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Western Wildlife

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NEWSLETTER OF THE LAND FOR WILDLIFE SCHEME

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JARRAH DIEBACK

Elaine Davison

Introduction

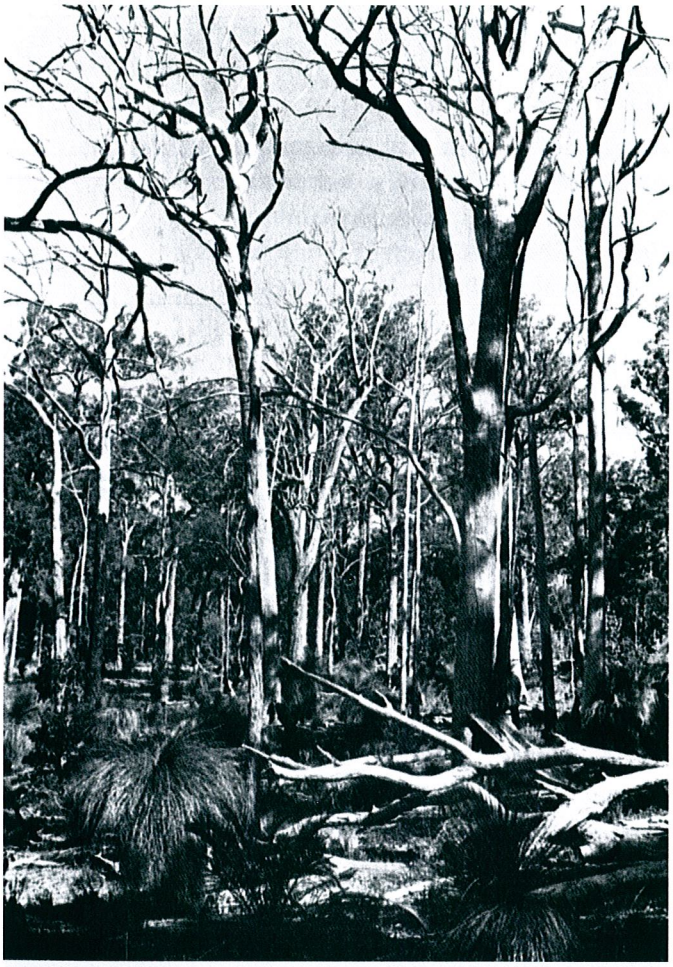
One of the most distressing things for a landholder is to watch a tree or group of trees decline in health or die. There are always questions of why this has happened, what the cause was, and whether the deaths could have been prevented. It is usually impossible to be completely confident about why the deaths occurred, but it is possible to suggest the most likely reason(s).

There are two groups of factors that can cause, or be the main cause, of tree death. The first is a combination of site characteristics and weather conditions; the second is that the deaths have been caused by pests and/or pathogens. The combination of site and weather conditions is, in my experience, by far the most common. So when asked for my opinion about recent deaths I go through my mental checklist of 'too dry, too wet, too hot, too cold'.

Site and weather conditions

There are some local examples of death or decline in health that can be attributed to a combination of site and exceptional weather. A recent example is the death of jarrah and other trees on sites with shallow soil in the northern jarrah forest that occurred in the summer and autumn of 2011. These deaths are consistent with drought deaths because they followed exceptionally low winter rainfall in 2010 and the exceptionally hot, dry summer of 2010/2011. The trees had shed a lot of leaves over summer, indicating they were under severe water stress for several months before they died. They had just run out of water.

An example of the 'too wet' explanation is the death of several species of planted eucalypts in the Lake Warden Catchment, Esperance, in 2007. These deaths started within a few weeks of the heaviest rainfall on record, in early January 2007. Although the rain was widespread, the deaths only occurred on duplex soils adjacent to saline areas. The most likely cause of death was either waterlogging, or saline waterlogging.



Dead Jarrah trees on a dieback area near Dwellingup in the 1960s. Photo: from 'Progress Report: Jarrah Dieback Research, November 1969, Forests Department Western Australia.'.

An example of heat scorch occurred in the Great Southern in February 1991 when there were several days with maximum temperatures in the mid-40s. Many wandoos, jarrahs and yates were affected. The crowns turned brown and the terminal shoots died, however most trees recovered within a few months. Similarly frost damage is not usually fatal, although it can lead to extensive dying back of affected trees.

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Editorial

Greetings all!

Members in the Hills and Avon Valley will be sad to hear that Zara Kivell has resigned from *LFW* due to ill health. Never in robust health, Zara had been finding it harder to cope, especially with having to drive to properties, so, after 11 years with *LFW*, she decided to retire. We will all miss her wide knowledge and detailed understanding of the bush, as well as her sense of humour and bubbly enthusiasm. She was an excellent *LFW* officer, and will be greatly missed.

In addition, Claire Hall has accepted the State Government's voluntary redundancy scheme, retiring on the 31st December 2014. She has been Technical Officer with *LFW* for 15 years and has been responsible for managing the programme's administration, including the database, as well as visiting *LFW* properties around Perth. Her careful and meticulous attitude towards her duties has ensured that *LFW* has run smoothly over the years. She is a wonderful colleague and will be greatly missed.

I am sure that readers will join with me in wishing both Claire and Zara all the best for their retirement.

The *LFW* office in the Parks and Wildlife building at Mundaring has been closed. The areas for which Zara and Claire were responsible will be looked after by myself. However, in January I will be reducing my hours to three days per week, so please be patient if I do not respond to queries as quickly as you would like.

This issue has some wonderful stories from members about the organisms that share our environment, often accompanied by so many excellent photographs that it is difficult to decide which to use. Here is where I would like some advice from readers – space constraints often dictate that we could use one or two larger size photographs, or four small ones. Which would you prefer?

With best wishes for an excellent end to the season.

Penny Hussey

[Note: the adjacent drawing is by Marjory Blamey, from 'The Illustrated Flora of Britain and Northern Europe'.]

The weed alert on p. 9 asks that you look out for Cleavers. In case some readers are not aware what it looks like, here is *Galium aparine*. *G. spurium* (False Cleavers), is almost identical. This drawing is about life sized.

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LETTER TO THE EDITOR

To: The Editor
Western Wildlife

Would anyone like to join us?

The Middlesex Conservation Farming Club Inc. (MCFC) has a property south of Manjimup of about 60 ha. A founding purpose of the club was to have a farm that would pay for the costs of running it and also preserve some natural bush. We are registered with *Land for Wildlife* (no. 86) and our bushland is covenanted to the National Trust of WA. The club has been in existence since 1973; the number of members has varied from 10-14.

In the past, we have had our own herd of breeding cattle but now have the paddocks leased for cattle agistment. There are also a few sheep. There are two houses, one of which is used as a clubhouse, and various farm buildings on the property. There is a commitment for members to contribute to the working of the property.

On the wildlife side there are about 20ha of remnant bush. Most of the bushland is now fenced off but it has been logged and accessible to stock in the past. There is karri, jarrah and marri. We do not cut timber and we leave naturally fallen trees for habitat. Overall there is good connectivity of the bush areas on the farm and, to some extent, to other bushland in the vicinity.

We have investigated the natural history of our bushland and have had considerable help with this. Volunteers from the Wildflower Society of WA helped us by means of a flora survey, putting in nine quadrats; we have made a herbarium and find new species from time to time. The WA Naturalists helped us with a fauna survey and established pitfall traps. Mycologists have identified or confirmed fungi for us. Officers at Parks and Wildlife have been most generous with their expertise. This nature work continues and could be expanded. Unfortunately there are weed species including those old enemies blackberry and bridal creeper.

It is a lovely property with a permanent creek. There are tracks that make for pleasant walks through the bush and indeed over the whole property. There is of course birdlife around including the charming splendid wren around the clubhouse.

We are on the lookout for new members who have a similar outlook to us. For further information email MCFC1973@outlook.com or phone Paddy on 0431 413 666

Dorothy Perret

Whose egg?

Remember this, from the last issue? Vikki Viela asked whose egg this was. Mary Woodward of Sawyers Valley has the answer.

I read with interest Vikki Viela's article on page five of October's *Western Wildlife*. I have seen similar clear 'marble like' eggs at my holiday cottage on the Warren River near Pemberton. It is Lea's Frog, *Geocrinia leai.*

Lea's Frog is a late autumn to winter breeder, they lay many eggs attached by jelly to the base of vegetation usually near bodies of water. The tadpoles develop inside the clear egg and eventually break free and wriggle into the water. This usually takes place during rain, which helps to break up the egg mass and washes the tadpoles into the water. In Vikki's vegetable garden, which she waters regularly through the hot and dry months, the frogs get confused and start laying a few eggs in the moist garden thinking rains are on their way.

The tadpoles are very small and take a long time to develop (more than 120 days). The male frogs have a repeated "tk..tk..tk.." call. This small, climbing frog grows to a maximum length of 25mm. The back is dark brown with an irregular central patch and grey, yellow and black colour. The undersurface is smooth and has a greenish hue. The hind limbs are relatively long and powerful with many dark cross-bands. Unlike any of the other small frog species, Lea's Frog has expanded discs on the fingers and toes. These frogs are found throughout the moist forested parts of the south-west from the Darling Ranges, south and eastward to the Albany region.

To actually spot one of these frogs or any of our smaller winter breeders it is best to wait until they start calling at dusk. Take a friend with a torch and together pin point where the call is coming from. The frog will usually be under vegetation or inside a burrow in the mud. Getting you hands dirty is all in the fun of frogging!

If you hear the quacking frog, *Crinia georgiana,* that makes the best duck impersonation, try doing your own "quack…quack…quack…" and you may be rewarded with an answer!

Happy frog spotting!

Mary Woodward

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Jarrah dieback

Pests and pathogens

There are two examples of pests and pathogens causing widespread tree deaths, neither of these occur in Australia, and both are of quarantine concern.

The pine wilt nematode infects the sapwood of many different pines. It blocks capillaries in the sapwood so that the trees cannot conduct water efficiently, and eventually die. Similarly, the fungal pathogen that causes Dutch elm disease blocks capillaries in the sapwood of elms, resulting in wilting and death.

Local problems, where does jarrah dieback fit?

Jarrah dieback was the most significant forestry problem after the Second World War. The name was given to the death of groups of jarrahs that died suddenly, on poor quality sites that had been recently logged, and were prone to waterlogging. Banksias and sheoaks also died.

The WA Forests Department and the Forestry and Timber Bureau in Canberra were so concerned about the economic impact on timber production, that they jointly established a research station at Dwellingup to determine the cause of these deaths.

There were a number of investigations. Trees were excavated and examined to see whether pests or pathogens were involved, but this did not appear to be the case. The only abnormality was that many of the capillaries in the sapwood were blocked, but it was not known whether these blockages were the cause or the consequence of death. It is now known that waterlogging can cause these blockages, so it appears that these deaths resulted from waterlogging damage.

How does phytophthora come into the picture?

By the late 1950s the investigations into jarrah dieback had stalled, so in 1959 the Forestry and Timber Bureau appointed Frank Podger as a research officer at Dwellingup to initiate new lines of research. He started by considering whether site and weather conditions might be causing these deaths. Then in 1962 he investigated the deaths of pine shelter-belts on the Swan Coastal Plain, which directed his attention to work on pine deaths and declines in other parts of the world. These were associated with phytophthoras, pathogens that had a wide host range and were difficult to isolate. It was a breakthrough moment because Podger thought that phytophthora might be important in jarrah dieback.

He started to work with Ralph Doepel, the diagnostic plant pathologist at the Department of Agriculture, to determine whether phytophthora was involved in jarrah deaths. In 1963 they excavated dying trees, but were unable to isolate a phytophthora. So in 1964 they started pot experiments using soil from sites where jarrahs had died. Their results indicated that there might be something in the soil that was affecting the health of jarrah and banksia seedlings, but they were unable to isolate a phytophthora.

Then George Zentmyer, a phytophthora specialist from the University of California, visited them in WA, and isolated *Phytophthora cinnamomi* from soil and root samples supplied to him. Using Zentmyer's techniques, Doepel isolated *P. cinnamomi* from soil from dieback sites in the forest. Podger started a large field sampling programme and showed that *P. cinnamomi* could be isolated from many different plants, and he also showed it could infect and kill jarrah and banksia seedlings. By 1966 he was confident that *P. cinnamomi* caused jarrah dieback. Podger's explanation was accepted in good faith by the Forests Department, which started a major programme aimed at minimising spread of this soil-borne pathogen, mapping its distribution, and determining whether there were alternative timber species that could replace jarrah on infested sites.

There was a problem however with Podger's interpretation that *P. cinnamomi* caused jarrah deaths. When establishing the cause of a disease, the first step is to show that there is a constant association between infection of the host and isolation of the suspected pathogen. Podger's approach had been back to front, and in order to rectify this, he conducted a major sampling programme between 1965 and 1968 to show that phytophthora could be readily isolated from jarrah and other affected forest plants. Although he sampled 100 jarrah trees he only found five were infected, and so did not demonstrate this constant association in forest trees. Unfortunately he failed to mention this in any of his reports. What he did was argue that jarrah dieback was a single problem caused by *P. cinnamomi* that did not just kill jarrah, but other forest plants as diverse as banksias and balgas. It was an explanation that was universally accepted.

What's in a name, one problem or two?

The most likely explanation of jarrah deaths in the wet decades of the 1940s-1960s is that they died from waterlogging because deaths were on sites that had been opened up by recent logging where waterlogging occurred. The trees had symptoms of waterlogging damage in their roots and there were no consistent signs of phytophthora infection. So these deaths are an example of the site/weather conditions scenario.

Some of these sites would also have been infested with *P. cinnamomi*,

as indicated by the records of banksia deaths. These deaths would have been caused by phytophthora, because it rapidly invades the banksia sapwood, although it is not known precisely how it kills. So this is an example of death resulting from invasion by a pathogen.

Since the 1960s these banksia deaths have also been called jarrah dieback, even if they occurred on sites where jarrah does not grow. It's a recipe for confusion. More recently the name jarrah dieback has been changed to phytophthora dieback, although no attempt has been made to discriminate between jarrah deaths and banksia death. It would be better to restrict the name jarrah dieback for jarrah deaths on wet sites following exceptionally heavy rainfall, and use the name phytophthora dieback for deaths of banksias and other plants on sites infested by *P. cinnamomi*.

Looking at the jarrah forest now, jarrah deaths don't occur on the scale described in the 1940s-1960s. The climate is now much drier, with reduced rainfall over the past 30 years. The last widespread jarrah deaths occurred in 1982-84, following exceptionally heavy rainfall in January 1982. *Phytophthora cinnamomi*, however, is still with us and has caused widespread deaths of banksias, especially in the sandplains.

Does any of this matter?

These confusions arose a long time ago but it is still important to sort them out. Let's use an analogy. It you visit the doctor the most important thing you will receive is an accurate diagnosis, because this is the basis for both prognosis and treatment. It is the same for plant diseases; an accurate diagnosis is the first step for managing a problem.

Phytophthora management is well understood with strategies of quarantine and hygiene to minimise the spread of infested soil, as well as the application of phosphite fungicide to increase plant resistance.

Is it possible to manage site conditions to favour jarrah? The old forestry maxim about understanding sites, and tailoring the species used in replanting to site conditions, is still essential for survival and growth. It is worth remembering that site conditions can be changed e.g. by altering drainage or stand density, so that a tree established on a site many decades earlier may not be able to grow as well when site and weather patterns have changed.

Dr Elaine Davison was employed by the WA government in 1979 to work on jarrah dieback. She has investigated this problem from the point of view of jarrah, studying how it grows and dies on dieback sites, the suite of pathogens, including phytophthora, that affect it, and how it responds to waterlogging. She has also worked on karri, pines, tree seedlings and with horticultural crops. Between 2011 and 2013 she was President of the Australasian Plant Pathology Society. She can be contacted on:

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[For the scientific paper from which this article is drawn, contact the Editor.]

THE HIDDEN WONDERS OF LFW PROPERTIES!

Wayne Gill

Whilst reviewing a 2001 *LFW* report before a revisit to a property in the Esperance area, my attention was captured by the mention of a significant plant. It was Salt Myoporum (*Myoporum turbinatum*) a Critically Endangered Threatened Flora species only known from the Beaumont area which is 35km further to the east of the property in question. The report mentions a sample was sent to Kings Park but nothing of the resultant identification. Having been recently seconded to the flora conservation officer position I was familiar with this name, and aware there were only several hundred plants in known existence. After seeking approval from the new owners to look for the plants, I eagerly headed out to survey. What I discovered was far beyond any expectations! Yes it was the right plant, and my surveys resulted in an additional estimated 6000 plants being added to the population data, as well as a significant range extension and large amounts of new potential habitat.

This and subsequent discoveries by colleagues have resulted in the conservation status for the species being reviewed and potentially downgraded from Critically Endangered. It just goes to show, you need to know what you are looking for, as in this case, because there may be DRF everywhere under your nose!

Yellow flags indicate the location of many Salt Myoporum seedlings and juveniles surrounding a salt lake NE of Esperance.

Photos: Wayne Gill

Salt Myoporum flowers and fruit

THE NANKEEN NIGHT HERON

Jackie Smith

It would be at least five years ago when Nankeen Night Herons first came to nest in our pine trees. This heron, also called the Rufous Heron, is nocturnal and leaves the trees at dusk to go fishing in the nearby salt lakes. The adults come to our trees around September to nest and rear their young. They build rather scrappy twig nests in the upper-most branches, at least 20m above the ground. The eggs, pale blue in colour and roughly the size of hens' eggs, seem to rest precariously in these nests. It is not unusual to find a young, almost featherless fledgling on the ground, which is totally ignored by its parents and left to die, and I wonder if they have been pushed out of the nest by the stronger siblings. When Wayne Gill, our *LFW* officer, climbed a tree he discovered a nest with three eggs in it, but they can lay up to five eggs in a clutch.

Nankeen Night Herons get their name from their buff-coloured chest feathers, which resemble the natural fibre of the cloth made in Nankeen, China. It is a large bird, with short legs, a chestnut back and two feathers on the top of their heads which they raise when alarmed. The juveniles are very different with a spotted plumage and large yellow eyes giving them a rather gawky appearance. They are not good flyers and can be seen climbing about in the branches. When they do take off in the early evening they fly high in the air in a group, and could be mistaken for large bats at a quick glance.

The Nankeen Night Heron is common and found throughout Australia, nesting near water sources. This year I have counted at least thirty adults, but last year there would have been double that. Just before dawn, when the adults return with fish, there are raucus goings on in the treetops, especially when the nesting site gets crowded and full of fledglings all eager for some food. We know they eat small bream, as we sometimes find small fish under the trees. However last year a few adults discovered a food source just a few metres from the trees – our yabbies which we keep in tanks and sell to the general public! We found a few discarded claws lying on the concrete one morning, so the next day I was up very early and caught the renegade red-handed. We had to net the whole area and also put a radio on a timer switch, which came on every 10 minutes or so. This did the trick.

By May the herons have all but left the trees, and then the Carnaby's Cockatoos can come in and feast on the pine nuts. These trees are Stone Pines that produce the cones from which the rather expensive pine nuts are extracted. I have tried to extract the nut using a hammer without much success, but the Carnaby's, with its powerful beak, can get inside the cone with ease.

I have no idea where the herons go when they leave our trees, but no doubt they will be back next year to start the cycle all over again.

The nest looks rather precarious!

The parents change over nest duty.

The first egg is hatching!

Juveniles on the nest.
Photos: Wayne Gill

CARNABY'S IN CANDY'S BUSH RESERVE

Rachel Walmsley

Candy's Bush Reserve in Moora now has *Land for Wildlife* status. The reserve is predominately Salmon Gum and Wandoo woodland regrowth, and houses some impressive wildflowers including at least 15 orchid species. A real sight to see during the winter/spring months!

Fiona Falconer, *LFW* Officer, did the official assessment in June and was impressed by the quality and variety of vegetation including forage habitat for Carnaby's Cockatoo. This *LFW* assessment was carried out as part of the latest Moore Catchment Council's State NRM project to protect and promote Candy's Bush Reserve as a local natural assest.

Since fencing off the reserve in 2014 during Stage 1, many of the degraded areas caused by vehicles have already started to cover over. This new Stage 2 project will create a walking trail with interpretive signage, linking it with the Moora Carnaby's town walk trail.

One of the unexpected and exciting outcomes of the project so far came after two artificial nesting boxes for Carnaby's were erected in the reserve in September 2013 by local Carnaby's carer Wally Kirkhoff. There are no trees old enough to have hollows in the reserve that could offer natural breeding sites, so these artificial hollows provide a much needed alternative.

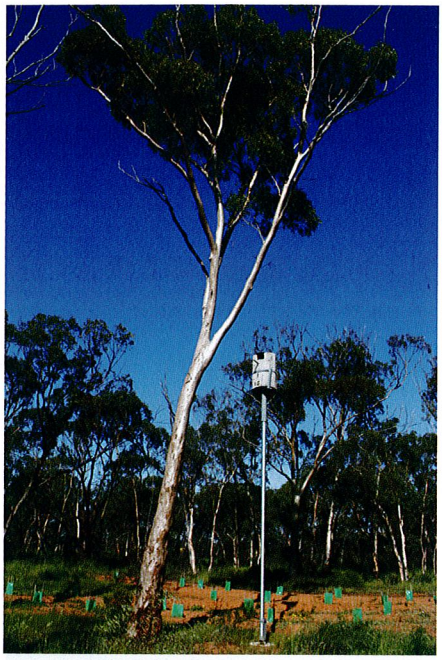
There is also a shortage of hollows around Moora town due to lack of suitable trees and competition from other birds and feral honeybees. Moora Townsite is a designated Birdlife Important Bird Area for Carnaby's, with around 60 pairs coming to breed every winter.

A pleasant surprise came in August this year when both boxes in Candy's became occupied by Carnaby's hens who both laid eggs and raised chicks. This is great news for both the species recovery and for Wally's design of nesting boxes. He uses natural hollow logs, and burns the middle out to enlarge them.

There are a dozen or so of Wally's boxes around town and all are occupied by Carnaby's year after year, although Wally has stated that no more should be erected due to the lack of forage habitat around town for the birds and their new chicks. Unfortunately success has to be scaled back sometimes, which is no fault of Wally's.

His next plan is to roll out more boxes in Coorow, Mogumber and Wannamal to help with breeding there.

Anyone wanting to find out more please phone Rachel Walmsley at Moore Catchment Council 9653 1355 or mcc.nrmo@bigpond.com



Left: LFWO *Fiona Falconer with the new LFW sign for Candy's Bush Reserve.*

Above: One of the new boxes next to a young Salmon Gum tree.

Below: The resident ladies in the two new boxes.

Photos: Rachel Walmsley

THE NATIVE IRIDACEAE

Penny Hussey

Above and right: Western Iris, Patersonia occidentalis.

Western Australia has so many introduced members of the Iris family, and they are so peskily obvious, that we tend to forget that we do have some native species too!

The family Iridaceae is worldwide, with about 82 genera and 1,700 species, having a major centre of diversity in southern Africa, and other concentrations in South America and the eastern Mediterranean. In Australia we have five native genera with about 26 species, outweighed by 24 naturalised genera with 54+ species. WA has 47 introduced species and 19 native ones, the natives in two genera.

The family contains mostly perennial herbs growing from a corm or rhizome. The flower parts are in threes and can form the very striking 'fleur-de-lys' shape, such as seen in the garden German or Dutch irises, or somewhat orchid-like, as in gladioli. But many others form a simple circular design.

The exact origin of the 'fleur-de-lys', the unofficial heraldic emblem of France, is lost in the mists of time but is generally thought to be based on the shape of an iris, the Yellow Flag, *Iris pseudacorus*, found throughout northern Europe except for Iceland and Spitzbergen (not a 'lily' as many people suppose). The shape represents an iris flower seen from the side, with two drooping sepals and one upright petal between them. This striking plant is commonly found along the edges of rivers and freshwater wetlands.

Iris pseudoacorus

Orthrosanthos, the Morning Iris, has four species in WA, and three in America. The name comes from the Greek and means 'morning flowering', hence the common name. Our species all look fairly similar, they are tufted perennials, growing from a rhizome, decked in spring with spikes of gorgeous sky-blue flowers. *O. laxus* is the most common, growing throughout the south-west; *O. muelleri* grows in and around the Stirling Range; *O. multiflorus* on the south coast from the Stirling Range to Israelite Bay, and also in SA and Victoria. It grows up to 60cm tall, but *O. polystachyus*, which grows between Busselton and the Warren River in damp shady gullies, is the tallest of all, and flowering stems can reach a height of 1m.

Morning Iris, Orthrosanthos laxus.

Patersonia is a genus of mostly tufted perennial herbs, with three broad flower segments, usually purple but sometimes white or yellow. The name commemorates William Paterson (1755-1810) who, when Lieutenant Governor in NSW, sent specimens to his botanist friend Robert Brown at Kew Gardens in England. In WA there are 14 species, all found in the south west.

The most common and widespread species is *P. occidentalis*, the Purple

Flag or Western Iris. This is a tufted plant with large purple flowers found throughout the south west from Northampton to Esperance. *P. pygmaea*, only a few centimetres high, is the smallest. It forms small tufts on laterite in the south west and has showy purple flowers. There are several other species that differ in the amount of hairiness or leaf shape. *P. babianoides* is rather unusual in that it dies back to a corm-like structure in summer, pushing up its solitary leaf in winter. The leaf is hairy and pleated, and looks very like the nasty weed *Babiana,* hence the specific name. (I once caused consternation among other members of the Wildflower Society on a bushcare day when I started to pull it out!) It is found on laterite in the higher rainfall parts of the Darling Range.

The only yellow-flowered member of the genus is the lovely *P. xanthina*, Yellow Flag. This forms part of the understorey of forest in the higher rainfall south west. On a sunny spring day the 5cm-wide flowers are like splatters of gold starring the often gloomy jarrah forest floor.

Patersonia babianoides.

Yellow Flag, Patersonia xanthina

Flowers of both genera only last a day, but the inflorescences do produce lots of them. If, however, flowers seem to be very rare on your healthy plants in bushland, suspect a nectar thief! Early in the morning, grey kangaroos will carefully pull off the flowers, one by one, and eat them, relishing the sweet nectar which has accumulated in the long floral tube.

Plants from these genera make good garden plants as border edging or in shady spots. They will flower in the second year from seed, and clumps can be divided and transplanted. Once established they are long-lived, and are well worth the initial effort to establish them.

WATCH OUT FOR CLEAVERS

The Bridgetown-Greenbushes Biosecurity Group Inc. (BGBG) has raised concerns about a recent explosion of cleavers species (*Galium aparine* and *G. spurium* - it is difficult to differentiate the species) within its Shire. *LFW* members Jenny Dewing and Eric Wheatley have been actively spraying dense, rapidly spreading patches of the weeds for several years, both along the Blackwood River and higher up in bushland, but fear they are fighting a losing battle.

Control is difficult because seeds germinate more than once a year and are probably moved by birds and kangaroos as the plants are covered in hooked hairs which cling to fur, feathers and socks. The plants are also self-fertile with hermaphroditic flowers. They often first appear in shade under trees, but also grow in open areas.

The BGBG is primarily focussed on control of Cotton Bush, Paterson's Curse, foxes and rabbits within the Shire, but believe that this invasive and fast-moving weed must be dealt with immediately in a co-ordinated approach. Please report all sightings of these weeds in the Bridgetown-Greenbushes Shire to the BGBG on info@bgbg.org.au. BGBG member Andrew Mathews says this weed is now within 1km of high value native forest in the headwaters of the Donnelly River. It is a serious threat to the region's Ramsar wetlands as well as to riparian and upland bush environments and also to the local agriculture sector as a contaminant in hay and wool.

Cleavers on the bank of the Blackwood. Photo: Andrew Mathews

The BGBG is also calling for residents to report sightings of sick or dead rabbits to assist with monotoring the spread of Rabbit Calcivirus and Myxomatosis. Fox and cat traps are also available for loan, as well as assistance with 1080 costs to landholders with a current 1080 baiting certificate.

Sheila Howat

A CUTE LITTLE SURPRISE

David Lloyd

My wife and I purchased our 14 acre property bordering Pink Lake in Esperance, in 2006. Back then it consisted of bare paddocks, with only a few trees and very little remnant vegetation. Initially we only had about 12 common bird species and very little to entice more onto the property.

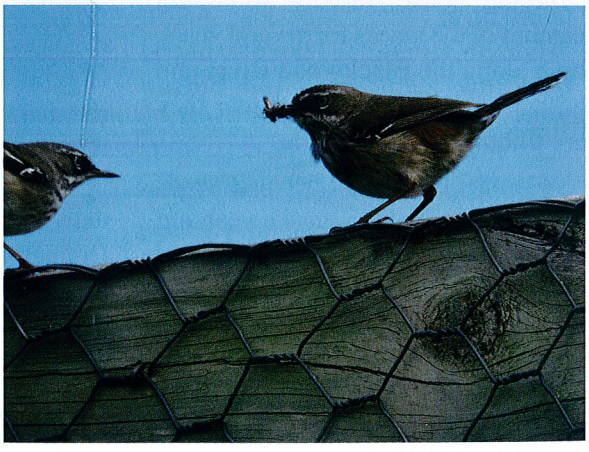
We soon signed up with *Land for Wildlife* (through Wayne Gill) and set about re-establishing native vegetation, including 31 species of Banksia as well as a diverse array of other local species. Eight years on and the hard work has paid off. We have attracted a large diversity of birdlife, in excess of 50 species at last count. Lately there has been a flurry of activity with nesting season in full swing. To our amazement a pair of White-browed Scrubwrens decided to nest in a pot plant in the vegetable patch, and then managed to hatch and raise three offspring. Several pairs of Scrubwrens have since nested successfully around the house. In all we have observed 24 species of birds nesting on the block.

In September we had the surprise of our lives. While working in the garden we noticed our dog, Buster, an 11 year old Jack Russell cross, paying particular attention to a tuft of grass under a eucalypt. The next thing we noticed was the dog playing with what I thought was a mouse, but closer inspection revealed it was a small marsupial mammal. I was unsure what it was, so sent off a photo to Wayne who identified it as a Honey Possum. We were over the moon, as this was the first time we had seen this species on our property. Since then we have observed eight more in different locations around the block.

I was hoping to encourage a family of possums to take up residence in a hollow log we placed in a tree, but instead it was colonised by bees. All the hard work in creating an ecosystem to attract the local wildlife has been a huge success, and has given us a great deal of pleasure.

Now the challenge is to maintain and improve this environment to hopefully encourage a more diverse range of wildlife to our little sanctuary. Next on the wish-list is a Pygmy Possum, so watch this space!

Above: then and now.



Above: the scrubwren nest in the parsley pot.
Below: the White-browed Scrubwren pair.
Photos: David Lloyd

One day, maybe?
Drawing: Ella Fry

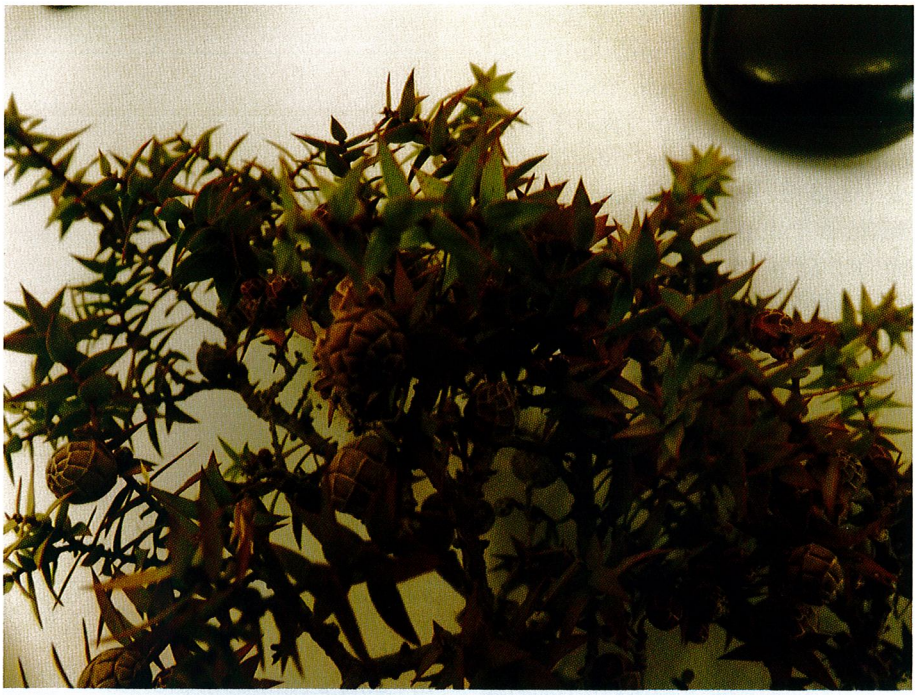
I THOUGHT I WAS TOO OLD TO BE FOOLED BY A GALL!

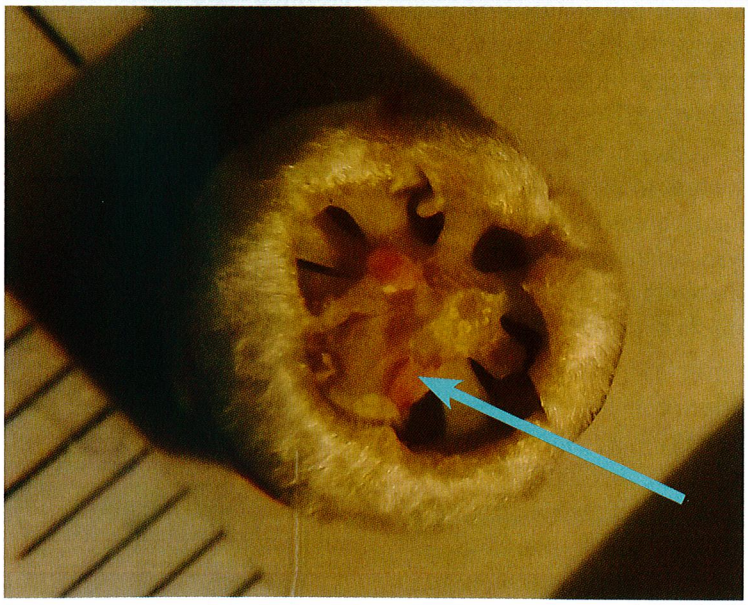
Stephen Fry

I am currently the Natural Resource Management Officer at Bruce Rock Shire, and have been involved in environmental works, revegetation, seed collection and trading, consulting and assessment for nearly 30 years. While renewing markers for a P4 hockey stick area [roadside marker denoting an occurrence of rare flora - Ed.], I came upon an *Isopogon* I had never seen before. In all respects, it should have been *Melaleuca undulata*, as neighbouring plants had the distinctive prickly leaves and fruit.

It is not uncommon for different plant families to have similar foliage. After some frantic research, the excitement built to the level of "Have I found a new plant, because isopogons should never have foliage such as this!" When the shell was destroyed the triangular segments were identical to *Isopogon* seed capsules. Out came the magnifier and it was revealed that even the smallest buds had identical markings. It was pretty clear that the buds had never been through the flowering phase. Does it flower microscopically and then form the seed? About here, was when I realised I might have taken the wrong fork in the road of discovery.

Not until I carefully opened the pod from the bottom did I notice that it was hollow. Bugged out, I thought. Try the magnifier. Voila! There were revealed the smallest little pink grubs, attached to a cauliflower structure within the pod, like piglets on the teat. What amazed me so much was the fact that all galls I am familiar with are just indeterminately shaped woody capsules encasing a grub in the middle. No real structure to talk about. These have an intricate structure and seem to be perfect replicas of an *Isopogon* seed capsule.





Above: the unusual structures. Below: the structure dissected. A grub is arrowed. Photos: Stephen Fry.

There must be some pretty clever genetic engineering going on here.

I confess to being a self taught amateur environmentalist and botanist, but thought I was past being fooled by galls! These galls have been sent off to Museum entomologists, who will attempt to hatch the insects and identify the adults. I think that this story has only just begun, so feel free to add substance to the story, or wait for further instalments. I am also quite prepared for my theory to be shot to pieces by someone who knows better.

Stephen Fry can be contacted on: nrmo@brucerock.wa.gov.au

SPOTTED-THIGHED FROGS IN THE BATHROOM!

Sylvia Leighton

It is lovely to experience wildlife living up close in our homes but sometimes we have to be practical about the impacts and safety of their presence. When more than 40 Spotted-thighed Tree Frogs, *Litoria cyclorhynchus*, decided to permanently set up residence in *LFW* member Pattie Leighton's bathroom on her *LFW* property 100 kms east of Albany, it was time to make a decision about whether this was the most sensible in-house resident to have. Not only did the daily smell of their numerous droppings on the bathroom floor become a little bit pungent, it also attracted a large number of Tiger Snakes into the surrounding farm garden and inside the bathroom.

The Spotted-thighed Tree Frog, is a particularly beautiful Western Australian species with bright black and yellow markings on its thigh area. It is endemic to the south-west of WA and has a range which begins about 60km east of Albany on the south coast, extends north to Broomehill and eastward to Israelite Bay with its northern boundary fringing the arid zone north of Scadden. Its natural habitats are rivers, swamps, freshwater lakes and wetlands.

The frog is similar in appearance to its western cousin, the well-known Motorbike Frog, *L. moorei*, bearing dark green or brownish patches with bronze or gold highlights on its back. Males can be up to 65mm, and females up to 77mm. However the *L. cyclorhynchus* can be differentiated by the numerous yellowish spots on a black background found on the underside of the rear legs and the underside margins of the frog's belly. The frogs have a spring breeding season but can be heard calling right through into December with summer rain events.

Above: Litoria cyclorhynchus *with its back legs streched out to show the handsome spotted thighs. (Note, holding it carefully like this does not hurt the frog.).*
Below, the frog as it sits normally.

The wooden rafters and relativly cooler conditions in Pattie's bathroom provide the frogs with an attractive elevated safe haven during the day. However, in the evening they all descend down to the ground to go hunting for beetles, earwigs, moths and any other small-sized snacks in the garden. Tiger snakes wait for the frogs to come down to ground level and the scream of a frog being consumed by a scaly predator is a regular nocturnal sound.

After another close call with a Tiger Snake inside the bathroom, Pattie decided she needed to remove some of the population and put them back out into the natural environment. In summer all seasonal wetlands on the farm are dry and the creekline pools become a bit too brackish, so a nice freshwater farm dam which has sedges, rushes and a remnant bush clump around it was selected as their new home. It was quite a performance catching twenty jumping, crawling, wriggling frogs and placing them in a large lidded container. Pattie's seven year old grandson helped with the release and most of the frogs seemed happy with their new home!

A laundry basket full of frogs. You have to be quick to get a lid on!
Photos: Sylvia Leighton

SPOTTING NUMBAT STRIPES

Tamara Wilkes-Jones

I often spend time looking for numbats in Dryandra Woodland and Boyagin Nature Reserve. Finding a numbat can be time consuming and I've found that roughly one in four driving events results in a numbat being seen. Warm sunny weather which numbats prefer certainly helps, as does slow driving and a keen eye. The numbat sightings vary, often they are fleeting glimpses as the numbat runs for cover, however there are occasions where the numbat is observed digging for termites in the soil and tearing at decaying logs.

I never tire of seeing this unique and rare animal, each occasion is always different and exciting. On one occasion I was driving through Dryandra on a sunny winter's day when a numbat ran for cover. I waited patiently in the car on the side of the road with my camera ready for over 40mins, but this numbat was not going to emerge. I decided to walk over to where the numbat was last seen and, looking at the base of this dead tree, no hollow was apparent,

where could it be? As my eyes went up the tree I was surprised to see the Numbat!

This image shows that standing dead timber is just as important as logs on the ground, numbats can climb dead timber quite well and obviously they rely on camouflage, although on this occasion its stripes have given it away!

I have been a member of 'Project Numbat' for three years and a committee member for one year. Project Numbat is a not-for-profit organisation which formed in 2005 and supports the objectives of the Numbat Recovery Program including: habitat management, population monitoring, feral predator control, education and awareness programs and fundraising for numbat conservation. (Read WW 16/4, October 2012 for more about the programme.)

With fewer than 1,000 numbats remaining, found only in the wild in the south-west of WA, and in fenced sanctuaries in NSW and SA, collaboration and fund raising for conservation is very important to support its survival. numbats have natural predators such as birds of prey and pythons, however it is the introduced predators foxes and feral cats that are having the greatest impact on the numbat population.

To find out more about how you can assist, visit www.numbat.org.au

The need to conserve pollinators

In a bid to discover why six of the nine Hammer Orchids (*Drakaea*) are rare and the other three are not, a group of researchers from UWA, Kings Park and ANU Canberra studied their mycorrhizal fungi and pollinators*. All of the species formed a mycorrhizal association with the same widely distributed fungal species *Tulasnella*, showing that rarity does not arise from the mycorrhizal association. It was a different story for the pollinators, however.

Hammer orchids are pollinated by sexually deceiving thynnine wasps (see "Sex, murder and deception: the private lives of thynnine wasps" in WW 15/2, April 2011). This present study showed extreme pollinator specialisation, with each species primarily pollinated by a single, orchid-specific wasp species. And in only two of the rare species was the pollinator detected beyond the range of the orchid.

This strongly demonstrates that, to conserve Hammer Orchids, you must know and conserve the ecological requirements of the pollinators as well.

[*For reference, contact Editor]

And the world gets warmer ...

This year saw the hottest September for globally averaged temperatures over land and ocean surfaces since such record-keeping began in 1880, according to the USA Government. The figure was derived by combining average temperatures over land and sea surfaces and resulted in 0.720C above the 20th century average.

It also marked the 38th consecutive September with a global temperature above the 20th-century average.

Record warmth was notable in much of north–western Africa, costal regions of south-eastern South America, parts of the Middle East, regions of south-eastern Australia. In WA, September temperatures were 2.750C above average, breaking the record set in 1980. Food for thought?

Avril Baxter

New Books

The Western Australian Explorations of John Septimus Roe 1829–1849

Edited, with an introduction by Marion Hercock

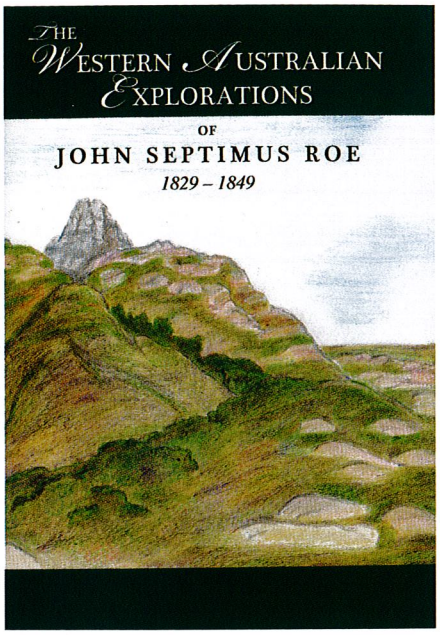
Hesperian Press, Carlisle, 2014

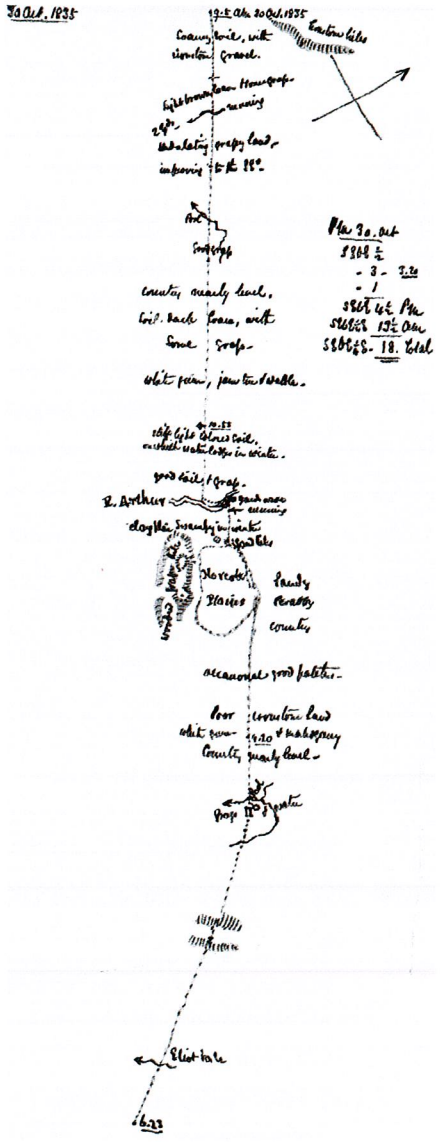
Cost: $100.00 + postage

This new book is the latest in the series *Western Australian Explorations* produced by the Western Australian Explorers' Diaries Project. It contains the field notes, sketches and exploration reports of WA's founding Surveyor General, John Septimus Roe, who left an unsurpassed record of the environment and the people at first contact with Europeans. At first glance this material looks difficult to navigate through, let alone read. However, careful editing and indexing has created a massive reference volume of detailed environmental information, which is easy to access.

The team of volunteers who worked on this book included scientists and workers on the land, one of whom was Gnowangerup farmer and *LFWer* Michael Lance. Some years ago Michael learnt about Governor Stirling and John Septimus Roe's 1835 expedition through the south-west of WA. All Roe's field notes, sketch maps and his official report of that expedition from Perth to King George Sound are reproduced in the new book. When Michael learnt that the 1835 expedition had passed though the Gnowangerup District, and most particularly through his family farm 'Cwmavon' on the Pallinup River, he was keen to retrace Roe's track through the district. Michael said that when he transcribed Roe's hand-written field notes into typescript, it gave him a great respect for the man, his diligence, and his notes and drawings.

"Roe's detailed description of vegetation, soil type and landform, done on horseback in pencil whilst on this journey gives an accurate blow-by-blow description of the south-west of Western Australia in the spring and summer of 1835," said Michael.





He added "To read Roe's journals is to be alongside him and his men as they journeyed through a landscape previously only known to the Aboriginal people of Australia and not documented until his extraordinarily detailed account."

Conscious of the criticism levelled at farmers for clearing the land and creating secondary salinity, Michael is quick to point out that the Pallinup River was troublesome to the exploring party because it was saline, but excellent grass was recorded in the vicinity.

Although much of the native vegetation has gone from the land that was described by Roe, and even the terrain has been altered, his descriptions of what was there provide a guide and baseline information for rural and urban land managers. Indigenous place names were also recorded by Roe in his notes and sketch maps. For example, his record of the lakes north of Perth to Joondalup and Yanchep in the years 1839 and 1841 includes many well-known names.

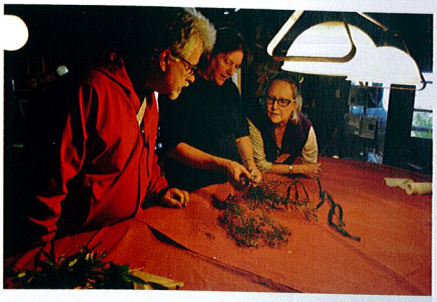
Every account of expeditions of exploration in this book is prefaced by a synopsis with a list of expedition participants, an outline of the route, topographical map references, a summary and archival references. Further information is provided by numerous explanatory footnotes; and dedicated researchers are provided with references to all the on line archival sources in the State Archives.

In addition to the indexes of people, places and a general index, the book is complemented by expert Appendixes. Botanist Alex George prepared the Appendix on plants, which includes an index of species; while zoologist Ian Abbott discussed the fauna and ecology and identified the animals mentioned by Roe. Background information on navigation and hydrographic surveying was provided by geographer Vivian Forbes.

The volume can be ordered from Hesperian Press: www.hesperianpress.com

Marion Hercock

Native Plant Propagation Workshop



Adrian and Wendy Colley of William Bay with Sabrina Hahn. Photo:Sheila Howat

LFW members from the South West, Perth and Wheatbelt came together for a Native Plant Propagation workshop in Bridgetown with celebrity gardener Sabrina Hahn, in November.

Cold and stormy weather drove us inside with our trestle tables, pots and potting mediums to work on plant material harvested from our *LFW* bush and garden.

The day concluded with a long, wonderful, group conversation by the fire. Although it was a diverse geographical group, managing a wide range of environs and property sizes, aspirations and commitment to maintaining habitat for wildlife were universal.

Very sincere thanks to Sabina Hahn for her on going support for *LFW*. She ended up doing a seven-hour workshop, covering any topic people asked for. This really was 'bushland management with friends', and an embodiment of what *LFW* is about.

Sheila Howat

Bob Turner of Boweling and Neil Notley of Bridgetown share LFW plans. Photo:Sheila Howat

Centennial Park, Dunsborough

Recently the Dunsborough Landcare and Coast Group's (DCALC) on going efforts to protect Threatened Western Ringtail Possums reached a milestone when Centennial Park along the Dunsborough foreshore was identified as a Western Ringtail Possum Sanctuary Zone.

LFW has worked with this group since 1998, when Cherie Kemp, the *LFWO*, provided spotlight night stalk training. On the first stalk, there were very few possums seen. Now, after years of careful management, there are many more, and Quendas have increased in numbers too – this despite the fact that the area is heavily used by locals and visitors during the daylight hours.

In September, the Dunsborough Primary School, the City of Busselton, Geocatch, DCALC and other local community groups combined to celebrate the declaration of the sanctuary zone, including the unveiling of the informative signs, one by the mayor, and one by Cherie.

This work is really superb long-term commitment by all concerned. The DCALC is a good example of what 'Citizen Science' is all about.

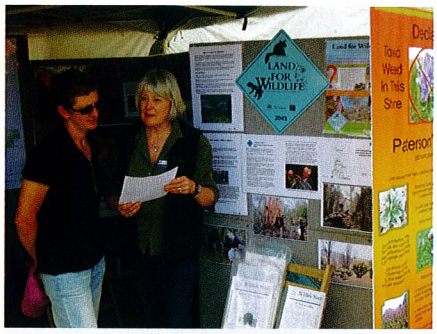
Cherie Kemp

Ron Glencross (DCALC), Cherie Kemp (LFW) and Will Oldfield (City of Busselton) with one of the new signs. Photo: Richard Clark

Definintion: "lottery" ... a tax on people who are bad at maths!

Bridgetown Agricultural Show

LFW officer Sheila Howat joined Jenny Carley of Bridgetown-Greenbushes Community Landcare and Kim Posavec of the Bridgetown-Greenbushes Biosecurity Group with an information display at the Bridgetown Agricultural Show, offering information on landcare, habitat creation, fauna requirements, feral animal and weed control and water testing.



Sheila Howat and Bridgetown resident Nic Fabiszk talking about LFW. Photo:Sheila Howat

Did you know ... ?

... that the increasing summer rainfall in north-west Australia is linked to warming sea surface temperatures in the tropical Atlantic?

Dr Yun Li, CSIRO, Floreat.

[If you would like to read the (rather mathematical) justification for this statement, contact the Editor for the reference.]

... that in the Victorian era, some odd words were invented? One was 'arachnophobia', that's easy isn't it – the fear of spiders. But have you ever heard of 'helminthophobia'? It is the fear of being infested with worms! I am not quite a 'spheksophobic', but I certainly give them a wide berth if I encounter their nest ... ! Does anyone else share my dislike of – paper wasps?

Penny Hussey

Coming Events / New books

2015 Great Cocky Count – Sunday 12 April at sunset

Join up for WA's biggest survey for the endangered Carnaby's Cockatoo! The seventh Great Cocky Count (GCC) will take place at sunset on Sunday 12 April 2015. This annual community-based survey aims to count as many Carnaby's as possible at their night-time roost sites on a single night each April. This year we will also include Forest Red-tailed Black Cockatoos in the count.

Roosts are places where black-cockatoos rest at night. The GCC roost counts help to estimate species numbers and identify critical roosting habitat, information that contributes directly to cockatoo conservation. Survey sites are located all over southwest WA, so there's a good chance there's a spot nearby that needs you! Get more information and register as a volunteer at www.birdlife.org.au/carnabys/great-cocky-count

We need to find more roost sites for both white-tailed and red-tailed cockies. For more information about the GCC or to tell us about a roost site, contact Matt Byrne on 9287 2251 or at greatcockycount@birdlife.org.au

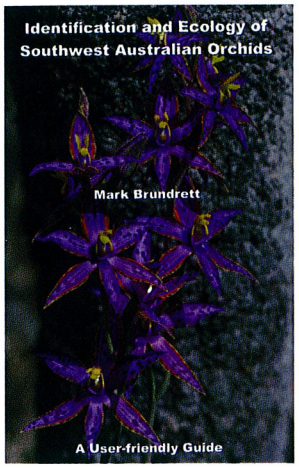
The Great Cocky Count is funded by Perth Region NRM through the Australian Government's Caring for our Country programme.

Identification and Ecology of Southwest Australian Orchids: a User-friendly Guide

Mark Brundrett

Pub: Western Australian Naturalists' Club

Cost: $55.00. From good bookshops or visit www.wanaturalists.org.au



"Goodness," I said when I first heard of this, "not another orchid book!" Well, true, but this one is not quite like the others, in many ways it is better. It is crammed with photos that highlight features useful for identification - tubers, leaves, microscopic hairs on tepal tips - all arrowed to point out exactly what you should be looking for. A very useful feature is the clear, simple keys to get you to exactly the correct species. There is excellent ecological information too, and a superb section on pollination. It really is immensely comprehensive, a fusion of both scholarship and love.

Whether you have other orchid books or not, you will find that this one will give you a new insight into this fascinating family. If you weren't an orchid enthusiast before you read this, you will be afterwards! An ideal Christmas present for a wildflower lover.

Penny Hussey

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

For lovers of apps ...

Field Guide to Western Australian Fauna

Pub: WA Museum

WA's animal fauna are unique and diverse. Detailed descriptions of animals, maps of distribution, and endangered species status combine with live images from their native habitat to provide a valuable mobile reference to be used in the bush, outback and metro regions of WA.

The content has been developed by scientists at the WA Museum and supplemented by scientists from other museums around the nation.

The app holds descriptions of more than 250 species encompassing birds, fishes, frogs, lizards, snakes, mammals, freshwater, terrestrial and marine invertebrates, spiders, and insects. The authors have put in a lot of the more common and widely seen species, as well as some unique animals that speak of WA's amazing diversity.

I have found this WA Museum Field Guide app very helpful. It is free and downloads all the information onto your smartphone or tablet so you can access the info in the field even

if you don't have phone reception. It works well helping one identify on the spot species you are not sure of. It is particularly good at pointing out small differences in similar species, eg rats, which then immediately clears up the identification.

Sheila Howat

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 Parks and Wildlife.

Published by the Department of Parks and Wildlife, Perth.

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