Issue 18 - December 2011

Wombat Forestcare Newsletter

Welcome to our final edition for 2011. We have had a beautiful spring with mass flowerings of pea species. The drier country just to the north of the Wombat displayed fields of wildflowers and spectacular orchids. As the International Year of Forests comes to a close we celebrate the wonders of the Wombat Forest and its great diversity of flora, fauna and fungi. A special thanks to all our members for their contributions to a successful year for Wombat Forestcare. ... Gayle Osborne

The destiny of a raindrop falling near Trentham – a journey down the Loddon River

By Alison Pouliot

This is the fifth article in the series looking at the rivers that rise in the Wombat Forest. With a length of 392km, the Loddon is the Wombat's longest river.

The Loddon River in high flow at Loddon Falls - photography © Alison Pouliot

It's raining. My favourite time to be in the Wombat. It's all damp earth and swirling cloud and intense forest scents. I'm near the source of the Loddon River, not far from Trentham, where some of the Wombat's most majestic trees stretch into the misty canopy. A single glistening water droplet catches my eye, momentarily shivers, then slips down a fern frond. This solitary water droplet then undergoes a journey across the soil to form part of the Loddon's headwaters.

The droplet soon departs the tall cool eucalypt forest and heads northward, tumbling over the basalt columns of Glenlyon Falls. It glides by platypus and native fish and further downstream traverses box-ironbark country, squeezing through the lichen-splattered boulders of Vaughan springs and onward past Guildford and Newstead. As the landscape dries out and trees become sparse, it may spend time in Cairn Curran or Laanecoorie Reservoirs, before continuing downstream to Bridgewater. Towards the end of its Loddon journey it flows into the Murray River near Swan Hill.

But during its course, a most bizarre thing might happen. It could be traded.

Gambling with water - Water Trading is simply the buying and selling of water access entitlements. It's not a new concept. South Australia first introduced water trading in the early 1980's. The scarcity and hence economic value of water has long been recognised in Australia. Water was being sold soon after European colonisation as settlers polluted their own local supplies and had to buy it from further

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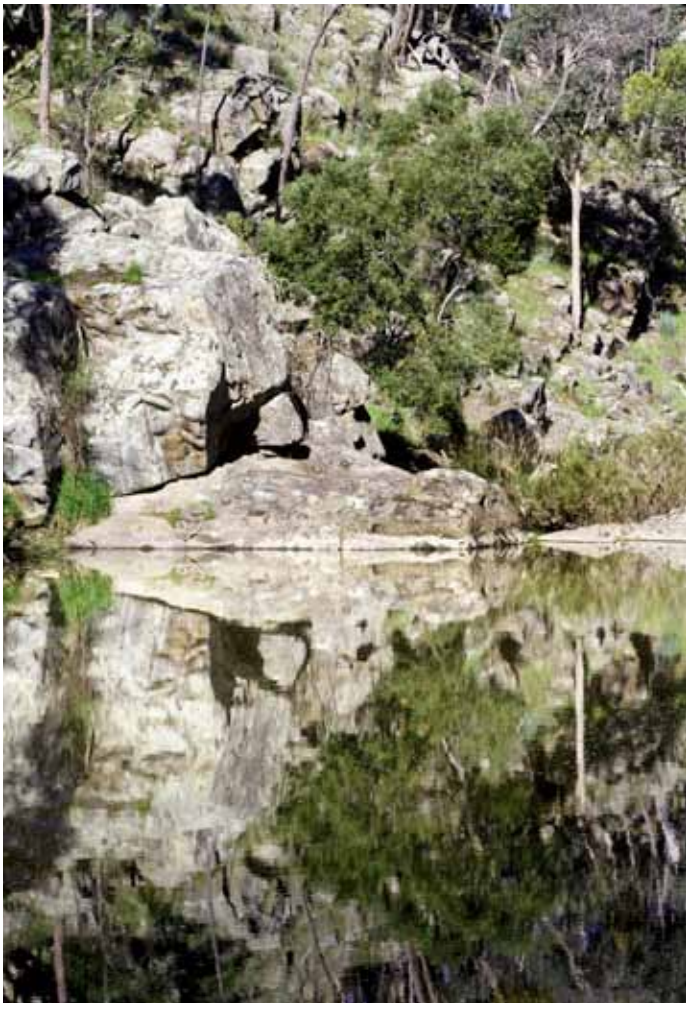
upstream. Australian history is deeply embedded in a succession of struggles for water across every state and territory. But has it all gone too far? At some point water has ceased to belong to the rivers, to the catchments and to all the life it supports. Something is seriously odd when a government must buy or buy back water to allow it to flow down a river. Water has become tradable property, and if you're lucky enough to have a 'water access entitlement', you can sell your water allocation for a decent profit. But what are the real costs of applying market principles to water and has its commodification had any real benefit to the rivers?

Aquatic connections - In previous articles I've lamented the loss of human connection with the environment. This disconnection often stems from the tendency to view humans as separate from 'nature'. Our current day approach to water, to water markets, to water trading, to water as a commodity, is a prime example of this rift. It seems, strangely, that many also view water as separate from the environment. Yet surely we're all fully aware that this is the same environment to which we're all inextricably linked. We tend to forget that that the economy is a mere overlay on the environment; that is, it's the environment underpins the economy, not the contrary. Yet economic interests inevitably take priority over environmental interests.



Reflections on the Loddon south of Vaughan Springs
photography © Alison Pouliot

I don't pretend for a moment to understand the complexities of economics, but surely the ethics of applying economic principles to water is dubious. It's a commonly voiced argument that water trading promotes more efficient allocation as market-based price encourages users to allocate resources from low to high value activities, but the environmental and social impacts have been largely overlooked. Part of the problem stems from the belief that everything is quantifiable and can be slotted neatly into economic models. But can one put a figure value on the sense of well-being inspired by a chorus of croaking frogs, the joy of watching a heron take flight, or a fish population able to survive because it still has some water in which to swim? Critics may view this simply as green sentimentality, but is this not the stuff that keeps us sane and whole, ignites our imaginations, gives meaning to our existence and defines what it is to be human? Is it not simply about making wise decisions to protect the very surrounds that allow us to exist? Despite the spin of economists and politicians, not everything is measurable in this world.

It seems that water trading has been very cleverly marketed and supports the fallacy that water can be sold without environmental consequences. Yet many highly regarded scientists argue that water trading is neither environmentally nor economically viable. Such a scenario might work in a country with surplus supply. But that country isn't Australia. We still don't seem to fully appreciate the value of rainwater as a resource. Only under the pressures of drought did governments finally wake up to the benefit of installing household water tanks. Token water saving campaigns have done little to shift our position as the country with the highest per capita water-use in the world. Given that we live on the world's driest inhabited continent, surely it comes back to real human responsibility and conscious and efficient water use.

Common sense - While there may be many parallels between environmental and economic modelling, in regard to water trading, economic measures appear fundamentally incompatible with environmental principles. When environmental principles don't

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align with economic priorities, the environment essentially gets shafted. My intention isn't to reproach water policy makers, many of whom are highly regarded colleagues with genuine environmental concerns. Yet we should continue to question the propaganda of government schemes such as water trading and emissions trading that protects the dirtiest polluting industries by allowing them to ignore environmental standards by simply buying the 'right to pollute'. It seems, sadly, that the more become embroiled we become in the water debate, the more we lose sight of good old common sense.

Returning to the Loddon, I hope that one day we will regard water, rivers, the Loddon, as something more than a mere utility. I believe that we are slowly developing a sense of stewardship and responsibility to reverse, where still possible, the past abuses of our river systems. To do so, we must first reconcile the 'imagined division' between the natural environment and humanity.

We know that water is precious. Water in the Wombat that rolls into the Loddon is especially precious as it supports a swag of threatened species such as growling grass frogs and powerful owls. The Loddon catchment was once a supply of water, fish and other fauna for the Dja Dja Wurrung and other Aboriginal peoples. They inherently understood this environment and were inseparable from the land. From their connectedness, we can begin to understand their belonging and responsibility for the natural environment. And from this, we too can learn how to reconnect with the environment, with the Loddon River. The choice is ours. It's never too late to think differently. ■ **www.alisonpouliot.com**

The Loddon squeezes past lichen-covered boulders near Glenluce - photography © Alison Pouliot

Painted Cup Moth *(Doratifera oxleyi)*

Great swathes of the eucalypts of the Hepburn Regional Park and the Upper Loddon area have been defoliated by this little guy and his/her mates. The caterpillar is a member of the Limacodidae family and most likely is the final instar of *Doratifera oxleyi*, the Painted Cup Moth.

When inspecting this caterpillar take great care to avoid the yellow stinging hairs. We will describe the life cycle in our next issue.

If you are trying to identify a caterpillar, moth or butterfly a great resource is:
http://lepidoptera.butterflyhouse.com.au/
but be warned it may be harder than you think.

Caterpillar - photography © Gayle Osborne

Wanted: female Satin Bowerbirds for fun times in Wombat State Forest, Trentham

By Tanya Loos

Satin Bowerbird *(Ptilonorhynchus violaceus)* - photography © Gayle Osborne

A young male Satin Bowerbird has constructed a stunning avenue bower in suburban Trentham, complete with a dazzling array of blue objects such as feathers, flowers and bottle tops. The young male tends to his bower and his court with meticulous attention, and performs special displays involving song mimicry, metallic buzzing and some very athletic looking 360 degree turns.

But the only creatures watching this magnificent young buck are some absolutely thrilled humans. Satin Bowerbirds are completely out of the ordinary in the Wombat State Forest region; the last sighting was one passing through at Mt Macedon, in 1976! The nearest populations are in the Otways, and east of Melbourne. So our friend, let's call him Stevie, is acting in complete isolation.

Satin Bowerbirds are our most familiar and well known bowerbird species. One subspecies occurs in an isolated population up near Townsville, Qld, and then another population can be found along the Great Diving Range from south eastern Qld through NSW down to the Dandenong Ranges in Victoria and then appears again in the Otways. Like other bowerbirds, Satin Bowerbirds are polygynous, which means that one male mates with several females. The males construct elaborate and beautiful bowers to attract the females and demonstrate their fitness as a mate. The females visit the various bowers in the area, and then mate with the male with the most beautifully constructed bower and the most attractive display of found objects. The female then goes off and builds the nest, and raises the young completely unassisted.

Satin Bowerbird populations are regarded as sedentary and resident; they inhabit the same territories all year round and do not undertake any large scale movements or migrations. They do have a tendency to move between habitats, spending the summer breeding period in rainforest, tall wet forests and the intersection between these and farmland, and the winter time in more open, lowland areas such as farmland, orchards, parks and gardens. Stevie's presence in suburban Trentham is not unusual behaviour in terms of habitat, in the usual parts of the Satin Bowerbird range; these birds are a familiar garden bird at the right time of year. Some flocking occurs in winter, with flocks of between 6 and even 200 females and immature males, or "green birds", observed on occasion.

Immature male bowerbirds do not acquire the spectacular, glossy blue black plumage and yellow-greenish blue bill colour of the adult male until their seventh year. Instead, they have the same rich green and chestnut patterning and blackish bill of the female Satin Bowerbird, and will acquire the blue-black plumage of the adult male in patches in their sixth year moult.

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The bower and the court - photography © Tanya Loos

Stevie has no patches of blue-black in his plumage, which places him in the second to fifth year age class. However, his bill is the same colour as an adult male, which means he is probably in the five year old age class. It is difficult to be sure, as there is some variation in age when males attain adult plumage.

Young males like Stevie have an extended immature phase compared to other bird species. It is thought that the males spend these years gradually acquiring the skills to be a successful adult male Satin Bowerbird. While the behaviour of adult males is well known, immature males have not been as well studied.

Very young males frequent and display at a particular patch of ground, without any sticks. By age two or three, the males start constructing rudimentary bowers, which consist of small, poorly constructed piles of sticks, without the upright avenue that makes the bower, and substandard displays of objects. A radio-tracking study of immature males in southeast Qld tried to find out more about how immature males acquire the complex bower building and display skills of the adult males. Mature male Satin Bowerbirds even use berry juices and other plant matter to paint the inner walls of the bower with dark purplish juices!

The researchers found that immature males visit both the rudimentary or practice bowers, and mature male bowerbird bowers. At both of these locations the young males practice displaying, building, and arranging objects. Some mature males do not take kindly to the young 'uns hanging around in this way, and the researchers concluded that this may be why immature males might visit only some of the bowers in an area. The social dynamics around practice bowers are similarly complex, as is the size and configuration of the immature males' home ranges (Maxwell et al 2004).

Stevie's bower cannot be described as a practice or rudimentary bower. It has all the hallmarks of an adult bower or "traditional" bower, especially the neat, tightly interlaced fine sticks arranged to create an avenue of parallel walls, with a north south orientation. Immature males often use large misshapen sticks in the bower, or the walls are flimsy and poorly constructed. Similarly, the court where Stevie displays his objects is lavishly decorated with objects of the correct colours, blue mainly, with some yellows and brown. One key difference is that Stevie has not "painted" the inner walls of his bower, as this is a distinctly adult trait.

My guess is that Stevie learned his art from adult males in the nearest population, possibly the Otways, or in the tall forests east of Melbourne, and then for reasons known only to him decided to set up his mighty fine practice bower in Trentham. An advantage with his unusual location is that he will not have to contend with other male Satin Bowerbirds stealing his decorations or destroying his bower, which is normal practice. But even with the most beautiful bower in the world, Stevie is at a distinct disadvantage if there are no females!

Stevie has been in Trentham in the same garden since around June, and immediately commenced building his bower upon arrival. Will Stevie stay in Trentham long enough to acquire his adult plumage? Or will he head back to his parent population – anyone's guess is good enough! The lucky owner of the garden where Stevie has established himself has requested to remain anonymous to reduce any chance of disturbance to this most remarkable visitor. ■

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Liverworts Do It Both Ways

By John Walter

Yes, Yes I know it is a provocative title but the fact remains, liverworts really do "do it both ways" but more on that later.

Liverworts, and their cousins the mosses and the hornworts, form a large group of plants collectively known as the Bryophytes or the non-vascular plants. Early botanists identified that the Bryophytes lacked the complex vascular system that the "higher" plants use to move nutrients and water in an organised way. It was also noted that a bryophyte's cells lacked lignin, reducing the strength of the cell walls. The combination of these two factors limits the size any one individual plant can reach although groups of plants can often cover a large area.

It is not possible to visit the Wombat Forest without noticing the trees, and many visitors also take an interest in the shrub and herb layers. Some will notice the orchids and the larger fungi but very few will see the mosses and liverworts. Their small size certainly plays a part in this, but I do not believe that this reduced interest is entirely due to size. A scan through almost every book on Australian plants will reveal an absence of mosses and liverworts and for many plant enthusiasts, identification of these small plants has been too difficult to contemplate. The publication of a field guide by David Meagher and Bruce Fuhrer in 2003 changed this and amateurs and enthusiasts like myself, have a chance of putting a name to that pretty little plant we so often find lurking in the background of our fungi and other photographs.

The first non-vascular plants looked a lot like modern liverworts and they evolved long before the higher plants such as ferns and conifers, while the new kids on the block are the flowering plants. It is wrong however to assume that because the bryophytes came first, the other plants evolved from them; in fact both the vascular and non-vascular plants evolved independently from the green algae. Recent studies have also shown that some bryophytes do contain specialised cells that can move water around, although they use a different system to the vascular plants.

The recent visit to the Stewarts Creek Hydrological Experimental Area by the group provided me with an ideal opportunity to capture the life cycle of another thallose liverwort, *Marchantia berteroana*. The thallose

Targionia hypophylla, a thallose liverwort with its characteristic black clog-like capsules in a typical bryophyte garden. There are at least six moss species, one leafy liverwort and one lichen also in the photo - photography © John Walter

An unidentified leafy liverwort, probably *Chiloscyphus semiteres,* scrambling over the much larger thallose species, *Lunularia cruciata* - photography © John Walter

Fossombria sp. with spherical black sporophytes and the dark green sporophyte of *Asterella drummondii* photography © John Walter

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liverworts have a large green fleshy base and are more easily seen and identified than their leafy counterparts. Most casual observers would choose a thallose form when asked to describe a liverwort even though there are a great many more leafy ones out there.

The Marchantia's are probably the most well known of all the liverworts and are generally used to illustrate the life cycle of liverworts even though their cycle has some unique features not seen in other liverworts. All liverworts contain structures called Antheridia (male) and Archegonia (female) and these male and female structures occur on separate plants called gametophytes. Raindrops weaken and then open the cellular flap covering the antheridia on the surface of the male gametophyte and the antheridia burst releasing the sperm. These sperm then swim through the water until they locate similarly open archegonia on a female gametophyte and can fertilise an egg held within. A completely separate and parasitic plant called the sporophyte then grows from the fertilised egg, ultimately releasing spores to the air which can germinate and produce new male and female gametophytes. The Marchantia species also do this but instead of the antheridia and archegonia being located on the surface of the liverwort, they are found at the end of specially grown umbrella like objects called the antheriophore and the archegoniophore. (I know the names get confusing after a while but we are nearly there.)

The addition of the umbrella-like objects means that once released, the sperm must swim up the archegoniophore in order to reach the archegonia and fertilise the egg but how does it know the way? The rain that caused the release of the sperm also weakens the cells surrounding the egg, releasing a chemical signature and washing it down the archegoniophore where it is detected by the sperm. The sperm then uses a phenomenon called chemotaxis to swim towards the concentrated source of the chemicals, eventually locating the egg which is still sitting embedded in the underside of the archegoniophore.

Now I did state at the beginning that liverworts do it both ways. It seems the dizzying heights reached by the Marchantia's sperm during sexual reproduction isn't enough as these little plants also reproduce asexually. In fact all the bryophytes can reproduce asexually. The Marchantia species produce a special kind of splash cup called a gemmae cup which looks a lot like a small nest full of eggs. Each egg is actually a small piece of gametophyte and raindrops break the connection

Marchantia berteroana
Top Left - antheriophore containing antheridia,
Top Right – immature archegoniophore,
Bottom – group of both male and female plants showing older dried brown archegoniophores - photography © John Walter

Marchantia berteroana gemmae cups with their distinctive crowned top and bundles of eggs within.
photography © John Walter

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between the egg and the nest and splash the egg out of the nest where is can be washed away and commence growing as a new plant.

Several fungi species also use the splash cups concept to assist them reproduce with perhaps the most obvious being the Jellied Birds-nest Fungus, *Nidula niveotomentosa.* In this instance however the eggs are spore capsules, each containing countless microscopic spores as a result of sexual reproduction.

Jellied Birds-nest Fungus (*Nidula niveotomentosa)* - photography © John Walter

So just why is it the liverworts do it both ways? I have recently observed two separate populations of *Marchantia berteroana*, the first is colonising very recently burnt soil and the second is on soil last burnt just over two years ago. In the first area there are no signs of sexual reproduction anywhere to be found while at the second site I had to search for a considerable time before I found the gemmae cups that helped me confirm the two populations were the same species. Does the age of the colony play a part in this? Certainly some studies have shown that the age of the thallus appears to play a role in the development of gemmae cups, with the older plants being more likely to reproduce sexually (Une, K 1984). In another study involving a British moss that has gemmae cups, Kimmerer (1991) found that plant density affected the production of gemmae with the likelihood of sexual reproduction increasing with increased density of plants. There is little cover available in newly burnt areas to aid moisture retention and the plants need to quickly reproduce before the warm weather dries them out. Perhaps this is best done asexually, placing the colony in a stronger position for viable sexual reproduction once there is more cover and the colony density is greater.

With summer coming on you may think it is a bit late to see some of these interesting plants in the Wombat but keep your eyes peeled around damp areas, creeks and streams and you just might be rewarded with the sexual antics of the humble liverwort. ■

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Australian Bryophytes, Australian National Botanic Gardens & Australian National Herbarium accessed at <http://www.anbg.gov.au/bryophyte/>

Correction - Apology to John Walter for incorrectly spelling his name in the September 2011 Newsletter

Dwarf Silver Wattle *(Acacia nano-dealbata)*

By Gayle Osborne

Most of us are familiar with the common wattle species of the Wombat Forest, the Silver Wattle *(Acacia dealbata)* and the Blackwood *(Acacia melanoxylon)* but there are many more including Narrow-leaf Wattle *(Acacia mucronata var. longifolia)*, Hop Wattle *(Acacia stricta)*, Prickly Moses *(Acacia verticillata)* and Snake Wattle *(Acacia aculeatissima).*

A population of the less familiar Dwarf Silver Wattle *(Acacia nano-dealbata)* is recorded for Bullarto on some roadsides. This wattle which is listed as "Rare in Victoria" is endemic to our State.

Acacia nano-dealbata flowers - photography © Gayle Osborne

Acacia nano-dealbata seed pods
photography © Gayle Osborne

Acacia nano-dealbata foliage - photography © Gayle Osborne

The Dwarf Silver Wattle can grow to 7 metres, which is hardly a dwarf, but the Silver Wattle can reach 30 metres. In the Wombat, however, they grow to a comparable size.

At a first glance the dwarf version of the Silver Wattle appears very similar to the common Silver Wattle, however it flowers about a month earlier than the common Silver Wattle and together with its neater and greener foliage, was easy to spot during August.

The seed pods of the Dwarf Silver Wattle are quite large and a distinctive oblong measuring about 7 x 1.5 cm. The flowers are a slightly brighter yellow and the shrub-tree somewhat bushier.

We were greatly surprised to find that there are extensive populations in the Wombat Forest along Osborne and Babbington Roads. Many of us have frequently travelled these roads without stopping to take a closer look.

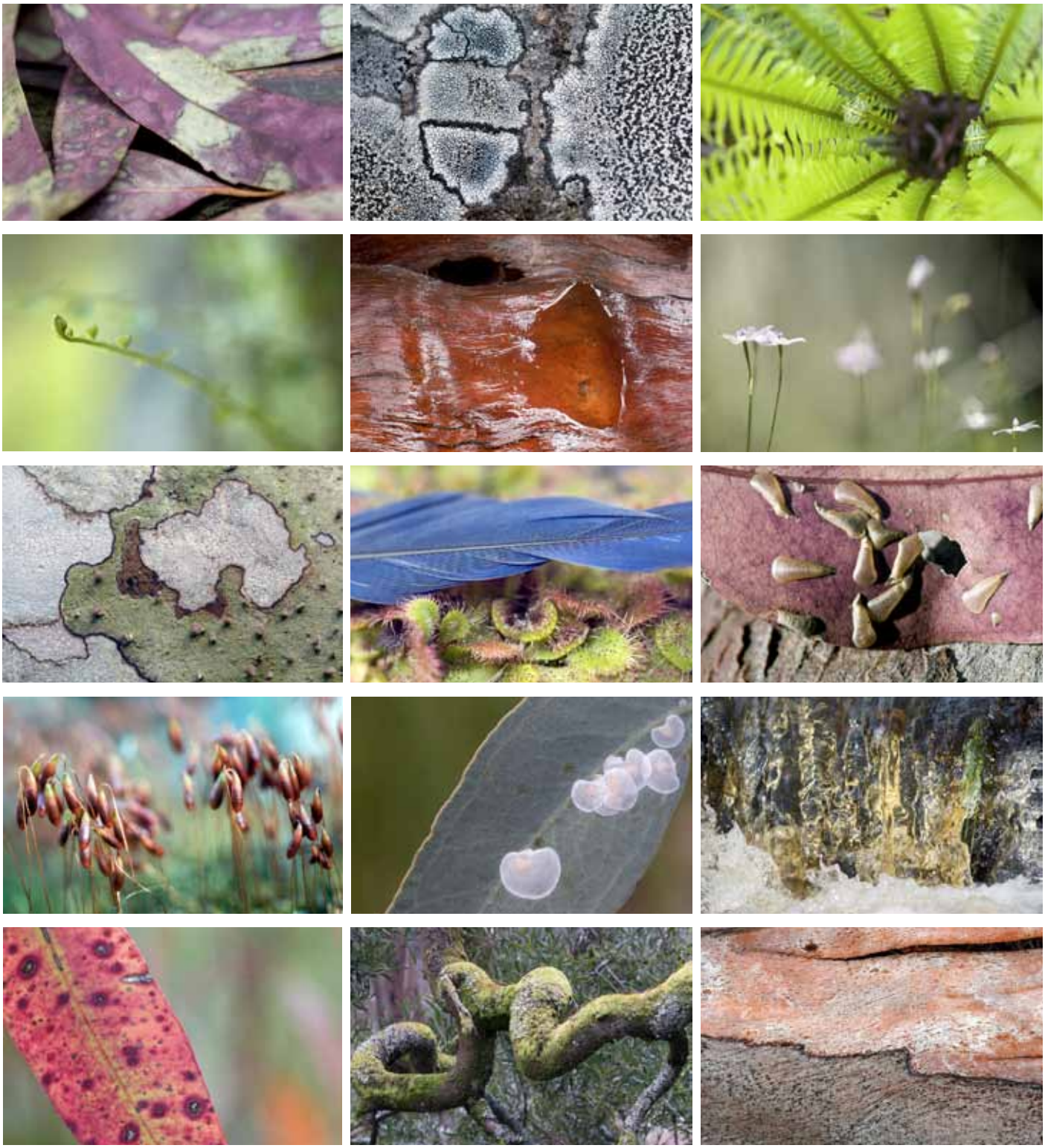
This rare wattle is found in the Otways, the Macedon/ Woodend/Riddles Creek area and around Healesville.

A single and very old tree which remained on Mt Buninyong, near Ballarat died several years ago. Fortunately, the local Landcare group had gathered seed and propagated plants to revegetate the area.

All this raises the question of the original distribution of the dwarf wattle. Was our population originally linked to Mt Buninyong? ■

A Huge Thank You!

As the International Year of Forests draws to a close, we continue our campaign to protect the Wombat. A huge thanks to all those who contributed in their endless efforts to protect our precious forest. We end this edition of the newsletter with some close-up impressions of the forest. Images by Alison Pouliot.



Wombat Forestcare Membership

Wombat Forestcare Inc. is dedicated to preserving the biodiversity and amenity of the Wombat State Forest by utilising the skills and resources of the community. By becoming a member you will have input into our activities and projects, and give support to caring for our forests.

For memberships and further information contact Gayle Osborne, phone 03 5348 7558 or email info@wombatforestcare.org.au

Membership fees are only $10 single and $15 family. **Visit our website - www.wombatforestcare.org.au**