Department of Conservation and Land Management
Conserving the nature of WA

Western Wildlife

Land for Wildlife

January 2006 Vol. 10, Number 1

NEWSLETTER OF THE LAND FOR WILDLIFE SCHEME

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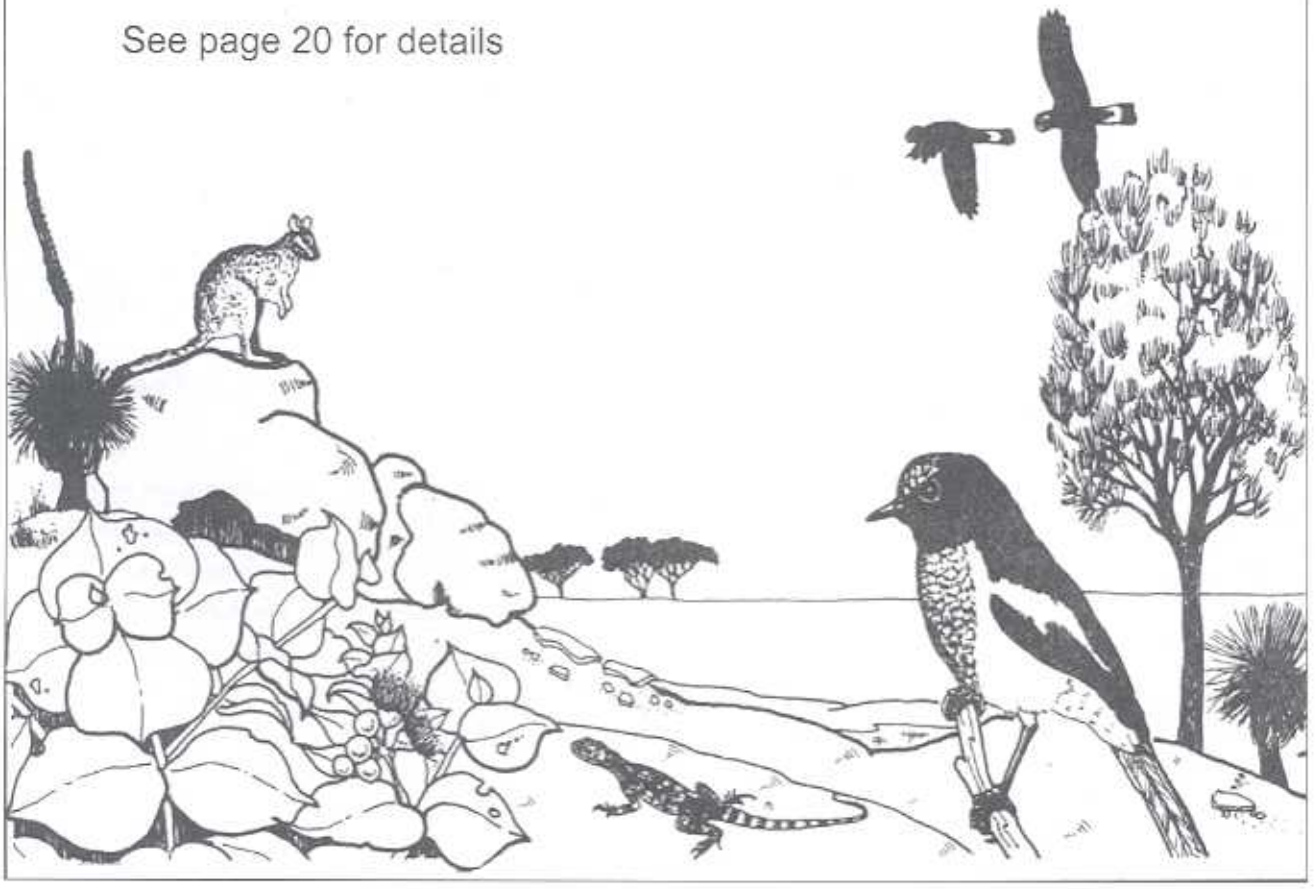
THIS IS LAND FOR WILDLIFE'S TENTH YEAR!

JOIN THE CELEBRATIONS!

See page 20 for details



EDITORIAL

Greetings all!

Welcome to the tenth year of *Land for Wildlife*!

In 1997 CALM started this extension service with the aim of providing information to landholders to help them manage their land 'with wildlife in mind'. At the start, we were not even really sure whether enough people would want this information, or use it in their management, but we soon found out that there was lots of demand for our services! In the process we have been privileged to meet thousands of wonderful people and see some superb bushland and revegetation. You are all such great people to work with!

During the year we will be celebrating some special events, culminating on our actual birthday in February 2007. Is there anything in particular that you would like to do? Contact your local *LFWO* to suggest it. You will be individually informed of events in your local area, but check the newly-renovated *Land for Wildlife* website for up to date information (see p 20).

'Western Wildlife' aims to be: 'The IN thing: INterest, INform, INvolve, INspire". With the help of all our wonderful contributors, it will continue to contain something of interest to everyone, but that depends on you sending in stories and pictures. The recent Questionnaire confirmed that you would like a special issue of Western Wildlife, so, please put together a short story, perhaps with 'before and after' photos, celebrating what you have done and send it to the Editor. Looking forward to hearing from you!

On a sad note, we are sorry to report that, due to family commitments, Rosemary Jasper has resigned as *LFWO* in Ravensthorpe. Best wishes for the future Rosey, your extensive knowledge and enthusiasm for the natural environment will be sorely missed.

Wishing everyone a happy, healthy and prosperous 2006.

Penny Hussey

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What bird is that?

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RESEARCH

WHEATBELT BIOLOGICAL SURVEY

Greg Keighery

The survey has shown that the region is more diverse than documented, less well known than imagined but still under as many threats as believed.

Background

Dryland salinity was first recognised as a significant threat to agriculture in the Western Australian wheatbelt in the early twentieth century. However, it was not until the early 1970s that rising saline groundwaters were identified as a major threat to wetland biodiversity.

In 1996 the WA Government launched the Salinity Action Plan (SAP), a thirty-year plan to combat rising saline groundwater in the agricultural region of WA. Delivery of the plan was based on the property, catchment and State scales. The SAP recognised that the natural biodiversity of the south-west agricultural region was poorly documented and requested that CALM co-ordinate and undertake a biological survey in the region, with emphasis on low-lying areas that are vulnerable to salinity. This involved collaboration between scientists from CALM, WA Museum, University of WA and the University of Adelaide. Between 1997 and 2001 data was collected on the occurrence and status of a wide range of wetland and terrestrial organisms at over 1000 sites.

In order to have predictive value the survey needed to be site based, describing the physical and biological attributes of each sampling site. To support the SAP, there was a need for information that allowed predictive modeling of areas that have not been surveyed. This link between the physical and biological data is essential to provide a basis for predicting the presence of species, or species assemblages, beyond the actual sampling points. In addition, a site-based approach is essential to provide a basis for monitoring.

View north from Kokerbin Rock, Bruce Rock Shire. Photo: P. Hussey

The specified study area extended from the 600 mm annual rainfall isohyet inland to the eastern edge of land clearing, an area of approximately 25 million hectares. The study area is central to temperate south-western Australia, an area that is recognised internationally as a mega diverse area for flowering plants.

Overall, approximately 930 terrestrial quadrats were established and scored for vascular plants and ground-dwelling arachnids (spiders, scorpions, centipedes). Some other invertebrates (carabid beetles and millipedes) and small vertebrates (mammals, reptiles and frogs) were sampled at 304 sites. 232 wetlands were sampled for aquatic invertebrates, waterbirds and wetland associated plants. Diatoms were sampled in about a third of the wetlands, with a bias towards saline sites.

There has also been a high level of community involvement ranging from field days, seminars and structured surveys. For example approximately 200 sites have been established on private and shire lands by members of the Western Australian Wildflower Society, supported by CALM. As an outcome of the survey, Woodland Watch was established by WWF to help with the conservation of woodlands.

A principal output has been the publication of the data in print and CD (see ref). This is mostly highly technical and not for casual readers, but it ensures that the information gathered will be available for future comparison and research. Taxonomic outcomes of the survey are also being published for the vascular flora (six new species) and wetland invertebrates (25 new species). Many more await scientific description, including a new family of crustaceans.

Findings

The survey revealed so many interesting facts that it is difficult to highlight just a few. Despite extensive clearing and consequent fragmentation, the WA wheatbelt still retains most of its biological richness at the species level (except

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RESEARCH

Salmon gum woodland, Depot Dam, Merredin
Photo: H. Adamson

for mammals), however, there has been extensive depletion of communities and of genetic variation within species. To continue to keep this, however, a major effort is required to combat the effects of fragmentation.

The best repositories of this biodiversity are the State reserve network of national parks and nature reserves, which are the largest and most intact remnants. However, many remaining freshwater wetlands are on private lands and most private remnants in good condition are of very high conservation value, often with unique combinations of biodiversity (communities, species or local variants). These areas are a vital component in the conservation of the biodiversity of the region.

Naturally saline areas are old and biodiverse in the wheatbelt, with numerous endemic plant and animal species, many previously unknown or undescribed. These areas require diverse hydrological cycles and are prone to increased flooding due to rising saline ground waters, leading to degradation.

Flora

The region has an estimated vascular plant flora of over 4000 species, of which at least 60% are restricted to the area. It is the centre of species diversity for many of the species-rich groups (*Acacia*, *Dryandra*, *Eucalyptus*, *Grevillea* and *Verticordia*) that characterise the south-west.

Of these 4000 species, over 1500 are found low in the landscape along valley floors. 850 are found only in fresh or naturally saline lowlands, which are directly threatened by rising ground water and salinity. Approximately half of these species (450 in total) are confined to the wheatbelt and are under threat of extinction by secondary salination. Several hundred other species found only in woodland sites in the wheatbelt, but not restricted to the wheatbelt, will be under threat of significant genetic erosion and population loss in the longer term.

Over 780 structural plant communities have been recognised across the wheatbelt, of which 200 are restricted to this area and 150 of these are threatened by salinity. Many of these are woodlands which, though now greatly fragmented, remain evocative of the area and are of considerable significance to our local and national heritage. The valley woodlands are under considerable threat from rising salinity and the wheatbelt will lose much of its local landscape character if they are not protected.

The survey discovered 16 previously unknown flowering plants and rediscovered three considered extinct.

It has long been established that Mt Lesueur (in the northern sandplains) and the Fitzgerald River / Stirling Range sandplains in the south are exceptionally species-rich. We have now demonstrated that wheatbelt woodlands are equally diverse, but in herbs, not shrubs. Species richness appears to be a common feature of the flora of south-west WA rather than a feature of only certain parts of it. As another example, the reserves of the Lake Muir – Unicup Recovery Catchment contain a vascular flora of almost 1000 species, considerably higher than that of Mount Lesueur.

Fauna

The survey has found much higher levels of biodiversity in ground dwelling invertebrates than previously suspected, eg previous estimates were of 200 spiders - we have now recorded over 750! Over 50% of these species are unnamed and many are restricted to the wheatbelt.

York gum woodland, grazed and ungrazed, Tammin
Photo: P. Hussey

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RESEARCH

Approximately 25% of its small ground-dwelling vertebrates (mammals, reptiles and frogs) and at least 40% of the region's terrestrial invertebrates have distributions centred on the wheatbelt or are endemic to it.

A significant decline in the biodiversity of terrestrial invertebrates is apparent in secondarily saline areas (even partially affected), which have an average of 30% fewer species than their non-salinised counterparts. This loss is actually higher as localised specialists are replaced by 'weedy' generalist species.

Wetlands

The survey has recorded over 1,000 species of aquatic invertebrates, much higher than previously suspected. Again, over 50% of these species are unnamed. WA may be a world centre for biodiversity of these animals (especially micro-crustaceans) as well as for plants.

The species richness of aquatic invertebrates halves for each doubling of salinity levels in freshwater areas. About 250 invertebrate species present in the region are at risk of extinction from secondary salination. Nearly 70% of wetland birds could be lost from the wheatbelt if trends continue, mainly due to the loss of the fringing vegetation around wetlands that they need to breed.

Summary

While the Biological Survey Program has generated highly significant results, it is important to be realistic about what has been achieved. Following surveys and more specific studies carried out by the WA Museum, Universities, CSIRO and Fisheries and Wildlife in the 1960s and 1970s, there was a tendency to assume the wheatbelt was 'known'. However, we recorded over 1,000 species of wetland invertebrates and over 750 species of spiders, whereas, previous estimates suggested the region contained less than a quarter of this result. This project has shown how wrong the assumption was and despite vast gains under the current program, it has sampled only a small percentage of a highly variable landscape of mega-biodiversity.

At least 450 flowering plants and 400 invertebrate species are at risk of extinction as a direct result of salinity, compared to estimates before the survey that 11 species of flora were threatened and one was likely to disappear. In addition all remaining remnants of many valley floor wetland, shrubland and woodland communities could disappear because of salinisation.

Last but certainly not least, a major highlight of the survey was the unexpected discovery of the huge variety of wildflowers and the diverse, scenic, often beautiful landscapes that occur in the wheatbelt, yet which few West Australians seem to know about. This is another reason to keep publicising the values and threats to this special, world-class area.

Reference

Keighery, G.J., Halse, S.A., Harvey, M.S., McKenzie, N.L. (eds.) (2004). A biodiversity survey of the Western Australian agricultural zone. Records Western Australian Museum Supplement 67

Greg Keighery is Principal Research Scientist at CALM, Woodvale. He was Project Leader for the Wheatbelt Biological Survey.

How the wheatbelt has changed

This large ring-shaped mound with a depression in the centre on John and Dionna Pickford's property at Woodanilling was, within living memory, home to a colony of boodies.
Photo: Kathleen O'Brien

FAUNA

GOING, GOING, GONE! VETERAN AND STAG TREES: A VALUABLE RESOURCE

Ron Johnstone

Since European settlement in Western Australia, millions of hectares of forest and woodland have been cleared for agriculture, cities, towns, timber production and mining. Thus millions of ancient trees that provided places where birds, reptiles and mammals could sleep, rear young, shelter from the weather and evade predators have been destroyed.

In the south-west of this State only about 10% of the original primary vegetation remains. Sadly the urban, agricultural, forest and woodland landscapes now contain far fewer trees with hollows than they did when Perth was first settled. Hollow formation in our unique south-western hardwoods (e.g. jarrah, marri, karri, wandoo, tuart and salmon gum) is an excruciatingly slow process relying on a myriad of fungi and invertebrates such as termites and other insects to decompose and excavate the heartwood. Hollows generally only appear when a branch or top of main trunk snaps off, or the tree is damaged by fire. This extremely slow process, combined with the fact that our hardwoods live up to 500 years, means that hollows can be quickly lost, but not easily replaced.

Recent studies have shown that hollows suitable for our large cockatoos do not begin to appear in eucalypts until they are at least 230 years old. A number of nest trees used by forest red-tailed black cockatoos and Baudin's and Carnaby's cockatoos are estimated to be between 300-500 years of age. This clearly shows that the large old and decaying trees used as nesting sites by our black cockatoos in the south-west began growing well before Captain Stirling sailed up the Swan River.

It is now very evident that the loss or decrease in hollow bearing trees in the south-west of WA is one of the most important factors to overcome in fauna conservation. Apart from the dwindling supply of hollows in some landscapes, hollow users must also compete with the introduced feral European honey bee that is infesting hollows throughout the entire south-west region at a very rapid rate. Some species can make do with alternatives, e.g. tree martins around Perth now nest in large numbers in street light fittings and there are several records of owlet nightjars breeding in tractor exhaust pipes in the wheatbelt.

Are artificial nest hollows the solution to our declining hollows? Not really. In some cases nest boxes and pipe hollows have been used very successfully for glossy cockatoos on Kangaroo Island and for Carnaby's cockatoos here in Western Australia. Nest boxes are, however, not a panacea - they can attract introduced species (such as feral European honey bees) and invading superabundant species (such as galahs and corellas) and are relatively expensive to erect and monitor. Also, further research into size, shape and placement of artificial hollows needs to be undertaken and with it a responsibility to discourage introduced and feral species from using the hollows. There is no doubt, however, that PVC pipe hollows could be used effectively for the recovery of Carnaby's cockatoos in parts of the wheatbelt where there is a scarcity of suitable hollows. It is impossible, however, to fully replicate all the habitats provided by veteran and stag trees.

Overall we must start growing the next generation of veteran and stag trees now, especially in urban and agricultural areas, and develop guidelines for selecting suitable trees for retention for hollow-using species. In recognition of this, one of the "Cockatoo Care" project objectives is to encourage habitat enhancement through tree planting, revegetation of degraded areas and the protection of remnant bushland with large trees.

Land owners and land managers must whenever possible retain their veteran and stag trees, which not only give character to the Australian landscape, but are crucial for the long-term survival of much of our wildlife.

Ron Johnstone is Curator of Ornithology at the WA Museum.

Did you know?

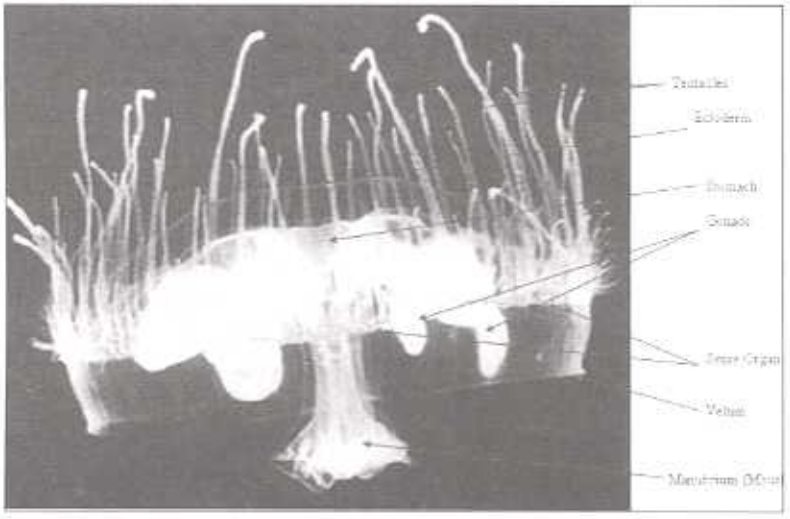
... that before modern transport, a new species used to become established on Hawaii every 25,000 to 50,000 years – now one is recorded every 18 days. *Global Invasive Species Programme*

FERAL FAUNA

FRESHWATER JELLYFISH?

Peter Vickridge

Have you ever heard of freshwater jellyfish? I must confess neither had I until I saw them with my own eyes!



Technically speaking they aren't really jellyfish, but a hydrozoid that has a medusa that certainly looks like a jellyfish. They are very small, the largest being a little larger than a ten cent piece. They look just like a saltwater jellyfish, complete with bell shaped body and tentacles with stingers. They also move by pulsating movements of their bell-shaped body, but there the similarity to saltwater jellyfish ends. In its lifecycle it appears as either a plant-like polyp which asexually 'buds' to produce the typical jellyfish appearance or the medusae can also reproduce sexually, with fertilised eggs. The latter form of reproduction is apparently more rare, as most populations are either entirely male or entirely female.

Reportedly *Craspedacusta sowerbii* is as old as the earth itself, apparently its fossil has been dated back to the Pre-Cambrian era. It may have originated in the Yangtze River valley in China but is now found throughout all the continents except Antarctica, where its appearance is usually sporadic, appearing and disappearing in waterways. *C. sowerbii* was first recorded as a species in England in 1880, in America in 1908 and for the first time in Australia in 1950 in a reservoir near Adelaide. In Western Australia the first sighting was in a goldfish pond in South Perth in 1959, with no further sightings recorded at the Western Australian Museum since then.

Craspedacusta sowerbii is found in a variety of water environments: freshwater lakes, reservoirs, dams, water-filled gravel pits, rock quarries, algae-filled ponds and occasionally in rivers (but usually in calmer water and not in rough water such as rivers). Their appearances are totally unpredictable, appearing and disappearing in suitable waterways, sometimes only appearing for one summer and not again, sometimes reappearing some years later. So where have I seen them? In our own dam, on our property just outside Kirup! According to the previous owner of the property they have, rather unusually, been appearing in the dam every summer for well over 15 years. I have also been reliably informed that they recently appeared in the Pemberton swimming pool, but this sighting went unrecorded.

The jellyfish-like medusa only appear during the warmer months and die off over winter, when the polyps become dormant. It is assumed that the dormant polyps are spread by being transported on plant material carried by aquatic fauna. The medusae feed on zooplankton, using their stinging cells on their tentacles to capture their prey. Fortunately their stingers seem unable to affect human skin, at least no one has been stung whilst swimming in our dam. They have proven to be difficult to keep in aquaria as their thin-walled structure is easily damaged by filters.

If you find all this hard to believe or want more information, try searching the web for 'freshwater jellyfish' the results are amazing. One site, for the Indiana University of Pennsylvania in America, has a huge amount of information on freshwater jellyfish.

If none of the above is new to you and you have actually seen freshwater jellyfish, please report your sighting to both the Western Australian Museum and Dr Terry Peard (tpeard@iup.edu).

References:

WA Naturalist **9**: 4 1964

Indiana Uni. of Pennsylvania http://www.nsm1.nsm.iup.edu/tpeard

Gen-yu Sasaki, Japan website at http://www.microscopy-uk/mag/artnov99/fwjelly

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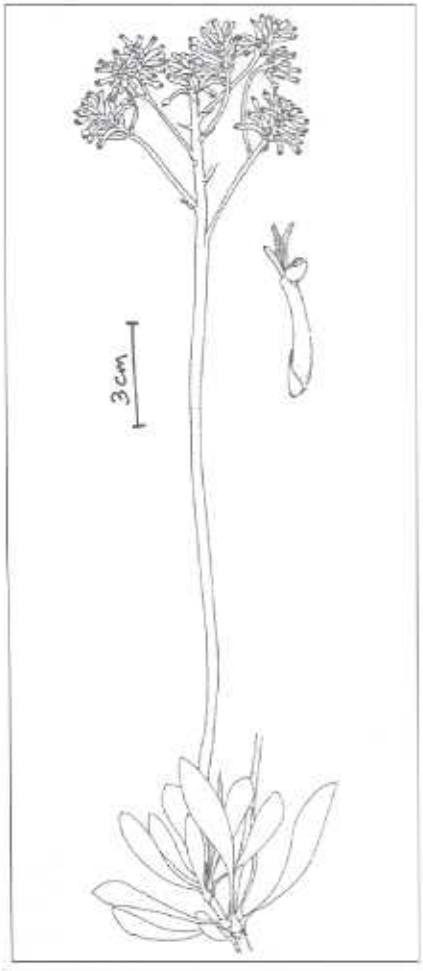
FLORA

SMOKEBUSH

Penny Hussey

Across the drab sandplain, a swirl of grey, bending, floating back, ephemeral as a drift of smoke, enigmatic, beautiful, alien; Smokebush has always fascinated newcomers to Australia - there's nothing like this in Europe! But not all smokebushes are grey and furry, some are smooth, and blue or cream rather than white. All have a delicate beauty.

Smokebushes (*Conospermum*) are in the Banksia Family (Proteaceae). The name *Conospermum* (which means 'cone-shaped seed') was given to the genus by Sir James Smith, an English botanist who had founded the Linnean Society in 1788. He published the name in 1798, in the Society's 'Transactions', from material brought back from explorations around Port Jackson. Eleven species of this solely Australian genus do occur in the east, but the centre of distribution is WA, where there are 42 species. Most of them prefer sandplain, either deep sand or an admixture of gravel, but some are confined to swamps. They are mostly shrubs but, in the absence of fire, some can grow into small trees. Like all in their family they have 4-lobed flowers.

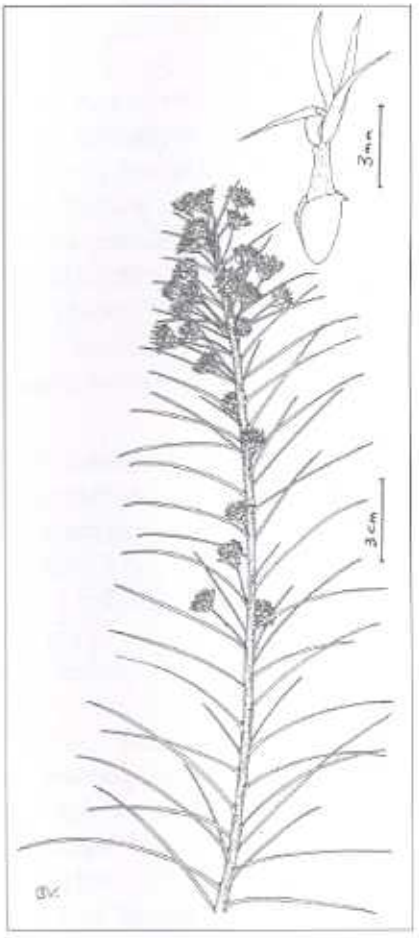


C. brownii

Despite being widespread and often common across the south-west, there is no record of any use by Aboriginal people – not even a name. Certainly, most species grow in sandplain country, areas which tended to be low in exploitable resources and so mostly ignored by humans. The great nineteenth century botanist, Baron Ferdinand von Mueller, suggested that farmers plant Common Smokebush, *C. stoechadis*, on "the worst desert country" as he asserted that "all kinds of pasture animals browse with avidity on the long tender and downy flower-stalks and spikes, without touching the foliage, thus not destroying the plant by close cropping". Was he correct, has anyone noticed? My feeling is that stock would eat the whole plant!

In recent years smokebushes have become prized for their beauty and so a trade in them as cut flowers developed. Twenty years or so ago, when commercial picking of wildflowers from the bush was at its height, tens of thousands of smokebush stems were harvested, dried and often dyed before export to fit in with the designer colour of the year. Nowadays there is very little bush picking, and greater concentration on cultivation and sale as fresh flowers. One species that the Dept. of Agriculture is working hard on is the beautiful blue, salt-tolerant Blue Lace, *C. eatoniae* (for colour pic see 'Managing Your Bushland' p147) but it is not proving easy (see Farmnote 110/99 'Smokebush for cut flower production' AgWA). This plant is much in demand in Japan, and commands a high price.

Smokebushes always attract interest, wherever you see them. One species I remember well is the Victoria Desert Smokebush, *C. toddii*. It is, as far as I know, the only specimen that I have collected which is cited as a reference in 'Flora of Australia'! It came about this way.



C. acerosum

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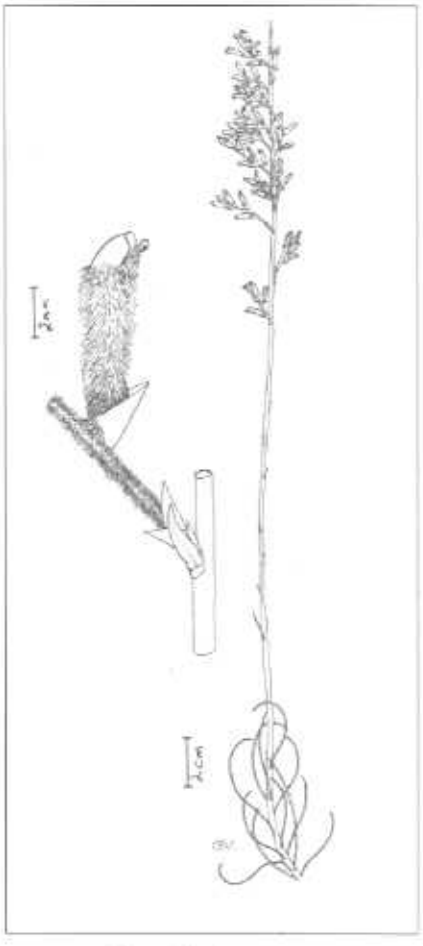
FLORA

In 1975, a group of friends decided to celebrate the centenary of Ernest Giles' expedition across Australia by visiting Queen Victoria Spring, an isolated dot north of the Nullarbor. We had to get permission to travel through land controlled by the Cundelee Aboriginal Community - not easy to obtain – so I went to the Herbarium and asked if they would be interested in any plants I collected in this very remote area. "No," I was told, "don't bother. We're going ourselves, just a month later." So, as we sat around toasting Giles, for my own interest I identified the hundreds of flowering shrubs (it was an excellent year) as well as I could from my trusty 'Blackall' – and used the sprigs as kindling to light the evening fire. All except the smokebush, for which I couldn't find a near match in the book, so I carried that one back home with me.



C. galeatum

But it's funny how things work out - unfortunately for the professional botanists, a group of anthropology students who followed us in, so offended indigenous sensibilities that they closed the track to all visitors for the rest of the year! Thus my single plant specimen became the second collection of that species in the Herbarium.

Fortunately, nowadays there is much greater appreciation of amateur collectors so, if you think you have an interesting smokebush, work through your local Community Herbarium and get its location recorded. Most especially so if you happen to live – or be visiting - the area between Kellerberrin, Bruce Rock and Narembeen. *C. galeatum* occurs there, and it has only been collected five times! It is a typical low shrub with 4-5 cm thread-like leaves and a tall spike of white-woolly flowers with a dark blue or blackish throat, flowering in spring. It grows on white sand and may be common after a fire, but is seldom seen otherwise.

Most smokebushes seem to be fire disturbance opportunists, appearing in large numbers when smoke stimulates the soil seed bank. They live for a few years then die back, remaining on site only as seeds. It is this refusal to germinate without a smoke signal that has frustrated horticulturalists trying to bring smokebushes into cultivation.

As an example of smokebush response to fire, readers who have driven from Gidgegannup to Toodyay will have noticed the Morangup Nature Reserve on the north side of the road. In 1982, under somewhat controversial conditions, most of the area was cleared, burnt and planted to clover. It was subsequently bought by the State Government and allowed to regenerate. In the first few years

C. glumaceum

after regeneration started, there was spectacular flowering of *C. glumaceum*, Hooded Smokebush, but you would be lucky to find even one plant now. But because you can't see them, does not mean they have died out at the site – they will still be present in the soil seed bank. This is a very difficult concept for non-Australian botanists/ecologists to grasp!

Smokebush bee

Smokebushes have a rather specialised method of pollination. They are visited by particular native bees from the genus *Leioproctus*, that have a proboscis covered in stiff bristles. Most smokebushes' anthers are contained within their small, tight-lipped flowers, where there is also a trigger mechanism that causes the anthers to burst explosively when a bee pokes in its proboscis. When the anthers explode, the pollen becomes packed onto the proboscis, and the bee then

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FIRE

Fires, Banksias, Seeds - and Galahs

Many WA plants hold their seeds in cones and capsules that open after fire to release seeds to grow on the ash. Thus, soon after the fire there is a veritable smorgasbord available for seed-eating fauna, especially rodents. However, the very abundance of the seed rain at this one time means that some will survive to grow on to the next generation, especially if the rains follow soon after, as happens in late summer/autumn fires.

But Byron Lamont of Curtin University has found that a new player has entered the lists!

Byron and his students have worked with various aspects of Banksia life history in the Northern Sandplains for many years and he has noted Galahs moving into the region. Galahs descend on recently-burnt sandplain, concentrating on eating the larger seeds released by the fire. They have been seen to walk around a banksia and eat every single seed that has fallen. This is very bad news for the long-term survival of those banksias that are killed by the fire and rely on their seeds to replace the population, such as *B. hookerana*.

Byron also commented to the Editor that he has also seen this problem at other sites, for example, there is almost no recruitment of *Hakea trifurcata* at Lions Lookout at the top of Welshpool Rd in Kalamunda following the most recent fire – again, feeding Galahs are the prime suspects.

Has anyone observed this happening in areas where Galahs have moved in? Could you let *LFW* know? Photographic evidence, even of tracks, would be very valuable.

Fire and Noisy Scrub Birds

In December 2004, a bushfire swept through the Mt Manypeaks area to which Noisy Scrub-birds had been translocated, where they were doing very well. Of the 427 scrub-bird territories known at the end of the 2004 monitoring season, it is expected that all the birds will have perished. This devastating impact has put the Recovery Programme back 10 years. In addition, over recent years other fires have burnt nearby bushland, making it unsuitable for fleeing scrub-birds, and it is estimated that only 4500 ha of optimal scrub-bird habitat remains in the Albany region.

If you would like to volunteer to help threatened species in the Albany region, including translocations and population surveys, contact Sarah Comer by email: sarahc@calm.wa.gov.au

More on Fire and Honey Possums

Vic Smith studied the effect of a wildfire in 1997 on the central part of Torndirrup NP, by extending his original fauna survey in the burnt area for four years after the fire. Apart from expected things, such as a large numbers of house mice immediately post-fire, the event had a big effect on honey possums. The fire killed the oak-leaved banksias (*Banksia quercifolia*) that had dominated the heathlands and had provided food and shelter for a large number of honey possums each winter. The plant has regenerated well from seed, but it takes at least five years before it produces many flowers so it will take a long period before honey possum numbers can return to pre-fire levels in those areas. Torndirrup NP had contiguous unburnt sections from which animals could easily colonise the regenerating area. If it had been an isolated patch that had been wholly burnt, honey possums would have become locally extinct. This data reinforces Annika Everaardt's message in WW 9/1 (Jan 2005) of the importance of long fire intervals for honey possum survival.

For the full story read: Smith 2005. "Effect of fire in Torndirrup National Park, South Coast, Western Australia". WA Naturalist. **14**: 205-215.

The beautiful illustration of a honey possum on oak-leaved banksia is by Mike Bamford from Vic's delightful book "Portrait of a Peninsula: the Wildlife of Torndirrup". Pub: Albany Advertiser, 1991. Anyone interested in the natural environment who is visiting Albany would enjoy reading this book.

MEMBERS PAGE

PLAN YOUR COUNTERATTACK AGAINST MARAUDING RING-NECK PARROTS!

Jan Rowley

The 28 parrot has an irreversible means of killing many specimens of xanthorrhoeas in the course of its insatiable summer smorgasbord diet. To counter the disastrous demise of a number of 1-2 metre high majestic examples of long-lived xanthorrhoea on our verge in Chittering, I trialled a possible recovery plan.

Last summer, before the birds completely eradicated the green growing shoots at the core of the plant, I used some of the circles of dead stem from previous years to cover the growing shoots. I made certain that the green tips were about 12cm at least below the top of the collar. As the shoots grew, I just increased the height of the collar.

The birds did no further damage to the plant and so far as I know did not attack other specimens nearby. When the rains produced other sources of food and the topknot was growing well, I removed the collar. Next summer I plan to collar the growth early and watch for the results.

If any readers have other ideas – proven or otherwise – for countering damage caused by the b***** 28s (I mean 'beautiful', of course!) please let me know on (08) 9571 4152.

[Loss of balgas to 28s has been an enduring issue for many *LFWers*. Concern and possible action was highlighted way back in WW 1/3 (July 1997) and 1/4 (Oct 1997). As well as letting Jan know your ideas, could anyone send *LFW* some photographic evidence of long-term protection that has worked? – Ed.]

Fig 1. In this group, parrots killed one of the 5 heads in summer of 2004. The damage done in earlier years is clearly visible. In early 2005, a 'circle for survival' was placed around the struggling growing tips of the remaining 4. This photo is Aug 2005, showing good growth at all four sites.

Fig 2. A collar in place.

Bush Detective

What's in this photo?

This 'living log' is a Bush Stone-curlew sitting on its nest. Bill Dawes from Yealering sent in this photo after reading an earlier article about Bush Stone-curlews living near homesteads. This one was nesting near some old machinery. Unfortunately, Bill says it is about 10 years since he last saw or heard a stone-curlew in his area.

FERAL FAUNA

DEVELOPMENT OF A FERAL BEE CONTROL STRATEGY FOR WESTERN AUSTRALIA

Jennifer Jackson

When we think of feral animals, we often think of the more conspicuous ones, such as foxes, rabbits and cats, but another well known exotic animal is having a negative impact on our environment in Australia. European honey bees (*Apis mellifera*) were introduced to Australia soon after European settlement in the 1820s. They were introduced for honey production, and to help pollinate plants and crops. However, since that time the managed bees have been swarming from their parent hives to form feral bee colonies. Although they are the same species, feral bees differ from managed bees. Feral bees are generally aggressive, have a tendency to swarm and they are of little value for commercial honey production.

Here in WA, feral bees are taking over hollows in trees at an alarming rate, and in the process evicting native birds and mammals that use those hollows for shelter or nests. Of particular concern is that the bees take over the nest hollows of our three iconic and threatened species of black cockatoo, the forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*), Carnaby's black cockatoo (*Calyptorhynchus latirostris*) and Baudin's black cockatoo (*Calyptorhynchus baudinii*).

Current forms of bee control are considered costly and time consuming because eradication is usually done on a hive by hive basis. However, recent research carried out in New Zealand has found an effective way to control bees, making the bees come to us, instead of us going to them. By presenting a small amount of pesticide with a sugar solution in a specially designed bait station, feral bees within a 500m radius can be attracted to the bait stations quickly and in large numbers. The bees consume the bait and return to the hive, and because the pesticide kills bees by ingestion and contact, if only 11% of the bees in a nucleus colony consume the bait, the entire colony dies.

With financial support from the Water Corporation, CALM will undertake research in the south west of the State to determine if the methodology used in the New Zealand study can effectively be utilised to control feral bees in Western Australia.

The research will investigate:

- the most effective method to attract bees to the bait;
- any risks posed to non-target native species (vertebrate or invertebrate) through proposed control methods, and eliminate or mitigate those risks to an acceptable level;
- the distances travelled by feral bees to a bait station, and the density of bait stations needed to treat a specific area;
- how long it will take to kill feral bee hives in a specific area; and
- how often hives or areas will need to be treated to keep them free from feral bees.

From the research undertaken by CALM, a Feral Bee Control Strategy suitable for Western Australian conditions will be developed, with the aim of reducing feral bee numbers in areas where they negatively impact on our native flora and fauna, without affecting the beekeeping industry.

In the meantime, **if you have feral bees on your property, we would like to know**. Our aim is to develop a database of the positions of known feral bee colonies throughout Western Australia. A GPS co-ordinate would be great; however details of your property location would suffice. Please contact me on 93340175, or email jenniferj@calm.wa.gov.au

Jennifer Jackson is Feral Bee Project Officer at CALM, Kensington.

House Mice eat Skinks!

In the July issue of Western Wildlife, Peter Mawson urged landholders in broadacre farming areas to install perches in crop paddocks to encourage owls to help control house mice. Hopefully lots of people have taken this up, it is such a simple thing to do!

Well, there is evidence that house mice are omnivorous – they don't just eat grain, they will eat animals too, including small skinks. A study in New Zealand showed that skink numbers recovered after house mice were removed.

House mice move out of paddocks into bushland when cover and food in the paddock becomes scarce. They could therefore be causing decline in the local skink population, both by competing for food and by eating the skinks themselves or, perhaps more likely, their eggs and young. Another good reason to get rid of house mice!

(Ps: If anyone has installed an owl perch, could you please send a photo? – Ed.)

PRACTICALITIES

CAN POISON PEAS REALLY CONTROL RABBITS? - A CALL FOR READERS' COMMENTS

Mike Griffiths and Robert Boase

Several articles in Western Wildlife over the years have covered the subject of our native peas and their role in the local bush and in revegetation. One group of native peas, the poison peas (*Gastrolobium* spp.) is well known for their toxicity to non-native animals, in particular sheep and cattle. For this reason they invariably cause farmers and graziers to shudder at the mere thought of them. But the active ingredient of poison peas '1080' poison (albeit manufactured artificially) is also extremely important in the control of another exotic species of mammal in WA – the red fox.

York road poison, *G. calycinum*

The dramatic effects of the toxins produced by the leaves, flowers and seeds of our poison peas on exotic animal species have long been recognised by farmers and ecologists, but few, if any, have written about the effects of rabbits grazing on the plants. However, the highly respected botanist, historian, artist and writer Rica Erickson, who lived for many years in the Victoria Plains district of WA, made the following observation in 1965 in her classic book "Orchids of the West":

*"There is a forgotten piece of land in this district of Bolgart, with timbered rocky gullies, fenced out from the neighbouring farms as worthless and even dangerous to stock because it is so infested with poison plants. Though rabbits are a constant menace of these farms, and though the fence around the wasteland is not rabbit-proof, there is little sign of the pest in that naturally protected wildlife reserve. It would be a curious piece of irony if we should sow the seeds of poison plants in reserves as the simplest method of protecting them from unwanted grazing"**

Mrs Erickson is famous for her knowledge of the WA bush, based on years of close observation. Her thoughts on the possibility of poison peas controlling rabbits seem to be supported by at least two farmers who have reported to us that the only bush remnants on their properties without rabbits are those that contain large patches of poison peas (typically box poison). It is also supported by one of the authors (RB) who remembers stuffing box poison (*G. parviflorum*) down active rabbit warrens on the family farm in the Dowerin-Goomalling district in the 1950s and observed no further activity for several months afterwards. Could 'smart' revegetation and fencing, incorporating stands of poison pea (and perhaps double fencing to ensure protection of livestock) be used in future bush protection projects as a long-term, inexpensive way to control rabbits?

We would be very grateful to hear from any Western Wildlife readers who may have observed the effects of poison bushes on rabbit populations on their own properties, or may have other comments on the subject, with view to writing a later follow-up article to include any feedback. We would also welcome hearing from anyone who is interested in being involved in rabbit control trials using *Gastrolobium*.

*Page 28, "Orchids of the West" (2nd Edn) by Rica Erickson. Paterson Brokensha: Perth, 1965.

Mike Griffiths is a biodiversity officer with WWF-Australia based at Northam. He can be contacted by phone on 9690 2232 or email mgriffiths@wwf.org.au

Robert Boase is a farmer and plant nurseryman at "Arinya Plants", Dowerin. He can be contacted by phone on 9634 1047 or email rcboase@hotmail.com

Illustration by M. Wilson from "A Naturalists' Guide to Perth" 1987. WA Naturalists' Club.

WEED ALERT

Why are some orchids weedy?

Orchids are charismatic plants, often of great beauty, and most landholders are delighted to find them growing in their remnant bushland. But why do some orchids appear to colonise disturbed areas such as roadsides relatively easily, but others are seldom seen? They all produce small, light seeds that blow in the wind like dust, so its can't be a distribution problem. Apparently it is down to their associated fungi.

Orchids form a mycorrhizal partnership with soil-living fungi. Their tiny seeds do not even carry enough nutrient to germinate without help from a fungal partner! So if an orchid seed lands on soil without the right fungus, it will just sit there. Some orchids are very specific, and can only form a partnership with one particular fungus, others are not nearly so fussy.

Common mignonette orchid, growing like a weed in the bush garden at CALM, Kensington.

Yumiko Bonnardeaux, an honours student who was working with Mark Brundrett and Andrew Batty (researchers from UWA and Kings Park) has begun to unravel the complicated relationships between orchids and fungi. They have found that common and widespread species such as the common mignonette orchid, *Microtis media*, are compatible with a wide diversity of fungi and so can grow almost anywhere. This species is also capable of self-pollination without insect assistance. Can you guess which orchid has the most fungal partners found so far? Yes, that fleshy invader, *Disa bracteata*, the South African orchid! No wonder it has spread so far, so fast, since it was first discovered in WA at Young's Siding near Albany in 1944.

(Mark would like to acknowledge funding for this work from ALCOA World Alumina and the Botanic Gardens and Parks Authority.)

Bridal creeper rust – has it killed plants, or merely knocked them back?

Several people have reported how bridal creeper rust has been very effective during the long wet season in 2005. Whole infestations seem to have collapsed. This is a wonderful result but, has it actually killed the plant, or will the tubers resprout? And if so, will the rust survive to attack again in 2006?

If you observed this very promising biological control at work in your area, could you please keep an eye out for regrowth this winter? Please let your *LFW* Officer have the details. Sequential photographs would be an excellent record of effectiveness.

Biological control is not cheap but if we can get it right, it is really the only option for widespread weeds. It is very important to gather evidence to support future research funding applications.

A condom for weeds?

A team from the Cooperative Research Centre for Australian Weed Management is exploiting a phenomenon called 'self-incompatibility' (SI) to create a possible plant contraceptive. SI is a biological system that prevents certain plants from fertilizing themselves with their own pollen. The team aims to fool the plants into thinking that compatible pollen is actually incompatible, therefore rejecting it and so producing no seeds.

The team is exploring two separate approaches:

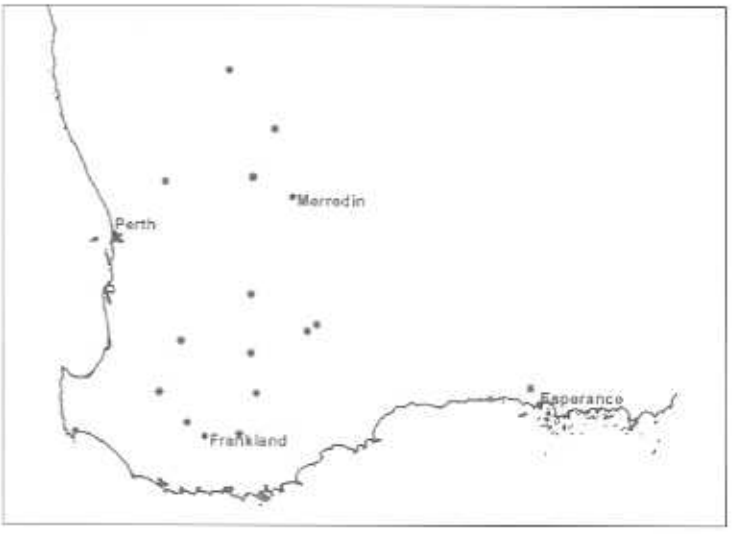
- the so-called 'chemical condom' in which a natural substance prevents compatible pollen from being accepted by the plant
- the use of compounds based on natural plant molecules to block the transfer of the pollen's sperm to the plant's egg cells – a concept akin to human vasectomy.

Currently they are working on wild radish, one of the worst weeds in the Australian grain industry, costing over $70 million a year in lost grain yield and as much again to control. It is also becoming resistant to herbicides. There is still a very long way to go, with lots of problems to solve – eg the compounds will have to be specific to each particular weed species. Imagine if you used it to control wild radish in a wheat field, but it spread to over the fence to infect a field of closely related canola!

Nevertheless, it's an interesting idea with a lot of promise.

NEWS

BUSTARDS ON THE MOVE



Thank you to all the *Land for Wildlife* members who reported bustard sightings. Reports came from as far afield as Kalannie, Esperance, Boyup Brook and Toodyay.

For some people this was their first sighting of a bustard, others had not seen them in their area for 15-20 years. In the western areas one or two birds were seen at a time, larger numbers were noted closer to the rangelands, with 30 birds seen near Gibson. Most birds were seen feeding in paddocks. Some birds stayed over winter, but have now left the area.

Avril Baxter (Photo: Mick Davis)

Jerdacuttup Wetlands & Hydrology Field Day

When was it? Just look up the rainfall records – it was on the Thursday in August when we got that 35mm of rain over a couple of days! But in spite of the weather about a dozen of us spent an interesting day listening to speakers in a warm and dry hall and then visiting 3 different wetlands where we measured water quality characteristics and sampled for invertebrate fauna.

Jerdacuttup is a farming area to the east of Ravensthorpe, on the south coast, where wetlands are a feature of the landscape. On the farms there is a variety of types and sizes of wetlands and then there are larger lakes along the coast in reserve land. Not a lot is known about their nature and we planned this day as an introduction to understanding and managing wetlands.

Two of the wetlands we visited were perched systems with very fresh water. The third wetland, a creek, only one kilometre away but 10 metres lower in the landscape, was naturally saline, being fed by ground water. These illustrated the diversity of wetland types in the area. It was fascinating to see the array of fauna living in each of the wetlands, emphasising that wetlands are indeed living and complex systems.

The field day has sparked interest in how we might improve our knowledge of the wetlands in this area.

Rosemary Jasper

The first 'Night Stalk' held in Busselton

The 'Great Australian Marsupial Night Stalk' was held throughout the south west of WA during Sept/Oct 2005. The night stalk is a nation-wide spotlight survey of marsupials undertaken by schools, community groups and other organisations, coordinated in WA by Perth Zoo. The aim of the night stalks is to gather information on marsupial numbers and distribution through low impact surveying e.g. spotlighting.

On the 1st Sept, a night stalk was held by Geographe PS in the bushland adjoining their school. The event was organised by the school with the assistance of CALM Bush Rangers, *Land For Wildlife* and FAWNA.

It was very successful with the children and parents spotting 7 Western Ringtail Possums, 1 Brushtail Possum and a Motorbike Frog. One of the Ringtails had the end of its tail chewed by either a cat or dog, which demonstrated the vulnerable state of these small possums in the urban areas of Busselton. The school will be sending their results into the Perth Zoo for data collection and these will be incorporated with results from all around Australia.

If you would like to be involved in the night stalks next year, or if you would like to do some night stalking individually, follow the "seven easy steps to organising a successful night stalk" which is available online at: www.perthzoo.wa.gov.au. *Cherie Kemp*

NEWS

Congratulations!

to Joy and Scott Angwin of 'Tamarcurrie', winners of the 'Farm Weekly Landcare Primary Producer Award'. Their farm adjoins nature reserves in the Dongolocking area and they consider that they are fortunate to have endangered animals such as the red-tailed phascogale and quendas in their area. They consider their habitat needs in all biodiversity projects, including the establishment of a corridor designed to encourage the movement of phascogales between two reserves. They have also fenced and revegetated laterite breakaways. Growth rates have been phenomenal in low rainfall years and in these traditionally hard to revegetate areas.

Avril Baxter

to Wendy and Peter Bessell-Browne of 'Naballing', winners of the 'Australian Forest Growers WA Tree Farmer of the Year Award'. They have been involved with the oil mallee industry since 1992 and are key players in its development in the area. Their *LFW* site is a 70 ha valley floor remnant which has been surveyed by the Wildflower Society of WA. Peter and Wendy were amazed by how many different plants were in the bush, noting that it really pointed to the importance of fencing remnants and letting them regenerate - also demonstrating how many species could be selected for revegetation programmes.

Avril Baxter

to Joy and Simon Ensor, of 'Yelverton Brook Luxury Eco Retreat and Conservation Sanctuary', winners of the 'Australian Government Bushcare Nature Conservation Award'. They have excellent quality jarrah/banksia woodland and a creek which regular surveys have shown to be used by Western Ringtail Possums, Brushtail Possums and Quendas. Recently a feral-proof fence has been completed and last year a population of woylies established. Joy and her children tell me that the woylies are breeding and are very happy in their new surroundings!

Cherie Kemp

DRAFT "GOOD NEIGHBOUR POLICY"

Goodrelationshipsbetween neighbours are fundamental to responsible land management across the whole landscape. The development of these relationships requires trust, respect and consistency from all parties. As a substantial land manager, CALM has a large number of neighbours.

The "Good Neighbour Policy" has been developed by CALM in collaboration with rural stakeholders including the WA Farmers Federation, the Pastoralists and Graziers Association and the WA Local Government Association. It sets up some formal guidelines for cross-boundary issues but emphasises that informal discussions are often the best way to answer queries.

The President of WAFF, Trevor De Landgrafft, Environment Minister Dr Judy Edwards and CALM's Executive Director Keiran McNamara at the launch of the "Good Neighbour Policy". Note the LFW backdrop!

A copy is included with this magazine.

The document is a draft, and is open for comment until October 2006. It mentions *LFW's* role in the provision of biodiversity advice to private landholders. *LFW* has always tried to maintain trust and the 'open and positive relationships' promoted in this document and, as evidenced from the most recent *LFW* Questionnaire, you think we're doing quite well! Please take time to read this new CALM policy and comment on it, either from the point of view of your knowledge of *LFW* or regarding any other issue you would like to raise.

Penny Hussey

NEWS

"BIRDING FOR BEGINNERS" AT DRYANDRA

What bird is that? - a LFW photographer-bird!

The "Birding for Beginners" weekend at Dryandra, jointly organised by Birds Australia and *LFW*, was attended by 33 people. It was a great weekend, with 57 of the 118 bird species known to inhabit Dryandra noted.

The photo shows Simon Neville, Dave Smith, Andrew Hobbs, Jill Hobbs and Pauline Whitehead.

Avril Baxter

LFW display at the Newdegate Show. It is a few years since Anne Rick last arranged for LFW to participate in this event, and this year well over 100 people stopped to talk to Kathleen O'Brien about matters related to farming and conservation.

OFFICIAL OPENING OF GWAMBYGINE POOL CONSERVATION RESERVE

In October, the Minister for the Environment, the Hon Judy Edwards, opened the Gwambygine Pool Conservation Reserve, on the Avon River between York and Beverley. The Minister congratulated the River Conservation Society for the tremendous amount of work they had coordinated at the site. She especially mentioned the Society's Chair, Dr Cecily Howell, for her ability to bring together resources and enthusiasm from a number of areas to achieve a common goal.

The Minister and Cecily Howell with the Reserve's LFW sign. Photo: John Feeney

WOOLORAMA

Need a new *LFW* folder?

Come and visit us at the Dept. of Agriculture pavillion, Wagin Woolorama,
Friday 10th - Saturday 11th March 2006.

FLORA

continued from page 8

Stress affects male mosses more than females!

Mosses have a complicated life history, involving two different generations, the gametophyte and the sporophyte. The familiar, leafy moss plant is the gametophyte, which is usually either male or female. Males make sperm that swim to the female plants to fertilise the eggs, held in place on the female. (Water, of course, is necessary for this stage.) The fertilized egg grows into a capsule attached to the moss plant, usually by a long stalk – this is the sporophyte generation and spores are made in the capsule. The spores grow into moss plants (gametophytes) and so on .....

Smaller, more fragmented bush remnants lead to dryer conditions within them. Mosses are badly affected by stress from drought and high temperatures and have to make complex proteins to repair cellular damage. This could mean that male plants no longer have the energy to express their maleness, which would give female plants an advantage in stressed areas as female sex expression in mosses is relatively cheap compared to males. Males might, therefore, become extinct! Indeed, a study in a desert area of western USA found that for some species, males are unknown. If current landuse is accelerating this process, it could affect the long term conservation of moss species.

For the full story, read: Stark LR, McLetchie D, & Mishler BD. 2005. Sex expression, plant size, and spatial segregation of the sexes across a stress gradient in the desert moss *Syntrichia caninervis*. The Bryologist **108**: 183-193.

Cyanobacteria contribute to fertility of low nutrient soils

Cyanobacteria (also known as blue-green algae) are microscopic photosynthesizing organisms found in a wide variety of habitats. They are often a constituent of biological soil crusts. Many have the ability to fix atmospheric nitrogen, and this could be an important contributor to soil nutrient balance.

During droughts the soil crust may be covered by a layer of dust, but light rain or even dew enable the cyanobacteria to become active. Their filaments travel to the surface to 'harvest' light for energy production, then retreat into their protective sheaths lower in the soil and fix nitrogen in the dark. This pool of near-surface nitrogen is used by germinating plants to fuel the flush of growth after significant rain. It appears to be a crucial part of the arid soil nutrient cycle.

So the growth of that wonderful carpet of everlastings depends not only on rain, but on cyanobacterial soil crusts as well!

For the full story, read: Belnap J. 2003. Nitrogen fixation in biological soil crusts. In: Belnap & Lange (Eds). Biological soil crusts: Structure, management and function. Ecological Studies 150. Springer Verlag, Berlin.

Smokebush (cont.)

transfers it to the pollen baskets on its hind legs.

Some of these small smokebush bees, eg *Leioproctus pappus*, have densely white hairy bodies, milky wings and white eyes, so are well camouflaged among the smokebush flowers.

Can you find any smokebush bees? *L. pappus* has only been recorded on three species, *C. incurvum*, *C. stoechadis* and *C. triplinervum*, but it is probably much more widespread. There are also several other genera of small bees found on smokebushes – as well as many smokebush species where no pollinators have been recorded. Terry Houston of the WA Museum would be very interested to know of your observations (email: terry.houston@museum.wa.gov.au). Look very carefully at the flowers to see the insect, and take a photo if you have a suitable camera, or collect a specimen of the bee. Unless you are 100% certain which species you are looking at, it would be wise to collect a piece of the smokebush too.

The more we study Western Australia's fascinating plants, the more we realise how little we really know about them. Can you help to increase our knowledge of smokebushes?

Penny Hussey can be contacted on 9334 0530 or email pennyh@calm.wa.gov.au

Illustrations by C. Vasiliu from 'Flora of Australia' Vol 16.

Mosses

IN BRIEF

Stalagmites record annual rainfall!

Caves often have beautiful interior decoration created when calcium carbonate, dissolved in water passing through the overlying limestone, is redeposited inside the cave - stalactites hanging down, stalagmites pointing up and flowstone on the floors. In a distinctly wet winter / dry summer climate such as ours, the material is deposited in annual pulses, leaving a layered deposit rather like growth rings in a tree trunk.

Pauline Treble of the Australian National University, Canberra, wondered whether these deposits could provide a record of what is happening to the climate – specifically the rainfall – up above the cave. For her PhD she analysed a small stalagmite from Moondyne Cave that had formed on a boardwalk, so its exact age was known. She found that phosphorous, magnesium and the oxygen isotopic ratio preserved in the stalagmite, record the known rainfall decrease from about 1970 onwards. In other words, stalagmites can tell us about past climates!

She has now started a new research project, testing materials from caves at Margaret River and Yanchep, to attempt to take our annual rainfall record back across the last 1000 years. The aim is to try to determine how naturally variable the climate is, for example, have dry spells like the past 35 years happened before 1850 and the recorded industrial revolution atmospheric changes? The answer to this will help us answer the question "How much of the current climate trend is man made?"

Watch this space!

How old are balgas when they first flower?

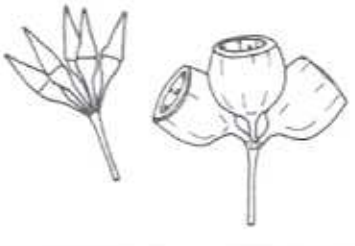
We have all heard those stories about how slowly xanthorrhoeas grow, but another interesting point is - how old are they before they have enough stored resources to produce the first flower? David Keith, of the Department of Environment and Conservation in NSW, has been studying his local grasstree, *X. resinifera*. He has found that they need to grow for 30 to 50 (or even more) years before they flower! He has also found they put on a real growth spurt in the first two years after a fire, after which they shut down, and only produce enough leaves each year to replace what is lost.

WA's balga, *X. preissii*, is probably very similar. Has anyone any historical records that would support this?

Did you know ?

... that the jarrah found on the Coastal Plain has been genetically separate from the jarrah on the Darling Plateau for 2.5 to 3 million years? Apparently at that time there was a major uplift of the Darling Scarp and incursion of the sea, such that some parts of the Scarp were coastal cliffs. That must have been sufficient to isolate the coastal plain population and because seed dispersal is very limited, this isolation can still be identified today.

Margaret Byrne, CALM



Roundup ® and frogs

In case anyone has read about some new research that purports to show that Roundup is more lethal to tadpoles than we had realised, John Moore (Weed Scientist, DoA, Albany) has taken the trouble to obtain and read the original papers.

He reports that the researchers were using it at much higher rates than usually applied in WA (indeed some of what they tried would be illegal here) and failed to distinguish clearly whether it was the active herbicide ingredient or the surfactant that was causing the problem. He concludes that 'normal' use should not cause frog deaths, but to be on the safe side near water, only those glyphosate products registered for aquatic situations (eg Roundup Biactive ®) should be used.

For a copy of John's 'Mythbuster' article, contact the Editor on pennyh@calm.wa.gov.au

Sale of *Lantana camera* now banned in WA

It is now prohibited to sell the weedy lantana, *L. camera*, in WA. This brings our State into line with the eastern States, where it is one of the most devastating environmental weeds. The ban does not affect *L. montevidensis*, a smaller, less aggressive plant with purple or white flowers.

People who have the plants in their gardens will not be affected, but no further trade or movement will be allowed from nurseries, garden centres or other outlets.

(For a photo of *L camera*, see "Western Weeds" p. 229)

NEW BOOKS

"Wajarri Wisdom"

Estelle Leyland

Published by The Yamaji Language Centre PO Box 433 Geraldton WA 6531 $30 Books can also be purchased from the office at Sanford Street Geraldton WA 6530.

A fascinating book in which Estelle Leyland has documented food and medicine plants of the Mullewa/Murchison District of Western Australia as used by the Wajarri people.

The book is divided into two sections, Part A Bush Food and Part B Bush Medicine. Chapters include discussion of nutritional values of bush foods, ancient apothecaries, how food was gathered and traditional implements used in the transportation and storage of items of food and medicine. Foods described include seeds, pods and beans, seeds from grasses, roots, tubers and bulbs, fruits, fungi, galls and insects, sweeteners, vegetables and water sources. There are full-colour photographs or line drawings illustrating each plant listed.

Fiona Falconer

"The Complete Field Guide to the Butterflies of Australia"

Michael Braby Pub: CSIRO Cost: $39.95

This is a superb guide. It will appeal immediately, with its simple, attractive layout. It is also convenient to use, and contains a wealth of information. The author, Dr Michael Braby, is probably the foremost expert on Australia's butterflies, and this book contains the latest information on all the 416 butterfly species currently known from Australia or its political territories.

The book is full of features convenient to the reader. It is of compact size, suitable for carrying in the field, in a rucksack. All the information on each species is together, in the one opening, the text and distribution map on the left-hand page, with the illustrations directly opposite, on the right-hand page. For most species there are four to six illustrations, showing the upper side and underside of each sex, and any different seasonal or geographical forms that may occur. Colours on the book's fore-edge enable readers to go straight to the right butterfly family. A further feature, just above the map, is a simple chart showing the months of the year when the adult butterfly appears. The succinct text on each species is full of useful information, including the butterfly's flight behaviour, habitat and status, and the plants on which it breeds.

Early chapters in the book provide useful general information, including the life-cycle of butterflies and how the different species are grouped into families. There are also discussion and pictures of the main butterfly habitats in Australia. This extremely useful book will encourage many more Australians to get to know our butterfly fauna.

Robert Powell

COMING EVENTS

YOUR WANDOO NEEDS YOUR HELP!

* Have you got wandoo on your block?
* What is its state of health?

The Wandoo Recovery Group needs help to set up permanent transects throughout the wandoo area to record the current health of the wandoo woodland. Although a major survey has already been undertaken (see WW 7/3, Jul 2003), detailed studies at individual plot scale now need to be done. You need:

* a stand of wandoo at least 100m long
* some time and patience.

All data will be combined in the search for a management solution.

Contact Liz Manning on 0427 441 482 or email lizmanning@bigpond.com for more details, including the survey sheets and info.

LAND FOR WILDLIFE WEBSITE

Our website has been updated! You can find copies of all Wildlife Notes on it, as well as contact details, current statistics, the registration form and other matters. By January 2006 there should also be a section on "Coming Events". This will specifically list things relevant to our tenth year.

The website will be brought up to date monthly.

See:
http://www.naturebase.net/orc/land_for_wildlife.html

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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