



Western Wildlife



NEWSLETTER OF THE LAND FOR WILDLIFE SCHEME

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DALGYTES ARE ON THE WAY BACK!

by Tony Friend

IMAGINE an animal designed by a committee from bits and pieces left over after a mammalian fancy dress party. An oversized head with huge rabbit ears and an extremely long snout, a tail that changes from jet-black to snow-white halfway along and tipped by a nail and hugely strong forelimbs with powerful claws, are all tacked onto a stout body covered in the softest, blue-grey fur, decorated with pinkish flashes on the sides. And if that's not odd, imagine that it digs a burrow that can be two metres deep.

The dalgyte, ninu, marrura, walpatjirri, rabbit-eared bandicoot, *Macrotis lagotis* or greater bilby was once widespread and common in arid and semi-arid Australia, that is, across about three-quarters of the continental surface. Settlers in the south-west of Western Australia used the Noongar name, dalgyte, for this animal, and numerous early accounts describe its habits. John Gilbert, while making collections of WA mammals in 1842-3 for his employer John Gould, wrote "The Dolgoitch seems to be almost entirely an insect feeder, and one of its most favourite morsels apparently is the larva of a species of *Cerambyx* [a longhorn beetle], found exclusively in the roots of the Jam-wood (*Acacia*)..." He also observed that "The flesh is extremely delicate, and when boiled greatly resembles that of the common rabbit." Gilbert collected

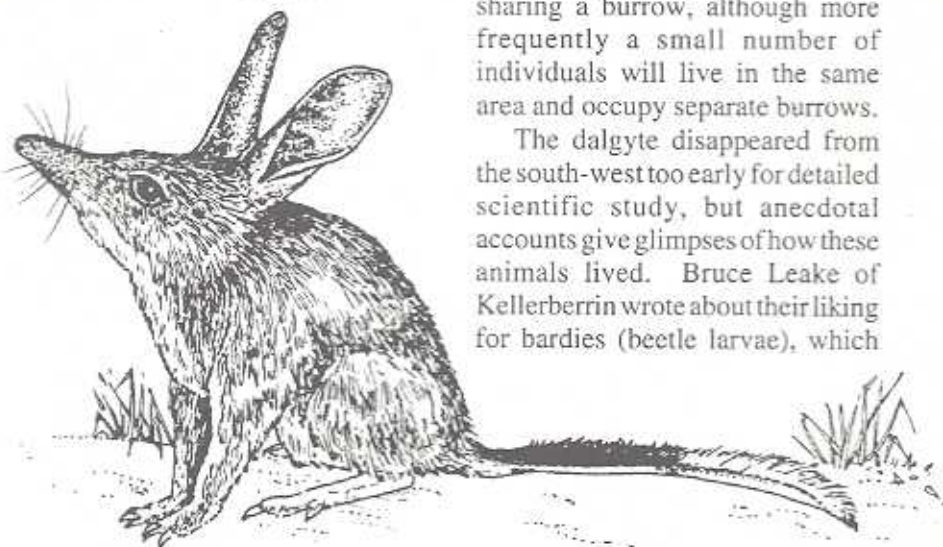
dalgytes from Moore River to Albany, and as he only sent skins home to Gould, had many opportunities to make this assessment.

Today the species is found only in arid parts of its former range, and even then only where rabbits are absent. Dalgytes occur in a wide sweep of desert country encompassing much of the east Pilbara, the Great Sandy Desert, the Gibson Desert and as far south as Warburton. In the north, they occur near the coast from Pardoo to Broome and inland along the southern edge of the Kimberley and across the Northern Territory border into the Tanami Desert. Further east, there appear to be no populations closer than the Channel country of south-west Queensland, where the Mitchell grass plains on

the Diamantina River support a few hundred animals.

In the desert, dalgytes have a varied diet, in accordance with the seasonal and spatial availability of food types. Termites, larvae of Lepidoptera (particularly hawkmoth larvae) and other insects, as well as seeds, tubers and bulbs are all on the menu. Most of these items occur underground and the telltale signs of dalgyte presence include their foraging diggings as well as their distinctive tracks, sand-filled faecal pellets and burrow excavations. In spinifex grassland, burrows are often found at the base of *Triodia* hummocks or under small trees, although dalgytes may also burrow into roadside banks pushed up by the grader, once they are vegetated. Dalgytes live in small colonies, a male, female and young sometimes sharing a burrow, although more frequently a small number of individuals will live in the same area and occupy separate burrows.

The dalgyte disappeared from the south-west too early for detailed scientific study, but anecdotal accounts give glimpses of how these animals lived. Bruce Leake of Kellerberrin wrote about their liking for bardies (beetle larvae), which



Greetings everyone!

At last most of the south-west is getting some rain, but it's a pity it rained on the rock wallabies as they were being released into their new home in the Avon Valley National Park and the adjacent private Paruna Sanctuary. Several *Land for Wildlife*s assisted CALM in this project, and you can continue to help - as well as have a great picnic and bushwalk - by recording rock wallaby sightings. See centrefold for details.

Another animal that, due to Western Shield's fox control, is beginning to make a comeback in the south-west is the dalgyte. As small mammals return, the ecological processes in remnant woodlands such as pest control, fungi distribution, leaf litter decomposition, water infiltration and fire balance should start to swing back more towards what existed in pre-european days. Two articles in this issue are about fencing out exotic fauna. Different projects, but both involved an awful lot of effort!

Jim Barrow's article takes a racing gallop through what used to be called 'physical geography' - the reason why the landscape looks the way it does today. Nowadays the word 'geophysiology' has been

EDITORIAL

coined to describe these interlinkages. Understanding the past can be a key to managing for the future. And if you want your management to continue after you have left your block of land, perhaps you should think of covenanting, as Wendy Payne explains.

Land for Wildlife and Greenskills are combining to run a Community Fauna Monitoring Course in

September, for landholders on the South Coast. It will be run by Angela Sanders, who wrote *LFW's* 'How to conduct a community fauna survey'. Although details are still being worked out, the course should enable landholders to undertake fauna survey on their property or within their group project area. This is an exciting and very new development, as normally fauna survey requires a professional biologist in charge. Contact Sylvia Leighton for more information.

Penny Hussey



"HELPING HANDS FOR YOUR LAND"

The *LFW* display at the Balingup Small Farm Field Day caused a lot of interest, including this young fellow who tried to feed the small mammals - alas, they weren't real live ones! photo: Jenny Dewing

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Dalgytes continued from page 1

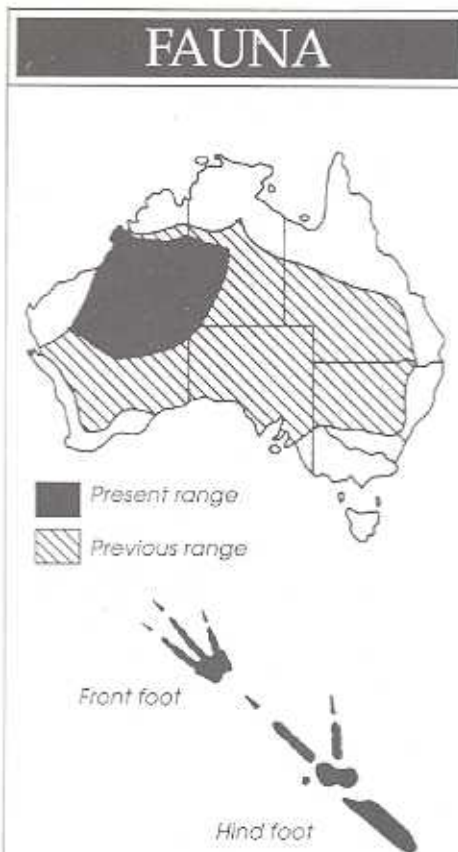
they dug from the roots of acacias. Job Haddleton from Kojonup nominated "bardies, grubs or insects" as their chief foods. Most early observers recount the difficulty in digging a dalgyte out, as the burrow dives steeply down in a spiral to a depth of two metres, and the animal can dig faster in escape than the human in pursuit.

Dalgytes disappeared quite quickly from the south-west in the early 1930s, following the arrival of the rabbit and coinciding with the arrival of the fox. C.F.H. Jenkins believed that indiscriminate fumigation of burrows to kill rabbits during the plagues of the early 1930s contributed to the demise of dalgytes. With the benefit of hindsight, we might put more of the blame on the fox, given more recent evidence of its devastating effect on native mammals in Australia.

Recently, efforts to reverse the dalgyte's decline have received support from an unlikely source – chocolate: The Easter Bilby is making a bold bid to displace the Easter Bunny from its role as the cuddly mascot of the holiday period. Rather than glorifying the rabbit, an introduced pest that has been the scourge of Australian agriculture and natural ecosystems alike, the Easter Bilby concept elevates a native animal to a positive social role – that of delivering chocolate eggs!

For the last five years, a partnership between Coles Supermarkets, government conservation agencies and NGOs has pushed dalgyte conservation programs ahead, as well as sustaining the educational value of the Easter Bilby concept. The scheme provided 50 cents from the sale of each of 90 000 chocolate bilbies to on-ground bilby conservation programs around Australia. Captive breeding, reintroduction programs and a predator monitoring project are amongst the activities funded by the vaguely dalgyte-shaped confectionery.

In WA, two major projects are returning dalgytes to their former range, in areas where foxes are



controlled by regular baiting. Both projects are part of CALM's *Western Shield* program. In July 2000, dalgytes produced in a captive breeding colony at Denham were released into the wild on Peron Peninsula, Shark Bay, as part of *Project Eden*, following the successful establishment of gnaw (malleefowl) and woylies released there earlier.

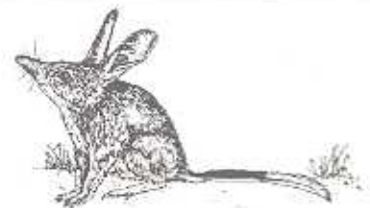
In April 2000, the first seven dalgytes were released into a pre-release enclosure within Dryandra Woodland near Narrogin as part of the *Return to Dryandra* project. A captive breeding colony run by June Butcher at Kanyana Wildlife Rehabilitation Centre in Gooseberry Hill was established in 1997, stocked with wild dalgytes from the Pilbara and Kimberley and captive-bred animals from the Northern Territory. More than 50 dalgytes were born at Kanyana up to April 2000 and many of these have been transferred to a 20-hectare breeding enclosure within Dryandra. Numbers rose quickly within the enclosure, enabling the releases into the wild to take place.

The Dryandra reintroduction was set up to determine whether release

via a small enclosure, where animals spend 2-3 weeks before the gates are opened, would reduce the tendency to bolt well beyond the release area. In the first release, seven dalgytes spent three weeks inside the enclosure before release, while eleven were released into artificial burrows outside. Both groups had food and water provided at the release sites. Despite the fact that the animals had dug burrows inside the release enclosure, radio-tracking showed that most moved well away within three nights. In both groups, some moved well away and some moved only a short distance. Several dalgytes moved right out of Dryandra into the surrounding farmland and had to be trapped and brought back. Ironically, most of the dalgytes spent their first nights of freedom in abandoned rabbit burrows they had found.

Since then two distinct colonies have become established within Dryandra and several young have been born in the wild. The dalgytes have dug their own burrows now and are once again extracting bardie grubs from the roots of Acacias.

Tony Friend is a Principal Research Scientist in CALM Science and is based at CALM Albany. His main interests are in the conservation biology of marsupials, particularly in the field of reintroduction biology. He can be contacted on 9842 4523.



Borer (bardie grub) damage to the above-ground parts of trees often causes concern. But there are bardies in the plants' roots, too. Dalgytes were the principal known predator on these, so they have probably built up in numbers. Could increasing root damage by bardies be one of the causes of the widespread tree decline seen in some areas of the south-west?

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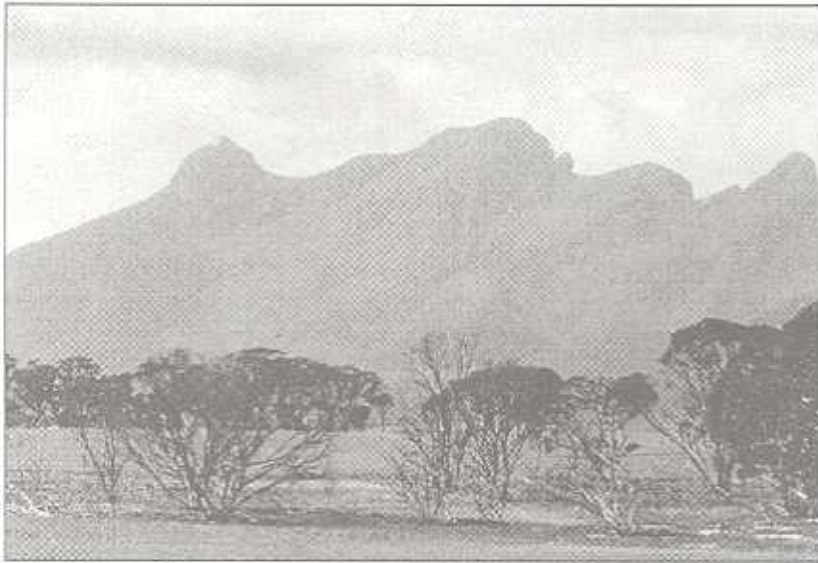
HOW SOUTH-WEST WA'S LANDSCAPES FORMED

by Jim Barrow

TWO obvious things can be said about the south west of WA: it's very sandy and it's very flat. Actually there are some important and interesting exceptions. But let us look at the obvious characteristics first. Both of them arise from the fact that the land surface is very old indeed.

When the earth was young, it took a long time to organize the constituents that had come together from interplanetary dust. The heavy (and meltable) material had to find its way to the centre and the rather small proportion that we walk on and call the continents had to come to the surface as a "scum". Relative to the rest of the earth, this material was rather light. It contained a good deal of silica - the oxide of silicon. Geologists refer to material with a lot of silica as "acidic". Beneath this acid scum was (and still is) a layer of rock with less silica, more calcium and more phosphate - a more "basic" rock.

Fortunately for us, this scum wasn't smeared uniformly across the surface. If it were, the whole of the earth would be level and would therefore be covered by water. It seems that convection currents in the semi-molten rock gave rise to lines of scum that came together to form rafts. Weathering was pretty fierce of course and there was a lot of churning so that there was some mixing of the scum with the basic



The rugged outline of the Stirlings shows their origin - sediments pushed up as the south west corner was squeezed between Antarctica and the granite block of the Yilgarn. The poor soils, and diversity of plants also originates from the poor substrate of the sediments. photo: P. Hussey

rock. This is a very simplified description of the processes that gave rise to the eastern section of the south west - the eastern goldfields. The greenstone belts are the remnants of this early churning and they tend to run in more-or-less north-south lines.

Once these early rafts started to form, they seemed to serve as zones alongside which there were further accumulations of silica-rich rock. Building of this area lasted until about 2 billion years ago with the western section rather younger than the eastern.

The rocks cooled from a molten state very slowly. This meant that there was plenty of time for decent-sized crystals to grow. In very simplified terms, three different kinds of crystals formed in the rocks. One kind was largish, glass-like crystals of silica, which we call quartz. The second kind was semi-rectangular crystals of a potassium

aluminium silicate called feldspar, and the third was black mica, looking like a stack of thin leaves. Have a look at a lump of granite one day with a hand lens. You can easily see these separate minerals. Mind you, that is a pretty gross oversimplification. For example, the term "feldspar" covers a suite of minerals with various amounts of potassium, calcium, magnesium and sodium. And there can be some other black minerals.

Granite doesn't break down all that quickly. That is why it is often used in monuments. But we have had a very, very long time. Most of the area has been very stable. There has been almost no volcanic activity, no major uplift and faulting, and no glaciation at least for the last 250 million years or so (unlike northern Europe that was scraped clean little more than 10 000 years ago). The mica goes first and in the process gives rise to some clay. Somewhat slower is the feldspar and it too produces some clay. The clay also continues to weather and when it is very old most of it has turned into the white clay we call kaolin. It tends to move down through the soil to lower levels leaving the quartz particles, the sand, behind. Just how this happens has been the subject of much debate. One idea is that it is a similar process to that which enables walnuts to come to the top of a mixture of nuts when they are shaken. As the

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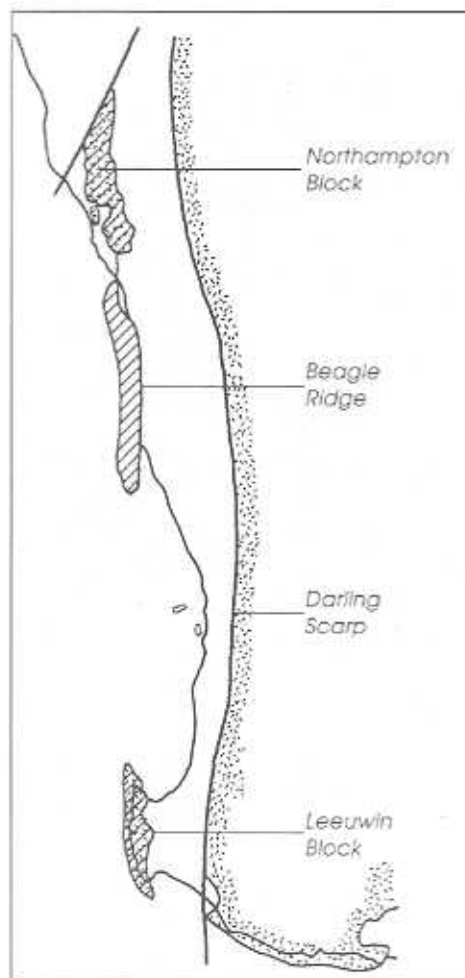
bigger particles jiggle, the smaller ones can slip past them. Whatever the cause, we finished up with large areas with sandy surface and with clay underneath. You see lots of evidence of this clay in road cuttings and in the white clay beside farm dams.

This gives the broad picture. But it is much more complex, and interesting, than this. Look at a map of south west WA. The first thing you see is the Darling Scarp running as a North-South line for almost 1000 km. We often say "Darling Range" but it is not a "range" - it doesn't go up and then down again but rather up then along. As you go towards the western edge of this low plateau, the streams run in steeper and deeper valleys. They are obviously younger here, or more accurately, rejuvenated.

Next you might notice the "chin" the bottom left hand corner between Cape Naturaliste and Cape Leeuwin that sticks out in a chin-like fashion. Then you might notice the southern ranges: the Stirlings, the Porongurups, and the Barrens. Finally you might notice that some of the soils in the south don't follow the pattern of being very sandy: the "Karri loams". And they grow a rather different vegetation. All these have a common explanation. In one word: Gondwana; in two words: continental drift.

The continents that seem so stable are actually racing around the globe. Australia is sprinting northwards - at about 5 cm a year, slightly faster than your fingernails grow. Five cm a year is 1 m in 20 years; 1 km in 20,000 years; 1,000 km in 20 million years; and about 3,000 km since Gondwana broke up about 60 million years ago. So it adds up.

Sometimes as the continents skitter about the globe they bang into each other. Just the other day India banged into Asia. What must happen then is that one of the continental crusts slides under the other. If it is a really big collision,



Map of the south west showing how the rocks of the "chin" line up with those near Northampton and with a sub-surface structure called the Beagle ridge. These rocks are the remains of the seam where land which is now in Tibet joined up to form part of Gondwana.

as for India, enormous mountains are thrown up. We call them the Himalayas. An essential part of this collision is that with the tremendous forces involved, the basic rocks that underlie the granites are forced upwards and to a certain extent are mixed into the granites. The rocks show the evidence of this squeezing in the formation of parallel bands of minerals. We then call these rocks "Gneiss" (pronounced "nice"). With long-term weathering, these bands of rocks may become exposed as the "seam" showing where two continents once joined.

This is the origin of the "chin". It is the seam showing the join with what is now part of Tibet. It is no

coincidence that the chin lines up with the hills near Northampton. These are the other end of the seam. Similar forces gave rise to the Porongurups. These too are part of a seam, but this time the join was to Antarctica. Because of the injection of some material from the basic rocks under the granite, the soils here are more fertile. The "Karri" soils at Manjimup and Pemberton also have had an injection of this basic material. They are not as sandy as much of WA and they are more fertile.

Continents can also split. Often this involves zigzagging straight lines. A series of such lines split South America from Africa. The split continued to open, giving rise to the Atlantic Ocean. The initial stage of these splits is a "linear sea" and the obvious one of them at the moment is the Red Sea. If you could have visited the south west about 250 million years ago, there would have been a linear sea off shore instead of the Indian Ocean. Somewhat earlier, more than 400 million years ago, there was a similar split a bit further north as another bit of Gondwana sailed off. Once the earth has opened up in this manner, the molten rock from below can sneak out. We have all seen wildlife programs about the volcanic activities in Kenya, where the earth is currently deciding whether to split or not. We had only the merest trace of such activity in the south west. You can see it on the beach at Bunbury where there is a small exposure of basalt dating from the time of the split.

Once these splits occur, the edges of the splits tend to slump in a series of parallel faults. One of these faults is the Darling Scarp. Many of us who live in Perth use it daily for quick orientation. And many are convinced there is nothing quite like it in the world. Well there is!

There is a series of these faults to the west of the scarp, of course well buried in sediments. Beneath Perth, there is about 4 km of sediments

LANDFORM

Landscapes continued from page 5

dating back to the Permian - about 250 million years ago. It is even deeper beneath Rottneest. As these sediments filled up the basin caused by the split, there was a chance that organic materials might have accumulated and given rise to oil deposits. That is why there was a lot of offshore drilling. The result is good knowledge of the sediments - but no oil. The more-northerly split also filled with sediments and these are now the red sandstones we know at Kalbarri.

It is of course a bit more complex. Sometime between 2 and 5 million years ago, there was an uplift along the Darling Scarp. The streams that had wandered across a flat plain were then presented with a sharp drop. So they started cutting back with deeper valleys. The streams were rejuvenated. Some of these valleys are relatively fertile, suggesting what WA might have been like had the geology been more active. The cutting back of the streams has reached a line that runs near Merredin. East of that line we still have the very broad valleys that are so flat that the streams don't know which way to flow.

Very much later than the western splits, about 60 million years ago, there was another split as Australia broke free of Antarctica and started its northward journey. The trailing edge tended to sink a bit and this lower region also received sediments both from the rivers that now flowed south and from sponges that grew in the shallow seas. Separating from Antarctica wasn't completely smooth and at one stage, our continent twisted so that the accumulation of sediments was jammed between Antarctica to the south and the mass of granite to the north. This pushed up the Stirlings and the Barrens. You can easily see how the sediments were pushed up and jumbled. So the neighbouring ranges of the Porongurups and the Stirlings have quite different origins: the Porongurups were formed when



*The smoother outline of the Porongurups comes from its origin as part of the seam when Australia joined Antarctica. The better soils and more luxurious vegetation come from the injection of basic rock as the two continents collided.
photo: L. Barrow*

Gondwana came together; the Stirlings when it came apart.

That is a broad outline of the major features of our landscape. On a more detailed scale, a prominent characteristic is that we have a lot of ironstone gravel and a lot of mesa-like structures capped by massive

ironstone. Tune in, same channel next quarter, to find how this came about!

Jim Barrow is a "semi-retired" CSIRO scientist.

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BUSH DETECTIVE



On granite rocks all over the south-west, as winter rains fill the pan gnammas, tiny plants grow from the muddy base. One widespread type looks like a tuft of bright green leaves, usually not more than 5 cm long. Visit your nearest granite outcrop and look in the gnammas - what sort of a plant is it?

Answer on page 18



LEGAL PROTECTION

THE south-west of Western Australia is a world hotspot of biodiversity; a unique jewel in Australia's rich natural heritage. As we know, much of this natural heritage that is so vital in maintaining our unique biodiversity is situated on private property. This gives private landholders a tremendous opportunity to contribute to our future and make room for nature. *Land for Wildlife* are, of course, already doing just that.

Increasingly now, those who have spent years working to preserve the bush they treasure, are thinking towards the future and seeking ways to ensure the protection and management of their land beyond their time. With Nature Conservation Covenants it is possible to do just that by creating your own private reserve. Such covenants are being offered in WA through programs run by CALM and the National Trust (WA).

But what exactly is a covenant? Sounds a little Biblical doesn't it? A Nature Conservation Covenant is a mutual pledge by both the landowner and the covenanting body to support the management of the nominated bushland by entering into a partnership agreement with common conservation goals in mind. They are voluntary agreements that are legally binding between the landowner and the covenanting body once registered on the title of the land, and bind any future landowners, thereby ensuring protection of the bushland in the future. Covenants set out what actions can't be undertaken on the land, in order to protect the bushland and its conservation values.

To provide this service, CALM has a team of local representatives skilled in nature conservation and covenants who offer a personalised service. Each covenant is individually designed to include a set of common conservation goals that suit the unique nature of each

CALM COVENANTS - CREATE YOUR OWN PRIVATE RESERVE

by Wendy Payne

parcel of bushland and cater to the owner's wishes and needs. Covenants are available at no cost to the owner, where they are not required for commercial reasons.

Placing a conservation covenant on private bushland provides benefits not only to the bushland but also to the landowner. Importantly, both ownership and control of the bushland remains with the landowner. The bushland is assessed for its conservation values and management needs. Owners are presented with an individual property assessment, a photographic record of their bushland, and assistance is given to create management guidelines that provide a focus for conservation efforts. If the landowner then chooses to proceed with placing a covenant over their bushland, they are guaranteed a long term-interest in the land and advice on a wide range of issues to assist them in their conservation efforts through CALM's Covenant Stewardship Program. Advice may be sought on management issues at any time by landowners, who also receive annual contact by telephone and a triennial visit to the land to discuss options for management issues that may change over time.

Whilst day-to-day management of the bushland remains the prerogative of the landowner, assistance in that management may be offered on a case by case basis. For example, funding may be given for initial management that is essential for the conservation of the

bushland, or to help contend with "out of the ordinary" threats to the conservation values that may arise from time to time. Funding is assessed on the conservation benefits that will result from the proposed works. Further assistance may be offered in helping to draft applications for funding through other sources. Where outside influences such as development proposals threaten the conservation of the bushland, CALM can also act as an advocate on behalf of the owner and assist with negotiations to achieve the best possible outcome.

The increasing use of conservation covenants in WA marks a shift in conservation thinking within our State. Conservation has moved from being seen to be the sole responsibility of government through formal conservation reserves, to an acknowledgment of the ability and desire of private landowners to make a valuable contribution to conservation on their lands. Together, a network of protected conservation lands can be created including private and government lands, to achieve an integrated approach to the protection of our natural heritage across the landscape.

Although CALM's Nature Conservation Covenant Program only began in 2000, it is now gathering momentum with covenants in place over 12 properties totalling 180 hectares of land and another 18 properties in negotiation totalling roughly 5,000 hectares. CALM looks forward in the future to making the most of its wealth of management resources and years of research into our natural environment to help the community in its own conservation efforts.

Wendy Payne is Covenanting Coordinator at CALM, Kensington. She can be contacted on 9334 0477 or by email: wendyp@calm.wa.gov.au

Did you know that:

- ▶ There are eleven species of cuckoos in Western Australia. Four of these visit the Perth region each year, one frequents the inland and the remaining six are found in the Kimberley. All except the Pheasant Coucal are brood parasites.
- ▶ Most cuckoos are migratory. On our Gooseberry Hill Study Area near Perth, Shining Bronze-Cuckoos arrive each year in July or August (Figure 1) and most will have departed for their non-breeding areas in Indonesia by the end of November. Fantailed Cuckoos arrive earlier (May-June) and retreat to southern Western Australia in October. Movements by the other two species are much more erratic. The Pallid Cuckoo visits our area during winter and spring, sometimes for the whole period, in other years for just a few weeks. On the other hand, Horsfield's Bronze-Cuckoos are numerous in some years, and rare or absent during others (Figure 1).
- ▶ Cuckoos have zygodactyl feet. Zygodactyl means two toes pointing to the front, and two pointing toward the rear, a characteristic that cuckoos share with parrots. Cuckoos also have prominent rounded nostrils and long pointed wings. In flight the larger cuckoo species can sometimes be mistaken for raptors. They also have an unusual diet showing a strong preference for hairy caterpillars, which other birds usually avoid.
- ▶ Parasitic cuckoos never raise their own young. Instead, they rely on a host species to incubate their eggs and feed their

FAUNA

CUCKOOS

by Michael and Lesley Brooker



Figure 2. Horsfield's Bronze-Cuckoo removing a host egg after laying in the nest of a Splendid Fairy-wren at Gooseberry Hill (drawing from videoclip, artist Belinda Cale).

offspring. When the female cuckoo is ready to lay, she searches for a nest of her favourite host species that is at a suitable stage of incubation. She then lays her own egg in the nest, at the same time removing one of the host's eggs. On four occasions we have watched Horsfield's and Shining Bronze-Cuckoos in the act of laying. Figure 2 is a sketch made from a video-recording of a Horsfield's Bronze-Cuckoo laying in the nest

of a Splendid Fairy-wren on Gooseberry Hill. The whole procedure took less than 10 seconds.

- ▶ Cuckoos are cunning. The female cuckoo lays her egg in the early morning, shortly after the host has laid one of her own eggs. If she lays before the host has started her clutch, the host female will bury the cuckoo egg under the nest lining and it will fail to hatch. If the cuckoo lays well after incubation has begun, the cuckoo nestling will hatch after the host young and so will receive insufficient food for survival.
- ▶ Cuckoo eggs are adapted toward the eggs of the host. In some cuckoos, the eggs are mimetic, which means they match the host eggs in colour and pattern. On Gooseberry Hill, we sometimes had difficulty in spotting a Horsfield's Bronze-Cuckoo egg in nests of Splendid Fairy-wrens and Western Thornbill nests (Figure 3a). However, close inspection shows that the cuckoo egg is usually more elongated. In other cuckoos, the eggs are not mimetic but cryptic. This means that the cuckoo egg is difficult to see against the background of the nest. One example is the Shining Bronze-Cuckoo which lays a dark olive green egg, while its host, the Yellow-rumped Thornbill lays white eggs (Figure 3b). We know from experience that Shining Bronze-Cuckoo eggs are

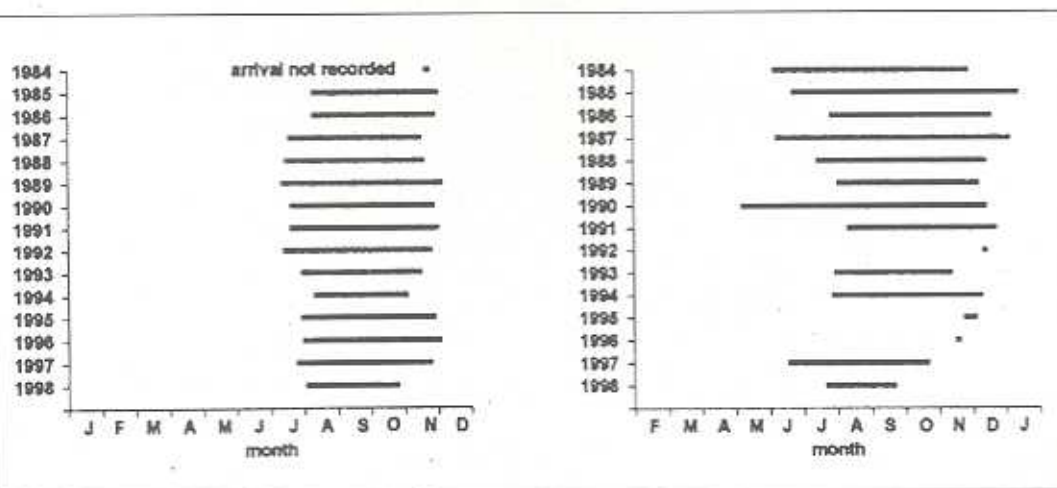


Figure 1. Arrival and departure dates for Shining Bronze-Cuckoos (left) and Horsfield's Bronze-Cuckoos (right) at Gooseberry Hill, WA.

extremely difficult to see in the dark interior of a thornbill's nest.

- ▶ Cuckoos lay eggs that are smaller than expected for the size of the bird. This allows them to parasitize species much smaller than themselves. The advantage is that, once hatched, the nestling cuckoo will grow faster than the host young and will have no trouble in dealing with its nestmates! Cuckoo eggs also have a shorter incubation period than their hosts, which means that the cuckoo egg usually hatches before the host eggs.
- ▶ Nestling cuckoos know how to survive. Even though the cuckoo is blind and naked when it hatches, within a day it usually manages to eject all of the remaining host eggs or newly hatched host young from the nest. By manoeuvring the egg or chick onto its slightly concave back and using its outstretched wings for balance, the nestling cuckoo clambers backwards up the side of the nest and deliberately tips its cargo over the rim. The foster parents never seem to intervene and completely ignore their own offspring once they are outside the nest. Now the sole occupant of the nest, the cuckoo has the undivided attention of its hosts for the rest of the brooding period and for a 2-3 week fledgling period.

As you can see, cuckoos possess an amazing array of adaptations to cope with their parasitic way of life. So amazing, that observers of natural history have not always been believed. The first published account of a nestling cuckoo ejecting its nest mates, made in 1788 by Edward Jenner (famous for his discovery of vaccination), was initially disbelieved and the paper rejected by an incredulous Royal Society in London.

Not all the mysteries have been resolved. Our studies of cuckoos on Gooseberry Hill and elsewhere in Western Australia have produced results which do not always fit the theories of the numerous overseas experts. This applies particularly to

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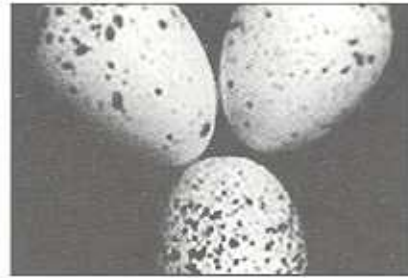


Figure 3a. One egg of Horsfield's Bronze-Cuckoo (bottom) with two eggs of Splendid Fairy-wren (top).

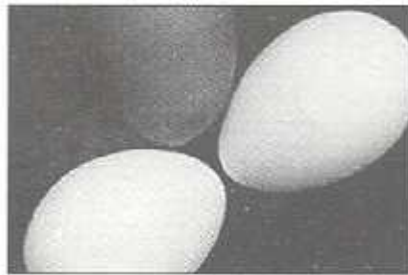


Figure 3b. One egg of Shining Bronze-Cuckoo (top) with two eggs of Yellow-rumped Thornbill (bottom).

explanations for the evolution of egg mimicry and egg crypsis. In the Northern Hemisphere, cuckoos lay eggs which closely resemble those of their preferred hosts and most of these hosts have been shown to be rejectors; i.e. the host will either desert or remove the cuckoo egg from the nest. Thus the mimicry can be interpreted as a cuckoo adaptation for countering host rejection. In our studies, however, we found the same mimicry by Horsfield's Bronze-Cuckoo of its hosts egg types, but none of the hosts species that we studied showed any rejection of foreign eggs, even when we added dummy eggs painted blue with conspicuous polka dots. One explanation could be that, in some Australian cuckoos, the mimicry is due to selection by competing female cuckoos, who remove one host egg when they lay. In other words, the mimicry is a cuckoo adaptation for out-smarting other cuckoo females. This would explain both the mimicry and crypsis in Australian cuckoos, since the crypsis could be the result of competing female cuckoos being unable to

detect dark cuckoo eggs in dimly-lit domed-shaped nests.

During our detailed study of cuckoos and their hosts, we found that, on Gooseberry Hill, 22% of Splendid Fairy-wren's nests were parasitised by Horsfield's Bronze-Cuckoos, as were 8% of Western Thornbill nests and one or two Scarlet Robin nests. Shining Bronze-Cuckoos preferred Yellow-rumped Thornbills as hosts (32% of nests) but also parasitised 5% of Western Thornbill nests. Fantail Cuckoos usually laid in the well-hidden nests of White-browed Scrubwrens, and occasionally in Inland Thornbill nests. We have no records for Pallid Cuckoos laying on Gooseberry Hill. Their favourite hosts are the larger species of honeyeaters. At Wyalkatchem, in highly fragmented habitat, 20% of Blue-breasted Fairy-wren nests were parasitised by Horsfield's Bronze-Cuckoos.

The wrens and thornbills are usually able to cope with these high rates of parasitism, as they have long breeding seasons, allowing them sufficient time to re-nest after raising a cuckoo. Female wrens will sometimes start building a new nest while the other members of her group look after her newly fledged cuckoo!

We now maintain a database, recording any report of parasitism by a cuckoo in Australia. This can be viewed on our Website www.users.bigpond.com/LesMikeBrooker/cuckoos.htm Please send us your own observations. A copy of our publication "Cuckoos Hosts in Australia" is available on request.

Michael and Lesley Brooker are scientists working with the Sustainable Landscapes Division of CSIRO. They specialise in avian breeding biology, distribution of rare and declining wheatbelt birds, avian brood parasitism, fragmented ecosystems and landscape design. They can be contacted at CSIRO Sustainable Landscapes, PO Box 5, Wembley 6913. Email address lesley.brooker@cse.csiro.au.

BLACK-FLANKED ROCK WALLABIES

In May an historic event took place. Black-flanked Rock Wallabies were released back into the Avon Valley National Park!

THE deep gorge on the Avon which is now part of the National Park is the 'type location' for this species, as it was named from a specimen collected there by John Glibert in 1842. It remained fairly common until 1909 but the last sighting was recorded by Walter Chitty in 1946. Then nothing - it had gone locally extinct.

Fortunately, a small population survived on wheatbelt rocks, and fox baiting by CALM has enabled numbers to build up (see "How to manage your granite outcrops" for the story). Indeed, they have been translocated to another inland rock. Now, they're back in the Avon Valley!

Many *LFWers* in the Toodyay, Gidgee, and Chittering areas (adjacent to AVNP) had expressed interest in the mammal translocation programme, and so *LFW* collaborated with CALM's Western Shield biologists to ask the community if they would like to be involved. There are two phases, first, to help with the actual animal release, and secondly, to monitor their survival.

Meetings were arranged in Toodyay (coordinated by *LFW* and the Toodyay Naturalists' Club) and in Lower Chittering (*LFW* and North Swan LCDC), at which Peter Orell explained about fox control, small mammal survival and the proposed release into the AVNP. Then, for three days, two (very wet!) days south of the river and one north, a total of 37 rock wallabies (from Mt Caroline Nature Reserve) were released into the park. It was really quite emotional as the little fellers



bounded off among the boulders! All told, over 50 people turned up to help, a wonderful response, and the scientists were very appreciative of the community's support.

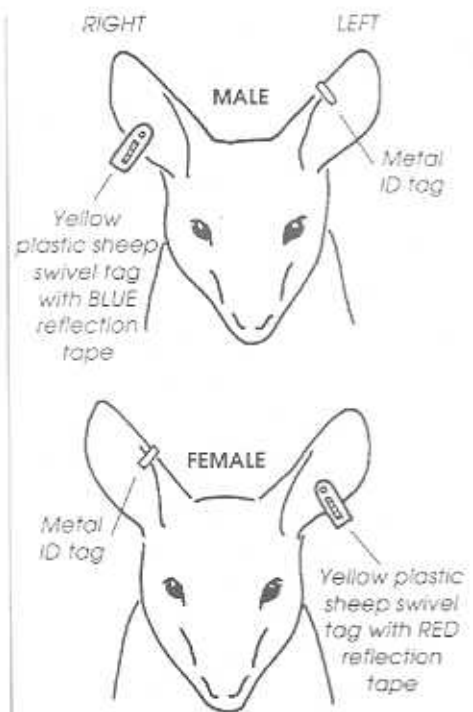
CALM would also like to acknowledge the efforts of the Copley family and the Australian

Wildlife Conservancy, through Paruna Sanctuary, in making the rock wallaby translocation possible. Paruna forms a 13km long fox-baited bridge between Avon valley and Walyunga National Parks. Ten rock wallabies have also been reintroduced into Paruna Sanctuary.

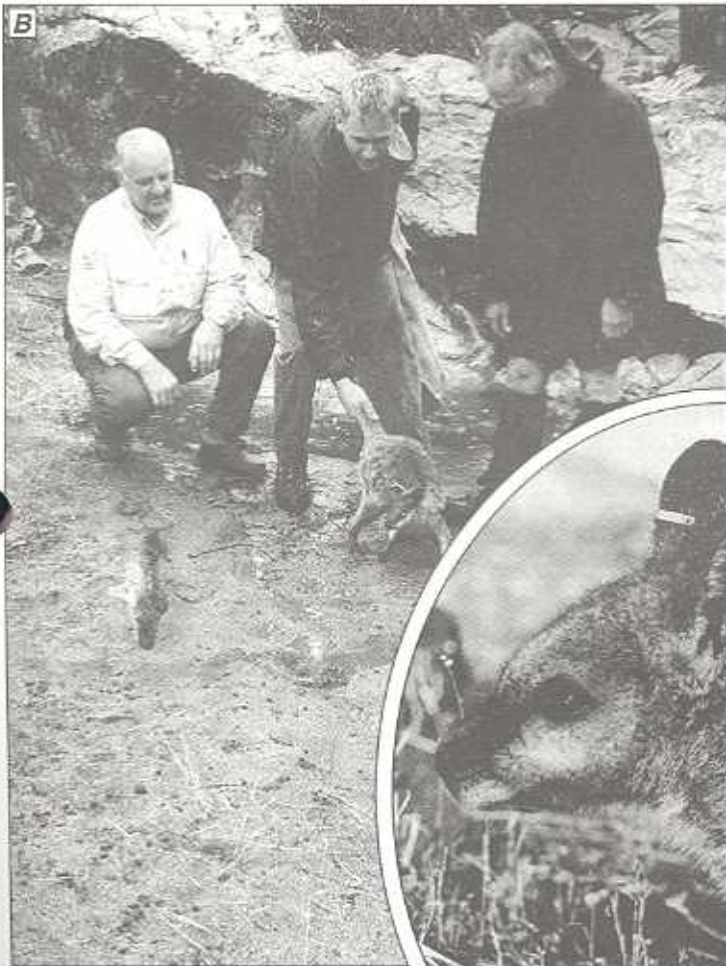
BUT WILL THEY SURVIVE?

FOR at least until this time next year, Western Shield needs reports of rock wallaby sightings. They bask on ledges and boulders in the morning or afternoon sun, especially during the cooler months - if you take your binoculars on a bushwalk to the right place, and then sit quietly, watching and filling in a simple record sheet, you could help this monitoring effort. The animals have ear tags for ID (see pics). Ring *LFW*, Toodyay Nats or Chittering Landcare Centre to pick up a map and recording sheet.

Make it a family excursion! The Avon Valley NP is a great place for a picnic anyway! As *LFW*er Fleur Crowe said on ABC News "People from Perth will now be able to see them!"



RETURN TO THE AVON VALLEY



A. Carrying rock wallabies to the release site. photo: P. Hussey
B. Jim Maher, Peter Mawson and Bob Frayne. photo: R. Huston
C. Roger Joyner and Peter Orell. photo: P. Hussey
D. Raffi Andreoli being filmed for ABC News. photo: R. Andreoli

E. Tammars, released a week earlier into dryandra thickets, in their carry-bags. photo: M. Meffert
F. A tamar, showing the ear tags. Is it male or female? photo: M. Meffert

PRACTICALITIES

SO YOU WANT TO BUILD A FENCE, DO YOU?

by Pamela Valton (alias 'the little lady')

KEEP the foxes out? Protect the orphaned roos and other wildlife? OK, where do we start? What with? How high? Where from?

After several weeks of looking, enquiring and finding out what others had done we came up with a combination of Wamsley's Earth Sanctuaries' fences, deer farm fences and a little of our own initiative. We chose galvanised pipe for corner strainer assemblies and gate way box strainer assemblies to be concreted into the soil because of termites and water inundation in winter. The wire we chose is 1.9m, 17 wire boundary deer fencing held up by galvanised pickets. Well, after much negotiating we eventually purchased our materials and were ready to start. Just one average bloke and one little lady plus some hand tools and big ideas.

First we ensured a good clearance along the boundary, no easy task, and commenced to dig the holes using a hand auger, in summer due to winter high water table problems, concrete in the posts and erect the box strainer assemblies. Around this time we learned of some old sheep wire netting being removed by a neighbour renewing his fences. We took many trips to collect the old wire - heavy, awkward and dirty. Why? To lay down flat along the fenceline to deter the foxes from digging under to gain entry. Whose job? The little lady's, of course, because the average bloke was still digging those holes by hand!

Next came the pounding in of the metal pickets with a hand post driver (known as a donger by some). On went the ear muffs, up went average bloke on a trestle to reach their height and little lady fetched, carried, positioned and held. By this time both were rather fit and average bloke had muscles to envy. Did I mention that we were fencing 4km? Well we were, and in summer through to autumn, but definitely NOT during the middle of the day!

So, many weeks later and several picnics on the job later we were ready to put up the wire itself. Thank goodness we had invested in a hoist for the back of the ute to lift the wire. Oh, oh! With what could we strain it? Many suggested two tractors pulling in either direction, but since we don't own a tractor that was no good. The little lady suggested that some giant ringlock strainer thingies might work but no-one seemed to have anything like that until ... Yes! - someone had heard of someone who knew someone who thought they might have used some to put up a deer fence. Contact made, and although we offered to hire them, they were loaned to us obligation free.

Now came the interesting part. The rolls of wire weighed 290kg and were 1.9m high. Very tricky, average bloke's muscles and all!

It wasn't too difficult to transport the rolls of wire to the locations, thanks to the hoist to load and gravity to



Just an average fence, built by an average bloke - a.k.a. Christian Valton

unload. It wasn't too difficult to roll it out along the fence line with only the occasional tangle with the old sheep wire. Hooking it up loosely to the steel pickets was tricky but reasonably simple. It was manipulating the wire moving along the tops of the pickets without bending them that challenged us.

So, whilst average bloke pulled and strained on the chains and levers to pull the straining boards to strain the ends of the fence wires together, little lady raced up and down the line lifting the top wire off the pickets moving it along and back onto the pickets following the direction of the strain - 200m one way, 200m the other and back. Each section took one day. By then it was autumn and cooler or it would have taken longer. However, it took the next day to join the 17 wires and prepare the next strip of wire for straining.

The strainers were fantastic but unfortunately required bolting and unbolting, were VERY heavy and required a lot of muscle to crank up the three sets of chains. Average bloke's muscles were looking good but not so his hands. In spite of the leather gloves they were callused and sore from all the wire twisting and fixing at the joins. 36 rolls x 17 wires. You work it out!

Finally all 4 kms of fence was up, but not yet finished. The tie wires to hold it onto the pickets had to be finished as only the middle had been done as we went along. Little lady left that to average bloke - she had had enough! A little later she did help again in securing the second layer of wire at the creek crossings - couldn't have those pesky foxes creeping in that way, now could we? Seven months in all, but now complete.

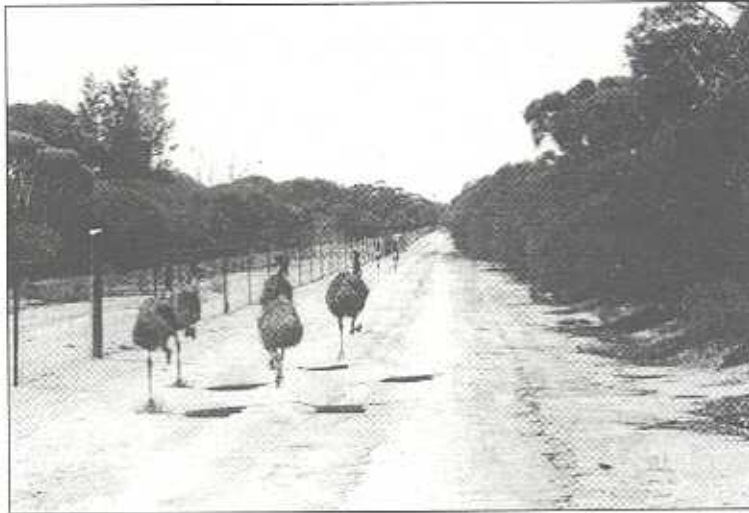
Yes, the fence looks fantastic and yes, we are proud that we did it, quite alone and completely self-funded. We are also very proud to see displayed on our entrance gate a sign which says 'Land for Wildlife'.

Happy fencing!

THE FAUNA AND FLORA OF THE STATE BARRIER FENCE

by Kathy Saunders

WESTERN AUSTRALIA'S State Barrier Fence, originally known as the Rabbit Proof Fence, turns 100 this year! Agriculture Western Australia (AGWEST) and the Agriculture Protection Board (APB) are co-ordinating the community celebration to be held at Burracoppin and Merredin on the 18 August 2001.



In late July 1901, A. W. Canning, an explorer and surveyor with the Lands and Surveys Department, was put in charge of a party to survey a line which commenced at Burracoppin. In December 1901 the work of erection began. R. J. Anketell, Superintendent of Rabbit Fence Construction, and his team constructed some 20 miles of fence per month. Gangs totalling up to 400 men were employed as day labour. Around 8000 tonnes of materials were carried by ship and railed to depots and then hauled overland by horse, camel or donkey teams.

Camels had to be muzzled on the northern section of the No. 1 fence from the 700 mile as poison bush covered this belt of country. Whilst Anketell had these plants eradicated for some distances on both sides of the fence the odd poisoning still occurred. By September 1903 there were 27 reserves along the fenceline, some 20,000 acres that comprised grazing areas, wells, soaks, gnamma holes and rock tanks. Posts were mostly wooden and were cut near to the fence line, using natural timber of white gum, jam, wodjil, pine, tea tree or mulga. Steel standards were used where timber was scarce.

Completed in 1907, the No. 1 Rabbit Proof Fence stretched from

THE WAY WE WERE ...

Starvation Boat Harbour, about 130 km west of Esperance on the south coast, to Cape Keraudren at the south end of the Eighty-Mile Beach, near Port Hedland. A distance of 1837 km (1139 miles), then being the longest fence in the world. Unfortunately, rabbits had by-passed the southern end of the fence before it was completed in 1903, and the northern by the end of 1907.

The Acting Chief Inspector of Rabbits, Alex Crawford, on return from a trip along a portion of the rabbit-proof fence to the north of Burracoppin where there were rabbits present, saw an illustration of the good the rabbit fence is doing. "On the outside of the No 1 fence there was not a blade of grass to be seen; on the inside there was any amount of grass from three to six inches high and any amount of old feed, while on the outside of the fence the old feed had been eaten down close to the ground, and there was not enough to feed even a bandicoot. A better illustration of the value of the fence it would be difficult to find."

Crawford also reported from a trip along the fence in 1904 that "Boodie rats are the greatest menace at the present time and I saw in three separate places they had scratched right underneath the fence, apparently within a few hours."

Gates were located every 20 miles apart, as were trap yards. "Up north they caught anything but rabbits –

foxes, boodie rats, night cats, sometimes a bungarra. There were a lot of native cats those days – spotted ones – but the bungarra would eventually dig a hole under the trap fence until he got out." Where cats or iguanas are caught in the trap yards the boundary rider would release them, as they were the natural enemies of the rabbit.

Frank Broomhall, a boundary rider on the No. 1 fence, and later the author of 'The Longest Fence in the World' describes the colour and life of the fauna and flora along the fence. In October 1926 in the mulga country, he writes: "I noted here was colour – rich red soil, the mulga forest itself, cararra and bowgada bush, sugar burra and spinifex gum and in the spring miles of pink, yellow and white everlastings forming a carpet for the whole earth." Later in the year: "The wild flowers and crowsfoot and other natural feed are dying off now – quondongs with their bright green foliage and deep red fruit are a refreshing sight against the grey green of the mulga – a pity most of the fruit is grub-eaten", his note ran.

In late January 1927 near the 126 mile, Frank Broomhall came upon a dirt mound. "I came across a mallee hen's nest, a large mound of earth, leaves and rubbish about eight feet in diameter and two feet

FAUNA

BIRDS ON ROADSIDES

by Brenda Newbey

THERE is no doubt that vegetated road verges really are a valuable resource for birds.

For over 30 years, Main Roads Western Australia (MRWA) has run a programme of land acquisition of strips of farmland adjacent to main roads. Many of the resultant verges have been revegetated, especially over the last 20 years as revegetation techniques have improved. In early days, neat rows of seedling trees, often of a single eastern states species, were used for replanting these strips of paddock. Now it is more usual for a mix of 20-30 local trees and shrubs to be included in the planting. MRWA was interested in finding out whether the revegetated verges were as attractive to birds as remnant verges so they took the opportunity of linking into the Birds on Farms (BOF) project, a Birds Australia initiative which aimed to find out more about birds in farming areas with an especial interest in bird use of revegetation.

The verge study comprised 161 half-hectare sites over 21 shires. The sites were visited up to eight times over at least two years. A total of 112 bird species were recorded.

The verge sites were of various widths none less than 10 meters, along one side of a road. Length differed accordingly. About one quarter were remnant (with up to 15% revegetation), one quarter had a more even mix of remnant and revegetation and the remaining 50% were revegetation (with up to 15% remnant).

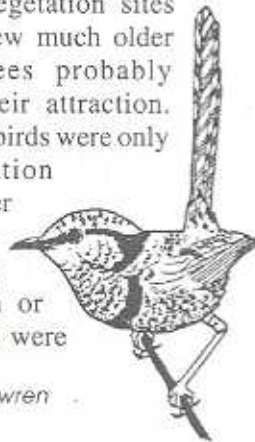
A few more bird species were found in remnant sites than in the other tree-history categories. They were species that have declined in numbers or range as a result of clearing for agriculture. However many species that have declined were just as likely or more likely to be found in revegetated sites. These included Splendid Fairy-wren, White-browed Scrub-wren and Rufous Whistler. Species more likely in remnants included Inland Thornbill, Weebill and Grey Butcherbird. Species only in remnant verges included Crested Bellbird and Rufous Treecreeper.

Understorey is important to most of the species that have declined. A

well developed understorey was shown to be important for several of those species including Splendid Fairy-wren, White-browed Scrub-wren and Inland Thornbill, but irrelevant to all the species that have benefited from farming such as the Magpie, Raven and Ringneck.

The species favoured by farming and most of the bush birds were found in all age categories of verges. The fact that many of the younger revegetation sites included a few much older remnant trees probably enhanced their attraction. Some scarce birds were only in vegetation averaging over ten years old.

For sites where seven or eight surveys were



Splendid Fairy-wren

ROAD VERGE SITE LOCATIONS



done, total species count ranged from five to 31. Total count of individuals ranged from 10 to 310. The higher-performing sites tended to be in higher-rainfall areas than the lower-performing sites. By far the highest-performing site of all was a 20 m wide direct seeded revegetation site along the busy Old Coast Road. The vegetation was continuous at either end of the site with a very vigorous understorey including much honeyeater-attracting *Calothamnus quadrifidus*. There was a remnant old Tuart. But the biggest drawback of all was the adjacent well-watered turf farm. Another high-performing site, in the shire of Swan, was a 15 m wide verge entirely composed of planted Marri with no understorey, adjacent to a stock water trough and ending near a farmhouse with a garden. Bird numbers here were highest in summer and autumn when the Marri was in flower or fruit and when water was most in demand. One winter visit to this site yielded no birds.

Two of the best sites were only 16 m wide, direct seeded in 1981, 16 years before the survey started. In Albany Shire, they were among the first of the direct-seeded road verges. Revegetated verges often have a higher density of flowering plants than remnant bushland. At flowering they are visited by large numbers of honeyeaters. This was certainly the case for these two sites. In autumn, *Hakea laurina* in full flower appears to be a powerful attractant with maximum numbers of New Holland Honeyeaters and Silvereyes found. Western Spinebills were only recorded at these sites in autumn. Red Wattlebirds were more common in spring when *Calothamnus quadrifidus* was in full flower and *Banksia grandis* was also flowering quite well. The south-west endemic finch, the Red-eared Firetail, was found at both sites, sheltering in the dense vegetation and feeding at the edge of the adjacent paddock. It is not known what will happen as these sites continue to age. All the other direct-seeded sites are younger than this and may not yet have reached

Birds continued from page 14

their maximum carrying capacity.

Some of the low-performing sites were long undisturbed remnant at the edge of a block of bushland so that there was no perceptible corridor effect. Others were opposite a better verge on the other side of the road. Vigorous introduced grasses appeared to have a negative effect on bird diversity and numbers. Crested Bellbirds, scarce in verges, were recorded from an isolated low-performing remnant verge.

Verges supply food and shelter for birds often in a very different mix from that of the surrounding countryside.

Bird use of verges has something in common with our notion of time-share accommodation. Overall there was little difference between numbers of individual birds across the seasons. But when separate species are examined by season, an interesting picture emerges.

More Red-capped Robins were found in verges in autumn than at other times of the years. Grey Fantails were more common in autumn and winter, Brown Honeyeaters were much more common in spring. Splendid Fairywrens were most frequently

FAUNA

recorded in summer though spring records were also high. Rufous Whistlers showed little variation throughout the year though numbers were up highest in spring when they call most vigorously. What is going on?

The Red-capped Robins use verges for dispersal in autumn and move away from verges for breeding. Grey Fantails move north and east as it gets colder in the south, returning in late winter. Brown Honeyeaters appear to gravitate to verges where there is a good food supply and often use them for nesting in spring. Splendid Fairywrens breed in spring in suitable verges with a dense understorey and their numbers peak in summer before autumn dispersal. Rufous Whistlers often occupy a verge as part of their long-term territory.

Bird numbers were high in the cooler months in the inland northern sites, with a sharp drop in summer. Summer totals for sites near Cranbrook and Augusta were high. It is critical for many species to be able to move through the landscape.

This project showed that birds will take up the advantages that a verge has to offer, responding to factors that impact directly on them such as structure, degree of isolation of the site, or plants in flower at the time. Factors such as road width and traffic flow were of little significance. Highest numbers of individual birds were recorded in narrow verges, lowest in the widest verges where the corridor effect is least pronounced. However some of the scarcer species were more likely to be found where the verges were wider.

In a landscape so often depleted of trees and shrubs, vegetated road verges have been a lifeline for bird species in agricultural areas of WA and revegetation programmes have been invaluable.

Note: While the BOF project in WA was mostly funded by the Gordon Reid Foundation for Conservation, the Main Roads part of the project was funded by MRWA. But a survey such as this is very labour intensive and both segments of the project depended heavily on volunteer support. For the full report, contact Birds Australia or MRWA.

Brenda Newbey coordinated BOF in WA. She can be contacted on: 9337 5673

Barrier Fence continued from page 13

high, the sides sloping a little and the top flat. A mallee fowl is not much bigger than a domestic fowl yet must be amazingly industrious for the nest contained easily three loads of dirt, practically half a day's work for one man with a shovel."

Kevin Davies worked for the Murchison Regional Vermin Council and describes his experiences: "I have seen many mobs of emus several miles long and up to half a mile wide all heading south on both sides of the Fence and especially on the west side. In the early thirties, emus, forced to move by the near drought conditions in the station country, began to travel down the Fence towards the agricultural districts and became such a pest that the Road Boards offered a one shilling bonus for every emu beak brought in. This offer

resulted in payment for a total of 56,204 beaks that year."

Today the fence has been modified and realigned and now known as the State Barrier Fence. It stretches over 1,170 km from the Zuytdorp Cliffs north of Kalbarri, follows around the north and north-eastern farming areas and around the Yilgarn Shire. The fence then runs east of the Lakes district, and south-easterly to Jerdacuttup in the Ravensthorpe Shire. It is maintained today principally to protect agricultural areas from migrating emus. Good rainfall, feed and breeding conditions in pastoral areas, followed by a prolonged drought, may result in a large number of emus migrating in a southwesterly direction. On average these conditions occur about every ten years.

Such a population explosion happened during spring 1994, when 40,000 emus were counted on the eastern section and over 15,000 on the northern section of the fence. Whilst some had to be controlled, most gradually dispersed when rain occurred, without causing serious damage to crops.

The State Barrier Fence also provides a baiting corridor for wild dogs; a barrier and traffic facility for feral goats; a 20 metre fire break between pastoral and agricultural areas; and a barrier for feral and domestic animals should there be an exotic disease outbreak.

Kathy Saunders is Communications Officer at AGWEST, Northam. She can be contacted on 9690 2082 or email ksaunders@agric.wa.gov.au

MEMBER'S PAGE

MORE ABOUT SNOTTYGOBBLE SEEDLINGS ...

by Lyn Atkins

JUST thought I'd throw in my two bob's worth on the snottygobble story from Gidgegannup (published in April's Western Wildlife)...

We have many *Persoonia elliptica* seedlings in the bush at home (Parkerville). We also have a resident brushtail possum who lives in a dead jarrah tree in the middle of the bush on the northern side of the house. Under this tree are several (4) snottygobble seedlings, which appear to be directly under the hollow I'd expect the possum to live in.

Most other snottygobble seedlings (probably about 75%) are within one metre of the trunk of either a marri or jarrah tree or more rarely a snottygobble tree or tree stump; the others are more randomly located but generally not close to a parent snottygobble, which would indicate transport by something large. There are less seedlings as distance increases from the possum home tree. With the exception of one tree which is on the property boundary, all snottygobble trees had been stripped of their fruit except on the smallest outside branches. There was also no evidence of fruit on the ground when I checked in April,

shortly after reading the article, so something has been eating it.

On the south side of the house the situation is different; as far as I can gather the possum visits this side less often because there is less evidence of tree trunks being climbed, probably because it would have to pass the dog to get there! On the south there are far less seedlings, they are located more randomly, but there are also less potential parent trees though they'd also lost their fruit.

And in all cases the seedlings are extremely slow growing (in fact I've not seen them grow at all!) but seem to live at a small size for ages. There is no correlation between seedlings and areas which we have burnt in the six years we've been there, but I don't know if these small seedlings survive a fire or not.

Of course this isn't a scientific study and the results are not statistically proven ... just my observations on a walk around to see if my theory of the seedlings being close to tree trunks was possible!

Lyn Atkins is a botanist with CSIRO in Floreat. She can be contacted on 9333 6448.

BIRDS, THE ELECTRIC FENCE AND ELECTRO-MAGNETIC FIELDS

MANY wetland areas are excised from private properties for conservation purposes - examples Karakin Lakes south of Lancelin and Wandering Spring between Narrogin and Wickepin. The latter is surrounded by an electric fence to deter sheep. In this area there are no small (11 or 12 cm) 'fence-sitting' birds. Treetop birds such as galahs, ringnecks, magpies, ravens and butcher birds are well represented.

We know that the magnetic field plays an important part in bird migration. We know that beneath high-tension electric wires birds are never seen. What is the effect of the electric fence on small fence-sitting birds such as robins and chats?

Mary Bremner, Kalamunda

The consensus is that it is habitat preferences which influence bird distribution, rather than an effect of the fence. But we will try to find out more. - Ed.

DISCOVERING DRF - JACKSONIA VELVETA

by Lyn White



THERE'S always an air of excitement when Val Crowley of Darkan suggests having a look through the bush at Dardadine, the property now owned by my two sons and managed by the younger, Jody. You never know what she might discover!

It was the unusual shape of the leaf which attracted her attention one day in July last year. Val did not recognise it as anything she had seen previously. Between flowering seasons, but with some old flowers still attached, it was obviously a pea and similar to, or possibly the same as the *Jacksonia* in the rare flora book. Only two populations of this are known to exist - one near Collie, the other Woodanilling.

Val needed to see it in flower, and with each visit our excitement increased! It was a long wait however, for they did not appear until late October. Each time, though, we discovered more plants, eventually estimating a dozen adults and a similar number of seedlings.

This same bushland is also host to the Priority Species *Stylidium coatesianum*, *Persoonia sulcata*, *Synaphea flabelliformis* and *Xanthorrhoea brevistyla*. (A photo of Val surveying the *Synaphea* is in the Autumn 2000 edition of "Landscape".) Remnant bush in our agricultural area is worth very little cash money, but what price its real value?

KEEP WATCH FOR FIRE ANTS!

AFTER an outbreak of the Red Imported Fire Ants in Queensland, metropolitan and rural residents are urged to send to AGWEST any unusual, small, red ants. There have been no records of this exotic ant in WA so far, but it could hitch a lift on a vehicle - especially earthmoving equipment.

The Red Imported Fire Ant looks very similar to many other common ants and is 2-6 mm long and red to brown in colour. It is distinguished by large ant mounds, which are commonly 30-40 cm high but can be up to 60 cm high and one metre wide. Another unique feature of the ant is the way it stings, forming painful pustules (pimples) within 24 hours.

Apart from their threat to humans, infestations of these ants can deter livestock from feeding grounds and their mounds can interfere with machinery in crop and orchard areas. They also compete for resources with native fauna, and can displace them from their natural habitat. They are most likely to gain a hold in the tropics, but could survive in the south-west around fresh water lakes and streams.

As there are more than 2000 species of native ants in Australia, the presence of this pest can only be confirmed by microscopic examination of actual specimens. Collect about a dozen suspect ants by attaching them to clear sticky tape and then sticking that to a piece of paper with your contact details. Post it to: Red Imported Fire Ant Surveillance, AGWEST, Locked Bag No 4, Bentley Delivery Centre, WA 6983.

IN BRIEF

BE CAREFUL WHEN PLANTING TALL WHEATGRASS

MANY people are planting Tall Wheatgrass, *Lophopyrum ponticum*, to provide pasture on saline soils. While it is undoubtedly useful for this, a report from Victoria warns that it can also be a serious environmental weed.

Geoff Carr and Matt White of Ecology Australia Pty Ltd, state that: "In southern Australia, this species poses a particular threat to saltmarsh vegetation and is capable of destroying most upper saltmarsh in western Victoria. Spectacular and rapid invasion of *Halosarcia pergranulata* shrubland has been seen at Lake Connewarre. We have also observed this species invading a number of native grasslands and pastures in central, western and north-western Victoria. Invasion by this species has occurred without planting or deliberate introduction for agricultural purposes, ie. it is capable of wide dispersal without direct human agency and its range is expanding rapidly."

Thus, while the plant remains useful for revegetation on secondary saline areas, care should be taken not to introduce it to the original, native, saline ecosystems.

DOES REVEGETATION ENCOURAGE INVERTEBRATES AND INSECTIVOROUS BIRDS?



RECENT research undertaken by Curtin Uni, in association with Northam LCDC, investigated whether trees planted for revegetation are colonised by invertebrates, and whether the abundance and variety of invertebrates on planted trees differs between tree species and between revegetation and remnant native vegetation. It also looked at the use of revegetation by birds and compared this to bird communities in remnant vegetation.

Indigenous trees tended to support the most diverse and abundant invertebrate faunas, those originating from other areas of WA supported the least. There was no significant difference in bird use between the revegetation and the remnant vegetation, however, all the birds found in both areas are widespread species.

To restore and enhance regional biodiversity, the researchers recommend that revegetation programmes, including commercial plantings, should use a variety of tree species and emphasise local species. Planted areas should also be diversified by using a variety of indigenous shrubs and herbs as well as trees, and by adding logs and coarse woody debris to the area planted. Provision of nest boxes would accelerate the colonisation of revegetated areas by hole-nesting birds.

For the full story, read: The Potential of Revegetation Programmes to Encourage Invertebrates and Insectivorous Birds. 2001. Majer, J.D., Recher, H.F., Graham, R. & Watson, A. School Of Environmental Biology, Bulletin No 20. Curtin University, Perth.



Did you know ?

why bats hang upside down?

Because bats have wings, the joints of the legs and hips have evolved to help support and control the wing membranes. In addition, the pelvic bones are small to help reduce weight. This means that bats can no longer stand on their hind legs, they can only hang.

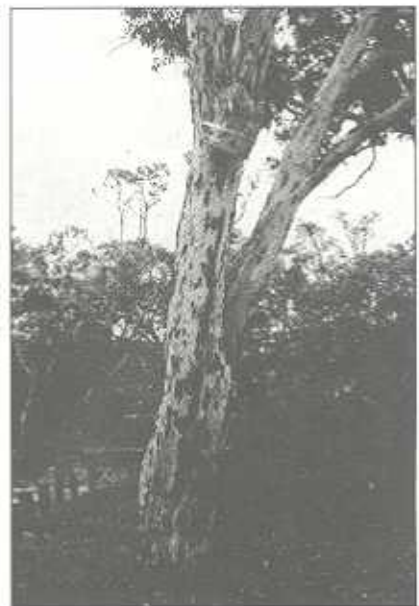


LFW NEWS

NESTING BOXES FOR A WILDLIFE RETREAT



The Green Corps team with Ayleen and Tony Sands



This nesting box blends nicely with a Wandoo tree.

WITH only 200mm of rain being recorded at the Stirling Range Retreat over the last nine months, Ayleen and Tony Sands have faced one of their toughest times since they took on the ownership of the Retreat on the northern boundary of the Stirling Range near Bluff Knoll turnoff five years ago.

Ayleen and Tony were one of the first landholders in the south coast region to register with LFW and they are also members of the eco-tourism association. They promote a strong conservation ethic to their guests to ensure tourism does not impact adversely on natural bushland. This has included making big changes to the management of the Retreat, eg:

- ▶ removing 175 fireplaces and educating guests about the risks of wildfire
- ▶ restricting camping to a designated area, instead of allowing guests to camp anywhere amongst the bushland
- ▶ advising guests not to bring cats or dogs, as they disturb the fauna
- ▶ revegetating degraded areas with both seedlings and direct seeding
- ▶ creating walking trails to discourage trampling over the bush

- ▶ providing information and guided walks so that people can begin to understand the fragile ecology of the area.

Recently the Albany-based Green Skills Green Corps team installed 23 nesting boxes which Ayleen and Tony had requested them to build. They are specially suited to Brush-tailed Possums, Brush-tailed Phascogales, Pygmy Possums, Honey Possums, Pardalotes, Parrots and other bird species. CALM made the wood

available from a tree with hollow limbs which had blown over during a storm and was blocking a firebreak. Five minutes after installation, a Rufous Treecreeper was observed inspecting one of the boxes.

The focus at the Stirling Range Retreat on preserving the wildlife is obviously attractive to human guests as well as the wildlife. Hopefully the area will get its much needed rainfall and the animals will increase in the comfort of their new homes.

Sylvia Leighton

BUSH DETECTIVE

It is a Quillwort, *Isoetes* sp. and there are several different kinds across the south-west. Often there are variations from one rock to another.

Quillworts are related to the ferns and reproduce by spores produced in sporangia at the base of the leaves. They are found throughout the temperate regions of the world, and at least eight species are known from Australia. They are a very ancient group of plants, whose ancestors were part of the great forests that covered much of the world in the Carboniferous era.

Quillworts survive the summer as spores in the mud on the bed of the gnamma. Trampling by hooved mammals breaks up this mud and allows wind and water erosion. In rangeland areas such as the Murchison, goats (and to a lesser extent sheep) use the granite outcrops as camp sites. Their grazing, trampling and accumulation of dung has so changed the pools that Quillworts are seldom found there any more. Grazed wheatbelt rocks show the same effect. Given the variation among these tiny plants, and the fact that they have survived so long, this is a sad loss of biodiversity.



FLORA

Marvellous Melaleucas

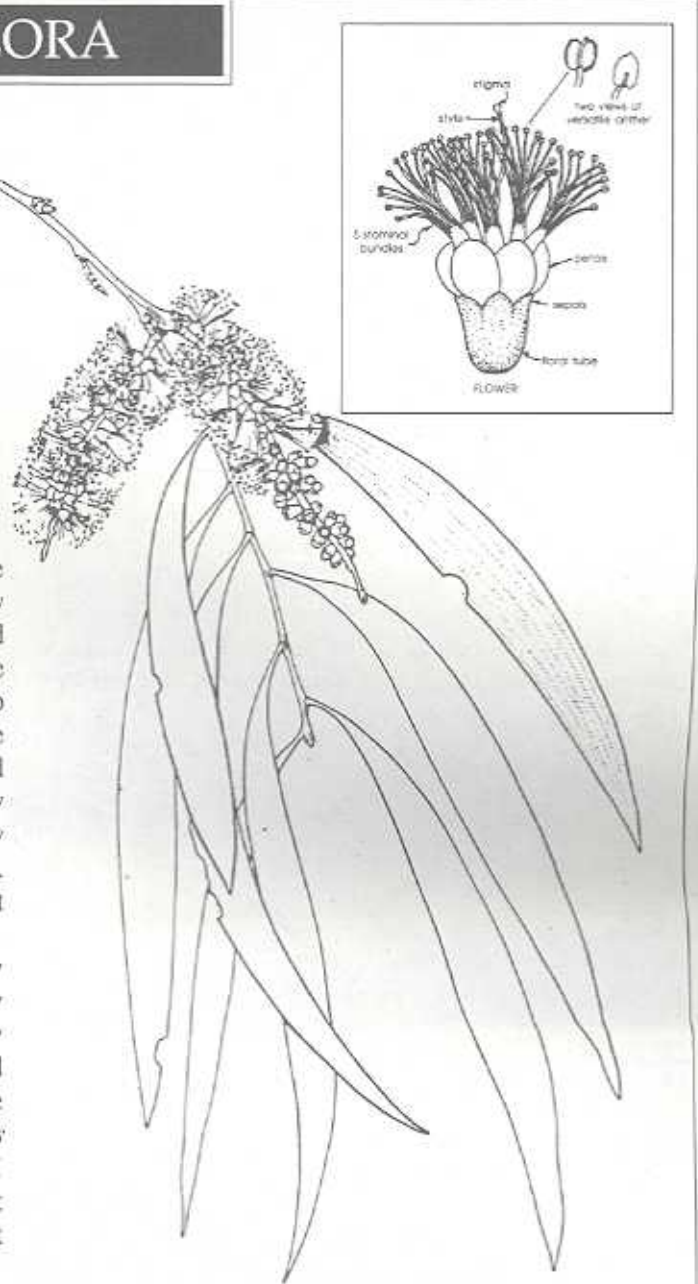
AROUND all the estuaries, lakes and rivers where early European colonists first settled, grow magnificent trees with white bark that can be peeled off in sheets. The settlers noted that Aboriginal people used these sheets to cover their mia-mias, or to wrap around fish before baking on the coals. Of course the trees were called 'Paperbarks', the first published record of that name being in 1842. Colourful shrubby relatives were called 'Honey-myrtles' because they were in the myrtle family and produced copious nectar. Nowadays we often use the scientific name, and just call them melaleucas.

There are about 220 species of melaleucas, mostly in Australia, but a few are found as far away as New Caledonia. Over 180 species occur in WA, and new species are being described all the time. One named recently honours *Land for Wildlife's* Rob and Anne Smart of Jerramungup; it is called *Melaleuca sapientes* (from the Latin meaning 'wise!'). Another is *M. tinkeri*, after LFWer Alan Tinker; the botanist concerned often stayed at the Tinkers' caravan park at Eneabba.

Melaleucas can be shrubs or trees. The flowers are grouped into spikes or heads. They have small petals and showy stamens, grouped into five bundles. The filament is fixed to the middle of the anther, allowing it to rock backwards and forwards. This arrangement is called 'versatile', and is a quick way of distinguishing this genus from the related genera of *Regelia*, *Eremaea*, *Beaufortia* and *Calothamnus*. (If it has versatile anthers but stamens not grouped into bundles, it's a *Callistemon* or a *Kunzea* - well, probably!) The hard woody fruits have three chambers, each containing numerous tiny seeds.

Like other members of its family, melaleuca leaves contain oils with a heady scent and, possibly, germicidal properties. 'Tea-tree Oil' comes from *M. alternifolia*, an eastern states species. Various WA species are under investigation for their oil content.

Leaves, flowers and seeds all provide food for various invertebrates, but it is probably the flowers which are most important for fauna. While many



melaleucas are spring flowering, others extend well into summer and all are a very important resource for nectar-eating insects and birds. The provision of nesting sites is also important, especially along waterbodies, where Paperbarks provide both roosting and nesting sites for waterbirds.

Melaleucas grow in almost all vegetation types in the south-west of WA, but they are especially important in wetlands, sandplains and granite ecosystems. The seed is easy to collect - just remove the fruits and place in a paper bag in a warm, dry place until they open and the seeds fall out. Most germinate and direct seed well.

No matter where your revegetation project is, or on what soil type or landscape position, you will find several melaleucas to enrich your planting by providing habitat for fauna and beauty for the human eye.

Penny Hussey



NEW BOOKS

An illustrated Key to the Perennial Grasses of the Avon Wheatbelt of Western Australia

Alexander R. Williams
WA Herbarium \$15.00

If you are interested in grasses, this book is essential. Simply written and illustrated in meticulous detail, it will enable you to identify all the grasses, both native and introduced, found in the Avon botanical district. Even outside this area, it will be useful to find the genus of your grass, even if you then have to identify the species elsewhere. You will need a bit of persistence and a good hand lens or a stereomicroscope (your local Community Herbarium could help here), but will find yourself becoming fascinated by the detail and diversity of this important plant group.

To order your copy, contact the Perth Herbarium, 9334 0500.



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COMING EVENTS

FACET Annual Conference 'Regional and Rural Tourism - strength through diversity'

30th - 31st July 2001

Albany

For further information, contact Pauline McMullan, ph: 9448 8150 or email: facetline@inet.net.au

State Barrier Fence Centenary Programme

18th August 2001

Burracoppin and Merredin

For further information, contact Kathy Saunders, email: k Saunders@agric.wa.gov.au

Salinity Seminar - Morawa

21st August 2001

Morawa Shire Hall

The seminar will cover the hydrological process involved in groundwater and salinity, nature conservation values and commercial options for saline land. The information is aimed at landholders and will be regionally based.

For further information, contact Robyn Stephens, ph 9972 3001; or email: rstephens@wn.com.au

Wildflower Walk - Calingiri

Sunday 26th August

Learn more about the beautiful bushland, share billy tea and damper, and enjoy a day out in a wonderful place! The Victoria Plains Tourism Association's popular annual event is scheduled for the Rica Ericson Reserve and Wyering again. Come and join us!

For further information, phone Linda Auburn: 9628 7029 or Betty Wemm: 9628 7121.

State Landcare Conference: 'Partnerships and Diversity'

11th - 14th September 2001

Mandurah Performing Arts Centre

For further info: contact your CLC or email: keynote@ca.com.au

Symposium 'Fire in South-western Australian Ecosystems: impacts and management'

12th-13th September 2001

Notre Dame University, Fremantle

A wide-ranging series of detailed, scientific papers and top levelspeakers. Minimal discussion time. Papers will be published.

For further info contact Glenda Godfrey, ph: 9334 0463 or email: glendag@calm.wa.gov.au



Weedbuster Week

7th - 14th October

What will YOU be doing?

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 Conservation and Land Management.

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