names of major canopy species and a c) a short bibliography of some useful references on fire ecology.

***a) Terms:***

**Planned Fire:** this term covers all management fires, including ‘prescribed burns’, ‘control burns’, ‘hazard reduction burns’ etc.

**Unplanned Fire:** this term covers ‘wildfires’, ‘bushfires’, ‘grassfires’ etc. While typical summer bushfires are unplanned fires (whether ignited by lightning or arson), some planned fires can turn into unplanned fires when the wind changes. Also note that unplanned is not the same as un-natural; and that some planned fires mimic natural regimes.

**Backburn**: a fire lit during a firefighting operation to reduce fuel in areas around the main fire front.

**Fire Event:** a particular fire e.g. the 2003 Canberra fires.

**Fire Regime**: the particular combination of *fire season,* *fire frequency* and *fire intensity* occurring at a point in the landscape over time after numerous fire events. Fire type can also be referred to as a component of the fire regime, namely whether fires are peat fires, surface fires, crown fires etc. While the details of the fire regime will vary from point to point, there will be tend to be a ‘typical’ regime regionally, but this will still vary locally with slope, aspect, geology etc.

**Fire Season:** whether fires typically occur in summer, autumn, winter or spring. This varies across Australia with climate.

**Fire Frequency**: typically, the interval between fires, but the term can also cover a variety of other measures involving time such as the number of fires over time at a point in the landscape and time since (last) fire.

**Fire Intensity**: the heat output from a fire. While fire intensity is a direct measure of energy, it is rarely measured during a fire, so the effect of fire intensity – *fire severity* – is often measured post-fire.

**Fire Severity**: the effect of a fire, usually as measured by scorch on vegetation.

**Leaf Scorch**: the degree or amount of scorching evident on leaves as measured post fire – commonly simply estimated as ‘green’, ‘brown’ or ‘black’. Note, where leaves are brown or black scorched, they will fall from the tree quickly and will start the process of leaf litter accumulation.

**Leaf Consumption**: where leaves are fully consumed during a fire – i.e. ‘beyond scorch’.

**Leaf Litter**: the bed of fallen leaves and twigs on the forest floor. This is also referred to from a fire management point of view as litter fuel, fine fuel or surface fuel.

**Fire Killed Species**: a plant which is killed by 100% leaf scorch. Such species rely on seed storage –a ‘seed bank’ to re-establish postfire. Where the seed bank is stored varies between species: some species have a soil seed bank (e.g. many Fabaceae such as *Acacia* and *Dillwynia*); some species have a canopy seed bank (e.g. many Myrtaceae and Proteaceae). If held in the canopy, seed may be released each season as the capsule opens (e.g. some *Leptospermum*) or held in the capsule for longer periods (e.g. *Eucalyptus* and many *Banksia*) until stem death or plant death through senescence, drought or fire. Species that hold seed on the plant for a long period of time in protective capsules are called serotinous species.

**Resprouting Species**: a plant which can resprout after 100% leaf scorch. Resprouts may be via underground storage organs (e.g. orchids); protected growing tips (e.g. grasstrees); bark protected epicormic shoots on trunks and branches (e.g. many eucalypts) or from basal coppice (e.g. many eucalypts). While some basal coppicing is from lignotubers (e.g. true mallees), not all is. Note: the ability to resprout can vary within a species based on interactions between age of plant, stem diameter, pre and post fire climate, fire intensity etc.

**Plant Succession**: the term has been used in many differing ways over the years and has evolved many different meanings, concepts and controversies over the length of the 20th century, but the simplest and least controversial definition is ‘a process of vegetation change at a location over time’. Traditionally, the term can be broken into ‘primary succession’ - where species are effectively colonising a new landscape such as occurs after glacial retreat or on newly exposed rock or mineral surfaces – and ‘secondary succession’ where an area of vegetation is disturbed in some way as in the case of flood, drought, fire etc. By far the more common situation is that of secondary succession where there is already a cover of vegetation in place, which recovers in a variety of ways from resprouting, seed germination or (re)colonisation etc. Recovery after fire is an example of secondary succession.

**Canopy**: the tallest and most dominant layer in a vegetation stand. This will be a tree if the vegetation is forested, but the canopy can also be a shrub in the case of heathlands.

**Understorey**: the lower layers in a vegetation stand. May be shrubs and/or grasses and/or forbs etc.

***b) Common and Scientific Names for Canopy Species in Western and Higher Parts of the ACT:***

Alpine Ash, *Eucalyptus delegatensis* subsp*. delegatensis*

Apple Box, *Eucalyptus bridgesiana*

Black Sallee, *Eucalyptus* *stellulata*

Brittle Gum, *Eucalyptus mannifera* subsp*. mannifera*

Broad-leaved Peppermint, *Eucalyptus dives*

Brown Barrel, *Eucalyptus fastigata*

Bundy Box, *Eucalyptus goniocalyx*

Mountain Gum, *Eucalyptus dalrympleana* subsp. *dalrympleana*

Narrow-leaved Peppermint, *Eucalyptus robertsonii* subsp*. robertsonii*

Red Stringybark, *Eucalyptus macrorhyncha*

Ribbon Gum, *Eucalyptus viminalis*

Scribbly Gum, *Eucalyptus rossii*

Snow Gum, *Eucalyptus pauciflora* (also *Eucalyptus debeuzevillei* and *Eucalyptus niphophila* in higher areas around Mt. Ginini, Mt. Gingera and Mt. Bimberi).

Swamp Gum, *Eucalyptus camphora* var. *humeana*

Other species we may discuss en-route:

Black Cypress Pine, *Callitris endlicheri*

River Oak, *Casuarina cunninghamiana*

***c) An Introductory Selection of Vegetation, Fire and Eucalypt Ecology References:***

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