LAND FOR WILDLIFE
South East Queensland

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Colouring the Forest Floor

These brilliant blue-coloured mushrooms are always exciting to find. They are usually hiding in deep litter on the rainforest floor or on rotting logs. They are decomposer fungi so are recycling the nutrients in the leaf litter and logs on which they grow. They don't have a common name so are referred to by their species name, *Entoloma hochstetteri*, although there is some contention about this name across Australia.

All Entolomas give pink spore prints and often a pink blush can be seen on the gills. Look closely in the photo above. Some readers may remember doing spore prints at primary school whereby you left a mushroom (minus the stalk), gills down, on a white piece of paper, and came back a day or so later and gently removed it, revealing an intricate spoke-like pattern of spores that had fallen from the gills. Spore prints are an important technique for identifying fungi as the spore print colour and microscopic spore characteristics like size and shape can all be analysed.

The other photo shown above is that of a coral fungus (genus *Ramaria*). Coral fungi are important to local ecosystems as they are mycorrhizal and so are the symbiotic fungal partners on the roots of many of our local plants. They give their plant partners micronutrients from soil and greater access to soil water. Coral fungi can grow quite large, to about the size of your hand, and can be found on the forest floor, often in wet eucalypt forests.

It is important to remember that fungi have different parts – the fruiting bodies that we see on the ground surface that contain spores and the colony of fine thread-like mycelium that live in logs, leaf litter or in plants themselves. Like plants, fungi only fruit occasionally, but unlike plants, we often don't know that fungi are present until they fruit.

The Queensland Mycological Society, with support from Sunshine Coast Council, has recently released two high-quality brochures on fungi – see review pg 16.

Article by Sapphire McMullan-Fisher
Queensland Mycological Society
Left image by Wayne Boatwright
Right image by Paul Vallier

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Australian Government
National Landcare Programme

editorial

Does visiting a rainforest improve one's mental health? Are rainforest frogs recovering from the devastating chytrid fungus? And should we be using fire to limit rainforest encroachment into neighbouring eucalypt forests? These questions and many more were posed by the symposium, Rainforests of Subtropical Australia (ROSA) in late March. Attended by over 200 people including many Land for Wildlife Officers and members, it was two days of thought-provoking discussion.

The first two questions above would probably be answered with a yes. The third question is more complex and ultimately depends on what the land manager is trying to achieve for that bushland area.

Some take-home messages included:

- It is arguably more important to protect refugia, such as creeks, gullies, mountain tops and swamps, than it is to connect patches of vegetation because Australia's plants and animals generally contract to refugia rather than move when the climate changes.
- Some native freshwater crayfish can live to 30 years of age, usually spending their entire life in one burrow system underneath the rainforest floor.
- Lyrebirds and scrub-birds are, evolutionary, the oldest songbirds on Earth and only occur in the subtropics.
- It is best to buy the same species of plant from many different native plant nurseries to increase genetic diversity and resilience.

It was wonderful to connect with leading science in genetics, ecology and technology. Genetics is being used in clever ways to determine evolutionary pathways and to also track gene flow between plantations and neighbouring wild plants. Technological advances are being made in acoustic monitoring, using radar to quantify tonnes of soil lost through erosion, and using fungi to break down plastic waste. Fascinating topics!

I will finish with a quote from the astute Ian Lowe who stated at ROSA that "It is our morale duty to see rainforests as essential, complex ecological systems… that allow us the opportunity to connect with our soul." I couldn't agree more.

Finally, I would like to welcome Martin Bennett as Land for Wildlife Officer for the Lockyer Valley. He brings great ecological expertise, as well as a thorough understanding of Land for Wildlife given his work with other Councils in this role. Welcome Martin.

Thanks to all the amazing contributors to this edition and, as always, I welcome your stories for future editions.

Deborah Metters
Land for Wildlife Regional Coordinator
Healthy Land and Water

Landholder Registrations, Land for Wildlife SEQ - 1/3/2017			
Registered Properties	Working Towards Registration	Total Area Retained	Total Area under Restoration
3246	877	59,560 ha	6,435 ha

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Land for Wildlife is a voluntary program that encourages and assists landholders to provide habitat for wildlife on their properties.

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fungi profile

Amazing Endophytes

The fruiting bodies of a large cup fungus (*Phillipsia subpurpurea*) growing on logs. These fungi are endophytes and live most of their life inside plants. When the plant dies, these fungi then need to fruit and reproduce. Photo by SJM McMullan-Fisher.

The longer we study ecosystems, the more we realise there are many organisms living together with intimate connections. You don't get much more intimate than the relationship between plants and their symbiotic partners called 'endophytes'.

The name describes where these fungi live: *endo* = inside and *phyte* = plant. We also have intimate relationships with other organisms like the microbiome in our stomachs that helps us digest food.

By definition, fungal endophytes are fungi, which inhabit the leaves, stems, bark and roots of plants without causing disease symptoms. Some of these may be latent pathogens but generally the relationship is beneficial to the host plant.

Endophytes in grasses have been the most widely researched because of commercial /agricultural implications. However, this article will focus on the non-grass endophytes, though their stories are similar and equally amazing.

Endophytes remain hidden from human sight when we look at ecosystems, as they are living and working entirely within the tissues of their host plants. Molecular (DNA) techniques are giving us insights into some of the amazing diversity of endophytes that live inside rainforest plants in Southeast Queensland.

Up to 20 different species of endophyte were found in the leaves of one plant (the humble Wombat Berry, *Eustrephus latifolius*), in a study by Mapperson & Dearnaley, 2014. Tropical rainforests have even greater endophyte diversity.

Some of the benefits for plants that host endophytes include:

- Improved resistance to herbivores, by production of chemicals that decrease palatability of leaves and stems.
- Improved ability to withstand extreme temperatures and drought.
- Increased tolerance to heavy metals.
- Improved salt tolerance in some plants.

So the community of endophytes found in the tissues of their host plant, live together for years with no need to reproduce as they are getting everything they need to survive (food and water). It is only when their host plant senesces or dies that the endophytes appear to revert to a decomposer lifestyle and start recycling their host plant. At this stage they produce fruit bodies and undergo sexual reproduction.

Many endophytes are in the phylum Ascomycetes, which often produce fruit bodies that are shaped like discs or cups. *Phillipsia subpurpurea* is one of these local endophytes with large burgundy coloured centres and white undersides found on rotten logs in local rainforests. Fruiting down near the ground allows the spores to be dispersed where there are young rainforest plants that the endophytes can partner with. If these young trees get the opportunity to fill a gap and grow up and join the canopy they will grow with their endophyte partners already inside them to help them live.

References

Mapperson RR & Dearnaley JDW (2014) Molecular taxonomy of Australian endophytic Pezizales. In: *2014 Scientific Meeting of the Australasian Mycological Society*, 21-23 April 2014, Brisbane.

Rodriguez RJ, White Jr JF, Arnold AE & Redman RS (2009) Fungal endophytes: diversity and functional roles. *New Phytologist*, 182(**2**), pp.314-330.

> ***Up to 20 different species of endophyte were found in the leaves of one plant, the humble Wombat Berry.***

These small club-shaped fungi (*Xylaria hypoxylon*) are probably endophytes. Shown here are their fruiting bodies on dead timber.
Photo by SJM McMullan-Fisher.

Article by Sapphire McMullan-Fisher (mycologist) and Frances Guard (Land for Wildlife member)
Co-authors of *Fungi of the Sunshine Coast* and *Mushrooms of the Sunshine Coast* produced by the Queensland Mycological Society (reviewed pg 16).

fauna profile

Queensland's Rarest Bird

Habitat of the last known Eastern Bristlebirds in Queensland - showing dense native tussock grasses (e.g. Sorghum and Poa species) under an open eucalypt canopy with nearby dense forest. Photo by Zoe Stone.

To tell the story about Queensland's rarest bird, I am going to start with a tale about the Californian Condor. This huge, long-lived bird of prey was once widespread across North America, but numbers plummeted, and by 1987 there were only 27 birds alive, all in captivity. Through significant investment, the Californian Condor's population increased to 435 birds in 2015. Now hundreds of these magnificent birds are flying free in the wild.

Although not quite as remarkable in stature, the Eastern Bristlebird is arguably Queensland's condor. Historically, the Eastern Bristlebird (northern population) extended from about Glen Innes in NSW north to the Conondales. Surveys in 1988 counted about 154 wild birds; 30 years later, numbers were down to less than 40. The current estimated wild population of Eastern Bristlebirds is about 38 individuals - six in Queensland and 32 in northern NSW.

All recent records from Queensland are from one Land for Wildlife property near Lamington Range in the Scenic Rim. Researchers are working in partnership with the landholders to actively manage and protect this population. Understandably, the Eastern Bristlebird is listed as Endangered under national and state legislation.

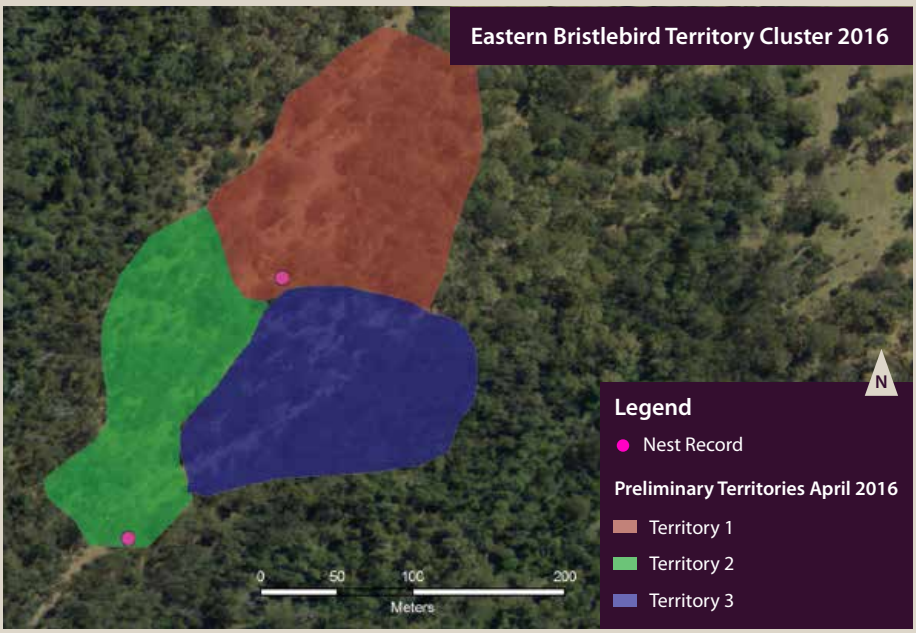
In 2013, a difficult decision was made by researchers to capture wild Eastern Bristlebirds from an at-risk population in northern NSW. These individuals were added to existing captive birds at Currumbin Wildlife Sanctuary to expand the captive breeding program. Since 2015, the captive population has successfully bred and hopefully this year a new facility in SEQ will open to further expand the captive breeding program.

Ecologist, David Charley has been monitoring Eastern Bristlebirds in SEQ and northern NSW since 1998. He has found that their populations are now quite stable, despite being so low. Male bristlebirds establish a territory about 1.5 hectares in size and will regularly patrol their territory ensuring that neighbouring Eastern Bristlebirds do not encroach. David has seen male bristlebirds 'yelling' at each other over their boundary 'fences'. All known Eastern Bristlebird territories are in steep and rugged terrain.

In 2016, David confirmed three territories in Queensland, each with a pair of birds, all on one Land for Wildlife property. See map below.

David's survey work includes finding nests and eggs, locating new birds, determining territories and managing their habitat. The Eastern Bristlebird is a ground-dwelling bird that builds a nest close to the ground, usually in dense tussock grass, such as Poa species. Their nests always occur on ground underneath gaps in the canopy, never under the canopy itself. This may be because individual tussock grass clumps grow larger and more dense in full sunlight rather than under a tree. They also seem to nest near old nests, but never re-use an old nest. Eastern Bristlebirds keep their nests very clean - there are no droppings or feathers. Assumingly, this is a strategy designed to avoid detection by predators.

A unique survey technique used by researchers is the conservation dog, Penny, who has been specifically trained



Eastern Bristlebirds are ground-dwelling birds with long 'bristles' extending from the base of their beaks. Males often call loudly from the edge of their territory. Photos by Todd Burrows.

Low-intensity, well-managed planned burns help create habitat for dense tussock grasses, which in turn, provide habitat for Eastern Bristlebirds. Planned burns aim to create a mosaic of burnt and unburnt areas. Note the low wind conditions and that the fire is travelling downslope. Photo by Zoe Stone.

Penny is a detection dog, shown here at work, trying to detect traces of Eastern Bristlebirds. She is trained to sit quietly next to a site if a positive indication is found. Photo by Liz Gould.

to detect Eastern Bristlebirds including their nests, feathers and droppings. She can easily move through potential habitat using her excellent sense of smell to detect bristlebird traces.

Penny is only used once per breeding season per site, with subsequent surveys done on foot by researchers. Playback of the bristlebird call is only used rarely in remote locations inaccessible to Penny, where human visitation is low and outside of the breeding season. The indiscriminate, regular use of call playback is highly disturbing to bristlebirds, as the resident male spends his time looking for the so-called intruder rather than caring for the female and young.

A crucial piece of the Eastern Bristlebird puzzle is its dependence on appropriately fire-managed landscapes. If there is not enough fire, its habitat becomes over-run with shrubs and herbs (e.g. Lantana, Crofton Weed, wattles and Red Ash, *Alphitonia excelsa*), which shade out and prevent germination of essential tussock grasses. If fires are too hot or too extensive, the birds cannot find escape routes or refugia and will perish in the fire. Eastern Bristlebirds are poor fliers and cannot fly far to escape fires. Appropriate fire management is therefore essential to the survival of Eastern Bristlebirds. The major decline in wild bristlebird numbers since the 1980s can be mostly attributed to the cessation of regular planned fires plus one extensive, hot wildfire.

The owners of the Land for Wildlife property with the Eastern Bristlebirds are cattle graziers who use fire as part of their land management strategy. They burn sections of their property every few years to encourage palatable grasses for their cattle and to minimise the risk of wildfire. Healthy Land and Water has long-supported the owners with weed control and the construction of fire breaks to assist with fire management enabling them to burn downslope.

When preparing a site for a planned burn, Lantana and Crofton Weed are first sprayed and killed to help create enough fuel for the fire to be carried as well as reducing the total number of weeds. Fires are generally lit along one front giving bristlebirds escape routes. Ideally, bristlebird habitat is burnt about every 3-6 years depending on rainfall. Planned burns are designed to create a mosaic patchwork of burnt and unburnt areas. Close-by gullies and rainforests are key refugia for bristlebirds and all known bristlebird territories adjoin rainforests or dense wet sclerophyll forest, which are not burnt.

The *Eastern Bristlebird Recovery Plan* guides on-ground work for wild populations as well as recovery activities for the captive population. Habitat management activities occur across private and public land (National Parks) in NSW and Queensland with regular cross-border collaboration. For example, Penny is owned and managed by the NSW Office of Environment and Heritage but also does survey work in Queensland. Eighteen private landholders are engaged with the Eastern Bristlebird Recovery Program, with appropriate fire management plans developed and being implemented. Similarly over the past 30 years, fire management within National Parks has been modified to restore and maintain bristlebird habitat.

Hopefully in the decades to come, the wild population of Eastern Bristlebirds will increase. New populations could be re-introduced to appropriately managed areas using captive-bred birds. As we know with the Californian Condor, successful recovery programs do work, but they can be expensive. If you are in a position to donate to threatened species recovery, then I encourage you to consider investing in the Eastern Bristlebird Recovery Program by supporting Currumbin Wildlife Sanctuary.

Article by Deborah Metters (Healthy Land & Water) with thanks to David Charley (WildSearch Environmental Services), Liz Gould (Healthy Land & Water) and Lynn Baker (NSW Office of Environment and Heritage)

property profile

Restoring and Rejoicing: A story of persistence and achievement

Victor and Michele Bales have been Land for Wildlife members for just over 10 years and have been living on their property for 35 years. Their property is situated in Pine Mountain, Ipswich and is adjacent to Sandy Creek in the mid-Brisbane River Catchment. It is believed that around 130 years ago the land was used as a vineyard and later for growing sweet potatoes, more recently for grazing cattle and horses. Horses were a total disaster during dry periods, as they grazed the grass right back to bare soil and ring-barked native trees.

During the years I have worked with Victor and Michele, I have observed significant changes in the ecological values on their property. Since retiring, Victor has been able to spend a lot more time fast tracking restoration outcomes on their property. The removal of weeds and restoring the natural values using local native plant species has been a priority for the Bales.

Victor is one of the most determined landholders I have come across, his passion and rationale for conservation is encouraging. Piles of removed Climbing Asparagus (*Asparagus africanus)* continue to grow in size as Victor laboriously hand-removes Asparagus crowns. Cobbler's Pegs and undesirable grasses are sprayed out, making room for native plantings. Next on the hit list is Balloon Vine (*Cardiospermum grandiflorum)*.

Victor has done exceptional work restoring a gully bed using native riparian plants. A diverse selection of species were chosen for different purposes. We started with structural species for the purpose of mitigating erosion, controlling velocity as well as reducing the effects of channelling. Such species included *Lomandra* sp., *Melaleuca* sp. and *Casuarina* sp. Bringing back wildlife and enhancing biodiversity is the next stage for the property.

Victor liked the idea of seeing more butterflies, small birds and invertebrates, so native plants such as *Dianella* sp., *Eucalyptus* sp. native grasses and *Acacia* sp. were planted and large hollow logs were left to provide refuge for reptiles and small mammals. Hoop Pine seedlings have naturally generated in their rainforest area, which is very exciting indeed.

Over the years of living at Pine Mountain, Victor and Michele's vision for their property has changed. Lessons were learnt from initial experimental planting of trees which proved to be unsuitable for the soil type. Restoring pasture, building a dam and planting trees to create a screen and filter dust from the road were priorities.

Over time, their values have become driven by the environment and providing a refuge for native wildlife.

> *"If possible, talk to older locals about your property. Look at the environmental history of your land and learn from previous mistakes made. Plan well, plant wisely and use tree protectors for new trees. Planting should improve your soil, its water holding capacity and provide food and shelter for the wildlife. Never remove old dead trees, who knows, an animal in need of shelter might make your home their home."* - Victor Bales.

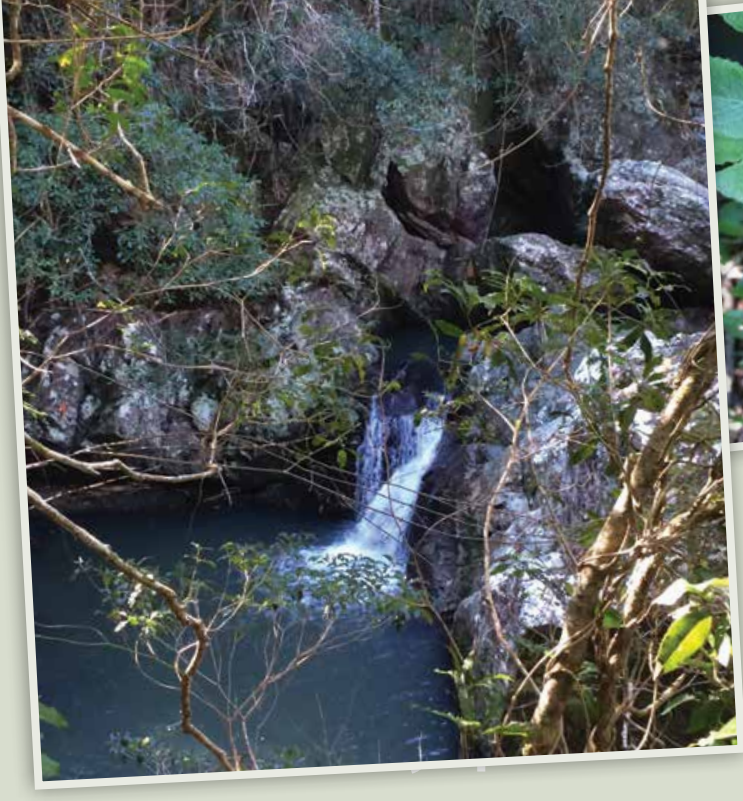
In recognition of his inspiring environmental restoration work, Victor won a Gold Award at the 2016 Ipswich City Council Awards for Excellence (Environment Category). Managing the nagging weeds and replacing the plants that do not quite make it is business as usual at their Pine Mountain property. Hard work is always rewarded when new discoveries are made, the most recent being a native bee hive in the fork of an old gum tree.

Article by Stephani Grove
Land for Wildlife Officer
Ipswich City Council

One of the many trees planted by Victor and Michele Bales.

Nest boxes for wildlife have been made and installed by Victor.

Understorey plants have been planted to provide shelter for small animals.



Laughing Waters hosted a Land for Wildlife workshop where other landholders glimpsed the natural wonders - the waterfall and the Endangered herb, *Plectranthus torrenticola* (left).

Laughing Waters: A treasure trove of natural wonders

My feet are dangling over a basalt rock formation that overlooks a spectacular 20m waterfall. The light breeze smells crisp and earthy; water vapour lingers in the air. Bursts of bird calls break the silence of the forest. In my hand I can feel the fleshy, velvety leaves and stem of a botanical specimen that I would soon find out was a highly endangered plant species. Above me, a glint of turquoise catches my eye as a Richmond Birdwing butterfly gracefully floats through the forest canopy. The scene is utterly mesmerising. Welcome to Laughing Waters.

Laughing Waters is a 24ha property which is nestled next to Kondalilla National Park in the Sunshine Coast Hinterland. Jane Abercrombie and Denis Wood have been custodians of the land for the past 19 years and were among the first Land for Wildlife members in the region.

After thinking long and hard about joining Council's Voluntary Conservation Agreement (VCA) program, Jane and Denis decided that they ultimately wanted to protect the remnant rainforest for future generations and the many trees they had planted over the years. The big catalyst for them was witnessing illegal clearing on a nearby property, where in less than two hours a bulldozer wiped out the equivalent of what had taken them 15 years to plant.

One of my first responsibilities when I started with Sunshine Coast Council was to oversee the process of surveying and registering a covenant on title as well as establishing the legal agreement and environmental management plan, which would form the framework for Laughing Waters to be protected through Council's VCA program. These are what led to me sitting on the edge of that stunning waterfall that day.

I sent the velvety plant specimen to the Queensland Herbarium. They identified it as *Plectranthus torrenticola* - listed as Endangered at a State and Federal level and only known from a handful of sites in the world. A vegetation survey also detected threatened plants including the Gympie Nut (*Macadamia ternifolia*), Richmond Birdwing Vine (*Pararistolochia praevenosa*) and ten hectares of the Critically Endangered Lowland Subtropical Rainforest ecological community.

Sunshine Coast Council's VCA program provides annual funding for contractor assistance for habitat rehabilitation. After many years of slogging away at planting and weeding on their own the help from professional bush regeneration contractors was a welcome change.

> *"Bush regeneration is rewarding, as is tree planting, but at times it is just plain hard work. So for me, Council providing contractors is a huge psychological boost and I don't feel I'm alone anymore. And the on-ground results are really encouraging!"* said Denis.

Under Council's Environment Levy Partnerships program, FaunaWatch did a fauna survey on the property. Noteworthy threatened species identified include the Richmond Birdwing butterfly (*Ornithoptera richmondia*), Cascade Treefrog (*Litoria pearsoniana*), Giant Barred Frog (*Mixophyes iteratus*), Tusked Frog (*Adelotus brevis*), Elf Skink (*Eroticoscincus graciloides*) and Rose's Shade Skink (*Saproscincus rosei*).

Jane and Denis are very active Land for Wildlife members. In the early years they attended many workshops to learn the knowledge and skills they needed to rehabilitate their property. Denis enjoyed the work so much he ended up making a career out of bush regeneration, becoming a contractor in his own right.

Denis and Jane generously hosted a Land for Wildlife workshop recently to pass on their valuable knowledge and experiences, and to showcase their stunning property to inspire other like-minded landholders.

As I walked back along the trail from the waterfall that day I passed along the babbling network of crystal clear streams and it was evident why Denis and Jane had named this special place Laughing Waters. Large boulders adorned with a diversity of tiny ferns, mosses and lichen overhung the walking track. Massive remnant trees with abundant hollows that had escaped a legacy of logging on the Blackall Range formed multistorey dwellings for wildlife. I felt so grateful not only that my job was to protect this magical place from future destruction, but also to be able to work with such progressive and dedicated nature lovers such as Denis and Jane.

Article and photos by
Danielle Outram
Land for Wildlife Officer
Sunshine Coast Council

property profile

Tools to encourage a biodiverse grassy understorey

Before I purchased my property in 1975 it had been used as part of a larger cattle property and was partially cleared. My 160 acres at Conondale is situated in the headwaters of the Mary River and covers a diversity of ecosystems from lowland riparian rainforest to wet sclerophyll and dry eucalypt forests on the drier spurs and ridges, which back onto Reesville on the Blackall Range.

The original survey map shows large areas depicted as 'open grazing with apple gum'. When I bought the property there were also many large Banksias. This open structure, together with fire-adapted plants seems to indicate that the area was managed with regular burning by the traditional custodians.

"Burning off" was a common land management tool in my early days on the land. All the farmers around me burnt annually which meant I had to deal with several fires a year. Usually I wasn't informed that my neighbours would be burning and it was often a matter of using back-burning to protect my property once I noticed a fire approaching. I often faced some dangerous situations with fires encircling my house. Because of this culture of uncontrolled, overuse of burning as a land management tool I became absolutely opposed to fire in natural habitats. I witnessed the dwindling away of my precious rainforest areas and many habitat trees were burnt down as fire entered their hollows. I believed that leaving the forest to its own devices would result in a healthier habitat.

In 2000 a huge wildfire, that was probably started by landowners burning off, rampaged through our valley and we couldn't leave the house for a week or more. The result was astounding; everything was bare. It was as though the landscape had been given a Brazilian wax. You could see much further into the distance and see the underlying land formations. I considered whether this openness would have greatly assisted Aboriginal people to hunt.

I could also see the ground where lantana had previously covered it with dense thickets. Only the skeleton of the plants remained. This didn't last for long though as they were quick to reshoot. It did however inspire me to start pulling them out as it was a much more achievable job. That was the start of my war against weeds.

After the big wildfire, which evoked my love of weeding, I joined Land for Wildlife and developed a property management plan and undertook more strategic weed control. Since that time a lot of my property is now weed free and reverting into beautiful natural bushland.

A few years back I noticed the emergence of a new understory of wet sclerophyll (along with lantana), under the eucalypt canopy that had previously had grass species. Bell Miners also seemed to prefer these habitats and the open forest has experienced a large extent of eucalypt die-back, which is compounded by the miners.

I started becoming more observant of the changes to the understorey and also read more research about fire as a management tool. Slowly I started to accept the idea of using fire as a habitat management tool. I consulted with Land for Wildlife and attended a fire management workshop which involved making a fire management plan for my property.

My aim is to maintain tall eucalypt forests with a grassy understorey by limiting intrusion of rainforest plant species. This will help maintain the rich biodiversity of a grassy understorey and will hopefully help manage the Bell Miner Associated Dieback (BMAD).

My plan involved identifying areas that would benefit from burning and protecting areas such as rainforest that would be damaged by fire. I then divided the property into manageable sections to burn using natural features and decided upon the frequency and intensity of burning according to the natural vegetation types on the regional ecosystem map. Alan Wynn from Land for Wildlife assisted me to select the first areas. These were selected because they already had a diversity of grasses that warranted preservation.

That was the beginning of another long

'The Terminator' - a posi-track with a front-mounted slasher was used to clear narrow, low impact, temporary containment lines.

> *My aim is to maintain tall eucalypt forests with a grassy understorey.*

journey that involved finding old farm tracks and clearing them strategically and sensitively as access tracks for fire management vehicles, fire trails and fire breaks. I used natural control lines where possible such as creeks, gullies and existing infrastructure such as roads. To re-instate some firebreaks such as old tracks and fence lines I used a rubber tracked "terminator" which has a narrow front-mounted slasher. The roots and debris then needed to be pulled out, removed and areas raked. Other areas were prepared with a brush-cutter or my ride-on mower and raked.

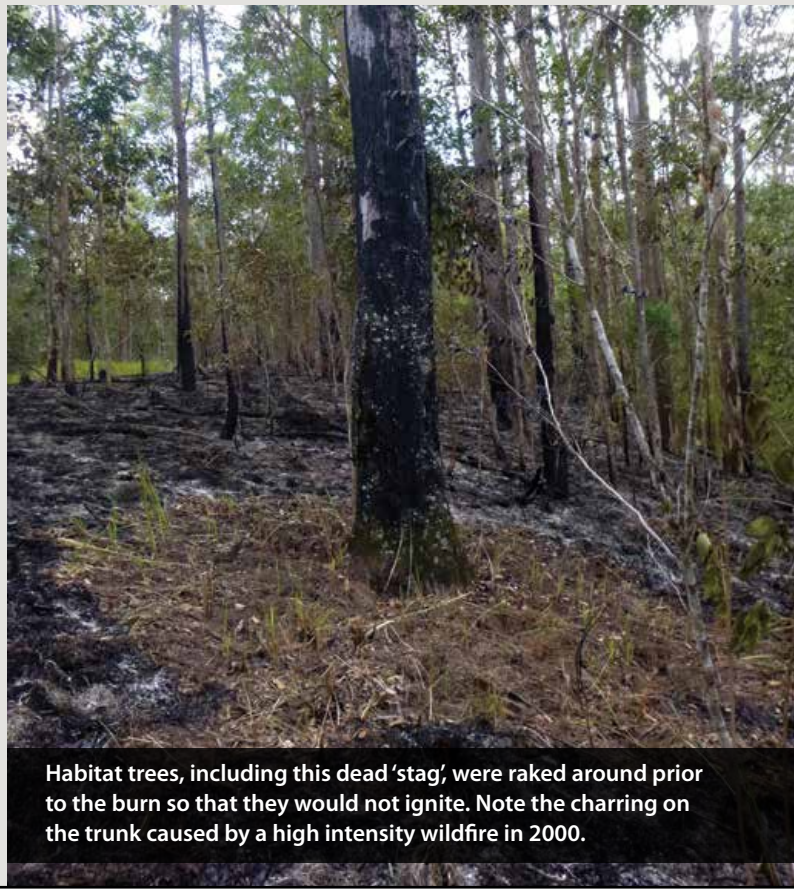
The fire in 2000 was the last uncontrolled fire on my property and since then the local land management culture has also changed with the influx of new residents looking for a lifestyle rather than an income from their land. There has emerged a strong resistance to burning. Even the local fire brigades were reluctant to undertake planned burns and were overly cautious about suitable burning conditions. Neighbours were concerned and resistant. Two years in a row, planned burns were scheduled but the conditions were not suitable and the fires quickly went out by themselves.

I have persisted and now have had three successful ecological

Story continues overleaf...

Fires are lit from the top of the hill and allowed to burn slowly down the slope, note the low flame height and low wind conditions.

Old vehicle tracks make great containment lines and allow smaller areas to be safely burnt, resulting in a mosaic of patches at different stages of post fire regeneration, including unburnt areas.



Habitat trees, including this dead 'stag', were raked around prior to the burn so that they would not ignite. Note the charring on the trunk caused by a high intensity wildfire in 2000.

Example of a 'natural containment line' where the fire went out when it reached the vegetation closer to the gully. This area has a well-developed rainforest understorey and is less combustible in the conditions at the time of burning.

The soil seed bank is stimulated to germinate after a burn. Here masses of native legumes and fire-adapted shrubs such as *Hovea acutifolia* seedlings have germinated. Photo by Nick Clancy.

burns on my place with the rural fire brigade being very supportive when they can provide the personnel (volunteers). These burns required a lot of planning and coordination with the rural fire brigade, fire warden (to obtain a permit), neighbours and other support people on the ground. Once the fire permit had been approved there were certain conditions that had to be met as well. Many hours of site preparation were required. Fire breaks and control lines were cleared and raked or even blown. The site was checked for trees that could fall across containment lines. Habitat trees, both standing and on the ground, were protected by raking away the leaf-litter from around them.

In initiating a burn the most critical decision is to determine the most suitable time considering the seasonal conditions, time of day, air humidity and dryness of vegetation. Conditions can change in a very short time and can either become too dry or too damp to burn. The rural fire brigade will come and assess conditions but often because of the short window of opportunity the resources (usually voluntary) cannot be assembled in time.

I have also had the advantage of advice from someone who has undertaken many environmental burns and can usually assess the conditions visually. I usually aim for a fire that burns consistently but doesn't rise higher than about 1.2 m high. If the fire is too hot a lot of vegetation will be destroyed and if too cool the affect will be minimal and may need to be undertaken again. The best time is at the end of the day when the air is still dry enough but at the time when humidity is increasing so the fire will naturally slow down.

The addition of fire as a property management tool has been the element that has put the icing on the cake as far as managing my property. The first successful ecological burn was perfectly timed. The extent and intensity of the fire couldn't have been better. I then immediately scheduled a second burn for the following weekend which again was perfect.

While some patchiness (unburnt patches) is a desirable outcome for ecological burns, my most recent burn last year was too patchy and had to be relit the following week. I have seen marvellous results especially in the flourishing understory of herbaceous plants and the increasing variety of grasses (see header photo pg 8). I have even witnessed areas of trees seriously affected by dieback spring back to life. For the time being at least the Bell Miners appear to have moved on. I intend to burn my first two sites again after a period of four years then every five years.

Article by Di Collier
Land for Wildlife member
Conondale, Sunshine Coast
Uncredited photos by Di Collier.

The strategy for rainforest areas, such as this one shown, on Di's property is to exclude fire. To help achieve this, controlled burns are undertaken in adjacent open forests to reduce the risk of wildfires entering these fire-sensitive rainforests. Photo by Nick Clancy.

my little corner

Carrying on in my great, great grandfather's footsteps

Rhett Richards-Dodd from Eudlo is 11 and is passionate about nature. His interest started very young with bird and insect watching. As his interest in fauna grew so did his interest in flora especially orchids.

He was very keen to get on board the Land for Wildlife program as we live in the bush and he learnt about the abundance of resources available. Rhett is so excited to receive the quarterly newsletter.

Rhett soon learnt about the endangered Richmond Birdwing butterfly and after discovering them at our home, he felt obligated to help breed them up to be released again.

Rhett's great, great grandfather (Frederick Parkhurst Dodd) was a famous naturalist working for the museum. His job was recording the behaviour of animals and insects and sending taxidermied specimens back to the museum. To supplement his income post war he sold butterflies and insects to some of the world's richest collectors such as the Rothschild family. He soon became known as the Butterfly Man of Kuranda because of his great collection that he displayed at his north Queensland home.

After returning from the Great War, Fred's eldest two sons and two daughters took Fred's collection on tour of Australia.

After years of research and negotiating with the newly opened CSIRO, Allan Dodd (Frederick's son) introduced the Cactoblastis Moth into Australia (1926) which saved millions of hectares of agricultural land being overrun by the dreaded prickly pear. The major reduction of one the world's most prolific weed was made successful by a moth from Argentina simply because prickly pear was its host plant. Allan Dodd was awarded the MBE and OBE for his efforts.

Rhett has continued his great, great grandfather's passion. The support offered by Sunshine Coast Council to Rhett is an investment in the young people of the Sunshine Coast to ensure the continued biodiversity and health of the region's ecology.

Article by Tim Dodd
Land for Wildlife member
Eudlo, Sunshine Coast

Budding entomologist, Rhett Richards-Dodd proudly holding one of his great, great grandfather's butterfly collections.

weed profile

Dwarf Papyrus

Over the last few years Dwarf Papyrus (*Cyperus prolifer*) has been increasing in its occurrence and density throughout the Redland City boundaries. It has now been identified as occurring in most of the rural areas within swamps, wetlands, drainage lines, water bodies and waterways.

This weedy sedge is native to Africa and was historically used to make paper. The rhizomes were also used as a food source, although they are not very palatable. It has been extensively cultivated as an ornamental pond plant in Australia and is readily sold in many nurseries as a water garden feature. As with many ornamental plants, it marched its way beyond the garden fence and found its way into the landscapes of Queensland and northern NSW.

In the natural environment Dwarf Papyrus invades wetland areas and is a smaller version of the other invasive sedge, Papyrus (*Cyperus papyrus*). Dwarf Papyrus is a perennial plant that likes to grow in sunny, damp or inundated areas with still or slow-moving water. Dwarf Papyrus can grow to 60cm high, usually in thickets as shown in the header photo. Like many sedges, the leaves of Dwarf Papyrus are reduced to sheaths at the base of the stem.

Dwarf Papyrus reproduces via its rhizomes, which spread along the ground creating large colonies of plants that are very tough and hard to remove once having taken hold of an area. It can also reproduce via seed, hence the species name 'prolifer' meaning a prolific producer. The flowering stems are rigid and upright with large, spherical shaped seed-heads. Each seed-head has a grouping of over 100 flowering rays each containing a number of green turning reddish-brown florets as they mature.

Why do we need to control this weedy cyperus? Well, if it is allowed to reproduce it will out-compete native species in a short period of time and change the natural ecosystem making it more difficult for both the native flora and fauna that would have once thrived in the area.

Manual removal of Dwarf Papyrus when in small populations is the easiest and best control method. However, once the plant has spread to form a dense thicket around a waterbody or waterway the best control method is to hand weed around native sedges and rushes such as Woolly Frogmouth, and then conduct a selective spray treatment with herbicide formulated for use in aquatic environments such as Roundup Biactive® or Weedmaster® DUO.

A follow-up treatment in 3-4 weeks and long-term monitoring and follow-up treatments will be required to assure long-term control of this invasive weed.

Some success has also been achieved by continuous slashing around the edges of infestations. However, this can result in seed spread if done when the seed is viable. It can also cause erosion around waterbodies/waterways if the area does not regenerate quickly after slashing.

As with all weeds, but especially aquatic ones, early detection and control is paramount to avoid the difficult process of controlling an established infestation.

Article by Maree Manby
Land for Wildlife Officer
Redland City Council

book reviews

Wildlife Conservation in Farm Landscapes

By David Lindenmayer, Damian Michael, Mason Crane, Sachiko Okada, Daniel Florance, Philip Barton and Karen Ikin

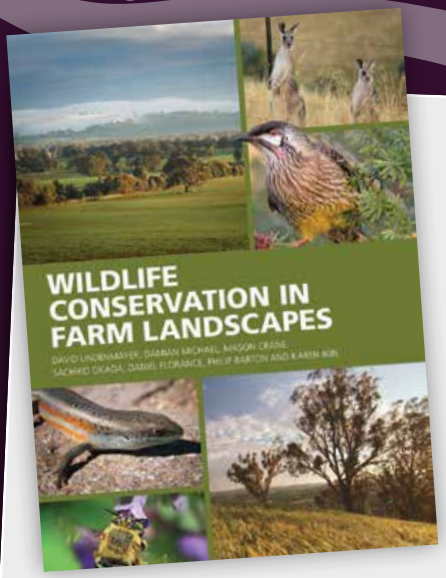
Now more than ever, I am hearing statements like; "we use to see small birds all the time, but now hardly ever" or, "the last time we saw a Koala was 10 years ago". The presence and absence of species is a crucial indicator of changing ecosystems and I believe it is the natural environment's way of telling stories.

Wildlife Conservation in Farm Landscapes explores the challenges of ecological sustainable farming in the presence of rising global populations. It draws upon science and people, and discusses how we can improve production and profitability whilst not undermining biodiversity, soils, vegetation and water quality. The philosophy of this book is based on 17 years of research from over 847 field sites located on 300 farms across Victoria, NSW and South East Queensland.

Repeated surveys across the landscape have allowed the authors to give detailed analysis over time and across varying climates. It provides exceptional examples of the importance of patchy native vegetation and structured habitats for biodiversity as well as improved production, pasture and pollination.

From controversial topics like kangaroos and conservation, to factual snippets like why there aren't Mistletoebirds in Tasmania, this book provides detailed and proven success stories to enable better informed individuals, communities and organisations for future generations.

This book is one for ecologists and for farmers. I have no doubt you will gain appreciation for the absolute need to integrate farming with conservation and conservation with farming as a result of reading this book.



Published by CSIRO Publishing, 2016
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Available from CSIRO Publishing or good bookstores. Also available as an eBook.

Review by Stephani Grove

Sedges, Rushes & Restiads of the Noosa Biosphere Reserve & Surrounding Regions

By Sonia MacDonald and Stephanie Haslam

I like plants. I know a few of them, even some aquatic plants. But I do not know much about sedges. I have tried to avoid questions about these very important pieces in the puzzle of plant life.

At last we now have a quality reference book by Sonia MacDonald and Stephanie Haslam that fills this void. This book adds to the already available *Grasses: Native and Introduced Grasses of the Noosa Biosphere Reserve & Surrounding Regions*, which was also written by the same authors. Indeed, grasses and sedges are similar, but different!

This book follows the same format of their grasses book with great photography by Stephanie and actual scans of real plants, with Sonia's notes on each species. The book also explains botanical terms and characteristics you need to identify these plants, as well as the grasses. This section is vital and is accompanied by quality photos of each plant part described. But wait, there's more.

An informative article on Landscaping with Sedges by Pat Aitken is also included and is followed by Using sedges in Wetlands as features in ponds and pots. Another article entitled Birds and Sedges by local bird expert Valda McLean talks about the importance of sedges to birds and other fauna.

It warmed my heart to also see a section on weedy sedges and rushes too. Thankfully there are not too many weed species, however the ones that are weedy are very weedy, and like aquatic weeds, once you get them they are almost impossible to get rid of. Read this section, and don't plant ornamental Papyrus!

Sedges, rushes and restiads (rush-like or bamboo-like plants) are vital parts of our ecosystems. They filter water, remove nutrients, slow water flow, help oxygenate water, provide habitat for many critters and they look good too!

I commend Stephanie and Sonia on this much needed addition to our knowledge of the Noosa Biosphere and the broader SEQ region.

Published by Noosa Integrated Catchment Association (NICA), 2017
Paperback with plastic cover sleeve, A4 format.
Price: $40 plus postage

Available from NICA via www.noosariver.com.au and select bookshops

Review by Phil Moran

research

Australia Zoo Wildlife Hospital and Koala Research on the Sunshine Coast

Left: The 'Koala Kindy' is a set of enclosures where young Koalas get used to climbing trees before graduating to the larger soft-release enclosure.

Above: Staff at Australia Zoo Wildlife Hospital taking blood from a Koala.

Recently, our team at Sunshine Coast Council had a tour of the Australia Zoo Wildlife Hospital. The hospital opened in 2004 and is managed by Australia Zoo Wildlife Warriors, a not for profit organisation. The facility has been purpose built for caring for wildlife and has the philosophy that by saving one animal, you help save the species.

While they treat all native animals, during the tour it became obvious that the Australia Zoo Wildlife Hospital specialises in Koalas, with almost 8000 being treated at the hospital over the years. During the tour we got to see Koala rehabilitation in action. We saw triage areas where Koalas were being treated under general anaesthetic. Outside were numerous large enclosures, a 'Koala Kindy' for young Koalas and a soft release area full of gumtrees to make sure they are capable of surviving in the wild again once released. The hospital is fully equipped to conduct X-rays and MRIs if required.

Australia Zoo Wildlife Hospital Quick Facts

- Up to 100 wildlife emergency calls received daily
- Up to 30 species admitted daily
- 70% of admissions are a result of trauma including car accidents or domestic pet attacks
- $7000 to treat one Koala
- Average of 70 Koalas treated monthly

We met a very small orphaned Koala joey who had been found alone in suburbia. Her mother was probably hit by a car or chased by dogs, resulting in the baby becoming separated from her.

Koalas are now listed as Vulnerable across Queensland, and some populations, especially in Southeast Queensland, are under more pressure than others. It is thought that Koala populations never recovered from when millions of Koalas in Australia were hunted for their skins in the early part of the 20th century. One hundred years on, it is estimated that Koalas are worth $1 billion annually to Australia's economy through tourism.

Obvious threats to Koalas are habitat loss, disease, animal attacks (including domestic dogs and cats) and being hit by cars. A less obvious threat is climate change, which is increasing the amount and intensity of droughts and heatwaves and stressing Koala populations further.

Sunshine Coast Council in partnership with researchers from the University of Queensland are studying three Koala populations, including some on Land for Wildlife properties. The Koalas are radio-collared to track their movements. Before radio-collaring, they are first given a thorough medical examination, and if something is picked up they can be treated at the Australia Zoo Wildlife Hospital.

Since going on the tour I have a much better understanding of how some of the issues affecting Koalas are treated, and it's good to know that Koalas needing medical attention are in very capable hands at the Australia Zoo Wildlife Hospital.

What you can do?

- ✓ Protect existing Koala habitat.
- ✓ Keep domestic dogs locked up at night.
- ✓ Keep domestic dogs on a leash when walking.
- ✓ Drive safely especially during the spring Koala breeding season.
- ✓ Donate to Australia Zoo Wildlife Warriors.
- ✓ See *Land for Wildlife Note A4* on Koalas for more information about this iconic animal.

Article & photos by
Stephanie Reif
Land for Wildlife Officer
Sunshine Coast Council

The Cycle of Life

We share our property at Witta, about 10 kms north of Maleny, with a lot of wildlife and this spring we were very privileged to witness two male 3 metre long Carpet Pythons fighting for territory on our roof and outside our back door.

The victor then mated with a female on the awning above our kitchen window. Unfortunately we haven't been able to find the clutch of eggs nor have we seen any babies yet. They can lay anywhere between 30 and 47 eggs and the female cares for the eggs until they hatch. She winds herself around the eggs and shivers to keep them at a stable temperature. The young hatch after 50-60 days at which time the female leaves to feed and the hatchlings are left to fend for themselves.

We have also been visited on numerous occasions by some or all the pythons individually. They checked out the garden under our pergola, warmed themselves lying between the pergola rafters and the tin roof, explored our ceiling cavity and sunned themselves on our pergola roof. One even knocked over the watering can and then spent about 5 minutes drinking the spilled water!

The cycle of life is a wonderful thing to witness.

Article by Jill and Peter Cutting
Land for Wildlife members
Witta, Sunshine Coast

PRIZES!

Healthy Land and Water has three copies of *Australian Wildlife After Dark* to give-away to selected Land for Wildlife members who contribute published articles about nocturnal wildlife. Please send your article and photos to the Editor (details pg. 2) by 1st May 2017. Winners announced in the July 2017 edition.

Right Conditions for Fruiting

I have been growing Richmond Birdwing Vines (*Pararistolochia praevenosa*) on my Land for Wildlife property at Pullenvale for around seven years.

These vines are the only source of food for the larvae of the stunningly beautiful Richmond Birdwing butterfly (*Ornithoptera richmondia*), which is now virtually extinct around Brisbane. I have planted several vines down in our bushland and up around the house. It has been a struggle to keep the bush-planted vines alive over the years, particularly during dry periods, however, the vines up at the house are thriving. The house vines receive regular watering, already having reached the top of the trees they are living on and cascading down again. Although the house vines have previously flowered, this is the first season they have successfully fruited. Currently, each vine is covered in fruit, and it has been very exciting and rewarding to observe the fruit slowly ripening over the weeks.

The vines are located is in a partly shaded area to the south of the house which was planted with ferns a year or so ago. Regular water for the ferns significantly transformed the initially dry area into a moist environment rich in leaf litter. Considering the Richmond Birdwing Vine flowers require a specific midge insect for pollination, I can only assume the moisture and heavy leaf litter was the right environment for the tiny insects, as the previously drier conditions never resulted in successful flower pollination.

Although it is unlikely that we will encounter a spectacular and rare birdwing butterfly, I will endeavour to maintain the vines in the hope that someday it will happen. Despite their reputation of being challenging to grow, I have found these vines to be hardy and easy to grow if one or two fundamental requirements are met, and I encourage all landholders to plant a few to assist in the return of these lovely butterflies.

Article by Emily Corbett
Land for Wildlife member
Pullenvale, Brisbane

New Fungi Brochures

These laminated brochures distil decades of research and appreciation into the fungi of SEQ by members of the Queensland Mycological Society (QMS). Each brochure offers thumbnail images of 100 species of fungi along with a basic description, relative size, spore print colour and its ecological role. Personally, I find the ecological role fascinating as it gives us an insight into whether the fungus is a recycler/ decomposer, an endophyte (see pg 3), a mycorrhiza or a pathogen.

QMS members often get the question, "Which fungi can I eat?" The answer, unfortunately, is none. Australia has so many fungal species (about 5000 on the Sunshine Coast alone), that it is nearly impossible to know for certain if you are eating an edible species or a similar-looking toxic one. So please don't be disappointed at these brochures for omitting edibility.

I hope these well-priced brochures increase the recognition of fungi's role in a healthy environment.

Written by Frances Guard and Sapphire McMullan-Fisher. Published by the Queensland Mycological Society.
Price: $5 each ($10 for both brochures) plus postage.
Available from Barung Landcare, Maleny or via www.barunglandcare.org.au
For bulk orders, please contact info@qldfungi.org.au

Maps for Sale

If you ever wanted a large, laminated, high resolution map of your property you can now order one online via the Land for Wildlife website at **www.lfwseq.org.au**. Land for Wildlife members receive a 10% discount and the map will be posted to you within 10 working days.

Mapping is done by the GIS Team at Healthy Land and Water using the latest aerial imagery available. Various layers can be requested such as waterways, contours and native remnant vegetation. Optional extras are also available such as historical aerial imagery (dating back to the 1940s) through to geology, ground temperature, soil and threatened species habitat.

A1 laminated maps (as shown in insert image above) are $150. A3 laminated maps are $50. Digital pdfs are $30.

Advertise your Property for Sale

Many Land for Wildlife members ask, "Can I advertise my property for sale through the Land for Wildlife program?" Well now the answer is yes!

Listings can now be advertised through the Land for Wildlife website at **www.lfwseq.org.au**. Your listing will be live for 3 months and includes 2 Facebook posts.

Listings can be done online for $240 with your advert going live within minutes. We hope this encourages more conservation-minded people to buy Land for Wildlife properties and continue the good work of previous owners.

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