Issue 26 - December 2013

Wombat Forestcare Newsletter

Our summer visitors are arriving to nest in the Wombat and the Hepburn Park.
Sacred Kingfishers, Satin Flycatchers and the beautiful Rufous Fantails. The Wombat is becoming a bird watching 'hot spot' with the return of a pair of cicadabirds that have decided to nest here far west of their usual range. Take your binoculars and experience our extraordinary forest.
Gayle Osborne (editor) & Angela Halpin (design)

Nooks and Grannies - The Wombat's Woody Elders

Words & images by Alison Pouliot

I recently asked some friends about their favourite haunts in the Wombat Forest. Without exception, they referred to two factors – the presence of old trees and/or water. The seven major waterways that rise in the forest have been explored in earlier newsletters so in this article I'll look at why the Wombat's old trees matter.


How old is old enough?

The most difficult part of writing about the Wombat's old trees is that there are very few left about which to write. Old trees are declining globally and unfortunately the Wombat hasn't escaped this trend.[1] Mining and logging in the second half of the nineteenth century razed almost all of the forest, hence few trees exist in the Wombat that are much older than a century.

When an old tree is lost from the Wombat, it is not just the loss of an individual tree as a discrete entity, but all its interconnectivities and functions as well. From their role in providing habitats for countless species, to watershed protection, to the more abstract role of storing carbon, old trees are vital to maintaining the biodiversity and resilience of the Wombat.

Why old trees matter

While in Europe a few years back, I witnessed the felling of several 500+ year-old linden trees – thought to be the oldest in the town – to make way for an apartment block. As these ancient giants toppled and were swiftly converted to a mountain of woodchips, a passerby must have observed my distress and commented, 'Don't worry, they can plant new ones'. Beside the fact that I did worry and the 'new ones' didn't materialise as an apartment block was in the way, I realised that old trees are considered by some as easily replaceable, and that the difference between old trees and new trees may not be well understood.

How does an old tree differ from a young tree? Old trees are important keystone structures in forests, performing unique ecological roles not fulfilled by younger trees.[2] As a tree ages it develops particular characteristics that provide habitats for a range of fauna, fungi and flora. Characteristics such as cavities, hollows, cracks, fissures and complex branching all create specialised habitats not found in younger

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trees. Decaying and hollowing roots at tree bases also provides access to underground cavities and other specialist habitats. As a tree ages, it typically become more heterogeneous in structure and form as well as providing greater overall habitat area.

Old trees provide very specific niches that are inhabited, for example, by saproxylic [3] invertebrates such as beetles, flies, millipedes and snails, as well as bryophytes and fungi. There are likely to be several thousand invertebrate species in the Wombat that are dependent on dead and decaying wood, each with particular habitat requirements. Numerous species of saprobic (decomposing) fungi break down complex compounds such as lignin and cellulose and hence play an active role in the formation of microhabitats for further species. Many of these specialist organisms are likely to be rare and may become rarer if more old trees are lost. As an example of the high demand for the specialist habitats provided by old trees, ecologist David Lindenmayer and colleagues reported that more than forty species of cavity-using vertebrates utilise old trees for nesting and shelter sites in mountain ash *(Eucalyptus regnans)* forests.[4] Vertebrate species that utilise hollows and cavities in the Wombat's old trees include birds such as crimson rosellas, gang gangs and cockatoos, owls such as boobooks, owlet-nightjars and powerful owls, along with various others including treecreepers, kookaburras and sacred kingfishers.[5] Hollows are also vital to mammals including various gliders, possums, bats and phascogales.[6] Moreover, once an old tree's life ends and it becomes a log on the forest floor, a whole other range of habitats for further groups of organisms becomes available. One only has to peer closely under a log to see the scurrying of a great suite of invertebrates and the tunnels and chambers, nooks and crannies they occupy.

The trials of the elderly

Some groups of organisms are at greater risk of extinction than others and long-lived species are especially prone.[7] There are essentially two types of older trees in the Wombat and both are at risk. There are those that form hollows (generally gums and peppermints) that are easily lost in fuel reduction burns but are not targeted for logging. Old hollow-bearing trees are also especially prone to bulldozing on the boundaries of fuel-reduction burns.[8] Then there are the 80 – 100 year old messmates, which have yet to develop hollows and are sought for logging.[9] All are also are prone to the combined impacts of climate change, drought, fire and habitat fragmentation.

Most trees in the Wombat never reach an age necessary for the hollow formation process to begin. In addition to reducing biodiversity, the loss of old trees and the resultant imbalanced forest age structure also affects natural fire regimes. Consequently, fires are likely to increase in frequency and severity and hence destructiveness.[10]

Few of the Wombat's trees reach an age where hollow formation occurs.

Even tiny cracks and crevices provide vital habitats for numerous organisms.

I recently had the great pleasure of trawling the archives of the Kew Fungarium (just like a herbarium but for fungi). The deeper I delved, the greater my appreciation of this collection of organisms and the future significance of their DNA. A tree is also a repository for DNA and other forms of memory, recorded in ways we may not know how to decode, now or in the future. Sometimes there is great creative potential in other ways of 'knowing', in pondering

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the Wombat's mysteries and enigmas. Molecular techniques have catalysed taxonomy and revolutionalised our understanding of species relationships but do they make us care about old trees? Scientific knowledge helps us understand them. Caring is required to conserve them.

Old trees, especially hollow-bearing trees, are particularly prone to fires

Repositories of Memory

Old trees affect us in subtle ways. For many, they inspire wonder and quietude in an over-stimulating world. While rarely a part of conservation arguments, the aesthetics of old trees stir our emotions and enrich our imaginations. Such arguments ultimately amount to simply being human. These are the less quantifiable reasons that comprise all the benefits of visiting an old tree, as one might an old friend. This is where memories form that may seem elusive. Not the kind that can be stored and accessed in convenient bytes, but the sort that might catch us in an unexpected moment. The sort that evoke a curious sensation, or a not-quite-describable feeling or thought; as though a fleeting shaft of light illuminates a memory deep in the nether regions of one's mind, hovers a moment, then passes, leaving us in a state of suspended incomprehension, but with a sense that something profound occurred. It's something each of us intuitively knows - that humanity is inextricably entangled with and deeply affected by nature, by old trees.

Old trees were once worshipped simply because they were old.[11] No further justification, counting, measuring or protesting was required. Being old was enough. In a few places that attitude prevails. Some of the Wombat's old trees could live to 400, 500, 600... or more years, if given the chance. Inevitably we all view the value of old trees differently. But if we lose the Wombat's last old trees, we lose not just the trees and their associated biodiversity, but also memory and meaning.

It is perhaps the dual resonance of visceral feelings inspired by old trees along with scientific arguments that together offer the greatest possibilities to conserve the Wombat's woody elders. ■

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Who is eating the truffles?

Words & images by John Walter

Australia is recognised as a hotspot for fungal diversity, a diversity that includes an extensive list of truffle-like fungi. I use the term truffle-like deliberately as these fungi are not even closely related to the well known and very expensive European truffles, but are instead related to the gilled mushrooms we all know and recognise. Both the truffle-like fungi and the true truffles are sometimes referred to as hypogeous fungi, meaning that their fruit bodies are either partly or fully buried below the soil or humus layer. Another term you may see in reference to them is sequestrate fungi which refers to the spores being "sequestered" or hidden from the outside. Estimates place the total number of Australian hypogeous and sequestrate species at around 1200 which is ten times the known number of European species.[1]

Many readers will know truffles use odours to attract animal species that readily eat them and disperse the spores via their faeces. Some research has been undertaken in Australia to examine the use of odour by fungi and one study clearly established the ability of Tasmanian Bettongs to locate buried fungi via smell.[2] There are also numerous references to squirrels and flying squirrels doing the same in the northern hemisphere, leaving little room for doubt about the role of fungal odours in attracting an animal intent on some fungi consumption. I cannot help but think of the Monty Python skit on the "Being Eaten by a Crocodile Competition" where the humans marinated themselves to enhance their attractiveness to the crocodiles and improve their chances to be the first competitor consumed; therefore winning the competition. The last line of the sketch sums it up thus. *"But nothing's predictable in this tough, harsh, highly competitive world where today's champion is tomorrow's crocodile sh*t."*

For our Australian truffles and truffle-like fungi becoming bettong or potoroo sh*t is as good as it gets and the more mobile the eater, the greater the chance of a distant discharge point for the spores. We do have some species of true truffles in Australia, but to date I have not found any. I have, however, found a good number of the truffle-like species and am fascinated by their evolutionary path.

Fungi have evolved many different pathways for spore dispersal including gills and pores, splash cups, cannons, sacs waiting for wind or raindrops to puff the spores out and of course the food pathway of truffles. Our

Above – *Zelleromyces* sp. – one of the Russulaceae

gilled fungi are highly successful, with tricks to keep the mushroom upright and finely-spaced tapered gills that ensure the spores fall free of the cap to be taken away on slightest breeze. Two very large and successful families of gilled fungi are the Cortinariaceae and the Russulaceae and a great many of our truffle-like species belong to these families. But I wonder what makes a fungus with a highly successful spore dispersal system such as gills move to a different pathway?

Even more interesting is the clear evidence that truffle-like members of the Cortinariaceae have evolved on numerous unrelated occasions,[3] indicating there are strong evolutionary pressures favouring the formation of hypogeous forms. The members of the Cortinariaceae and Russulaceae families are well known for their importance in the establishment of a healthy forest as they form a mycorrhizal relationship with the forest trees; enhancing the tree's ability to gather water and micro-nutrients and taking the by-products of photosynthesis in return. By fruiting in suitable fungi habitat and then being eaten by an animal from the same habitat, the fungus is increasing the likelihood of its spores being dropped next to a plant that is suitable for the re-establishment of a mycorrhizal relationship. This strategy can only prove successful, of course, if you have fauna, with a penchant for fungi as food, available in the habitat. Australia's smaller mammals have become very well known for their mycophagy (fungi eating) with some showing a strong preference for hypogeous fungi. This is no doubt a factor in the evolution of such a diverse range of hypogeous fungi species in our country but being eaten by a mammal does not cause a fungus to develop a hypogeal sporocarp. It has been suggested that "the initial selective pressure for hypogeal fruiting habit may have been in response to climate ... with later selection for animal dispersal of spores."[4]

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Above and **Right -** Habit, shape and section of a *Cortinarius* species

In Australia the mycophagy gluttons are the bettongs and potoroo's and Claridge & May's 1994 study listed this group as having fungi spores in 100 percent of faecal samples examined. Fungi is believed to make up at least 25% of their overall diet by volume and the consumption spans the entire year, not just the peak fungi seasons when consumption is higher. The Tasmanian Bettong *Bettongia gaimardi* was once widespread throughout our region and the wider south east, but it is now believed extinct on the mainland. The only other southern Victorian species in this group is the Long-nosed Potoroo *Potorous tridactylus* which is more coastal in habitat but does occur in the Grampians and there is a single record for just north of Ballarat. The Southern Brown Bandicoot *Isoodon obesulus* is also a consumer of the truffle treats but this omnivorous species is more seasonal in its selection of foods.[5]

Above - *Descomyces* sp. (Cortinariaceae)
Right - *Cortinarius* sp.

Above - Unknown
Left - *Protoglossum* sp. (Cortinariaceae)

Its range is similar to the potoroo and it is not recorded locally, so who is eating the Wombat Forest truffles? Claridge and May's 1994 study also listed the Swamp Wallaby *Wallabia bicolor* as a major consumer of fungi with spores found in 100 percent of samples tested. Another study in 2001 showed that a high diversity of fungi is eaten by the Swamp Wallaby with a focus on hypogeous species.[6] Our much-loved local wallaby is more generally known as a generalist browser but research undertaken in northern New South Wales has shown that fungi comprised 15 percent of the stomach contents of culled wallabies (annual average with a range from 4 to 23%).[7] I do not grow roses at home but do grow plants especially for our resident wallaby ensuring he remains much-loved, even after he visits our garden.

Perhaps the most surprising details for me were the references to mycophagy by rodent species. Local species listed by Claridge and May were the New Holland Mouse *Pseudomys novaehollandiae*, the Bush Rat *Rattus fuscipes* and the Swamp Rat *Rattus lutreolus*. While these native rodents are high consumers of fungi there is a tendency (at least with the Bush Rat) for the main consumption to occur during the winter fungi season. The marsupials mentioned earlier however maintain high consumption levels throughout the year.

Another very interesting listing was the introduced Black Rat *Rattus rattus*. It is a high consumer of fungi and another New South Wales study found spores from a similar numbers of fungi species in the scats of both Black Rats and Swamp Wallabies collected in a fragmented forest on the New England Tablelands. Most of the fungi species recorded were hypogeal and as there are no native bettongs or rodents at the site, it is thought the Black Rat is playing an important role in the dispersal of truffle-like fungi and is therefore important to the health of these fragmented forests by aiding the ongoing establishment of mycorrhizal relationships.[8] So now I know what the rats were doing when they were not chewing the sweet corn and the tops of my carrots last year.

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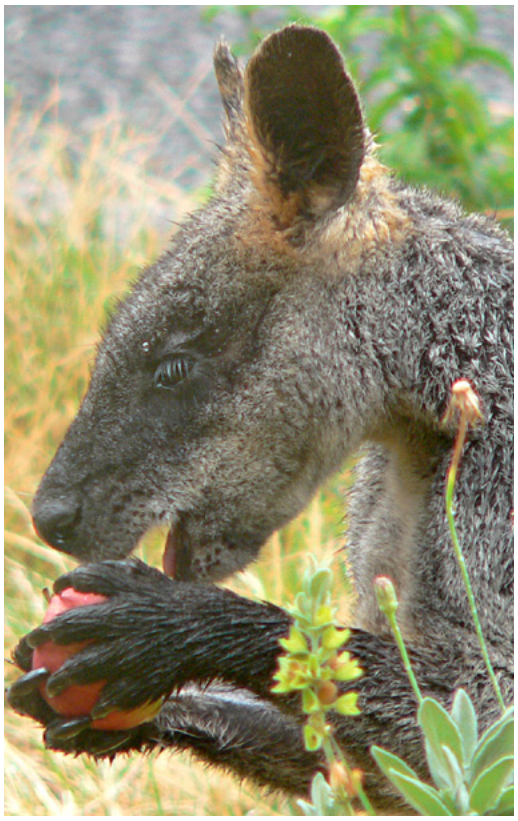
The ever increasing decline of the small mammals in our forests must be considered as a threat to the long term health of the forest, both from the reduction in dispersal of mycorrhizal fungi and also from the reduction in soil turnover as a result of their foraging for these underground food packets. This soil turnover is extremely important as it aids the infiltration of water and traps organic matter, increasing microbial activity and returning nutrients to the soil. The Swamp Wallaby population has not been impacted in the same way as the smaller mammals and it is now a major contributor to the success of many hypogeous species in the Wombat Forest. We should note, however, the findings of Melissa Danks in her PhD thesis that the Swamp Wallaby does not eat hypogeous fungi based solely on availability but showed distinct preferences.[9] The forest is an integrated system that requires a diversity of fungi eating mammal species in order to remain truly healthy, it cannot thrive on the power of wallaby sh*t alone. ■

Top – The introduced *Rhizopogon luteolus* found under pine trees is related to the Boletes

Below – Our much loved wallaby eating one of his much loved apples



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Great new car sticker

Catch up with us at our next Wombat Forestcare event and get our new $1 car stickers. Help support our campaign to get Park status for Wombat Forest. Locally printed, our quality sticker should last up to 8 years in the weather. Help protect the Wombat Forest.

Camera Project Update

By Gayle Osborne

Our motion-sensing camera project commenced in March 2012 and we have complete surveys on eleven of our thirty research sites in the Wombat Forest. These sites were set-up in 2006 in mature forest and were surveyed using hair-tubes and spotlighting.

With advice from a scientist, we decided to deploy the three cameras for three weeks along one side of the site and then a further three weeks on the other side. Our progress is slow but this increases the chance of recording species, as even if species occur on the site there is no guarantee of recording them on our cameras.

As well as our project, the Victorian National Parks Association (VNPA) has used volunteers to survey 20 of these sites with cameras.

We aim our cameras at a tea infuser containing an attracting bait, so our survey method is skewed towards fauna which find the bait interesting.

What have we found? Agile Antechinus *Antechinus agilis* were on all our sites, to such a degree that we have thousands of images. We have to assume these images are of Agile Antechinus as the hair samples confirmed their presence, however there is always the chance of another specie of Antechinus being present, for which we may not have a clear enough image to identify. The VNPA has identified a Dusky Antechinus *Antechinus swainsonii* on one site.

Bush Rats *Rattus fuscipes* have been recorded on seven sites, with an introduced Black Rat *Rattus rattus* on one site. This is where a number of images assist with identification. As the rat climbed a log, the very long tail alerted us to the difference.

The cameras show us that there are healthy populations of Swamp Wallabies *Wallabia bicolor*, Common Wombats *Vombatus ursinus* and Echidnas *Tachyglossus aculeatus* on nearly all sites.

One interesting result has been the number of Mountain Brush-tail Possums *Trichosurus cunninghami* (4 sites) and the lack of Common Brush-tail Possums *Trichosurus vulpecula* (1 site). Our old camera has been deployed at a few other locations and there are more sightings of the Mountain Brush-tail.

We have had Common Ring-tail possums *Pseudocheirus peregrinus* pass in front of the cameras, however they do not appear to be interested in the bait and do not linger.

We have had an increasing number of birds hop through, and it was surprising to see a White-throated Treecreeper *Cormobates leucophaea* and at another site a Red-browed Treecreeper *Climacteris erythrops* both on the ground. Birds that we usually associate with tree trunks.

A male Spotted-quail Thrush *Cinclosoma punctatum* was found near Farm Road adding to the record on Amblers Lane, with the VNPA group finding one near Paddy's Point. This bird is listed as *Near Threatened* in Victoria and these are new recorded sightings.

Grey Currawongs *Strepera versicolor* have found the cameras to be particularly interesting and there are great images of currawongs staring into the camera.

As well as providing important data, the cameras afford us a chance to glimpse the usually unseen world of our fauna. ■

Trevor's Bird Page

By Trevor Speirs

Return of the Cicadabird

Readers may recall the article in our March newsletter (Issue 23) of sightings last summer of Cicadabirds *Coracina tenuirostris* in the Wombat Forest.

Extremely rare west of Melbourne, this spring/summer migrant to Victoria is now breeding in the same area they were previously seen.

While the male has been reclusive, the female has been in regular attendance on the nest (very small for the bird's size), high in a fork of a messmate.

Red-browed Treecreepers

In Victoria, the Red-browed Treecreeper *Climacteris erythrops* is not found any further west than the Wombat Forest, and even then it is an uncommon sight.

There is a particularly fertile birding area in the Wombat Forest near Trentham, a damp, ferny spot with a seasonal creek, which supports a variety of bird species throughout the year. It was here that Red-browed Treecreepers were observed in mid-September entering a sloping hollow at the top of a dead tree (stag) about 6 metres high.

Dead sloping trees like this are a preferred nesting site for Red-browed Treecreepers.

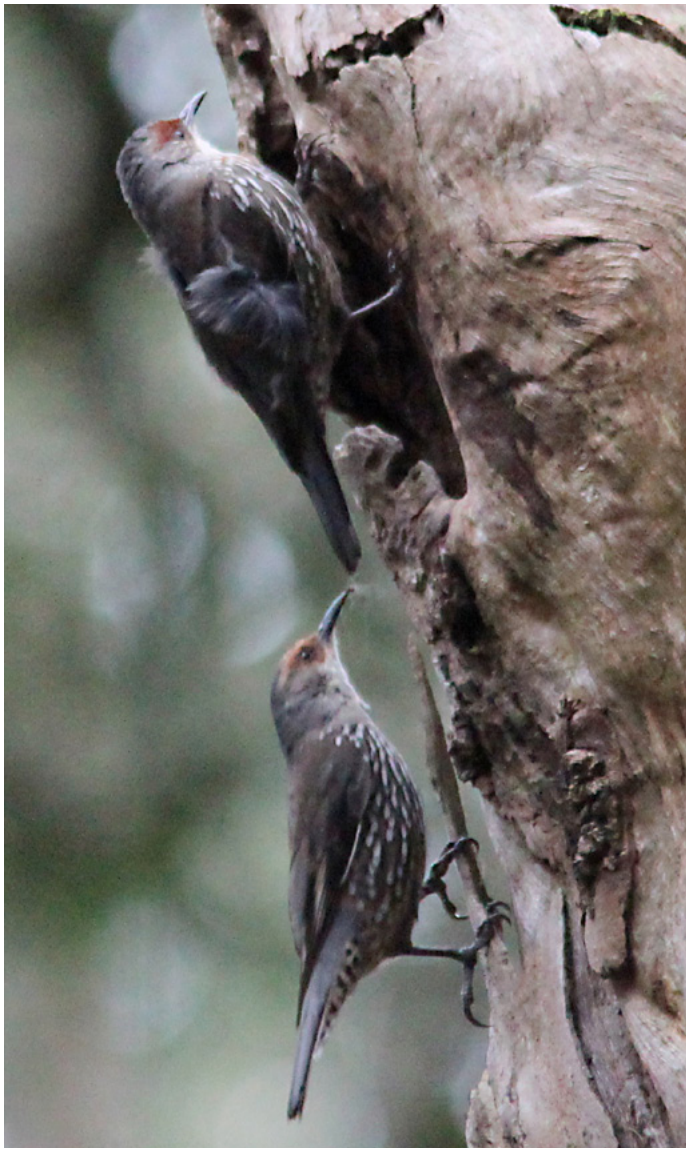
Subsequent visits to the site confirmed breeding activity, with male birds seen entering and leaving the hollow regularly. A female was observed only once in mid- September.

Red-browed Treecreepers are cooperative breeders, with up to three helpers from previous offspring, nearly always males, assisting the parents.

By early November the nesting tree was still standing despite a very windy spring and a fortunate delay of a planned fuel reduction burn.

Sacred Kingfishers *Todiramphus sanctus* appeared recently to nest nearby and were seen inspecting a hollow high in a eucalypt.

About 50 metres away a pair of Satin Flycatchers *Myiagra cyanoleuca* have arrived from NE Queensland or New Guinea and are perching on the same dead branch where the remains of last year's nest are still visible. ■



Top - Female Cicadabird *Coracina tenuirostris* on nest
Above - Male Red-browed Treecreepers *Climacteris erythrops* line up to enter the nest hollow
Photography © Gayle Osborne

Sprung

Words and images - Alison Pouliot

If you go down to the woods today...

Following a recent mass migration from their native habitat of the bedroom, mattresses appear to have comfortably adapted to pretty much all of the Wombat's habitat types. While commonly seen in swampy riparian woodland areas and roadside verges, they're also partial to shrubby foothill forests. Unlike most species they are seemingly indiscriminate to differences in geology, soil type, altitude, water availability, aspect or other environmental factors.

Scientists are currently trying to understand their means of reproduction, which so far, has remained a mystery. Asexual reproduction in the form of budding has been suggested based on numerous observations that one mattress very quickly becomes two, although identical genetics with the parent mattress have not yet been established. Researchers have not so far been able to directly observe the budding process, most likely because it occurs after darkness. While moonlight may be a trigger in the process, the absence of daylight is thought to play a greater role.

Although the Wombat mattress population is steadily growing, many threats exist for mattresses such as rain, fire, piss, mould, 4WDs and Clean Up Australia Day.

It is also not known, for example, how climate change or UV radiation may affect their future survival. It is likely that they are highly susceptible to sudden changes in weather as well as longer term climate shifts. Of longer term concern is the probability of inbreeding and loss of genetic variation in small fragmented populations. Poaching could also become a serious issue.

To date researchers have been perplexed as to their means of dispersal. It was originally thought that they may have multiple life phases, somewhat like slime moulds, which have a creeping phase during which feeding and growth occur and an immotile reproductive phase.

Others have suggested that mattresses may be highly social organisms similar to ants. Once a queen mattress has mated it may be fertile for the rest of its life, flying to new locations to start a new colony, biting off its wings on landing. However, rather than using wings for flight, the prevalence of rubber tyres in the vicinity of the mattresses could provide further clues to their mobility. The discovery of springs inside mattresses has also prompted further suggestions that they can bounce over large distances, similar to macropods.

Most promising is the theory of the assistance of a mammalian vector in their distribution. This cutting edge idea arose following the detection of homing hormones in mattresses. The discovery of highly specialised cells – known colloquially among researchers as boomerangocytes – represent a significant breakthrough in possibilities for reuniting mattresses with their vectors.

As the orchids push through the earth and birds tends their nests, readers can rest assured that this story has a happy ending in knowing that the mattresses will soon be back in the bedrooms they came from. ■

Growing up in the Wombat

By Judy Weatherhead

Bill Franzke, one of our members, spent his school holidays exploring the forest south of Trentham with his grandfather, a naturalist.

The family gained their livelihood from distilling eucalyptus, gold prospecting and harvesting timber for mineshafts, houses and firewood in the 1950's and 60's.

Bill's grandfather introduced him to the natural world, particularly orchids. Each spring they added to the collection of orchids including caladenias and blue sun orchids, which can be found in the forest today.

Bird life seen in those days included wrens, Eastern Spinebills, Crimson Rosellas, hawks and Wedge-tailed Eagles. Only in the open country near Tylden did they see cockatoos and corellas.

Fishing for trout in the Coliban, near Spring Hill was often rewarded by the sight of platypus swimming nearby.

On one occasion they sighted 3 or 4 emus grazing in the open country near Little Hampton. Emus would have been a common sight before clearfelling started in the area.

Hunting for rabbits and foxes was another activity where Bill became competent and was using a rifle by the age of ten.

Bill's butterfly collection consisted of Imperial Whites and Wood Whites, which produce two, broods each summer, laying their eggs on mistletoe and wild cherries. The Imperial Blue has a symbiotic relationship with the Silver Wattle and black ants. The Sword Grass Browns are found laying their eggs on sword grass.

Nowadays Bill's interests are trout fishing and bird observation in his Trentham garden.

Top - Giant Sun Orchid *Thelymitra aristata*
Above - Pink Fingers *Caladenia carnea*
Photography © Gayle Osborne

We welcome his contributions to our group and the sharing of his extensive knowledge. ■

Wombat Forestcare Membership

Wombat Forestcare Inc. is dedicated to preserving the biodiversity and amenity of the Wombat State Forest by utilising the skills and resources of the community. By becoming a member you will have input into our activities and projects, and give support to caring for our forests.
For memberships and further information contact Gayle Osborne, phone 03 5348 7558 or email info@wombatforestcare.org.au
Membership fees are only $15 single and $20 family. **Visit our website - www.wombatforestcare.org.au**