Western Wildlife

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

LAND FOR WILDLIFE

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EFFECT OF FIRE ON BUTTERFLIES

Matt Williams

BUTTERFLIES are not a conspicuous part of our insect fauna. In the Western Australian Year Book of 1898/99, Arthur Lea wrote that "what strikes the visiting entomologist ... more than anything else is the great rarity of butterflies". So you might be surprised to learn that there are more than sixty species of butterfly in the south-west, as well as another dozen or so brightly coloured day-flying moths that are often mistaken for butterflies. (The butterflies are a relatively well documented group of insects and all of our south-west species are described and illustrated in Michael Braby's book *Butterflies of Australia: their identification, biology and distribution*, CSIRO publishing, 2000.)

Butterflies are an important part of ecosystems because they pollinate many native plants and their early stages form part of the food chain. However, their role as pollinators is being taken over by introduced butterflies such as the cabbage white, or by feral insects such as introduced honeybees.

Many butterflies and day-flying moths (collectively referred to as "butterflies" in this article) are becoming increasingly rare. This is because butterflies have three characteristics that make them particularly susceptible to local extinction in bushland remnants.

First, the caterpillar that will eventually become a butterfly is usually very selective about what it will eat. For example, the caterpillars of the blue iris-skipper eat only the leaves of purple flag, *Patersonia occidentalis*. The caterpillars of some butterflies are a little more tolerant. For example, in the Perth metropolitan area the caterpillars of the western jewel butterfly feed on green stinkwood, *Jacksonia sternbergiana*, and rattlepods, *Daviesia divaricata* — but they will survive on these plants only if a particular species of ant (*Crematogaster perthensis*) has a nest at the base. Western jewel caterpillars shelter inside the ant's nest during the day,

The western jewel butterfly seems to be able to recolonise burnt areas in the first year or two after a fire, so long as a nearby population exists to provide colonists (photo: Trevor Lundstrom)

emerging at night to feed. The ants tolerate the caterpillars because they produce honeydew that the ants feed on.

Second, the early stages of butterflies (eggs, caterpillars and pupae) are highly vulnerable to fire. Most caterpillars live and feed on the above-ground parts of plants, and so are killed by fire. The western jewel's caterpillars find refuge from fire underground, but probably die from lack of food soon afterwards.

Finally, despite being able to fly, most species of butterfly will not disperse across unsuitable habitat. Although a few species — such as the yellow admiral, Australian painted lady and chequered swallowtail — are capable of flying exceptionally long distances, most

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EDITORIAL

Greetings all!

LAND FOR WILDLIFE has recently undergone a significant change, our staff have become permanent (albeit part-time) public servants. This is a very important step as it means that the programme - and the stewardship we provide to our members - are here for the long term. We hope you continue to find the service we provide useful!

Sadly, two *LFW* Officers have left the scheme recently. Steve Newbey, who has been working from Katanning for the last year, will be spending more time on his new property at Collie, as well as continuing to work with National Trust Covenanting. Alison Dugand, who worked in the Hills and Avon Valley area since last November, has left to take up a full-time job with Australian Nature Conservancy. Those of you who met either of these people will know how lucky we were to have them working with us, even if only for a short time, and we wish them both well for the future.

This issue is full of peoples' observations about wildlife and the environment, each one adding something to our knowledge of the natural world. Piece by piece we are fitting the jigsaw puzzle together to create the big picture. Maybe an observation that you have made is one of the missing bits?

Best wishes for the end of the year.

Penny Hussey

Coogee Primary School are in the news again! Here, Environment Minister, Dr Judy Edwards, opens a walk trail, helped by the school's environment teacher, Keith Brown. Note the LFW sign!

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FAUNA

DIET ANALYSIS OF MALLEEFOWL

Jessica van der Waag

IN the final year of my Curtin University degree in Environmental Biology, I began a diet analysis study of Malleefowl. It was a fascinating project with many interesting findings, such as one bird that had eaten two small plastic discs (they did look a lot like *Acacia* seeds!). I was given great support by my supervisors, Prof Stephen Davies and Dr Marcello Pennacchio and the Malleefowl Preservation Group through the voluntary coordinator Susanne Dennings.

Why Malleefowl? Well, it is a threatened species. One of the major causes of its decline is habitat destruction. The birds are thought to be primarily granivorous, taking seeds from the shrub layer. In many areas, bush remnants are grazed by stock or rabbits, which reduces seeding. Examining the stomach content of these birds provides information as to the food types taken, plant species used as food by the birds and seasonal preferences.

The stomach contents; crop and gizzard, from 18 roadkilled birds and one chick (killed by a cat) were examined. These included eight from South Australia (loaned from the SA Museum) and 11 from Western Australia (10 loaned from the Malleefowl Preservation Group and one from the WA Museum).

The content of the stomachs was sorted into type (flower, leaf, seed, invertebrate) and then into morphospecies (this one looks like that one). These were then examined by researchers from many areas including the Department of Agriculture, Curtin University, APACE Nursery and the WA Herbarium. Most of the plant material was taken to family or genus. Thanks to Dr Brian Heterick, the invertebrates were taken to genus or species.

The results of this study show that seeds were taken by the Malleefowl throughout the year. Seeds (excluding fruits) made up, on average, 67% of the stomach content of Malleefowl (ranging from zero to 99%) with the rest being the invertebrates and plant vegetative material (leaves, flowers, pods and stems). 172 morphospecies were isolated (though the actual number of true species is expected to be much less). Of particular interest were the stomach contents of a chick which contained mainly Fabaceae (Pea) seeds, probably *Daviesia* sp. and termites.

Male Malleefowl at the mound, Ongerup (photo: J van der Waag)

A number of roadside weed species including *Hypochaeris* sp. (flatweed), *Medicago* sp. and *Asparagus asparagoides* (Bridal creeper) were identified. Agricultural crops were also taken with 10 of the 19 malleefowl examined having lupins and/or wheat in their stomachs. It is possible that Malleefowl have adapted their foraging patterns to use roadside grain spills and plant growth.

One female Malleefowl (collected from Jacup) had a large number of winged ants in her crop along with 48 locusts. From other stomach analysis studies, it appears it is uncommon for a Malleefowl to collect such a large number of invertebrates while foraging. The Malleefowl had probably taken advantage of a flight of insects to gorge. One of the South Australian birds had also taken advantage of an insect outbreak, taking a large number of lerps.

The smallest seeds taken by one of the Malleefowl were three seeds measuring 2 mm by 1 mm. Another bird had taken 34 fruits of 1 mm diameter. Several ants of 2 mm length were also found in specimen crops. It is possible these were taken incidentally while feeding on plant material, however observations of such small ants being taken by Malleefowl have been made in previous studies.

Conclusions

- More work is required to identify samples further to produce a comprehensive species list. This would include flora surveys of the areas where the Malleefowl were collected.
- To reduce the high number of Malleefowl roadkills, road authorities should be encouraged to increase signage for public awareness in areas of high Malleefowl density.
- Roadside verges are valuable and should be expanded and used as corridors in a management plan to connect remnant bush.
- Malleefowl usage of roadsides and standing crop as feeding areas may indicate there is not enough food available in small remnant areas. As there is a high mortality among chicks, with 80% thought to die through starvation in the first few weeks of life, providing supplementary feed in small managed remnants may assist recruitment of the young into the population – more work on this is needed.

Thanks to my supervisors for their support and encouragement and to all the people who gave their time to assist me in this project.

Contacts: If you see a Malleefowl, please fill in the sighting form found on the Malleefowl Preservation Group's (MPG) website: hhtp://www.malleefowl.com.au/MalleefowlSighting.htm
If you come across a roadkilled Malleefowl, record details of where you found it and freeze it. The MPG can advise where the bird can be taken.
To contact Jessica: vanderwaag@ozemail.com.au

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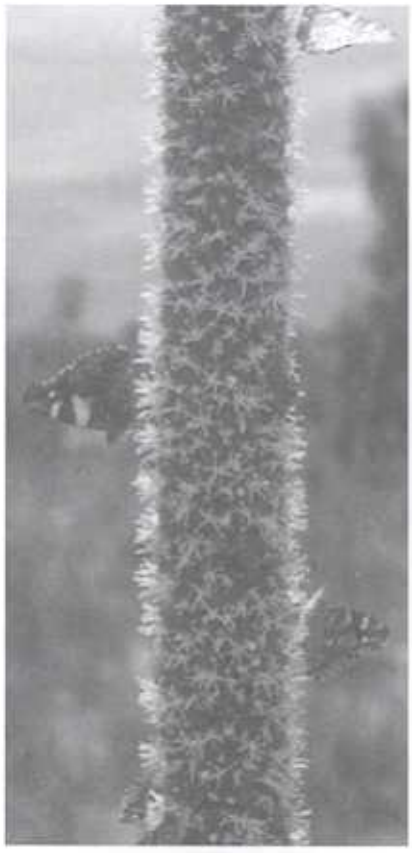
are extremely sedentary and do not disperse more than a few hundred metres (if that) during their lifetime. Barriers such as roads, urban areas and farmland are insurmountable for many species of butterfly.

Taken together, those characteristics mean that if the butterfly population in a reserve dies out, or its specific food plants are destroyed or defoliated, perhaps after a particularly severe fire, the chance that a new population will establish itself by immigration from elsewhere is extremely low. With the increasingly fragmented nature of our native bushland, and frequent occurrence of fires in the more heavily populated areas, butterflies are exposed to a high risk of local extinction within the remaining bushland reserves. This is particularly true if the reserves are small, or a long way from other butterfly populations.

For example, many of the native butterfly species that once occurred in King's Park are now locally extinct. The species that still regularly live and breed there are those that have adapted to feeding on introduced weeds, are strong dispersers that can easily re-establish themselves, or have both characteristics. Seven native butterfly species that were probably resident in pre-European times are now locally extinct in King's Park and have not been able to re-establish themselves, even though the Park contains suitable habitat.

I am currently studying the effects of fire on native butterflies and do regular surveys to monitor changes in the abundance of butterflies after fire. Currently, I have four study sites in the Perth metropolitan area: Koondoola Regional Bushland Reserve, Warwick Conservation Area, Cottonwood Crescent Bushland and Kensington Bushland. So far, I have recorded thirty species of day-flying Lepidoptera (27 butterflies and 3 day-flying moths) in these surveys.



Many butterflies are attracted to flowering Xanthorrhoeas after a fire, such as the yellow admiral (centre left) and Australian painted ladies (photo: Matt Williams)

Koondoola Regional Bushland (Bush Forever Site 201, 13 km north of Perth city) is a 120 ha reserve of *Banksia attenuata* woodland on Spearwood and Bassendean dunes. Koondoola Bushland is predominantly in excellent condition and probably has an intact butterfly fauna. Of my four study sites, Koondoola has the most species of butterfly (28 recorded so far), and also the greatest numbers, with an average of about 150 individuals being recorded on a 4 km survey during spring. Species sensitive to disturbance, such as the spring-flying sun-moth *Synemon ?discalis*, forester moth, fringed heath-blue, western jewel, blue iris-skipper, large bronze azure, western and large brown skippers and the mallee ochre, still occur at Koondoola but are rare or absent at the other sites.

Warwick Conservation Area (Bush Forever Site 202, 58 ha in area) is about 4 km to the west of Koondoola and has similar vegetation. Divided into four fragments by a road, high school and playing fields, Warwick bushland has been subject to greater disturbance. Some parts have been burnt frequently, and weed invasion is more noticeable. Some butterfly species, however, are more abundant at Warwick, most notably the endangered graceful sun moth (*Synemon gratiosa*). Just why this rare moth, which flies during autumn and whose caterpillars feed on a mat-rush (*Lomandra* sp.), is more common at Warwick is not known. My study, which is also assessing the abundance of food plants at each site, may eventually be able to answer this question. Species that can utilise introduced weedy grasses as food plants, such as the marbled xenica, western brown and western grassdart, are also more abundant at Warwick.

Cottonwood Crescent Bushland in Dianella (Bush Forever Site 43), is only 11 ha in area but is in remarkably good condition. In vegetation type and condition it is very similar to Koondoola, which is 4 km to the north. Cottonwood has a very diverse butterfly fauna for such a small remnant, having 10 of the 20 resident species known from Koondoola. Its butterfly fauna is a subset of Koondoola's and future surveys may well expand the species list for this site.

Kensington Bushland (Bush Forever Site 48) is a 9 ha remnant only a couple of kilometres south of central Perth, and so has been isolated for the longest time. It has also been subject to repeated burning (most recently when over three quarters was burnt in February 2003) and is the most disturbed of the four sites, although the bushland is still in reasonably good condition. The vegetation type and soils are similar to those of the other sites. However,

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Virtually nothing is known about the effects of fire on some species, such as this day-flying forester moth (photo: Phyllis Robertson)

The fringed blue butterfly appears to be heavily impacted by fire and is most abundant in long-unburnt areas (photo: Trevor Lundstrom)

Kensington Bushland is depauperate in butterflies, having only about 5 resident species, with many species now locally extinct. I am currently planning to re-introduce blue iris-skippers to Kensington bushland in November 2003.

Over the past two years I have devised and tested a standard survey technique to assess the abundance of butterflies. I have found that using existing tracks and firebreaks to conduct the surveys is adequate, and is both faster and causes less disturbance than transects through the bushland. Warm, sunny weather is needed for the surveys. Days with maximum temperatures between 23 and 30 °C are ideal. Surveys vary from 1 to 4 km in length and are conducted between 10 am and 3 pm. The main flight period for butterflies is mid September to mid December, with peak activity in early November, but additional surveys around March are needed to detect some autumn-flying species such as the graceful sun-moth and wedge grass-skipper.

Now that I have finalised a standard survey technique, more reserves in the Perth metropolitan area will be added to my list of study sites in the coming year. The help of volunteers in conducting these surveys is always welcome, and if you would like to assist me with these surveys, and learn how to identify some butterflies along the way, please get in touch with me.

Matthew Williams is a Research Scientist in CALM's Science Division. He can be contacted on 9334 0399, or email: mattw@calm.wa.gov.au.

IN BRIEF

LAUGHING KOOKABURRAS ARE NOT WANTED IN WA!

LAUGHING kookaburras are not native to WA, they were brought here in the 1890s - 1900s in a Government-sponsored programme, and they are now common in the south-west. They are predators, taking mostly reptiles and young birds and are especially fond of the dragon lizards which bask on granite rocks.

But a Hills resident recently observed a different sort of kill ..... the family were watching a group of quendas, including two young ones. Suddenly a kookaburra swooped, and grabbed a baby bandicoot in its beak. It gave one strong flick of its head, before the heavy brigade (the humans) attacked, and the bird dropped its prey and flew off. But the baby bandicoot was dead, its back broken.

Our small marsupials are under a lot of stress already. It's one thing for quendas to be taken by pythons, monitors or owls - they don't need kookaburras too! Remember they are feral here, and try to discourage them wherever possible.

Penny Hussey

RAINBOW LORIKEETS

DAVID LAMONT reports that Rainbow Lorikeets have now established on his property at Yanchep. They were first seen as nomads in 1995, but they are now constantly present. Jenny MacKintosh at Mt Helena reported the first group flying across her block in August this year.

Has anyone else recorded an expansion of these noisy, colourful ferals?

FLORA

POLLINATOR OBSERVATIONS IN CARNIVOROUS PLANTS AND ASSOCIATED SPECIES

Allen Lowrie

Each time I am in the field I am constantly on the lookout for the pollinators of carnivorous plants - strangely, a rarely observed event. Very little is known about the pollinators of these plants and it is always a privilege to view pollinators at work when they are encountered.

The insect pollinators I have witnessed pollinating carnivorous plants in south-west Western Australia are *Bombyliid* flies. These same insects are also pollinators of many *Stylidium* species (triggerplants), a genus of plants commonly found in the same habitats as most carnivorous plants throughout south-west Western Australia.

At many locations I have observed floral mimicry between a triggerplant, *Stylidium repens* and a pygmy sundew *Drosera parvula*. Even though the triggerplant has a 4-lobed laterally paired flower and the sundew a 5-lobed circular flower, both species are clearly mimicking each other. Each species has small bright white flowers with red spot marks near their petal bases. It is conceivable that these two unrelated plant species too maybe using the services of the same pollinator.

If the same pollinator serviced these two unrelated species, pollen would be dabbed onto its body in two segregated zones. In the case of the triggerplant because of its column length and position, the pollen would be placed on the upper parts the pollinator's body. The sundew's pollen would be smeared onto the pollinator's belly from the 5 erect anthers as it sipped nectar from around the base of the ovary. The placement of each species' pollen onto segregated areas of the same pollinator's body would insure that each species does not dilute the other's pollen patch. This also insures pollen in these segregated patches will be delivered to the correct species' stigma/s.

Stylidium repens

Drosera parvula

On an expedition in June 1995 to the remote region of the Kimberley, at a beautiful location on the banks of Grevillea Creek on Beverley Springs cattle station, I was privileged to see two noteworthy events, one of a pollinator at work on a carnivorous plant the other an unusual flowering phenomenon. Here, in a wet, very rich in different species herb-field, many different carnivorous plants grew together. The following species were recorded:- *Drosera indica* (3 forms); *D. burmanni; D. ordensis; D. petiolaris; Utricularia antennifera; U. caerulea; U. chrysantha; U. fistulosa; U. lasiocaulis; U. limosa; U.* aff. *leptoplectra; U. quinquedentata; Byblis filifolia* as well as a number of *Stylidium* species, *S. costulatum; S. fissilobium; S. flumenense; S.claytonioides; S. pachyrhizum; S. quadrificatum; S. schizanthum;* and *S. semipartitum.*

At this location there were three clearly different *Drosera indica* 'species'. One species had reddish foliage and large mauve flowers with yellow stamens. A second species also with reddish foliage and orange flowers with yellow stamens. The third species in this *D. indica* complex was the green foliaged densely glandular white flowered species bearing large blood-red cobra-hooded-like stamens. No hybrids between these individuals were found. I have observed these same species as well as other combinations of these and yet other species of *D. indica* within the same habitat at numerous other locations throughout tropical

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northern Australia every year since 1988. It is not unusual to find two or more different *D. indica* within the same habitat. Dr. John Conran (Adelaide University-Botany Dept.) and a number of his students as well as myself have been collectively studying the *Drosera indica* complex for a number of years. A number of good morphological character differences within the complex have been discovered. John Conran and his students are currently applying chromosome and DNA studies to the plants and it is hoped that this cutting-edge research will throw further light on relationships within this rather difficult complex.

The Grevillea Creek location produced two noteworthy observations. I had just finished photographing all the carnivorous plants and triggerplants in this herb field, and Pauline (my wife and assistant) and I were taking a break from the intense two hour photographic session. It was hot and very humid and about 11 a.m. The first strange happening that caught my eye while I was having a breather sitting on my camera case was: all the white flowered species of *Drosera indica* with blood-red stamens I had just finished photographing, were closing their flowers without any explanation. The flowers of the orange and mauve flowered forms of *D. indica* at this same time however were still fully open.

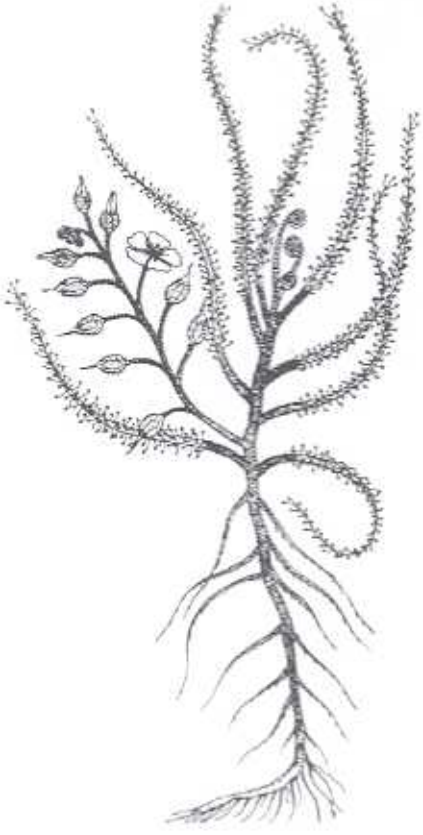
About the same time a large green woolly bee flew into our view. Right before our eyes we witnessed this insect pollinating all the orange flowered *Drosera indica* in its flight path. It zoomed to and fro from side to side and from one orange flower to the next as it worked its way away from us across the herb field. Each time it landed right dead centre in the middle of the slightly cupped flower right in amongst the stamens and stigmas. Just as quick as it landed the pedicel of the flower (which clearly could not support the weight of the green woolly bee), tipped completely over to become momentarily umbrella-like and flipping the insect out at the same time. The flower then flipped back just as quickly to its original upright position to be on display once again.

It was amazing, it only took a second or two from the time the insect landed to the time it was tipped out of the flower. No sooner had it been dumped from one flower it had just as quickly landed on another flower to repeat the process once again. Pauline and myself watched in utter amazement as we followed the insect zigzagging from side to side right across the herb field and in doing so visited every orange flowered *Drosera indica* in that area. The insect did not miss a beat. Every flower numbering about 50+ before us in a width of 5 metres over a forward distance of 10 metres (one of the borders of the herb field) was visited. Not one orange flower was missed. The insect at the time of this observation bypassed all the mauve flowered *D. indica* as well as all of the other different coloured flowers (of which there were many) in its flight path.

This insect clearly had one thing on its mind and that was orange flowered *Drosera indica*. This observation may explain how three different forms of *D. indica* can coexist with each other and carry on as if they were individual species (which after all our research may prove to be the case). This observation clearly showed that the orange flowered species was pollinator specific.

Unfortunately I did not see what insect was pollinating the mauve or white flowered species of *D. indica* at this site. Furthermore, I could find no evidence as to why the white flowered *D. indica* closed its flowers so early in the day. Both these points remain unsolved. I would be most interested in hearing from others of any observations they may have seen with regard to the pollinators of carnivorous plants and triggerplants.

Detailed reference list available - Ed.



Drosera indica

Allen Lowrie is a botanical author and artist. He can be contacted by mail at: 6 Glenn Place, Duncraig, WA 6023.

Want to know more about carnivorous plants?

You need to read Allen's three detailed and superbly-illustrated books:

Carnivorous Plants of Australia. Allen Lowrie
Pub: Uni WA Press
Vol 1 1987
Vol 2 1989
Vol 3 1998

As WA is a world hot-spot for sundews, they should be on every plant-lover's bookshelf! - *Ed.*

FLORA

FIRE, FLOWERS AND SUNDEWS

Kingsley Dixon

WESTERN AUSTRALIA has many fire-flowering species. You only need to visit any bushland the spring after a summer fire, to realise just how closely the flowering and seeding cycles of many Western Australian plants are linked to fire. But just what is the agent that is involved in triggering many species to flower?

Research has now indicated that smoke and ash have little to do with the flowering response in some of our *Drosera* species. Indeed, our original suspicions that the common fruit ripening gas, ethylene, was involved, was proven correct when we injected small quantities of the gas into bushland soil where the common red-ink sundew (*Drosera erythrorhiza*) was lying as dormant tubers. Four months later in early winter we were rewarded with a display of the sweetly scented flowers only on plants subjected to the gas treatment. The next step was to measure the amount of ethylene produced during a 'hot' summer fire. A device to trap the ethylene was devised and a fire set - the results were truly remarkable with ethylene production to such a degree within the the first 5 minutes of the fire front passing that the instrument being used went off scale!

The role of ethylene in flowering is well understood in many plants. For example the pineapples you

Drosera erythrorhiza

enjoy have been forced to flower on cue by application of ethylene. So our little Western Australian sundews have adopted the same mechanism as many other plants to 'sense' the passage of a fire. So the next time you see a red-ink sundew flowering just remember that this smart plant has captured the essence of a summer fire - literally!

Dr Kingsley Dixon is Director, Science at Kings Park and Botanic Garden. He can be contacted on kdixon@kpbg.wa.gov.au

For the full story, read "Defining the role of fire in south-west Western Australian plants", K. Dixon & R. Barrett. 2003. IN *Fire in ecosystems of south-west Western Australia: Impacts and management. pp205-223.* Ed. *Abbott & Burrows. Backhuys, Leiden.*

IN BRIEF

FIRE - HOW DOES THE LAW AFFECT YOU?

MANY landholders ask us about their legal responsibilities regarding fire. If you are concerned about this, a magnificent paper has just been published which will answer all your questions - including an easy-reference table which tells you, the owner or occupier of private land, just what acts or regulations apply to you.

"Fire and the Law" by Sandy Boulter, a solicitor at the Environmental Defender's Office, is published in "Fire in ecosystems of south-west Western Australia: Impacts and management. Vol 2: Community Perspectives about Fire", pp12-36. It is available (free) from Glenda Lindsey at CALM, phone: 9334 0463 or email: glendal@calm.wa.gov.au

BUSH DETECTIVE

WHAT SORT OF PLANT IS THIS?

LOOK carefully among the tiny plants on granite swards, stream banks or among the everlastings in woodlands and mulga and you should be able to find an Adder's Tongue. It has a single, bright green leaf and a central stalk with a double rank of spore-containing capsules at the top. The whole plant is usually no more than 5 or, at most, 10 cm tall. What group of plants does it belong to?

Ans. It is a fern, the clue is the fact that it bears spores. The drawing is the common *Ophioglossum lusitanicum*, widespread throughout the State. There are four other species in WA, all are very similar. Just one of the interesting tiny plants it is worth looking for among the herbfields.

ECONOMIC ASPECTS OF BIODIVERSITY

WHAT'S IN A NAME? - A MARKETING DILEMMA

John Day

IN the last issue of Western Wildlife Penny Hussey wrote about the imminent name change of some species of *Agonis* (those with ten stamens) to the genus *Taxandria*. This includes *Agonis fragrans*, which, for the last three years, we have been cultivating to extract its essential oil. The name change was of some concern to us as we (Paperbark Essential Oils) had already commenced the lengthy process of introducing the oil derived from this plant to the public. We had applied the name Fragrant Agonis to this oil, and labels and marketing literature all used the name *Agonis*.

Harvesting Fragrant Agonis at Albany.

I contacted Chris Robinson who has been working with us in the commercialisation of this oil and was involved with Judy Wheeler and Neville Marchant in ascribing the species name *fragrans*. Chris's advice was that although the 'new' name *Taxandria fragrans*, will be botanically correct, the oil name *Agonis fragrans*, can still be used as it still refers to the oil from the same species. In other words *Agonis fragrans* can be traced back from (and is an outdated synonym) for *Taxandria fragrans*. I guess this is much the same as when some one marries and changes their name: the new name becomes legally correct although that person may still be identified by their previous name!

Chris quoted the pragmatic approach of emminent WA taxonomic botanist Greg Keighery from CALM, as follows: "There is no problem in using *Agonis* as a common name in horticulture or commerce, since *Rhodanthe* was used in Horticulture for years after it was submerged in *Helipterum* and *Leschenaultia* is still the common name for *Lechenaultia*. In fact there is no scientific problem in using an alternative generic name in any sense, viz *Eucalyptus* vs *Corymbia*, since both are valid, and both are not 'real' biological entities like a species: they are constructs by taxonomists and both relate directly to the taxon in question.

To update on latest developments, we undertook two harvests in about March this year, one at the Water Authority site at Albany, and the other at our Harvey essential oils farm.

The Gas Chromatograph Mass Spectrometry (GCMS) analysis of these oils confirmed minor differences in the percentages of constituents of the oils, as expected, as the seed for each planting came from different genetic stock. We applied the constituents to functional groupings, and in conjunction with Mark Webb (Clinical Aromatherapist, Sydney) it was postulated that not only did the oil have antibacterial properties, but very likely could have effective anti-inflamatory properties. Anecdotal evidence to date seems to strongly support this theory. And the good news is that we may now be able to apply some scientific basis to the theory. Chris worked hard last year to submit an application to RIRDC for a grant to further study this oil, and that application has recently been approved. Expenditure will be administered by Great Southern Development Commisssion, Chris will manage the study and carry out field population collections, UWA Microbiology Department (Tom Riley) will conduct antibacterial and anti-inflamatory testing, GCMS analysis will be by Wollongbar Agriculture Institute (Ian Southwell), degradation and comparision testing and clinical trials by Mark Webb, and industry participation by Paperbark Essential Oils. A Curtin University honours student under Professor Luis Evans will investigate the immunostimmulatory properties of this oil on aquaculture (marron).

Keep and eye out for this new and exciting Western Australian essential oil!

Paperbark Essential Oils is also developing another new WA oil - a 'citral' chemotype of *Melaleuca teretifolia* or Marsh Honey Myrtle, found growing naturally at our property at Harvey. This oil was the subject of a joint research project (*Melaleuca teretifolia* chemovars: Australian Source of Citral and 1.8Cineole), between Wollongbar Agricultural Institute, UNSW School of Chemistry, and ourselves. Now recognised as the highest 'citral' *Melaleuca* yet discovered in Australia it is a wonderful aromatic oil, and has considerable antimicrobial potential. Commercial quantities of this oil are now available under our applied name 'Honey Myrtle oil.'

These oils, and others we are investigating, have huge potential and are a vast untapped Western Australian resource.

John Day can be contacted by email: jrday@global.net.au

FAUNA

FERAL BEES AND HOW WE COPED WITH THEM

Carole Sutton

OUR one-hectare property, in the foothills of the Darling Range, provides part of a corridor from the suburbs to the hills for birds and wildlife. Four years ago my husband made a number of bird nesting boxes and placed them in our trees. Since then, we have watched with delight many families of Maned Duck and Port Lincoln parrot take up residence and rear their young.

This year we also had some unwanted visitors. Feral bees. They were first seen on a neighbour's property, where they had taken over an owl's vacant nesting box. At first we were pleased to see them. After the shortage of bees the previous year, we looked forward to a better pollination program.

Then, a second swarm moved into one of our duck boxes. By the time they took over their third box we were becoming concerned, and decided it was time to do some culling. But how do you get rid of a box full of stinging creatures? It was summer and the land was tinder dry; fire was out of the question. Leaving the neighbouring owl's box alone, we experimented on the second box. It was lower down, in one of our trees, and more accessible. We tried popping mothballs in the hole. A week later the bees were as busy as ever, and taking no notice of our efforts.

Another swarm had taken over a fourth box. Fortunately it was out of the breeding season. In the hope of preventing more arrivals, we took the ladder around to the remaining empty boxes, brought down any needing repair, and nailed a cover over the openings of the others.

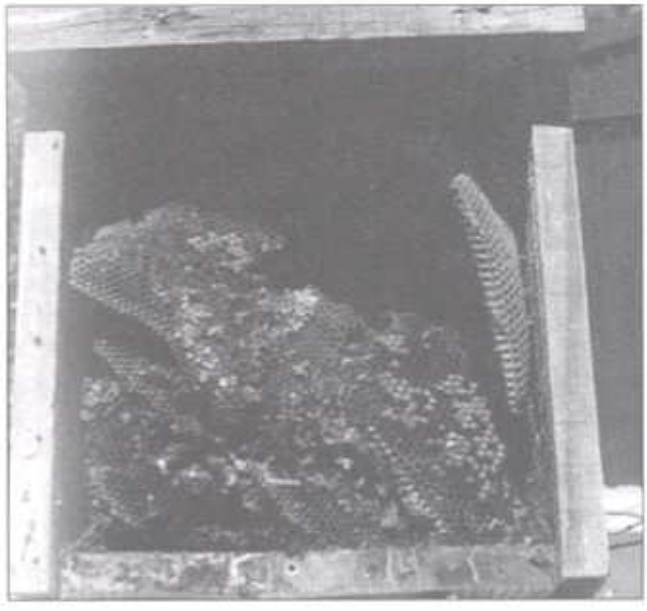
Next we tried camphor blocks in number two box. Again, to no avail. By now we were having to keep tight control of our grandkids, and dogs, one of which was allergic to bee stings, as a fifth colony of bees finding no open houses, settled into a huge mass on a low shrub. They stayed there for two weeks before moving off.

We tried ringing around to find a willing bee-keeper to come and collect them. But nobody wanted to know about feral bees. The Internet had masses of information on bees, but nothing on how to dispose of them. Our enquiries eventually brought us to a commercial maker of bird-nesting boxes, and how he dealt with the problem.

He used Mortein Moth and Insect Strips. They were readily available from the local store or supermarket. There is no mention of bees on the instructions, of course, but insert one whole strip into the box after dark. For the necessary potency you can use a strip only once. We tried it on box number two, and within three days the nest was clear of feral bees.

The remaining two boxes were more difficult, both were much higher in the trees and needed an extension ladder to reach them. We tried the parrot box first. It had

Swarm on nest box



Honeycombs inside nest box

continued on page 11

FAUNA

continued from page 10

a hollow log on the front of it, and navigation through the log, whilst standing on a wavering ladder, would be a tricky business. In fact it took several attempts, using a pair of long BBQ tongs, to get the strip through the log and into the box.

The last box was the one we dreaded. The bees had formed a mound on the outside of the entrance hole, and the strip had to be pushed through the swarm. In the dark, on a hot summer's night, with the grandkids gone and the dogs locked in the house, we ventured out, suitably covered up, to make our final assault. I held the ladder firm, whilst my husband, again, using tongs, inserted the strip in the centre of the mound, and pushed it in. We made a hasty get-away before any angry bees could home in on us.

We had been lucky, over the whole period we had got away with only two stings apiece.

A few days later we took the boxes down. The honeycombs were stacked like books on a shelf inside, and obviously quite inedible after their poison strip treatment. We cleaned the nest boxes and made them ready for the next season's ducks and parrots.

Our helpful advisor also told us how to use the strip as a preventative. For those who want to know: cut one cm square off the strip and pin it inside on the roof of the box. We haven't done this yet, and are still wary of the idea of possibly contaminating the baby birds' environment. But at least, now we know how to deal with future bees.

At the first sign of a takeover this year, we'll be up the ladder with our Mortein, Moth and Insect Strips.

Note that the Suttons attach a piece of natural hollow log to the front of their boxes. They say that it increases the attractiveness of the box to birds.

WEED ALERT

Watercress and arsenic salad, anyone?

WATERCRESS (*Rorippa nasturtium-aquaticum*) is often found growing in disturbed wetlands and drains from Geraldton to Albany. Revelling in the nutrients these drains often carry, the plant grows lush and succulent, just right for a salad - or is it?

Bannister Creek Catchment Group (Canning) noticed some growing in their superb rehabilitation area and, knowing what the water contained, decided to get the plant tested. It proved to be very high in the 'big five' heavy metals, lead, zinc, arsenic, copper and cadmium, a lethal salad indeed! The question arises about where the contaminents come from - are they a by-product of the industrial area upstream, or are they simply leaching out of the natural acid sulphate soils that had been cut into so that the 'creek' could drain the area for industrial and urban development? Acid sulphate soils are a real problem in parts of WA - they helped shut down the mineral sands mine at Beenup, near Augusta, for example - and they could have a severe effect on aquaculture or irrigated agriculture using groundwater ... even a backyard veggie patch ...

The moral of this particular story? Don't eat weedy watercress!

'Weed Watcher' - a new Internet map site

AGWA website at: http://www.agric.wa.gov.au/weeds/wwatcher.htm

AgWA has mapped 50+ agricultural and environmental weeds, covering the agricultural region between Northampton and Esperance and including the Metropolitan area. Detail is given of size and density of infestations, when and how they were discovered, and any control mechanisms in place. Users can then enter the details of their own observations on a form which is entered into the database.

As a management tool, it will enable groups to produce maps of local weed problems, which will assist in developing project plans and applying for funding and resources.

THE WAY WE WERE

CHANGING TIMES - WANDOO FOR TANNIN

Avril Baxter

MANY people are aware that an extract from the bark of *Eucalyptus astringens* (Brown Mallet) was used to tan leather, but few know that the extract from *Eucalyptus wandoo* (White Gum) was prized by some as the second best tanning agent to the European Chestnut tree.

Land for Wildlife members Nicola Harman and Tim Hussey have a 5 hectare property on the Hotham River at Ranford near Boddington. On this property in 1935, because of a deep permanent pool on the Hotham River, Industrial Extracts Limited established a tannin extraction plant which was to operate for 20 years and employ up to 100 people at a time.

The processing plant worked non-stop and consumed up to 300 tonnes of White Gum logs per day. Logs, up to 10 feet in girth and 11 feet 6 inches long, were harvested from the surrounding countryside and fed endwise into a revolving drum like a giant pencil sharpener. Chips were leached in wooden vats, the liquor was then pumped into copper tanks and the excess water evaporated. The extract known as "Mertan" looked like Grass Tree gum. The coarser dried chips of White Gum after the leaching process were used to fuel the boilers and finer residues were used as a dressing when resurfacing tennis courts or paths.

World War Two created a heavy demand for the product resulting in Industrial Extracts Ltd. being the first company in WA to be declared a man-powered organization, the "Mertan" used for tanning leather for the military.

60 000 gallons/hour of water was needed to cool the condensers and came from the adjacent Darnminning Pool. Pumps drew the water from 20 feet below the surface and heated water from the plant was pumped on to the surface of the pool where it gradually cooled. Good quality underground water was also available and used in the boilers to produce steam for powering the plant.

In 1957 the plant was in need of upgrading, however the distance to the White Gum resources (now often more than 30 miles away) made the building of a new plant on this site uneconomic. Since then, the plant has been used as a factory for manufacturing pegs, a storage depot and a battery chicken operation.

Tim and Nicola bought the property in 1991 and made it their home. They have planted trees and shrubs every year since then and aim to have a thick tree line all around the edge of the property with shrubs along internal fencelines to encourage birds and other fauna to move between the Hotham River and the adjoining Railway Reserve.

Outside the extraction plant in 1938

The site today, note the boiler chimney in the background.

They are pleased with their success, the ground is now spongy to walk on and plants are recolonising previous bald spots and road surfaces. The place abounds with frogs, skinks, geckos and birds, and whilst Tim and Nicola state that revegetation can never replace the original bush, they are happy to revegetate an area that has had a long industrial history into a *Land for Wildlife* sanctuary.

Source: *Becoming Boddington*. Ferrell J. Shire of Boddington 1992.

FAUNA

FROG MATTERS

Louise Schofield

LIVING on the city's fringe, tucked between farmland and bush, you are presented with all kinds of challenges and responsibilities foreign to a city dweller. You also gain banal pleasure from things most city folk would consider dull. You begin to see the world through different glasses - sometimes bird-watching binoculars – and, if you immerse yourself in your different world, you develop a quirky love for things other folk find unpleasant (or don't notice at all).

While city dwellers might complain about dogs barking into the night and the squealing of speeding cars, some of us "fringe bushies" relate to friends - with red eyes - how the mating possums, frolicking under the bedroom window, kept us awake with their hissing and blood-curdling squeals.

And the motorbike frogs kept on changing gear but failed to ride away...

Frogs. Is there another category of creature that attracts such a mixed reception from people? Some love them. Some hate them. Some wouldn't mind if they disappeared off the planet forever ... The latter group of humans needn't worry. If we continue doing what we've done over the past 100 years, frogs will disappear. Some species have already become extinct – Queensland's Gastric Brooding Frog for one.

What I've come to realise is that many people misunderstand these amphibians and their important role in our world – even the people who quite like them. In my neck of the woods, near a brook and man-made lakes, I've been trying to encourage people to leave rushes and sedges growing near the water's edge for the native wildlife, including frogs. The more, the better. *But they are messy*, many say. *What about snakes? There's a bit over there, that's enough!*

What many people don't seem to realise is that frogs – like many of our native creatures – need to move around to survive. Frogs don't always stay in or near bodies of water, nor do they stay in the same spot. Many dwell in trees or bushes and only travel to water for breeding. Others live under mulch and any debris lying around – a clean sweep of lawn provides no refuge.

Frogs need a variety of safe covers so they can move around to feed and find mates, otherwise they are easy prey for hunters (birds, animals and humans alike). They also need to be protected from the sun and dry winds, otherwise their skin dries and they die.

As well, frogs need the right vegetative environment to attract plenty of insects for their food sources. Many weeds and garden plants taking over our wetlands are poor habitat for frogs. Watsonia is choking waterways across WA and is very poor habitat indeed. Pampas grass is a curse.

What can you do about it? Just because you live in the suburbs, or in the middle of a paddock, doesn't mean you can't have frogs in your garden. You just need to provide a pool of water and surround it with a variety of insect-attracting and shady vegetation. Water plants will help keep your pond cool and clean. Choose types that don't multiply quickly.

A few fish help keep down mosquitoes until the tadpoles get to work, and if you choose Pigmy Perch and Western Minnow they won't eat your precious frogs' eggs either. Ponds can be made safe for young children with strong mesh, secured a few centimetres above the water level. If you can afford it, add a little fountain.

Old plastic shell pools for kids can be buried and turned into ponds (you were wondering what to do with them, weren't you?), but shallow ponds need plenty of shade and topping up in summer. Old car and truck tyres can be buried and lined with thick black plastic or special liners. Naturalise the edges with rocks or old bricks. Give your pond time, and the frogs will find you.

Even if you never build a pond, respect the wild look of nature and learn to like untamed bushland and riverine vegetation. Support local groups protecting these areas and you'll be rewarded with a world brimming with noisy frogs and other wonderful wildlife.

Louise Schofield is a journalist and the author of children's books Secrets in the Tingle Forest *and* The Zoo Room *(both with Fremantle Arts Centre Press) and has numerous books with educational publisher Thomson Learning Australia including* Frogs: Friendly & Fascinating. *(see review, p20)*

illustration: Luke Jurevicius

MEMBERS' PAGE

NATURE RED IN TOOTH AND CLAW!

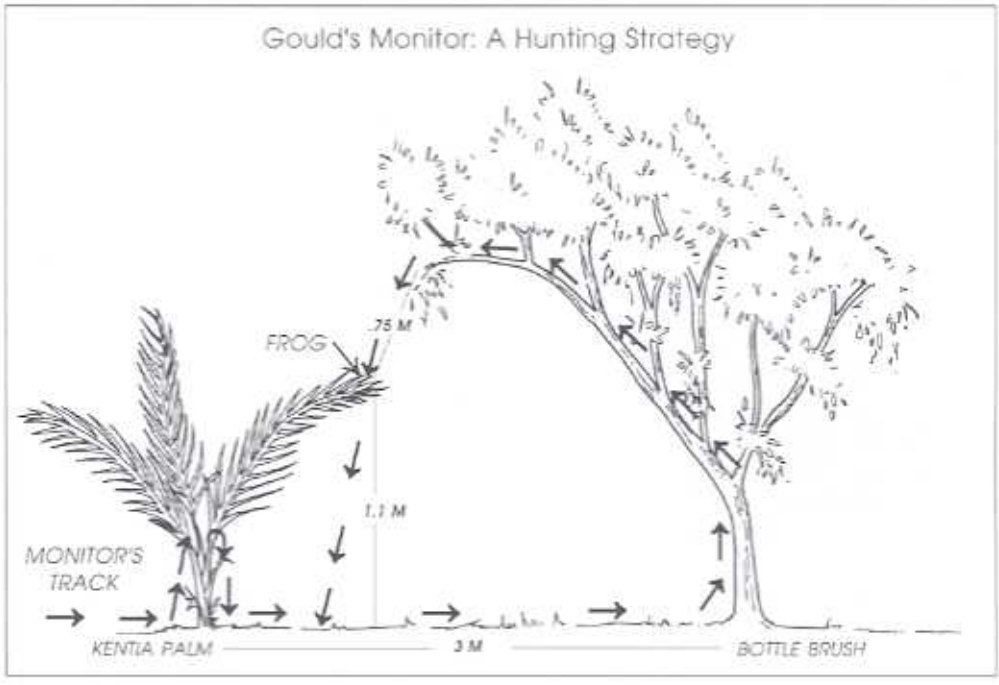
STEVE DAVIES took this photo on his verandah during autumn this year. He and his wife Val have a property near Albany, which their revegetation efforts have recently lifted from "interim" to "full" registration. At night, the verandah lights attract many insects, making it a good hunting ground for frogs. Here, a Motorbike Frog (*Littoria moorei*) has caught a very large moth. It started to swallow it head first and, within a couple of minutes, the whole lot had gone in.

We asked Matt Williams of CALM's Science Division, if he could identify the moth. He said: "It

is a swift moth, in the family Hepialidae, probably *Abantiades* sp. The 'watermark' pattern on the wings is a fairly distinctive feature of these moths, but to be certain of the genus, the antennae need to be examined - something not possible with that unfortunate specimen! The Hepialids are very large, showy moths that often emerge after rains in late summer and autumn and they are strongly attracted to light. The larvae are usually subterranean, feeding on tree roots. The pupal cases are sometimes found protruding from the ground."

GOULD'S MONITOR - THE HUNTER!

I thought all reptiles found their prey more by chance than by design, after all, as ground dwellers they wouldn't be able to see very far in the grass and surface litter, their vision adapted to and limited by their environment - and no powers of mental thought. That is, until one hot February afternoon when I watched a monitor from the patio .....



It was trying to climb the smooth bark of a kentia palm. Abandoning this effort, it marched on to a Kings Park bottlebrush about 3m away, shinned up it and onto a branch above the palm frond. Without much hesitation it lept through space onto the frond and crashed to the ground - with a screaming frog in its jaws!

Only then did I realise what I had witnessed!

This monitor would have spotted the frog from the ground - ie good eyesight. Its first plan of attack failed. Plan two must have taken quite some thought ..... "That frog would make quite a tasty snack, can't give up too easily! There's that tree with a branch hanging over the palm. Can I climb it? Can I leap the gap, catch the frog and crash to the ground all in one movement? Is it worth the risk of injury?"

The monitor's strategy worked perfectly and I have changed my mind - reptiles, especially monitors, can think and work out a plan of attack to catch their next meal.

Robert Harrington, Oakford.

MEMBERS' PAGE

"Hail to thee, blythe spirit"

Joanna Seabrook

BIRDS have been the stuff of many poets and legends down the ages and yet today many of us hardly notice their existence, or perhaps only noticing them as pests, whereas in reality the world of nature would suffer if they were not around to do the jobs that are their part in the ecosystem.

The deterioration in bird numbers has been well documented. It is obvious that many of the once most common species are now seldom seen and others are taking their place. This is largely due to habitat removal and the best we can do in our efforts to "Look after Australia" is to refrain from doing further damage to habitat and try to improve and enhance what there is left.

It is seriously necessary to think what it is the birds need for food, especially the little birds - robins and wrens, thornbills, pardalotes and weebills, willie wagtails, honeyeaters, finches and warblers which should inhabit our gardens and roadsides.

Amongst these birds we have insectivorous and nectar eating birds. As insects like nectar as well, it can mean that the same plants suit both kinds of birds. Because the metabolism of these small birds is so fast and they use so much energy they need to eat often, so whatever it is they need it has to be available all the time. We can't have the birds without the right flora.

The countryside looks great with patches of vegetation amongst the paddocks, however when looked at more closely many of the patches of vegetation are not really bush but just trees, unfenced and with no understorey but grass. Sadly these patches have no future as they are unable to regenerate. They are sometimes referred to as the "living dead" because they are the last generation. So patches of real bush are a lot scarcer than we think.

This is about how to attract and sustain these delightful small creatures in country townships by using native Australian plants throughout all public open spaces. Many of the country towns are situated on rivers or creeks which are vegetated with Flooded Gums (*Eucalyptus rudis*). These can act as corridors for the flightpaths of some of the small birds which are unable to travel without shelter and food. The towns could quite easily be made into oases of habitat for these little birds simply by growing the local native plants and trees in streetscapes and gardens (it's much easier than growing roses). The rivers and creeks and also road verges and rail reserves could be connections between the towns.

In providing a habitat for these little birds the benefits spread to everything else in the local ecosystems. Is this just a dream, or could we do it? It would not be hard to do with all we know about seeding and with help from everyone. It needs the will and the agreement and organisation - any volunteers?

Are there any readers involved with rural towns - perhaps on the Shire - who would like to work with Joanna to develop this idea? She can be contacted on: joannaseabrook@westnet.com.au

OUTSMARTING AUSTRALIA'S MOST SKILLFUL FERAL

Robert Stain holding up one of the 'efficient killing machines'.

A recent article in the Australian Magazine (June 21st 2003) quoted David Gold from Australian Hunting Safaris For Feral Pests saying;

"... that for every domestic cat basking in front of the family heater this winter there are at least six feral cats prowling around Australia's bushlands ... estimated to be around 18 million ... Cats are only loyal until their next meal: take that away and they'll soon abandon you for the next food supply... They are prolific breeders: kitten season can extend from February to November and some females have three litters of six or seven each year."

Land For Wildlife members, Donna and Robert Stain, are becoming expert feral cat 'trappers'. They live on a 604 acre property approximately twelve kilometres north of Mount Barker. In the last three years they have captured thirty feral cats in their one cage trap which they leave permanently open. The local butcher in Mt. Barker kindly donates the fresh fish heads or mullies which Donna and Robert say is the magic ingredient to attract these wary predators into the cage.

Sylvia Leighton

FAUNA

WESTERN GROUND PARROT

Brenda Newbey

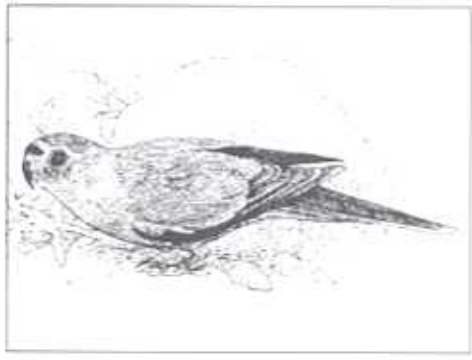
ONE of the least known birds of southern Western Australia is the Western Ground Parrot. It is the rarest of three subspecies of ground parrot and the only one that occurs in Western Australia. There are several good reasons for its low profile.

Typically it lives in low heathland with the densest stratum less than half a metre tall. Although its call is distinctive, it rarely calls throughout the day. The most reliable calling times are after sunset and before sunrise. It flies well but only when disturbed in the daytime. Otherwise flights of a few hundred metres between roosting and feeding sites are pre-dawn and dusk, as for calling. Nevertheless it is active in daylight hours, moving about on foot to feed on the many easy-to-reach plants. It has longer legs than most parrots and walks without the rolling gait that other parrots have.

Another major reason for its low profile is that it is extremely scarce. The range was probably almost continuous near the coast from Israelite Bay to Dongara before the fire regimes and the fragmentation that began in 1800s and the arrival of the cat and fox. It is now known from only three separate areas - near Cheyne Beach and Mount Manypeaks, in the Fitzgerald River National Park, and in the Cape Arid National Park where a small number were found in May this year after failure to find any there in searches between 1990 and 2000. That is the good news. The bad news is that the Waychinicup -Manypeaks population appears to be shrinking.

There could be Western Ground Parrots on privately owned heathland along the south coast. Dispersing birds may fly over 100 km. Fire-age related to rate of growth (rainfall) matters, as the birds need

Western Ground parrot



Rock Parrot

cover and food within vegetation that is up to half a metre above the ground. They will at times use vegetation that later grows too tall. They are able to use vegetation of a younger fire-age if older suitable heathland is adjacent. Swamps are optional habitat requirements but sedges form an important part of the birds' diet.

It is not uncommon for people to report seeing a flock of 'ground parrots' on dunes or beaches of the south coast. These cetainly occur in flocks on the ground but are Rock Parrots. The Western Ground Parrot is of similar size but it is unlikely that more than two would be seen together. Rock Parrots when disturbed will often fly high; a Ground Parrot will fly just above the low vegetation, soon dropping down into the vegetation again. Both birds could basically be described as 'green' but there are many plumage differences. For example the Ground Parrot has conspicuous brown or black barring on many of its feathers; the Rock Parrot is plain.

In January this year due to concern about the status of the Western Ground Parrot, its low profile and the uncertainty of its short-term survival, the community group, Friends of the Western Ground Parrot, was revived. Members receive information about the parrot and related projects past and future. There are lots of things happening this spring! If you can, please help! The goal is to see the numbers of birds increase so that it is no longer at such risk.

For more information about the bird or the group contact Brenda Newbey 93375673; e-mail sfryc@iinet.net.au or Anne Bondin e-mail albanybirds@hotmail.com

Stop Press: partly due to the note about this new group in Western Wildlife in April this year, a possible sighting has been recorded at Hill River in the West Midlands. If confirmed, this would be of enormous significance, as it is within the historical range of the species, but was thought to be extinct there.

If you have the opportunity to do any Ground Parrot surveying especially between Cervantes and Jurien it would be well worthwhile. It would be very useful if it could be recorded on the WGP survey form. A survey form can be sent to you by Brenda Newbey or go to Birds Australia WA website at http://birdswa.iinet.net.au and then access projects, Western Ground Parrot.

REVEGETATION

TIME TO PLANT A FUTURE

CALM's Narrogin Plant Nursery has been operating since 1955, propagating seedlings for the protection, conservation and restoration of Western Australia's bio-diversity. Some 135 WA endemic species including shrubs and trees for ornamental and revegetation plantings are propagated. They are sold in trays of 60 seedlings. A new line introduced this year is the pre-mixed 'Biodiversity' and 'Food For Fauna' trays.

The Biodiversity trays consist of a mixture of species designed to replicate particular sites such as 'Wandoo woodlands', 'gravel ridges' and 'granite outcrops', to name just a few. The number of species and quantities of each included in the Biodiversity trays have been selected to closely reflect the balance that nature intended.

Included in the Food For Fauna trays are a mixture of species that grow to less then 3 metres high and flower at various times of the year. Currently, there are two types of these trays, one specifically for the wheatbelt and the other for the lower south west coast. The Food For Fauna trays can be included with other species in revegetation projects or planted around the house and sheds to attract fauna to the garden.

It is recommended that orders be placed before 1st Nov. to avoid disappointment. Included in the seedling price is free delivery to a metropolitan CALM office or a shire locality in country areas.

You may place an order for seedlings or obtain further information by visiting http://www.calm.wa.gov.au/projects/plantations_nursery_narrogin_splash.html or telephoning the Nursery Officer, Tricia Sprigg, on 9881 9212.

SEEDBALLS

THE Calingiri Primary School Seedball project was started in 2002. The idea came from Californian eco-artist Kathryn Miller. The school children make balls of clay and local soil containing seeds of local provenance native plants.

The seedballs are excellent for those hard-to-reach areas where you can't get in to rip and mound. The seedballs can be thrown into the air to give a natural pattern when they germinate. (Remember that prior weed control is vital.) The timing of germination will be when the conditions are right, which may not be for a season or so. The seedballs also represent an economic saving as seed is much cheaper than seedlings and you get the advantage of having a mixture of plants and so is more like the remnant bush. Because of the clay surrounding the seeds there is some protection from insects and so increase the likelihood of good germination.

The Calingiri/New Norcia LCDC has secured funds from Envirofund to continue the project this year.

IN BRIEF

AMAZING!

IN 2001, Czech entomologist Dr Svatopluk Bily was in WA collecting beetles and had travelled to the large area of uncleared land north of the Lake King - Norseman Road. One day, while photographing wildflowers, he noticed 'a little stripey squirrel' and photographed it. Off he went back home, reporting, as required, on all the insects his collecting licence had allowed him to take, but he didn't think to mention the 'squirrel'.

And there things might have rested except that, on a subsequent trip to WA, a visit to a numbat reintroduction site in the Stirling Range with a local person, prompted a discussion on numbats. Dr Bily showed his holiday snaps to WA entomologist Mike Powell and zoologist Barb Jones who got very excited and confirmed what he had recorded - a numbat, of course! Wildlife experts have assumed that numbats have been extinct in the area for at least 50 years, based on observed declines and extinctions elsewhere.

If there are numbats, perhaps there are other mammals too? Peter Orell and the Western Shield team are off on a field trip this October, let's hope they make some exciting finds!

So please folks, if you see something interesting, photograph it. You never know what an amazing record you might be making!

MEMBERS' PAGE

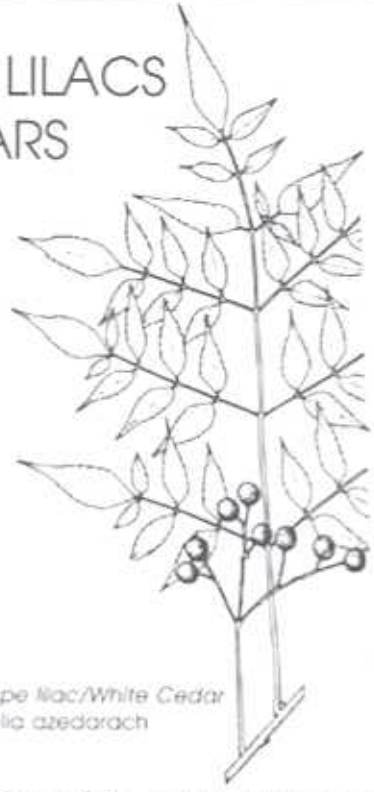
MORE ABOUT CAPE LILACS AND CATERPILLARS

IN 1978-79 I lived in Roebourne in the Pilbara where the winter deciduous Cape Lilac/White Cedar grow quite well when watered, and there were a few old trees around station homesteads and the older towns. My house had a row of about six rather stunted lilacs along the side fence which had not had adequate water to flourish. The White Cedar Moth caterpillars attacked them in the summers and I had to resort to the hessian band around the trunk to capture them. They aren't all bad, however, as the Horsfield Bronze-Cuckoos would turn up and feast on them. These are about budgie size, so they had a bit of a struggle to soften up and swallow the large adults. Unfortunately bronze cuckoos are a bit scarce around Perth.

So it is quite feasible that humans brought the caterpillars south, especially as they hibernate as chysalids in web in protected corners and could easily come down under garden furniture or other outdoor gear with people shifting back to the big smoke.

Climate could also have played a part. The flamboyantly flowered and shady poinciana tree of Madagascar (*Poinciana regia*) was a garden favourite in the Pilbara. The poinciana moth whose green looper caterpillars reduce the large bipinnate frondy leaves to a skeleton and rain little brown droppings, reached the Pilbara from Darwin one year when the monsoon slipped south and we had about five weeks of humid weather. Over the next couple of years they found their way down to Exmouth and Carnarvon, so they could turn up here also. It would be interesting to hear if the White Cedar Moth similarly staged its way to Perth.

I have a huge lilac in my back yard. Occasionally the twenty-



Cape lilac/White Cedar
Melia azedarach

eights and the galahs which have found their way to Perth chop open the green fruit to extract the seed, but apart from its use as a meeting place and staging post for all the birds flying through North Fremantle (including black cockies while they decide whose turn it is to rip into my large peppermint, *Agonis*, to extract the borers), it's not providing much for the birds. I successfully controlled the caterpillars by a combination of ambushing them with a pyrethrum spray as they made their way up the trunk in the evening and trapping them in bag around the base when they come down in the morning.

So yes, the message is, grow native, or at least something the birds can feast, shelter or nest in. Turn your lilac into bowls, bookshelves and tables - it's not called white Cedar for nothing, the timber is superb.

Charlie Nicholson

Charlie Nicholson is Principal Environmental Officer in the Natural Resource Branch, CALM, Kensington. He has a particular interest in rangelands, and can be contacted on
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A YOUNG PALLID CUCKOO AND YELLOW-RUMPED THORNBILLS

IN July's Western Wildlife, Lesley Brooker mentioned the hosts of Pallid Cuckoos and Heather Adamson had a story on Yellow-rumped Thornbills - I can link these together.

Some time ago, on my five acres in Whitby, I heard the typical begging cry of a young bird, sounding like a small magpie. After homing in on the sound, I saw a young Pallid Cuckoo sitting in a grevillea about 50 cm above the ground. It was being fed very industriously by a group of Yellow-rumped Thornbills. A flock of these regularly grazed over our dichondra patch, picking out the seeds. It did look comical to see these small birds so busily feeding the much larger young cuckoo. It seems logical to assume that it had been hatched by the thornbills and was being raised by them - a real con job!

Geoff Brand

Pallid Cuckoo

Lesley Brooker comments:

"Thanks for the record. Yellow-rumped Thornbills are a major host of the Shining Bronze-Cuckoo. Young Shinings are also larger than Yellow-rumps, so it could be that the cuckoo seen by Geoff was a Shining. It can be hard to pick the difference between fledgling cuckoos as they tend to look much the same at that age. Probably the biggest difference between Shining and Pallid fledglings is size (Pallids are larger and more mottled). A photo of a Shining fledgling can be found on http://www.users.bigpond.com/LesMikeBrooker/nestling.htm - unfortunately we don't have a good photo of a Pallid fledgling."

NEWS

COCKYS FOR LANDCARE - COME FOR A DRIVE WITH US!

Sarah Mason

OUR group is the Calingiri/ New Norcia Land Care District Committee and, as you will have noticed, that is a mouthful. We realized that if we are to get corporate sponsorship we needed a good name and marketable logo. Carnaby's cockatoo nests in our area and we know it is endangered, so it seemed logical to adopt it as our emblem, and have as our name "Cockys for Landcare". We know the spelling is incorrect; however we wanted to be memorable and distinctive and utilize the play on words!

To promote the work being carried out by landholders in our area, we devised a Landcare Drive. We hope that this will bring visitors into our Shire and so aid the local off-farm economy. We chose 7 sites that are representative of what we wanted to showcase. All have signs with a small amount of information on them, and usually a question to stimulate people to think! The drive starts at the Rica Erickson Reserve between New Norcia and Calingiri and includes a salt scald, an artificial nest for Carnaby's Cockatoos, farm forestry, remnant bush management and other sites of interest.

We have been fortunate to get some of the State's experts to talk on the CD (and Peter Garrett to introduce it!). This will hopefully lead to an increased understanding of some the issues facing landowners in the agricultural areas. We also give a contact for those who wish to find out more, or visit our Shire as a volunteer, which is an extension of our policy of encouraging city/country links. The CD, brochure and map can be collected from the Tourist Offices in Bindoon, New Norcia and Wongan Hills. Visitors can take the brochure with them and are requested to leave the CD at the last site.

We have plans to expand the drive to incorporate other areas within the Shire, as we have quite a varied landscape and we want to promote those farmers who are caring for the land. We see the Landcare Drive also as a way to market products from producers who are diversifying, such as bush foods, olives, soft wheat milling and others. The group thanks the NHT Envirofund, the Shire of Victoria Plains and the speakers for funding and other support.

For further information, contact: Elizabeth Tierney, Landcare Coordinator, ph: 9628 7004, email: etierney@victoriaplains.wa.gov.au

"BRINGING BACK THE BIRDS"

WALLATIN WILDLIFE AND LANDCARE INC (Kellerberrin) obtained funds from the Gordon Reid Foundation to have CSIRO design a nature conservation plan for the Wallatin Creek Catchment. The design uses the 'focal species approach' whereby the most 'bush-dependant' birds are chosen and reveg planned to benefit them, on the assumption that it will also benefit all the rest of the native fauna. The proposal is then considered in the farming context, and the combined design is the plan.

The plan was launched by naturalist Eric McCrum, in Rod and Judy Forsyth's SUPERB woodland. (Over 50 native plants were seen in the short bush walks, as well as dozens of dependant fauna.) The Wallatin group are good at forming partnerships, and present at the launch were representatives of the Commonwealth Government (CSIRO); State Government (*LFW* / CALM); NGOs (GAWA, WWF and WA Naturalists' Club); NRM groups (Avon Catchments Council), and, of course, the people on whom the future of the landscape really depends, the landholders themselves. With such a force working together for sustainability, how can we fail?

For more info, contact: Sue McFarlane, ph/fax 9045 8244, email: msmcfarlane@bigpond.com

Did you know?

That the curled up new fronds of bracken will take the sting out of a bull-ant bite? You just rub the young green frond on the offending area.

Dorothy Redreau, Albany