

FRIENDS OF HODDLES CREEK
NEWSLETTER



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Burning Leaf Litter

Do we really know what's going on in fuel reduction burns?

Many questions arise regarding fuel reduction burns and one of these is the loss of the leaf litter and hence the creatures which inhabit it. Our knowledge of invertebrate species is woefully deficient with very many species not yet identified and their responses to fire barely studied.

Bacteria, fungi and invertebrates help decompose organic material and release nutrients for new growth. The leaf litter also assists with moisture retention and maintenance of soil structure. Litter is a vital component of the life cycle of the forest.



A recent example of 'scorched earth' at Spargo Creek. Photography © Gayle Osborne

Important decomposers of litter include species of beetles, cockroaches, millipedes and surprisingly moths. Amongst the leaf litter we find dead leaves that have been skeletonised by moth and beetle larvae.

In many places decomposition occurs mainly when litter is wet, however, in Australia's dry sclerophyll forests nature has developed species to deal with dry litter. Sclerophyll is a Greek word meaning hard-leaved (sclero - hard and phyllon - leaf).

Of particular interest are moths of the *Oecophoridae* species. Their larval habits are diverse, but many feed on dead Eucalyptus leaves on the forest floor. There are thought to be over 5,000 *Oecophoridae*

species in Australia, but fewer than half of these have been scientifically recognized and given names.

An entomologist recently pointed out that there are a number of unstudied moths of the *Anthelidae* species, the caterpillars of which feed in the winter and remain dormant underground in summer, so avoiding natural summer fires. Burning when they emerge from their safe refuges underground is rapidly making these species extinct before they have even been sampled and named. It is so sad.

Ted Edwards (co-author *Moths of Australia* and retired CSIRO scientist) has written a number of articles on fuel reduction burns. He writes, "What is relevant to the control burning method of managing forests and woodlands is that the macro-invertebrates, micro-invertebrates and the rest that are essential in leaf litter breakdown in Australian forests are entirely vulnerable to fire. Fire kills them all.

The normal way that these invertebrates deal with fire is to repopulate from unburnt refuges following the fire."

The theory is that fuel reduction burns will be patchy allowing for recolonisation from the patches, and in places they are patchy. However large sections of many burns are 'scorched earth' with absolutely no chance of recolonisation for insects, reptiles and small mammals.

Ted Edwards also notes, "From a philosophical point of view a technique (control burning), which kills all the biological agents of litter breakdown, is very unlikely to be an efficient or effective way to control litter." (continued on page 4)

This article, by Gayle Osborne, appeared originally in the Wombat Forestcare Newsletter and is reproduced with the kind permission of the author.

Lyrebirds: our forest firefighters

We've all enjoyed the amazing songs and mimicry of the superb lyrebird and have no doubt caught a glimpse of one dashing across a road or through the trees. But did you know that the lyrebird may actually reduce the likelihood of fires in our forests? New research by Daniel Nugent and his colleagues from La Trobe University has provided evidence of this important role for one of our iconic Yarra Ranges inhabitants.

The study

Anyone who has watched a lyrebird foraging will have noticed just how effectively they can rake through ground litter. With large feet that look like garden rakes they turn over leaves and small ground plants in their search for worms and other critters that live in the soil. In fact, lyrebirds are so efficient that estimates suggest that they can turn over the whole forest floor every two years.

All this activity accelerates the decomposition of litter in Eucalyptus forests, preventing it from drying out. During the warmer months, when wildfires are most likely, lyrebird activity is concentrated along the margins of gullies, possibly reducing the accumulation of surface fuels and disrupting fuel connectivity (necessary for lateral spread of a fire). Could this activity reduce the likelihood of fire?

The La Trobe study, conducted in 2011-12, examined the interaction between lyrebird foraging and fire in burnt and unburnt sites in Eucalyptus forests in the footprint of the 2009 Black Saturday fires.

What were the results?

By comparing matched areas where lyrebirds were present and fenced areas where they were excluded, the authors found that lyrebirds reduced litter fuel loads by an amazing 1.66 tonnes per hectare over a 9 month period.



With feet like garden rakes, the superb lyrebird is well designed to forage through leaf litter on the forest floor in search of food



Lyrebird on his mound showing just how effective those feet are at clearing undergrowth

Commenting on these findings, they added “Our modelling suggests that the reduction in litter fuel loads brought about by lyrebird foraging has the potential to result in markedly subdued fire behaviour relative to that predicted in the absence of lyrebirds.”

Lyrebirds were more likely to forage in unburnt patches, even though the overall quantities of food were similar in both burnt and unburnt areas. Lyrebird activity might also be a contributing factor in sparing gullies from the effects of wildfire, providing fire refuges for other species as well.

Lyrebirds: our forest firefighters

(continued from page 2)

Keeping the balance

Following a high severity fire, lyrebird numbers may be severely reduced as a direct result of being killed by the fire. Less food and thick vegetation regrowth may keep numbers down and the absence of lyrebirds would allow the build-up of higher fuel loads, increasing future fire risk. Low intensity fires do not trigger the same level of seedling growth and, in this environment, lyrebirds can continue their foraging and disturbing activities, decreasing the likelihood of future fire.

Increased planned burning by fire management agencies aimed at reducing the risk of wildfires may threaten lyrebird populations. In areas where lyrebirds are present, planned burns should only use low-intensity fire that does not enter fire sensitive gullies.

Predation is also a risk to lyrebird populations. Foxes and cats pose significant threats, especially in urban fringe areas. The loss of lyrebirds from forests adjacent to such areas could result in higher fuel loads and an increased likelihood of wildfires threatening human life.

Reference. Nugent, DT, Leonard SWJ, Clarke MF. Interactions between the superb lyrebird (*Menura novaehollandiae*) and fire in south-eastern Australia. CSIRO Publishing: Wildlife Research, <http://dx.doi.org/10.1071/WR14052>.

Lyrebird photographs: Alex Maisey



Silver Banksia tree

Have you seen our 'other' banksia?

We are all familiar with the Hairpin Banksia, (*Banksia spinulosa*), with its cylindrical, orange-yellow flowers at this time of year, covered in stiff black 'hairpins'. But Hairpin Banksia has a local sister we may not have noticed.

Silver Banksia (*Banksia marginata*), has smaller, paler yellow, more oval flowers; its leaves are shorter, broader when young and less toothed when mature, and silver rather than pale green on the underside.

In western Victoria, Silver Banksia can grow in to a substantial tree – an image on the internet shows one with a trunk about 1m in diameter. In other areas it is a low heathy shrub.

The Silver Banksias we are seeing in Hoddles Creek are often only knee-high, but others are slender trees 2-3 metres tall, flowering, but (worryingly) hardly ever setting seed – the seed-bearing cones are not forming.

How big would our local Silvers grow, given the chance?

It is suggested that Silver Banksias were sought after to fuel baker's ovens in the early days of white settlement. This, plus subsequent clearing and burning, might explain while all the plants we are seeing are young or very young. In addition, they appear to be suckering from the roots of a long-gone tree, rather than growing from seed. We don't know how old a tree needs to be to set viable seed, or for how long the roots can keep resprouting.

Have you seen Silver Banksia growing locally? If so, please let us know where, how big they are, and if there are any cones.

To contact us, email friendsofhoddlescreek@gmail.com.



Silver Banksia flower

Are planned burns just a short-term fix?

(continued from page 1)

We need to ask whether these burns are a short-term fix that make our landscape more fire prone? Are we losing all the complicated natural mechanisms that keep litter in check?

The article on page 2 of this Newsletter reported that lyrebirds reduced forest litter by a massive 1.66 tonnes per hectare over a nine-month period. However, lyrebirds are not present in areas that have been completely burnt. Other birds, such as White-winged Choughs also scratch



Skeletonized Eucalyptus leaf. Photography © Gayle Osborne.

their way through our bush, moving large areas of litter around and, to a lesser extent, many other birds and animals such as Bassian thrushes and Echidnas also shift litter. We have already lost other digging and scratching species such as bandicoots and bettongs.

Although there is a proposition for benefits of planned burns in the event of a wildfire, are these benefits being realised? According to McCarthy & Tolhurst (2001) -



Garrha demotica, a moth of the *Oecophoridae* family. The caterpillar of this species grows to a length of about 1 cm and lives in a portable case made from oval pieces of plant leaves joined with silk. Photo taken in the Cape Liptrap Coastal Park.

Effectiveness of Broad-scale FRB (fuel reduction burns), “surface fuels appear to re-accumulate to pre-burn levels within the first 4 years” and reduced bark is effective for between 4 and 10 years. The report also notes that “Only about 1 in 20, on average, of the fires sampled in conjunction with FMZ 3 ran into a ‘helpful’ FRB. This result suggests that in the current circumstances the impact of FMZ 3 treatment is close to that of random fuel management.”

FMZ3 refers to the zone furthest from human habitation and the McCarthy and Tolhurst research shows that the assistance these burns provide in controlling a wildfire is arbitrary.

The ABC recently reported “Scientists warn that the wrong fire patterns could see more losses of threatened species across the country.” Reports published by the CSIRO and BirdLife Australia cite “inappropriate fire regimes” as threatening more than 50 Australian mammal and 50 Australian bird species.

It is often said, particularly by government fire agencies, that Australian flora, fauna and fungi are 'adapted' to fire, but I prefer to see it as 'adjusted' to fire. Having adjusted (adapted) to occasional burning does not mean that species will survive repeated burning, such as delivered by the current fuel reduction burn regimes.

Tolerable fire intervals have been developed for many vegetation communities; these are based on the time it takes for flora species to set viable seed. In the 2013 Victorian State of the Environment Report, the commissioner found that, in 2012, 40% of native vegetation was burnt below the tolerable fire interval.

The answers are not simple, but there is no doubt that fire is being used excessively and that our understanding of the complexities of natural litter decomposition is poorly understood and studied.

Time to pause and review.

References

- Ted Edwards - <http://www.npaact.org.au/res/File/2009/Fire2.pdf>.
- 2013 State of the Environment Report - <https://www.ces.vic.gov.au/publications/state-environment-report-2013>.
- <http://www.theage.com.au/victoria/not-just-a-pretty-tail-the-lyrebird-is-a-superb-firefighter-20150303-13tg3o.html>.

Like to join FOHC?

The Friends of Hoddles Creek are always on the lookout for new members to add new ideas, new helpers and new friends to our group. If you'd like to join, simply contact us with your name, address and phone or email details. You can mail these to FOHC, PO Box 298, Yarra Junction, Vic 3797, or email us at friendsofhoddlescreek@gmail.com.

See more at our website (www.provender.com.au/fohc) or on Facebook – just search ‘Friends of Hoddles Creek’ or ‘FOHC’.

