DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA

Western Wildlife

LAND FOR WILDLIFE

April 2004 Vol. 8, Number 2

NEWSLETTER OF THE *LAND FOR WILDLIFE* SCHEME

REGISTERED BY AUSTRALIA POST PRINT POST: 606811/00007

NATURE-BASED FARM TOURISM – MAKING IT HAPPEN!

Fleur Porter

IN Jan 2001 we embarked on a nature-based tourism venture on our family farm located on the Murchison River in the Midwest of WA. We called our venture "Riverside Sanctuary" to compliment our existing farming enterprise "Riverside Ajana", and in the two and a half years since its inception have enjoyed (almost) every minute.

My family has been at "Riverside" since 1927. The Porters originally settled in Ajana in 1910 on a block 'big enough to starve on' before acquiring more land further north-east. "Riverside" was a traditional wheat and sheep farm, riding along on the sheep's back for many years and supplementing the farm income with various crops. After many years my dad, Bob, slowly began to decrease the number of sheep with a view to phasing them out entirely. The damage being done to the land and the bush was not worth the work or the income. We took on share-farmers in about 1995 and we would crop part of the land and they would do the rest, but for the last 3 years they have cropped the entire property. This arrangement has worked really well and has taken the management pressure off dad and given us time to focus on other things.

We have about 15kms of Murchison River frontage running through the middle of the property. Most of this area has been protected from livestock since 1965 because it was easier to muster stock at watering points rather than having them roaming free-range in the river, but this has been one of the best management decisions made on the farm during that period of time. The river had always been a popular place to visit, for the family and for the local people, and it had become quite degraded. Duck shooting was a regular activity and the river had stopped being a safe environment for native wildlife. In 1989 the entire length was fenced off to protect the riparian zone from vehicles and to give the bird life some peace. The changes to the river have been amazing and documented on a series of slides Bob has taken. This Slide Show and a number of walk trails to the river are just a few of things we offer our guests during their stay with us.

But to begin with we had a long way to go.....

Barriers/the hard stuff and Opportunities/the good stuff to consider:

Employment: One of our weaknesses was 'employees', or a lack of. At the early stage I was working in Geraldton and couldn't commit to the farm full-time so an opportunity arose to employ someone to assist. We employed Angie Goddard as a Landcare Trainee for 18 months, thus providing her with a fantastic training opportunity and giving us the extra assistance we needed.

Finance: Once we had acquired some more hands, Bob and Angie started on the hard task of renovating existing accommodation. We had spare houses on the farm, all of which have now been fixed up. This

continued on page 4

EDITORIAL

Greetings all!

IN March, all the *LFW* staff got together for our annual workshop - always an inspiring event hearing about all the things happening in different regions. One interesting session this year was a discussion with Herbarium botanist Colin Yates about what triggers Salmon Gums to regenerate, and how we can mimic this in remnant woodlands. More later!

We also considered future directions that the programme should take. When it was set up, *LFW* had a '10-year plan'. Now that we are in Year 8, we need to seriously consider whether we are achieving our aims. Should we continue as before or, perhaps, change to new directions? At some time we will be asking you, the *LFW* members, to give us your thoughts on this. Please consider, what could *LFW* do that would help you most?

New to the group was Julia Boniface, the new *LFWO* based at CALM Nannup. Middle Blackwood members might like to give her a call to say hello. At the moment she is working hard to catch up with the local issues in her area. As well as knowing the local ecology, Julia is a permaculture expert, so, if you have any queries along those lines, she'd like to hear from you!

This is rather a small issue as many potential authors are overburdened by other priorities, or else have gone away for holidays over summer. Nevertheless, I hope everyone will find something of interest.

Keep an eye out in the media for the results of the national 'Banksia Awards' which are judged in May. "Riverside Sanctuary", who tell their story in this issue, is an entry in the category "Business Environmental Responsibility and Leadership", while *LFW* has been entered in the category "Environmental Leadership in Communications". Wish us both luck!

Penny Hussey

LFW sites on maps for NRM planning

I owe you all an apology over this 'box' in the last issue - first of all it said "please reply by 1st Feb" and many people hadn't even got the magazine by then. I apologise, production delays occurred which were beyond my control. Of course, if you wish to discuss this or any other matter, call me at any time: (08) 9334 0530.

The second point was the use of capitals; readers who are not familiar with the formal landcare scene found them confusing. Below are some of the abbreviations I used, and what they stand for.

NHT = Natural Heritage Trust. A Commonwealth Government funding programme.

NRM = Natural Resource Management. "The ecologically sustainable management of the land, water and biodiversity resources for the benefit of existing and future generations, and for the maintenance of the life support capability of the biosphere."

NRM Councils = the community committees who will plan for NRM in their region, and then deliver NHT funding to impliment their plans. The six NRM Councils are: Rangelands, Northern Agricultural, Swan, South West, Avon and South Coast.

CLC = Community Landcare Coordinator. Locally based landcare facilitator.

CSO = Community Support Officer. Locally based NRM facilitator.

RVPS = Remnant Vegetation Protection Scheme. A fencing subsidy provided through the Department of Agriculture, now no longer operating.

Penny Hussey

INDEX

Contact details for *Land for Wildlife* Officers

	Location	phone & email
Heather Adamson	Merredin	(08) 9041 2488 heathera@calm.wa.gov.au
Avril Baxter	Narrogin	(08) 9881 9218 avrilb@calm.wa.gov.au
Julia Boniface	Nannup	(08) 9756 1465 juliab@calm.wa.gov.au
Fiona Falconer	Coorow	(08) 9952 1074 davidfiona@bigpond.com
Claire Hall	Perth	(08) 9334 0427 claireh@calm.wa.gov.au
Penny Hussey	Perth	(08) 9334 0530 pennyh@calm.wa.gov.au
Rosemary Jasper	Ravensthorpe	(08) 9838 1890 rosemaryj@calm.wa.gov.au
Cherie Kemp	Busselton	(08) 9752 5533 cheriek@calm.wa.gov.au
Zara Kivell	Mundaring	(08) 9295 1955 zarak@calm.wa.gov.au
Sylvia Leighton	Albany	(08) 9842 4500 sylvial@calm.wa.gov.au

REVEGETATION

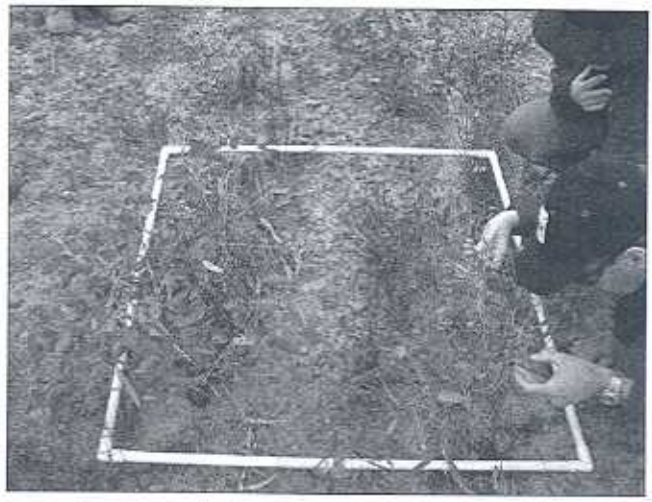
IMPLEMENTING A BIODIVERSITY REVEGETATION PROJECT

Susie Murphy White

FROM 2000 – 2003 there were 18 revegetation sites implemented as part of the Biodiversity Revegetation Project or 'Meta Project' in the Wallatin Creek catchment, Doodlakine. These sites were planted on 117ha using 122,000 local provenance seedlings and 12ha of direct seeding. The focus for these revegetation sites was biodiversity with most sites able to implement part of a landscape design that was produced by CSIRO focal species approach. At the same time the sites needed to address land degradation issues like salinity and be workable into the farming system.

Implementing the project involved selecting the sites using aerial photography, combined with the focal species landscape design and the potential recharge maps. A revegetation plan was developed in conjunction with the farmer to ensure that revegetation design fitted into the farming system and met the nature conservation goals. A planting map was developed through this process. These sites included corridors, expanding remnant areas that were under the minimum requirements, reconstructing a Banksia patch, sandalwood plantings and seed production areas. This was followed by negotiating cost sharing arrangements with the farmer.

The focal species approach first developed by Robert Lambeck at CSIRO identifies remnant vegetation patches that failed to meet the spatial requirements that are needed by a focal species. The most sensitive species is the 'focal species', in this case the focal species were birds. Guidelines regarding composition, quality and configuration of patches were used to guide reconstruction of the main habitat type. The focal species analysis defines the features that must be present in a landscape after considering the threats responsible for decline.

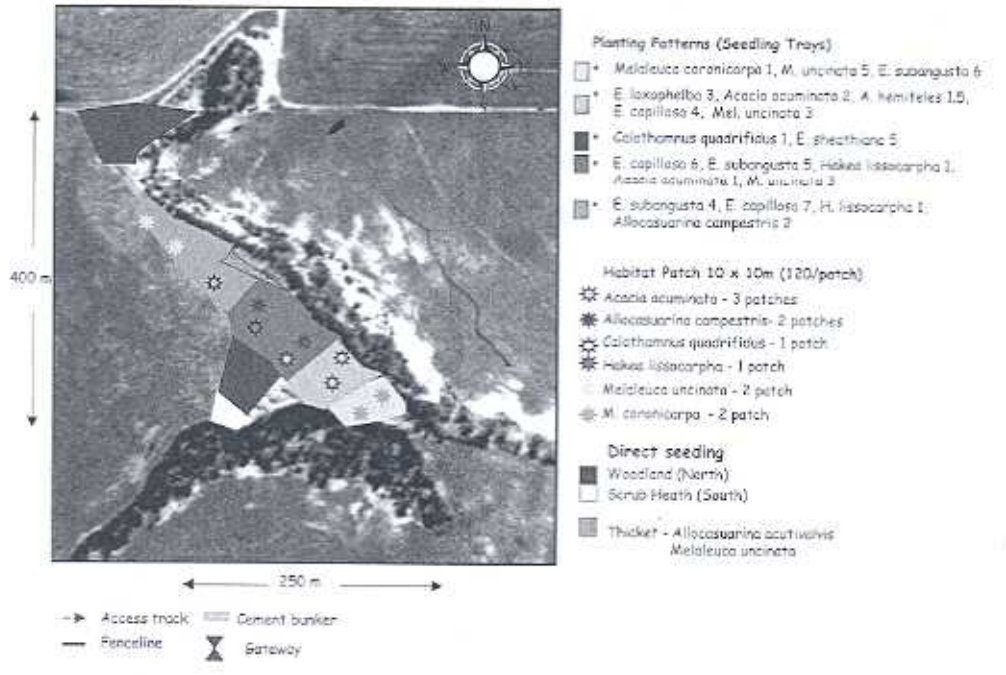


Measuring survival in direct seeding area.

The potential recharge map developed by the Dept Agriculture focus catchment process delineates areas

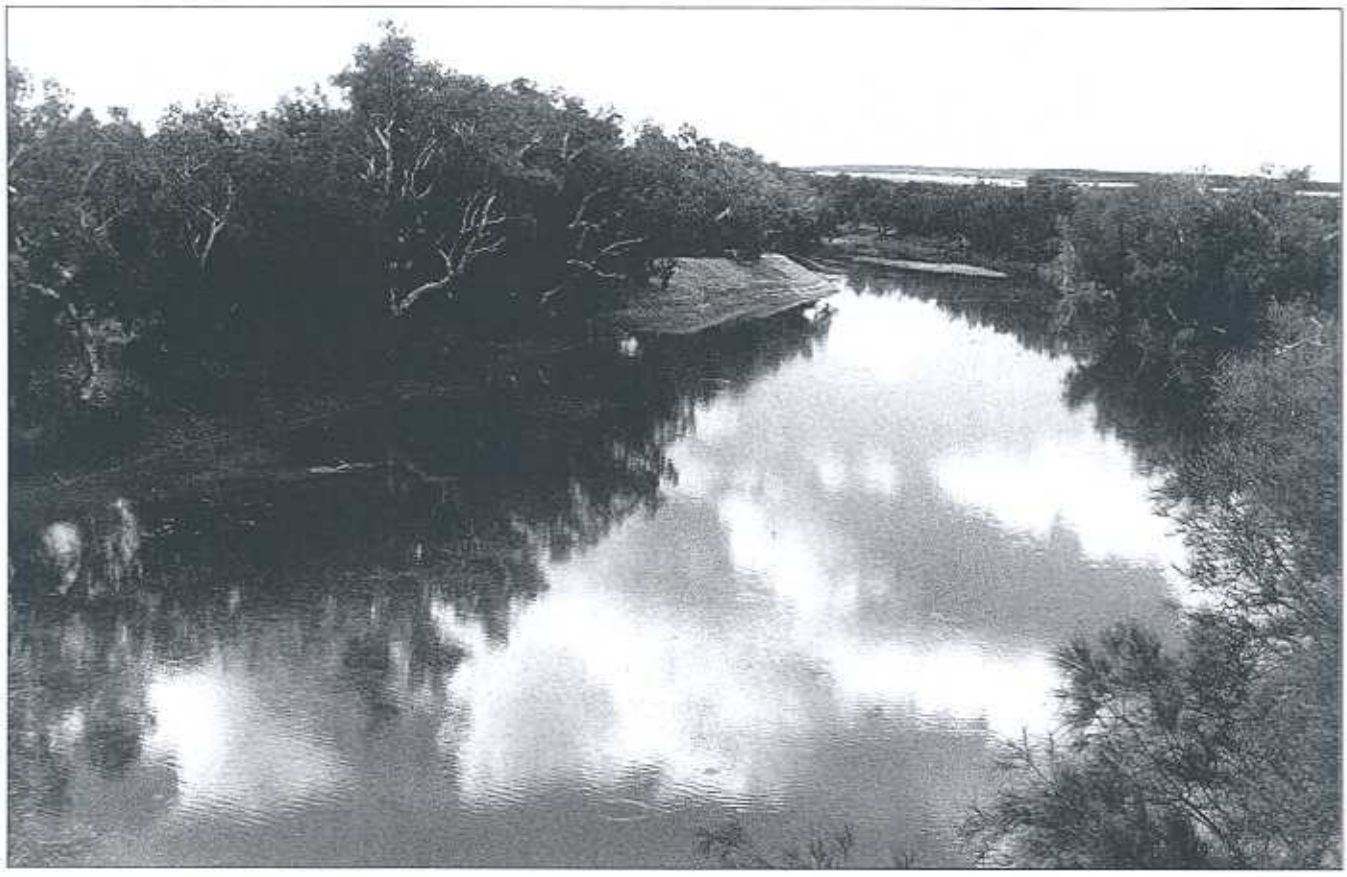
continued on page 8

Breakaway Revegetation planting design (60 seedlings per tray)



continued from page 1

ECONOMIC VALUE OF BIODIVERSITY



Murchison River at "Riverside Sanctuary".

brings in another barrier - money. We are fortunate that our venture is backed up by a profitable farming business. If we did not have the money to invest in getting started we would be struggling now. Fortunately we started with a view of doing something different and not of making money and this has meant we are not struggling to make tourism financially viable in the first few years. This takes some of the pressure off and means you are able to work at establishing your product and reputation before stressing about raking in the dollars. Our initial set-up costs have been the biggest expense, but then there are ongoing costs such as employment, maintenance, marketing and new big ideas. At present (after 2.5 years) the venture is probably just beginning to pay for itself, but it will still take a while to get ahead.

Making it a comfortable place to stay: People are more and more looking for comfort in the bush. There are those who will be happy with shearing shed-style back-packers accommodation, but in general we have found that people like creature comforts. They love seeing the bush and the river and the flies all day, but like to have somewhere clean and comfortable to go home to. For us it was a matter of thinking about what kind of places we would like to stay in. We have also since expanded and made changes to our shearing shed to accommodate groups, and we have found we can just about do anything - it is a matter of being flexible with our arrangements. This flexibility is definitely another trait important to running such a venture.

Marketing: The next hard task has been marketing. We have had to consider our product carefully and therefore our market. We have a definite conservation angle to what we do, the focus on nature, conserving the environment and the Aboriginal and European heritage of our area. The most important thing, I think, is establishing our reputation, almost all the visitors say they would like to come again. We had 10 000 brochures printed. It is definitely worth getting more printed, you are much more eager to give them away, which is how people get to know about you! Our website www.riversidesanctuary.com.au was designed by my brother and has generated many bookings. Marketing is definitely a tricky one and is worth talking to as many people as you can to find out what works for them.

Beautifying our surroundings: We are beautifying the farm bit by bit. We had a major clean-up to get the houses in order and

ECONOMIC VALUE OF BIODIVERSITY

plans are beginning for gardens and pathways and walk trails. It just makes the place you live a much nicer place to be, not just for tourists but for us too!

Mixing farming and tourism: Certain times of year at the farm are pretty busy, and it's important to make sure that you can maintain your product when you may not have as many helping hands. During seeding and harvest Bob and my partner, Russell, work with our sharefarmers, so Mum and I have to manage the fort. Although it may mean a heavier load for us, many of our visitors love to see the big machines in action – and we can show them our cropping enterprise working alongside, and as a part of, our land management. It is almost impossible to separate the two, because that landcare work here has provided part of our tourism product and many of the stories of our history and heritage are related to farming.

Discoveries and personal education: Taking people on tours and showing them around makes room for many more discoveries and for personal education. My parents started a herbarium collection in 2000, and still every time we go out in the bush we discover something new. Your appreciation of the Australian bush grows each time you hear someone exclaim how beautiful or amazing or diverse it is.

Event organisation and educational opportunities: We have organised a number of events including National Tree Day planting events, the Great Marsupial Night Stalk spot-lighting tours and tree planting events for school groups. These events don't make money, but they are a great social event, people get to come and see what you have to offer and there is the chance to educate people on the importance of looking after the environment.

Bob, Dawn, Fleur and Russell.

Meeting people: One of the most rewarding aspects of nature-based tourism is the people you meet. Because we have a product that is based on what we do and what we are passionate about, the people who came often share those values. So we learn a lot from them too. Much of what we do is simply based on Australian rural hospitality, which is something we have always done, and they love it. Some of the comments we have received have been so good it's almost embarrassing. But I wanted to share one with you because often the simplest things are what people enjoy and remember the most. And that is an opportunity because often it is stuff you do every day.

"We enjoyed the most: peace and quiet, sitting by the river, seeing a red capped robin, April's 'news', the slide show, the generosity of inviting us to a meal, hearing about the innards of feral cats, everything!"

Which just goes to show that maybe you just need to see the potential of what you have! Once you have a vision and have the logistics sorted, you will just need to be ready to share yourself and your time with people and be passionate about the environment, your home, the local community - and want to talk about it a lot!

Ps 'Riverside Ajana' was assessed for Land for Wildlife *registration in 1997 and we are number 18! Not a bad effort!*

FAUNA

HOW WELL DO YOU KNOW YOUR NEIGHBOURS? (THE WESTERN SPOTTED FROG STORY)

Robert Davis

FOR the last two hours, I have been driving through brown and parched agricultural land, an endless sea of sheep and wheat broken only occasionally by a small remnant of deliciously pink salmon gums and thick, scrubby Acacias. The sun had been shining brightly on my trip from Perth, but now that I have reached Kellerberrin, it's a different story. Standing in a remnant patch of *Banksia prionotes* all ablaze with fiery orange and pink flowers, and seething with Spiny-cheeked Honeyeaters, I watch nervously as dark storm clouds scud towards me, the sky painted with lightning. The wild winds wail around me, sweeping through the She-oaks and blasting through the Banksias. The distant paddocks become obscured in a blanket of rain and I begin to shudder as cold drops run down my neck. I race to my vehicle and shelter in its warmth, listening to the vicious torrents of rain beating a rhythm on the roof.

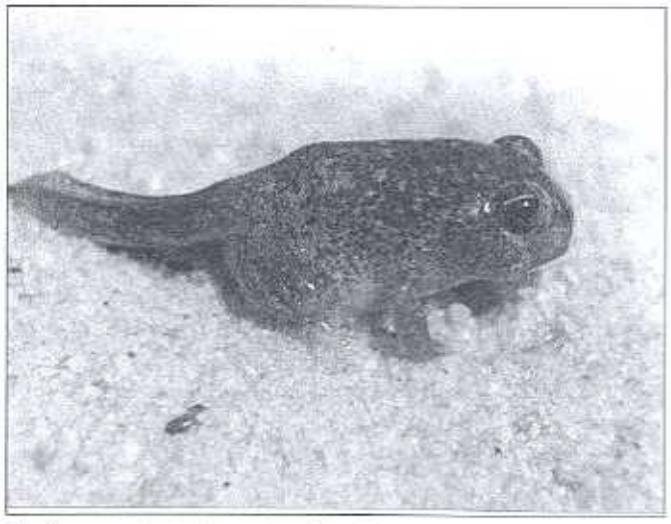
Now, fast-forward one year. I am sitting under the old tin verandah of a rambling farmhouse waiting for rain. It's hot and dry and I watch as warm winds sweep across the parched paddocks, whipping up small clouds of red dust. Galahs suddenly burst into the blue sky, thundering past me in a whir of wings as a passing car disturbs them from their quiet solitude. I notice dark thunderclouds building on the horizon again, another bluff! Yesterday I had raced along the Great Eastern Highway from Perth through a gigantic front. It rained solidly for the entire two-hour journey, with water streaming across the road in a tumultuous torrent. But alas, as soon as I got towards Kellerberrin, the heavens cleared and the fiery sun burnt away the rain clouds. By the time I arrived in the town it looked like a desert dustbowl. The drought still had not broken, sheep lay dead in fields, the historical buildings were coated in a layer of red dust and I presumed that the frogs were still holed up in their cool, moist, below-ground retreats.

These two frustrating climactic extremes are just some of the many challenges I faced during my four year PhD study on frogs at UWA. You may be asking yourself why anyone would study frogs in this dry area receiving an average of less than 350 mm of annual rainfall? The answer is that the central wheatbelt encompasses much of the range of a species of large burrowing frog called the Western Spotted Frog *Heleioporus albopunctatus*.

This species is found throughout the semi-arid region of WA from near Kalbarri in the north-west to Esperance in the south-east. Western Spotted Frogs have a unique breeding system. Males excavate burrows up to 1 m deep in sandy areas surrounding ephemeral waterbodies and start calling from burrows in autumn (March/April). Mating occurs in the burrow and females deposit a foamy egg clutch of up to 800 eggs in a chamber at the base of the burrow. Development to early-stage tadpoles takes place within the eggs, but final hatching is dependent on winter rains filling the waterbody and flooding burrows. Tadpoles then hatch and complete development in the pond.

So why did I choose Kellerberrin? The Kellerberrin region is an old and extensively cleared shire with only 7% of its native vegetation remaining, primarily as small fragments and roadside corridors. Kellerberrin thus unites my two passions, namely metapopulation ecology and frogs.

Western Spotted Frog.



No longer a tadpole, not quite a frog!

FAUNA

Burrows.

Study site.

"Meta *what*?" I hear you say. Put simply, a metapopulation is an ecological concept describing the structure of populations in a landscape. Frog populations can be found at suitable locations all across the landscape. A single population does not have much chance of indefinite survival on its own. It all comes down to how well you know your neighbours! The long-term survival of a population may be ensured if it is linked to other nearby populations. In the same way that people might move house to another town or city, frogs often disperse to neighbouring populations. This can have a number of benefits for their neighbours. Dispersers bring in new genes that increase the genetic variation of their new population and decrease its chances of becoming inbred due to a decline in genetic variation. They may also bolster populations that are in decline (known as the rescue effect) due to an ageing population and finally in the same way as a person moving to a new town, they may bring new skills or attributes. In a frog's case this may be being a good breeder and therefore bolstering the recruitment rate of very small populations.

This is all well and good, but what if you can't migrate between populations? This is the problem facing the Western Spotted Frog. A large-bodied species endowed with white spots and big soulful eyes, it is facing a tough existence in a highly modified landscape. Most of the species' former breeding sites have been lost due to rising salinity, and it is now largely found in man-made breeding sites such as roadside ditches. Its breeding sites are few and scattered, and individuals have to walk (or hop!) up to 2 km across cleared paddocks to get to neighbouring populations. From an ecological perspective it is important to know if this landscape (in this case the wheat paddocks of Kellerberrin) is hostile to species and if individuals can form metapopulations with other nearby populations. Most individual Western Spotted Frog populations are now facing an array of problems including high soil and water salinity, early pond drying and predation. Ultimately, however, the long-term survival of this appealing frog may depend on how well it gets on with its neighbours.

To investigate if these frogs knew their neighbours, genetic studies were undertaken in a transect from the most easterly range of this species, near Southern Cross, to their westerly range in the Darling Scarp near Perth. The results revealed that although there was generally a low level of genetic differentiation (consistent with gene flow and therefore dispersal, across the range), a number of populations suffered from apparently high levels of inbreeding (some of the highest recorded in any other frog studies). This indicated that gene flow between some populations was being restricted. What factors might have caused this restriction of gene flow? Traditionally, gene flow can be obstructed by large natural barriers such as mountains and drainage systems or by human modifications such as roads that are barriers to dispersal. I was unable to pinpoint the exact cause of these high levels of genetic subdivision, but investigated several possible causes including large-scale salinity and cleared land (paddocks) acting as barriers to dispersal. I found no obvious clue as to why some populations were suffering from restricted gene flow, but it didn't appear to be related to isolation by paddocks. Further studies in this area may shed some light on this.

Isolation is not the only issue Western Spotted Frogs face. There are a number of other threats arising from man-modified landscapes, including poor reproductive success resulting from increased salinity, breeding ponds that hold water for only short periods of time and the impacts of sustained drought on populations. Studies of recruitment success (basically how many offspring are produced each year) showed that over 87% of 45 breeding ponds studied failed to recruit juvenile frogs over a three year period! I measured many aspects of water quality, including salinity, but

continued on page 8

FAUNA

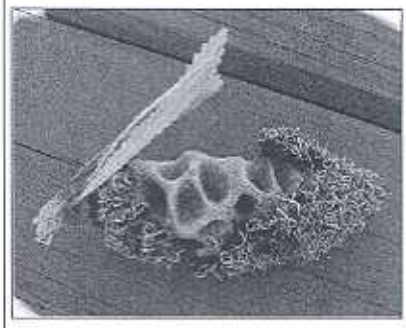
The Western Spotted Frog continued from page 7

the majority of recruitment failures were due to ponds never filling with water (especially in the drought of 2001) or ponds drying too early, leading to mass tadpole deaths. It seems that the problem might lie in the Western Spotted Frog's switch to human-modified landscapes. It now breeds in ditches, salinity-interceptor banks and dams which do not hold water for long enough. The cues for breeding sites (possibly the ability to sense below-ground water) often lead to ludicrous situations like frogs calling in the damp sections of a paddock that is never likely to form a pond! It wasn't all bad news though. Some populations did recruit each year and these were the ones with the deepest ponds that held water for more than 3 months. Ongoing studies to identify these important breeding ponds will assist in managing this species.

Anyway, there is much more to tell, so stay tuned for more on this topic in future issues of *Western Wildlife*! Meanwhile if you are lucky enough to have Western Spotted Frogs in your area, listen out for their mournful calls drifting across the landscape on a still moonlit evening in autumn. Spare a thought for these amphibian battlers adapting to a human-modified landscape ... and hope that they are well acquainted with their next-door neighbours!

Robert Davis is in the process of finalising his PhD thesis in Zoology at the School of Animal Biology, UWA. He has studied Western Spotted Frogs and other frog species for the past 5 years.
Rob can be contacted at rob@graduate.uwa.edu.au and would love to hear of any Western Spotted Frog sightings. An electronic copy of the Western Spotted Frog call is available on request, to aid identification. The best time to look and listen for these frogs is during the autumn breeding season from March to late June.

BUSH DETECTIVE



This cone was found beneath Slender Banksia, *B. attenuata*, trees at Yanchep last November. It has been stripped right back to show the rather beautiful pattern made by the inside of the seed follicles. Can you guess how this was done?

Ans: Quite right! It was done by our noisy friends with the immensely powerful beaks, Carnaby's Cockatoos. They open the cones so that they can eat the seeds. (Thank you to David Lamont for this puzzle.)

Implementing a Biodiversity Revegetation Project continued from page 3

that are contributing to a rising watertable. High recharge areas are in the upper catchment and commonly form undulating landforms. Low recharge or discharge areas occur in the drainage lines or valley floor. A network of piezometers is located across the catchment and indicates the watertable rise after long term monitoring. This map was used to identify areas of high potential recharge that could be revegetated to prevent the further spread of salinity in the Wallatin Creek catchment.

Local provenance seed was collected each year from Nature Reserves and some private remnants in the catchment. This seed was used for both tube stock and direct seeding. In the second year of the project each farmer who had a revegetation site was invited to come and help collect seed for a couple of hours. This enabled them to understand the techniques in seed collection and appreciate the importance of local provenance seed.

The tube stock was grown in selected nurseries. These nurseries were visited during the growing season to ensure that seedlings were produced to specified standards.

The site preparation included ripping to a suitable depth and controlling weeds by herbicide application. Planting each revegetation site took place in partnership with the farmers, Revegetation Officer, other CALM staff and local volunteers.

A debriefing meeting and dinner was organised after the planting season with the farmers who had revegetation designs implemented. The debriefing questionnaire results were compiled to improve the adoption and implementation of the project and associated revegetation techniques. It was also used to document the decision-making process used by landholders.

These biodiversity revegetation sites have been written up as case studies and can be found on the Nature Base website along with other tools and tips for revegetation. http://www.calm.wa.gov.au/projects/habitat/revegetation.html

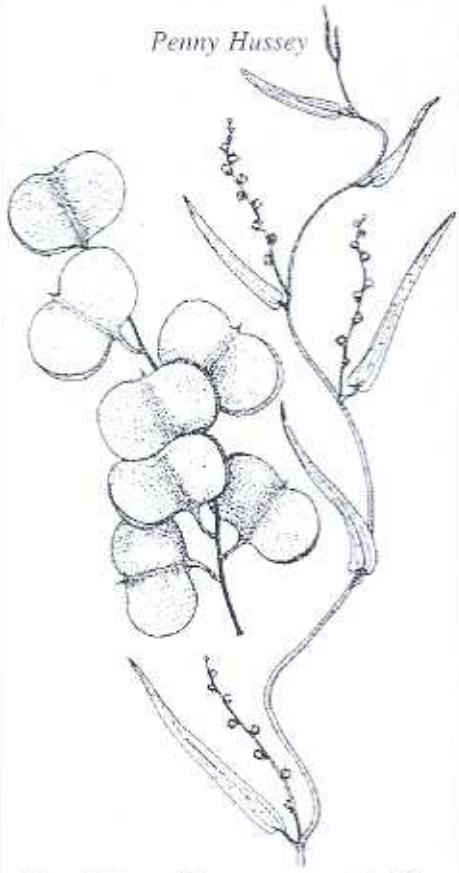
---

For further information contact: Susie Murphy White, Revegetation Officer CALM Merredin susiem@calm.wa.gov.au

FLORA

WARRINE - THE LOCAL YAM

Penny Hussey



SOON after the first rains, early in winter, rocky areas throughout the Hills and Avon Valley are bedecked with a scramble of yellow flowers. The tiny blossoms on wiry twining stems stand out clearly against the dark grey of dolerite rocks like a necklace of golden beads. Later in the year the yellow-green, arrow-head-shaped leaves are more obvious, then, as summer's heat cranks up, everything dies back, leaving only the biscuit-brown winged fruits guarding their papery winged seeds. This is Warrine, the native yam.

The Yam Family, Dioscoreaceae, has six genera and around 600 species, mostly in the tropical areas of Asia, Africa and America. Some are extremely important as human food. Several species of *Dioscorea* have been cultivated for thousands of years and, with cassava, provide the main starchy food for millions of people; in the West Indies, tropical South America, the Pacific islands, wet tropical parts of Africa and the Asiatic tropics. All are twining plants with large storage roots (the one I grew in West Africa developed tubers two feet long and six inches thick). They all have the advantage of easy cultivation, easy vegetative propagation, freedom from pests and diseases and easy storage without deterioration.

In Australia there are five yams, two are endemic while three are introduced, probably by Macassan fishermen. All but one are found in the tropical north.

As they still do today, fishing boats from the north make long voyages to Australia, carrying a store of yams as food. Perhaps the crew deliberately planted sections of tuber for use when they returned, or maybe the plants grew from scraps, but it seems very likely that, for example, *D. bulbilifera* which grows in disturbed rainforests and coastal vine thickets all around the north coast was carried here by them. It produces both potato-like tubers and bulbils on the stem, and the Bardi people have learnt to eat it, both the tuber and the bulbils, roasted in hot ashes.

Warrine (*D. hastifolia*) however, is an endemic, found only from the Murchison River to the Darling Range south of Perth, on rocky soil, among forest, woodland or thicket, not penetrating much further inland than the western edge of the wheatbelt. It, too, grows from underground tubers and these were gathered in considerable numbers by Noongyar people.

The tuber grows about 30cm underground, all you have to do is dig it up. Sound easy? Well, try it some day! Not only is it hard to dig on rocky ground (imagine doing it with a digging stick) but you have to follow the stem down from the surface, which is easier said than done as it is thinner than string and may bend a lot. Is it any wonder that the women, whose job this was, returned year after year to the same sites, where digging was relatively easy! They chose places where dolerite outcropped at the surface, and had eroded into numerous small boulders. By simply pulling the boulders away, and rolling them downslope, they could easily get at the buried tubers, and just as easily replant ones which were too small to eat at that time. Over thousands - perhaps tens of thousands - of years, these actions have created a scree of dolerite boulders with Warrine growing thickly all over them. These are 'yamming grounds' and you can find then all through the northern jarrah forest, Darling Range and Avon Valley. These actions prompted the eminent botanist, Baron Ferdinand von Mueller, to note of *D. hastifolia* "The tubers are largely consumed by the local aborigines for food; it is the only plant on which they bestow any kind of cultivation, crude as it is".

There is a very famous yamming ground in Walyunga National Park, where annually there would be a big gathering of people alongside the pools in the river. The men would go hunting, or sit around talking politics, while the women did the hard work of digging the yams. But, like any community event, there would have been a lot of fun too!

It is important to cook yams, as the tubers of some species contain poisonous alkaloids which leave an unpleasant effect in the mouth and throat if eaten raw. (Some of these may have economic value - *D. villosa* from North America is the richest known source of phytoestrogen and was used by the Native Americans to treat female health disorders. In the 1930s scientists extracted steroid hormones from these wild yams which were eventually used in the making of birth control pills.) Whereas in the edible cultivated yams the toxins have mostly been bred out and the small amount remaining is easily destroyed by boiling, Aboriginal people in eastern Australia used complex preparation techniques of soaking and mashing to extract the unpleasant principle from the yams found in their area. Warrines should be roasted or boiled before eating.

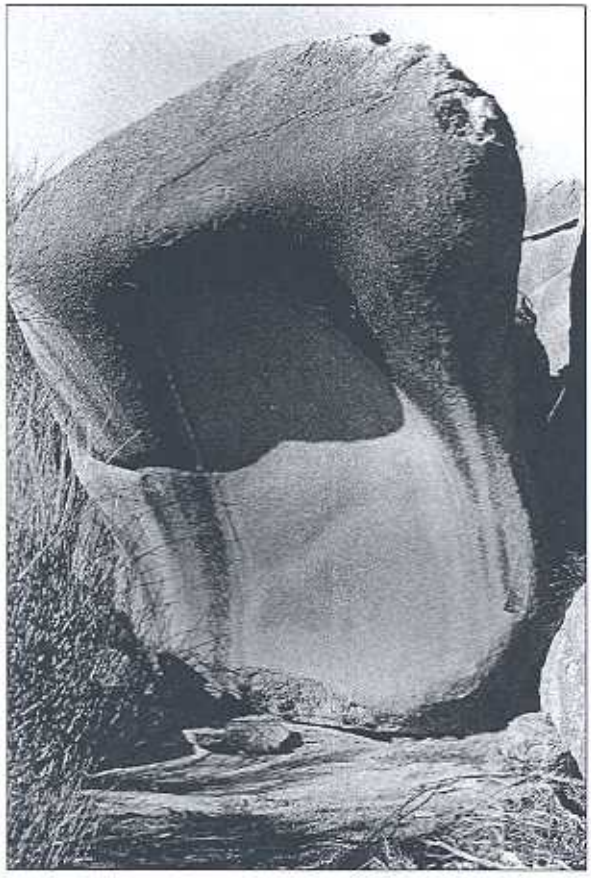
So, when you see Warrine flowers shimmering in the sunlight this winter, think about how they fitted into the Australian picture of Man in the landscape!

LANDFORMS

GRANITE LANDFORMS OF THE WHEATBELT - A BRIEF REVIEW

C.R.Twidale and J.A.Bourne

GRANITIC rocks underlie all of the continent and crop out over about 15% of the land areas. Exposures typically give rise to plains interrupted by isolated hills or inselbergs ('island mounts'). Many of these hills are domical – they look like half-oranges set down on their cut surfaces - and are, increasingly, known as bornhardts after the German explorer of central Africa, Wilhelm Bornhardt, who in 1900 published a wonderful account of such forms in what is now Tanzania.



Tafoni or alcove formed inside a boulder on Kokerbin Hill.

Bornhardts are developed in massive rocks, typically granite (but also volcanics, sandstone conglomerate and limestone), with few open fractures. Their plan form is determined by steeply-dipping fractures, which also find expression in the orientation and shape of various minor forms A few outcrops have produced tall angular towers and blades of rock, as around Mt Manypeaks, east of Albany. The convex-upward profiles of bornhardts is associated with arcuate sheet fractures, which delineate massive slabs of rock and which, though widely attributed to offloading are basically due to crustal compression. Bornhardts occur in many climatic environments and many topographic settings but all are found in multicyclic landscapes in which there is evidence of more than one period of planation in the form of an overall stepped morphology.

A characteristic suite of minor landforms is developed on granite outcrops. It includes basins or gnammas, gutters and grooves; tafoni or alcoves and alveoles or small hollows, pitting or rough surfaces, polygonal cracking, flared slopes, A-tents or pop-ups (U.S.), triangular wedges of rock, and slipped slabs.

These various forms, major and minor, are of three types. Some originated below the land surface at the base of the soil or regolithic cover and subsequenty were exposed and modified: they are *etch* forms. Some have been shaped by processes active on exposed rock surfaces and are of *epigene* or subaerial origin. Others are due to earth movements and are *tectonic*.

Etch forms

('etch' - to eat away by chemical action).

Water, and especially soil or shallow groundwater charged with chemicals and biota, reacts with rock-forming minerals. Granite consists of interlocking crystals of quartz, feldspar and mica. Thus, granite is of low porosity and permeability, i.e. water does not easily pass through the body of the rock. On the other hand, granite is typically well-jointed, with orthogonal systems (three sets of joints disposed at right angles to one another) and arcuate sheet fractures delineating thick slabs of rock, well represented. If open, such fractures allow water penetration and are avenues of weathering. Feldspar and mica are altered (or weathered) to clays, and even quartz is eventually taken into solution. Where open fractures are numerous or where weathering has been active for a long time, the granite is transformed into a weathered mantle or regolith consisting of clay and quartz fragments or simply clay. The base of the regolith, the junction between regolith and fresh rock is frequently abrupt and is known as the weathering front.

Shallow groundwaters exploit weaknesses in the country rock. Fractures, for example, or rocks that are vulnerable because of their composition (e.g. an abundance of mica) are more rapidly weathered than massive compartments lacking mica. Thus the weathering front is frequently topographically differentiated both in gross and in detail. Nevertheless, long periods of weathering of well-jointed granite have in many places produced weathering fronts that are essentially planate,

LANDFORMS

interrupted only by isolated protuberances based in massive or resistant rock.

Thus, where for whatever reason the regolith has been eroded, the weathering front is exposed as a plain with isolated hills. The latter tend to be steep-sided because water percolating through the regolith flows down the slope of the projecting mass and it and so weathering are concentrated at the base. The inselberg landscapes so typical of the Wheatbelt and other parts of Western Australia have formed in this way. The plains are mainly soil covered, but rock platforms, some of them quite extensive, are common. That bornhardts originate beneath the soil cover is demonstrated by their exposure in artificial excavations and in valley-side slopes and by various other lines of evidence and argument.

Subsurface weathering of the outer shells of bornhardts has produced block- and boulder-strewn nubbins or knolls (U.S.). They are common in the tropical north. Pronounced weathering of the margins of domes just beneath the surface has resulted in small steep-sided castellated hills or koppies (the 'tors' of Britain and other parts of Europe). They are rare in Australia but Castle Rock, near Mt Manypeaks, is a fine example and there are others in the Brookton area.

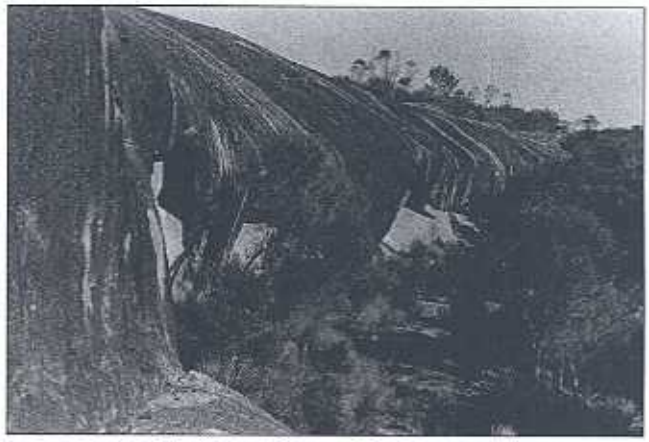
Such etch forms are also referred to as two-stage features for they have developed in two stages and have two ages: a period of subsurface weathering followed by exposure.

Many minor forms associated with inselbergs were also initiated at the weathering front. Steeply dipping fractures are exploited to form clefts or slots (U.S.), many of them with flared sidewalls due to intense subsurface weathering in the at the base of the slope. Sills or veins of relatively weak rock, such as pegmatite or coarse granite, are preferentially weathered, giving rise to shallow linear depressions and intervening linear ribs. Such differential weathering occurs at a variety of scales. Boulders are the result of the rounding of blocks derived from the break down of sheeting slabs (because corners and edges of blocks are more rapidly weathered than are plane faces). Pitting is due to the differential weathering of mica and feldspar leaving quartz and large feldspars in microrelief. Rock basins or gnammas are initiated by weathering of pods of feldspar or of fractures, and gutters by runoff along the weathering front.

Whether the hollows or alcoves known as tafoni (Italian, aperture or window; and alveoles are etch forms is debatable. At some sites (Kokerbin Hill, Uluru) tafoni are developed alongside flared slopes known to be of subsurface derivation. At The Humps, near Hyden, there is compelling evidence that basal tafoni undermining boulders were initiated below soil level. On the other hand, no tafoni have been exposed in excavations and the enlargement of the hollows, due to salt crystallisation, demonstrably occurs after exposure because at many

Part of Kokerbin Hill, a typical Wheatbelt bornhardt with a wide range of minor landforms developed. Note the flared slopes and alcoves at the base of the slope.

Castle Rock a caste koppie with flared sidewalls located in the Mt Manypeaks district east of Albany. Note the angular remnant on the skyline and near it an ensate or blade-like form.



Tafoni at the base of Kokerbin Hill alongside flared slopes.

sites flakes of rock can be seen in the ceilings and on the floors of the hollows.

Epigene forms

Most granite forms were initiated at the weathering front but the exploitation of fractures to form clefts continues after exposure, and the saucer-shaped

continued on page 12

continued from page 11

LANDFORMS

depressions formed at the weathering front evolve into pits, pans or armchair-shaped hollows according to rock structure and slope. But patches of soil (especially if vegetated) retain moisture and seepage from such hollows supports black algal veneers that apparently protect the rock surface and in places have converted the floors of gutters into slightly raised ribs. Similarly, water drains into gnammas but the surrounding rock surface, especially if soil-covered, retains moisture so that weathering is faster there than around the basins. Hence the annular rims or rock doughnuts found at some sites.

Tectonic forms

Earthquakes affect all parts of the crust though some areas are more unstable than others. Brittle rocks like granite crack under pressure so that fault scarps, fissures and rock bursts are quite common. Of particular interest are the A-tents or pop-ups that develop during tremors and which are well represented on massive granite outcrops. Wedges that are triangular in cross-section also are formed by compressive stress, squeezed vertically adjacent to steeply-dipping fractures on platforms and gentle hillslopes. Larger wedges have been pushed out along sheet fractures on steep rock faces. Broken slabs have been shaken and have slipped downslope.

Forever or Everlasting hills

Perhaps the most astonishing feature of the Wheatbelt inselbergs is their apparent age. The rocks in which they are shaped are very old, varying between 2.3–3 billion years according to locality. Many of the inselbergs were shaped beneath the soil cover during the Cretaceous period about 70-130 million years ago and later exposed. The crests of a few, however, like The Humps, Boyagin Rock, Jilakin and Pingaring hills were evidently already hills during the Cretaceous for they stood above the plains that carried an ironstone (lateritic) soil at that time. They have withstood the elements for at least 70 million years, and in some instances longer. They are truly what Penny Hussey has called the Forever Hills. They are the 'everlasting hills' of Genesis (49: 26).

A-tent or pop-up on King Rocks.

Slipped slabs on King Rocks.

Further reading

Twidale C.R. 1982. Granite Landforms. Elsevier, Amsterdam.

Twidale C.R. and Bourne J.A. 1998 Origin and age of bornhardts, southwest Western Australia. Australian Journal of Earth Sciences 45, 903-914.

Twidale C.R. and Bourne J.A.2001. Field Guide to Hyden Rock, Including Wave Rock. Wave Rock Development Company.

Prof Rowl Twidale and Dr Jenny Bourne can be contacted at: School of Earth and Environmental Sciences, University of Adelaide, Adelaide SA 5005
E-mail:
rowl.twidale@adelaide.edu.au

MEMBERS' PAGE

A NEW IDEA FOR COPING WITH TICKS

Jay Barnett

HAVING spent a fair bit of time in the Julimar district of Toodyay Shire during the last five years, my wife Ginny and I wondered what could possibly be causing the irritating little hard bubbles that appeared on various parts of the body. It was not very long afterwards that we learned these little bites were the result of kangaroo ticks.

Over the next couple of years we tried just about everything to repel the ticks, none seemed to work very well. Once the liquid repellant dried out, the ticks are not too concerned. Probably the best product we found was given to us by the former *LFW* Officer, Bob Huston. It consisted of six parts olive oil, with one part each of tea-tree oil and citronella oil. This worked up to a point but once the tea-tree and citronella oil had disappeared, it left a rancid smell on one's clothes.

One hot February morning I had been digging some holes in order to plant some grevilleas, given to us as Christmas presents. While we were sitting on the verandah, resting after the planting, Ginny noticed minute little reddish insects climbing all over my legs. They were pepper ticks! I had been doing a small job which required masking tape, and there was a roll handy. It was difficult picking off the ticks, so I tore off a piece of masking tape and dabbed it on the area where the ticks were - they came off easily (along with the hairs on my legs, rather painful!).

We soon learned to live with ticks and accepted that they are part of the bush scene. During the following couple of years we just tried to minimise the tick bites with all the precautions that are known to us.

Then the masking tape idea came back to us but this time we used it in a different way.

It was just before last Christmas that we decided to wrap the masking tape around our ankles, legs or thighs - sticky side on outside. It worked! The ticks were trapped! I had been spending a bit of time in bird hides and it's a rather comfortable feeling to know that the ticks are going to be stopped dead in their tracks; we find that they struggle for a while then stay still. We even have competitions on how many we have caught - Ginny holds the record with 14! The smaller ticks get stuck in the first 5mm of tape, the larger ones get further, then become exhausted. We have found that the success rate for control while sitting on chairs having a cuppa or birdwatching is just about 100%. Walking through thick low scrub, the tape tends to come off and needs to be replaced.

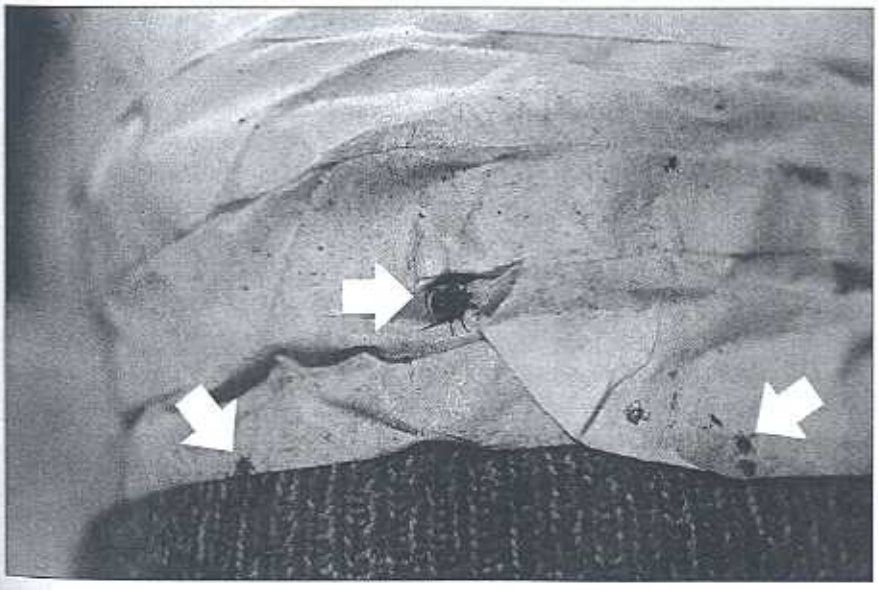
Constantly brushing against Balgas or Dryandra can attract the ticks onto oneself, as they are doing what comes naturally, looking for a host. In this situation the tape can be put on one's shoulder, upper arms and chest. Double-sided tape is more useful in this instance, albeit at twice the price. We now keep a roll of tape in our back-packs and see it as being as important as our flask of tea! We've found that the tape quickly loses adhesion if we are working with mattocks or rakes on our firebreaks.

Early in the piece, we took some pepper ticks down to the Department of Agriculture in Kensington. At first they thought they were mites, then under the microscope it was discovered that they were indeed ticks. Mites we would have gone along with, as the previous owner of the property kept Carnaby's Cockatoos captive in our bedroom!

Another bonus is that, since Christmas, we have had no complaints from family members accusing us of transporting ticks to Perth. Occasionally they must have left us to try out new blood!

We hope the masking tape will work for you.

If you'd like more detail, Ginny and Jay Barnett can be contacted on 9361 0922.



THE WAY WE WERE

A BOODIE RAT WALL

THOMAS FARMER, great grandfather of *Land for Wildlife* member Ray Farmer, selected land in the Boddington area in the late 1850's. Thomas Farmer and George Blechynden had camped for two nights on the banks of the Hotham River on their journey south looking for suitable land. Whilst George settled further south in Boyup Brook, Thomas returned to the fertile banks of the Hotham River.

He selected 100 acres on either side of the river, built a wattle and daub hut and started clearing the land to grow wheat for the family and pasture for their animals. The land chosen was very fertile and lies within the only "greenstone belt" in the southwest section of the Yilgarn block known as the Saddleback Group. Here the iron-rich basalt rocks have weathered to form a very strong crumbly chocolate soil, 3-4 feet deep. The selection was also adjacent to a stone quarry used by the aboriginal people for making spear tips and axe heads.

"The old field" as the 100 acres is known today, had very little timber and was covered in Grass Trees (*Xanthorrhoea* sp). A post and split rail fence was built to enclose the area and gradually the fertile soils were cleared. They produced an average of 8 bags of wheat to the acre for the first 12 years without the addition of any animal manures. That is if you managed to harvest the crop!

Ray Farmer and the remains of a dry-stone wall built to keep boodie rats out of his great grandfather's wheat crop.

Boodie rats and tammar wallabies also chose to feed from the area. During the first years a member of the family would stay up at night and scare the animals off with a loud gunshot, however in the interest of a good nights sleep for all, a more permanent solution needed to be found.

The plentiful rocks in the area lent themselves to the building of a dry-stone wall by piling rocks up to the second rail in the post and rail fence. Included in this dry-stone wall are discarded "core stones" from the nearby quarry.

The boodies and tammars would graze up to the stone wall, then travel along it rather than "hop the fence". It also provided an effective break to bushfires, ".....more than one bushfire has been kept out of the cornfield by means of this wall". (Inquirer, August 1887).

The post and split rail fence has long since gone and all that remains are the piled stones to remind us of a time when small mammals roamed the area.

Avril Baxter

Acknowledgements: Ray Farmer and Becoming Boddington. Ferrell J. Shire of Boddington 1992.

FLORA

UNLOCKING THE DARK SECRETS OF THE WESTERN AUSTRALIAN UNDERGROUND ORCHID

Kingsley Dixon

DEEP beneath the broom bush shrublands of Western Australia is one of the world's more extraordinary plants. A fully subterranean orchid! Known since the 1920s when the waxy white and maroon flowers were uncovered by ploughing near Corrigin, the orchid (*Rhizanthella gardneri*) has eluded all but the the most avid of observers. Without green leaves, no surface growth and with flowers buried up to 5cm underground it takes some effort, usually on all fours, to uncover the exquisite flowering head of this remarkable plant.

From the time of the first discovery of the orchid, scientists pondered how this plant could possibly survive without light and growing in such demanding conditions. Kings Park and University of Western Australia scientists started work on the plant in 1980 to try and unravel how the plant grows, what pollinates an underground flower and how to germinate the species for ensuring its long term conservation. Kings Park has successfully germinated seed and is now growing a number of plants in association with the plant partner that the orchid needs to ensure a supply of carbohydrate and other nutrients. Not surprisingly the orchid appears to only grow on the root system of the broom honeymyrtle (*Melaleuca uncinata*) one of the most common shrubs in the wheatbelt. Flowering is expected in May 2004 if all the plants continue to grow at their present rate.

If you have the broom honeymyrtle on a remnant site on your farm it might be worth having a look for the orchid next May-June when it flowers. Just gently scrape away the top layer of leaf litter and a few mms of soil and if there is an orchid you will see the distinctive glistening, waxy white flowers. Sounds easy? Well it is important to remember that on average it takes about 8 person-hours to locate an underground orchid in a new location! If you locate an orchid you must not further disturb it as they are specially protected by Law. Contact me at Kings Park and take a photograph. We would be happy to hear of any new finds.

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

FAUNA

EVEN MORE DIBBLERS RELEASED AT PENIUP!

Tony Friend

HEAVY rain over the preceding week did not prevent the release of 43 captive-bred dibblers at the 6530-hectare Peniup proposed nature reserve, 20 km south-west of Jerramungup, in October 2003. The release followed a gathering of about 30 local community members and volunteers, many of whom are involved in management and monitoring of Peniup and neighbouring Corackerup Nature Reserve.

The dibblers were the third group bred at Perth Zoo for release at Peniup by the zoo's Native Species Breeding Program. They are descended from 11 wild individuals captured in 2000 and 2001 by CALM scientists and volunteers in the Fitzgerald River National Park. Dibblers have now been released in early October each year since 2001, in the first reintroduction of dibblers on the mainland. Regular trapping by CALM Science Division and Albany District staff with help from community members has shown that dibblers are surviving and breeding in Peniup. Fourteen young dibblers born on site were captured this spring, prior to the 2003 release.

Dibblers were believed to be extinct until 1967, when a small population was found at Cheynes Beach, east of Albany. Other populations were discovered in the Fitzgerald River National Park in 1984 and on Boullanger and Whitlock islands off Jurien Bay in 1985. The Dibbler Recovery Team, comprising dibbler experts and other stakeholders from CALM, Perth Zoo, five universities, the Malleefowl Preservation Group and local communities, has overseen dibbler recovery since 1996. The first new dibbler population was successfully established on Escape Island, through the release during 1998-2000 of 83 dibblers bred by Perth Zoo from nearby Boullanger and Whitlock Islands stock.

The good rains that have fallen in the region over winter and spring this year are expected to increase insect food for dibblers in Peniup and aid the rapid growth of the fledgling population.

Tony Friend is Principal Research Scientist, CALM, Albany.

A dibbler in the hand - note the pale eye-ring.

Cathy Lambert, Dibbler Keeper at Perth Zoo, with one of her progeny.

IN BRIEF

PANDAS IN THE BUSH?

WITH approximately only 3% of tall eucalypt woodlands left in the Western Australian Wheatbelt, there is still much to be learnt about their extent, health and status. WWF Australia's Woodland Watch project, now in its fourth year, has recently expanded into the Northern Agricultural Region. The project works with individual landholders and communities to raise awareness of just how complex these woodlands are, their current health, and how securing their future will have long term benefits to landholders.

Woodland Watch Project Officers Bronwen Smith and Joel Collins are working with interested landholders to achieve best practice bush management, but readily acknowledge the good stewardship by many farmers that is already occurring. Some of the benefits landholders may receive by becoming involved include professional flora surveys of woodland remnants, practical management advice, help with funding applications (for projects such as fencing), and assistance in accessing other bush conservation incentive schemes, not to mention the long-term flow-on effects from keeping your bush healthy in the context of whole farm planning.

Woodland Watch works closely with a range of other NRM agencies and programs, including *Land for Wildlife*, and congratulates *LFW* on its impressive achievements in community conservation. WWF looks forward to continued cooperation with the *LFW* team in assisting private landholders in the NAR manage their remaining bush habitat.

You can contact Bronwen and Joel at the Shire of Dalwallinu on 9661 1001 or on their mobiles 0427 387 644 (Bronwen) and 0427 389 764 (Joel) and by email: bsmith@wwf.org.au and jmcollins@wwf.org.au

Woodland Watch is supported by the Natural Heritage Trust, Alcoa World Alumina Australia and the Northern Agricultural Catchments Council.

IN BRIEF

RAINBOW LORIKEETS

IN response to the brief note in WW 7/4, several readers rang to say that Rainbow Lorikeets are definitely expanding both their breeding and their foraging range. Records from all around the outer edge of the Metropolitan area, including both Coastal Plain and Hills, have been passed on to David Lamont.

CALM has declared the species to be acclimatised fauna (fauna in a wild state because of escape or release) and has gazetted an open season, allowing the species to be shot or live-trapped on private land without the need to obtain a licence.

In order to prevent new populations from establishing in the wild, any lorikeets sighted outside the metropolitan area should be reported to the Department of Agriculture.

Anyone keeping rainbow lorikeets must have a licence and should ensure that the birds are securely housed, preferably in a double-doored aviary. Anyone who sees rainbow lorikeets outside of the metropolitan area should report the sighting to the DoA's Pest and Disease Information Service on 9368 3666.

More information is available from Farmnote 08/2002 'Rainbow Lorikeets' on DoA's website at www.agric.wa.gov.au

FORMATION OF DIEBACK RESPONSE GROUP

PLANT deaths caused by *Phytophthora* (sometimes called 'Jarrah Dieback') are one of the greatest threats to WA's biodiversity. Half of WA's 350 threatened plant species and 2000 of the 9000 known plant species in the south-west are susceptible to the disease. In March, a Dieback Response Group was formed to coordinate and encourage appropriate actions to combat this threat. The DRG will develop a dieback atlas; prepare management guidelines for private land; develop risk assessment methodology and specifically develop a plan to combat the dieback threat in the Fitzgerald River NP.

As a start, CALM has produced "Best practice guidelines for the management of *Phytophthora cinnamomi*" and "Policy Statement No 3: Threat abatement for *Phytophthora cinnamomi*". Both of these documents are drafts, open to comment until May 7th, and you can download them from CALM's website: http://www.naturebase.net. If you live in the greater than 400mm rainfall zone, and especially if you are in jarrah forest or banksia woodland, you might well be interested in this material. Your comments on the drafts - or any other matters to do with the disease - would be valued.

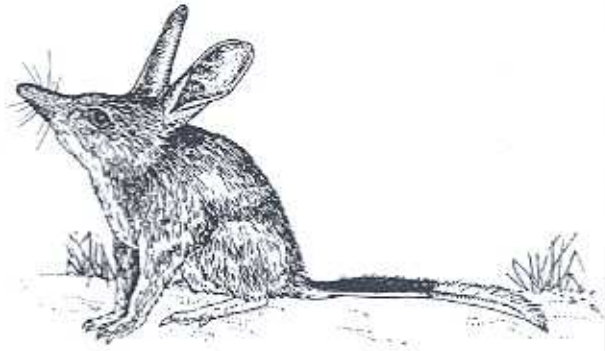
TAIL PAINTING OF CARNABY'S COCKATOO FLEDGLINGS

BRIGHTLY coloured tails are the 'in' thing for fledgling Carnaby's Cockatoos this year! In the interests of science, about 30 fledglings will leave the nest this summer with red, green, blue, orange and purple tails. The different colours denote different breeding sites in the northern wheatbelt. Eventually, of course the birds will moult and return to white tail panels.

Could you please keep an eye out for coloured tails? The information required is:

- date and time of observation
- colour of paint
- number of marked birds
- number of birds accompanying the marked birds
- location (be as specific as possible here, even GPS if you can)
- your contact details

Send to Leonie McMahon, Birds Australia: phone: 9287 2448, email: ljmcmahon@bigpond.com



BOODIES AND DALGYTES AT DRYANDRA

LAST September, as part of the 'Return to Dryandra' captive breeding programme, 30 dalgytes and 21 boodies were released in Dryandra Woodland, where rigorous baiting keeps down foxes. Monitoring has shown that the populations are thriving, despite natural predation by birds of prey and pythons, and that they have bred since being released. Unfortunately, though, one boodie has been shot and another killed by a car. If driving in the general area, especially at dusk, please take care. Native animals have no road sense!

IN BRIEF

CONSUMERS ADVISED TO LIMIT CONSUMPTION OF PATERSON'S CURSE HONEY

FOOD Standards Australia New Zealand (FSANZ) have advised people who eat a lot of honey to limit their consumption of honey made exclusively from Paterson's Curse. It seems that honey made from that plant contains high levels of the naturally-occurring toxins known as pyrrolizidine alkaloids which can cause liver damage when taken in large amounts. Most honey producers blend their honeys to keep the problem at a safe level. Nevertheless, its use for honey production is occasionally offered as a reason not to control this invasive weed, and it would appear that we would be better off without honey from this potentially toxic source.

More info - Australian Honey Bee Industry Council website www.honeybee.org.au

CONTAMINATED SITES ACT 2003

THE Contaminated Sites Act 2003 was passed by State Parliament in Nov 2003, with the new laws to take effect in mid-2004. The new laws will include land affected by acid sulphate soils and they will have implications for a wide range of NRM managers. Copies of the Act are available from the State Law Publisher (www.slp.wa.gov.au), with Contaminated Sites Management Series Guidelines available at www.environ.wa.gov.au under 'contaminated sites/ technical guidelines'.

IS THE COST OF CONSERVATION TOO MUCH TO BEAR?

ECONOMIC losses, uncertain outcomes and a lack of available labour and skills often make it difficult for farmers to adopt ecological principles and practices to sustainably manage their lands. Barriers like this mean limited prospects for wide-scale private adoption of conservation strategies and beg the question 'to what extent should landholders bear the public costs of conservation?' In an attempt to resolve some of these issues, economist Neil MacLeod from CSIRO Sustainable Ecosystems (NSW) has been testing the viability of ecological principles for different vegetation communities. His team has used economic modelling to define costs for specific management activities. They suggest that beef production and biodiversity conservation might co-exist if alternative solutions and realistic approaches to breaking the barriers and problem-solving are employed.

More info - download fact sheet PF020205 from www.lwa.gov.au/products

MEMBERS' PAGE

WESTERN WILDLIFE has been given permission to publish these evocative haiku from the very varied bush writings in prose and poetry produced by members - few of them practised creative writers! - who gathered at Perup last October for an innovative weekend of *WRITING THE WILD*. We hope to bring you more of this work in future issues.

The golden whistler
Proud of song and yellow breast
Swoops to take an ant
© Erica Shedley

Birds in flight
Midway Puppets on strings dangling
Toys of heaven
© Blandford Scott

Kambarang season.
Parrots pluck marri blossoms.
A fine rain falling.
© Diane Beckingham

Still moon on water
Broken by raindrops released
By drooping branches.
© Gaynor Clarke

Note coming events:

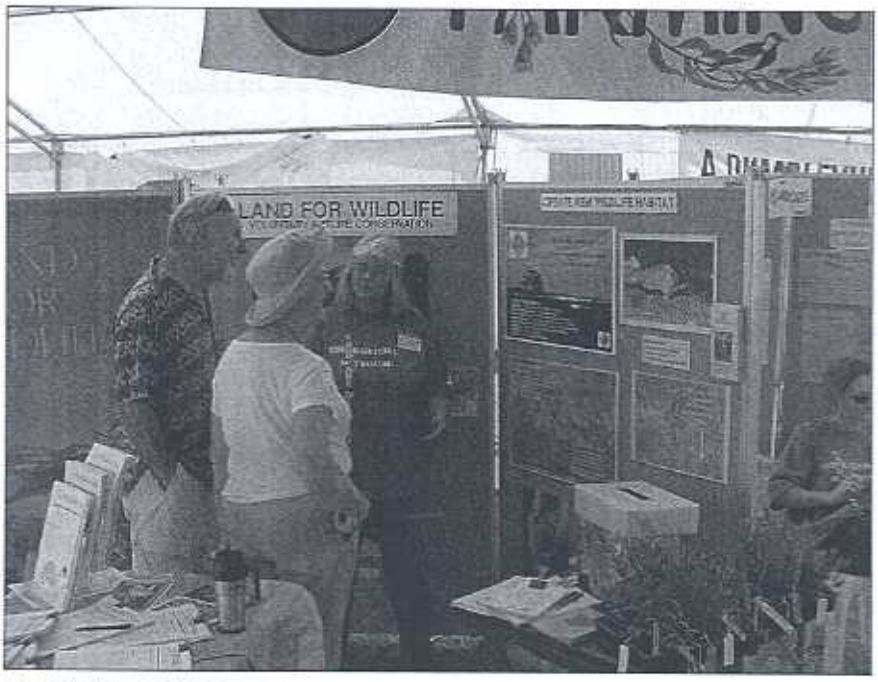
Jenny de Garis advises that the next *WRITING THE WILD* will be at Dryandra this 28 - 31 October.

On August 27 - 29 she will run a catered weekend of WRITING IN WILDFLOWER COUNTRY at Waddi Farms, Badgingarra.

At monthly third-Sunday mornings *Women Writing* at Piney Lakes Reserve, Perth, she will lead into creative writings following inner and outer seasons.

Enquiries to Jenny de Garis after noon: 9310 3896; email: jjdeg@yahoo.com

NEWS



LFW display at Woolorama.

FAUNA

KING KONG AND MINNIE MOUSE!

THE two phascogales are very different in size when you see them together! These mounted specimens used in the *LFW* display at Woolorama show the differences clearly. On the left the Wambenger or Brush-tailed Phascogale, *Phascogale tapoatafa*, is larger than a rat, while the Red-tailed Phascogale, *P. calura*, is much smaller. Wambengers are found in the higher-rainfall forests of the lower south-west, while Red-tails are in western wheatbelt woodlands.

Both animals rest during the day in a snug nest in a tree hollow, coming out at night to hunt. They take mostly invertebrates such as insects, spiders and centipedes, but they will also have a go at any vertebrates they think they might be able to subdue - one *LFWer* recently described seeing a wambenger riding a chook around the yard, biting away. They are considerably smaller than chuditch, so the wire netting around hen runs in forested

country may need to be very fine indeed!

The males compete for females during the winter breeding season, and may exhaust themselves by so doing, being easily caught by cats or knocked over by cars afterwards. Females may bear up to eight young.

Avril Baxter

NEW BOOKS

"Looking after Australia for everybody - the Lucky Country"

Joanna Seabrook

Private publication

Readers will remember that in WW 7/4 Joanna Seabrook wrote an article "Hail to thee, blythe spirit" promoting the idea of making rural towns more wildlife-friendly. It was one of a series of articles published in a York paper that together lead to her 'Dream' for future Australia. These have now been gathered together and produced in a small but inspirational booklet that was launched by the York LCDC in March.

Some copies may be available for purchase. If you are interested, please contact the author on 9641 1667 or by email: joannaseabrook@westnet.com.au

"Life along land's edge - wildlife on the shores or Roebuck Bay, Broome"

D.I. Rogers, T. Piersma, M. Lavaleye, G.B. Pearson & P. de Goeij.

CALM. Perth

$39.95 + p&h

If you have ever been to Broome, and especially if you have visited the Broome Bird Observatory, you will adore this book. Stunningly illustrated with photos by Jan van de Kam, it is packed full of fascinating natural history about the fauna and flora of the coastal area of Roebuck Bay as well as how people use the area. Everything about how the coast and its inhabitants live and interact are described here; especially fascinating are the detailed descriptions of what lives in or on the mud - the most biodiverse mud-flats in the world!

Great for your own bookshelf, or as a present for friends.

Penny Hussey

FERAL ALERT

ARE YOU DINING IN TONIGHT?

PATCHES of bushland are often blamed for harbouring foxes, and many people do not want to bait on their adjacent farmland because they do not see that the fox problem also concerns them.

Whilst it is true that foxes will often shelter in bushland during the day, they may not feed in that area, hence baiting in the bushland will not eliminate all foxes from an area.

Graham Blacklock, the Department of Agriculture (DoA) Biosecurity Officer at Kojonup likens it to staying in a motel; some of the guests will eat in the motel's dining room whilst others will go out to a food hall and eat from a different stall each night or from a number of stalls. And so it is with foxes. Feeding-wise they are territorial animals feeding from different food stalls within a specific area.

Hence if you only bait in the bush, you will only kill the foxes that sleep and eat there, and when foxes are eliminated from the area, others will quickly move in. For fox control to be effective groups of landholders need to be involved so that a dent is made in the whole fox population.

Graham says baiting in March eliminates many foxes as they are hungry when there is not much food around. He recommends baiting for a month or until baits are not being taken up. A co-ordinated fox shoot could then follow this to mop up any remaining foxes. In September a follow-up baiting could be carried out to kill vixens that are feeding their cubs.

Baits can be purchased from rural traders in most country towns on the production of a voucher issued by an Agriculture Biosecurity Officer. A simple one-page application form from the landowner accompanied by a map and a 10 minute training session on the safe use of baits, will generally result in the necessary approval.

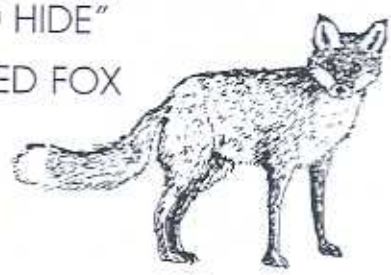
If a minimum of 20 neighbours get together and form a Declared Species Group then the APB in conjunction with the DoA are providing grants of up to $5000 per Shire to be matched by the landholders on a $ for $ basis to help with fox control. Grants are available for a maximum of two years.

Western Shield has proven very successful in bringing small mammals back from the brink of extinction. Extending this fox control across the rural landscape will help ensure their survival in other areas.

If you live in the Kojonup area and want more info, Graham Blacklock can be contacted by phone: 9831 1997. Otherwise, contact your local DoA office.

"NOWHERE TO RUN, AND NOWHERE TO HIDE"

CO-ORDINATED FOX BAITING AND SHOOTING – MARCH 2004



FOXES are territorial animals and will travel dozens of kilometres to feed. If an area has been baited, new foxes will commandeer the area left vacant within two weeks. For this reason, landholders in twenty-three Shires and NRM Groups stretching 300 km across the south-west have embarked on one of the largest co-ordinated fox baiting drives ever.

The targeted area ranged from Albany's eastern hinterland and the Fitzgerald Biosphere Group in the south, north to Brookton, east to the Shires of Newdegate and Kondinin and west to the Shires of West Arthur and Kojonup.

Baits were laid between the 8th and 19th of March 2004. Shooting activities with local Gun and Service Clubs were also linked into the program, increasing the capacity to remove a large proportion of foxes from the south-west agricultural area.

Land for Wildlife members in the Dwarlaking Catchment Group, which adjoins Tutanning Nature Reserve, took part in this activity. At a recent meeting where they received training from the Pingelly Biosecurity Officer on the handling of baits, they invited representatives from the Shire to see how they could work together to increase the area under baiting. This is an excellent first step for the group who are looking to bait at least twice per year.

Contact: Ella Maesepp, Landcare Zone Facilitator, Dumbleyung Landcare Centre Ph: 9863 4225.

FUNDING

AUCTION FOR LANDSCAPE RECOVERY - NEW ENVIRONMENTAL CONSERVATION PROGRAM

IF you want to enhance and protect nature conservation assets such as bushland and/or control salinity and waterlogging, or improve water quality on your property, then you may be interested in the new and innovative conservation program, Auction for Landscape Recovery.

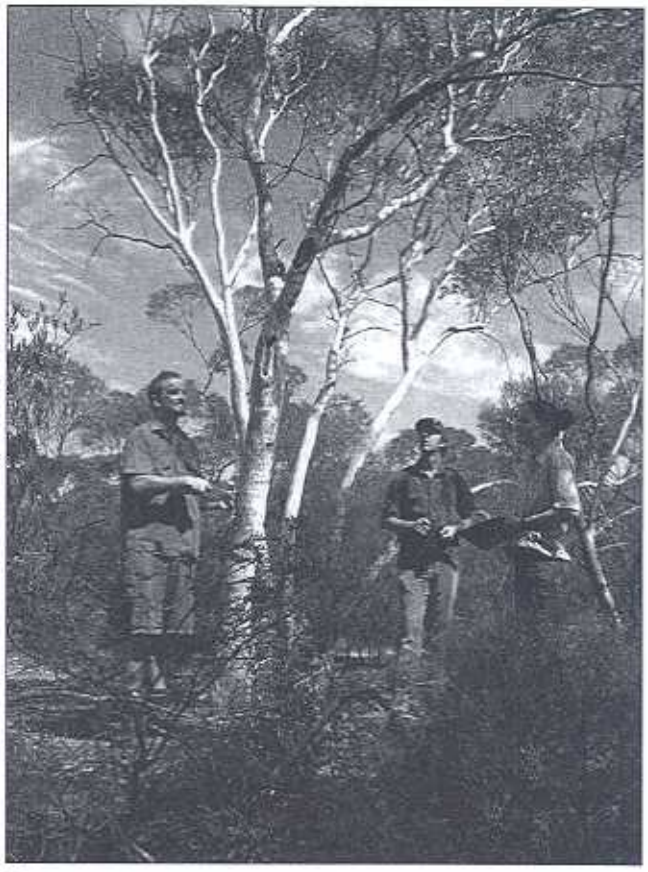
The Auction for Landscape Recovery is a voluntary land and nature conservation program for landholders operating as a pilot project in the north east wheatbelt. It allows landholders in the NEWROC Shires of Koorda, Mount Marshall, Mukinbudin, Nungarin, Trayning, Westonia and Wyalkatchem to "name their own price" for conservation work that they want to do on their farms.

What sets this conservation program apart from the rest is the ability for you, the landholder, to include all costs, including forgone income, into your tender: there is no need to include 'in-kind' contributions and there is relatively very little paper work involved. You nominate the management activities that you are willing to undertake to protect conservation assets on your land and the amount of money required to do that work.

Tenders are evaluated on the basis of 'value for money' for nature conservation and other benefits including dryland salinity control in the region. Farm projects with the highest long-term nature conservation value that meet multiple environmental outcomes in the area are most likely to be funded. The focus of the project is on achieving nature and land conservation benefits at the landscape scale.

Currently the first round is under way. However there is still a chance to be a part of the program as the project involves two rounds, with the second round of calls for interest opening mid July – mid August. Field staff (community support officers) based in Wyalkatchem, Nungarin and Mt Marshall, are more than willing to provide you with more information or answer any questions you may have.

More information
Cheryl Gole, Project Coordinator
(Ph/Fax: 9293 4958; email: gole@starwon.com.au)
OR
Teagan Smith, Community Support Officer and Team Leader
(Ph: 9681 1166; email: tsmith.newroc@westnet.com.au)



The team: Sam Atkinson, Mathew Field and Teagan Smith in Wyalkatchem Nature Reserve.

AWARD

Congratulations!

to Hidden Valley Forest Retreat, Yelverton, national winner of the Australian Tourism Award, Hosted Accommodation category. This is a strongly contested award, showcasing the very best tourism enterprises. The Retreat provides self-contained accommodation in a pocket of very good quality jarrah and banksia woodland with a creek and soak. Ann-Marie Lynch and team can be contacted on 9755 1099.

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.
Published by the Department of Conservation and Land Management, Perth. All correspondence should be addressed to:
The Editor 'Western Wildlife', Department of Conservation and Land Management, Wildlife Branch,
Locked Bag 104, Bentley Delivery Centre, WA 6983.
Design and Desktop publishing by Louise C. Burch Graphic Designer.