

Western Wildlife

LAND FOR WILDLIFE NEWSLETTER



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Conservation and Attractions

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QUENDA - FILLING AN IMPORTANT ROLE IN ENVIRONMENTAL HEALTH

Trish Fleming

Mycorrhizal fungi are vital to maintain plant health

Australia's ancient landscapes have infertile, weathered, nutrient-poor soils that are especially deficient in phosphorous and nitrogen. The vast majority of native plants (including all our *Eucalyptus* species) have therefore evolved symbiotic relationships with mycorrhizal fungi, which increase the opportunities of obtaining nutrients and water resources.

Mycorrhizal hyphae may extend metres into the soil from plant roots and access additional chemical pools of nutrients (e.g. phosphorous). They then release phosphatases or carboxylates that enhance the availability of organic phosphorous, or sparingly-soluble phosphorous, respectively. Fungi also represent a major contribution to plant nitrogen sources. In return the fungi are provided with photosynthates from the plant.

Mycorrhizal fungi play a vital role in maintaining plant health, increasing both plant vigour and resilience to root pathogens. These fungi therefore increase the capacity of plants to deal with abiotic and biotic changes.

Many mycorrhizal species form above-ground fruiting bodies (i.e. mushrooms and toadstools), but there are also many more that form spore-filled fruiting bodies underground (i.e. truffles).

Digging mammals assist dispersal of fungi

Mammals that consume the fruiting bodies of mycorrhizal fungi play an important role in dispersing these fungi. Digging up and eating truffles moves the fungal spores about the landscape. The spores pass intact through their digestive tracts and are deposited in their faeces*. For some fungi, passing through the animal's gut can break spore dormancy, leading to increased germination.

Although they have an omnivorous diet with a high reliance on invertebrate prey, bandicoots including the



Quenda are a type of bandicoot. They were previously grouped with southern brown bandicoots from the eastern states, but are now recognised as genetically distinct*. They are marsupials, and females carry their young around in a pouch. Photo: Narelle Dybing

quenda eat a considerable banquet of fungi. Our research team set out to identify just how much fungi quenda consume.

The diet of quenda has been relatively difficult to study for a few reasons. They are generally nocturnal, and much of their foraging goes on in the dark, when small items are consumed before you can even see them dug up. Material coming out in their scats represents the indigestible bits of their diet, such as insect body parts and fungal spores, while soft material (which would make identification that much easier) can completely disappear. This is where technology has come to the rescue.

We used DNA barcoding to determine what food items were present in 60 scats collected across a range of urban reserves. This technique allows a level of detailed analysis that would otherwise be impossible. The amount of DNA reads is a semi-quantitative approach that allows direct comparison between diet items for the same samples.

(Continued on page 3)



EDITORIAL

This issue of *Western Wildlife* has several articles that relate to ecosystem elements that require closer observation than we often indulge in as we walk through the bush.

Mycorrhizal fungi are often not visible, but underpin the health of many ecosystems and plant groups, and are more important than ever in supporting the resilience of dominant trees in our vegetation to impacts from disturbance and disease. Mycorrhizal fungi are also essential for germination and survival of orchids. Some orchid species can partner with a range of different fungi, and some require a more specific association. If you have a range of different orchids, it's one indicator that mycorrhizal fungi are present and supporting plant health.

Quenda are one of a range of digging mammals that support distribution of these fungi through bushland, as well as improving soil characteristics in other ways.

Euryglossine bees are also one of the small wonders of our native bushland, not often noticed. Euryglossine bees construct their nests in wood or in earthen tunnels, often with many nests constructed near one another in a small area. They make thin papery cell capsules from a salivary secretion which hardens into a cellophane-like material, and provision them with pollen-rich fluid, on which they lay an egg. They are some of the

very many invertebrates that support the food chains of the vertebrates we are more likely to see with a casual glance.

Priority flora species don't have arrows pointing to them in the bush either, so some interested people are upskilling to be able to seek them out in an effort to clarify their conservation status. *Land For Wildlifers* in the Wheatbelt are welcome to get involved with this project.

I'm pleased to be able to share a case in point where fencing and control of weeds and feral animals has been demonstrated to radically improve the health of an endangered rock wallaby population, and also the ecological health of the reserve they call home.

This issue is the first to come to you via email. This change in delivery is intended to reduce printing and delivery costs so that our resources can be more effectively utilised. If there is an alternative email address you would prefer to use to receive *Western Wildlife*, please let me know via email at lfw@dbca.wa.gov.au.

Contributions to *Western Wildlife* from *LFWers* are most welcome — it is always interesting to share observations from members, perhaps about species they have observed on their property, or response of their bushland to an event like fire.

My best wishes to you all,

Gillian Stack

Land for Wildlife Coordinator

These shrubs in Brigadoon are part of healthy vegetation, and provide vital nectar, pollen and resting and nesting shelter to a wide range of vertebrate and invertebrate animal species. Photo: Carole Anderson and Guy McElroy



PLEASE NOTE: If you change your postal address, phone number or email, or no longer own your *LFW* property, please let *LFW* know—contact details on back page!

CONTENTS

- 1 Quenda—filling an important role in environmental health
- 2 Editorial
- 5 Australia's little and little-known Euryglossine bees
- 8 Rare Flora Search and Rescue
- 10 Wallabies get some space
- 11 Felixer — feral cat control development
- 12 Peel-Harvey Catchment Council
- 13 Perth Natural Resource Management
- 14 Rangelands Natural Resource Management
- 15 South Coast Natural Resource Management
- 16 South West Catchments Council
- 17 Wheatbelt Natural Resource Management
- 18 Northern Agriculture Catchments Council
- 19 In brief
- 20 Rodenticide impact—Chuditch research

(Continued from page 1)

Our analysis revealed over 800 different fungi across our samples – each with its own unique barcode. Each scat sample contained an average of 46 different fungi (range 8–120). We had thought that we would be able to identify which species they prefer, but it turns out that our study shows us just how few of our fungi have been genetically identified previously. We could only assign 20% of the fungi to known species. For the rest, we know their DNA barcodes, but we have no library to match them to.

South-west Western Australia has a huge diversity of mycorrhizal fungi – probably greater than any other part of the globe. Much of this diversity lies beneath our feet, and most of us would therefore be unaware of this biodiversity treasure. I know that I was before we started this project.

Despite once being described as common, digging mammal species have been lost from the Australian landscape over the last 200 years. Around half of digging mammal species are now extinct or under conservation threat, and the majority of extant species have undergone marked range contractions*. Australian ecosystems have undergone a massive loss of ecosystem processes relatively recently. Effects of these losses – such as reduced plant recruitment and growth, flowering, seed set – are likely still to be felt.

Quenda are one of the only digging mammal species that have remained reasonably abundant across south-west Western Australia. Recognising where populations exist and continuing to quantify and understand their vital role in ecosystem health will help us work towards conservation of our precious bushland.

What can I do?

Quenda have been persisting in and around our cities across south-west Western Australia, suggesting that they are fairly resilient little critters, but we can help them too:

- Predation has been identified as a major cause of mortality in quenda*. Pest animal control (e.g. baiting or trapping of feral cats, dogs, foxes and pigs, and restriction of domestic cats and dogs) is therefore required in many bushland areas to protect this and other vulnerable native species. Semi-permeable fencing around bushland could help to prevent domestic dogs from entering, while leaving small enough gaps for quenda to pass through.
- Quenda live in many people's backyards in populated areas. It seems that they generally avoid backyards where dogs are present.



Above: Quenda use their extraordinary olfactory capabilities to sniff out underground food such as grubs and truffles. Photo: Joanne Brazier

Below: Native truffle species – they will probably never make it to our plates (they don't taste or smell that good to me), but they are culinary bliss for quenda. Photo: Backyard Bandicoots



Excluding your dogs from bushland or keeping them on a lead will help quenda* – even if your dog does not attack quenda, quenda will move away from cover if they are disturbed while they are sleeping, increasing their exposure to predators or being hit by cars. Restricting your cat's opportunity to hunt in bushland will also help.

- Quenda diggings across our lawns are valuable aeration of the soil, increasing water infiltration*. As an added bonus, the animals are probably digging out beetle grubs that would otherwise damage the roots of the lawn.
- Quenda sleep during the daytime in dense vegetation, so they will not benefit from garden or bushland 'clean-ups'. We often find them resting under the skirts of grasstrees where these touch the ground – naked grasstrees offer no protection, so please leave the skirts to become wild and woolly in areas which do not pose a fire risk to your home.

ECOLOGICAL CONNECTIONS

- We can improve the habitat quality of our backyards as well as bushland to maintain and potentially increase quenda populations. Retaining and planting dense native bushes which allow protection from predators, would be especially helpful. Many species are suitable, including *Acacia* and *Calothamnus* species. Native plant nurseries can often help with advice on which species are native to your area (not just native to Western Australia or Australia).

These tactics will benefit many other native fauna species vulnerable to predation as well.

Can quenda influence how we manage fire?

Quenda can influence the properties of fire. They bury leaf litter under the soil as they dig, which increases the rate of leaf litter breakdown, returning nutrients to the soil. This also serves to reduce fuel load for potential fire. Each quenda has a small role to play, but with a healthy population, their activities can quickly mount up. In reserves with digging mammals, there is 24% less leaf litter lying on the ground, which would have substantial impact, reducing flame height and rate of spread of potential fire*.

- Close to homes, planting low, dense shrubs rather than mid-height or tall dense shrubs will still provide the valuable cover these animals need, while reducing the risk of potential fire reaching into the canopy.
- Another way to reduce risk of fire moving from ground level into the canopy is to prune tree branches to a height of around 2m from the ground.
- Leaving gaps between clumps of cover will also help to ensure that fuel is not continuous.

All of these suggestions allow the presence of some dense low cover as habitat, while minimising fire risk near a home.

Dr Trish Fleming is a wildlife biologist. She spends her life following animals around the bush.

[* For references, contact Editor.]



Quenda leave a variety of size diggings. Nose 'pokes' are small disturbances of the leaf litter and top soil layers. Their foraging digs (shown here), made in pursuit of fungi, insects and plant bulbs deeper in the soil layer, are conical in shape (following the shape of their nose and jaw) with an average diameter of 100mm and depth of 70mm (depth range 35–135mm). My finger is pointing to the impression of the animal's tail, while the arrows indicate the impression made by the quenda's back feet while using its powerful front legs to dig through the soil in pursuit of food. *Photos: Backyard Bandicoots*



An example of dense low cover used by a different small mammal—this woylie nest was completely concealed beneath the low dryandra in the photo above, and only discovered when the woylie broke cover. *Photos: Kimberley Page*

AUSTRALIA'S LITTLE AND LITTLE-KNOWN EURYGLOSSINE BEES

Kit Prendergast

Australia has an incredible diversity of native bees, yet just a single non-native species – the European honeybee (*Apis mellifera*) – dominates media attention. While this species certainly plays an important role in the honey industry (especially in Western Australia where we boast some of the most sought-after honey in the world) and is a pollinator of various flora, including agriculturally-important crops as well as native flora, it is an introduced species. Hailing from Europe, it was introduced to Australia almost two centuries ago, and now exists throughout most of the country in both managed and feral colonies wherever there is free water available.

There are an estimated 2000 species of native bees in Australia, many of which have yet to be formally named and described. The most species-rich of all major taxa are bees in the subfamily Euryglossinae (in the Colletidae family). Save for just a few species in New Zealand and New Caledonia, this subfamily is endemic to Australia: found nowhere else in the world. Yet despite dominating the bee fauna in number of species, and often being relatively abundant, few people even know they exist, let alone can recognise them. Indeed, recognising euryglossine bees is no easy feat for the untrained eye, as this group of about 400 species comprises bees that are both very small, and don't fit people's conceptions of what a typical bee looks like.

Recognising euryglossine bees

All euryglossine bees are small to minute in body size, being less than a centimetre and most much less so. In fact, the smallest bee in Australia is a member of this clade – *Euryglossina clypearis* from Cape York in far north Queensland, is Australia's, and perhaps even the world's, tiniest bee. The male is a mere 1.8mm long, and the female 2.1mm long — unlike the typical sexual dimorphism in body size in mammals, the male is smaller than the female in most bee species.

An unusual feature of euryglossine bees is their lack of pollen-carrying hairs (known as scopae). They share this feature with the closely-related colletid bees in the subfamily Hylaeinae, commonly known as "masked bees". Although they do have some sparse hairs, these are short and are simple, as opposed to the branched structure of scopae that are adapted for collecting pollen. Common to all female bees (save the kleptoparasitic "cuckoo" bee species that lay their eggs in the nests of other bees), euryglossine bees still require pollen as food to provision their young with as a source of

energy, nutrients and protein. But rather than collecting it with scopae, the females ingest pollen and carry it to their nest in their crop (a thin-walled expanded area of the alimentary tract used for food storage) which they then regurgitate. Their small size, lack of hair and behaviour of swallowing pollen makes them relatively poor pollinators, but euryglossines are nevertheless important components of ecosystems and a valuable, irreplaceable component of Australia's natural heritage.

Apart from being small and relatively unhairly, euryglossine bees are diverse in form and colour. Some species are fairly nondescript, with black or dark brown bodies. Others have brilliant patterns, often of gold or vivid yellow and black.

Because they are small and unhairly, many people may mistake euryglossine bees for flies or small wasps. But closer inspection reveals they clearly differ from flies in having two sets of wings (rather than one pair and a small pair of 'halteres'), longer antennae, usually smaller eyes, and different wing venation. They also differ from wasps in the venation of their wings, having a less jerky flight than wasps, round rather than 'bean-shaped' eyes,

Euryglossina (Euryglossina) perpusilla. The pattern of rigid veins which help to support the wings in flight varies between insect groups and are important identification features. *Photos: Kit Prendergast*



FAUNA

antennae that are typically higher up on the face than in wasps, and a different tongue structure. Unlike wasps, whose young feed on other insects, euryglossine bees feed exclusively on pollen and nectar.

Very little is known about the reproduction of euryglossine bees, and few observations of mating have ever been made. One remarkable reproductive behaviour that has been recorded is the mass mating swarms of species in the subgenus *Xenohesma*, genus *Xanthesma*. In the hotter months hundreds of male bees will form mating swarms, where like a murmur of sparrows, they zip back and forth in a "cloud." Females are attracted to the cloud of male bees and fly in where they are quickly taken by a male, with copulation ensuing. To aid in seeing the females as soon as they arrive, the males have evolved enlarged bulbous eyes. Having witnessed one of these swarms, with the minute black and bright-yellow males flying back and forth, I can attest it is quite a spectacle, made all the more remarkable when I saw the amazing eye morphology and vivid colours when viewing some male specimens I collected up close under the microscope.

As with mating behaviour, little is known about the nesting habits of euryglossine bees, as nesting observations are few and far between. It appears

the majority nest in the ground, but two genera – *Pachyprosopis* and *Euryglossina* – nest in tiny pre-made cavities in wood created by termites or wood-boring beetles. Indeed, I have observed female *Euryglossina perpusilla* bees nesting in tiny pre-made holes in a branch of an old banksia tree.

As with the majority of bees, and unlike honeybees, euryglossine bees are solitary. They do not live in colonies, and every female is capable of reproducing, unlike the single breeding queen of a honeybee colony, with sterile daughters who maintain the hive, care for their younger sisters, and forage for food.

After a female euryglossine bee has mated she will dig or locate a cavity to nest in. At the end of a shaft she will create one or more cells (depending on the species), which she then provisions with nectar and pollen, collected over a number of foraging forays. Once she has stocked enough food in the cell to meet the energy requirements of a bee to develop from egg, to larva, to pupa, to adult, she then lays an egg and seals the cell, thus marking the end of her parental involvement with her offspring. She will then start working on another cell.

As with all bees (and indeed all Hymenoptera – bees, wasps, ants and sawflies), euryglossine bees



Xanthesma (Xenohesma) perpulchra females (left) and males (right).

The greatly enlarged eyes of the males is a diagnostic characteristic of *Xanthesma (Xenohesma)* species. The males form large flying aggregations which attract females. Females that fly into the swarm are quickly discovered by the males thanks to their enormous eyes, which give a substantial field of vision.

Photos: Kit Prendergast

have haplodiploid sex determination: fertilised, and thus diploid eggs with two sets of chromosomes develop into females, whereas unfertilised, and thus haploid eggs with just the maternal set of chromosomes develop into males.

Plant associations

Most euryglossine species are restrictive in which plants they forage on. At least twenty species in the subgenus *Euhesma*, genus *Euryglossa*, forage exclusively on plants in the genus *Eremophila*, many of which are commonly known as emu bushes or poverty bushes. All 260 or so *Eremophila* species are endemic to Australia, and are particularly associated with more arid regions of the continent, being especially abundant in WA. The euryglossine species that specialise on *Eremophila* have co-evolved with the relatively tubular floral structure such that they are adapted to match the flower's form: all have modifications to the head and mouthparts, in particular having elongated and enlarged segments.

Other euryglossine bees are strongly associated with Fabaceae, and indeed I have collected many from native pea plants including the south-west WA endemic species grey stinkwood (*Jacksonia furcellata*) and green stinkwood (*Jacksonia sternbergiana*).



Female euryglossine bee (undescribed *Euhesma* species) foraging on green stinkwood (*Jacksonia sternbergiana*). Photo: Kit Prendergast

The plants that attract the most euryglossine bees, however, are mass-flowering Myrtaceae, such as marri (*Corymbia calophylla*) and jarrah (*Eucalyptus marginata*). Indeed, I've sweep-netted literally clouds of tiny euryglossine bees from the blossom-laden branches of these WA native trees.

I have been studying native bee assemblages in

the urbanised region of south-west WA. The suburbs of Perth are situated in an internationally-recognised biodiversity hotspot. Biodiversity hotspots support a high diversity of species (>1500 endemic plant species), many of which are endemic – found nowhere else on the planet. South-west WA clearly fits this criteria: almost 80 percent of the 7239 vascular plant species are found nowhere else in the world. Another feature of biodiversity hotspots is that they have undergone extensive land-clearing, with losses of over 70 percent of their original habitat, and unfortunately this is also certainly true of south-west WA: it has been estimated that 93 percent of the original vegetation in the Wheatbelt and 80 percent of the Swan Coastal Plain has been completely cleared.

Originally much of the land was cleared for agriculture, but an increasing threat is land clearing to make way for urban expansion. My study has involved surveying native bee communities in residential gardens and in urban bushland remnants, and one finding that has emerged is that euryglossine bees in particular are strongly tied to bushland remnants. Although they do occur in some residential sites, this is entirely dependent on the presence of native Myrtaceae trees – namely marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), and red-capped gums (*Eucalyptus erythrocorys*) that line verges. These findings highlight the fundamental role of bushland remnants, as my findings underscore that residential gardens cannot perform the same role in supporting euryglossine bees. Unfortunately, councils are often called on to chop down large trees perceived to be a hazard, but this would destroy the only valuable resources for euryglossine bees, as well as a suite of other species, that are strongly tied to such native trees. These trees take decades to grow, and are not easily replaced.

Euryglossinae are wonders of evolution. This diverse group of tiny bees are inimitable components of Australian ecosystems. Their tiny forms reveal exquisite details of beautiful and bizarre features and adaptations. If we are to preserve thriving communities of these unique bees, it is vital that we preserve intact, natural bushland ecosystems and prevent further destruction of native ecosystems and their biotic components, including in urban areas.

Kit Prendergast is a zoologist and conservation biologist completing her PhD as a Forrest Scholar studying native bees in south-west WA. She hosts the Facebook group 'Bees in the 'burbs in a biodiversity hotspot', where members can learn and share knowledge, observations and photos of native bees, and participate in citizen science projects.



FLORA

RARE FLORA SEARCH AND RESCUE

Judith Harvey

Rare Flora Search and Rescue is an exciting citizen science project, and a collaboration between the Wildflower Society of WA, WWF-Australia and the Department of Biodiversity, Conservation and Attractions (DBCA). It has engaged and is still engaging volunteers from the city and regional areas to help search for our rare and poorly known flora in the Wheatbelt.

Priority flora are considered potentially rare, but can't be afforded additional legal protection as Declared Rare Flora until survey has established that there are not plenty more just waiting to be found. This project is looking at Priority 1 and 2 species, which are those that are under threat and known from only a few records.

The project is focusing on the highly cleared areas between Geraldton and Esperance. We inform, train, support and equip volunteers to enable them to search for these rare and poorly known species independently in the future.

Volunteers are registered with DBCA to provide health and safety training, insurance cover and eligibility for volunteer rewards. Participants with good botanical knowledge can obtain a Scientific or Other Prescribed Purposed (SOPP) Licence so that voucher specimens can be collected from new populations and lodged at the WA Herbarium and relevant regional herbaria. This is important evidence to verify our ever-growing knowledge of native flora. Any photographs submitted to Florabase must be associated with a voucher specimen lodged in the Herbarium, ensuring the photo is labelled accurately.

Flora Collector is an app developed specifically for this project which enables the collection and collation of information from volunteers in the field, including mapping of flora.

Fact sheets for 50 target species provide information about existing and potential locations, plant descriptions, habitat, other indicator species and key differences between similar common and priority species. Permission to search on private



Gastrolobium tenue, a low bushy shrub and Priority 1 species. Photo: Eddy Wajon

property is sought in areas where suitable habitat occurs.

Results

Public interest and participation in the project has been great. During the initial survey period of June – November 2017, 50 survey days were conducted by 76 individuals. Thirty six of those individuals participated in two or more surveys and 40 people came once. Well over half (64%) were from the agricultural regions, often people associated with Regional Herbaria in Newdegate, Ravensthorpe, Esperance, York, Wongan Hills, Jurien Bay and Merredin. A total of 175 volunteer days, valued at over \$36,000 (@ \$30/hr) were contributed to the project by the community.

Fifty-five people were trained in the use of the Flora Collector app — most people preferred to use it on their own Android or iOS devices, but some devices were available through the project for others. Developing the tools and the skills of participants means this new capacity to gather information about priority flora species will extend beyond the life of the project. Five DBCA flora conservation officers provided background information on the species, previous survey information and participated in the training and surveys. DBCA has committed to support coordination of these regional surveys into 2019.



Members of the Jurien Bay Regional Herbarium and others with *Calytrix ecalycata* subsp. *pubescens* east of Dandaragan. Photo: Julia Cullity



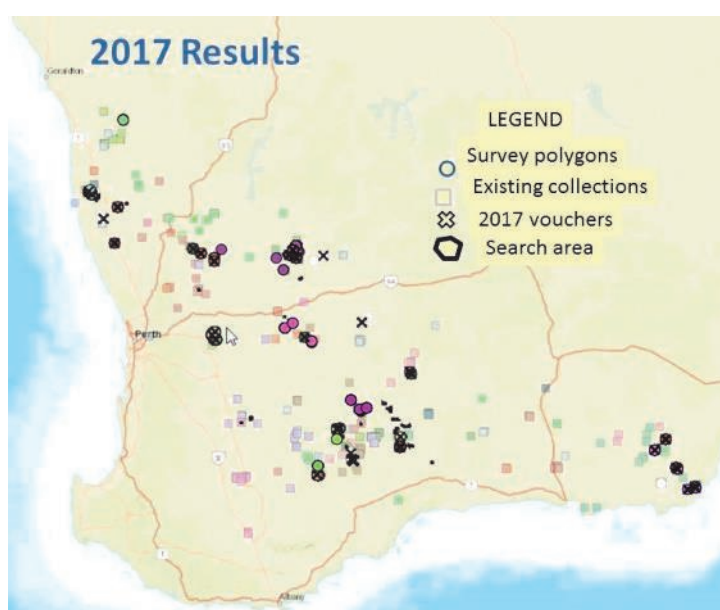
We searched for 38 species in 2017, and found 32 new populations of 11 species. Twelve new populations were found near Newdegate (four of *Drosera grieviei*, three of *Banksia epimicta*, three of *Gastrolobium euryphyllum*, one of *Astroloma chloranthum* and one of *Roycea pycnophylloides*); and another six were found near Jurien (three of *Lyginia excelsa*, two of *Stylidium* sp. Banovich Rd and one of *Calytrix ecalycata* ssp. *pubescens*). Two new populations were located east of Esperance (both of *Eucalyptus luculenta*), and one each near Wongan Hills (*Guichenotia glandulosa*) and York (*Eremophila glabra* ssp. *York*).

The data can be viewed on NatureMap and will be incorporated into the DBCA Threatened and Priority Flora database.

All the data collected is being reviewed and recommendations made for further areas to survey or reclassification. Surveys can clarify the habitat preferences of a species, refining areas to target for further survey. When survey has established whether a Priority species is more common than was known, or is genuinely rare, recommendations will be made to reclassify the conservation status of that species.

Surveys ongoing — in your bushland?

Much of the survey in 2017 was carried out on reserves but we are also keen to survey private bushland. If you are in the Wheatbelt area, please contact Judith if you wish to know what Priority flora species may be in your area or if you would like to become involved. Judith can be reached at Judith.Harvey@dbca.wa.gov.au or 0409 290 610.



38 species surveyed, 114 populations seen, 32 new populations discovered, 161 search areas covered and 40 voucher specimens collected.

Judith Harvey is a vegetation researcher and is currently volunteer coordinator of the Rare Flora Search and Rescue Project.



Hemigenia sp. Newdegate, a spindly low shrub and Priority 1 species. It is in the Lamiaceae family, along with mint, basil, and rosemary, which share the characteristic two-lipped, open-mouthed tubular flowers. Photo: Anne Rick



NatureMap is a tool to view species occurrence data on an online map. It is possible to search by species (for example, where have numbats been found?) or by location (for example, what different species have been found near my property?). Threatened species will stop being displayed on the map when the zoom gets too close. Clicking on individual points gives you more information about each record, such as when it was seen and perhaps habitat notes.

Species lists can be generated for an area, giving you names to put into search engines to learn more about the native species that live in your area. You can also generate the list as a spreadsheet if you want to make notes about which species you have seen on your property.

Access it online at naturemap.dpaw.wa.gov.au. Registration is not necessary to view information or download reports from that information; only to download spatial data.

Contact the editor if you would like tips for use.

FAUNA

WALLABIES GET SOME SPACE

Jazmin Lindley

A revisit to Nangeen Hill Nature Reserve these days will warrant an extra look. The reserve is slowly but surely recovering from years of overgrazing from both introduced herbivores and a special macropod the reserve is renowned for - the endangered black-flanked rock wallaby (*Petrogale lateralis lateralis*). It has been over five years since the reserve and its inhabitants were protected by an introduced-predator exclusion fence and a lot has changed.

Nangeen Hill Nature Reserve is located south of Kellerberrin in Western Australia's Wheatbelt region, and supports 200 hectares of woodland and *Allocasuarina* shrubland surrounding a granite tor. It has long been held in the hearts of locals and conservationists alike.

The black-flanked rock wallaby has been of continuing interest to conservationists. In the WA Wheatbelt it has persisted in small areas within a landscape where the native vegetation has been heavily fragmented. Highly efficient introduced predators became common, as did introduced herbivores that competed for scarce resources like food and shelter. Many other populations became locally extinct.

The nature reserve is managed by the Department of Biodiversity, Conservation and Attractions (DBCA). During the early 1980s, Dr Jack Kinnear of the department conducted research on the use of 1080 poison baits to control fox predation on the black-flanked rock wallabies. This was extremely successful for many years and was a forerunner to what became the *Western Shield* wildlife recovery program. Jack continued to be a key driver in the fight to protect the black-flanked rock wallabies up until his passing earlier this year.

Fencing key to improved ecological balance

With the assistance of a WWF-Australia grant, the department constructed an electrified fox and cat exclusion fence around the perimeter of Nangeen Hill Nature Reserve in 2013. This, coupled with long-term introduced predator baiting in the reserve under *Western Shield*, saw rock wallaby numbers increase from five individuals up to 90 in 2018.

Management within the reserve continued, with weed control of ice plant and capeweed the first priority. This was followed by the planting of native tree and shrub species within the then bare meadow of the main rock refugia. Greening Australia, the Department of Primary Industries and Regional Development and WWF-Australia



Nangeen Hill Nature Reserve in August 2016, three years after the fence was installed. Photo: Natasha Moore/DBCA

were involved in this planting, with direct seeding and planting of tube stock of local species. A prescribed burn was conducted by DBCA staff in 2015, targeted to regenerate senescent rock wallaby feeding habitat. Native species have regenerated well. Annual rabbit control was vital to the success of the rehabilitation work, protecting both the plantings and natural recruitment from over-grazing.

The Nangeen Hill rock wallaby population became strong enough to be used as one of the sources of animals for translocation into Kalbarri National Park, with animals being moved to different locations in the gorge in 2016, 2017 and in May 2018. Those translocated animals were radio-collared and tracked over the next 6-12 months. Results from this year's monitoring show the Kalbarri population to be breeding and thriving in their new environment.

The fencing and other management has provided a unique opportunity to observe the impact of baiting and fencing and their relationship to predator fear behaviour in the rock wallabies at Nangeen Hill. Where once they did not range more than 20-30 metres from the fractured rock, they are now being seen on remote cameras foraging up to one kilometre from the rock. This change in behaviour is thought to be a response to a decreased fear of predation, similar to the behaviour shown by rock wallabies on islands where there is an absence of introduced predators.

This is good news for the rehabilitating meadow, as it reduces the grazing pressure and shifts it to a more even spread throughout the reserve. With steady rainfall in the Wheatbelt this year, the future is only looking brighter for this endangered species and the majestic reserve they call home.

Jazmin Lindley is a flora and fauna operations officer with DBCA's Wheatbelt Region.



Left: Black-flanked rock wallabies at home. Photo: © D. Parer and E. Parer-Cook

Below: Textured pads on the hind feet help the wallabies to navigate their rocky habitat with confidence. Photo: Briana Wingfield



FELIXER — FERAL CAT CONTROL DEVELOPMENT

Gillian Stack

The substantial impact of feral cats on native fauna is well-established — they are implicated in the extinction of more than 20 of Australia's native mammals and the reduced abundance and distribution of many more native species.

While DBCA's Eradicat® feral cat baits are showing promising results in some areas during field trials, additional methods of feral cat control are also being developed for locations or seasons when baiting may not be effective or possible.

One such method is Felixer, a device that targets cats through their strong grooming instinct. The Felixer grooming trap has been developed by environmental consultancy Ecological Horizons, and shows promise as an effective supplementary method of control. It uses an array of ranging sensors to identify the shape and speed of passing animals. Feral cats have a higher shoulder and belly line than many similarly sized native animals, and a different gait. When a target animal (feral cat or fox) is identified from the pattern of sensors activated, a sealed dose of toxic 1080-based gel is squirted onto the animal. The grooming response of the cat or fox results in the gel being ingested.

Fauna species from WA generally have a tolerance to 1080 toxin due to it occurring naturally in native *Gastrolobium* plants ('poison peas'). Introduced animals have not evolved with the toxin, and it is lethal even in small amounts.

The design of the Felixer's weather-proof, solar-powered unit has been refined and improved over several iterations with a view to its eventual commercialisation. This could offer a valuable (although expensive) new tool for land managers. It should be noted that this method of detecting feral cats and foxes would also target pet cats and small dogs, so use of a grooming trap would be constrained in residential and rural areas unless cat-sized pets were wearing special tags that block the Felixer from firing.

A two-year research trial is currently being conducted by DBCA in the Pilbara to verify the target specificity and effectiveness of the units in northern quoll habitat. This project is a collaboration between DBCA, Roy Hill Holdings, Fortescue Metals Group and Ecological Horizons. The units were initially used in photo-mode only while checks were made on accuracy of target detection. High accuracy rates of target/non-target detections have been reported in the trials conducted to date, and introduction of the toxic gel is planned.

The success of the grooming trap depends on the cat walking past the unit. Speakers play audio-lures such as recordings of birds and mice to entice predators towards the unit, and it will be interesting to see if this is effective.

The grooming traps could be very useful in areas where there is a natural bottleneck in the landscape, or a special population which requires additional protection. They would be particularly useful around threatened species enclosures that are patrolled by cats, or on peninsulas or otherwise narrowed vegetation that would increase the likelihood of feral cats coming into contact with the unit.

Felixer enquiries can be sent to felixer@thylation.com.



A northern quoll investigates the Felixer and is identified as a non-target. Photo: Judy Dunlop/DBCA



Jordon Garbellini

Banksia woodlands are a beautiful feature of the Perth and Peel regions extending north and south across the Swan Coastal Plain from Jurien Bay to Dunsborough. Banksias, the feature plant of this community, are in an ancient family of plants that began appearing around the same time as the extinction of dinosaurs, about 70 million years ago.

To prevent them from going the same way as the dinosaurs, 'Banksia woodlands of the Swan Coastal Plain' were listed as a Threatened Ecological Community (TEC) under the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2016.

These banksia woodlands are characterised by four dominant tree species: firewood banksia (*Banksia menziesii*), candlestick banksia (*B. attenuata*), acorn banksia (*B. prionotes*) and/or holly-leaved banksia (*B. ilicifolia*). Current knowledge indicates that banksia woodlands play a key role in supporting over 600 native plants, 74 reptiles, 16 mammal, 38 bird and seven frog species.

Banksia woodlands have evolved over thousands of years to support numerous important connections between plants and animals. For example, the extended flowering period of the dominant banksia species helps to support many nectarivorous birds and other fauna that rely on flowering species for food all year round, including the honey possum (*Tarsipes rostratus*).

Rare and threatened species that call the woodlands home include the endangered Carnaby's cockatoo

(*Calyptorhynchus latirostris*), western quoll or chuditch (*Dasyurus geoffroii*) and the brush-tailed phascogale or wambenger (*Phascogale tapoatafa* subsp. *wambenger*).

The woodlands have been listed as a Threatened Ecological Community as they have been extensively cleared since European settlement, and those areas remaining are under increasing threat. Today remaining areas are cleared and being degraded by urban development and mining, unauthorised vehicle access, rubbish dumping, feral animals and the spread of *Phytophthora* dieback disease. Together with these threats, climate change is contributing to decline through groundwater depletion, altered fire regimes and other ecosystem changes.

Active management of remaining banksia woodland remnants is essential to combat these threats and restore and maintain healthy woodlands. The Peel-Harvey Catchment



Acorn banksia (*B. prionotes*). Photo: Mark Brundrett

Council is keen to work with landholders and land managers to restore and protect banksia woodlands. If you are interested in hearing about possible future funding opportunities to help protect banksia woodlands please contact us at admin@peel-harvey.org.au.

Banksia woodland on the Swan Coastal Plain, with firewood banksia (*B. menziesii*, left), candlestick banksia (*B. attenuata*, centre), grasstrees and red and green kangaroo paw. Photo: Mark Brundrett

Scattered eucalypts and other tree species may occur within or above the banksia canopy, and the understorey is species-rich with many wildflowers, including shrubs, sedges and herbs.



PERTH NRM

Luke McMillan

Perth NRM has been hard at work this year developing our Living Landscapes Program under the Federal Government's Regional Landcare Partnerships program. It has been a rewarding challenge to identify common ground between our own local and regional environmental priorities and the national and international priorities of the Regional Landcare Program and try to build projects to satisfy a broad range of stakeholders. We are very pleased to be putting the finishing touches on two successful projects, 'Living Landscapes: Back from the Brink Project, Stage 1' and 'Living Landscapes: Improving the condition of Threatened Ecological Communities in the Swan NRM region, Stage 1'.

We will be managing threats and doing restoration work in some critical habitats, working with our partners Australian Wildlife Conservancy, WWF-Australia, the Ellen Brockman Integrated Catchment Group, the South East Regional Centre for Urban Landcare, the City of Swan and the Department of Biodiversity, Conservation and Attractions. The current projects are for 2018-19, and we hope to extend these a further four years, through to 2023.

The 'Living Landscapes: Back from the Brink Project, Stage 1' project targets strategic management activities to achieve an 'improved trajectory' of five priority threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These species are the black-flanked rock wallaby (*Petrogale lateralis*), chuditch (*Dasyurus geoffroii*), woylie (*Bettongia penicillata*), western ringtail possum



Claypans of the Swan Coastal Plain Threatened Ecological Community at Forrestfield Nature Reserve, part of the Living Landscapes project. Photo: Luke McMillan

(*Pseudocheirus occidentalis*) and Carnaby's cockatoo (*Calyptorhynchus latirostris*).

The 'Living Landscapes: Improving the condition of Threatened Ecological Communities in the Swan NRM region, Stage 1' project will improve the condition of eight EPBC Act-listed Threatened Ecological Communities (TECs) across fourteen sites in the Swan NRM region. The figurehead TEC for the project is 'Banksia woodlands of the Swan Coastal Plain'.

'Stage 1' projects operate exclusively on public lands and Australian Wildlife Conservancy sanctuaries. In addition to continuing these works in 'Stage

2', we are exploring options to use the projects to resource delivery of some *Land for Wildlife* services in the region. We are also considering how we might engage with the existing LFW network to support threatened species and community recovery on LFW properties.

If your property is in the Swan NRM region and contains habitat for EPBC Act-listed threatened species or TECs, and you would like to register your interest in taking part in future Living Landscapes projects, please contact Luke McMillan on 9374 3321, or at luke.mcmillan@perthnrm.com.

Chuditch, or western quoll (*Dasyurus geoffroii*). Photo: Mick Davis



LFW & NRM PARTNERSHIP

RANGELANDS NRM

Mez Clunies-Ross

Would you like to be involved in a new pilot program combining conservation work with grazing systems? Want help making your station *Land for Wildlife* too?

Rangelands NRM are in the process of rolling out a tailored and locally relevant *Land for Wildlife* pilot program in the WA Rangelands.

This pilot program will provide the opportunity for land managers to better integrate conservation values into a productive pastoral/grazing system. In the first instance the new pilot program will provide the opportunity to 'beef up' your wildlife-friendly credentials with programs you're probably already employing, without compromising existing farm income streams, and by creating mutually-beneficial business and environmental services.

This integrative approach will focus on understanding basic habitat needs of the wildlife native to your area, and assist you to spot key indicators for what's benefiting these animals and their habitats. We will support you to marry some of these things together within your existing grazing systems.



Hamersley Gorge. Photo: Mez Clunies-Ross

The result? A well-credentialed plan to show how your station is taking a holistic landscape management approach to production in 2018 and beyond.

The *Land for Wildlife* process will help consolidate your understanding about how your existing operations already implicitly benefit wildlife habitat. This will lead on to how you may wish to expand on the good work you're already doing in practical station-friendly ways. Potential projects will be developed in association with the land managers.

For example, some land managers are working on developing fire strategies for their spinifex country to bring a finer-grained fire-scar mosaic back to the country to minimise the risk of damaging wildfires. This is being done in association with grazing-based fuel reduction and actual prescribed burns, which they see as benefiting their pastures as well as the key wildlife species being affected by severe wildfires.

In another example, some producers are identifying key wildlife refuges such as wetlands and looking to minimise disturbance through different grazing strategies and virtual fencing systems.

Land for Wildlife is all about helping producers showcase what they're already doing and identifying strategies that fit within existing operations to benefit wildlife.

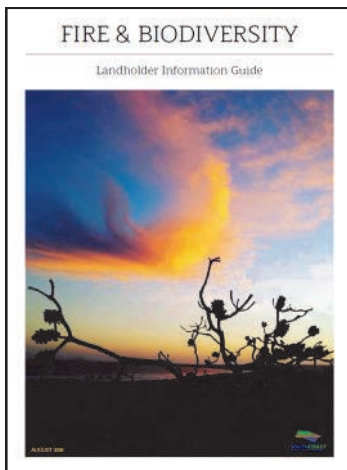
We are seeking expressions of interest from stations/land managers that would like to be part of the pilot *Land for Wildlife* program in the WA Rangelands. For more information please contact Mez Clunies-Ross on 0413 857 048 or maryannec@rangelandswa.com.au.

Spinifex shrubland. Photo: Mez Clunies-Ross



SOUTH COAST NRM

Meredith Spencer



**South Coast NRM
Fire and Biodiversity
Landholder
Information Guide—
balancing wildfire
risk reduction with
biodiversity
conservation.**

Land for Wildlife landholders are well aware of what a devastating bushfire could mean for their properties. The *South Coast Fire and Biodiversity Information Guide* can help landholders apply practical measures that both manage bushfire risk and protect biodiversity values on their land.

The guide is useful for applying risk reduction activities in both urban and rural environments. It was developed for the south coast of WA but is based on broader principles that are relevant across southern Western Australia.

Protection of life and property continues to drive fire management decisions and recent changes to legislation and policies have increased obligations for landowners in relation to bushfire risk. However, there are excellent opportunities for landholders to contribute greatly to the

maintenance of our unique biodiversity through their fire management decisions.

The guide outlines practical considerations when managing fire for biodiversity conservation and describes the relationships between fire, fuels, plants and animals. It includes information on:

- ecological responses to fire
- planning and management guidelines for the risks associated with undertaking burns
- using fire to manage fuel loads for reduction of bushfire risk
- promoting regeneration of some vegetation communities through managed fire regimes.

Included is information on planting design and suitable species, as well as management of small and larger parcels of remnant bushland beyond the asset protection zone. While many animals and plants have adapted to fire, others in our region are fire sensitive, and property owners need to be aware that any fire in these ecosystems will cause irreversible change to the biodiversity values on their property.

The guide also discusses interactions of fire with other types of disturbance such as *Phytophthora* dieback, invasive weeds, grazing and feral animals, and provides a summary of relevant legislation and useful links to further information.

The guide concludes with specific ecological considerations for the region's animals and plant species, providing advice to assist with the planning of fire regimes that will help to maintain our unique wildlife and habitats.



The guide will shortly be printed for distribution. Please contact South Coast NRM for a copy on 9845 2355 or info@southcoastnrm.com.au.

A controlled cool burn being undertaken on private land in the Walpole area. This is being undertaken to reduce fine fuel in the vicinity of the house, thereby reducing the potential intensity of a future wildfire in that area.

Photo: Brett Dal Pozzo



Brian Chambers

Most people are aware that Australia has the undesirable claim to the world's worst mammal extinction rate over the past 200 years. Many people are not aware that almost half of the species that have been lost are fossorial, or digging, mammals. Many other fossorial species have suffered major contractions in their distributions and are now found in small isolated populations at significantly lower densities than they were prior to European settlement. This loss of digging mammals has potentially caused serious disruption to and contributed to the decline of many of our ecosystems because of the important role that these species played through their digging activities.

Fossorial mammals can move an enormous amount of soil per individual through their digging activities. Woylies are estimated to move more than 5 tonnes of soil per year per individual* and quenda have been estimated to move over 3.9 tonnes per year*. Burrowing mammals, such as bilbies and boodies, can move almost 10 times the amount of soil relative to their body weight. This turnover of soil has a multitude of benefits to ecosystems, including the inclusion of organic matter and nutrients into sub-surface soil, improvement in water penetration and inoculation of the soil with fungal spores.

Australia has some of the oldest and most nutrient-depleted soils on the planet and our native ecosystems have evolved over millions of years to cope with this poor soil quality. Digging mammals have played an important role in supporting ecosystem function in these poor quality soils through turning over the soil and mixing



Once widespread, boodie populations were wiped out on the mainland, surviving only on islands. They have since been reintroduced to feral-proof enclosures in mainland WA, NSW & SA. Their complex burrows (below) typically have several entrances and interconnecting passages, and can shelter many animals. Photos: Judy Dunlop/ DBCA

organic matter below the surface. The diggings created by these mammals fill with organic matter and hold moisture longer than the surface soil, making them the ideal place for seeds to germinate more successfully.

Digging mammals also play an important role in improving water infiltration into our notoriously water repellent soil. The soil in the hole and the spoil heap from the digging have substantially lower water repellency compared to undisturbed soil which is important in allowing the

infiltration of rainfall, particularly during the autumn months*.

Protecting our medium-sized fossorial mammals is likely to be critical to addressing the decline in many of our native ecosystems. It's not simply a case of needing to protect habitat for the benefit of native fauna, but protecting entire ecosystems so that the processes crucial to their function can be maintained.

Contact swcc@swccnrm.org.au or 9724 2400.

[* For references, contact Editor.]



WHEATBELT NATURAL RESOURCE MANAGEMENT

Rowan Hegglun

Wheatbelt Natural Resource Management Inc (Wheatbelt NRM) is an independent community-based organisation working across the Wheatbelt to meet the vision outlined in the Regional NRM Strategy – “A healthy environment that has a viable agricultural industry and retains a strong sense of place.”

We believe the only way we can achieve this vision is by developing a legacy of community action. We approach our work in partnership with the community. Currently one of our focus areas is the Wheatbelt woodlands threatened ecological community.

The ‘Eucalypt woodlands of the WA Wheatbelt’ are listed as a critically endangered Threatened Ecological Community (TEC) under Commonwealth legislation, and are in decline across their range due to myriad threatening processes. This unique ecological community and the ecosystem services it provides are not well understood and require further investigation. It is important to preserve this community in a functional state — in order to achieve this, we must first have a greater understanding of where the woodlands are and the kinds of management interventions required to improve their condition.

The conservation advice for the ‘Eucalypt woodlands of the Western Australian Wheatbelt’ recognises that land tenure within the key Wheatbelt subregion is over 80 percent freehold. Wheatbelt NRM aims to involve the community to help secure these woodlands for future generations. To aid in identification and help increase understanding, Wheatbelt NRM is developing an assessment tool that will enable

community members to assess patches of vegetation for consistency with the TEC conservation advice. Importantly, the assessment tool will also identify which remnants require specific management actions, such as a reduction in rabbits, excluding stock or infill plantings.

The woodlands themselves are characterised by the dominant presence of a range of eucalypt trees, including salmon gums, York gums and wandoo. The TEC is comprised of a multitude of complex sub-communities, which can be differentiated by the dominant eucalypt species present and associated understorey species. A range of iconic Wheatbelt plants and animals, including chuditch, red-capped robin, ornate dragon and tawny frogmouth, call the woodlands home and are important components of some sub-communities.

Wheatbelt NRM is also looking for the endangered matchstick banksia (*Banksia cuneata*) throughout the region. The current extent has been severely reduced and remaining populations are fragmented. Current monitoring shows continued population decline, and intervention is needed now to ensure the continued existence of this beautiful plant. Matchstick banksia is found in small, localised patches of scrub-heath or open woodland on deep yellow sands. These specific requirements explain the smaller population sizes and considerable distances between remaining populations. It is known from the Pingelly, Brookton and Quairading areas - if you believe you have matchstick banksia on your property Wheatbelt NRM would love to hear from you.

For more information on how you can be involved in protecting the Wheatbelt woodlands, please contact Anika Dent at Wheatbelt NRM on adent@wheatbeltnrm.org.au, or 9670 3104.



Left: Salmon gum woodlands with dampiera and everlastings in flower. Photo: Wheatbelt NRM

Below: Matchstick banksia (*Banksia cuneata*). Photo: Andrew Brown/DBCA



Jessica Stingemore

Do you have bushland that needs protection from feral animals? Would you benefit from the use of motion sensor cameras, cage traps, or funding for baiting? Whether it be on your property or a local community reserve or creekline, the Northern Agricultural Catchments Council wants to work with communities and land managers to protect natural areas from feral animal impacts.

NACC currently has two projects available to land managers in the Northern Agricultural Region – *Feral Fix: Feral Animal Education and Control* and *Rabbit Awareness Project*.

The *Rabbit Awareness Project* will improve landholder awareness in the Northern Agricultural Region regarding the importance of employing alternative methods of managing rabbit population size that coincide with the release of biological control virus. It will also involve the release of the biological control RHDVI-K5 calicivirus at selected sites.

Feral Fix aims to improve community capacity and increase the number of land managers adopting more coordinated approaches to feral animal management. Cage traps and motion sensor camera loans, together with support for baiting and shooting events will reduce the effects of cats, foxes, pigs and rabbits on biodiversity assets, including threatened flora, mammals, birds and reptiles.

The loan of motion sensor cameras has proven to be popular, with land managers regularly returning SD cards full of interesting photos. Some interesting captures have included a family of emus, murders of crows, willy wagtails



A brushtail possum seen on a LFW property near the Murchison River. Brushtail possums lead a largely solitary life and home ranges vary from one to 15 hectares. Photo: NACC

chasing sheep, black cats, tabby cats and fat cats.

One camera from a *Land For Wildlife* property along the Murchison River even captured a brushtail possum. Although the possums' range extends into the Pilbara, predation by red foxes has been catastrophic in arid and semi-arid areas of their range, and there can be large gaps between populations. The impact has been severe rather than catastrophic in the higher rainfall areas of the south-west, and better where foxes are controlled. All of this makes this northern sighting very interesting, so the NACC team are hoping to set a few more

cameras to monitor the population. Tree hollows are very important habitat for this species to shelter from predators, as for many others.

Not to be outdone by the native wildlife, one very cheeky farm dog tempted by the chicken wing used to attract feral cats to the cage trap, set off the trap mechanism and spent the night feeling rather sorry for herself. Luckily only her ego was damaged!

For more information about these projects or to express your interest contact NACC's Biodiversity Coordinator Jessica Stingemore on 9938 0106 or jessica.stingemore@nacc.com.au

One sheepish dog. Photo: NACC



A PLACE IN THE COUNTRY

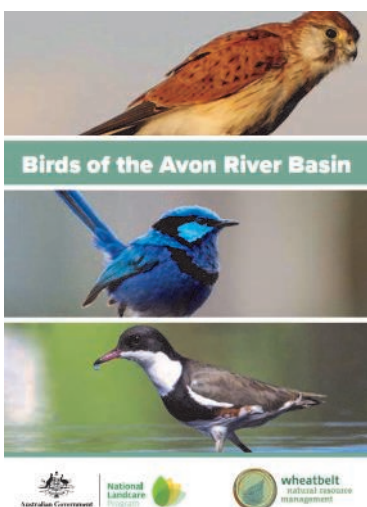
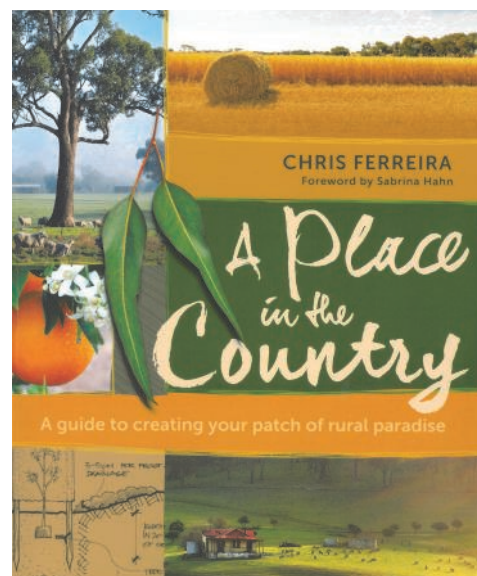
Chris Ferreira (Fremantle Press)

A Place in the Country is a fantastic new book for small (from 0.5 to 1000 hectares) property owners, written in a very readable style.

It covers topics of key relevance to LFW members, including managing bushfire risk, developing healthy soils to increase productivity, establishing shelterbelts, protecting old growth trees, managing remnant bushland and revegetating cleared areas. Chris Ferreira offers strong advice on the right questions to ask yourself about what you want to get out of any particular feature and the property overall; the kind of information you will need to develop and build on your answers; plus where to find that information if it is not presented in the book.

For example, the design and placement of shelterbelts is described in detail, with information about the problems a good shelterbelt can address, characteristics of a good shelterbelt, and the different ways it can be achieved depending on what else you want from your shelterbelt—a pasture-belt to protect pasture and crops, wildlife corridors, firebreak belts to reduce fire risk, timber-belts for firewood and so on. Species suggestions are made, with the note that locally native species are often best suited to local growing conditions, and will provide the most ecological support to local wildlife. It also covers management that will be required to sustain the function of the shelterbelt as it ages, in keeping with the dynamic nature of living systems.

All in all, a great text to develop and inform a cohesive management plan for a small property, or just the particular tasks that you want to undertake.



BIRDS OF THE AVON RIVER BASIN

Wheatbelt NRM

Birds of the Avon River Basin is an excellent guide book to the birds of the Wheatbelt region, available free of charge (download from wheatbeltnrm.org.au).

The Avon River Basin covers an area from Toodyay to east of Southern Cross; from Dalwallinu to Lake King. If your property is anywhere within that zone, and possibly also beyond, this book is for you!

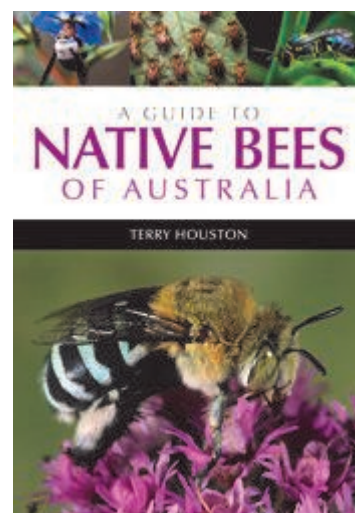
It provides some useful introductory information, including habitat types different birds occur within, and birds are grouped by areas you are likely to observe them. Very usefully, it also includes notes of behaviours and other distinguishing features that may assist with identification.

A GUIDE TO NATIVE BEES OF AUSTRALIA

Terry Houston (CSIRO Publishing)

In this book Terry Houston presents a wealth of information about native bees, their biology and behaviours, as well as information on encouraging native bees in the garden. (A number of these principles can be extended to revegetation too!) He indicates that bees occupy almost all terrestrial habitats, with greatest diversity in the semi-arid, temperate regions.

The guide also provides sufficient information to identify any native bee to family and genus, if not species. (With some 2000 species, many not formally described, this seems more than reasonable.) Accurate identification will also likely require at least a hand lens, or better for the enthusiast, a stereo microscope, but if you are not committed to having that level of certainty, an interested observer could learn a lot from this book just narrowing an identification down to a few suspects, or indeed building general knowledge without a particular bee to identify.



RODENTICIDE IMPACT—CHUDITCH RESEARCH

Gillian Stack

There are good reasons for mouse and rat control, but choice of method can have unseen flow-on effects. Rodent poisons can impact heavily on native predators like owls and chuditch, with some poisons worse than others. If physical traps are impractical in your situation, look for rodenticides that have warfarin or coumatetralyl as an active ingredient. These break down much faster in the body and so are less likely to be lethal to predators higher up the food chain. That is, the predator is more likely to be able to process that dose before receiving another dose in another meal, keeping the effects sub-lethal, although not necessarily inconsequential. Similar to the effects of alcohol on a human, the 'hangover' of processing the toxin can make them more vulnerable to other mishaps like car strikes.

Chuditch research - can you help with conservation of this threatened species?

High levels of multiple rodenticides have been detected in two chuditch from the Perth area, and researchers would like to investigate further to get a better understanding of how these predators might be impacted and by which rodenticides.

If you find a dead chuditch, please freeze it and label with the date and location it was found and contact

information for the collector. Road-killed chuditch can still provide very useful information. Researcher Mike Lohr can be contacted on m.lohr@ecu.edu.au to arrange delivery. Your assistance will be much appreciated.

This information will add to information gained recently about rodenticide impact on boobooks, another predator of small mammals.

[For more information on Mike Lohr's research into southern boobooks see Western Wildlife 20/1.]



Chuditch on the move. Photo: Kimberley Page



Western Wildlife
LAND FOR WILDLIFE NEWSLETTER

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Land for Wildlife

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Reader contributions to Western Wildlife are welcome via above contact points.

Website: www.dbca.wa.gov.au/landforwildlife

A range of LFW publications are available for download from the website.

Facebook: www.facebook.com/LandForWildlife

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

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