Issue 43 - March 2018

Wombat Forestcare Newsletter

Welcome to our March edition. This issue features the iconic Wedge-tailed Eagle, parasitic fungi, more pea species and fantastic photography by our members. With autumn arriving, it is that fungal time of year again and a perfect opportunity to walk in the forest and enjoy their great array of colours and forms.
Gayle Osborne (editor) and **Angela Halpin** (design)

Wedge-tailed Eagle.
Photography © Lynda Wilson.

High and Mighty

By Trevor Speirs

At last count twelve diurnal raptor species have been recorded in the Wombat Forest but identification can be quite difficult as these birds are often spotted high in the sky and then disappear over the horizon while you're focusing the binoculars. This is never a problem with Australia's largest bird of prey, the Wedge-tailed Eagle *Aquila audax*, which is a reasonably common sighting in the forest, with pairs often seen soaring and gliding high on the thermals, sometimes with a magpie or raven in pursuit. With a wingspan of over two metres these majestic birds are very adaptable, occurring in diverse habitats from arid country and farmland through to woodlands, forests and mountains.

While rabbits and carrion are the staple diet of Wedge-tailed Eagles in Southern Australia they have a surprisingly varied taste, with remains of animals such as Mountain Brushtails, Common Brushtails and Eastern Ringtail Possums having been found in their nests. Unlike some falcons, eagles are not known to be capable of night hunting so this raises the question of how nocturnal mammals become prey of diurnal raptors. Some of the possible reasons could be the result of roadkill, a consequence of fire meaning less cover and hollows for possums, injury (e.g. blindness in possums) and crepuscular hunting by the eagles. There has in fact been a daylight observation of a Wedgie pulling a Brushtail Possum (probably a Common Brushtail) from within its hollow but this may not be the norm.

Birds the size of ravens are also

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Massive stick nest with young Wedge-tailed Eagle.
Photography © Sandy Scheltema.

Immature Wedge-tailed Eagle. Photography © Lynda Wilson.

prey and there are a couple of rare observations of Yellow-tailed Black Cockatoos being snatched in flight, which is a little unusual as most Wedge-tail food is taken from the ground. A few years back, deep in the Wombat, in a small clearing on the forest floor, I saw a pair of Wedge-tails making short work of a Sulphur-crested Cockatoo, quite possibly plucked from the tree canopy. Another particularly memorable sighting occurred several years ago in open woodland east of Kyneton where I saw three Wedge-tailed Eagles continually banking and dipping over an Eastern Grey Kangaroo for well over an hour as they tried to push the kangaroo to a state of exhaustion.

It is well known that Wedge-tailed Eagles have suffered from severe persecution in the past and there are still regular reports today of illegal shooting, trapping and poisoning, especially in sheep growing regions. And while still considered to be common on the mainland, the New Atlas of Australian Birds 2003 reported a significant decline nationally of 28 percent in the final two decades of last century. Another modern day threat, not just to Wedgies but raptors in general is the advent in Australia of wind farms. In 2014 The Age reported an independent study carried out for AGL, owners of Macarthur Wind Farms, Australia's largest, that an estimated 500 raptors a year were killed by Macarthur's 140 turbines. Brown and Black Falcons, Nankeen Kestrels, Spotted Harriers as well as Wedgies were some of the raptor species killed. Of course renewable energy is of vital importance but let's hope that companies and their engineers can come up with some bird friendly answers to help our precious wildlife.

On a more positive note, in Western Australia (where Eagles fans abound!) one young man has been fitting real Eagles with a solar powered GPS, and the tracking results have been quite amazing. Adult breeding pairs of Wedge-tailed Eagles are considered sedentary while young birds are dispersive and can travel long distances. This was borne out with one youngster logged travelling 1000 km through arid WA in only three days. Other results revealed birds reaching altitudes of 2900 metres above sea level and maximum speeds of around 100 kmp. Check out the blog, very interesting. www.wedge-tailedeagletracking.blog.com.au ■

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Embracing the Wombat's Parasites

Words and images by Alison Pouliot

Mention the word *parasite* and some people instantly begin to scratch. It is not a word that always sits comfortably, conjuring odious images of ticks or leeches or freeloading *Homo sapiens*. On the contrary, organisms that are deemed *indicators* (e.g. frogs) or *pollinators* (e.g. bees) are usually held in higher regard because their significance to humans is more readily apparent.

The reproductive sporophores of the vegetable caterpillar, *Ophiocordyceps robertsii*. Photography © Alison Pouliot.

Unlike the partners in mutually beneficial symbioses, parasites do not believe in reciprocity. However, even though they do not directly avail their hosts, parasites inadvertently help others and are vital to forest function. Through their effect on processes such as competition and predation, parasites play a critical role in the maintenance of biodiversity, directly influencing energy flows and nutrient cycling.

The pictured parasitic fungus is one of the vegetable caterpillars called *Ophiocordyceps robertsii*. It could easily be mistaken for a twig and passed by. Originally named *Cordyceps robertsii*, it was the first of the *Cordyceps* recorded in Australasia and is thought to be one of the largest in the world. This species usually parasitises moth larvae from the family Hepialidae, such as the Victorian swift moth, *Oxycanus diremptus*. These poor old moth larvae get a rough ride as they are also parasitised by other *Cordyceps* including *C. gunnii*, *C. hawkesii* and *C. cranstounii*.

The process of parasitisation is believed to begin when the caterpillar inadvertently consumes fungal spores that are caught up in leaf litter. The caterpillar's innards provide ideal habitat for the spores. As the caterpillar burrows beneath the soil in preparation for pupation, the spores begin to germinate. The resulting mycelium feeds on the caterpillar and completely fills its body cavity, effectively consuming it from inside out, killing it in the process and transforming it into a mummy. Once satiated, the fungus sends up its reproductive structure (stroma) above the soil surface to release its spores and the cycle begins again. It is perhaps little wonder that *Cordyceps* attract the macabre fascination of zombie afficionadi.

Entomopathogenic fungi (those that grow in or on the bodies of insects) are thought to play an important role in regulating insect populations (as well as those of other arthropods such as spiders, mites and ticks). In tropical forests, *Cordyceps* are the most frequently encountered fungi on arthropods and by preventing any one species from gaining the upper hand, help to control population dynamics. Insects are of course vital to forest function but when a particular species rapidly increases in numbers, say following local disturbance such as fire or more global processes such as climate change, they can have catastrophic effects on vegetation, especially monocultures. The default human response of hitting them with chemical insecticides usually increases the insects' resistance, perpetuating the problem. However, the agricultural and forestry industries are investigating the use of entomopathogenic fungi as a form of biological control to suppress target species below what they consider to be *economic thresholds of harmfulness*.

Several hundred species of *Cordyceps* have been described worldwide, occupying diverse habitats from aquatic environments to deserts. In forests they are found in soil, leaf litter, the forest canopy and almost everywhere in between, infecting about 65 percent of all insect orders. Five species have been recorded in the Wombat and surrounds and more are likely to be revealed.

Few organisms in nature elicit less compassion than body cavity-invading fungal parasites that cause the slow demise

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of their hosts. If there is one person who can convincingly do so it is David Attenborough. The segment from his Planet Earth documentary provides an astonishing glimpse into the staggering diversity of *Cordyceps*. Through their aesthetics and ecological significance, Attenborough challenges the viewer to switch attitudes from revulsion to enthrallment. In doing so he re-enchants the forest floor from a place of death and decomposition to something alluring and wondrous, something that might even be worth saving, even if only for its wondrousness. The Wombat Forest also abounds with thrilling and fascinating life forms that collectively contribute to a functioning forest, so perhaps keep a look out for suspicious-looking twigs on your next visit.

If you'd like to join a fungus foray or workshop this autumn, several are running from Trentham, Creswick, Blackwood, Woodend, Ballan and beyond. For dates, details and bookings visit ***www.alisonpouliot.com*** ■

Left: Once removed from the soil, the mummified caterpillar can be seen with the stroma protruding from its head. Photography © Alison Pouliot.

Greater Gliders

By Gayle Osborne

One of the very special creatures of the Wombat Forest is the Greater Glider. There are no estimates of population size or population trends, but our spotlighting expeditions are showing some reasonable numbers.

We spot lit along one track on 24 February 2017 and located six gliders. We returned to this track on 11 February 2018 and saw eleven gliders in approximately 800 metres.

Our first sighting occurred as we were standing at the car as dark was falling and there was a dull thud as a glider landed on a tree. Not only had a glider landed, but two gliders were emerging from a hollow. Along the track where another glider was emerging from a hollow, a second glider was making its way along branches towards the emerging glider.

Further along the track we saw other gliders on branches as well as gliders in the canopy. Usually we only see gliders emerging from hollows or high in the canopy feeding. It is very rare to see them exposed on a branch and that got us thinking about mating season, which starts in February, with births occurring between April and June.

Greater Glider *Petauroides volans*. Photography © Lynda Wilson.

This does not explain the discrepancy between the two years but we may have been observing gliders seeking mates during our visit this year. ■

Communities listening for nature – acoustic monitoring in the Wombat State Forest

Wombat Forestcare/Victorian National Parks Association/Museums Victoria

By Lynda Wilson

The forest will not be silent
The forest speaks to us … if we care to listen

When we go into the forest, the initial response is most likely based on a landscape level visual experience. The visual senses may be stimulated at a more macro level by an encounter with a wombat crossing the track, the flash of frenetic birds, or the indigenous flora in mass bloom. Those with keener eyes may even investigate the forest further at a micro level, interrogating the insects and fungi in minute detail.

Some may even take the time to utilise their sense of smell to add to their experience by noting the distinctive fragrance of eucalypts or impending rain, or as some of Wombat Forestcare members are known to do, the musty odour of a fresh scat.

We might even use our sense of touch if only to find that the soft looking foliage we've been admiring is actually quite prickly.

How much of your experience of the bush is influenced by your auditory senses?

Installing acoustic monitoring equipment.
Photography © Emily Noble.

Adult Powerful Owl near active breeding site.
Photography © Lynda Wilson.

Sound recorder. Photography © Gayle Osborne.

Scientists and naturalists alike have relied on animal sounds to locate and study species that are vocal, such as birds, frogs and mammals. A cryptic frog or bird species, for example, may be detected if its unique song is recognised.

In June 2017, Wombat Forestcare commenced recording bird calls along with the other intriguing sounds of the Wombat State Forest using new acoustic technology. This project is part of a broader program coordinated by the Victorian National Parks Association (VNPA) in partnership with Museums Victoria and with the generous support of the Helen Macpherson Smith Trust. Similar projects under the VNPA program are also being conducted at Mount Worth State Park and its surrounding district and Bunyip State Park.

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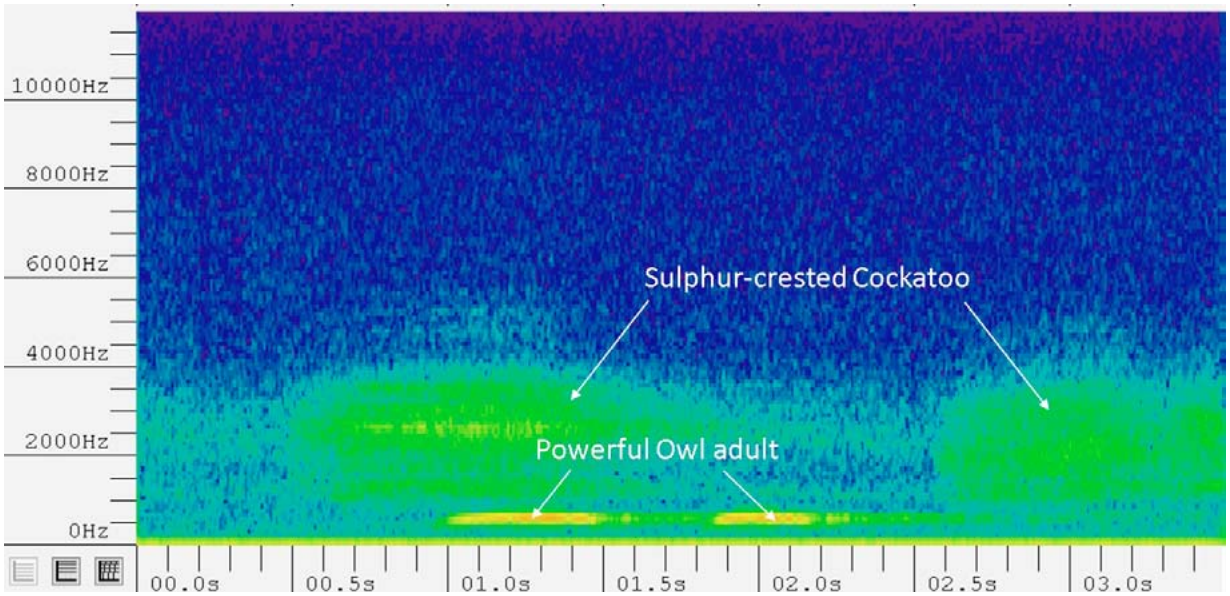

Figure 1: Spectrogram of two calls from both a PowerfulOwl and a Sulphur-crested Cockatoo over 3 seconds.

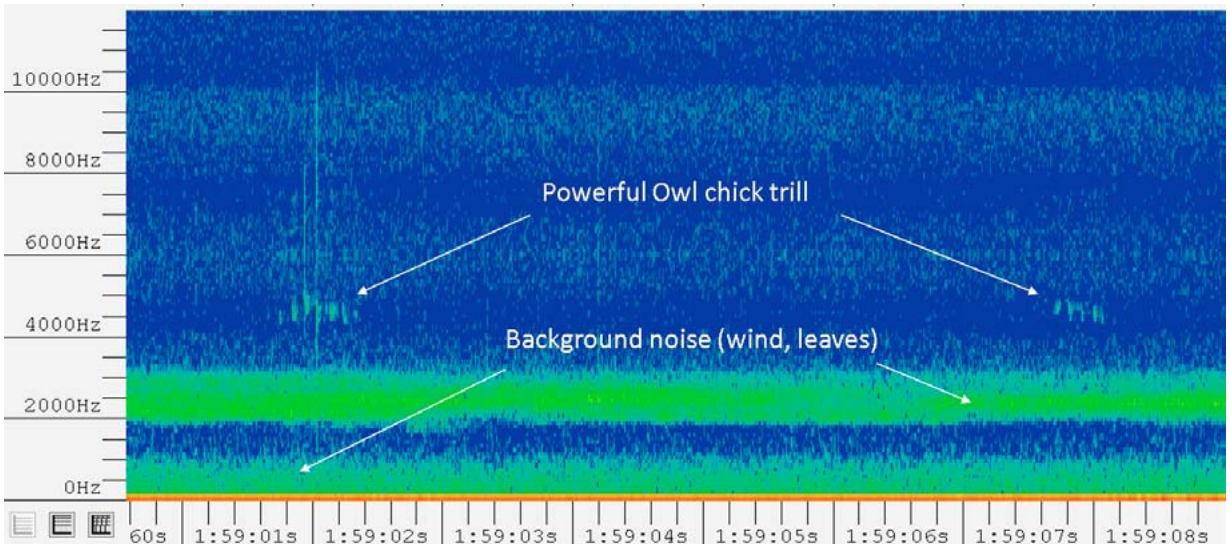

Figure 2: Spectrogram of Powerful Owl chick trill.

The Communities Listening for Nature project uses automated sound recorders specifically to record bird calls at multiple sites for extended periods. Twelve monitoring sites have been selected across the Wombat State Forest representing a cross section of wet versus dry forest, gullies versus ridges and recently burnt versus long unburnt forest. Four sound recorders are being rotated around the sites so that recordings will be taken at each site in spring, summer, autumn and winter.

The acoustic recorders allow us to record bird calls for two hours at dawn, three hours at dusk, and for ten minutes every other hour for approximately three weeks at each site. If you're good at arithmetic, you may have already calculated that this program adds up to more than 32 hours of recording per day just for our project. That's an awful lot of acoustic data!

Museums Victoria will review the field recordings utilising skilled listeners and automated sound analysis software that works in a similar way to voice recognition software. Figure 1 is an example of the spectrogram showing two calls from both a Powerful Owl and a Sulphur-crested Cockatoo. The spectrogram shows sound as changes in frequency (pitch) over time (seconds).

In the short term, WFC volunteers have been able to confirm an active powerful owl breeding site as vocalisations of a hungry chick was captured on the song meter [Figure 2]. In the longer term, these spectrograms can be used to generate a model of the species' vocalisation, which can then be used to detect matching vocalisations in collected field recordings. Over time, the data can be analysed to identify which species are present at a given site and how their presence at a site changes through the seasons, providing an unparalleled opportunity to improve our understanding of the diversity and distribution of vocal species in the forest.

The field data collected by Wombat Forestcare volunteers will be added to the public library of Victorian bird sounds managed by Museums Victoria and will eventually become available via their online collections. Just one more way to help connect Australians with their wildlife. ■

Egg and Bacon 6 – The last Bush-peas plus one

Words and images by John Walter

It is not surprising that many visitors to our local bush become confused with the wide array of Egg and Bacon readily found out there. We have already noted eight different genera in this series and discussed in detail six different *Dillwynia*, three members of *Daviesia* and eight of the *Pultenaea*. In this article we will cover the remaining six *Pultenaea* species found locally and our plus one is the related *Almaleea subumbellata.*

Before I dive headlong into this mass I want to record that since the last article, Gayle and Trevor have located a large population of *Pultenaea scabra* in the east of the Wombat Forest. It has been previously recorded to the south in the Lerderderg State Park but this large population in the Wombat Forest is an important find.

Our remaining six Bush-peas can be broken into two simple groups. Those I have found, and those I have not! Of course, this system of classification has little scientific merit, but it does serve to remind me that there are still large areas of forest out there that I have not explored. I will start with those I have not yet found in the belief you will not easily find them, and I can therefore be brief and move on to those species I have found. The "not founds" are *Pultenaea mollis*, *P. laxiflora* and *P. dentata*.

The leaves on *P. mollis* and *P. laxiflora* are similar as they are "terete" or needle-shaped and appear like the leaves of many of the *Dillwynia*. Of course, both these *Pultenaea* species have stipules at their base which you will not see on *Dillwynia* species. On *P. mollis* the stipules are strongly recurved, and the leaves are 10 to 20mm long ending in a fine but not pungent point. The stipules on *P. laxiflora* remain erect and the 4 to 12mm long leaves have a blunt, slightly recurved tip and are lightly warty on the underside. The Latin word *mollis* means soft so *P. mollis* is the Soft Bush-pea. It was found to the west of Hepburn Springs by the Castlemaine Field Naturalists and is also recorded to the west of Blackwood and is widespread in the Lerderderg State Park and around Macedon. *Laxiflora* translates as loose flora and implies well-spaced flowers although this is not necessarily apparent as the flowers on this species can be densely clustered. *P. laxiflora* is therefore known as the Loose-flower Bush-pea. There is one record for Daylesford where it was collected in 1878. It is more commonly found to the north of Castlemaine.

The last of the "not found" species is *P. dentata* and this has been reliably recorded in a line from Lyonville to Trentham, between the Domino Trail and Domino Road. The swampy nature of this part of the Wombat Forest provides ideal conditions for this species whose distinctive bracteoles are tri-dentate or toothed near the tip. It is also known as the Clustered Bush-pea due to the terminal clusters of flowers. The narrow leaves are generally hairless and have strongly incurved margins. The photographs below of these

Top: *Pultenaea mollis*, note the short wide lobes on the calyx. Photography © Chris Lindorff.
Centre: *Pultenaea laxiflora*, the calyx lobes are long, narrow and curved. Photography © David Francis.
Bottom: *Pultenaea dentata*, the hairless incurved leaves are distinctive. Photography © Cathy Powers.

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three species all come from the NatureShare website and are used with permission of the photographers.

Our final three local *Pultenaea* species are *P. largiflorens*, *P. gunnii* and *P. stricta*. The first mentioned is commonly known as the Twiggy Bush-pea and the southern part of its range just reaches into the Wombat's nearby forests. I have found *P. largiflorens* in North Drummond, Glenluce, Irishtown and places further north and the Castlemaine Field Naturalist have recorded it at Glenlyon. Corrick notes that is has "comparatively large flowers"[1] but this is not the source of the name. In Latin, *largus* means abundant or plentiful so this species is named for its plentiful flowers.

The small incurved leaves with a strongly recurved tip are hairless on the upper surface and are very distinctive. The stipules lie flat on the stems that are covered in flattened silky hairs where the growth is new. The calyx is also distinctive with its claw-like lobes and the bracteoles are fitted with brown papery stipule-like appendages near the base. It is a very showy plant when flowering and is barely noticeable when not.

The last two *Pultenaea* species are similar but can be easily separated once you understand what to look for. *P. gunnii* is named after the well-known Van Diemen's Land collector, Ronald Gunn and is also known as the Golden Bush-pea. It has small leaves, generally less than 5mm long, and in the Wombat Forest, they are 3mm wide with recurved margins, giving the leaf the appearance of a small triangular green pillow. In other areas the leaves may be longer and taper to a point. The leaves of Rigid Bush-pea, *P. stricta*, are 10mm long and 4-5mm wide and oval-shaped. They remain flat except for the extreme tip which is strongly recurved. They also have a prominent mid vein on the underside and the margins are slightly thickened. The term *stricta* is a reference to the straight or upright growth habit of this plant.

Other differences between these species include the position of the bracteoles on the calyx, in *P. gunnii* they are short and attach about the middle of the calyx tube whereas in *P. stricta* they attach in the upper half of the tube and may be as long as the calyx lobes. The bracts are also a key difference as *P. gunnii* does not have any whereas the developing flower buds of *P. stricta* are protected by large cup-shaped brown papery bracts. It does get a little tricky here as the bracts on *P. stricta* are deciduous and *P. gunnii* has enlarged stipules at the base of the flower clusters. These stipules are pointy however and never cover the developing flowers like the bracts of *P. stricta*. A close examination of the expanding flowers of *P. stricta* may uncover a few bracts that have become caught up once they detached from the plant.

Left: Leaves of *P. largiflorens* in profile showing typical shape,
Right: Note the stipule-like appendages on the bracteole of *P. largiflorens*.

P. largiflorens.

Left: Leaves of *P. gunnii*,
Right: Enlarged pointed stipules at the base of *P. gunnii* inflorescence.

Left: *P. gunnii* with dark bracteole on mid calyx tube,
Right: Leaves of *P. stricta*.

Left: Cup shaped bracts enclose the inflorescence of *P. stricta*,
Right: *P. stricta* shows its upright habit.

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The Golden Bush-pea, *P. gunnii* is widespread and found throughout the Wombat Forest although it is rarely seen north of the Great Dividing Range. The Rigid Bush-pea, *P. stricta* is much harder to find and is recorded near Barkstead and in wetter sedgy country near the Werribee River at Spargo Creek where it grows alongside our plus one species.

Almaleea subumbellata was once known as *Pultenaea subumbellata*, hence its inclusion in this article. It differs from the *Pultenaea* in having a hooked style with an enlarged tip, where the style in *Pultenaea* has a minor curve and tapers to a fine point. Its stipules are tiny and are only seen with a hand lens, however, they become very enlarged near the flowers as the leaves transition into bracts. The hairy bracteoles are attached to the stem of the flower, not the calyx, but you are unlikely to find them in the flower clusters without a bit of dissection. The genus is named after Alma Lee, a well-known botanist at the NSW herbarium, and *subumbellata* means almost umbrella shaped. There are no records for this species in the Wombat Forest listed on the Atlas of Living Australia, but I have found it at Spargo Creek as noted above, on the Coliban River on Domino Road, in the sedgelands between Lyonville and Trentham where *P. dentata* is found, and on the headwaters of the Campaspe River in conjunction with *P. weindorferi*.

If you are still reading, then you have survived the most difficult group in this Egg and Bacon series and in our next issue I will review the *Bossiaea*. I will then move on to the *Platylobium* and in the last of the series we will have a wrap up of the remaining two species and a peek at the "other" peas of the Wombat Forest. ■

References

1. Corrick, M "Bush-Peas of Victoria – genus *Pultenaea*" published in 24 parts between 1976 and 1990 in the *Victorian Naturalist*

General texts include H B Williamsons "A Revision of the Genus *Pultenaea*", published in five parts between 1920 and 1928 in the *Proceedings of the Royal Society of Victoria*, Corrick also prepared the section on *Pultenaea* published in 1996 in the *Flora of Victoria Vol 3*, R P J de Kok et al "A revision of *Pultenaea* (Fabaceae)" published in four parts between 2002 and 2005 in *Australian Systematic Botany*, and M Crisp & P Weston *"Almaleea,* a new genus of Fabaceae from south-east Australia" published 1991 in *Telopea*

The top and middle images are taken under a dissecting microscope.
Top Left: The stipules of *Almaleea subumbellata* are 0.5mm long,
Top Right: Enlarged stipules on leaf adjacent the inflorescence.
Above: Hairy ovary and hooked style of *A. subumbellata*.

Flowers of *A. subumbellata*, the hairless smooth linear leaf to the right of the stem is typical for this species and they are often held upright along the stem.

Nature Page

By Gayle Osborne
Images by Sandy Scheltema

Sandy Scheltema was delighted when a pair of Yellow-faced Honeyeaters *Lichenostomus chrysops* built a nest in the climbing rose on her veranda. Totally unperturbed by the ten year old boys and the dog, the female honeyeater proceeded to lay and incubate the eggs. The boys christened her Bethany.

Perhaps the honeyeaters decided that with so much commotion and activity, the nest would be safe from predatory birds.

There is considerable concern regarding the photographing of nesting birds, as they may abandon their eggs or offspring. Any unusual activity may alert predators. In this case the birds were obviously not sensitive to the clatter of the family's daily routine.

It is a privilege to live so closely with nature.

Nestling

Fledgling

Wombat Forestcare

research • education • action

Wombat Forestcare Inc. is dedicated to preserving the biodiversity and amenity of the Wombat State Forest, Central Victoria, Australia, 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, (03) 5348 7558 or email info@wombatforestcare.org.au
Membership fees: $15 single and $20 family. **Visit our website - www.wombatforestcare.org.au**