Dear Members,

The year is quickly passing, and before long our freezing cold winter nights will fade into spring. Don't you just love spring! The smell of flowering blooms and sweetened nectar, and the birds flitting from one shrub to the next, each busying themselves in their nest building, ready for courting the fairer sex. Then there's the sleepy hibernating fauna awakening and re-emerging to restock their food supplies. The longer days, the warming sunshine and the lazy summer days that lay ahead.

This is the ideal time for bushwalking and birdwatching. The time when the landscape erupts into green from its grey, brown, earthy tones, and bright yellows dominate the vista. Have you ever noticed that yellows dominate the colour scheme in Australian flowering native plants? Followed by white, red and shades in between. The blues and mauves are striking, as are the masses of green orchid leaves emerging.

What about the bright red and blue which dominate the colourful world of birds? There's the scarlet robin to the crimson rosellas, the pale-headed rosella to the purple swamphen, the greens and yellows in parrots and honeyeaters. Then of course, there's black and white, the colours of camouflage, the pinks of the galah and flamingoes. There is just so much diversity and colour in our natural world.

I miss our patch of mallee scrub, and the wonderful flora and fauna we had with the changing seasons and where each living thing serves a purpose unto another. Where you could smell the native pines in the cool air, and feel the breeze, the warmth of the sun upon your back, and the quietness and seclusion of the place lost amidst nature.

Our scrub was so special we had part of it declared a Heritage Area, and the remaining was gazetted a wildlife sanctuary. Believe it or not, no matter how stressed or depressed one felt, a walk in the scrub was like lifting a heavy weight from your shoulders. It did us all, whoever walked in it, a world of good. It made us appreciate what was so special and uniquely Australian. The mallee was so full of life yet so many people believe the landscape is dull and boring. No matter whether its mallee scrub, forested areas, rainforest, the tropics, the riverine or coastal areas or the arid interior - each place has its own special uniqueness, which is truly Australian. What's it like where you live? We found our experience unique, and wonderful!

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Growing Grass trees  Harry Franz
Sneaky Orchids  G.Torr & M.Robinson, Nature Australia, Spring 2003
Footprints in the Pollen Part 2  Phil Watson
Cheeky Acacias  Leigh Murray
Genes ain't genes  Linda Broadhurst
Be Wise- look out for Owls from Bush Matters, Winter 2004
Conservation News and Hot Topics and.....much more
GROWING GRASS TREES -
the Queensland experience
by Harry Franz

Grass trees (Xanthorrhoea Species) are uniquely Australian. All varieties of Queensland Grass trees are classified as Protected. It is now illegal to dig up wild plants anywhere without a licence. There are some licensed operators digging up wild plants for sale to the public. Some of these grass trees are salvaged from sites threatened by development, mining or other processes. Many grass trees dug up from the wild die even when the best practises are used. They resent disturbance and can take up to two years to die even if they look good for awhile.

Grass trees are easily grown from seed. The Seed remains viable for up to two years at room temperature. Dried seed will live for many years if kept in a refrigerator. Store in moisture proof containers. Freezing would probably kill the seed.

To propagate seed, use a very sandy mix. Seedlings are very intolerant of poor water quality and can die quickly. Use tank water for good results if available. Seedling grass trees usually grow quickly when planted into the garden from about two years of age.

They do not like waterlogged soils. They will grow in full sun or dappled shade, and respond to a light fertilising of blood and bone or manures, can use mulch as normal. A regular watering is necessary only during establishment, in fact over watering can be detrimental to some species.

Local species appear to be frost hardy. Avoid using herbicides in close proximity to grass trees. Avoid spraying with any oil based insecticides as losses of plants have occurred, particularly when sprayed onto the growing centres of the plants.

Some species appear to flower better after bush fires, Xanthorrhoea latifolia is one of these. Xanthorrhoea glauca is damaged by fire and may not flower for some years after the skirt of old leaves burns. Xanthorrhoea glauca flowers irregularly at best.

The ABC Gardening Show suggested that transplanted grass trees would benefit from several applications of a brown sugar and water mixture to stimulate micro-organisms. The mixing rate is half a cup of brown sugar to 5 litres of water. Small plants would require a smaller quantity of mixture. Water monthly with the brown sugar solution for two years.


Most plants use bright flowers or offer nectar to lure insects. However certain types of orchid attract male insects by pretending to be females. Not only do they look like the insect in question -usually a bee or wasp- but many appear hairy in all the right places and produce a scent similar to the pheromones produced by the female. In some cases the male insects try to fly off with the fake female, or try to mate with it. What they end up with is a packet of pollen known as pollinia.

Many orchid species specialise in their own insect species, which reduces cross-pollination. The male wasps mature quicker than the females, and they investigate anything- so long as it looks, smells and feels like a female. But an orchid is not as good as the real thing! The plants time the maturation of their flowers to coincide with that of the male wasps. But even if most flowers aren't pollinated, it only needs a single successful pollination to yield millions of seeds.
Footprints in the Pollen (Part 2)

It is not until one sees the diversity of different insects busily working the sweetly scented blooms of plants like Native Box *Bursaria spinosa* that it is realised there is a whole new world of insect pollinators awaiting exploration.

Following Part 1 of this article detailing the fascinating roles that water, wind, birds and animals play in the plant's mating game; Part 2 will expose the equally enthralling interrelationships played out by a diversity of insects.

**Bees are nectar and pollen addicts**

Whereas other pollinators only require nectar and/or pollen for part of their life cycles bees are addicted to these honey ingredients throughout their adult and larval stages. To accumulate one kilogram of honey, bees will have pollinated a million individual flowers and flown over 50,000 kilometres.

Sadly, native bees are declining or have gradually been displaced since the introduction of the commercial honey bee and more recently the bumble bee. This has lead to a reduction in native flora pollination and an increase in the pollination of weeds. Hence weeds like Lupins, Agapathus, Genista, exotic *Solanum* sp and Foxgloves populations are flourishing amongst our indigenous plants. Recent studies of the Bush pea *Gompholobium huegelii* report a large reduction in flower visits by the native *megachilid* bees where they competed with the bumble bee. The hairy body parts of this native bee perfectly match the location of the flower’s anthers and stigma, whilst the equivalent areas on the bumble bee are smooth and unable to attach pollen.

In general, our native bees favour the blue and purple flowered Sun Orchids, *Thelymitra* spp., Blue Iris *Patersonia* sp. Blue Bush Pea, *Hovea* sp., and Happy Wanderers, *Hardenbergia* sp., although they are happy to add their footprints in the pollen of yellow, mauve, pink and white blooms.

**Pollination by long tongues, short tongues or buzzing wings**

Bees are very capable of manipulating a variety of floral constructions to gain access to the nectaries; some flowers have developed finely tuned relationships so that only a few species of bee can decode the cryptic clues leading them to the flower’s rewards. A classic example is the Bloodroot *Haemodorum* spp, where specialised bees are able...
to enter and pollinate their closed flowers, thus eliminating other nectar competitors.

The largest and most commonly seen bees are the sparsely hairy short tongued species that have evolved in parallel with the Myrtaceae family; gums Eucalyptus spp., tea trees, Leptospermum spp., paperbarks, Melaleuca spp., and heath myrtles Baeckea sp. etc. have shallow cup-like nectaries ideally suited for lapping by short tongues. Prolific nectar producers such as Native Box Bursaria spinosa, and Fairy Waxflower Eriostemon sp. are also suited for short tongued bees, although there are numerous other insect competitors.

Only a small number of the estimated 700 species of solitary bees are long tongued. One, the leaf cutter bee, confine their foraging to flowers with deep floral tubes such as Native Fuchsia, Correa spp. Native Rosemary, Westringa sp, Native Heath Epacris spp. and hence benefit from the lack of competition for the nectar. As they feed the pollen is dusted onto their bodies or hairy legs and is carried to the stigma of another flower so accomplishing pollination. This process has recently been short circuited by the ubiquitous bumble bee which has learnt to thieve the nectar by drilling into the base of the Epacrid’s corolla tube.

Of horticultural importance to commercial growers for pollinating glass house tomatoes is the bumble bee’s buzz pollination technique. However it is also feasible that native buzz pollinators such as the large, hairy, metallic green Carpenter Bee and smaller Blue Banded Bee could fulfil this role. These bees collect the pollen that is flung from vibrating flower anthers. They carry it to their nesting holes bored in the soft wood of Grass-trees’ Xanthorrhoea flower shafts or old Banksia trunks. Here, an egg in each cell is provided with a feed of pollen and nectar porridge before it is closed off with wax and frass.

Spur Velleia protects its nectary with a spur at the base of the petals

Species such as the golden Guinea Flower Hibbertia

Footpri: Phil Watson 14
*riparia*, Kangaroo Apple *Solanum laciniatum*, Fringe lilies *Thysanotas sp* and Flax lilies *Dianella sp*, rely on buzz pollination but are often inundated by ineffective raiders such as the honey bees. Interestingly, *Hibbertia spp* have no nectary, but instead rely on its pollen to attract bees foraging for high protein food to feed their larva.

Members of the *Goodeniaceae* family such as *Goodenia lanata* Native Primrose, and *Velleia paradoxa* Spur Velleia also have buzz-pollinated flowers, but they are designed differently to protect them from self pollinating. With the aid of a cup-like structure (indusium) they catch maturing pollen that is ready for dispersal. Once the pollen is dispersed or becomes non viable, the stigma will change to become receptive for pollination. Most *Goodeniaceae* have the nectary spur hidden at the base of the petals which restricts nectar access only to long tongued pollinators

**Bush peas are a bee’s favourite**

The Bush Peas (*Fabaceae*) with their functionally designed wing and keel structure (eg. Showy Bossiaea *Bossiaea cinerea*, Bitter Peas *Daviesia sp.*, Golden pea *Aotus ericoides*) along with the pea-like flowers of the Polygalaceae (Blue Love Creeper *Comesperma volubile*) etc, have evolved an ingenuous system suited for bee pollination.

With the anther and stigma protected below the flexible lower keel petal, only the landing of appropriately sized bees attracted by nectar guides and its deep nectary can part the petals and trip the spring loaded organs to tickle the bee’s hairy belly.

**The wing and keel form of the *Bossiaea* flowers protects its nectary from raiders**
Nectar Guides

Intriguing associations have evolved with native bees and other insects whose eye receptors are strongest in the far blue end of the UV spectrum. This allows flowers that appear white to mammals and birds to display distinctive UV colour patterns which act as nectar guides. Common UV patterns include light blues with darker maroon or violet streaks and patches. Coupled with the flower’s ability to emit romantic pheromone attractants, the guides become magnets for bees and other insects. Numerous examples include the vivid set of spots and streaks on Donkey orchids *Diuris* spp. and Bush peas, the rosy red streaks on the petals of Native Pelargonium *Pelargonium australe* and the prominent purple veins on the floral throats of Native Flax *Linum marginale*.

*Linum* sp. purple veins act as nectar guides

The bee and orchid love story

Due to the lack of a nectary, many of our native terrestrial orchid’s pollination needs are contingent on their ability to mimic nectar bearing flowers found within their vegetation communities. The Tiger and Leopard Orchids (*Diuris sulpurea* and *D. paradina*) mimic numerous bush peas, by replicating their timing of opening, structure and colours. This enticement, coupled with their ability to emit the female bee’s pheromones, lures the male bee into attempting to mate with the labellum, which results in pollen transfer.

Similarly, the blue-flowered species such as Sun Orchids *Thelymitra* spp. Small flowered Caladenias and Wax Lip Orchid *Glossodia* sp., all have modified labella that are similar in size and shape to their petals. This has enabled them with their strong aromatic scents to mimic blue flowered irises &/or lilies (Blue Iris, *Patersonia* sp., Flax Lily *Dianella* sp etc) and attract a similar suite of pollinating insects, mostly
native bees.

**Pollen Clogging**

As insects rapidly learn to recognise the flowers that provide key food supplies, these flowers’ colour, shape and overall appearance are soon retained in their memory. Specialised native bees, like many other insects, indiscriminately visit flowers that fit within the same group or “guild” (e.g., blue lilies and sun orchids). Hence they often accumulate pollen on their bodies from several different species. With this mix of pollen types scattered over their bodies, foreign pollen can be inadvertently placed on the stigma of a flower preventing pollen of its own species reaching the stigma. This **pollen clogging** is cunningly avoided by some highly evolved inter-relationships as a result of the anthers positioning the pollen consistently on one point of the bee’s hairy body, so that only the perfectly poised stigma receives a brushing of this pollen.

**Flies, gnats, midges and mosquitoes**

As quiet achievers in the pollination game fly species frequent flowers ranging from complex orchid blooms to simple radial flowers. Remarkable in the extreme are the specialised **long-proboscis** South African flies whose needle-like mouth part is up to 70mm or 4 times their body length. Without the ability to retract its prodigious appendage, it must fly with it extended forward or tucked loosely below its body. They have co-evolved with purple, red or bluish flowers of *Pelargonium sp.* which exhibit intensely coloured nectar guides and long-floral tubes containing deep nectar pools. While this intricate symbiotic relationship excludes nectar raiders, the impacts of climate change or habitat loss could easily result in extinction. Other typical examples are from the **Irioids**, including *Babiana sp.*, *Sparaxis sp.* *Homeria sp.* and *Ixia sp.* Some of these species are flower garden favourites in SE Australia, but with no specialised flies, they lack the ability to be open-pollinated.

Commonly known for their biting and uncouth behaviour are the **short-tongued flies** such as blow flies, carrion flies and march flies. These species have lapping mouth parts and are attracted to decaying putrid scents and livid-coloured flowers such as the *Milkweeds Asclepiaceae*. An excellent example in WA is the brown and yellow Stinking Roger flower *Hakea denticulata* which smells of rotting wallaby. Pollination is carried out when blowflies, attracted by the smell, seek egg laying sites. Using a similar style of smelly attractant, the Helmet Orchid *Corybus recurvus* entices flies and gnats to their dull, ground hugging fungus-like flowers. Once pollinated the
fungus-scented flower shrivels and then rises on an elongated stalk blocking further pollination.

Interestingly the cryptic orchid-like, ground-dwelling Fairy lanterns *Thismia* *sp.*, which also emit a fleshy odour, are considered to be pollinated by a gnats, midges, as well as beetles and other invertebrates.

The well known Greenhoods, *Pterostylis* *spp* emit alluring pheromones of the female *fungus gnats* or, less commonly, of a mosquito species. This is intended to entice the male onto the cocked elastic labellum. Once triggered the labellum flips inwards encapsulating the insect inside the flower. In its frantic attempts to escape, the gnat initially brushes its pollen load onto the stigma before being directed by columnar wings to be pollen dusted and finally set free. As a testament to their very short memories and the power of the pollination process, they will soon forget the experience and suffer a repeat episode. For those who have been attacked near wetlands by swarms of blood thirsty female midges, flies and mosquitoes, one can be consoled in the knowledge their blood is fuelling these pollinators to skim around the flowers on the wetlands’ surface.

**Wasps, sawflies and ants**

One can only but be amazed by recent reports indicating that over 500 species of male thynnid wasps have evolved close relationships, some 1:1, with indigenous terrestrial orchids eg Duck orchids *Caleana* *sp*. Hammer orchids *Arthrochilus* *sp*. Spider Orchids *Caladenia* *sp.* and Mosquito Orchids *Acianthus* *sp.*. In contrast, ants are poor pollinators, due to their lack of body hair and tendency to damage the pollen during its transport.

In recognition of the importance of thynnids in the pollination game, some species of Hammer or Elbow Orchids have been renamed *Thynninorchis* *sp.* to highlight their symbiotic relationship. Two species of *Thynninorchis*, namely *T. huntianus* and *T. nothofagicola*, are able to mimic in shape and scent the flightless female wasps after she emerges from her underground cell and climbs up on a grass stalk or low shrub. Here, posing with erect antennae, she releases a pheromone unique to her species. Mistaking the orchid for a female, with which he expects to fly off and mate on the wing, the male wasp seizes the elasticised labellum only to be thrown into the pollen presenter. Records indicate that many of these thynnid wasp pollinated orchids are at their peak of flowering just before the females emerges. Interestingly, after mating the...
male relocates the female to her original site where she parasitises corby or curl grubs by using her long proboscis to inject her eggs.

**Hammer Orchid’s mimics the female thynnid wasp**

A similar scenario occurs between the male *Scoliid* Wasp and the Bearded Orchids *Calochilus herbaceous*. The strikingly big hairy labellum with its pair of eye-like glands at its base combines with the pheromone scent to lure the male wasp.

Sawflies, a variety of wasp, are also active pollinators of plants such as the large Flying Duck Orchid *Caleana major*. Their upside down flowers, with broad columnar wings, presented on a wiry scape mimics the female wasp sufficiently to entice the male to attempt pseudo copulation.

**Beetles**

Although beetles may have pollinated some of the very earliest of flowers, their contribution is mostly limited to the diverse Myrtaceae and Asteraceae families. Some, such as gum beetles and cockchafers, are more prone to eat and damage the flower rather than pollinate them and their larvae also damage the plant’s root system. Typically, Myrtaceae benefit mostly from beetles especially the jewel beetles whose footprints are common in the pollen of the gums, ti-trees, Baeckees, and paperbarks.

Importantly the gregarious behaviour of some brightly coloured hairy beetles has been used to advantage by open flowered daisies including Billy Buttons *Craspedia glauca* and *C alpina*, Dolly Bushes *Cassinia sp.* and Daisy Bushes *Ozothamnus spp.* where they feed on the pollen or gather to mate. During their frolicking the beetles become

Footprints in the Pollen
dusted with pollen ready to transfer to the next species. The beetle pollinated plants have shallow, broadly concave or convex brightly coloured flowers held erect with short sturdy exposed organs. These make attractive landing platforms. Some flowers even have ornamental beetle-like markings to lure passing mates with the promise of company, and hence participate in the pollination process.

**Butterflies and Moths**

Since most of the 22,000 Australian moths are active after dark, plants adapted to moth pollination have white or pale colours, with little scent during the day. These help to camouflage them from other insects in the day. Some moth-pollinated plants remain fully closed during the day further minimising impacts from raiders. In the evenings majestic transformations occur, including alluring perfumes and luminescing colour patterns. By first light they begin reverting to their neutral day time forms. Typical native examples include Boronia *Boronia* sp., White Candles *Stackhousia* sp. and Hounds tongue, *Cynoglossum* sp., while the strongly scented cottage garden favourite *Cestrum nocturnum* exemplifies the moth pollination features found in some of the exotic weeds.

Both the larva and their adult moth or butterfly depends totally on living plants or their associated decaying organic matter. Subsequently they have a major effect on plants by either aiding with pollination and organic matter breakdown for nutrient supply or by destructively feeding on the plant parts.

*Bursaria spinosa* is a butterfly favourite and is well known for attracting the Tasmanian butterflies Bright Copper and Shouldered Brown to its prolific nectar-bearing flowers.

Indigenous plants such as Rice flowers *Pimelea* sp., have adapted their form and structure by positioning their nectaries at the base of long thin corollas. Whilst the moth is probing deeply for nectar, the prominently exerted anthers and stigmas transfer the pollen to and from their hairy bellies. As one of the earliest emerging spring butterfly, the Hobart Brown is strongly attracted to Rice flowers, *P. humilis* & *P. linifolia* whilst the Tassie species of Macleay’s Swallowtail, whose larva feed on the foliage of Sassafras *Atherosperma moschatum*, seek out *Pimelea* spp. on forest margins and road sides.

**Alpine Pollinators**

In the alpine zone the meandering low flying Leprea Brown butterfly is strongly
reliant on the prostrate alpine heath *Pentachrona pumila*.

The Mountain Blue is the most alpine-adapted butterfly in Australia and is an important pollinator of alpine daisies such as Alpine buttons *Cotula alpina* Mountain Daisy, *Erigeron sp.*, and Silver Snow Daisy, *Celmisia saxifraga*. To protect itself from predation the undersides of its wings blend well with the grey lichens and dead twigs common in alpine areas. The Dominula Skipper, White Grass Dart and the Yellow Banded Dart also feed and help pollinate the herbaceous daisies in montane woodlands. They have low whirring flight patterns ideal for seeking out the ground hugging Snow Everlasting *Helichrysum milliganii*, Paper Daisy *Leucochrysum albicans* and Everlasting Daisies *Craspedia alpina*. Whilst feeding they adopt a distinctive profile at rest with their forewings held erect over their bodies and hind-wings held horizontally.

**Recommended Readings**


Phil Watson
Be Wise — look out for Owls

Den and Geoff Robin have a VCA over their land at Dignams Creek, on the slopes of Gulaga (Mt Dromedary), where some four owl species are regular visitors. Den writes about owls and rodenticides.

The devastating effect of habitat destruction on Australia’s owls is well known.

A lesser-recognised threat to owls is ‘secondary poisoning’ occurring when they prey on mice or rats that have eaten rat poison (rodenticide). The toxins from these poisons may build up in the owls’ livers and eventually kill them.

There is evidence that pest rodent species are on the increase and, use of rat bait is necessary sometimes to keep them at bay. The good news is that there are some products which are safer to use and being less harmful to owls.

At the recent meeting of VCA holders at Bournda National Park, it was suggested that I should pass on the following information in the interest of the owls.

Rodenticides have been around for more than 40 years. The early rodenticide chemicals known as ‘first generation’ of these were multiple dose baits containing anticoagulants (such as warfarin or coumatetralyl), that compete with Vitamin K1 and reduce the rodent’s blood-clotting ability. After eating sufficient bait, the rodent dies within 3-8 days after the initial feed. Few secondary poisonings of wildlife were reported during the use of this first generation of rodenticides.

However, the more recent and now more common ‘second generation’ rodenticides pose a much greater risk of secondary poisoning. The reason for this is that they are single dose, more potent, including anticoagulants such as bromadiolone, brodifacoum and flocoumafen. These products are capable of killing rodents after a single feed, although the rodents still take some 3-8 days to die, giving them more time to eat extra poison and to be available as prey. Perhaps more significantly, the products are effective against populations that have become resistant to the first generation warfarin. The greater toxicity of these active ingredients and their greater persistence in animal bodies is what causes the danger to owls.

The issue of rodenticides was discussed at the International Owls 2000 symposium in Canberra in January 2000.

One of the papers reported on trials using a product containing coumatetralyl, a first generation rodenticide, which was registered in 1999 for use in Australia’s canefields following withdrawal of a second generation rodenticide. As well, a number of measures were recommended to minimise exposure to non-target species, including the use of rodenticide in bait stations, as part of the integrated pest management program. It has proved effective in rodent control and with a reduced risk of secondary poisoning.

As researchers and ornithologists point out, there is no perfectly safe bait, but the risk to non-target species can be reduced by the choice of a product which uses coumatetralyl as the active ingredient.

So look out for the owls! If you have to resort to rodenticides, read the label carefully and choose an owl-safe product. (See Editor’s note below for names of chemical involved)

Ornithologists generally distinguish 10 species of Australian owls, including the Christmas Island Hawk Owl. In southeastern Australia, at least four species are listed as endangered or threatened — the Powerful, Masked, Sooty and Barking Owls. It is in our power to reduce the threat to them.

The Owls 2000 symposium proceedings are now available as The Ecology and Conservation of Owls, Published by CSIRO 2002.

Editors Note:
First Generation chemicals include coumatetralyl and warfarin, however in some places rats have become resistant to warfarin.

Second generation chemicals include bromadiolone, brodifacoum and flocoumafen.

There are a variety of rodenticide products and brands which contain these chemicals.

Further information on this topic is available from The Barn Owl Trust in the UK — www.barnowltrust.org.uk/ Forms/no_21.pdf
CHEEKY ACACIAS by Leigh Murray

We grow a lot of acacias because many are wonderfully tolerant of drought, frost and salt winds, and a lot of them are remarkably beautiful. They uplift our spirits when they're flowering. We love them. Some of our favourites are Acacia boormanii, A. howitti, A. pycnantha, A. spectabilis, A. drummondii and A. genistifolia. Many birds enjoy acacia seeds, especially those of A. rubida (rosellas and cockatoos) and A. boormanii (pigeons). Insects and honeyeaters fancy the nectar produced by glands at the base of the leaves of A. pycnantha and A. implexa.

Indigenous to our few hilly, well-drained acres at Queanbeyan are A. rubida, A. implexa, A. mearnsii, A. genistifolia and A. dawsonii. A. doratoxylon grows further down our ridge, and A. pycnantha occurs naturally on a nearby hillside. All of these grow well in the shaly soil, and they're tough. Others that thrive at Queanbeyan include A. howitti with its gorgeous weeping habit (we have one that's about 6 metres tall), A. iteaphylla, A. covenyi, A. spectabilis and A. pravissima. At Tuross Head, A. sophorae is indigenous and we've planted A. implexa, A. covenyi, A. pycnantha, A. boormanii, A. rubida and A. drummondii.

A. rubida is handsome when kept well pruned and tidy, with red stems and ferny foliage. It grows as a shrub of a few metres high and wide, or it can be trained on a clean trunk as a small tree. Its main pest problem is borer, which kills plants after maybe 10 years or so, although well-cared for plants seem less susceptible to this pest and usually last longer. As a bonus of the borer-ridden plants, Yellow-tailed Black Cockatoos regard the borers as a delicacy, and will rip open trunks to get at them. It's such a joy having the birds at our place that we don't begrudge them the odd ripped rubida.

A. implexa forms a slender tree of up to about 8 metres, rather sparse and open at Queanbeyan but dense at Tuross Head, where I planted them as tall screens- kept well-pruned to stop them reaching the sky), they do a splendid job. They have cream ball flowers in summer, an unusual time for acacia. They're popular with birds, especially the small fry such as thornbills and wrens. A. mearnsii is a large shrub or small bushy tree that bears strongly-scented cream ball flowers in early summer. A. doratoxylon grows as a small slender tree at Queanbeyan (rather like A. implexa) as does A. pycnantha, which can look spectacular in flower. It's not our national floral emblem for nothing! Both are very hardy indeed.

A. genistifolia is a small prickly shrub, very slow growing. Our plants are too small to provide the protection for little birds that they might do if they ever reach their maximum size of a metre or so high and wide. They flower early in winter, with cream ball flowers. A. dawsonii is another small, local shrub that grows slowly; it flowers in spring with bright yellow flowers. Smallish non-indigenous acacias that grow well at Queanbeyan include A. montana and A. wilhelmsiana; both are useful low screening shrubs. At Tuross, A. drummondi is thriving in a sheltered, rather shady spot, and it flowers magnificently each spring with gold rod flowers.

A. boormanii is handsome when kept well pruned and tidy, with red stems and ferny foliage. It grows as a shrub of a few metres high and wide, or it can be trained on a clean trunk as a small tree. Its main pest problem is borer, which kills plants after maybe 10 years or so, although well-cared for plants seem less susceptible to this pest and usually last longer. As a bonus of the borer-ridden plants, Yellow-tailed Black Cockatoos regard the borers as a delicacy, and will rip open trunks to get at them. It's such a joy having the birds at our place that we don't begrudge them the odd ripped rubida.

For sheer showiness, it's hard to go past A. boormanii and A. spectabilis. They stop us in our tracks with their brilliant displays of bright yellow ball flowers. The flowers of A. boormanii even last well after rain, and its seeds are said to be a favourite food of Common Bronzewing Pigeons (of which we
have quite a few). It has a slender habit, which is handy for tall screens in tight spots. It also has a tendency to sucker, a feature that is often useful and has never proved a nuisance in our conditions. *A. spectabilis* grows as a slender, graceful tree, with grey ferny foliage and stunning flower displays. For striking foliage *A. covenyi*, with light grey foliage, is one of the best. It grows as a gangly tree at Queanbeyan, and as a large dense shrub at Tuross. We also love the purple foliage of *A. baileyana purpurea*, which has never seeded at our place, and doesn't show the weed potential of the normal *A. baileyana*.

*A. iteaphylla* is a marvellously tough large shrub. It withstands the minus 7 frosts we get at Queanbeyan, and the heat and dryness of summer. It is one of our most drought hardy plants, and it makes a splendid contribution to a windbreak. After we had to remove a large established plant that was poorly located on the boundary line, suckers came up from the stump. Two suckers were left to grow on, and the rest were dug up, potted up and treated like cuttings until they sprouted new foliage, when they were planted out. Most survived, and they've grown steadily during the drought. Many forms of *A. iteaphylla* are weeping; a few are more upright. One smallish form flowers in and off throughout the year. *A. howitti* is another favourite of ours, but it is not as tough as *A. iteaphylla*. It definitely needs more moisture, and seems to prefer a more protected position. It grows as a tall, weeping shrub, with bright green foliage. *Pravissima* also grows as a tall shrub, and likes similar conditions to *A. howitti*. We planted several *A. vestita*, and they have done well, spreading widely as large shrubs of maybe 2m tall by 4m wide, with a completely different habit to the much taller *A. pravissima* and *A. howitti*. A single *A. cultriformis* popped up at Queanbeyan, though we don't think it's indigenous. It's withstood very tough conditions.

Years ago, when drought was not an issue, we planted an *A. melanoxylon*. It grew into a large tree, and suckered vigorously over an area of several square metres. For twenty years it looked a happy chappy. But then the recent drought began to bite, and eventually it died. It does, however, live on in its sucker offspring, although presumably if the conditions stay generally drier, they too will die.

Our acacias get their fair share of pests: borers, galls, scale and distorted foliage. These are usually easy to control, by such simple measures as pruning off scale and distorted foliage, leaving most galls and ignoring the borers, which provide such good tucker for the Black Cockatoos. I try not to prune until the birds have feasted on the seeds, but then a good prune seems to be helpful to the plants, as does frequent tip pruning. Generally, our acacias could not be described as being short-lived (as acacias often are). Most of our Queanbeyan plants are more than 20 years old and going strong. They're terrific. Not only do they provide splendid screening but also they give great delight to us, and food and shelter to many birds.

Botanist and physician Carolus Linnaeus was born 300 years ago on May 23, 1707 in Rashult, Sweden. He explored Lapland throughout Sweden and studied in Holland for his MS (1735). His system of botanical nomenclature was aired in publications during the 1730s, including in *Critica Botanica*. He used a sexual system of classification to arrange plants into orders and classes. He promoted the use of binomial nomenclature in 1749. Each plant was given a Latin generic name (indicating genus) with a specific adjective (indicating species). After his death in 1778, his manuscripts and collections were purchased and housed at the Linnean Society in London, founded in his honour in 1788.

### Dire need for more nature reserves

*From The Advertiser, March 13, 2008*

Governments urgently must boost funding for nature reserves and protected areas to save endangered wildlife and ecosystems. A report by conservation group WWF found 72% of threatened species were in decline, but where land area was protected, decline was less common.

The area of protected land in Australia is 10.5%, far below that of other mega-diverse countries such as Colombia, China, Peru and Malaysia. Commonwealth funding averaged about $8 million per year in the past decade. The report found that states and territories, on average, spent eight times more on protected area management programs.

A cash injection of at least $250 million over five years was needed to save endangered wildlife and ecosystems, it said.

"Such an investment, which equates to the cost of a box of Cornflakes a year from each taxpayer, could extend protected areas to 15.5% of Australia's land by 2012.

### WORLD POPULATION MILESTONES

<table>
<thead>
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<th>Year</th>
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<tr>
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<td>1927</td>
<td>2 billion (123 years later)</td>
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<td>1960</td>
<td>3 billion (33 years later)</td>
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<td>1987</td>
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<tr>
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<tr>
<td>2010</td>
<td>7 billion (11 years later ?)</td>
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You do the sums!!

### DID YOU KNOW?

- The **Australian Cassowary** has a horny helmet called a casque. It is not born with a casque or the dangling neck wattles. These grow as the chick gets older.

- The large blue and black **Ulysses Butterfly** is easily spotted by hungry birds. However like most colourful insects taste terrible or are poisonous. Predators learn that bright colours are a warning.

- The adult **Crimson Rosella** is red and blue, but the juvenile is mostly green and looks like a different type of bird. They both have blue cheeks and a red forehead.

- A **Ring-tailed Gecko**, can cast off all, or part of its tail to escape predators. The tail regrows with a different pattern and colour.

- The **Striped Possum** eats insects. It tears apart bark or rotting wood with its teeth to find prey. Then it pokes around with its long tongue or clawed fingers.

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*The views and opinions expressed in this newsletter are not necessarily those of ASGAP, or state APS groups. No responsibility is taken for any information or advice contained therein.*
CONSERVATION NEWS AND HOT TOPICS

Weed Spotter's Workshop discovers toxic plant

Last year in a workshop at Longreach, Qld. participants found and identified Parthenium along a roadside. Parthenium is one of the most noxious weeds in Qld., as it is toxic to stock and can cause severe allergic reactions in humans. Often by the time new weed incursions are found, an infestation has grown to a scale where eradication is difficult, expensive, or even impossible, suggested Weeds CRC. Here are some more staggering statistics on weeds in Qld.:

- 1044 specimens submitted to the Qld. Herbarium
- 402 naturalised species with 61% incorporated into the Qld. Herbarium
- 1 new naturalisation in Australia
- 6 new naturalisations to Qld.
- 8 new naturalisations to a Qld. pastoral district
- 159 plants submitted were Declared under the Qld. Land Protection (Pest and Stock Route Management) Act 2002
- 27 occurrences of seven Class 1 species. These were notified to Biosecurity Qld. as Class 1 species are all subject to eradication programs
- 87 occurrences of 22 Class 2 species
- 45 occurrences of 13 Class 3 species

These statistics were collated in September 2007

Info. kindly supplied by Weeds CRC.

Weedwatch 17 May 2008

Knobby Club Rush helps to stabilise sand dunes from Releaf No. 106, Autumn 2008

The Knobby Club Rush (Isolepis nodosa) is common in a range of vegetation types and is widespread through South Australia, also occurring in NZ, South Africa and South America.

The spherical seed heads are fairly unmistakable and can't be confused with exotic species that occur locally.

It is a perennial plant that forms clumps connected by short rhizomes. It mainly occurs in sandy habitats and is important in stabilising coastal dunes to prevent wind erosion. It also occurs in wetlands along watercourses and in dryland habitats.

The Knobby Club Rush is easy to propagate; the small, shiny, dark brown seed can be collected at any time of year from mature heads and needs no pre-treatment. It establishes well from seedlings and is a very useful stabilising plant for use in revegetation or landscaping projects.

New home for rare wombats

The Queensland Environmental Protection Agency plans to move a small number of northern hairy-nosed wombats, the second most endangered mammal in Australia from their current single location in Epping Forest National Park, near Clermont, Central Queensland, to form a separate breeding colony 600 km south near St George. To find out more about the project and northern hairy-nosed wombats visit: http://www.wildlife.org.au/news-nhnwombat.html

2020 Summit environmental outcomes

'Australia faces an unprecedented challenge from climate change. We risk losing our natural heritage, our rivers, landscapes and biodiversity. We have a brief opportunity to act now to safeguard and shape our future prosperity,' says the introduction to 'Population, Sustainability, Climate change, Water and the Future of our Cities' section of the 2020 Summit initial report.


DID YOU KNOW

POSSUM or OPOSSUM

Possums are Australian marsupials. The brushtail possum is 60cm. long and mainly nocturnal. Opossums are marsupials that live in America. The Virginian Opossum is about 80cm. long, and is also mainly nocturnal.
Phoebe Ashton Biodiversity Project Officer, from the Nature Conservation Council of NSW (NCC) has provided the following information on an upcoming conference, titled 'Saving a Sunburnt Country'. The Department of Environment and Climate Change NSW is the principal sponsor for the conference which will be held on the 19 & 20 November, 2008 in Sydney. To indicate your interest in attending the conference please register by snail mail to:
Nature Conservation Council of NSW
Level 2/301 Kent Street, Sydney NSW 2000
Ph: (02) 9279 2466 Fax: (02) 9279 2499
or email on our website at
www.nccnsw.org.au/sunburntcountry
Some of the possible themes currently being discussed include the following:-
- How Australian species and ecosystems might respond to climate change
- The effect on human society of changes to biodiversity and ecosystem functions caused by climate change
- Planning for higher temperature scenarios and other climate induced changes - the challenges of assisting mitigation and adaptation for biodiversity and ecosystems
- What further contributions, research, planning and innovations on the part of community and government are available to protect our biodiversity and ecosystems.

Nature Stories Podcast: Audio Downloads of Great Stories and Great Places
Nature Stories are now available by podcast from the Nature Conservancy. Nature Stories brings you interesting and unexpected weekly tales of people's connections with the natural world in a high-quality audio download. You can listen to these fascinating stories online or download them to iTunes® or your MP3 player and take your nature on the go! All of our stories are drawn from the Public Radio Exchange and many are from Stories from the Heart of the Land, a public radio series sponsored by the Conservancy and Visa, and produced by Atlantic Public Media. To find out more visit http://support.nature.org/site/PageServer?pagename=podcast

Coorong & Lower Lakes contributed by Anne Hartnett
My understanding of the recent COAG agreement was that a lot of money has been made available for engineering works, whilst there was very little talk about improving the poor health of the majority of the system.
In fact, in Milang the following day Prime Minister Rudd blamed the whole problem on climate change, and did not include the years of political overallocation of the river which has led to the River dying from the mouth up, now affecting the Coorong and Lakes Alexandrina and Albert.

There is an environmental disaster occurring in the Coorong and the Lakes. Most graphically seen in the tubeworm (white coral like encrustation) completely covering and immobilizing the turtles who live in the Lakes. Those not infected are moving out of the unsuitable water, and are just dying or being killed by foxes. This is a national biodiversity disaster, and is the result of excessive water harvesting, and the immense off -river storage dams upstream. If all the States and the ACT who use the river each contributed 50 gigalitres of water towards river health - now, the health of the River and Lakes would improve markedly. The Murray, Lakes and Coorong are a part of what it means to be Australian, part of our national heritage. I hope we can save them.....

Garnaut's Review from Conservation Council of SA
Like Sir Nicholas Stern’s previous analysis, Professor Ross Garnaut has highlighted that the earlier we act, the better off we will be. Professor Garnaut has identified Australia's major climate
change challenge: to decouple our economic growth from our greenhouse gas emissions. As one of the richest countries in the world, blessed with abundant opportunities to utilise clean renewable energy sources, we stand poised to lead the world. Immediate opportunities now exist to abate greenhouse gases; through energy efficiency savings, stopping native forest/land clearing and boosting carbon sequestration in soils through improved agricultural practices. You can find out more, and make your own submission, at www.garnautreview.org.au.

Carbon Capture and storage
Prof. John Kaldi from the Australian School of Petroleum, University of Adelaide spoke recently (July 2008) on Carbon capture and storage - reducing greenhouse gas emissions to the atmosphere. Fossil fuels supply around 85% of the world's energy needs, but their burning is a major source of CO₂, the gas most blamed for the increased concentration of greenhouse gases (GHG) in the atmosphere and for global warming. There is no 'silver bullet' to deal with the massive challenge faced; rather a range of solutions is needed. The talk described one of the options: carbon capture and storage (CCS), which involves the longer term storage of CO₂ emissions in deep geologic formations. CO₂ has to be captured at the source, (eg. power plant or gas production facility), then transported, typically via a pipeline, to a suitable site. Australia’s first CCS demonstration project is east of Warrnambool in Victoria.

UNWANTED WILDLIFE

Just recently we have been blessed with the presence of three Brush Turkey chicks (Alectura lathami) in our rather small town yard in Maleny. "Blessed" I hear you say, “just you wait till they start raking all your well-paced mulch and ripping out plants, then who’ll be blessed!"

Glutton for punishment that I am, I still think we're blessed, even if they did do those things. Fortunately, we have never had problems with Brush Turkeys.

Brush turkeys are one of those local species that have adapted to the changes that we have wrought on the landscape and yet are referred to by many as a nuisance. However, they are not the only successful wildlife that cops the and press. Our cultural fear and loathing of snakes never fails to surprise me, and yet we have far more of a chance of dying when in the vicinity of a car than from a dreaded snake. Native raspberries can thrive in paddocks and on forest edges but are surely a nuisance because of all those prickles? And yet they are crucial wildlife habitat - because of the prickles! The list of successful and yet unpopular native species goes on and on and can include possums, bush rats, stinging trees, wattles- but for now let’s get back to the turkeys.

When I read the many horror stories about Brush Turkeys devastating tree plantings that some intrepid re-vegetators have been undertaking- I can’t help but think the said writers are under the impression that the turkeys are purposefully targeting them or that these feathered little bandits should be more grateful for all the trees being planted. After all, it’s for their own good, isn’t it?

Well that’s where we might be wrong. The Brush Turkey is just doing what Brush Turkeys do (nature is very Zen!) The Brush Turkey, like the rest of nature, is living very much in the here and now and seizes opportunity as it arises. Therefore we have to think of how we can improve our gardening techniques to better suit our local environment and the turkeys.
Our friend Carmel kindly passed over her notes from a talk she gave at a social gathering. Carmel is a hard-working, no nonsense dairy farmer. Her talk was originally prepared for and read to a group of city people who had been complaining about the impact of water restrictions on their gardens. I invite you to find the time to read Carmel's notes and, if you feel so inclined, also make them available to others, as it portrays the situation in South Australia's food bowl, and of people everywhere in the mallee and drylands doing it tough.

**Drought - the Four 'D's** by Carmel Critchley, dairy farmer, Wall Flat in the Murraylands (lower reaches of the Murray), S.A. shared 27 April 2008

Drought is far more than a lack of rain, far more than being short of water for gardens. City people are more sheltered from this horrible monster that spreads its tentacles far and wide and brings the bush and its people to their knees. It is a big DRY dust, debt, disappointment: when clouds that look to be full of rain pass us by. It is depression and despondency when month after month, year after year it goes on. And nothing you can do makes a difference. Despair and the suicide of friends cut really deeply, and isolate us more. It is a time of decisions for farms and families, but with determination and faith in God one knows there is a future.

I'll tackle each of the 'D' words singly.

**Dust** is destruction - the topsoil moving in the wind, soil fertility that takes years to achieve just blowing away. Seed banks of native grasses and trees end up far away, sometimes lost for good. Dust is that cruel daily reminder that penetrates houses, washing, even your hair and your eyes. That daily reminder that climate is changing. Dust storms, sandstorms are part of this country's history. Our pioneers survived - and so will we. But we need determination. I remember as a child on a farm 20 miles east of Loxton being told never to play in the sandhills in the wind because sandhills 40 feet high literally walked and we could get covered and never be found. The dust storm a few weeks ago brought something new to us this time - flying cowpats, just like frisbees. Frosts are just as destructive as dust. We have had 46 frosts in just one season.

Drought almost always means an increased level of **debt** for farmers. We need to buy the feed we cannot grow. Crops fail. The flow of $$s for next year's crop are not there. Banks are sometimes reasonable, but not always. Hay and fodder stocks are better than $$s in the bank for livestock farmers. Fruit and veggie farmers live on a knife edge. Along with increased debt and financial pressure come family tensions. Husbands and wives cope differently. Kids react to tension. All sorts of problems emerge. I know of people who cannot open their mail, cannot bear to know what the power bill will be. Women who cannot justify spending money on a haircut. The kids need bigger sneakers. Some people turn to drink, or drugs, and unleash even bigger problems. Uni. students use these stresses to get a PhD. The relationships between stress, financial hardship, remoteness, whether married or single people cope better, are analysed at length with Government funding. Exceptional Circumstances Relief (EC) is Government's way of "helping". The paperwork is incredibly complicated and it cost me $9.50 to post in my application. We were rejected. Only a very small proportion of people are eligible. On the river, only 3% of the dairy farmers could get EC. A financial counselor from the Riverland told me that the average citrus and vine grower in the Riverland has a -17% (minus 17%) equity in their property. Thus, if they sold, they would have to pay back 117% of their proceeds. These people have no hope of ever getting out of their financial mess. Sadly, some take the attitude, "Well, we'll have another baby and get the $5,000 baby bonus".

Financial hassles are often the cause of suicides. The shame of financial problems depresses people. There are many more suicides than people realize. I know of 3 dairy farmers who have died this way. In Victoria, milk tanker drivers travel in twos, in case they arrive at a dairy and find the farmer hanging by a rope. A close friend teaches at a rural school with 7 staff. Six of those 7 have had a husband, father, brother or son die from suicide in the recent past. Sometimes it's something as small as the death of the farm dog that is the suicide trigger - the good old dog that has been told all of their worries. I know here on the river there were a few farmers we all watched and visited if possible - families or single blokes pushed to their limits by banks, Environmental Protection bodies, "wallabies" (Water And Land Biodiversity) - and these people were and are good people, good farmers, doing it tough. A recent high-profile murder in country S.A. has a strong drought component in it, though it is no
excuse to batter someone to death. The physical workload of drought is unreal: hand-feeding stock, lifting heavy buckets, extra tractor work, transporting stock across properties, the list goes on. We do what has to be done, whether it is daylight or dark. Women on isolated farms sometimes have to put an animal out of its misery. They might take days to recover from the stress, with no-one to talk to. Native animals like kangaroos are dangerous when stressed, and it gets quite scary. Checking water troughs becomes a compulsion. Here on the river we have had to do earthworks, expensive stuff. Buying pumps costing $9,000 and not knowing if there will be enough water to run them is worrying indeed. Water is always precious. We could not, in conscience, put it on a paddock to grow grass when fruit-growers elsewhere on the Murray are losing their trees. When the 2007/08 water allocation of 4% was given out, we were down, despondent, and nearly gave up. We talked, we prayed, we planned with a farm consultant, and decided we would change our whole style of farming to lot-feeding. We stopped trying to grow grass. We let the farm die. We were scared, but we did it. We leased our water to upstream SA fruitgrowers. Then after 3 months, the money came in and we bought hay from the mid-north. We have a mountain of hay, and feed a bit of grain and supplements. The cows stayed fat and fertile and now go out for a different view into paddocks offering a change of scenery. The bank was happy we did not need to extend our already over-extended overdraft. As far as we are concerned, the old way of dairying is gone, for good.

The trees on our farm are stressed. The swamps are deeply cracked, but the native plants are hanging on. The last drought brought a huge regrowth of gums. The trees are now more valuable than grass to our farm. The recent record-breaking heatwave proved that. Our tree planting will continue on the swamps. Nature can heal itself after drought is over, but I feel the management of our river upstream of Lock 1 (Blanchetown) will have priority over us down here on the end of the river and lakes. I am not confident that South Australia matters.

Native wildlife get out of proportion in a drought. Only the corellas bred last year. On our Rockleigh farm, the kangaroos are in plague proportions, and mostly with little joeys. The rabbits, too, are breeding. Hopefully this year we will get good rains in the catchment areas, as well as here. It will take many years to recover. We need 6 feet of water from the lakes to Blanchetown.

The lessons we have learned have been sandblasted into us. Life is what you make it. A little lamb I am bottle-feeding at the moment epitomized the survival spirit of drought in nature. Its mother died next to a trough in the last few days of the heatwave. The lamb had enough sense to get into the water and wait. By trusting a human, it survived. If we trust our faith, we too will survive.
Blindsnakes: our harmless burrowing snakes

One group of Australian snakes we know very little about is the blind snakes. These snakes are harmless burrowers that spend most of their time underground and are rarely seen. Occasionally, they are encountered moving around on the surface, usually after heavy rains or on warm humid summer nights. At other times they can be found in burrows under rocks, in or under rotting logs, or inside ant nests or termite mounds.

Blind snakes are easily identified from other venomous snakes by their glossy, worm-like appearance. Unlike other snakes, which have large ventral belly scales, blind snakes are completely covered in small glossy scales. The head is indistinct from the neck, and the eyes are reduced to two dark pigment spots. The tail is very short, usually only one to two centimetres long, and ends in a sharp, downward-pointing spine which is used as an anchor point when digging into the soil. The mouth is small and ventrally placed, like a miniature shark's mouth, and only the upper jaws have teeth. When handled, blind snakes often emit a foul-smelling odour from their anal scent glands that probably helps to deter predators.

Blind snakes are found in a wide variety of habitats on mainland Australia, but are absent from Tasmania. Australian blind snakes belong to a single genus, *Ramphotyphlops*, and individual species are recognised by variations in scalation. In Victoria there are four species of blind snakes which are commonly encountered.

They range in size from small skinny species like the Trilobed Blind Snake (*R. bituberculatus*), which grows to about 45cm in length, to large heavy-bodied species such as the Stout Blind Snake (*R. proximus*) which can grow to 75cm in length. The shape of the snout of blind snakes varies and can be strongly trilobed in some species like the Trilobed Blind Snake or rounded in shape in others like the Eastern Blind Snake (*R. nigrescens*). The belly of most blind snakes is cream in colour, but dorsal colouration varies considerably. The uppermost surface of the Eastern Blind Snake is purplish-pink whereas in the Stout Blind Snake (*R. proximus*) it is rich dark brown.

Blind snakes feed mainly on the pupae and larvae of a variety of different ant species, although termites are sometimes taken. Ants commonly preyed on by blind snakes include the small black ants which invade homes to steal sugar (*Iridomyrmex* spp.), sugar ants (*Camponotus* spp.), meat ants (*Iridomyrmex purpureus*) which build large mound nests, and the small metallic green stinging ants (*Rhytidoponera* spp.). Interestingly, one large species of Victorian blind snake, the Stout Blind Snake, feeds on the brood of the large and formidable stinging ants of the genus *Myrmecia*, commonly know as the 'jumping ants' or 'bull dog ants'. The coating of thick protective body scales and wide body of this blind snake makes it extremely difficult for the bull dog ants to bite or sting it. Bull dog ants will readily attack intruding blind snakes but are unable to find any weak spots to grasp or sting them. If blind snakes had well-formed eyes they would be much more vulnerable to ant attacks; luckily for blind snakes their eyes have become reduced to dark pigment spots which are protected by thick scales.

Due to their eye reduction, it is unlikely that blind snakes can see very well; at best they can probably distinguish light from dark. Interestingly, embryonic blind snakes have very well developed eyes as do most other snakes. Presumably the eyes have been lost over time as an adaptation to a burrowing lifestyle.

Being blind would appear to pose problems for these secretive animals but, unlike humans, snakes rely heavily on their tongue to discover information about their environment. Snakes use their tongues to pick up molecules from the air or ground which are then transferred to the Jacobson's organ in the snake's mouth. The Jacobson's organ

continued on page 12

The harmless Eastern Blind Snake *Ramphotyphlops nigrescens*. Next time you get stung by an ant, just remember that the blind snakes on your property, with their appetite for ants, are taking your revenge! Photo: John Webb.
Organ is able to identify the odours of a prey item, a predator or a mate. By flicking their tongues in and out, snakes are able to detect and follow the scent trails left by a prey item or a member of the opposite sex. As you might expect from a snake with poor vision, blind snakes rely heavily on scent to find their prey. Many species of ants leave detectable scent trails which fan out from their nests. Blind snakes are able to detect these ant trails and follow them back to the nest. Presumably, the snakes are able to tell the right direction in which to go by detection of a gradient along the trail; the scent should become stronger as the snake gets closer to the nest.

How blind snakes locate other blind snakes for the purpose of mating is not known. The paired anal scent glands may be important in this respect. Presumably, females leave a scent trail which is able to be followed by males. This is common in other species of snakes which have been studied. Most species of blind snakes reproduce by laying eggs. Mating takes place in spring, and females usually lay three to thirteen eggs in early summer. Hatchlings appear in late summer and look just like small earthworms. How fast they grow, like much of their ecology, is not known.

Blind snakes often rely on objects, such as rocks or fallen logs, for shelter sites. Many other animals, some of them threatened, also use fallen timber for shelter or breeding sites (Land for Wildlife News Vol. 1, No 10), so the importance of preserving such habitats cannot be overstressed. Rocks and timber will also benefit properties by stabilising the soil.

Blind snakes are fascinating reptiles that are also useful to have around. They are one of the few main predators of ants and play an important role in ecosystems. So next time you get stung by a bull ant, think of what it must be like for one of these snakes when it enters a nest of several thousand angry ants!

John Webb, University of Sydney.

References for further reading:

Books


Articles


If you find a blind snake please record details of the location, date, and habitat and send these details to the Atlas of Victorian Wildlife, PO Box 137, Heidelberg, 3084 (if possible accompanied by a photograph). Any dead specimens should be passed immediately to an office of CNR, the Museum of Victoria. Please note that it is an offence to be in possession of wildlife without authority.

Editor.

The Trilobed Blind Snake

Ramphotyphlops bituberculatus is named for its three-lobed head. Photo: Glen Shea.

The Stout Blind Snake

Ramphotyphlops proximus feeds on large stinging ants. Photo: Glen Shea.

JUST A GALAH!

While Americans pay $1000 for a galah on the illegal market and many Australians keep galahs as family pets and delight at their antics, the Australian farmer can eradicate this grain-destructing bird quickly enough.

Galahs are probably the most familiar and familiar of all Australian parrots. Scientific opinion about their classification is divided and they are placed either in a genus of their own as Eolophus roseicapilla or with cockatoos as Gaciscus monophyletic. Well-known birds growing to about 35 centimeters in length, galahs are grey above but have a rump, blue tail, and eye-stripe, and are a white and pink crest. Their bill is yellow and the beak dark grey. They are dark in the male and pink in the female. Removed for their beauty and their ability to trim the boughs, galahs are popular pets.

The galah is one of the few native Australian species that has benefited greatly from European settlement and the industrialisation of the land. Before British settlement they were rare, east of the Great Dividing Range but are now found over most of the continent, including Tasmania and some of the islands. Only in quite recent years have they become established along the eastern seaboard and in the southern half of Western Australia. Observers have noticed the galahs are the first record of the Northern Territory. Galah populations are the most northerly of the distribution areas. They are numerous there at other times, but in recent years they remain infrequent to exist in numbers.

The great increases in range and numbers of numbers is largely due to the growing of grain, the extensive provision of water for stock in and around grazing areas, and irrigation schemes which have encouraged the growth of eucalyptus and other trees. To fill the demand for grain, extend of land has been cleared, galahs are abundant. At night, galahs are mainly in trees, often in pairs, and travel in groups of mixed species. They appear to be particularly given to city and town, but in recent years they have also developed a taste for the work of provenance and seeds, such as millet and sunflower. To re-use the fact that they are town-dwelling, farmers, note their numbers and cover.

A young galah-painting cherrybarks out of its nest. Galahs usually nest near each other but will not tolerate anyone coming between.
Reptiles have coped with a lot of dramatic environmental changes over the past 350 million years — the rise and fall of continents, acid oceans, lethal atmospheres and catastrophic meteors — only to succumb to urbanisation.

Whether it’s the rapidity of the changes, the fragmentation of bushland, the dangers of all those wonderful flat, dark sunbaking surfaces (roads), or the impact of cats and foxes, the reptilian diversity of cities appears to be steadily declining. Although many people tend to expel snakes of all description, even harmless and more appealing species seem to be losing out. Unfortunately, the general neglect of research into animals in the city is even more pronounced in reptiles: urban ecology studies of reptiles have largely been confined to icons such as blue tongues and dangers such as snakes.

Two attempts to redress this lack of knowledge are recent studies on eastern water dragons and freshwater turtles, both conducted in the suburbs of southern Brisbane by Griffith University students Amy Bond and Raymonde de Ladouther. As well as the water dragon, the dragon family (Agamidae) includes the bearded dragon (Pogona barbata) and the famous frilled lizard (Chlamydosaurus kingii). These two larger species, widespread in Australia, are present in southern Queensland but have suffered greatly from the massive development in the region. The frilled lizard appears to be in serious decline.

The water dragon, in contrast, is still common, and not just in the bush. Many parklands, suburban bush patches and even back yards host groups of this large, gregarious lizard. Clearly, it has prospered. Long-time reptile enthusiast Amy Bond was determined to discover why. It was soon evident that water dragons were common in networks of small creeks and ponds, as well as in a surprising number of apparently highly disturbed locations, including entirely artificial ponds

advantages, including access to our food wastes and opportunities to live and breed in places shunned by other species. Where frilled lizards depart as people arrive, water dragons move in. Ignore the picnickers, but grab their discarded scraps.

However, this process of habituation has to be learned. Experimentally approaching water dragons in places where the animals encountered lots of people and also in places where people were far less common, Amy found that she could get to within 4m of the habituated animals. Less people-familiar dragons fled when Amy was still 14m away.

Raymonde de Ladouther was also interested in aquatic reptiles, but was much less certain about their ability to survive in the suburbs. Her focus was fresh water turtles. South east Queensland supports five native species although one, the northern snapping turtle (Elseya dentata), is confined to a small area on the northside. Most of these species occur naturally in flowing creeks and rivers, but some have found their way into still ponds in suburban areas. Raymonde was interested in finding out which species were prospering in this atypical environment. Using a range of trap designs, she surveyed eight large ponds in southern Brisbane. To her considerable surprise, she captured 368 turtles of four species. Each pond supported between 14 and 86 turtles; the Brisbane River turtle (Emydura macquarii) was by far the most abundant. (During her study, a single exotic red-eared slider turtle (Trachemys scripta elegans) was also detected — and extracted — by the pest authorities.)

Given the state of some of Brisbane’s water bodies, these urban reptiles can clearly tolerate poor water quality!
The vital link

Before you act, you have to care.

More facts and figures rarely get the blood racing. If someone is really moved, they are much more likely to do something about it. These are simply stated conclusions from important recent findings by environmental psychologists – and they have serious implications in relation to urbanisation.

As we flock to cities, we are increasingly removed from natural environments and processes, and are likely to care less about them. Given the magnitude of environmental challenges we will face in the not-too-distant future, many people are growing very concerned about whether the next generation will be motivated enough to do anything about them.

The distancing of urban dwellers from nature has been likened to an extinction of experience – the cessation of the vital link between being part of an event and its meaning. All of us can probably recall a particular experience – an interaction with a rare species, a close encounter with a special animal – that has stayed with us for life. It may have helped motivate our interest in ensuring that such experiences continue. But what happens when contact with ‘nature’ becomes as remote as a television show, or as unwelcome as a visit from a ‘dangerous’ snake or lawn-defacing bandicoot. We simply don’t know what long-term effects these changes will have – but they aren’t likely to be very positive.

We do know that for many people, getting marooned within an urban environment actually increases the longing for some form of connection with natural things. This may be as simple as pictures of wild environments, visits to local parks or feeding birds. Numerous studies show that events as basic as these can be significant factors in increasing wellbeing, reducing stress and even improving rates of recovery following illness. There does seem to be something intangible but undeniable about elements of the non-human world that many people value extremely highly.

One element of these new insights with which some – myself included – are struggling relates to what actually counts as ‘natural’ for the contemporary urbanite. For example: recent studies from the highly urbanised cities of North America and Europe have found that even the presence of introduced birds may be greatly valued. I still find it hard to see a starling or sparrow as something special, but for large numbers of people living in some of the world’s most densely built up urban areas, a visit by some of these common, even pest species may be all they need to see a reason for caring.

Obviously, our vigilance concerning any potential new imports must remain acute. Keeping sparrows and starlings out of Western Australia is vital. But for species already present, the current thinking is very much about risk assessment and most effective use of limited resources. Finding the last red-eared slider turtles and red imported fire-ants is critical; worrying about sparrows in suburbia is not.

Ironically, of course, the house sparrow is an introduced species in serious decline throughout its global range. To add weight to this discussion, English ‘Save the Sparrow’ groups are now dedicated to understanding and reversing the decline of a beloved national icon. How? By arresting the clearing of traditional hedgerows from the English countryside. Hedgerows, densely-planted lines of shrubbery used for hundreds of years to separate fields and laneways, are primary habitat for this species and a wide range of others.

From little things, big things grow.

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