

ASSOCIATION of SOCIETIES FOR GROWING AUSTRALIAN PLANTS Inc.



Wildlife and Native Plants Study Group Newsletter

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Dear Members,

Yes, its that time again for another newsletter. The year seems to be flying by and the days are certainly drawing out now and the sun is turning up its heat.

Doesn't the garden look wonderful in spring, fresh and green. Even the harsh Australian bush comes alive, and the air is filled with the scents of our unique flora, and the sounds of wonderful birdsong. It is no wonder that Spring is called the season of life. It is certainly time to be soaking up the pleasures of the sun and the garden.

Biodiversity and improving knowledge about the subject and how it relates to the Australian flora and fauna may be the greatest scientific challenge of the 21st century. Learning where species are, their role in maintaining healthy ecosystems and how we can conserve them will be vital for making wise decisions about our rivers, land and oceans. It is hoped that through his newsletter some information, knowledge and experiences can be shared to enhance the understanding of plants and wildlife in the great scheme of things. Please help me to help you, by passing on your thoughts, ideas and experiences to build a newsletter of value to all who may read it. In this way we can all be satisfied that we are all doing our little bit towards the survival of our unique 'Aussie' flora and fauna.

Did you know that Australia has a critical international environmental role as one of only 17 "megadiverse" nations in the world - and that together these nations are home to two-thirds of the world's known species? Or that Australia has a very high proportion of species which are found nowhere else on Earth? Life on Earth is a complex web of interactions which connect millions of species together to sustain life- including human life. Without this system, humans cannot survive. Around the world there are clear signs that the system is breaking

down. One of the clear indicators of this breakdown is the level of species extinction.

Are you aware that there are a number of environmental events happening between October and December 2003. For information on the events listed below visit the Environment Australia website on www.ea.gov.au/events

- OCTOBER 3 Walk to Work Day
OCTOBER 5 Respect the Beach Day
OCTOBER 6 World Habitat Day
OCTOBER 12-19 Weedbusters Week
OCTOBER 19-25 National Water Week
OCTOBER 26-NOV.1 National Bird Week
NOVEMBER 1-9 Frog Week
NOVEMBER 10-16 National Recycling Week
NOVEMBER 23-28 Darwin & Katherine Arbor Week
DECEMBER 1-7 Coastcare Week
DECEMBER 5 International Volunteers Day
DECEMBER 7 Ocean Care Day

IN THIS EDITION

- Suitable Street Tree Species for NSW by Peter Vaughan, Gumnuts 54
Spending Time on the Docks by Phil Watson
Fire Ants NSW Agriculture
Planning a Pond and Creating Habitat for Frogs by Christine Jones
Why revegetate a wetland by Margaret Brock LWRRDC
Using riparian land as wildlife corridors Land & Water Australia Ed.23,2003
.....And much, much more

"Nature, like a careful gardener, thus takes her seeds from a bed of a particular nature and drops them in another equally well fitted for them." Charles Darwin On the Origin of Species 1859

ROADSIDE VEGETATION from a leaflet from
Dept. Environment & Heritage SA.

Why is it important?

The native vegetation which occurs along roadsides is widely regarded as being of very high environmental importance.

First impressions of scenic landscapes falsely suggest that areas are well vegetated. In truth, in a lot of areas often 90-99% of the vegetation has been cleared.

Due to this clearance, roadside vegetation is now particularly important because:

- In some districts the roadside vegetation is virtually the only native vegetation left - the last remnant of the natural heritage of the area and the only hope of survival of some species of native animal in that locality
- Roadsides are often the home of small native shrubs and groundcovers which have disappeared from bush on private land because of clearing or grazing by stock: many small rare and endangered plants occur on roadsides
- Roadside vegetation forms vital corridors for the movement of birds and other native fauna
- A good cover of native roadside vegetation will suppress weeds (many of which increase fire hazard) and will provide shelter for adjoining farmland.

Management of the vegetation may be difficult because the road verge carrying the native vegetation is often only two to four metres wide. These verges are therefore highly vulnerable to disturbance, particularly through invasion by exotic weeds and grasses. Weed invasion is often enhanced by soil disturbance after fire. Other management issues include fence line clearance by adjoining landholders, occasional clearance during council or other roadworks, and firewood collection. In general the management of roadside vegetation requires a policy of minimal disturbance and, where possible, careful weed control so as to restore native areas.



TORTOISES AND WETLAND BUFFERS

Information from Land for Wildlife.

We typically associate freshwater species, such as tortoises and frogs with a water body in which they are usually found and so it is easy to assume that protecting the water body will protect the animal. But this assumption may be incorrect.

A study in the US looked at the requirements of three freshwater turtles inhabiting an Atlantic Coastal Plain wetland in Carolina. Turtles leave the wetland environment to find nest sites and also during hibernation.

The researchers found that current US Federal wetland regulations, which provide a 30.5 metre buffer zone, insulated just 44% of nests and hibernation burrows beyond the designated wetland boundary. Full protection would have required protection of a 275metre buffer but 90% of nests could be included by a 73 metre buffer.

The authors note that, unlike in the wetland, limited compatible development in the upland zone may be feasible. This study provides an example of the important link between terrestrial and aquatic environments (as between terrestrial habitat types.)

Reference: Burke, V. J. & Gibbons, J.W. (1995) Terrestrial buffer zones and wetland conservation: A case study of freshwater turtles in a Carolina bay. Conservation Biology 9:6 pp. 1365-69.

SOME COMMON WEEDS OF ROADSIDES AND RIPARIAN AREAS courtesy CRC for Weed Management Systems.

- ☒ Boneseed - *Chrysanthemoides monilifera* ssp. *monilifera*
- ☒ Bitou bush - *Chrysanthemoides monilifera* ssp. *rotundata*
- ☒ Broom - *Cytisus scoparius*
- ☒ Blackberry - *Rubus fruticosus* aggregate
- ☒ Bridal Creeper - *Asparagus asparagoides*
- ☒ St. John's wort - *Hypericum perforatum*
- ☒ Horehound - *Marrubium vulgare*

SUITABLE STREET TREE SPECIES

From *Gumnuts* 54 comes the following information on suitable street tree plantings in NSW provided by Peter Vaughan. Peter has had an interest in street trees for many years and he was asked to provide some thoughts about appropriate trees for Newcastle City Council as part of a submission to Council by the Newcastle Group of APS. I thought others might find Peter's ideas both interesting and useful, so here's what he had to say.....

"Street trees are something I feel strongly about. A few quick ideas are:

The best eucalypt is *E.robusta* (Swamp Mahogany). It is not a tall tree, it flowers spectacularly, and the nectar appears to be higher in protein (for reasons stated below) as the bee keepers reports it builds up hive strength, but more importantly the birds such as the Regent Honeyeater (one of Australia's rarest and most endangered birds) migrate to flowering *E.robusta*. Regent Honeyeaters spend much of the year in the Capertee Valley (Mudgee area), but migrate to the coast each year. They have been reported in the lower Hunter region a number of times, and as the recovery plan for the Regent Honeyeater improves their numbers (assuming they don't go extinct) we can expect to see more Regent Honeyeaters in our region. The Swamp Mahogany has the historical significance of being the first street tree planted in Australia, and some of the original plantings are still alive and growing in Sydney Botanical Gardens.

Another Eucalypt is *E.curtisii*. There are a few growing as street trees. It is a mallee that can be grown under power lines and never need trimming. It flowers every year, is hardy. It is really a great plant.

Eleaocarpus obovatus and *E. reticulatus* - both great trees to keep bower birds, figbirds, orioles and larger honeyeaters in urban areas. Both have great flowers and easy to grow. They are not attractive to fruit bats which may make them more user friendly.

Native Frangipanni - great tree but short lived, expect about 10 years. Is that acceptable?

Palms - we should be growing the local species, the *Cabbage tree palm* and *Bangalow Palm* (but the *Alexander Palm* is acceptable if desired, it does appear to grow stronger). If the site is correct they will do well. Palms are important as a number of fruit pigeons are nomadic following the fruiting of palms, in particular the *Cabbage Tree Palm*. We should not be planting date palms or *Washington Fan Palms*.

Lilly Pillys are important trees. Councils have the concept that we should live in the valleys, and preserve the bush on the ridgelines for scenic beauty. Nature wants it the other way around. The nutrients, ie. soil and fallen leaves, wash down into the gullies, and so this is where the best trees grow, and on the ridges few animals can survive. In the valleys the trees receive enough nutrients so they can afford to give some away with their nectar and fruit. Therefore the trees from valleys are sought after by fruit and nectar eating birds and these are the important conservation areas (proven in studies by NSW Forestry). However we have cleared the valleys, consequently to compensate we should be planting some of these trees in our streets. Very important local species are the *Lilly Pillys*, and there is a wide range of forms now available. They can be grown from cutting so the size and form can be pre determined.

Cupaniopsis anarcardioides is another great tree for local birds. The figbirds migrate to our area when they fruit. It is a species that tolerates and grows well in poor soils and harsh conditions. *Brachychitons* should also be considered of course, but not the flame tree. Perhaps the lacebark, but I would suggest hybrids for improved form. I would recommend lacebark rootstocks and grafting hybrids on top. This is a very easy procedure.

White Cedar is ideal for carparks because of its umbrella shape. Please use local sourced plants, not the common plant grown that is Indian or Chinese in origin. The local plant appears to have smaller fruit, and so is more attractive to local birds.



Importantly, the *White Cedar* should not be mulched around as this allows the leaf stripping caterpillar to attack it. The caterpillar lives in the mulch during the day and eats the leaves at night. I have watched the trees next to the Newcastle Museum and they are not mulched and the caterpillars do not seem to be able to survive to attack them. Therefore if you grow *White Cedar*, have bare earth around them. They perform very well in the hot dry situation that car parks provide. Council may worry that the fruits of the *White Cedar* may attract birds that will crap on the cars in car parks. However the *White Cedar* fruits ripen when there are no leaves on the tree, which means the birds don't hang around in the tree but eat their fill and go and sit somewhere safer. Also the fruits are rather large, so the birds cannot eat many anyway, and have to move on. The tree is using the old gambit "don't put your fruits all in the one bird" as that bird may get eaten and they never know where the seeds will end up!

Also note that Council seems to like *Grevillea 'Robyn Gordon'*. Inform them that *Grevillea 'Superb'* grows much better and should replace '*Robyn Gordon*' on Council's lists."

©

Spending time on the Docks

By Phil Watson

The diverse Dock or Buckwheat family (*Polygonaceae*) consists of over 800 species, which are represented to the backyard gardener as one of those common, pesky weeds known as Dock *Rumex sp.*, Sorrel *Rumex acetosella*, or Wireweed *Polygonum aviculare*. However, the family boasts numerous attractive exotic ornamentals, (eg the small brightly flowering herb *Polygonum affine* and the strikingly beautiful tree Long John *Triplaris surinamensis*), Tasmanian natives used for bush tucker, (eg Swamp Dock *Rumex brownii* and the Climbing Lignum *Muehlenbeckia adpressa*), Rhubarb *Rheum rhaponticum* as well as the grain and green manure crop Buckwheat *Fagopyrum esculentum*. Spending time on the docks reveals an intriguing set of attributes spread amongst the diverse array of family members

Docks and Lignums deserve a place in the bush tucker patch

The Tasmania native Docks (Swamp Dock, Mud Dock *Rumex bidens* and Native Dock *Rumex dumosus*) have distinctive flower heads, which can simply be used to add texture and colour to your bush tucker patch. These and the exotic docks are generally considered as weedy opportunists, without the gardener being aware of their important use as Vitamin C rich, leafy greens and traditional medicines. As a precautionary note, they, like rhubarb, shouldn't be consumed in large amounts due to their high levels of oxalic and tannic acids. A mild laxative effect can be experienced following an over indulgence.

Of concern to the farmer and gardener alike, are their invasive abilities resulting from their hooked seedpods, which can easily attached themselves to marsupial fur or sheep fleeces. An astute gardener always considers their presence as a bonus due to their ability to enhance the soil fertility and provide nutrient rich compost ingredients. This is a consequence of their long taproots, which extracts and stores from deep within the soil, leached nutrients and minerals.

Although the small native Swamp Dock prefers a moist forest habitat it tends to be much larger when grown in a cultivated site or bush tucker patch. A few plants can produce enough succulent leaves and stout stems to replace the traditional Silver Beet crop with a superior flavoured green. Besides using it in stir-fries, enjoy it as a seasoning for soups, omelettes or roast lamb.

The exotic Curled Dock *Rumex crispus* is also a favourite green and the leaf stems can be sweetened with sugar and cooked as an alternative to Rhubarb. Mixing stewed apples or pears with cooked diced stems can provide a rhubarb-flavoured tang to the traditional apple pie or tart. Medicinally, the crushed leaves can be applied as a poultice to open wounds and used to take the heat out of skin infections. Root decoctions are used to treat gout.

Sheep Sorrel *Acetosella vulgaris*, a weed of sandy soils, has a reputation as a tasty green, dating back to Henry the Eighth. A small amount of the bitter tonic 'sorrelade' which was made from fresh leaves is used as a diuretic, for upset stomachs or menstrual discomfort. Stock can be poisoned if they ingest excessive amounts of the oxalates found in the leaves.

Another dock plant called 'Native Hops' *Acetosa vesicaria* forms, after rains, rosy red blankets across vast tracks of sandy outback

desert. So prolific is this weed, that it is now viewed as a spectacular floral tourist attraction. It was introduced from North Africa, where it is still popular Bedouin tribal green.

Different from the docks is the drought tolerant native vine Climbing Lignum *Muehlenbeckia adpressa*. It is an ideal screening plant for growing on trellises. From the shade and moisture loving Macquarie Vine, *M.gumnii*, edible acid tasting berries can be harvested as bush tucker. The seeds can be ground into nutritious flour.

Buckwheat is a gluten free grain and an ideal green manure

The Europeans have cropped the triangular seeds for millenniums due to buckwheat's high protein content. It has also served as a nutritious stock feed. Roasted seeds (called kasha) can be prepared like rice or alternatively ground to form buckwheat flour. The flour is traditionally used for Russian type pancakes (blinis) or similar Breton versions (galettes). They have a delicious and distinctly grainy flavour combining temptingly with vegetables. Buckwheat has developed a reputation as an allergy free alternative for those who are demanding gluten free diets, replacing cereals such as wheat, oats, rye etc.

Surprisingly both wireweed and buckwheat flowers are a well-proven sources of honey production. More significantly to the organic gardener is this disease resistant plant's ability to loosen compacted clay soils and generate voluminous quantities of green manure. It thrives in low phosphate soils, of which cereals crops are intolerant. Since it concentrates phosphates composting it or green cropping will enhance the soil's organic phosphate levels.

Exquisite ornamental trees and weird shrubs with diverse uses

Closely related to the docks, the tropical street tree 'Long John' is endemic to South America. This tree presents an unforgettable picture of dense shuttlecock like clusters of white flowers turning into bright red blooms as they age. Since thousands of fierce stinging ants often hollow out their stems they command unusual respect. Amazonian Indians exploit these ants by channelling them into selected branches to be hollowed out for tobacco pipes.

The weird shrub *Homalocladium platycladium* aptly named the Tapeworm Plant proved a great garden favourite in Edwardian glasshouses. The twisted and jointed, flattened

green stems (cladodes), with their tiny leaves and red berries, looked just like real tapeworms.

An unexpected relative of the dock is the tolerant, coastal American tree, known as Seagrape, *Coccoloba uvifera*. Its name derives from the edible, reddish fruits that hang down in grape like clusters, which can be made into 'seaside jelly' or wine. It is a popular small tree for Florida landscapes providing street shade, windbreaks and a tropical look near the sea.

The bark was once used in Mexico for school writing paper. Its craft wood is prized for the fine polish it takes and the red dye it exudes when boiled. Its gum is renowned for easing throat ailments, while roots decoctions treat dysentery successfully.

Hopefully, when next targeting dock 'weeds' in your garden, some section of this insight into the Docks, will flash into your mind, adding interest and understanding towards your gardening chore. ©

DID YOU KNOW?

KINO

Kino is a blood-red gumlike substance which oozes from the bark and timber of the eucalyptus. Some uses include marine timber protection from shipworm, and in pharmaceutical preparations to stop bleeding.

PLANNING A POND AND CREATING HABITAT FOR FROGS

Creating a water garden or feature with flowering marsh plants and water lilies can add a stunning feature to your garden. It can also create a haven for frogs that will help to keep our common frogs common, and may even provide much needed habitat for our threatened frogs.

Australia is home to about 220 frog species, most of them found nowhere else on the planet. But since the 1980s many have declined or disappeared. Even species that used to be common in city areas, like the Green and Golden Bell Frog, are now threatened with extinction.

- ❖ Learn to identify what frogs live naturally in your local area.
- ❖ Design a frog friendly habitat in your garden.
- ❖ Plant native plants that attract insects for frogs to eat.
- ❖ Never move frogs or tadpoles from their natural habitat.
- ❖ Build a frog pond in your garden or at school to attract frogs. An ideal place is part sunny, part shady, but not directly under trees. Put your pond away from your neighbours' houses as frogs can be noisy.
- ❖ Avoid using chemicals, such as insecticides, near frog habitat.

Over 1 in 10 frog species is threatened with extinction.

Frogs are attracted to habitats which offer a diversity of plant types at various height levels. Your frog friendly garden should contain suitable native vegetation and plenty of shelter in the form of rocky ledges, thickly mulched areas, hollow logs and dense shrubbery.

Why you don't see frogs in winter.

During the cooler months frogs tend to be less active and are not seen as frequently around the garden. With the frenzy of summer mating and nightly hunting finished for the year, they will settle down to a lethargic state of semi-hibernation, emerging from their shelter only occasionally to look for a meal.

Reference: Casey, K. (1996) Attracting Frogs to Your Garden. Envirobook.



Planning Your Pond

information provided from HomeLife Autumn 2003.

- ❖ Ponds, fountains, and goldfish are very attractive to small children, so position your pond in a highly visible location and avoid creating wet, slippery areas around it.
- ❖ Avoid a location where falling leaves, flowers or fertilisers are likely to land in and pollute the pond. Ideally your pond should be exposed to no more than 6 hours of sunlight per day.
- ❖ Make sure you know where sewerage and other underground utilities lie, and check before construction with your Council as to whether a permit is required.
- ❖ If you are planning a pond smaller than 4 sq. metres a pre-formed pond basin is preferred.

Installing a pond liner

- ❖ Calculate the dimensions of your pond. It should be at least 40cm deep at its deepest point to avoid overheating or freezing the water. Allow 20cm of overlap material around the perimeter. A 3m x 4m pond liner can get your garden pond established.
- ❖ Outline the design of your pond with a garden hose and then start digging from the centre.
- ❖ After digging, check the hole thoroughly for rocks and other debris that may damage your liner.
- ❖ Spread 5cm of sand inside the pond cavity to act as a cushion beneath your liner, then compact it down.
- ❖ Drape the pond liner carefully over the hole, securing the edges with rocks or bricks before filling with water. Try to remove any folds before filling, and smooth any wrinkles that develop during the filling process.
- ❖ Once the pond is filled, reposition the rocks or bricks to allow the liner to settle, then bury the excess liner, either with stones or rocks, or in a small trench.
- ❖ Add timer recycling water pumps, fountains and statues if desired, pond bog plants and fish.
- ❖ 2 x 20 watt underwater lights can be installed to transform the pond at night. The low voltage, halogen globes are safe and easy to install and maintain.

Don't spread fire ants

Landscaping materials, such as potting mixes and soils, make an ideal medium for the transport and spread of fire ants.

Don't ...

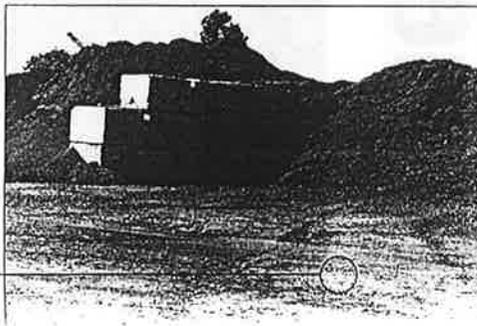
- move infested items to or from your property
- disturb nests
- store high-risk materials directly on the ground if you intend to move them.

Do ...

- check with suppliers of high-risk materials to ensure that their products are free from fire ants.

High-risk materials ...

- Pot plants
- Soil
- Mulch
- Potting mix
- Baled hay or straw
- Landscaping and construction materials
- Machinery and equipment
- Any materials that have come in contact with fire ant-infested ground



what you can do

first aid

If stung by a fire ant ...

- Apply a cold compress to relieve the swelling and pain.
- Gently wash the affected area with soap and water and leave the blister intact.

People who are allergic to insect stings should seek medical attention immediately. On rare occasions, fire ant stings can cause severe acute allergic reaction (anaphylaxis).

If you suspect you have fire ants ...

Ring the NSW Agriculture Call Centre on 1800 888 251 (free call).

To send in a sample ...

- Kill some larger ants (workers) by spraying them with a household insecticide spray. (This should be done away from the nest.)
- Use a disposable plastic spoon (or similar) to scoop up the dead ants.
- Place the ants in a sturdy plastic container (e.g. plastic pill bottle) and seal it.
- Place the container in a tough envelope suitable for posting.

Post the envelope to:

Taxonomy Unit
Orange Agricultural Institute
Forest Road
Orange NSW 2800

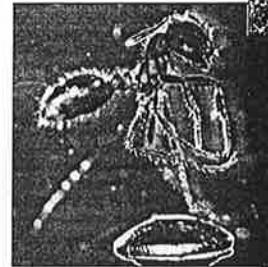
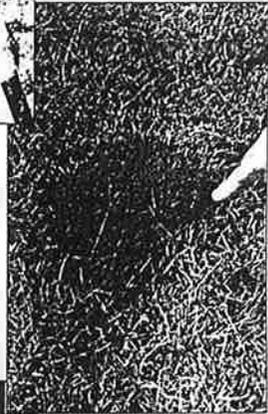
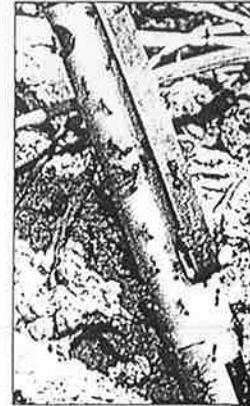
Don't

- touch the ant or the nest
- add any liquid, such as water and methylated spirits
- send live ants.

To find out more about fire ants ...

- Ring the Call Centre on 1800 888 251
- Visit the website at www.agric.nsw.gov.au

Fire Ants



the impact of fire ants

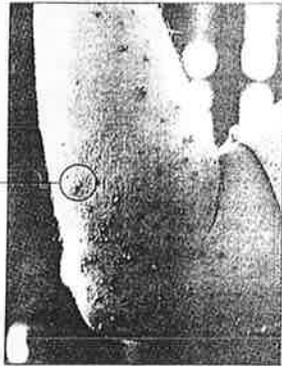
Fire ants will affect everyone. They have the potential to destroy Australia's outdoor lifestyle, environment and agricultural production.

Fire ants ...

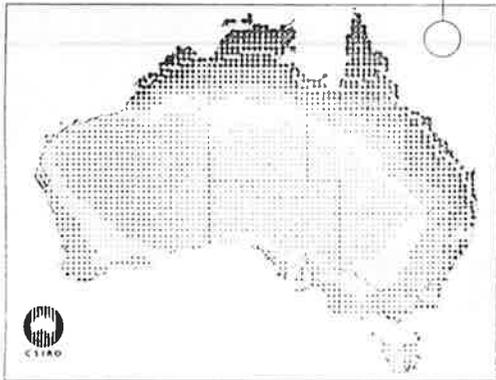
- inflict a painful, burning sting
- invade our backyards, parks and recreational areas
- damage native flora and fauna
- injure animals and damage crops
- damage equipment.

The presence of fire ants will prevent our children from safely playing in our backyards. Family picnics in our parks and playgrounds will no longer be regular events.

A small blister forms at the site of the sting



map showing potential distribution of fire ants in Australia



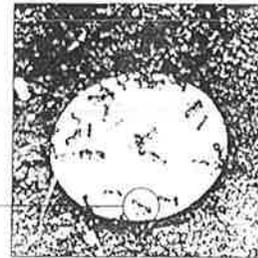
identification

Size of fire ants compared with other ants

Actual Size	Image	Species Name
1 2-6 mm		<i>Solenopsis invicta</i> Fire ant
4 mm		<i>Indomymex rufoniger</i> Black ant
5 mm		<i>Rhytidonera metallica</i> Green-headed ant
9 mm		<i>Camponotus sp</i> Sugar ant
15 mm		<i>Myrmecia sp</i> Bull ant

Images of life by BioTrack®
www.bioback.net.edu.au

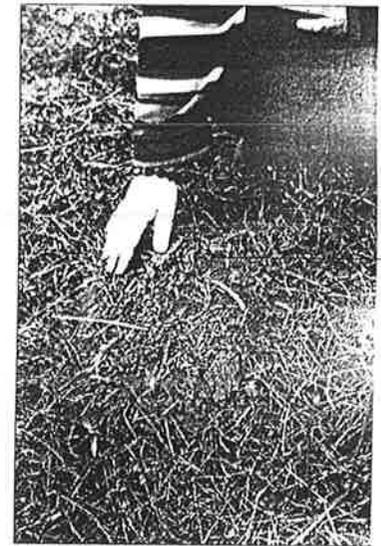
comparative size of ant to a \$1 coin



- Small, 2-6 mm long
- Reddish-brown and black in colour
- Very aggressive
- Agitated when disturbed
- Inflict a fiery sting

the nest

- Domed
- Up to 40 cm high
- Usually with no entry/exit hole
- Internal structure has a honeycomb-like appearance
- Various shapes and sizes



Fire ant nests vary in shapes and sizes (above and below)

USING RIPARIAN LAND

as wildlife corridors

Objective

To provide refuge and passage for wildlife within and along riparian land.

Management principles

Riparian land provides habitat, as well as a pathway for wildlife moving from one patch of vegetation to another, both in cleared and uncleared landscapes. The greater the 'connectivity' (or linkages) between these patches, the easier it is for animals to move between habitats. This helps to sustain wildlife populations in forest and woodland patches, as well as in the riparian environment itself. Areas of remnant vegetation should not be too widely dispersed or isolated. A distance of more than 500 metres may act as a barrier to less mobile species like small mammals and tree-dwelling marsupials moving between patches, compared to many birds which may regularly travel 1000 metres or more.

The width of natural riparian vegetation needed for habitat or movement depends on the wildlife species, habitat type and landscape setting. Research can provide estimates of preferred corridor widths, but not the exact corridor width in any particular case. It is known that wider is certainly better, but even narrow corridors are useful to some species. Narrow corridors in cleared landscapes have significantly more edge relative to their area, and so tend to experience negative edge effects, such as temperature changes and weed invasion. This impacts significantly on the effectiveness of the corridor itself.

The width of your riparian corridor is only one consideration in the overall context of habitat requirements. For example, breeding birds require nesting sites, suitable vegetation height

and structure, and tree hollows (or substitutes), together with adequate corridor width. As some riparian land acts as a temporary refuge or pathway for threatened, endangered or locally significant land or in-stream species, their specific habitat requirements need special consideration. When planning your riparian corridor it is a good idea to consult with local experts about the requirements of particular animal and plant species so that you can revegetate accordingly.

Corridors can also aid the movement of feral animals and plants. Particular care should be taken when choosing non-local plant species for revegetation (such as for wood production) to connect parts of the landscape. Genetic pollution of the local remnant patch can result through the cross-fertilisation of closely related plants brought into close proximity by the wildlife corridor. Pellen transfer has been recorded in native eucalypt forest remnants connected to corridors established using non-local species.

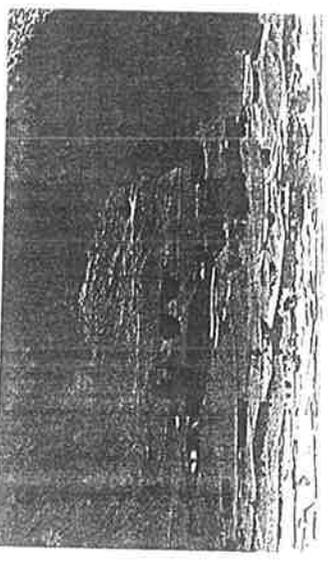
In most cases, however, the risk of genetic pollution to eucalypts is small. This is because there are strong barriers to hybridisation (cross-breeding) between distantly related species, for example, differences in flowering time, or differences in other characteristics of the flowers. The sorts of vegetation communities most at risk of genetic pollution are those that are naturally small or remnant populations. In these cases, acceptable isolation distances need to be defined, and these will depend on factors like the movement of birds, insects, marsupials and other mammals that pollinate them or disperse seed. Predominantly bird (and flying fox) pollinated eucalypts are likely to require larger buffer distances to prevent unwanted gene flow, than those mainly pollinated by insects. Isolation distances need to increase as the size of the 'source' (corridor) increases relative to the 'sink' (remnant patch).

The value of your riparian land as a corridor for wildlife is an important consideration in deciding how to manage it.

While species diversity is the most important factor, there are genetic and silvicultural tree management opportunities that can help minimise the risk of genetic pollution. For example, close spacing is known to reduce the abundance of flowers, and flowering on the corridor edges may be countered with guard rows of non-hybridising trees.

Key references

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- Potts, B., Bahrour, R. & Hingston, J. 2001. *Genetic pollution from farm forestry using selected species and hybrids*. Rural Industries Research & Development Corporation, Publication no. 01/111. Canberra.
- Wheeler, I. 2000. *Managing the genetic diversity of remnant vegetation in 2000*. Final Report 4/00. Commonwealth Scientific and Industrial Research Organisation, Canberra.



Remnant populations of the main plantation species in rural landscapes are in immediate at risk from genetic swamping of exotic introduced species. The genetic diversity of remnant populations should therefore be protected. Photo: B. Potts.



MANAGING FOR BIODIVERSITY

All remnant vegetation provides some biodiversity. Where large animals are concerned, a bigger remnant is likely to be more valuable, but even small and isolated patches and individual trees are important. Isolated remnants should not be cleared simply because they are isolated. It is not only the size of the remnant that is relevant, but also its condition. This includes factors such as tree health, understorey diversity, structural diversity, the number of tree hollows and weediness. Isolated remnant or planted vegetation (particularly at the boundary between riparian and agricultural land) tends to suffer from edge effects — species loss, weed invasion and nutrient enrichment. You should be aware of the full range of processes that can threaten your riparian land and manage each accordingly. For example, the removal of large trees for timber can reduce the number of hollows available for native animals and the ‘cleaning up’ of fallen dead trees can remove habitat for ground-dwelling animals.

Photo of ash in riparian corridor is being through a formerly cleared landscape, and providing a vital habitat for wildlife. Photo: CSIRO Ecosystems Services Project.

WHY REVEGETATE A WETLAND?

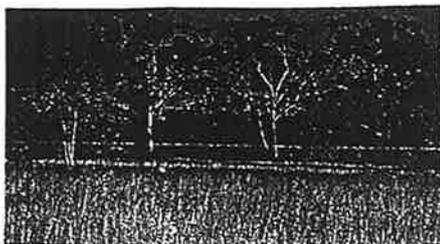
by Margaret Brock & Michelle Casanova, (2000) *Are there plants in your wetland?* LWRRDC.

Some wetlands have no vegetation, either because they are new, or because the vegetation that was there has died. Vegetation can be killed by periods of drought, or by extended periods of flooding or grazing. Some drought and flood cycles are natural but others have been brought about by humans, and this is when extended changes to the vegetation are likely to occur.

A wetland without plants is unsightly and without intervention can remain muddy and denuded. Plants are part of the food chain in wetlands. They provide food, habitat and breeding sites for a variety of organisms including fish, waterbirds, invertebrates (including insects), algae, fungi and plants. Plants are part of the biodiversity in wetlands, and help maintain it.

Wetlands typically have several kinds of habitat where plants can grow; soil at the edges; soil covered by shallow or deep water; the water itself; and the water surface. Some water plants can grow in one or all of these habitats; some grow in the soil at the edge or under water; others float on the surface with dangling roots, and still others have no roots at all.

Water plants can help keep the water clear by stabilising sediment and preventing re-suspension of mud. They also use nutrients that might otherwise encourage algal blooms, and can provide habitat for animals such as snails and tadpoles that eat algae. Plants growing at the edge of wetlands can filter runoff from the surrounding land and prevent sediments, contaminants and rubbish such as plastic bags from reaching the water. Edge plants provide habitats for frogs and birds such as reed warblers, coots and herons. Plants growing in shallow water typically have growing parts above the water level and provide nesting sites for swamp-hens, moorhens, grebes, swans and ibis. These emergent plants transport air down their stems to the soil and prevent the soil from becoming smelly and non-productive due to lack of oxygen.



What happens to the plants when the water levels drop or the wetland dries out?

Plants can persist in several ways: as growing plants that are drought tolerant; as drought resistant tubers or fragments in the soil; or as seeds in a soil seed bank. When the wetland floods again the drought resistant species are refreshed and the tubers and seeds are stimulated to grow. We can use these natural abilities of plants to assist us in revegetating wetlands.

If you want to revegetate your wetland you need a vision in mind at the outset.

What kind of wetland do you want to create? How do you want your wetland to develop? Remember that a healthy wetland is a complex, dynamic system that is changing all the time.

The aims of revegetation

- ❖ To introduce desirable plants to your wetland, and
- ❖ To develop a plant community that will sustain itself naturally.

How long will it take?

You will need patience!

In natural wetlands the vegetation takes decades or even centuries to develop, so you can't expect to see a fully vegetated, functioning wetland habitat after only one year.

It may take your wetland ten years to develop self-sustaining vegetation and become a diverse habitat. However, under the right conditions, vegetation can be established from seed bank or transplanted plants within about three years, and, hopefully, birds, tortoises and frogs may soon follow.

Important considerations in revegetation:

- ❖ Temperature
- ❖ Shelter and protection for the new plants
- ❖ Water
- ❖ Light and turbidity
- ❖ Competition
- ❖ Slope

In 1859, Charles Darwin found 537 plants 'of many kinds' grew from a breakfast cup of mud from the edge of a little pond.

Plants you might want in your wetland:

AMPHIBIOUS PLANTS

Common name	Species name
Australian sweet grass	<i>Glyceria australis</i>
Blowngrass	<i>Agrostis avenacea</i>
Clubrushes	<i>Isolepis species</i>
Waterwort	<i>Elatine gratioloides</i>
Flat sedges	<i>Cyperus species</i>
Floating fern	<i>Azolla species</i>
Floating liverwort	<i>Ricciocarpus natans</i>
Floating pondweed	<i>Potamogeton tricarinatus</i>
Lilaeopsis	<i>Lilaeopsis polyantha</i>
Lipocarpha	<i>Lipocarpha species</i>
Loosestrifes	<i>Lythrum species</i>
Knotweeds or smartweeds	<i>Persicaria species</i>
Mudmats	<i>Glossostigma species</i>
Mudwort	<i>Limosella australis</i>
Nardoo	<i>Marsilea species</i>
Paperbark	<i>Melaleuca species</i>
Pennyworts	<i>Hydrocotyle species</i>
River clubrush	<i>Schoenoplectus validus</i>
Sedges and tassel sedges	<i>Carex species</i>
Sneeze weed	<i>Centipeda minima</i>
Spike rushes	<i>Eleocharis species</i>
Swamp isotome	<i>Isotoma fluviatilis</i>
Swamp stonecrop	<i>Crassula helmsii</i>
Swamp wallaby grass	<i>Amphibromus species</i>
Umbrella sedge	<i>Cyperus eragrostis</i>
Water milfoil	<i>Myriophyllum species</i>
Water snowflake	<i>Nymphoides species</i>

SUBMERGED PLANTS

Pin fern	<i>Isoetes muelleri</i>
Ribbonweed	<i>Vallisneria species</i>
Soft stoneworts	<i>Nitella species</i>
Stoneworts	<i>Chara species</i>
Watermymph	<i>Najas tenuifolia</i>

TERRESTRIAL PLANTS

Common name	Species name
Pin rushes	<i>Juncus species</i>
Purslane	<i>Portulaca oleracea</i>
Water panic	<i>Panicum gilvum</i>
Swamp daisies	<i>Brachycome species</i>

Habitats in your Wetland

Terrestrial (land) zone:

- ❖ above the highest water level. Water never or rarely reaches here. Types of plants include eucalypts, wattles, sheoaks, pasture grasses and dryland plants.

Edge zone:

- ❖ between the water's edge and the highest water level. Water sometimes reaches this area. Types of plants - amphibious and terrestrial species - reeds, grasses, herbs, pasture weeds, and legumes.
- ❖ At the water's edge. Water levels fluctuate. Types of plants - sedges, rushes, knotweed, water milfoil, grasses and other flowering plants including some amphibious shrubs, trees and vines.
- ❖ In shallow water. This area sometimes dries out. Plants include some algae, waterwort, rushes and reeds.

Submerged zone:

- ❖ In deep water. The area rarely dries. Submerged and amphibious plants include some algae, ribbonweed and pondweed.
- ❖ The water itself. This habitat disappears when the wetland dries out. Types of plants include microscopic algae, liverworts, plants without roots.
- ❖ The water surface. This habit also disappears when the wetland dries out. Types of plants include floating duckweed, and floating fern.

FURTHER INFORMATION ON WETLAND PLANTS

Some useful books to help you to identify plants in your wetland or for further references on wetland revegetation.

Aston, H.A.(1973) Aquatic Plants of Australia, Melbourne Uni.Press: Melbourne, Vic.

Boulton,A.J.& Brock M.A. (1999) Australian freshwater ecology: processes and management Gleneagles Pub. :Glen Osmond SA.

Chambers,J.M., Fletcher,N.L. & McComb,A. (1995) A guide to emergent plants of South Western Australia. Marine & Freshwater Research Lab.: Murdoch Univ.Press.

Romanowski, N.(1998) Aquatic and wetland plants : a field guide for non tropical Australia. Uni.NSW Press: Sydney,NSW.

Sainty,G.R. & Jacobs,S.W.L. (1994) Water plants of Australia. Sainty & Assoc.: Sydney,NSW.

Sainty,G.R. & Jacobs,S.W.L.(1981) Water Plants of New South Wales. WRC: Sydney, NSW.

©

PLANTS TO ATTRACT BIRDS from a USA publication Gardening Made Easy

Australian natives

Melaleuca (Honey Myrtle)

Bottlebrush

Hakea

Lambertia (Mountain devil)

Kangaroo Paw

Grevillea 'Superb'

Eucalyptus

Acacia

Eriostemon (Wax flower)

Banksia

Pimelea (Rice flower)

Pandorea (Pandora -Wonga Wonga)

Exotics

Sunflower

Cotoneaster

Fuchsia

Malus species (Crabapple)

SUNSMART CHECKLIST provided by the Anti-Cancer Foundation of South Australia.

- ✓ Avoid the sun between 11 am and 3 pm (daylight saving time) if possible. This is when the UV rays are strongest. If you have to be outdoors during this time, use shade as much as possible.
- ✓ Wear a wide brimmed hat and leave it on.
- ✓ Slip on a long sleeved shirt, preferably with a high collar and made from woven material.
- ✓ Apply a Broad Spectrum SPF 15 of higher sunscreen. Water resistant is best if you're active.
- ✓ Apply sunscreen 20 minutes before going outside to give it time to absorb into the skin. Re-apply at regular intervals (about every 2 hours), particularly after swimming or heavy sweating.
- ✓ Avoid damage to eyes from UV radiation by choosing sunglasses with an EPF of 10, or which comply with the Australian Standard 1067.
- ✓ Even when it's cool or cloudy, you're still at risk from UV radiation.
- ✓ Be particularly careful if you are involved in any water activity, because water reflects UV rays.
- ✓ Skin damaged by too much sun is damaged for life. The damage is cumulative and most of it occurs during childhood and adolescence.
- ✓ It is never too late to protect your skin. You can't undo the damage that has already occurred, but you can prevent further damage.
- ✓ Too much sun also causes premature aging - wrinkles and thickened, blotchy skin!

PRACTICALITIES

Feral Bees and how we coped with them

Our one-hectare property, in the foothills of the Darling Range, provides a corridor from the suburbs to the hills for birds and wildlife. Four years ago my husband made a number of bird nesting boxes and placed them in our trees. Since then, we have watched with delight many families of Maned Duck and Port Lincoln parrot take up residence and rear their young.



This year we also had some unwanted visitors. Feral bees. They were first seen on our neighbour's property, where they had taken over an owl's vacant nesting box. At first we were pleased to see them. After a shortage of bees the previous year, we were looking forward to a better pollination program.

Then a second swarm moved into one of our duck boxes. By the time they took over their third box we were becoming concerned, and decided it was time to do some culling. But how do you get rid of a box of stinging creatures? It was summer and the land was tinder dry: fire was out of the question. Leaving the neighbouring owl's box alone, we experimented with a second box. It was lower down, in one of our trees, and more accessible. We tried popping mothballs in the hole. A week later the bees were as busy as ever, and taking no notice of our efforts.

Another swarm had taken over a fourth box. Fortunately it was out of the breeding season. In the hope of preventing more arrivals, we took the ladder around to the remaining empty boxes, brought down any needing repair, and nailed a cover over the openings of the others.

Next we tried camphor blocks in number two box. Again, to no avail. By now we were having to keep tight control of our grandkids, and dogs, one of which was allergic to bee stings, as a fifth colony of bees finding no open houses, settled into a huge mass on a low shrub. They stayed there for two weeks before moving off.

We tried ringing around to find a willing bee-keeper to come and collect them. But nobody wanted to know about feral bees. The Internet had masses of information on bees, but nothing on how to dispose of them. Our enquiries eventually brought us to a commercial maker of bird nesting-boxes, and how he dealt with the problem.

He used Mortein Moth and Insect Strips. They were readily available from the local store or supermarket. There is no mention of bees on the instructions, or course, but insert one whole strip into the box after dark. For the necessary potency you can use a strip only once. We tried it on box number two, and within three days the nest was clear of feral bees.

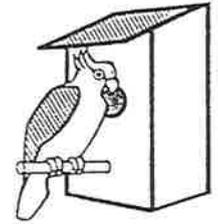
The remaining two boxes were more difficult, both were higher in the trees and needed an extension ladder to reach them. We tried the parrot box first. It had a hollow log on the front of it [they attach a piece of natural hollow log to the front of their boxes, to increase the attractiveness of the box to birds] and navigation through the log, whilst standing on a wavering ladder, would be a tricky business. In fact it took several attempts, using a long pair of BBQ tongs, to get the strip through the log and into the box.

The last box was the one we dreaded. The bees had formed a mound on the outside of the entrance hole, and the strip would have to be pushed through the swarm. In the dark, on a hot summer's night, with the grandkids gone and the dogs locked in

the house, we ventured out, suitably covered up, to make our final assault, I held the ladder firm, whilst my husband, again using tongs, inserted the strip in the centre of the mound, and pushed it in. We made a hasty getaway before any angry bees could home in on us.

We had been lucky. Over the whole period we had got away with only two stings apiece.

A few days later we took the boxes down. The honeycombs were stacked like books on a shelf inside, and obviously quite inedible after their poison strip treatment. We cleaned the nest boxes and made them ready for next season's ducks and parrots.



Our helpful adviser also told us how to use the strip as a preventive. For those who want to know: cut one cm square off the strip and pin it inside on the roof of the box. We haven't done this yet, and are still wary of idea of possibly contaminating the baby birds' environment. But at least now we know how to deal with future bees. At the first sigh of a takeover this year we'll be up the ladder with our Mortein Moth and Insect Strips.

Carole Sutton, taken from Western Wildlife – newsletter of the Land for Wildlife Scheme WA, Vol 7 no 4 Oct 2003

NATURAL HISTORY

Little rotters

Plants and animals store nutrients which are recycled back into the ecosystem when they shed part of themselves (such as leaves, bark and branches for plants, and exoskeletons, hair feathers and dung in the case of animals). Decomposition of dead plant and animal material is undertaken by a plethora of bacteria, fungi and invertebrates. While bacteria and fungi do most of the nutrient recycling, invertebrates play very important roles such as breaking up the material into smaller pieces and increasing the surface area for bacteria and fungi to act upon, and by moving these pieces through the litter and soil layers.



The activities undertaken by invertebrates are varied. Some physically break down plant or animal material by consuming it and converting it into frass. Others contribute to decomposition by building burrows that assist movement of water and nutrients into the soil or by mixing the different layers of soil and plant litter. Then there is the microcosm of associated interacting biota: predators, parasitoids and scavengers.

Some of the best known decomposers are earthworms, slaters, cockroaches and millipedes. In all these groups, there are both native and introduced species. In many parts of Australia, the native earthworm fauna is impoverished or else the native species have been displaced by activities associated with agriculture and horticulture. One of the amazing species that has managed to survive, although it is a listed threatened species, is the Giant Gippsland Earthworm. This species is long-lived and grows up to a metre in body length.

One of the lesser known groups associated with plant decomposition is the oecophorid moths. There are several thousand species of oecophorid moths in Australia because it is a group that has adapted to feed on eucalypt leaves. The caterpillars of many species feed on dead Eucalyptus leaves on the ground, while other species feed on live leaves in the canopy.

Alan Yen, Invertebrate Ecologist, Taken from Land for Wildlife News – newsletter of the Land for Wildlife Scheme (Vic), Vol 5 no 5 Aug/Sep 2003