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NECTAR NOMADS: A NATURAL HISTORY OF HONEYEATERS

Harry F. Recher

Honeyeaters, birds of the family Meliphagidae, are among the most abundant birds of Australia's eucalypt forests and woodlands. They are noisy, gregarious, quarrelsome, constantly on the move, and a joy to watch. Honeyeaters were the first birds I studied on coming to Australia in 1967 and they continue to give me hours of pleasure in studying their behaviour. For the past 20 years, Ted Davis, my colleague from Boston University, and I have had a special interest in the honeyeaters and their natural history. We've followed them through Dryandra Forest, on Mt Gibson Station, near Albany, and from Yellowdine to Norseman in the Great Western Woodlands.

Honeyeaters are nectar-feeders and are most conspicuous wherever eucalypts, banksias, hakeas, dryandras, grevilleas, eremophilas, and other nectar-rich flowers are in bloom. As with all nectar-feeders, honeyeaters respond rapidly to the seasonal abundance of blossom and move long distances, hundreds of kilometres or more, throughout the year between sources of nectar. Congregations in areas of blossom commonly exceed thousands, if not tens of thousands, of individuals and as many as 10 to 12 species. Importantly, these 'nectar nomads' pollinate the flowers they take nectar from and are 'keystone' species on which the survival of many other species depends.

Very likely, honeyeaters, like other food nomads (animals that follow the changing locations of food), have a 'communal or flock memory' and 'know' when and where to find the richest sources of nectar as season and weather dictate. In this, they do not differ from honeyfarmers (bee keepers) who shift their hives from one patch of flowers to another, perhaps moving hundreds of kilometres overnight.



A Tawny-crowned Honeyeater on Graceful Honeymyrtle (*Melaleuca radula*)
(Photo: Bert & Babs Wells/DEC)

Nectar is rich in sugars and provides honeyeaters with an abundance of energy. As rich as it is in carbohydrate energy, nectar is poor in protein and nectar-feeders, like honeyeaters, must also have a source of protein. The Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*), a common associate of honeyeaters in the South West, obtains the protein it needs from pollen, which it can digest.

Honeyeaters, however, appear unable to digest pollen and rely instead on insects and spiders for protein. Having access to an easy source of energy in nectar, honeyeaters are able to exploit the smallest insects for protein. Ted and I watched Red Wattlebirds (*Anthochaera carunculata*) north of Norseman last spring catching insects on the wing (hawking). The wattlebirds were nesting and needed protein for their nestlings. The insects they were catching were so small that I doubt I could have seen one a metre in front of me, but the wattlebirds were seeing

EDITORIAL

Greetings all!

LFW Victoria is celebrating 30 years since the start of the programme with a number of events throughout the State. They hope to hold a 'Coordinator's Conference' early next year at which WA will be represented. This is a very long time for a government-funded extension programme to be running, and it demonstrates the usefulness and value to landowners of the original, simple, on-site visit and subsequent report. Although there are nowadays many groups and organisations that provide a similar service, *LFW's* long-term stability means that we can set up and maintain wide-ranging networks of people who share our aim of maintaining, and if possible enhancing, native flora and fauna into the foreseeable future. And you are all such great people to work with!

INDEX

Bat listening project gets under way	3
Bush detective	2, 13
Cats caught on candid camera	7
Cycads	16
Did you know ... ?	13, 15
Editorial	2
Fencing possums out!	8
Grevilleas in the northern agricultural region	11
In Brief	14, 15
Nectar nomads: a natural history of honeyeaters	1
New books	19, 20
News	18
Out and about in the bush: the Pallid Cuckoo	12
Regeneration of xanthorrhoeas	6
Salmon Gum Bolete	11
Semi-aerial roots on paperbarks - a glimpse of the 'hidden half'	10
Stick-nest rats	9
The Australasian Bittern Project	19

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It is also interesting that the majority of new members, in WA at least, join the scheme because they have heard about it from friends and neighbours. If you know of someone who has bushland on their place, you might like to suggest that they get in touch with *LFW*, so that we can share knowledge and experience, and continue to enjoy talking about bushland management with friends.

We are also delighted in this issue of *Western Wildlife* to be able to include a range of articles from members, both photographs with queries attached, as well as feature-length stories. Check out the natural *Xanthorrhoea* regeneration, for example. There is also an article from a Tasmanian *LFWer* that explains in detail how to construct a fence to keep Brushtail Possums out of house and garden. When opened up on the computer screen, the photographs show construction details very clearly, but space restrictions meant that the scale we had to use in the magazine is a bit small. If you are interested in this type of fence, and get in touch with me, I can email the original images

to you, so that you can enlarge them for study.

This time last year, we urged you to listen for White-striped Bats. You will see from the report on page 3 that many people did send in records, but more are needed (especially from country areas). For those who sent in records last year, please can you start recording again from this October or, if you haven't tried this yet, give it a go! The procedure is very simple and straightforward, and the potential results of great significance – not only for understanding the natural history of this particular bat, but also for understanding the effect climate change is having on fauna.

What a difference a wet winter makes! I had forgotten what it was like to have whole days of rain! It is such a pleasure to go out into the countryside and talk to landholders who have a smile on their faces, and to meander through bushland that is just bursting with new growth. With very best wishes for a superb finish to the season.

Penny Hussey

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www.dec.wa.gov.au/landforwildlife

FAUNA

BAT LISTENING PROJECT GETS UNDER WAY

Nic Dunlop

ClimateWatch, the Conservation Council (WA) and *Land for Wildlife* are partners in a monitoring program that uses the temperature sensitive, migratory White-striped Bat (*Tadarida australis*) as a climate indicator. Observers (bat listeners) were asked to begin submitting their records of White-striped Bat activity to the ClimateWatch website during Conservation Week in October 2010.



Data is now available from community 'bat listeners' for the period 23rd October to 5th December. A total of 30 records were received. These included 21 from WA, eight from Victoria and one from NSW. Of these, 16 were recorded in the metropolitan areas of Perth, Melbourne and Sydney while 14 were recorded from rural areas. The daily rate of records received show an initial surge during Conservation Week, 23rd to 30th October, followed by a steady rate of collection through November. More data was submitted by bat listeners in 2011 but this has not as yet been compiled for analysis.

The data included 16 positive records and 14 equally important negative records. All data collected, with the exception of a single positive record from the Pilbara region of WA, were within the latitudinal spread that the species is expected to occupy during these months. These data, while preliminary in nature, show that the method of data collection employed by the ClimateWatch program has potential to provide a viable method of monitoring the effect of temperature and productivity change on species such as *T. australis*. However a significantly

higher public participation rate will be necessary to provide a statistically robust sampling density. Attention needs to be directed at getting more participation outside the metropolitan areas, particularly from the Pilbara, mid-west and Goldfields regions.

Project science advisor Bob Bullen has independently confirmed the Pilbara record. It was taken at a site close to a meteorological station that

has recorded overnight temperatures of 20°C during late October and early November. This bat is believed to be one that was late in departing south, probably associated with mild overnight temperatures, averaging 18°C at Newman, during October 2010.

Recent results from automated bat detection recorders on the Swan Coastal Plain indicate that the northward migration in April is highly synchronised, with most of the bats passing through in a period of about a week. This may suggest quite precise temperature related cues. The timing of these movements may also shift with climate change. We may shortly be able to coordinate community 'bat listening' into relatively short critical periods.

From October through to April, please listen for this bat and record your observations.

If you haven't done so already, visit the Climate Watch website and register as a participant (www.climatewatch.org.au). For detail on sampling protocol, re-read *Western Wildlife* 14/4, October 2010.

Bush Detective

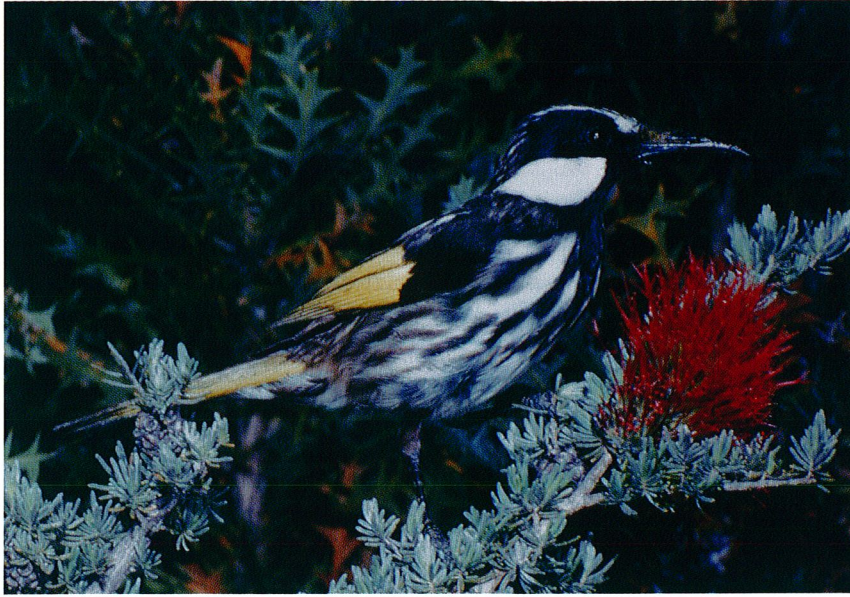
• *Who made these diggings?*

There are often diggings like these in the spoil bank at the side of many country roads. Who made these holes? (Hint: look at the deep, slightly sideways, scratch marks on one of the spoil heaps.)



Turn to page 13 for the full picture!

continued from page 1

Honeyeaters**FAUNA**White-cheeked Honeyeater on *Beaufortia incana* (Photo: Bert & Babs Wells/DEC)

and catching them at distances of up to 50 m from the trees in which they were foraging. Obviously it took more energy to catch each insect than the insect provided, but it was the protein that was important; eucalypt nectar was abundant. As do all honeyeaters, the wattlebirds also took insects from foliage and bark, but most were taken in those spectacular long-distance sallies.

Although we describe honeyeaters as nectar-feeders, and all honeyeaters take nectar when it is available, not all honeyeaters depend on nectar as a source of energy. Many honeyeaters rely on lerp, honeydew, manna and sap rather than nectar to provide the energy they need. Lerp and honeydew are the sugary excretions of sap-sucking insects and are abundant on eucalypts. In order to obtain enough protein to grow and reproduce, sap-suckers process more sap than they need to supply their carbohydrate needs and so secrete (lerp) or excrete (honeydew) the excess sugars. Lerp is produced by psyllid insects and forms a covering or cap over the insect that protects it from drying out and, no doubt, from predators. Lerp is rich in sugars (taste some, it is sweet) and can be quite large (check the

internet to see what lerp looks like). For many forest and woodland birds in Australia, not just honeyeaters, lerp is an important source of energy. Weebills (*Smicrornis brevirostris*), pardalotes (*Pardalotus* spp.), and some thornbills (*Acanthiza* spp.) rely as heavily on lerp as do some honeyeaters. Even magpies and cockatoos can be seen feeding on lerp, especially that of the largest psyllids, during outbreaks. Psyllids live on the leaves of eucalypts, but most honeydew appears to be taken

from insects living on the young bark under the outer, dry layers. Thus, we see many honeyeaters, such as White-eared (*Licheonstomus leucotis*) and Yellow-plumed (*L. ornatus*) Honeyeaters, probing under loose and decorticating bark of eucalypts. Probably they obtain many insects and spiders while doing this, but it is the energy-rich honeydew they are after.

Being able to exploit the rich supplies of energy from nectar, lerp and honeydew, not to mention manna and sap, both of which are sugary excretions of the tree in response to damage, honeyeaters need only small amounts of protein – just enough to repair damaged tissue, replace feathers and grow. This allows honeyeaters, and other nectar and lerp-eaters, to sustain large populations and use habitats that are otherwise low in productivity. Kwongan shrublands, mallee, dryandra shrublands on laterite ridges, and coastal heaths are good examples, but many eucalypt woodlands and forests are also low in productivity and able to support only small populations of birds that rely solely on arthropods for both energy and protein.

Red Wattlebird in Bull Banksia (*Banksia grandis*) (Photo: Bert & Babs Wells/DEC)

continued from page 4

FAUNA

Honeyeaters

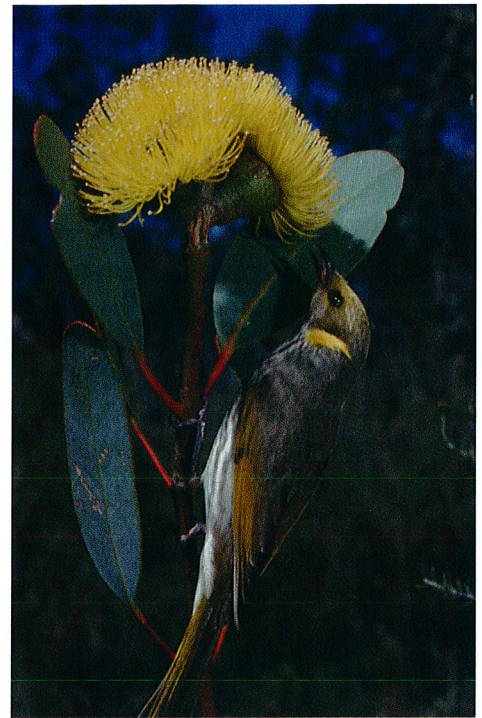
Honeyeaters that depend on nectar for energy and those that rely more on lerp and other carbohydrates differ in important ways. Nectar-dependent honeyeaters tend to have relatively long and decurved bills. This allows them to probe deep into flowers for nectar. Those with the longest bills, such as the Western Spinebill (*Acanthorhynchus superciliosus*), can exploit flowers with long corollas, but are not restricted to these. Short-billed honeyeaters, such as Singing (*L. virescens*), White-naped (*Melithreptus lunatus*), and Brown-headed (*M. brevirostris*) Honeyeaters, feed more on lerp or probe for honeydew and arthropods under loose bark. Body size is also important in determining where a bird can feed. At Dryandra, where dryandra nectar is the principal source of energy for honeyeaters in winter, the large Red and Western (*Anthochaera lunulata*) Wattlebirds favour the large inflorescences of *D. nobilis* which are borne on sturdy branches. New Holland (*Phylidonyris novaehollandiae*) and Tawny-crowned (*Glyciphila melanops*) Honeyeaters, and Western Spinebill also feed on *D. nobilis* nectar, but can also take nectar from the much smaller inflorescences and less sturdy branches of *D. sessilis* and *D. armata*, neither of which are much used by wattlebirds.

Wattlebirds aggressively exclude the smaller honeyeaters from *D. nobilis* inflorescences, providing a good reason for the smaller birds to frequent *D. sessilis* when nectar from both is available. There is a 'pecking order' among honeyeaters, with the largest species excluding the smaller ones, not to mention excluding con-specifics. In the Great Western Woodlands, it is as common to see a Red Wattlebird defend a flowering eucalypt or patch of eucalypts as it is to see them defending *D. nobilis* shrubs at Dryandra. New Holland Honeyeaters do the same, only

deferring to the larger wattlebirds.

All honeyeaters are aggressive and this has significant consequences for other birds and the ecology of eucalypt woodlands and forests. Many honeyeaters that rely on lerp and other carbohydrates are colonial or semi-colonial and exclude other similar sized and smaller birds from their colonies. The best known examples of this behaviour occur in eastern Australia where Bell (*Manorina melanophrys*) and Noisy Miners (*M. melanocephala*) aggressively dominate large areas of forest or woodland to the detriment of other birds and the health of the habitats they occupy. The dominance and proliferation of Bell Miners has led to the decline and death of large areas of moist forest in a syndrome known as 'Bell Miner Dieback', while Noisy Miners have driven small birds from both agricultural and urban landscapes. Fortunately, the Yellow-throated Miner (*M. flavigula*) in the South West, does not behave in the same way, perhaps because they are not so abundant and flocks appear to be smaller and less sedentary than the miners on the east coast. This does not mean that Western Australia is not without its 'honeyeater deserts', as Ted and I refer to them.

One of the most common honeyeaters in the South West is the Yellow-plumed Honeyeater. In the wandoo woodlands of Dryandra and the morrel woodlands of Norseman, Yellow-plumed Honeyeaters form extensive colonies from which other birds are excluded creating virtual 'bird deserts'. Although forming colonies confers advantages to Yellow-plumed Honeyeaters, it also puts them at risk. Yellow-plumed Honeyeaters are among the first woodland birds to decline as woodlands are cleared and fragmented; maintaining a colony requires the most productive woodlands, as well as extensive areas of habitat. For this reason, and despite



Yellow-plumed Honeyeater on Bell-fruited Mallee (*Eucalyptus preissiana*) (Photo: Bert & Babs Wells/DEC)

its abundance, I consider the Yellow-plumed Honeyeater a 'threatened species'.

Other honeyeaters are also threatened. With climate change will come new patterns of rainfall and seasonal cycles of nectar and lerp production. How honeyeaters will respond to these changes is unknown, but birds which depend on periodic or seasonal abundances of food are at risk whenever those resources fail. To protect Australia's honeyeaters, so that others can experience what Ted and I have enjoyed in studying the honeyeaters of the South West, we must protect the habitats that provide them with the food they need to live and reproduce. Scattered conservation reserves are inadequate; we must keep the Great Western Woodlands and forests of Western Australia intact.

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MEMBERS' PAGE

REGENERATION OF XANTHORRHOEAS

Robin Gentle



Robin standing among young xanthorrhoeas, one marked with date of emergence. The multiple-header at the rear is estimated to be four metres tall - 400 years old?

It was around the turn of the century that I realised the ageing *Xanthorrhoea preissii* (Blackboy or Grass Tree) on my farming property at Quellington near York were becoming an endangered species and I needed to do something about the situation.

I had been growing *Eucalyptus* and *Acacia* etc on my farm since the mid 1970s, but had not given much thought to replacing some of the longest growing natural flora. It was also a time when more than I would wish for of the xanthorrhoeas had fallen over and died. As I grew my own farm trees generally from local seed, I tried my hand at doing the same from the seed procured from the ancient plants growing on Quellington Hill. Many of the seed spikes that were ready for harvesting were out of my reach or in an inaccessible area. At last I found a good strong specimen, backed my utility up to it and tried to extract the seed head from the body of the tree. It took a considerable effort to break it free, but then it snapped and crashed onto my utility spewing a large amount of seed. I had good results in germination and growing the seedlings whilst within the tree nursery, but none of the plants survived when planted out in areas that previously had supported xanthorrhoeas.

After discussions with the local landcare technical officer Liz Manning, we applied for a fencing grant to enclose approximately 10 hectares of the hill, and with the support of Alison Dugand, then the local *Land for Wildlife* Officer, we were successful in obtaining an Envirofund

Grant from the Commonwealth Government in 2003. It was a difficult fencing job due to the undulating nature of the terrain and the granite rocks that seemed to be in every place I tried to put a post.

For the first two seasons following fencing not much changed within the area other than the grasses flourishing, as they were not being eaten by the sheep, unlike before fencing. I planted approximately 200 Jam (*Acacia acuminata*) trees in a plantation form nearby within the fenced area and was surprised how rapidly the trees grew in this rocky area. These trees now have Sandalwood (*Santalum spicatum*) seeds planted next to them and the Sandalwood is also growing well.

To our surprise and delight in 2006-07 the juvenile xanthorrhoeas began to emerge naturally. Many of the seedlings are growing next to or from under granite boulders and from places that appear unsuitable for plant growth. Maybe my earlier attempts at establishing the seedlings were stymied due to the lack of understanding of the positioning of the young seedlings (I was too soft with them).

Together with the flourishing Sandalwood and acacia woodlands, I am satisfied that the xanthorrhoea population on Quellington Hill is such that future generations may continue to enjoy this unique area.



Planted Jam and Sandalwood on the less steep slopes of Quellington Hill. Note weed control around trees.

RESEARCH - FAUNA

CATS CAUGHT ON CANDID CAMERA

Jessica Ashburner



Feral cats are a huge problem for native wildlife. Predation and competition by feral cats places a considerable threat on native Australian animals. A large investment has been made in resources committed to the control of feral cats. However, there is uncertainty over how successful feral cat control is. The only way to measure the success of feral cat control is to monitor feral cat populations. A variety of methods are currently used - these include cage trapping, leg hold traps, track counts, scat counts, spotlighting and camera trapping.

Many of the current monitoring methods yield unreliable results. This is highly problematic as the effectiveness of control measures still remains uncertain. Spotlighting has a poor rate of detection success, as feral cats often do not look towards light sources. Methods involving track usage (track counts, scat counts and spotlighting) are often ineffective as cats don't generally use tracks or roads. Methods involving the use of baits or lures can also be unreliable as cats use visual and auditory cues to locate their food, rather than olfactory (smell) cues, so baits are not taken by the cats. Overall, monitoring of feral cats presents many challenges because they are shy, cryptic, solitary animals occurring at low densities.

It is clear that there are problems in the current monitoring methods available to monitor feral cats. A promising solution to this problem lies in the form of camera traps. Camera trapping involves the use of motion sensitive cameras to collect digital photographs of animals moving in the area. Camera traps have shown to be a very effective monitoring method where other methods are not successful, particularly in the case of cryptic and elusive species.

A study currently under way at the University of Western Australia is asking the question: "Are camera traps an effective way of monitoring feral cat populations?" The cameras used in this project are triggered by using an active infrared beam to detect motion in the camera's range of detection. This sends a signal to the camera to start taking photos, and the photographs are recorded digitally on the camera's internal memory card. Cameras operate continuously during the sampling period. Photographs recorded during the day are taken in colour, and photographs taken at night are taken using an infra-red exposure. Three photographs are taken with a two second delay in order to increase the chance of obtaining a clear image. A delay is set on the camera to prevent photographs to be taken for 10 minutes after taking a photograph. This prevents repeated photographs

being taken of the same animal. All photographs are imprinted with the date and time of the event.

So far this study has produced plenty of results, with tens of thousands of photographs collected from Mt Manypeaks Nature Reserve, near Albany. It has been great to see that there are many native animals active in the area, including quokkas, bandicoots, possums, echidnas, wrens and lizards. Exciting photographs of feral cats have been taken. Cats have been seen to be moving both during the day and night. It has been interesting to see more than anticipated numbers of foxes caught on camera. This suggests that camera traps are successful in monitoring introduced predator (fox and cat) populations. One standout feature of the cameras is the high quality of the photographs taken. This makes identification of the animals in the area simple. The cameras are able to continuously collect data with minimal effort required to maintain them, making them a cheap and effective way of monitoring.

Jessica Ashburner is studying for a BSc in Restoration Ecology (Hons) at UWA, Albany. She can be contacted on: ashbuj01@student.uwa.edu.au.

(See also page 15.)

PRACTICALITIES - INTERSTATE

FENCING POSSUMS OUT!

Geraldine de Burgh-Day

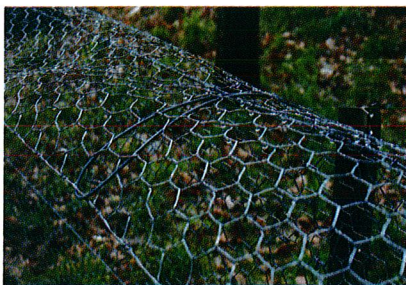
This detailed description of fence construction could be adapted in WA to keep wildlife in!

We live in Lorinna, Tasmania and share our locality with literally hundreds of brushtail possums and small wallabies known here as pademelons. One possum can wreck a vegetable garden overnight so it is pointless trying to grow anything without totally effective fencing.

The options are:

- total enclosure – a cage.
- electric – two wires are essential with one on an outrigger
- floppy top fencing – described here.

Floppy top fencing works on the understanding that possums will not climb on something that they feel is insecure. This means that the fence should have a tight lower section, with a roll of flimsy netting on the top point outwards from the area to be protected – towards the side that the possums will attempt to climb. It is very important that the floppy wire is supported sufficiently to stay sticking out from the fence. If a possum pulls it down onto the tight part of the fence, they will then climb over and use this section as their regular route.



(See following picture of corner treatment to ensure the floppy wire does not hug the tight part of the fence as it goes around the corner – a triangular gusset is inserted to give a floppy roll around the corner.)



It is important to ensure the floppy roll stands out at every part of the fence. Note difference in grass length from possum/wallaby side to inside.

Protecting the bottom from burrowing

When the tight bottom of the fence is being set up, set low so that a roll of about 10-15cm lies on the ground surface pointing out to the wildlife side. When the fence is new, hold this down so that it firmly touches the ground all the way. Use rocks, bits of wood etc. The grass will grow through the netting and anchor to the ground within a year, then the weighting objects can be removed. Note the roll of netting in grass on the ground in the picture above.

Gates must also have full netting and a floppy top, with all floppy rolls touching to form a continuous barrier when the gate is closed. If you have a gate located on a slope, there are two types of treatments that can be used for the bottom, to ensure that nothing burrows under the fence.

Treatment #1 is a heavy weight on the bottom of a skirt of netting attached to the bottom of the gate. It is best if this is the full length of the gate if necessary, so animals don't squeeze through between weights.



This is a long gate with a batter drain at the hinge end. The drain end has a weight holding the skirt down. The pic above shows the gate closed.

The next pic (overleaf) shows the gate open, and the slope of the drive

continued from page 8

PRACTICALITIES

Possum fencing

can be seen from the fence angle as it continues on to the right.



To hold the gate open without squashing the floppy fence roll, a long wire hook with a bend is pushed through the gate when opened so that it hooks the gate at the correct angle to the fence.

The benefit of this system is that the gate is easy to open from either side. Gates are kept open in daylight for convenience and closed before sunset. Wildlife only come out to feed between dusk and dawn.

Treatment #2, here a rolled skirt is attached to the bottom of the gate, with a wire attached to the outside of the bottom roll. This wire goes up to the top of the gate with a hook in the wire so that it can be pulled up to lift the edge of the roll to clear the ground when the gate is opened. A heavy weight is placed in the roll so that when the wire hook is unhooked from the top of the gate, the roll lowers to the ground and is held there firmly. A wire hook is needed at each weight. The gate in the picture has three wire lifting hooks. The disadvantage with this system, is that the gate is not so easy to open from the side opposite the hook end (handle).



The wire hook and handle is shown here.



Operating the hook using the handle end.



Closed gate showing the weight holding the skirt down. Note the slope of the fence to the right and the continuous floppy top touching the gate floppy top.

These fences are rabbit proof, wallaby proof and possum proof.

Maintenance

It is key to check regularly to ensure that the floppy top is standing out from the main fence. Check all gate closures are working. If a possum does get in, it will usually be via a 'tree bridge'. Look up as trees grow. If the tree is inside the fence, there is no problem if branches hang out over the fence as long as they are at least two metres above the ground. If a tree outside the fence has ANY branches hanging over the fence – even metres from the ground – possums will drop in.

Remove these branches. If a tree outside is within three metres from a tree inside the fence – possums will jump from tree to tree and shin down to your garden!

Locating the fence

This is critical to its performance. Hills, corners and gates are no problem, as shown in the photographs. Trees ARE critical. Walk around the proposed fence route and consider each tree inside and out. Also, consider the growth of each tree in the lifetime of the fence.

Our fence has been erected for nearly 10 years, and in that time when we have had possums get in, it has always been via a tree bridge. When the facilitating branches have been removed from suspect trees – or the trees removed, the problem immediately ceases.

Geraldine de Burgh-Day and her husband Paul run a certified organic mixed farm, including beef and dairy. For further details about this type of fencing, she can be contacted by email at gdeburgh@harboursat.com.au

STICK-NEST RATS

Greater Stick-nest Rats (*Leporillus conditor*) were once widespread over the arid zone. Their cave nests, glued together with a sticky black mess of urine and faeces, remain obvious long after the animals have become locally extinct (by the 1930s on the mainland). They have recently been re-introduced into a feral-proof fenced enclosure on the Australian Wildlife Conservancy's Mt Gibson Station. So far they are doing well, gaining weight, constructing nests and having babies. For further information, contact the Australian Wildlife Conservancy: www.australianwildlife.org.

MEMBERS' PAGE

SEMI-AERIAL ROOTS ON PAPERBARKS - A GLIMPSE OF THE 'HIDDEN HALF'

Tim Colmer

Roots of plants typically grow below ground, although there are several spectacular exceptions. Being out-of-sight, roots are often ignored and some plant scientists have even referred to roots as 'the hidden-half'.

Avril Baxter (LFW Officer at Narrogin) came across an interesting specimen of paperbark (*Melaleuca strobophylla*), with roots emerging from high up on the trunk. This tree had several thick roots that had emerged as high as two metres above the ground, with the roots then running down the outside of the trunk into the soil.

M. strobophylla is described as a spreading tree or shrub, typically 3–12 metres high, that grows on clayey/sandy-silty soils, and usually in depressions, or near margins of salt lakes and watercourses. *M. strobophylla* is well known to tolerate standing water for long periods, and several species of *Melaleuca* have been reported to grow roots from the stem/trunk base during shallow flooding, although a quick search of 'The Web of Knowledge' did not reveal any specific studies of *M. strobophylla* for this capacity.

The growth of so-called 'adventitious roots' (i.e. roots that emerge from the shoots, typically from stems) is a common response of flood-tolerant species. In some wetland species new adventitious roots emerge from stems within a few days of submergence, whereas in others it can take weeks. Production of adventitious roots upon stem submergence has been studied in detail in herbaceous species, and the process is regulated by the plant hormones ethylene and auxin.

Adventitious roots that form in response to flooding usually contain large, interconnected gas-filled channels (termed aerenchyma). These channels act as a snorkel to enable movement of oxygen down the roots to the growing tip, so that the root can penetrate into anoxic waterlogged soils. Adventitious roots formed by *Melaleuca* species have been reported to contain aerenchyma; being consistent with a reputation for flooding tolerance.

The height up the trunk, however, of the thick roots on the specimen in the photograph seems awfully high for a flood! One could speculate that these roots might have been initiated when the tree was younger and experienced partial stem submergence. If so, this raises interesting questions regarding the rates of increases in stem height (usually does not change) and downward root growth, otherwise a malformed appearance might have been expected. Determination of the ages of the root tissues, as compared to the tree's overall age, might be informative in solving this mystery.

It would be interesting to know how widespread this occurrence of thick adventitious roots, originating high up the trunk, is for these paperbark trees. Studies of formation and persistence of adventitious roots on younger individuals, during and following prolonged flooding events, as well as the functioning of these unusual roots,



This tree, with these astonishing aerial roots, is growing on Derek Cameron's property near Lake Norring. Why did they arise - and persist? Is this feature common in this species of paperbark?

If you have this sort of lake edge winter-wet country, could you please look to see if any of the paperbarks have these aerial roots, and let your LFWO know?

If they are found in several areas, perhaps there might be a student willing to investigate the why and how of this strange feature.

Incidentally, wetlands in coastal areas have a very closely related tree, the Modong or Stout Paperbark, (*M. preissiana*). It would be worth checking to see if it, too, develops such roots.

would expand knowledge of root biology and of the ecophysiology of *M. strobophylla*.

Prof. Tim Colmer is a plant physiologist in the School of Plant Biology at UWA. His main research interests are plant adaptations to soil salinity and flooding, with research projects on salt lake halophytes and pastures and crops for salt affected lands. Contact: timothy.colmer@uwa.edu.au

MEMBERS' PAGE



Grevillea candicans



Prickly Plume Grevillea, Grevillea annulifera



Grevillea candelabroides

GREVILLEAS IN THE NORTHERN AGRICULTURAL REGION

There are more than 300 grevilleas in Australia, two-thirds of them in WA. They range from prostrate shrubs to tall trees, and many are spectacular in flower. It seems to me that we have an especially large number in the Northern Agricultural Region, mainly growing on sandplain, but some do grow on gravel and clay. They are at their best from late spring to early summer, and roadsides are often excellent places to spot them.

This spring, take a drive along the Wildflower Way from Wubin to Mullewa, across to Northampton via Yuna, then to Kalbarri, returning to Geraldton and then Perth via the Brand Highway. There are about 60 species of *Grevillea* in the region, from prostrate to large shrubs, with flowers from cream to yellow, pink to dark red. If you take the time to look, you should be able to find at least 30

different species on this tour! And if you enjoy a particular wildflower roadside, perhaps you could take the time to call into the appropriate Shire office to say so? It would help to reinforce how important these linear strips are.

The photos are of some of the larger grevilleas you will certainly see.

Bob Porter



Flame Grevillea, Grevillea eriostachya

They are all well worth including in revegetation projects!

Is this the biggest?



This photo of a monster toadstool was sent in by Alan Carter of Cunderdin. It is the Salmon Gum Bolete, *Phlebopus marginatus*, and can often be found in early winter, associated with Wheatbelt woodlands. We reckon this one is about 60 cm across.

**Have
you seen
bigger?**

Do tell!

Or this?



When we checked the identification with mycologist Neale Bougher, he responded with this photo, taken with an American colleague Brandon Matheny (on right) near Wandering in July 2011. Is this bigger?

MEMBERS' PAGE

OUT AND ABOUT IN THE BUSH: THE PALLID CUCKOO

Fiona Falconer

The Pallid Cuckoo (*Cuculus pallidus*) arrived early in the northern wheatbelt this year (calls being heard as early as April/May) and seems to have been very vocal throughout winter and now into spring - living up to its reputation as the rain-bird?

More often heard than seen, this bird has a plethora of common names, including Unadorned Cuckoo; Grasshopper or Mosquito Hawk; Rain, Scale, Semitone, Storm, Weather or Wet Bird, Brainfever Bird and Harbinger of Spring. Its Latin name, *Cucullus*, is onomatopoeic for the call of its European relative, while *pallidus* refers to the pale grey upperparts. In the south-west of WA, a recorded Aboriginal name is Djudarran.

The Pallid Cuckoo ranges in weight from 65-90 grams or more commonly 80-85. It is bigger than the Fantailed Cuckoo (42-48grams) and unlike any other Australian cuckoo because of its pale appearance. The Pallid Cuckoo has an obvious dark eyestripe that continues down the sides of the neck, a white spot on the centre of its nape, and a rather small head. The long pointed wings and long rounded tail give it a falcon-like appearance. Females differ markedly from the male with a dark greyish brown forehead and crown streaked with reddish buff or brown and more streaked and spotted than the male.

Widespread throughout Australia, but rarer on the Nullabor and other desert areas, the Pallid Cuckoo is generally found in open woodlands with sparse understorey. The bird is migratory but arrival and departure dates can vary considerably, depending on weather conditions. There are years when, in some

districts, it may not be seen at all. Studies in WA show that rain does have a bearing on arrival or non-arrival.

The distinctive call of the male bird is a rising series of whistling notes, often made from a perch on a fence. The female varies widely from the male. Calls are described as monotonous, prolonged and stereotyped. Calls are made throughout the days and also at night for prolonged periods. The scale or semitone call may be made for over an hour, then slowing down for a longer period.

Like all cuckoos, the Pallid Cuckoo lays its eggs in the nest of other birds. It prefers species that construct open, cup-shaped nests. Hosts of the Pallid Cuckoo in the wheatbelt include at least 16 honeyeaters; four woodswallows; four robins; four whistlers or relations; the Willy Wagtail, Restless

Flycatchers and Magpie Lark; however, there are others.

The Pallid Cuckoo has a varied diet of mistletoe berries, millipedes, centipedes, cockroaches, grasshoppers, cicadas, bugs, beetles, caterpillars, ants and spiders. You may be lucky in spring and early summer to be out in the bush and come across the hungry young cuckoo being fed by its foster parents – often much smaller than it is!

Many thanks to Brice Wells of Birds Australia for help with information, and to Peter Wittwer for the superb photograph taken on his property near Carnamah. For more information on cuckoos, read Michael and Lesley Brooker's article in WW 5/3, July 2001. You can find it on our website.

Fiona Falconer is LFWO at Coorow. She can be contacted on: fiona.falconer@dec.wa.gov.au.



Taken in August 2011, this is probably part of a courtship ritual, because there was a bit of wing-fanning and showing off as he delivered the offering. What a lovely present, a hairy caterpillar! Yummy! (Photo: Peter Wittwer)

IN BRIEF

Did you know that ... ?

... in Australia's arid zones, there are (now – since the extinction of the megafauna) almost no mammalian grazing animals, so most (70%) of the recycling of organic material (ie plant and animal matter) is done by **termites**? In other arid zones, mammalian grazers are far more important.

Prof. Kingsley Dixon, KPBG

... when the **Marri Millipede** (*Antichiropus variabilis*) becomes stressed, it releases gaseous hydrogen cyanide? Why - as a deterrent to predators, perhaps? Marri Millipedes are found among thick leaf litter in the Jarrah/Marri forest of the Darling Plateau, especially in more open areas among Marri. They eat eucalypt leaves and thus contribute to the formation of humus on the forest floor.

... **turtles' brains** have special adaptations to survive periods of low oxygen? Sending nerve messages is a very high energy-requiring activity, so that for most vertebrates, depriving the brain of oxygen very quickly leads to damage, or even brain death.

But some animals, especially those that hibernate, burrow or dive, are able to survive for very long periods of time without oxygen at all. For example, the Musk Turtle (*Sternotherus odoratus*) can remain submerged in anoxic waters for an average of 21.6 days at 3°C.

... **African elephants** will flee at the sound of disturbed and angry honeybees? Who says size is paramount!

... **Brown Mallet** (*Eucalyptus astringens*) woodlands are typically found on the clay loam below breakaways. They are usually seen as monospecific stands, just the mallets with little or no understorey. And yet, during their lifetime they are not always that way. Brown Mallets are killed by fire, and regenerate from seed, creating a dense tangle of mallet seedlings together with fire-stimulated understorey species such as dryandras and sheoaks. But as the mallets develop towards maturity, the other plants die out. The mallets themselves help accelerate this process. When it rains, water is channeled down the mallet trunk and branches into the soil alongside the tree. In addition, the soil underneath the mallet crowns becomes very water repellent, a condition that is caused by the breakdown products of their leaves. Thus the Brown Mallet maximises its own access to water, while denying it to other plant species.

Go away!

I'm busy!

It's lunchtime!

Graded banks on the edges of roads provide an ideal habitat for termites, and echidnas, who need to eat around 10,000 termites daily, are quick to sense an opportunity. This particular section of the access track into Dryandra Woodland Village is a well-patronised snack bar. (Photo: Penny Hussey)

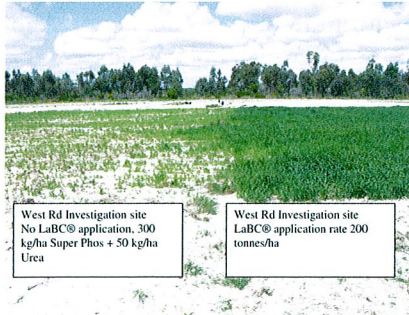


Bush Detective

IN BRIEF

SOIL AMENDMENT FOR PERENNIALS ON THE ELLEN BROOK CATCHMENT

Tom Long



The Water Corporation has developed a new alkaline soil amendment product called Lime-amended BioClay®, or LaBC®. Its purpose is to lower the risk of mortality when establishing deep-rooted perennial plants on leaching, acidic Bassendean sands. In addition to eliminating soil water repellence, it doubles water retention, provides slow release nutrients, raises soil pH, and improves the ability of the soil to bind phosphorus. One of the components of LaBC® is lime-amended biosolids—the high pH from the lime ensures LaBC® is sterile, and free of pathogens.

LaBC® has been developed for use initially in the Ellen Brook Catchment, a major source of high nutrient loads to the Swan River. Our objectives for the project are to encourage planting of perennial vegetation to increase sequestration of carbon and intercept nutrients adversely affecting the Swan River. Soil amendment with LaBC® will 'climate harden' the region by increasing the environmental effectiveness of rainfall and improving soil water retention. Trials have shown it significantly boosts plant dry matter production. LaBC® also reduces native seedling and farm tree mortality under difficult site conditions, and research has shown it kills two species of dieback fungi.

The LaBC® production system is nearing completion at the EMRC Red Hill Solid Waste facility on Toodyay Road. For more information, please see the website: www.watercorporation.com.au/B/biosolids_ellenbrook.cfm.

THE COST OF MONITORING FAUNA

Did you know that the cost of fauna monitoring to assess the success of management actions is very high? A recent paper* discusses how to monitor the ecological effectiveness of the fox baiting programme carried out between the Fitzgerald River and Stirling Range National Parks. The methods evaluated included trapping, spotlighting and motion sensitive cameras, and the costs were calculated for a 10-year monitoring period.

Some of the findings were, for example, that monitoring Brush Wallabies by spotlighting (the preferred method) would cost \$261,600, but by cameras, \$195,180. The preferred method of monitoring Red-tailed Phascogales is trapping, which would cost \$473,760, while spotlighting would be \$430,400; camera costs were not given. The cheapest of all to monitor were echidnas, by looking for their tracks, at \$163,200; trapping them would cost \$473,760.

The authors use this and other data to emphasise that when managers wish to assess the value of on-ground actions to native fauna and to justify conservation investments, it is important to choose an indicator species that will characterise the entire system (in this case it turned out to be the Brushtail Possum). They also point out that the costs of such monitoring, often years after the initial management action has taken place, must be built into the project design and funding request.

[* For ref, contact Ed.]

COEXISTING WITH FIRE: THE CASE OF THE MEDITERRANEAN TORTOISE

Mediterranean ecosystems (such as in south west WA) have been subject to bushfires since long before humans emerged, and species within them may be adapted to a particular fire regime. However, in modern times, changes to agricultural and other land-use practices may alter the frequency and characteristics of fires. In addition, climate change predicts an increase in droughts and severe fire events. So how will fauna cope with this? An understanding of individual species' responses to fire regimes is essential for land managers.

Recent research in the shrublands of Spain* looked at populations of the tortoise *Testudo graeca* in relation to fire. The authors found that a sound knowledge and understanding of species' population biology and dynamics is crucial in order to implement appropriate conservation management policies. In other words, the better you know an animal's natural history, the better you will be able to manage it. This is very relevant to WA, where we know something about a few animals, but almost nothing about most of them. So do keep records pertaining to wildlife on your property, so that they can be added to our collective knowledge store. In the case of *T. graeca*, the researchers found that their models predicted severe decline in populations subject to more frequent fire regimes.

[*For ref, contact Ed.]



T. graeca in the grounds of Hadrian's Library, Athens. (Ph: P. Hussey)

IN BRIEF

In case you still need proof - another Quenda passes on ...

This photo of a superb predator and its prey (a Quenda) was taken by a fauna monitoring camera installed in Cape Arid National Park by the Western Ground Parrot team. They are working on a trial of the uptake of feral cat baits. Thanks to the team and DEC South Coast Region for allowing us to use the photo.

For a note on how, at the turn of the nineteenth century, the then government paid for 200 domestic cats to be taken out from Israelite Bay and distributed into the bush to 'get rid of the rabbits', read *Western Wildlife* 6/4 page 9 (October 2002). You'll find it on our website, or, ask the Editor and we will send you a copy of the article some other way.



Did you know that ... ?

... Australia is not the only country to have problems with **phytophthoras**? The genus is well named 'plant killer'. *Phytophthora ramorum*, first recorded in the UK in 2002, is causing havoc in the wetter western areas of that country by attacking garden plants and is beginning to spread out into the countryside. Rhododendrons, spectacular shrubs imported mostly from Himalayan regions, are especially badly affected and so are forestry plantations of larch.

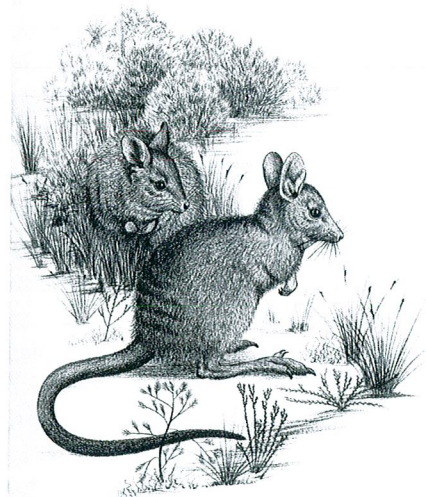
So if you want to see some of the spectacular rhododendron gardens, such as Bodnant in Wales and Exbury in Hampshire, best to go soon! On the west coast of the USA, this species of phytophthora is attacking oak trees.

... the **Banded Hare Wallaby**, *Lagostrophus fasciatus*, from Barrow Island, has the lowest rate of water turnover of any mammal in the world? A useful adaptation if you are going to live in a desert.

Prof. Don Bradshaw, UWA

These beautiful little animals were once found across the Wheatbelt, especially the western areas. Fortunately, populations still occur in islands off the north-west coast of WA and may, perhaps, be able to be reintroduced into predator-proof enclosures.

The illustration is one of Ella Fry's exquisite drawings for W. Ride's 'A Guide to the Native Mammals of Australia', published in 1970. Long out of print, this book is well worth searching out in libraries and second-hand bookshops.



FLORA

CYCADS

Penny Hussey

Back when the southern continents were united into Gondwana, when dinosaurs ruled and before flowering plants were even invented, around 250 million years ago, dense rain forests of cone-bearing plants covered the land. Many of these had palm-like leaves and one line of direct descendents from these Gondwanan forests can still be found on rocky areas in the Kimberley – cycads.



Cycas furfuracea, west flank of Mt. Ord (Photo: Tim Willing)

Cycads are superficially palm-like plants with a thick trunk covered by the bases of old leaves. The leaves form a dense crown. The plants can be either male or female, and they produce their reproductive structures in cones. The male cones have a large number of stiff, wedge-shaped 'cone scales', the underneath of which is covered by masses of pollen sacs. At maturity, the cone elongates and opens up a bit so that the pollen can be carried away by the wind (or, recent research suggests, by insects, especially weevils). The female reproductive structures have fewer cone scales, and only two to eight ovules along the margin. They just cluster together and do not make a real cone.

On reaching the female cone scales, the pollen germinates and pollen tubes grow towards the ovules. In a final stage, the pollen tubes open to let large flagellated sperm swim towards the opening in the ovule. Large seeds are formed, with a fleshy outer covering and a starchy kernel. Among living seed plants, only the cycads and the Maidenhair Tree from China (*Ginkgo biloba*) still retain independently motile male gametes (sperm). This characteristic has almost certainly been retained virtually unmodified, through 300 million or more years, from their distant seed fern relatives.



Female cone, *Cycas furfuracea*, Sampson Inlet (Photo: Tim Willing)

All cycads use cyanobacteria (also known as blue-green algae) to fix atmospheric nitrogen within their specialised 'coralloid' roots and thus contribute useful nitrogenous material into the soil, similar to the much later-evolved wattles and peas.

The cycad family, Cycadaceae, has only one genus, *Cycas*, with about 50 species found in tropical areas from Africa and Madagascar through south-east Asia to Polynesia and Australia. There are 27 species in Australia, with four in WA, all found in the Kimberley.

The name *Cycas* has a very long history in Western botanical science; it stems from usage by the ancient Greek botanical author Theophrastus (370-285 BCE) in his monumental classic *Enquiry into plants*. In this amazing book, written in 327 BCE (Before Common Era, used to be termed BC Before Christ), he describes all the plants known to his society, with their uses to Man. He uses the name 'koikas' for the Doum-palm (*Hyphaene thebaica*), common in the drier areas of the Mediterranean and North Africa. When Linnaeus was naming plants in 1737, he thought that cycad leaves were very palm-like, so that was the name he applied to this genus. In fact they are gymnosperms and thus quite distinct from palms, as shown by Robert Brown in 1827, nearly a hundred years later.

There are four species in the Kimberley, occurring in woodland, usually on rocky soils. *C. basaltica*, *C. furfuracea* and *C. pruinosa* are endemic, while *C. lane-poolei* occurs right across northern Australia. They are distinguished principally by the structure of the leaves and the female cones.

continued from page 16

FLORA

Cycads

Aboriginal people in the Northern Territory are reputed to have made a preparation from the male cones of *C. armstrongii* mixed with human urine to treat spear wounds, but there is no record of similar use in the Kimberley.

Cycad nuts are large and starchy, and James Cook's crew discovered lots of hulls scattered around Aboriginal fires where they beached the *Endeavour* in north Queensland. Believing this meant that the seeds were edible, some of the crew tried them but they became extremely ill with "a hearty fit of vomiting and purging". In fact, cycad nuts are highly poisonous, but Aboriginal people have developed a method of treating them to extract the toxin. *C. media*, *C. angulata* and *C. armstrongii* nuts are known to have been eaten. The kernels are pounded, dried 3-4 hrs in the sun, then placed in a dilly-bag and immersed in water. They are kept in running water 4-5 days, or in stagnant water 3-4 days, by which time the toxic principle will have been leached out. Two flat stones are then used to grind the material into a fine paste which is baked in the ashes. The explorer Ludwig Leichhardt, on an expedition to Port Essington in 1844-5, recorded a similar method of preparation, but with the seeds first cut into very thin slices and sun dried before soaking, fermentation and finally baking. The only WA record I know of was brought to my attention by Mike Hislop from the WA Herbarium; it is a note on a specimen label that says Indigenous people ate the nuts of *C. basaltica*, soaking them prior to eating.



Cycas basaltica, Aboriginal name *Kungurum*, Careening Bay
(Photo: Tim Willing)

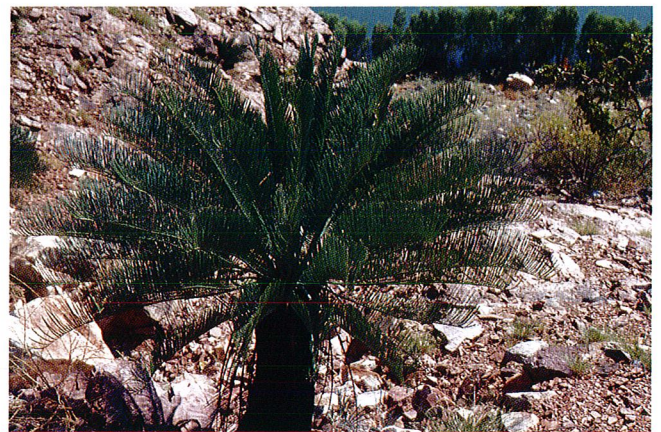
Of concern, however, is some research from the island of Guam, correlating a high incidence of human degenerative brain disease with the consumption of cycad meal from *C. rumphii* many years previously. Interestingly, the women who prepare the cycad meal are more subject to cycad poisoning than the men who

only consume the product – that is, there is considerable danger from handling the seeds prior to and during the process of leaching out the toxins. Cycad pollen also contains toxins, so don't belt your companions with ripe male cones, such that they inhale the pollen – remember that nasal membranes are the shortest route to the brain and possible neurological damage!

There have also been many studies of the toxic effects that grazing of cycads has on livestock. Presumably, all this formidable chemical armour helps explain why these ancient plants have survived into modern times.



Cycas furfuracea, Sampson Inlet (Photo: Tim Willing)



Cycas pruinosa, Ord Gorge (Photo: Penny Hussey)

A closely related family, Zamiaceae, occurs in the south-west of WA. It contains the *Zamia* (*Macrozamia reidleyi*), the Sandplain *Zamia* (*M. fraseri*) in the northern agricultural region, and the South Coast *Zamia* (*M. dyeri*) which grows from east of Albany across to Israelite Bay. (Incidentally, there are 38 species of macrozamia in Australia.) See WW 4/3 (July 2000) for more about zamias.

Penny Hussey can be contacted on 9334 0530.

NEWS

BUSHLAND MANAGEMENT WORKSHOP, MARGARET RIVER

There was a good turn out on a rainy day by members of the Cape to Cape community for a workshop on bushland management organised by Cape to Cape Catchments Group (CCCG) and *LFW* in June, 2011. The workshop started with presentations on fauna, including the use of motion-sensitive cameras, and management issues including weeds and increasing numbers of grey kangaroos. Many options were discussed, including up-to-date chemical control treatments for weedy species, kangaroo management, dieback hygiene and treatment and regeneration/revegetation techniques.

All boarded a mini bus and travelled to 'Glenbrook', an eco-tourism property (also *LFW*) on the outskirts of Margaret River owned by John and Betty Hindle.



John pointing out some history of the property (Photo: Cherie Kemp)

John gave a short history of the property over lunch and then everyone followed him on a walk to see how he has managed his bushland for conservation purposes. Over the years, the Hindles have established cabin style accommodation and a camping site for school groups. Now the property is open to all visitors and groups to visit and stay to enjoy the natural bushland. Apart from firebreaks and walk tracks/trails, the bush has been left for wildlife and

humans to enjoy. All participants were keen to question John about his past and present management and were impressed as to the quality of the bushland and the effort he and his family have put in.

Very many thanks to CCCG and John and Betty Hindle for their help in organising an interesting and informative day.

Cherie Kemp

FUNGIMAP CONFERENCE

I was fortunate to attend the National Fungimap Conference held in and around Denmark in July. Fungi enthusiasts of all ages and backgrounds, from beginners to boffins, came from all over Australia and some even from the USA to not only enjoy the conference, but the south-west biodiversity experience.

We were given the opportunity to learn from the experts, participate in workshops and field forays, discover how to conduct fungal surveys and to take fantastic photographs. And fantastic fungi photographs were certainly on show, the most exciting of which not only catalogued the specimens but also told the story of their environment.



I found that fungi hunting is a bit like birdwatching in that if you stand still long enough they come to you! They are everywhere, even in this Bull Banksia cone. (Photo: Sheila Howat)

Along with the day of thought-provoking talks, the field forays were a highlight for me. There were

20 field forays over two days into a variety of local bushland types. My day one foray was in a Jarrah/Marri/Banksia forest reserve led by fellow *LFW* members and fungi experts Mark Brundrett and Karen Clarke. We had lots of fun, found a huge variety of fungi, learned identification techniques and how to prepare specimens for the WA Herbarium. My day two also had a *LFW* connection with a foray through wonderful diverse bushland on the Quinn family's *LFW* property.

Overall, 665 observations of macrofungi were recorded. How exciting it was each day to return for lunch and a show and tell exhibition of our finds.

Take a look at the Fungimap website, www.rbg.vic.gov.au/fungimap.

Sheila Howat

CHIEF SCIENTIST VISITS NARROGIN

DEC's *LFW* and Wheatbelt Region hosted Prof Lyn Beazley, WA's Chief Scientist, during her recent visit to Narrogin.



The group - Prof. Beazley 4th from left, Avril Baxter 5th. (Photo: Cath McKeown)

As Chief Scientist, Prof Beazley plays a part in providing the state government with advice on topics that are important to the future direction of science and innovation in WA.

Lyn was very interested to hear of the facets of nature conservation management in the region from the

NEWS

THE AUSTRALASIAN BITTERN PROJECT

Robyn Pickering

The Australasian Bittern (*Botaurus poiciloptilus*) is an endangered and cryptic waterbird found primarily in Australia and New Zealand. In WA it is thought that only 38 to 154 adults remain, while the Australian population estimate is 247 to 796 adults.

In WA it is found in wetlands in four main areas of the south-west: the Swan Coastal Plain, Manjimup wetlands, south coast from Augusta to Bremer Bay and from Esperance to Cape Arid. However, with the right conditions and habitat available it can be found anywhere from Lancelin to Cape Arid. It is primarily found in medium to large wetlands with large stands of sedges and/or rushes. For more information, go to the Birds Australia website at www.birdsaustralia.com.au/our-projects/bittern-survey.

The aims of this Birds Australia/DEC/Lotterywest project are to:

- determine the bird's current range, population size and location
- determine the specific habitat requirements, including drought refuges
- document threatening processes
- increase awareness of the species and the importance of wetland conservation
- make recommendations for the conservation of the bird and its habitat.

But first we need to know where they are!



Surveys in spring 2011

While the Australasian Bittern is a fairly large bird, it is cryptic and more often heard than seen. Listening surveys conducted at twilight in spring are the most efficient survey method. The more listeners, the better - can you help?

Planned camp-out surveys are being conducted at the Cape Le Grand/Condingup wetlands (Esperance) on 9-15 October, Muir-Unicup wetlands (Manjimup) on 28-30 October, and at the Manypeaks and Two Peoples Bay wetlands (Albany) on 4-6 November. Other surveys are planned for the Perth metropolitan area, Benger Swamp (between Harvey and Brunswick Junction), Gingilup Swamps (south-west of Nannup) and Maringup Lake (south of Northcliffe).

If you would like to get involved or would like more information, please contact me by email r.pickering@birdsaustralia.com.au or telephone 0405 395 286

(Illustration from Atlas of Australian Birds, Birds Australia)

continued from page 18

deliberation on the use of fire to feral animal control and how we prioritised our limited resources in protecting the plants and animals in this world-renowned biodiversity hotspot.

The role of LFW members in protecting bushland and observing flora and fauna in our fragmented landscape was acknowledged. The challenge for science and innovation is how to harness this wealth of knowledge in a way that can be useful to the scientific community.

Avril Baxter

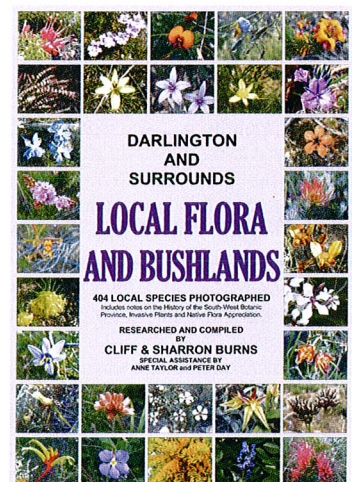
PLEASE NOTE: If you change your postal address, phone number or email, please let LFW know.

Darlington and surrounds: local flora and bushlands

*Cliff and Sharron Burns
Authors and Shire of Mundaring. 2011.
Free, on a personal visit to Shire Office,
Great Eastern Highway, Mundaring.*

Long-term Darlington residents Cliff and Sharron Burns have combined their passion for bushwalking and photography to produce this excellent book. 404 local species are illustrated, often with several images giving details of flowers, fruits, leaves and habit. There is minimal text with the pictures, but there are brief introductory notes and some fascinating little 'boxes' here and there. In collaboration with the Shire of Mundaring, the authors obtained a Lotterywest grant to cover the printing, so the book is being distributed free.

Remember that, in order to put a limit on their endeavours, the authors confined the species shown to those photographed within Darlington and its surrounds, so it would be of greatest



use to residents of Mundaring and nearby Shires. However, many species are widespread, so anyone living or working in the Perth hills would find it helpful. Browse the pictures and become familiar with different genera as you do so. Enjoy!

Penny Hussey

NEW BOOKS

Mistletoes of Southern Australia

David M Watson
CSIRO Publishing. 2011
\$49.95

I am often asked to identify mistletoes, particularly by people who are concerned about heavy infestations in road-side and remnant vegetation. With David Watson's book you can now identify all the mistletoes of southern Australia for yourself. Each species is described, illustrated with a photograph and a full-page painting by Robyn Hulley. Moreover, each has a distribution map.

Mistletoes of Southern Australia



DAVID M WATSON
Illustrations by Robyn Hulley

reproduce. Another on 'Ecology' describes their pollination and seed dispersal (both depend on birds), seasonality, life cycles and their importance to a wide variety of birds, butterflies and beetles, even other mistletoes that grow on them. There are also chapters on their cultural significance and, most importantly, their management. Throughout the text, the author avoids jargon but pays particular attention to clarity and accuracy.

While the book will be a useful field guide and a fascinating read, it does have some drawbacks for users in WA, the distribution maps being the most serious. Many are inadequate. e.g. the Box Mistletoe map suggests it is restricted (in WA) to a small area in the Murchison. In fact, it occurs from the north Kimberley almost to the south coast. Indeed, it is common in Perth and often seen as a pest, particularly in wandoo and marri. Some of the illustrations are good. Others may accurately represent eastern Australian populations but not ours. Again, the Box Mistletoe is an example. Finally, I would have found a key useful. To identify a mistletoe, one has to flip through the illustrations. You could be forgiven for not identifying a Box Mistletoe collected in Perth if you relied on the illustration and the

Tony Start

But the book is far more than a field guide. Copious photographs illustrate chapters on many fascinating topics. There's one on 'Biology' which explains what mistletoes are, how they obtain nutrients and how they

Tall Timber – a great forester revisits the many people who influenced the course of his long life.

Author Richard St Barbe Baker OBE LLD
Editor Barrie Oldfield OAM
Published in a limited edition by Men of The Trees Inc, WA Branch, PO Box 103 Guildford 6935. PH: 9250 1888. Cost: \$60

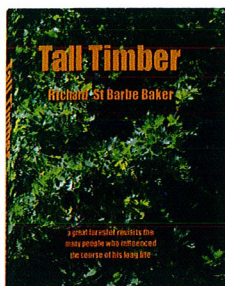
Richard St Barbe Baker, founder of the world-wide voluntary organisation Men of the Trees, spent his whole long life encouraging people everywhere to plant trees, to reverse the spread of deserts, and to respect and conserve native forests and woodlands everywhere. He foresaw climate change long before that phrase was invented. His fervent message was that as global forests declined so the world would become unable to support its increasing burden of humanity.

He travelled widely summoning people to the cause. He wrote 23 books and many articles on trees. Only in the last years of his life did he write about the people he met along the way and whose support for his cause was invaluable. In this book, no less than 173 of these people have earned a chapter in his autobiographical reminiscences. They range from Franklin Delano Roosevelt who, as President of the United States, instigated the Civilian Conservation Corps employing six million people over eight years on tree planting and other conservation work. Sir John Chancellor who, as Governor of Palestine and seeing what St Barbe had achieved in Kenya, revived the old Jewish 'Feast of Trees' and facilitated the reforestation of the promised land by bringing heads of religions to plant for this common purpose.

C E Lane-Poole derived great support from St Barbe when he was caught with the prospect of the closure of the Australian Forestry School during the great depression. St Barbe stepped in to keep it open by arranging for forestry students from Oxford to spend a year in Australia studying the eucalypt forests and their understorey.

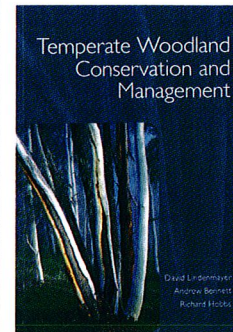
Many insights into the history of the 20th century crop up, for wherever armies

marched or governments came to power the forests of the world were always a negotiating factor representing wealth, health and good governance.
Barrie Oldfield



Temperate Woodland Conservation and Management

David Lindenmayer, Andrew Bennett and Richard Hobbs (eds.), 2010.
CSIRO Publishing. \$89.95



This excellent book will be valuable to anyone owning or managing woodlands in south-west WA. It contains 40 short chapters summarising the key findings and recommendations of many of Australia's

leading woodland researchers and managers while providing readers with a good understanding of the major issues to be addressed in conserving and managing woodland habitat. Each chapter contains an extensive list of references from where the detail on how to conserve and manage woodlands can then be obtained.

Two important issues deserved more consideration. The first is the use of artificial nest boxes. Many chapters emphasise the value of retaining old trees, including isolated paddock trees, because of nesting and roosting hollows that occur only in trees of reasonable age. Other chapters reiterate the crucial need to revegetate degraded landscapes and woodland patches. However, no authors combine these two important issues together by suggesting that artificial hollows can provide roosting and nesting sites during the 50 to 100 years that tree seedlings take to grow large enough to develop usable hollows.

The second is a chapter on fire and its role in creating and maintaining woodlands in a healthy and diverse condition. Only one chapter makes more than a passing reference to fire.

Overall, there is much to commend this publication. Owners and managers of woodlands, together with state and federal policy makers, will find it a source of many valuable and thought-provoking facts, conclusions and recommendations relevant to long-term woodland conservation and management. In particular, the emphasis placed on working with private owners of woodlands should not be underestimated, since much of our remaining woodlands exist off-reserve on private properties.

Bernie Masters

This newsletter is a compendium of articles written by many different people. The views expressed are those of the authors, not necessarily those of the Department of Environment and Conservation.

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