

# Wildlife and Native Plants Study Group Newsletter

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## WELCOME to our 50<sup>th</sup> issue!

Doesn't the time seem to fly by, these days. I do hope members that you have been in good health, and that the winter bugs and flu have stayed away. Unfortunately we haven't been so lucky down south, and the flu has been quite severe, and wanting to hang on and on. Even our gardens seem out of sorts - our wattles are flowering weeks before they should be, and seem to flower earlier and earlier each year, and sometimes even flower twice in the year. Strange and changing climatic patterns. What's it been like in your area? It's been really cold here, and Mt. Lofty has even had snow. I know some areas of Australia have had wonderful, welcoming rain, at a time when it seems most needed, and when it looked like drought was here forever. There's been an array of natural events - fire, drought, high winds, mini tornadoes, huge seas and flood. There is so much truth in the words of the song "I love a sunburnt country"

..... a land of sweeping plains  
of rugged mountain ranges  
and droughts and flooding rains.

So are these phenomenal weather events a thing of today, or has it always been so? Our native flora and fauna have had to adjust and adapt over the years to such extremes.

Neil Palframan, a new member, has sent a photo of flooding, west of the Darling. Thanks Neil it is heartening to know that rain has finally come to these parts.



Moving on, I must thank all those members who have paid their subs. early. Those late payers will have to bear the increased fees unfortunately. Subs. from 2005 on, are now \$10 p.a. It is a sign of the times, given our ever increasing postage and printing rates.

**WELCOME to new and renewing members** - it's great to have you. Many thanks too, for those members who have sent in articles. This is very much appreciated, as it is YOUR newsletter. If you have contributed an article, and can't see it in this edition, don't worry it's been held over for a future newsletter. It's really good to hear about what's happening in your area. So please, keep the articles coming.

New members, Lynette & Peter Reilly write that they live on a suburban block beside the sea at Runaway Bay on the Gold Coast. By using mostly local plants in the garden, they count themselves lucky to have a variety of birds, butterflies, and skinks. They have become avid birdwatchers and are trying to learn more about butterflies. We all strive to learn more about our native plants and wildlife, and the relationships that exist between flora and fauna. I hope each issue can provide some insight into this.

Happy reading! Chris.

## IN THIS EDITION

- Gone batty! *By Chris Jones*
- Native Cresses and Cabbages by *Phil Watson, APS Tas.*
- Follow-on from Alphabet Soup
- An Australian Invasion *by Dr. Barry Traill*
- Media articles
- Book reviews.....and more

## ASGAP WILDLIFE & NATIVE PLANTS STUDY GROUP

### GONE BATTY! *By Chris Jones*

Haunted houses, ghost bats,  
    eerie wailing, mass flight,  
Spooky chatter, vampire bats,  
    all are creatures of the night ....

No this is not an introduction to a science fiction thriller, but the world of bats.

Probably no animal has been so maligned as the bat, and yet it does much service to our world. Did you know bats have an evolutionary history of some 55-60 million years? They are globally widespread and it is this that makes them the second most abundant order of mammals in the world.

There are approximately 74 species of bats in Australia, roughly divided into two sub groups - (1) mega-bats - big bats, fruit bats and flying foxes (mainly fruit and nectar eaters) and (2) micro-bats - small insectivorous bats. They all belong to the Order *Chiroptera*.

The noticeable differences between the species are found in the eyes. Mega-bats (eg. flying foxes) have large, round eyes, while the insectivorous bats have very small eyes the size of pinheads. Fruit-eating bats also have no tail whereas an insectivorous bat does. Bats are more common in the tropics.

### VALUE

These small, brown flying mammals should be much valued, as the insectivorous bats help to control insect populations, as they consume nearly their own weight in food each night. Fruit bats that feed on nectar, pick up pollen on their fur and transfer it from flower to flower assisting in pollination; and bats that eat native fruit, spread fruit seeds through the forest as they migrate from one feeding area to another. Since different fruit bat species feed at different levels, most rainforest trees and shrubs benefit from pollination and seed dispersal by bats.

### LIFESTYLE

It is true, that bats inhabit caves and other dark places, even drains, hollow trees and house walls - and they do come out at night. They are known to swoop from their huge roosts or camps, to take to the air in the hundreds. But these nocturnal aerialists become frightening by the noise that they make, called echolocation, in which they seek out their prey.

### ECHOLOCATION

The noise heard is made by each bat uttering about sixty high frequency sounds per second. When a sound strikes an object in the bat's fly-path, an echo bounces back to the animal's large ears, which serve as microphones, and the echo is interpreted by the bat's brain. In this way the bat is able to dodge obstacles or pursue an insect. Echolocation also allows the bat to navigate in total darkness, preventing it from bumping into walls, other obstacles or even other bats.

### COMMUNAL LIVING

Bats live together in concentrated groups or colonies of a hundred or more in one small area. They hang upside down, their sharply curved claws preventing them from falling. The index finger is also clawed in fruit bats (flying foxes). The bat is able to use its wings to flip an insect into its mouth when in flight, to wrap around themselves in the cold, or to fan themselves in the heat. When they are at rest they hang upside down by their feet and fold the wings against their body.

### ON EXAMINATION

Upon close inspection a bat has large leather-like wing membranes, stretched taut between its forearms and weak hind legs. The knees are generally bent forward, and the body is hairy and mouse-shaped. They have five clawed toes on each foot, and their sense of touch is remarkably well developed. The two most likely bats to be encountered are the flying fox, and mastiff.

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### NEW LIFE

Female bats become mothers at approximately the same time because of delayed fertilization. After mating, they store dormant semen in the uterus, when a single baby usually is born to each mother. As true placental mammals (eutherian), bats give birth to well developed but hairless young, which are suckled on teats at the side of their chest. The young have large claws and strong jaws which it uses to cling to its mother, while the mother uses her wing to support them. Mothers carry their young until they become too heavy, and then they are left at night in a nursery roost while the mother goes foraging. Independent flight usually occurs from one month when it joins its mother and learns how and where to find food.

### BIG BATS.....

There are 12 known species of fruit bats in Australia, belonging to the family *Pteropodidae* in the suborder *Megachiroptera*, otherwise known as the fruit eating big bats or 'mega-bats.' The most commonly known are the flying foxes, which are frequently seen hanging from branches in their communal roosts. Other smaller species include the tube-nosed bat and tiny blossom bats. As would be expected the Australian fruit bats use their sharp eyes and their well developed sense of smell for finding fruit and flowers which make up their diet. (*Encyclopaedia of Australian Wildlife, 1997*)

### ...AND SMALLER BATS

The insect eating bats are members of the suborder *Microchiroptera*, to which all other Australian bats belong. Most are quite small with wingspans of about a metre, a small body and weigh about 3 grams. Insect eating bats are able to see, but unlike fruit bats they use hearing rather than vision to navigate and to detect their insect prey. (*Encyclopaedia of Australian Wildlife, 1997*) Most insectivorous bats are opportunistic feeders, preying upon whatever insects are abundant at the time. Insects commonly consumed by bats include moths, beetles, flying ants, lace-wings, flies,

mosquitoes and caterpillars. Flying insects may be caught while the bat is on the wing, or may be taken directly by the mouth. Larger insects are scooped up in the bat's wing, collected and taken to a feeding place. Small piles of unpalatable insect parts such as wings and heads, may be found under bat feeding roosts. Some bat species are adept at recovering insects from the ground, or from foliage. One species the large-footed myotis (*Myotis adversus*) flies over streams and pools raking the surface with its large feet to catch aquatic insects and even small fish.

Where there are large bat colonies there are also corresponding piles of bat guano (droppings), rich in nitrogen and phosphorus and in certain areas these have been mined for the substance to be used as fertilizer. (*Reardon. & Flavel, 1991*)

### FRUIT BATS -Family *Pteropodidae*

The best known of the fruit bats in Australia, and the largest of all bats, are the flying foxes. 'Most differ from bats of other families in having comparatively plain or simply furred faces, without the complex folds of skin that form nose-leaf and similar structures (which serve to control emitted sounds) or the complex external ear shapes.

The four largest species known as flying foxes have wingspans of more than a metre, and can be recognised by their long-snouted, fox-like faces. They live in large 'camps' containing thousands of individuals, usually situated in rainforest, mangroves or swamp trees, flying out for considerable distances in search of fruit and blossoms.' (*Morcombe, 1980*)

### FLYING-FOXES

Flying-foxes feed on the nectar and pollen of eucalypts, paperbarks and banksia, and also eat rainforest fruit such as figs. Some species fly up to 30kms. a night to their feeding area, and some migrate over a 1,000 kms. in a year as they follow the flowering of the eucalypts. They also feed in orchards as

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so much of their natural feeding areas has been destroyed by man. Of the seven species known to occur in Australia there has only ever been one recording of the dusky flying fox (*Pteropus brunneus*) probably now extinct. Two others - the large eared flying fox (*P. macrotis*) and the Torresian flying fox (unnamed species) are listed as rare.

### GREY-HEADED FLYING-FOX (*Pteropus poliocephalus*)

These are very large grey-furred flying-foxes with a pale reddish-yellow mantle around the shoulders and back of the head which is a lighter grey than the body. These flying-foxes inhabit tropical and sub-tropical coastal areas, and sometimes beyond, being found along the eastern coast from central Qld. to Melbourne, and occasionally Tasmania. They mate between March and April each year with the young being born in October. Although the Grey-headed flying-fox may raid orchards, nectar filled blossoms and wild rainforest fruits such as figs make up a major part of their diet. Their camps are usually trees deep in the rainforest or mangrove swamps. They are capable climbers, using clawed thumbs of their winged hands as well as their feet.

### SPECTACLED FLYING-FOX (*Pteropus conspicillatus*)

These are yellow mantled, black coloured rainforest bats of Far North Qld. They live either in the rainforest or within 10 kms. of it. They feed mainly on rainforest fruits and have a symbiotic relationship with certain trees which depend entirely upon the bats for regeneration.

### LITTLE RED FLYING-FOX (*Pteropus scapulatus*)

The little rusty coloured red flying-fox are important pollinators and distributors of seeds in forest ecosystems. They are a nomadic species that follow the blossoming of eucalypts and paperbarks

in the coastal areas of northern and eastern Australia.

### BLACK FLYING-FOX (*Pteropus alecto*)

These bats have a reddish brown mantle, not black as their name would suggest. They are common in the tropical north camping in coastal mangroves. Migration occurs of one population from New Guinea to the Torres Strait Islands from October onwards each year, and they follow the ripening of mangoes.

(Information sourced from *Encyclopaedia of Australian Wildlife, Readers Digest, 1997* & *M. Morcombe, An Illustrated Encyclopaedia of Australian Wildlife, 1985*)

### BARE-BACKED FRUIT BAT (*Dobsonia moluccensis*)

The bare-backed fruit-bat lives only in northern Cape York and nearby New Guinea. Its wings grow from the middle of its back instead of the sides of its body, which gives the fruit-bat a much larger surface area for flight, and allows it to manoeuvre, hover and fly backwards. It roosts safe from predators such as sea eagles and pythons in caves or boulder piles which are dimly lit. Its agility assists in feeding in densely vegetated areas, such as deep in the canopy of the rainforest and along rivers. It prefers native fruits but feeds on eucalypt blossoms, and forages in open forests and woodlands on species such as the cycads. It mates at the end of the wet season and mothers give birth by the start of the following wet season when food is abundant. The young are weaned at about 4-5 months.

### TUBE- NOSED BATS

These bats weigh only about 50 grams. They have round heads, large red eyes, tubular nostrils and yellow spots on their ears and winged membranes. They usually roost among the foliage of rainforest trees where they are camouflaged looking like dead leaves. The most common of the three

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Australian species of tube-nosed bats is the eastern tube-nosed bat (*Nyctimene robinsoni*) found along the north-eastern coast of Australia. Their diet consists of fruits of various understorey plants, and in the canopy on fruits such as figs, quandongs and lilly-pillies. Their large, unusual shaped nostrils allow them to breathe while gorging fruits.

### BLOSSOM BATS

The blossom bats are mouse size and important pollinators of rainforest and tropical plants. They feed on nectar from flowers of many trees and shrubs, including bananas and banksias and transfer pollen from one plant to another in the process. The tongues of blossom bats are highly adapted for feeding on nectar and can extend to the same length as their head to reach into flowers. The tips of their tongues have fleshy projections for collecting the nectar and their snouts are long and pointed. Unlike other bats the blossom bats breed twice a year. Like many animals when food is short or when it is cold they hibernate. The **common blossom-bat** (*Cyconycteris australis*) lives along the east coast of Australia as far south as central NSW, while the **northern blossom-bat** (*Macroglossus minimus*) lives in the northern tropics.

### GHOST BAT (*Macroderma gigas*)

The ghost bat is the second largest insectivorous bat in the world. It takes its name from its pale colouring. It is sometimes called the false vampire bat. They feed on large insects, birds and small animals such as lizards and other bats. It has excellent vision and powerful jaws, and takes its catch to a special roost to eat it. (*Morcombe, 1985*) The ghost bat used to be widespread throughout Australia but now it is largely confined to the tropics. Mummified specimens have been found in South Australia's Flinders Ranges but its range has contracted

northwards. It is now considered an endangered species. (*Reardon & Flavel, 1991*) It is thought that the population may have been reduced by the introduction of feral cats and foxes, the reduction of vegetation by grazing livestock and rabbits. There are thought to be only about 10,000 ghost bats left in Australia. The ghost bat has a nursery roost either in caves or abandoned mine shafts, where the young are born each September to November.

### LEAF-NOSED BATS (*Rhinonicteris aurantius*)

The leaf-nosed bats may be bright orange or drab brown depending on their moulting condition. They are very small mouse-like bats weighing about 10gms. and they roost together in a cave in the thousands. There are seven leaf-nosed bat species in Australia, most living in the tropical north in caves. Most give birth at the start of the tropical wet season when insects are most abundant. The orange leaf-nosed bat flies close to the ground in open woodlands to catch small moths.

The **diadem leaf-nosed bat** (*Hipposideros diadema*) is an endangered bat which weighs about 50gms. This bat catches its food, usually large beetles or moths, by hanging from a twig and ambushing prey, catching several insects at one time, partially chewing each one and storing the masticated portions in cheek pouches.

The **fawn leaf-nosed bat** (*H.cervinus*) is found in the Cape York area with a total population of less than 5000 individuals. Others are **Semon's leaf-nosed bat** (*H.semoni*) from the same region. The dusky leaf-nosed bat (*H.ater*) may weigh as little as 4 gm. It is widely distributed across northern Australia. It uses large limestone caves or sandstone cliff crevices as roosting sites.

The endangered **orange leaf-nosed bat** (*Rhinonicteris aurantius*) lives

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in dry tropics and moults to a lemon colour.

(Information sourced from Encyclopaedia of Australian Wildlife, Readers Digest, 1997 & M.Morcombe, An Illustrated Encyclopaedia of Australian Wildlife, 1985)

### HORSESHOE BATS

While these bats resemble the leaf-nosed and have similar roosting patterns, the obvious difference are the flaps around the nostrils which form a more prominent noseleaf, which are used to beam echolocation calls. They have large ears and can move in different directions to view their surroundings. Horseshoe bats feed close to the ground, catching mainly small moths, and the occasional beetle or spider. They have great manoeuvrability in flight.

The most common is the **eastern horseshoe bat** (*Rhinolophus megaphyllus*) which weighs about 12 grams and is mouse sized. This species inhabits the mountains and coastal forests of the Great Dividing Range and is one of the commonest bats in the Queensland tropics, where large colonies roost during the day in caves, abandoned mine shafts, under bridges and tree hollows. In southern Australia only underground roosts can provide the high humidity required in raising the young.

The **large-eared horseshoe bat** (*R.phillipinensis*) has much larger ears (about half the size of its body). These bats are only found on the eastern side of Cape York Peninsula.

### Sheath-tail Bats

Sheath-tail bats are found throughout the world. There are eight species found in Australia divided into two groups, with those in the genus *Taphozous* living in caves and those in the genus *Saccolaimus* living in tree hollows. Sheath-tailed bats have a pointed snout,

big eyes and long, tapered wings that allow them to fly very fast. They are not as agile however as other bats. They usually feed in forests or woodlands above the tree canopy.

The **common sheath-tail bat** (*Taphozous georgianus*) is widely distributed across northern Australia. It usually roosts in the twilight zone at the entrance of caves or in the dimly lit crevices and slits of rocky outcrops. Although common sheath-tail bats live in the tropics, where insects are normally abundant they build up their body fats in summer to hedge against scarcity of prey in winter. When insects are in short supply they go into torpor to save energy and do not re-feed until the nights become warmer.

**Hill's sheath-tail bat** (*T.hilli*) from Central Australia is similar in behaviour and biology. The **coastal sheath-tail bat** (*T.australis*) has a very restricted range in northern Qld. and rarely lives further than 5kms from the coast. Most colonies roost in sea caves. Colonies of about 20 bats prefer coastal views. Another rare and endangered bat is the **Arnhem sheath-tail bat** (*T.kapalagensis*) discovered in the late 1970s is found only in Kakadu National Park.

The most widespread sheath-tail bat in the genus *Sicilians* is the yellow-bellied sheath-tail bat (*S.flaviventris*) which has black fur on its back, and white, cream or yellow fur below. Other species of the genus are rare and restricted in distribution and are endangered. The **Papuan sheath-tail bat** inhabits the north of Cape York; the **bare-rumped sheath-tail bat** (*S.saccolaimus*) has one form in the Top End and another in northern Qld.

### Freetail Bats

There are six species in Australia of these fast flying, insect-eating bats that usually feed above the tree canopy. Most live in tree hollows or buildings while the **northern freetail bat** (*Chaerephon jobensis*) occasionally lives

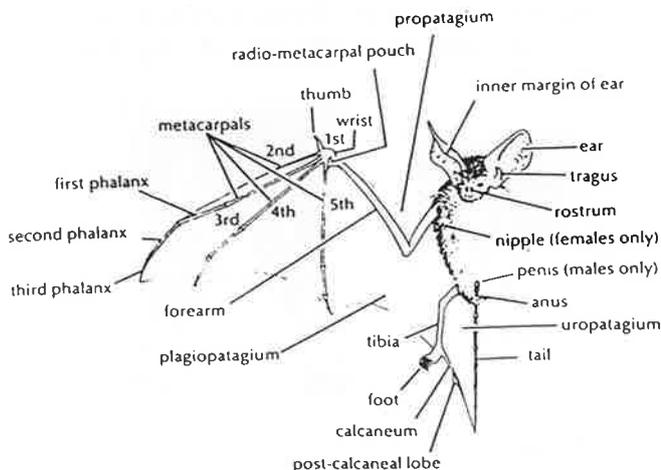
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in caves. A colony is known to exist living in the jetty pylons at Derby on the northern coast of WA. Small groups have been spotted flying about 50m above open ground. The **white-striped freetail bat** (*Nyctinomus australis*) has the same characteristics as other freetail bats however is much larger in size. Both feed on invertebrates such as large beetles and moths, however the white-striped bat also consumes scorpions found on the ground. Both bats have clearly defined territory divided by the Tropic of Capricorn.

The other freetail bats are in the genus *Mormopterus*, with only four species recognised at the present time, however many more remain unidentified. All appear to have a similar biology, roost in tree hollows, although in north Queensland they also inhabit houses. They have thick ears, a wrinkled upper lip and a flattened head that allows them to crawl into small spaces to roost.

There are three types of **southern freetail bat** (*M. planiceps*). One with shaggy grey fur inhabits the eucalypt forests and woodlands of the south-east, another has short fur and prefers arid conditions, while the third is found in southern Western Australia. There is also a **little northern freetail bat** (*M. loriae*) and **Beccari's freetail bat** (*M. beccarii*) both of which live in the northern tropics. The rarest is the endangered **eastern freetail bat** (*M. norfolkensis*) which has a very restricted distribution and is threatened by logging.

(Information sourced from *Encyclopaedia of Australian Wildlife, Readers Digest, 1997* & *M. Morcombe, An Illustrated Encyclopaedia of Australian Wildlife, 1985*)



## ORDINARY BATS

Ordinary bats, family *Vespertilionidae* - often known as **simple-nosed bats**, have plain faces without large nose leaves. The tail is characteristic for it extends to the very edge of the tail membrane but never beyond. Most bats are mouse-sized and weigh from 3 - 15 gms. There are 11 genera of this family in Australia, comprising in excess of 40 species, some of which are highly specialized in their feeding, roosting or preference for habitats such as wet gullies or patches of thick forest. They are sensitive to habitat disturbance.

## Bentwing Bats

The **large bentwing bat** (*Miniopterus schreibersii*) lives in forests throughout the east coast and ranges, and in the woodlands of the Kimberley and Northern Territory. The **little bentwing bat** (*M. australis*) is found in the warmer areas of the east coast. Bentwings form large colonies and live in different caves or mines depending on condition of breeding or hibernation.

## Pipistrelles and False Pipistrelles

Two species live in Australia's tropical northern woodlands - the rare **Cape York pipistrelle** (*Pipistrellus adamsii*) in the north east and the more common **northern pipistrelle** (*P. westralis*) in the north-west. The northern pipistrelle prefers to feed in the mangroves.

There are also two false pipistrelle species, found only Australia. The **eastern false pipistrelle** (*Falsistrellus tasmaniensis*) lives in cool temperate eucalypt forests and can endure colder climates. The **western false pipistrelle** (*F. mackenziei*) has been recorded in the forests of south western WA. False pipistrelles roost in tree hollows in small colonies of 30. One colony was found in a hollow log on the ground in a jarrah forest in WA.

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## Tube-nosed insect bat

This is a very rare species (*Murina florium*) inhabiting the rainforests of the wet tropics of northern Queensland. It has short broad wings which it often wraps around its body like an umbrella to keep dry in the misty mountain tops where it lives. It is thought that this bat roosts during the day amongst foliage, and feeds at night on the nectar and insects of rainforest flowers.

## Large-footed mouse-eared bats

There are three highly specialized species known. They feed over the smooth surfaces of lakes or ponds using echolocation to detect small ripples made by aquatic insects or fish. They roost in caves, old mine shafts and under bridges. A widely distributed species *Myotis moluccarum* ranges along the north coast of Australia southward to the NSW border. *M. macropus* ranges along the coast of NSW and Victoria, with some populations living inland on the border between Victoria and SA. *M. advenus* has the smallest range found only in a small pocket, centred around Lismore in northern NSW.

## Wattled Bats

The wattled bats are the most common of the ordinary bat species. They are black with a V-shaped patch of white fur on their undersides. Most live in tree hollows. The **chocolate wattled bat** (*Chalinolobus morio*) named for the colour of its fur, is common in southern Australia. **Gould's wattled bat** (*C. gouldii*) has very dark brown head and shoulders and occurs across the continent with the exception of Cape York. The **hoary wattled bat** (*C. nigrogriseus*) is black frosted with grey and found in northern Australia. All three species live in eucalypt forests and woodlands.

The **little pied bat** (*C. picatus*) of inland Australia and the **large-eared pied bat** (*C. dwyeri*) of south-eastern Qld

and north-eastern NSW, are black with a strip of white fur along their flanks. Both are considered endangered species.

## Vespadeluses

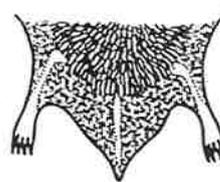
There are nine species in this group which live only in Australia. Most are common and several species are known to share the same habitat. In the eucalypt forests of the south-east there are three abundant species- the **large forest bat** (*Vespadelus darlingtoni*), the **southern forest bat** (*V. regulus*) and the **little forest bat** (*V. vulturnus*). All roost in the hollows of trees and feed on small moths and other small insects. These are very tiny bats weighing 3-8 gms.

Two other species can be found in the central arid zone - the **inland forest bat** (*V. baverstocki*) which lives in hollows of low trees and in buildings, and **Finlayson's cave bat** (*V. finlaysoni*) which roosts in caves and crevices of rocky outcrops.

The **eastern cave bat** (*V. troughtoni*) is common in the coastal tropics of Qld, where it feeds on mosquitoes in late afternoon and evening. During its lifetime each bat consumes hundreds of thousands of insects.

The **eastern forest bat** (*V. pumilis*) lives in north-eastern NSW, another in south eastern Qld and yet another in the mountain rainforests of north Qld. Two other vespadeluses are restricted to the tropics.

The **western cave bat** (*V. caurinus*) is common from the Top End to the Kimberley, the rare **yellow-lipped bat** (*V. douglasorum*) which has yellow feet, head and arms is found only in the high rainfall areas of the north western Kimberleys. Small colonies live in caves and bear offspring during the wet season.



definite tail



no tail

~ Fruit-eating bats have no tail while insectivorous bats have a definite tail.

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## Broad-nosed bats

These are also common all over Australia, and as their name suggests have broad flat noses. The **inland broad-nosed bat** (*Scotorepens balstoni*) and the **little broad-nosed bat** (*S.greyii*) live in small colonies in tree hollows or in the hollow cores of timber fence posts. The **eastern broad-nosed bat** (*S.orion*) and the **greater broad-nosed bat** (*Scoteanax rueppellii*) live only along the east coast, in forests and woodlands. The **northern broad-nosed bat** (*Scotorepens sanbornii*) lives in coastal forests in the tropical north and east.

## Golden-tipped bat

This is one of the most unusual bats found in Australia, (*Kerivoula papuensis*) so named because of its golden tips on its woolly body fur. Unlike most bats it can fly amongst dense tangled vines where it searches for spiders. Found along the eastern coast of the mainland, it roosts by crawling into the nests of scrubwrens which are mossy, spherical constructions hanging from a branch over a creek bed..

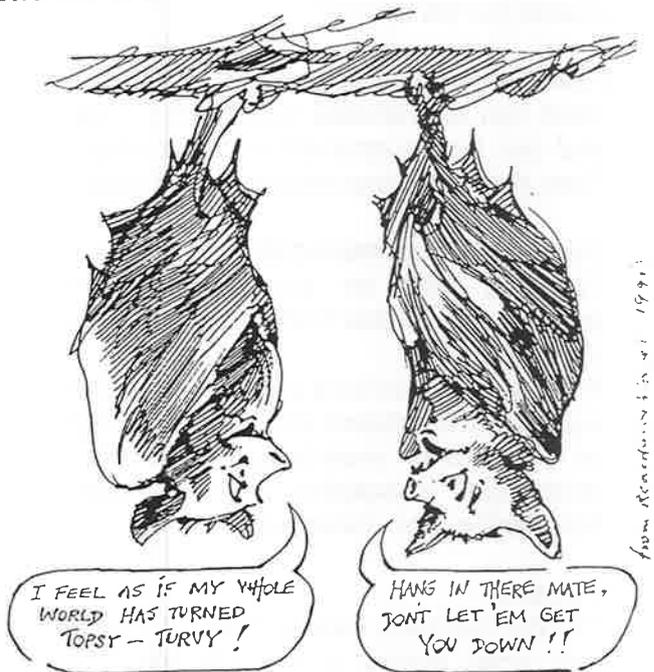
## Long-eared bats

So named because of their large ears, which are generally folded back at rest, these bats listen to the sounds of calling insects which they catch from bark or leaves. They also feed on flying moths and ants. All nine species live in tree hollows, under loose bark, in buildings and under old sacks hanging in farm sheds. **Tropical long-eared bats** often roost in the skirt of dead fronds beneath the foliage of palm and pandanus trees. Some species such as the **lesser long-eared bat** (*Nyctophilus geoffroyi*) are widespread throughout the mainland. This bat although shelters in tree hollows, rock crevices or caves may also be found hiding under large pieces of bark on a tree trunk or even under a stone on the ground. When hunting for insects these bats will land on the

ground to take beetles and other insects. Their weak legs cannot assist them to take off, so they jerk themselves upwards by a flick of their wrists, wings folded, suddenly opening their wings when clear of the ground. In Tasmania the lesser long-eared bat is one of only two species found. The second is the **Tasmanian long-eared bat** (*N.sherini*). Lesser long-eared bats are usually about nine cms. in length, and in colder areas hibernate in winter.

(Information sourced from *Encyclopaedia of Australian Wildlife, Readers Digest, 1997* & *M.Morcombe, An Illustrated Encyclopaedia of Australian Wildlife, 1985*)

## The Life of a Bat



## Evening Bats

Family VESPERTILIONIDAE

- 1 Ear length greater than 20 mm..... 2

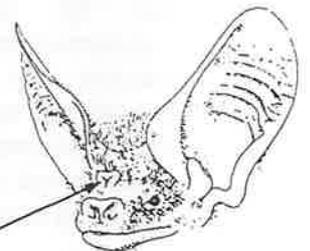
OR

- Ear length less than 20 mm..... 3

- 2 Y-shaped groove in rostral elevation, forearm shorter than 40 mm

OR

- No Y-shaped groove in rostral elevation, forearm longer than 40 mm



LESSER LONG-EARED BAT  
*Nyctophilus geoffroyi*



GREATER LONG-EARED BAT  
*Nyctophilus timoriensis*

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## RESCUE

Trapping of Bats is illegal without a permit. However on occasions you may find an injured bat or flying fox. So what do we do with it? Handle it very very carefully. A scratch or bite from a bat can cause severe illness.

## Handling fruit bats and flying foxes

Grasp behind the head while the claws are gently removed from whatever they are holding. Loosely wrap the bat in a cloth leaving the head protruding, and allow them to grip onto something. Transport is best in either a cage or box with a widely-spaced wire-mesh top so that the bat can hang comfortably. Alternatively strong sticks can be secured across the top of a box to enable the bat to hang.

## Handling small insectivorous bats

Most can be handled with bare hands and can be transported in calico bags. They should be kept insulated and quiet.

## Temporary accommodation

For fruit bats an aviary with high perches and shelter from the weather is desirable.

For insectivorous bats a small enclosure such as a cardboard box with towelling or some other material pinned on the inner 'wall' is suitable, to keep these bats during their convalescence.

## Feeding

For the fruit bat a variety of soft fruits cut into small pieces or blended together can be offered. It should be supplemented with a high protein and calcium mix such as Complian which should be sprinkled on the fruit. The food container should be hung from the walls or roof of the aviary so that the bat can hang comfortably while feeding.

For insectivorous bats, hand feeding of small insects may be necessary in the first few days in captivity. A high protein, high energy paste made from equal

parts of high protein baby cereal, Digestelac, honey and water can be offered on the end of a small brush. Insects such as fly pupae, mealworms or moths may be eaten when offered with a pair of forceps. The bats should be kept warm before and after feeding to facilitate digestion. Leave a small dish of mealworms in the enclosure to encourage bats to feed themselves.

*(Information from Walraven, E. Guide to the Care of Urban Wildlife, 1990)*

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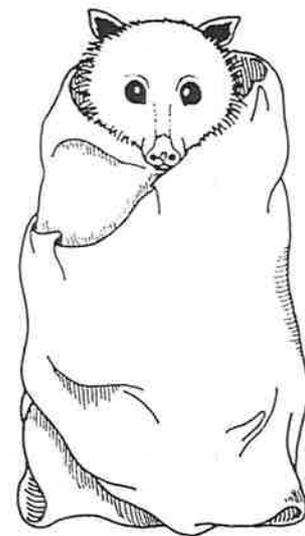
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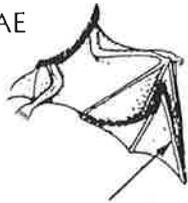


*Very small flying foxes can be wrapped up loosely to provide warmth and security.*

## Evening Bats

Family VESPERTILIONIDAE

Continued



- 3 Last phalanx on third digit longer than 30 mm

COMMON BENT-WINGED BAT  
*Miniopterus schreibersii*

OR

- Last phalanx on third digit shorter than 30 mm.....4

- 4 Small lobe on bottom lip near corner of mouth.....5

OR

- No lobe on bottom lip near corner of mouth.....6

- 5 Dark-brown fur of head and shoulders contrasts with light-brown fur of body, forearm 40–48 mm long

GOULD'S WATTLED BAT  
*Chalinolobus gouldii*

OR

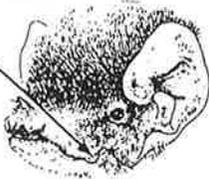
- Body fur uniform chocolate-brown, forearm 35–39 mm long

CHOCOLATE WATTLED BAT  
*Chalinolobus morio*

OR

- Body fur black except for a white stripe where wings meet belly, forearm less than 36 mm long

LITTLE PIED BAT  
*Chalinolobus picatus*



## Evening Bats

Family VESPERTILIONIDAE

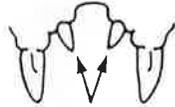
Continued



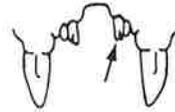
- 6 Calcaneum extends three-quarters of the distance from heel to tail, tragus pointed

OR

- Calcaneum extends only half the distance from heel to tail, tragus rounded.....7



- 7 Two upper incisors, not bifurcated, muzzle with naked, swollen, glandular pads.....8

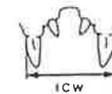


OR

- Four upper incisors, first pair bifurcated and much larger than second.....9

- 8 Forearm 29–33 mm long  
Inter-canine width (ICW) 3.9–4.7 mm

LITTLE BROAD-NOSED BAT  
*Scotorepens greyii*



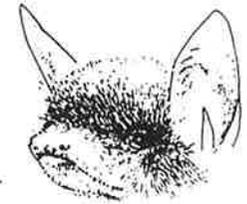
OR

- Forearm 34–38 mm long  
ICW 4.8–5.6 mm

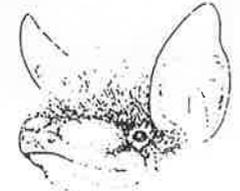
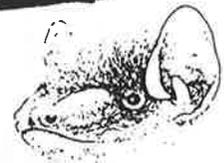
WESTERN BROAD-NOSED BAT  
*Scotorepens balstoni*

- 9 Four upper incisors, first pair bifurcated and much larger than second

*Eptesicus* species



LARGE-FOOTED MYOTIS  
*Myotis adversus*



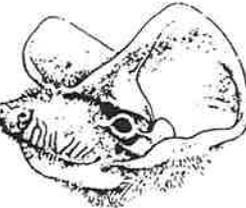
**Free-tailed Bats**  
Family MOLOSSIDAE



Forearm longer than 50 mm, prominent throat - pouch



**WHITE-STRIPED MASTIFF BAT**  
*Tadarida australis*



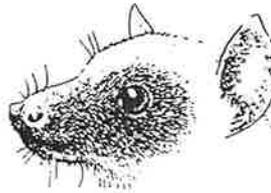
OR

Forearm less than 40 mm long, throat - pouch absent



**LITTLE MASTIFF BAT**  
(two species)  
*Mormoops planiceps*

**Fruit Bats**  
Family PTEROPODIDAE



Forearm longer than 110 mm, fox-like face



**LITTLE RED FLYING-FOX**  
*Pteropus scapulatus*

**Sheath-tailed Bats**  
Family EMBALLONURIDAE



Dull grey-brown fur all over body, forearm less than 72 mm long



**HILL'S SHEATH-TAILED BAT**  
*Taphozous hilli*

OR



Belly fur creamy yellow, back and head black, forearm longer than 72 mm



**YELLOW-BELLIED SHEATH-TAILED BAT**  
*Saccolemnis flaviventris*

*Tadarida australis*  
*Mormoops planiceps*  
*Pteropus scapulatus*  
*Taphozous hilli*  
*Saccolemnis flaviventris*

## Native Cresses and Cabbages

By Phil Watson, APS Tas.

The spectrum of attributes and uses amongst the 3500 annuals or herbaceous perennials making up the Cabbage and Cress family (*Brassicaceae*) are impressive. Of the well known members, the vegetable varieties of *Brassica oleracea* ssp. (Cauliflower, Broccoli, Cabbage, Kohlrabi and Kale), the salad leafy greens from the Water Cresses, the staple root crops from the Radish and Turnip tribes and the spicy Black and Yellow Mustards (*Brassica nigra* & *Sinapis alba*) have well deserved reputations.

For the native plants enthusiastic there are the 150 Australian *Brassicaceae* of which 20 are indigenous Tasmanian species. Typical are the numerous edible species such as the peppery Slender Bitter Cress, *Cardamine tenuifolia* and moisture loving Perennial Marsh-Cress *Rorippa dictyosperma*.

Unfortunately, within the family there are many persistent agricultural and environmental weeds of which none are more persistent than Charlock and White Weed (*Sinapis arvensis* & *Cardaria draba*). The weeds, like many of the others have originated from medieval herb gardens.

As an offset to this weed problem, today's floral display gardens have benefited from the hundreds of years of fastidious plant selection to form many well-loved flower favourites. These include the cheery winter flowering Wallflowers *Cheiranthus* sp., bold colourful Stocks *Matthiola incana* and the sweetly scented Alyssum varieties (*Lobularia maritima*).

Other members originally cultivated in monastic gardens have given rise to an array of useful plants. These include medicinal herbs such as the decongestants (Wintercress, *Barbarea* sp.) and condiments (horseradish). However, one shouldn't forget the natural insecticides or biofumigants (Mustard green crops) and the vegetable oil/margarine sources derived from Rape seed, now commercialised under the marketing name of Canola.

Interestingly, a pronounced characteristic of these family members is their distinctive 4-petaled, cross-like flowers. This feature was used to derive the original family name of *Cruciferae*, Latin for Cross former.

### Bush Tucker favourites

Water cresses, both native and introduced, have been part of our diets for millenniums. Tim Low in his book "*Bush Tucker*" pointed out that "this little herb with the big name of *Rorippa nasturtium-aquaticum*, is the only well known vegetable that has not been transformed by centenaries of horticulture". The supermarket version is exactly the same as the wild plants found in drains and rivulets. It actually contains more Vitamin C by weight than oranges!

Following the Colonial Botanist Joseph Hooker's conclusion that the greens from Native Cresses such as (*Rorippa dictyosperma*, *Cardamine gunnii* & *C. tenuifolia*), afforded excellent pot-herbage, the native varieties soon became popular as a means of reducing scurvy amongst bushmen and sailors.

Native Cresses were similarly collected by both the aborigines and early colonists, for use as spicy bush greens and/or peppery herbs. Aborigines steamed them on hot rocks within earthen pit-ovens, allowing their peppery flavours to infuse through their kangaroos and other game meats. These spicy infusions were commonly extracted from herbs such as the rare Rubble Pepper Cresses, *Lepidium hyssopifolium* (distinguished from other *Lepidium* sp. by the thick hairs on its flower stalks), the Tasmanian Pepper Cress *L. pseudotasmanica* and the endangered, endemic Thread Cress *Stenopetalum linearis*. Surprisingly, the only location where they still flourish is under the drip lines of large gums, she-oaks, wattles and even exotic pine trees, where competition is minimal.

Many leafy greens, including the endangered Native Winter Cress *Barbarea australis* were collected by aborigines along river flats and banks. Their zesty, tender young green shoots and their ground dried

seeds and pods acted as a spicy condiment for game meats.

#### **Degradation threatens their existence**

Disappointingly, many of Tasmanian's *Brassicaceae* remain under threat of extinction. For example, the limited river side habitats for *Barbarea* are being subjected to altered flow regimes due to the effects of willows, in-stream dams and tree plantations. These degrading impacts reduce or often eliminate the natural flood cycles that are required for the Winter Cress's seed germination.

Over the history of pastoral activities, the preferential grazing for these tasty inter-tussock Native Cress species, by sheep, cattle and rabbits has all but eliminated them from native-grass pastures. Sadly, the tiny much branched annual herb Southern Shepherd's Purse *Ballantina antipoda*, which occurs in moss mats on basaltic or granitic seepage areas, is rarely seen today, due to this rabbit and wallaby grazing, whilst the annual herb *Hutchinson tasmanica*, (last collected by Gunn in 1848), is now assumed to be extinct for the same reason.

#### **Brassica weeds are valued as medicine and food.**

Most Brassica weeds introduced from England and America have long histories of cultivation for a variety of food and medicinal uses. These include the agricultural weeds Wild Radish *Rapanus sp.*, Field Cress *Lepidium campestre* and the yellow-flowering Indian Hedge Mustard *Sisymbrium orientale* along with the garden weed, Shepherd's Purse (*Capsella bursa-pastoris*).

The old English herb 'Splitting Jenny' or 'Common Bitter Cress' (*C. hirsuta*) is better known to nurserymen today as the irrepressible 'Flickweed'. From its ripe pods seeds are ejected for metres. These germinate rapidly on any moist substrate creating a huge weed problem. The only positive feature is its tasty Water Cress-like foliage.

Although attractive and tasty in salads, the weedy Nasturtium (*Tropaeolum majus*) derives its name from Latin for 'nose-twisting' alluding to its pungent leaves. These were cooked as tasty green,

whilst the seed pods were pickled as capers.

Another useful weed, introduced as ballast in early 1800's, is the beach weed American Sea Rocket *Cakile edentula*. It provides spicy mustard-like young shoots which emus adore. More importantly, the seeds often sustain the rare **Orange Bellied Parrot** prior to migratory flights across Bass Strait.

Shepherd's Purse is another good example of the variety of uses given to many of these weeds. Its young crisp leaves were cooked in soups and stews, whilst by grinding their dried peppery pods and seeds, mustard and a tenderising salt were produced. The seeds were sprouted and eaten like Watercress presenting a rich in Vitamin C source. As a medicine, in the form of a strong decoction, it stopped internal bleeding and was regularly used during childbirth to contract the uterus. Many of the Cabbage family's weeds contain sufficient amounts of the active ingredient isothiocyanate ITC to gain herbalists recommendations as an anti-carcinogen. They also are noted for their ability to break up congestion in the lungs but too much can cause a depression of the thyroid function.

#### **The first Weed called Woad**

When the Roman's invaded England they were greeted by a horde of barbaric warriors painted with a bright blue dye extracted from the Woad plant (*Isatis tinctoria*). This very resilient herb, which is covered with masses of golden flowers in spring and forms a deep foraging root system, was the source of a highly valued dye. By the 15<sup>th</sup> century, Woad was in such huge demand as a fabric dye; it attracted the princely sum of 10/- per cwt at London markets. This resulted in it being cropped far and wide across England. However, by the 16<sup>th</sup> century many alternative dyes were available and Woad became less valued. The lack of interest initiated its escape across the countryside, finally becoming a bugbear to farmers who desperately tried to eradicate it. The modern day term weeding is a corruption of the olde term 'woading'.

### **Brassica's active ingredients are ideal soil bio-fumigants**

Most of the older folk can remember their Mum's repetitive plead "Eat up your Cabbage and Brussels sprouts or there will no dessert". Little did our mums know that these vegetables were an acquired taste and definitely not for the sensitive palates of kids. This is due to the strong flavours associated with the sulphur containing compounds (*Glucosinolates*), which after chewing; release a strong flavoured derivative called *Isothiocyanates* or ITC. The attraction for this strong taste is akin to how a mature palate has developed a liking for red wine.

This ITC is very toxic to a range of plant pests and diseases. By growing mustard cover crops or including cabbages, broccoli, Brussels sprouts, native cresses etc, in agriculture crop rotations and vegetable gardens, the soil will be naturally bio-fumigated by the residual ITC. Substantial enhancement in plant health of the following-on agricultural crops or vegetables is clearly evident.

### **Bio-diesel and Insecticides from reused Canola Oil**

The Cabbage family member Canola leads the forefront in alternative fuel technology. Recycled Canola oil has become valuable following its conversion to bio-diesel using a catalysed methanol. Today petroleum based diesels are being mixed with this bio-diesel resulting in significant reduction in air pollution. Ironically this process is leading refineries away from the mineral oils and back to original vegetable based diesel fuels. An important by-product of bio-diesel production is a Natural Mustard Insecticide containing ITC.

### **Cabbage White Butterfly is friend or foe?**

One important insect which devastates crops from the Cabbage family is the Cabbage White Butterfly. It is rapid flying white butterfly, which is not only an attractive garden member but also supplies a major food source for our native birds.

Although it is a problem for all Brassica growers, they are easily controlled by well timed applications of the parasitic *Bacillus*

*thuringiensis* marketed under the name of 'Dipel'. These little bugs parasitise their bottled-shaped, cream coloured caterpillars and swiftly interrupt their lifecycle.

### **Conclusion**

It is hard to imagine the world without the contributions made by many of the well known Cabbage and Cress family members. However, care is needed to ensure that their gene pool remains as diverse as possible by including in revegetation projects, where possible some of its rare indigenous members.

**FOLLOW-ON FROM ARTICLE 'Alphabet Soup'** by Leigh Murray which appeared in Newsletter No.48 .

I have been contacted by APS NSW member Mark Abell. This is what Mark has to say about the use of exotic and native fish for ponds.

'In the April issue, the "Alphabet Soup" article by Leigh Murray makes the recommendation to use "White-Cloud Mountain Minnows" as a frog friendly pond fish. The White-Cloud Mountain Minnow (*Tanichthys albonubes*) is a native fish of China, it is a small peaceful fish and was previously recommended for frog ponds as it tended to leave the tadpoles alone, plus at the time the initial recommendations were made, no feral populations were known. Unfortunately these fish should no longer be used in ponds.

A number of feral breeding populations have recently been found in the Sydney region. Some of these populations are likely to be the result of pond escapes - a large enough downpour (rare though they are in recent times) can cause ponds to overflow & some of the fish in them to be washed into the nearest creek. More suitable fish for ponds are the smaller local area native fish (*note: Gambusia is not a native fish*). These fish may be a little more aggressive towards tadpoles, but a well planted pond will ensure a good tadpole survival rate.

A poster was produced by ANGFA NSW (Australian & New Guinea Fishes Association) on the "Freshwater Fish of the

Sydney Region". This has photos of all of the native freshwater fish in the Sydney region & indicates which ones are considered to be "tadpole friendly". For more information you can contact ANGFA NSW, contact details can be found on their web page - [www.angfa-nsw.org](http://www.angfa-nsw.org).

Fisheries are currently looking to produce a poster indicating suitable pond fish for different parts of NSW. For the Sydney region (& much of coastal NSW) the most suitable fish are:- Pacific Blue-eye (*Pseudomugil signifre*), Firetail Gudgeon (*Hypseleotris galii*), & Australian Smelt (*Retropinna semoni*).

Mark further writes:

'It is only recently that Mountain Clouds have been confirmed in the wild. An ANGFA field trip to Pearl Beach, last November confirmed the first feral population, since then at least 2 other separate populations have been found.

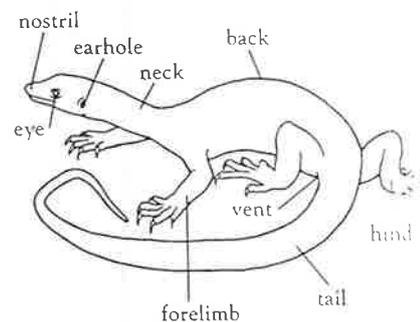
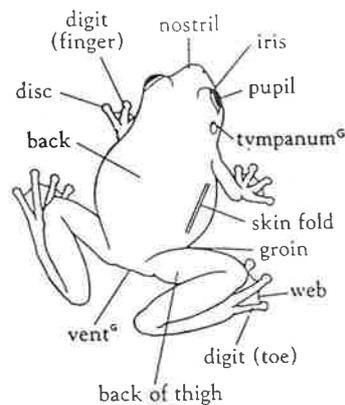
The Frog & Tadpole Study Group had been recommending them for frog ponds for the last decade. When making their recommendation, they looked at what damage they did to tadpoles & the fact that they had been in the country for the better part of 100 years without having established any feral populations. Unfortunately, they did not take into account that they had only been used as an aquarium fish prior to their recommendation. **The only safe option for ponds, is really local area native fish**, I have a feeling that just about every fish that has been widely kept in ponds has become established in the wild somewhere. One of the original bloodlines for the Carp found in the waterways was originally Koi Carp.'

#### DISCLAIMER

VIEWS AND OPINIONS EXPRESSED IN ARTICLES ARE THOSE OF THE AUTHORS AND ARE NOT NECESSARILY THE VIEWS AND OPINIONS OF ASGAP OR STATE BRANCHES.

## Is it a frog or a reptile?

A FROG	A REPTILE
Egg emerges in jelly	Egg has tough shell
Egg laid in moisture	Egg laid in warm, dry place
Egg fertilised outside female's body	Egg fertilised inside female's body
Tadpole (larva) hatches from egg	Small version of adult hatches from egg
Tadpole undergoes big changes to become adult	Reptile grows larger and matures
Frog has moist, glandular skin	Reptile has dry skin from which grow scales
Frog has no tail, 4 limbs	Reptile has tail, may have 4, 2 or no visible limbs
Frog breathes through lungs, inside of mouth, skin	Reptile usually breathes through lungs, or, rarely, skin
Frogs eat insects and other animals	Reptiles usually eat animals, but a few eat plants



## **AN AUSTRALIAN INVASION: PROTECTING OUR LAND WATERS AND SEAS FROM INVASIVE PESTS.**

*By Dr. Barry Trill, President, Invasive Species Council. Reprinted from Releaf, Iss.95*

*A few years ago I read Feral Future, a book by Tim Low which came out in 1999. In reading it I realised that as an ecologist and environmentalist I had missed something very basic. Until then I had the idea stuck in my head that the problem was largely one of pest species that were already in Australia - rabbits, foxes, cane toads, blackberry, olives, etc. Such species were largely not eradicable, but needed on round control work to minimise their environmental and economic impact. Tim's book made me realise the unfortunate point that large numbers of new environmental pest species are still establishing in Australia, being either illegally or legally introduced or accidentally brought in.*

**The rate of new invasive species establishing is probably increasing.** Talking about the issue with other environmentalists I realised that my lack of knowledge was common. Invasive species - weeds and feral animals - just weren't high on the agenda. Certainly systematically stopping new ones wasn't.

### **A PROBLEM IN TWO PARTS**

The problem of invasive species needs therefore to be addressed in two parts. Firstly, control and if possible eradication of existing invasive species where they already occur. Secondly, stopping new invasives from threatening our environment.

**So not only is there a need to prevent the spread of invasives already in the country into parts of Australia where they are currently absent but also to prevent new introductions into Australia.**

Historically little has been done beyond quarantine at the national borders about this second part of the problem. Farm lobby groups systematically push for the maintenance of tight quarantine laws to protect agriculture, but there is little lobbying in regards to potential and known environmental pests.

Until quite recently, this lack of lobbying and campaigning to stop new environmental pests has been a huge gap in conservation work in Australia.

## **BUT WHAT IS THE PROBLEM?**

Firstly, just what is an 'invasive species'? Invasive species is now the term used most around the world to describe the problem of introduced species causing environmental problems. It is fairly useful jargon because it covers all types of plants and animals and describes what they do - invade natural habitats. Different invasive species cause different problems when they move into a natural habitat, but there are some useful generalisations we can make:

### **1.THEY COMPETE FOR RESOURCES**

For example all weeds (including marine weeds) compete for light, nutrients, and/or space with indigenous plants. Grazing animals such as rabbits and camels compete for food with animals such as bilbies and wallabies. European honeybees compete for nectar with honeyeaters and native bees.

### **2.THEY EAT NATIVE SPECIES**

Invasive animals eat our homegrown species. Foxes, giant sea worms, cats, black rats, Pacific sea stars, cane toads, European wasps, Tilapia fish, trout, European snails, rabbits, deer, camels, donkeys, goats, pigs, cattle, horses and water buffalo, etc. etc. etc.!...all eat native animals and plants. If too many are eaten this is of course a problem for the populations of the eaten!

### **3.THEY CHANGE ECOSYSTEM PROCESSES**

Invasive species can alter fundamental ecosystem processes and in doing so become 'ecosystem transformers' damaging whole natural communities.

The most noticeable example in Australia is weeds that increase or decrease fire fuel loads and hence fire regimes. Gamba grass, a weed in Northern Australia greatly increases fuel loads so that eucalypts are killed in savannah fires. This turns treed savannahs into grasslands full of Gamba.

Other weeds alter hydrological cycles. The effect of some grazing animals may be to alter regeneration processes and turn woodlands into grasslands, or vice versa.

### **4. THEY CAUSE DISEASES**

Introduced pathogens (bacteria, viruses, moulds etc.) can also become invasive

species. If they attack indigenous species they can have huge impacts as indigenous species are unlikely to have immune or other defences against new diseases.

Disease has been suggested as the reason for the massive decline in quoll numbers in the early 1900s, which probably contributed to the extinction of Eastern quolls on mainland Australia.

### 5.WEIRD THINGS!

Some effects are very idiosyncratic. Cane toads poison goannas, snakes and quolls that try to eat them. European honeybees cut holes into some tube shaped native flowers, to steal the nectar without pollinating the flower, reducing seed production.

### THE SCALE OF THREAT

The current environmental impacts of invasive species are huge, both in Australia and overseas. **Systematic overviews of generic threats to nature consistently list invasives as one of the top threats on Earth.**

Australia is particularly at risk because of its unique period of 30 million years of isolation as a continent. Quantification and comparison of threats at the continental scale is always difficult because of the trickiness in comparing the effects of different threats. However, I personally rate invasives as probably the number two threat to nature in Australia, after climate change. This assumes that we retain recent advances in controlling land clearing in Queensland and other states.

In part, the high degree of threat from invasive species comes from the fact that the risk cannot be removed. **Every other known major threat can ultimately be removed by human action, including climate change. But the Earth will always contain millions of species which have the potential to move into Australia and establish themselves.**

Active quarantine measures will still be required in the next century even if we somehow control or eradicate all existing invasives.

### STOPPING FURTHER INVASIONS

There is a lot to do and increasingly more work is being done. Recent investigations

have shown an incredible black hole in quarantine of foreign plants.

**Thousands of plants known to be environmental and economic weeds overseas are still on the 'Permitted List' of plants to be imported into Australia. Following strong lobbying, the Federal Government has agreed to revise the list properly to include only species known not to be pest species.**

In Northern Australia many African pasture grasses and legumes were brought into the country by CSIRO pasture scientists to try to improve pasture for cattle. Most that have survived have become environmental weeds, some of them such as Gamba grass are so severe they can alter whole ecosystems.

But awareness is increasing now and controls are being put into place to slow the spread of these horrific weeds.

There are some basic steps that need to be taken.

**We need strong and enforceable national laws that provide a first line of defence and stop new potential invaders coming into the country.**

**This needs to be backed up by a greater number of quick response teams to wipe out invading species that are establishing new populations.**

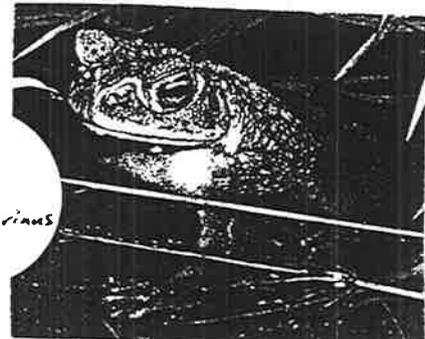
Eradication is usually only possible when populations are small. And we need tighter controls on trade so that potential invaders can't be sold.

The biggest source of new invading species at the moment is gardens, and the nursery trade that supplies new plants. As a minimum, we shouldn't be allowing the sale of plants (or fish, or anything else) which has the potential to go wild.

Lastly and most importantly we need more people in conservation groups, the general public, industry and government to know more about the scale of the problem- and the solutions.

The invasions of our bushlands, seas and rivers won't cease until more people know and care about stopping the next salvation Jane, the next Japanese kelp, or the next cane toad.

CANE  
TOAD  
*Bufo marinus*



## MEDIA ARTICLES

### Little Bat's Habitat Threatened

from *Sunraysia Daily* (VIC) 16/4/05 p.7

The article claims that 'construction of the proposed toxic waste facility at Nowingi would endanger the habitat of the last known refuge of the Greater Long-eared bat (*Nyctophilus timoriensis*)' in Victoria.

State Government commissioned a search as part of its Environment Effects Statement to locate the bat which proved fruitless. A flora and fauna survey conducted in the area in November 2004 located only one bat. It was said to be only the fifth time the species had been located in Victoria.

'Officially listed as a vulnerable species, the bats have been found in south central Queensland, central western New South Wales and north western Victoria.

Major Projects Victoria commissioned Biosis Research Pty Ltd. to undertake a further targeted survey for the bat after the find in November. The later search was conducted in late January and early February of this year. Three locations were chosen for the search - south of the western gravel pit where the species was recorded in November 2004, adjacent to the eastern gravel pit and the "triangle"- an area in the mid west of the study area.

Greater long-eared bats eat insects and roost in tree hollows and underneath loose bark. They forage low among the canopy and understorey for insects and possibly even forage on the ground.

"However there have been few studies of the species' basic ecology and no information is available on movements or home range of the species."

The bat has only been sighted five times in Victoria- 1888 at Yarrock, north of Kaniva; 1962 in the Sunset Country from an area of Mallee scrub; 1987 at Hattah-Kulkyne National Park; 1992 along Bullock Creek near Pyramid Hill and 2004 at Nowingi.

A male was trapped at Nowingi in an area supporting old growth mallee trees. Extensive loss of habitat has been identified as the primary reason for the decline of the species. Harp traps and mist nets were used earlier this year by Biosis to again find the bat.'

### Bats for Biodiversity from *Over the Hills & Plains*, Vol. 6 Iss. 4

'All bat species in SA eat insects, not only mosquitoes but species that are pests to agriculture. Bats are the only mammals that can sustain flight, and the Mt. Lofty ranges bat species are uniquely Australian and do not occur anywhere else in the world. Bat species are thought to be in decline, with the major threat the loss of habitat caused by vegetation clearance. Bats need tree hollows to roost in during the day and a diversity of vegetation to forage in at night.

Bats for Biodiversity began as a community bat monitoring project (known as Batwatch) in the Mt. Lofty Ranges with community members monitoring bats in the region over the 2002 summer months. Batwatch was the first bat community monitoring project of its type in Australia and aimed to develop an understanding of the presence of the 12 bat species in the greater Mount Lofty Ranges.

The first recording season saw about 40 landholders involved in bat monitoring by hosting the overnight automatic recording of bat echolocation signals using specialised equipment. Landholders were encouraged to increase bat roosting opportunities, habitat and undertake further monitoring.

Today the Bats for Biodiversity Project aims to encourage landholders to promote and conserve native vegetation especially around watercourses and wetlands, by fostering an interest in bats, their habitat and the role they play in riverine and wetland ecosystems.'

## MEDIA ARTICLES

### Homes made for bats

*From Shepparton News 26/4/05 p.36.*

Old trees and paddock trees (dead or alive) are an inspiring part of the Victorian rural landscape. In large stands they provide much needed protection for stock from inclement weather, they assist with watertable and salinity control and importantly provide habitat for a wide range of native birds and mammals.

One particular group that relies heavily upon old paddock trees is insect eating bats. Bats play an integral role in the functioning ecosystem of farms and bushland ..... Most bat species are insectivorous, and studies have found that they can consume up to half their body weight in insects every night. Therefore, bats are beneficial in helping reduce the impacts of agricultural pests on crops, and limiting the use of potentially harmful chemicals.

Paddock trees including individual trees play a vital part in the bat's life cycle as they provide valuable roost sites for many species of bats. It is the old trees that provide the best habitat for bats, due to the hollows that form after prolonged exposure to natural forces of wind, fire, heat, lightning, rain and attack from insects, termites and fungi.

Bat habitats are under threat due to clearing, exposure to fire (stubble burning) and impacts from stock. Management of paddock trees is an important step in retaining habitat for bats.

### Bat Facts

- ⊕ There are 13 species of insect eating bats in northern Victoria.
- ⊕ Bats make up 45 per cent of all mammal species in the Shepparton area.
- ⊕ They can eat up to half their body weight in insects in one night.
- ⊕ Bat research has led to technological advances including navigational radar and medical scanners.

### Study Shows Habitat's Value

*From The Rural 13/5/05*

An Australian study of older aged eucalypt plantings on agricultural land has found that they can significantly improve biodiversity.

The study by RIRDC and NSW DPI, found that habitat for a wide range of fauna can be greatly increased by plantings of native trees and shrubs particularly in areas near remnant bush. The research was conducted in the Albury - Wodonga region where substantial areas of local eucalypts and shrubs were planted in the 1970s. The study aimed to identify major factors influencing biodiversity in the lower rainfall (600-800mm) fragmented rural landscapes susceptible to salinity of the State's western slopes.

A total of 120 sites were surveyed for the presence of bats, birds, arboreal marsupials, terrestrial mammals, reptiles and amphibians in an effort to provide a guide for future planting schemes.

The impact on biodiversity was uneven in that birds and bats favoured stands of trees over 10 years old. Even younger plantings attracted many birds, as long as the patch of vegetation was larger than five hectares.

The size of the plantings is a key factor, larger eucalypt plantings and larger remnants having more species of birds and more individuals than smaller patches of either vegetation type.

Bats were widespread in all vegetation types and were recorded flying over cleared paddocks, although they were more common in remnant vegetation.

Remnant vegetation was also the most important for arboreal mammals, nocturnal birds and reptiles, but the older plantings (greater than 20 years) also contributed habitat for these species. Younger plantings and cleared, or sparsely covered areas provided little habitat for these species. No reptiles were recorded in paddocks and ground animals were virtually absent.

## MEDIA ARTICLES

The scientists said remnant vegetation was particularly important because it was essential habitat for some species and also usually contained essential roosting and nesting sites in tree hollows.

Other recommendations included:

- ⊕ Not removing old paddock trees and logs on the ground when preparing sites for eucalypt plantings;
- ⊕ Excluding grazing from areas where plantings are established primarily for nature conservation; and
- ⊕ Excluding stock from some dams or parts of dams, because of their importance for frogs and many other species.

Further research was recommended in order to determine rankings of the various planting alternatives, as a way of weighing up the best management options for promoting biodiversity.

### Plants Threat Sparks Worry

*From The Rural, 22/4/05 p.6*

'Beautiful plants escaping from Australia's home gardens are inflicting ugly damage on the nation's landscapes, national parks and nature reserves' was recently re-affirmed by Australian Weed Management CEO Dr Rachel McFadyen. Home gardeners need to be more aware of the havoc their hobby is wreaking in the wider natural environment, states the article.

"We're asking home gardeners and garden advisers to be equally conscious of the harm their choice of plants can have on our native bush and be just as vigilant in preventing escapes."

The new CSIRO Report- Jumping the Garden Fence, commissioned by WWF Australia showed 'escaped invasive garden plants have major costs to the environment and agriculture. Scientists across Australia are reporting scores of new weed invasions every year- many of them being plants which have escaped from home gardens.'

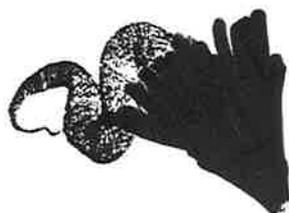
"In a way, the damage caused by invasive plants is greater than that caused by feral animals, because some plants can take over an entire landscape, wiping out the native vegetation and drastically changing the mix of birds, animals, reptiles and insects it can support," Dr.McFadyen said.

Among the many garden favourites which have gone feral and started to devour the bush are plants such as agapanthus, broom, Singapore daisy, bridal creeper, asparagus fern, ivy, purple morning glory, periwinkle, Japanese honeysuckle, seaside daisies, gazanias, ericas, arum lilies, pampas grass, pigface and Italian lavender. Garden escapers cause damage by out competing native plants for water, light or nutrients and increase in the frequency of bushfires. Some are poisonous to native and domestic animals. Others cause human allergies.

### HUGE SNAKES GROW ON TREES

*(from Australian Geographic Members Newsletter July-Sept.2005)*

'Australia's longest snake - the amethystine, or scrub, python - spends up to four weeks at a time lolling in basket ferns up to 30m above ground, research has discovered. On the Atherton tableland in Far North Qld. winter temperatures of around 10-16° may mean...that the snakes need to climb higher into the tree canopy to bask. "If you're in the rainforest and you're after sunshine, you have to go up," said Alastair Freeman who, with his wife Amanda, has been implanting radio transmitters in scrub pythons and tracking them. He said the snakes- which can grow up to 8.5m long- ascend diagonally up into the canopy, using several trees, then rest for weeks in large epiphytes. This research supports 19<sup>th</sup> century reports by Norwegian naturalist Carl Lumholtz that Aborigines climbed rainforest trees and searched epiphytes for snakes for tucker.'



## MEDIA ARTICLES

### FLOODS BRING LIFE ALONG THE PAROO-DARLING

*(From Australian Landcare June 2005.)*

Flood events are a time for celebration and renewal of life in the outback. But while our native species thrive, so do the exotic and the feral.

A vast, dry lakebed dotted with saltbush and sedges stretches as far as the eye can see. The tantalising illusion of water shimmers in the distance under a relentless summer sun. "Welcome to Peery Lake" says NPWS ranger Paul Burton.

Peery Lake, in Paroo-Darling National Park, western NSW, is one of the largest lakes on the Paroo River overflow. The Paroo is one of the last major free-flowing rivers in the Murray Darling Basin, meandering south from its source 600kms. away in Queensland's gorge country.

Along the way the Paroo fills a vast system of wetlands, only reaching Lake Peery after high rainfall in the north or occasional local floods. But when the lake does fill, waterbirds arrive in their tens of thousands in a spectacular and noisy parade of mating, feeding and breeding.

"Floods are fundamental for bird life because the food cupboard becomes so much bigger. Foraging areas multiply a thousand-fold during flood events," says Professor Richard Kingsford from the University of NSW.

While native plants and animals thrive during floods, so do exotic and the feral. Wild pigs can build up to huge numbers on the floodplains during wet times. "They love the mud and food is abundant -like our native species- ferals flourish." "Floods are highly valued here, Aboriginal people lived off the bounty of the rivers and lakes for tens of thousands of years, and local pastoralists know good grazing follows floods."

Richard Kingsford maintains that floods are the driving force of life in Australia's outback, even if there are downsides

such as goats, pigs and foxes. He says that 'tannins leach from eucalypts when the water fills the floodplains and can be toxic to fish, and weeds can also spread with the floodwaters. Weeds tend to seed, spread and become established during floods. Lippia is a very strong-rooted weed found in the Macquarie and Gwydir river systems - once it gets established it can be extremely hard to get rid of."

Kingsford stresses that native species of plants and animals as well as migratory waterbirds, have adapted to the cycle of wet and dry. "Without a flood, things just don't happen. Floods may be punctuated by years of droughts, but when the floods come they bring bumper years for graziers, and boom years for plants, invertebrates, frogs, fish and waterbirds."

"While floods can also bring feral and weed problems, a lack of flooding can be an even greater problem. Arguably the world's longest bloom of toxic blue-green algae occurred in 1991, along the Darling River. The bloom stretched for thousands of kilometres, killing stock and poisoning drinking water. "Algal blooms tend to happen when water levels are low. But when floods come, they flush the waterways out and improve the water quality."

"When the water comes, the birds just seem to know. Pelicans, black swans, darters, great egrets, red-necked avocets and pink-eared ducks start to arrive - there can be 50,000 birds out there. "

I look across the dry lakebed, imagining it full of water, bursting with life. I'd like to see that.'

### BOOK REVIEW- Tree: A Biography

By David Suzuki & Wayne Grady

The life story of a tree - a majestic Douglas-fir of North America. Follow the tree's progress as it grows and discover what role the tree plays in the forest throughout its life.



## PRACTICALITIES

### Tube-stock Planting Revegetation Techniques

#### Site Preparation

Good site preparation is crucial to the success of tube-stock revegetation.

#### Woody weeds

Allow at least two years to undertake primary clearance and follow up control of woody weeds. It is very difficult to control woody weeds emerging amongst your new seedlings, so ensure they are under control before planting.

#### Pre-planting weed control

Some weeds do not significantly compete with tube-stock. Most annual (winter) grasses have died back by late spring and early summer and pose little competition to new plantings during their peak establishment period. Annual grasses can actually have benefits, such as providing shade during summer, as well as groundcover to suppress and prevent more aggressive weeds from becoming established.

The biggest problem species for new plantings are the perennial grasses and broadleaf species, which actively compete for water over late spring and summer. These species include phalaris (*Phalaris aquatica*), rice millet (*Piptatherum miliaceum*), plantain (*Plantago lanceolata*), thistles, kikuyu (*Pennisetum clandestinum*) and all the woody weed species (broom, blackberry, gorse etc.). These generally grow over late spring to early summer, are aggressive and quickly outgrow tube-stock. We would suggest the following techniques for control:

- Perennial grasses – spot spraying using a glyphosate product.
- Broadleaf weeds – spot spraying using a metsulfuron methyl herbicide or mechanical slashing to reduce growth and therefore competition (it can also stop further seed set).
- Woody weeds – cut and swab using a triclopyr or glyphosate product, foliar spot spray using a triclopyr product.

#### Planting

The importance of good planting practice is often overlooked. It is important to plant your tube-stock well so that survival is optimised, and the effort of growing and planting is not wasted. A few easy tips can make a huge difference to the success rate.

#### Digging the hole

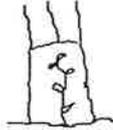
First scrape 1-2cm of soil from an area about 30cm x 30cm and move it to one side. Do not mix it back into the planting area. This action will remove any weed seed from the area around the planted stem. Next dig a hole big enough to contain the plant, a 2-3cm are of soil insulation and a 2-3cm 'watering bowl' which will catch and deliver precious summer rain to the roots of your seedling. All up, your hole will need to be 5-8cm deeper than the size of the tube-stock. Save the 'clean soil' to one side to backfill around your plant.

#### Orient the plant

Remove the plant from the pot. This is best achieved by first rolling the tubes between your palms to loosen the root mass. Holding the plant by the stem, place the plant in the hole and face it to maximise leaf exposure to the winter midday sun. Most broad leaf plants have many of their leaves facing the same direction to seek the sun, therefore orient the plant so that most leaves are facing north.

#### Stability and insulation

Set the plant at the lowest point in the hole and refill the hole using the 'clean' soil you placed to one side. Ensure the soil is crumbled in around the root mass to minimise any air holes in



the soil, and be sure that 2-3cm of soil covers the top of the root mass. The finished planting should resemble a flat-bottomed bowl with no raised mound of soil around the stem. This provides stability, insulates surfaced roots against drying or frosts, and gives the plant a better chance of recovery from disturbances such as grazing. Ensure the finished plant is absolutely upright; plants that lean over are more vulnerable to frost damage, weed competition, fungal problems and damage during follow up weed control.

#### Watering in

Once backfilled, pour up to 2 litres of water into the bowl. This will ensure any stress on the plant is minimised, help to settle the soil around the roots, and give you an opportunity to check that the watering bowl is level and functional.

#### Prevent shading

If staking the plant for tree guards or for demarcation purposes, place the stake to the south of the plant to prevent shading – winter sun is crucial for good survival rates.

From Manual for Revegetation with Local Native Plants, Onkaparinga Catchment Water Management Board, but the editor takes full blame for the illustrations.

## NEW PRODUCT

### Attractant for Foxes and Wild Dogs

After months of R&D and production, Pestat Ltd's FeralMone™ is now on the shelves. FeralMone™, a spray attractant, is designed to increase visitation of wild dogs and foxes to bait or trap sites to assist in bait uptake.



Foxes and wild dogs have recently been estimated to cost primary producers more than \$100M per annum in direct losses and costs of control, and managing these pests is an on-going activity for many farmers and rural agencies. FeralMone™ will be a useful tool in this process.

Pestat Ltd developed the product in collaboration with Australian Wool Innovation Ltd and the NSW Parks and Wildlife Division. FeralMone™ is based on the synthetic fermented egg mixture originally devised by the United States Department of Agriculture almost three decades ago. The mixture has a strong smell, which has in the past proved difficult to handle. The formulation is packaged in an aerosol can, so the odour is contained, and importantly, can be supplied and applied in a user-friendly manner.

Over the past year, the formulation was tested in field trials in the ACT and South-east NSW, and was found to increase both the attendance rate of foxes and wild dogs at treated sites, and also increase the uptake of baits from these sites.

Author: Lauren Starr, from imPACT, the bimonthly e-newsletter of the Pest Animal Control Cooperative Research Centre

### Did you know?

Eucalypts develop hollows at all ages, but hollows suitable for vertebrate fauna do not typically appear until trees are at least 120 years old. Hollows for larger species may not appear until trees are at least 220 years old.



References Gibbons, P & Lindenmayer, D. (2002). *Tree hollows and wildlife conservation in Australia*. CSIRO Publishing.

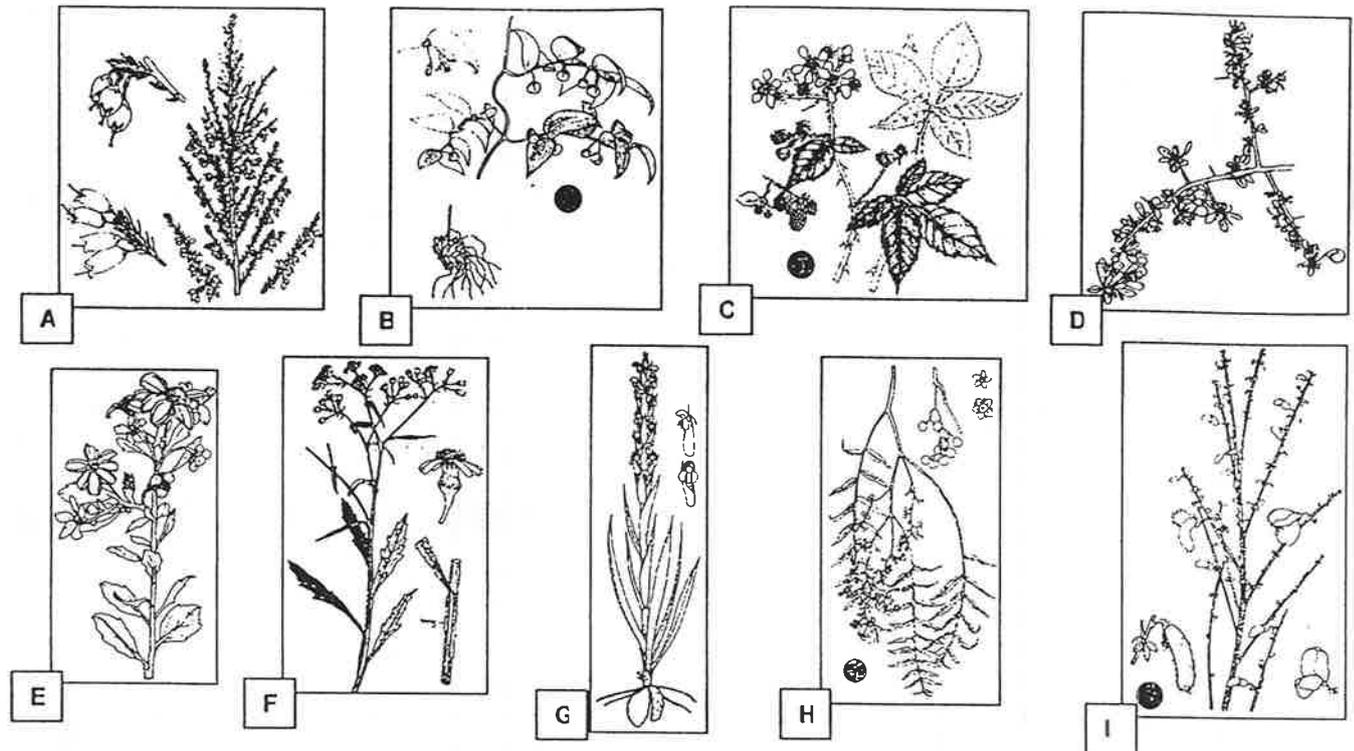
From Land for Wildlife News Vol 5 no 7 Aug Sep 2004.

**EDUCATION/FUN & GAMES**

**QUIZ**

Match the pictures below to the names of these common weeds.

1. African Daisy 2. Blackberry 3. Boneseed 4. Boxthorn 5. Bridal Creeper 6. English Broom 7. Erica 8. Monadenia 9. Pepper Tree



Illustrations from *Stop Bushland Weeds* by Meg Robertson, except for *Monadenia* from *It's blue with five petals* by Ann Prescott, and *Boxthorn* from a *Save the Bush* fact sheet African boxthorn by Richard J. Carter.

**BIRD ID FOR BEGINNERS**

**Butcherbirds**

There are only two species of Butcher Birds you will encounter in SA. The Grey



Butcherbird is widespread, often seen in the Mallee, woodlands, mulga partly cleared farmland and suburban parks and gardens. Its



voice is rich and varied. It has a black head, grey back and white underparts. Its partial white collar is obvious in the field.

The Pied Butcherbird is famed for its beautiful song which comes 'in fluted, far-carrying notes that seem to reflect the



loneliness of its outback haunts' (Morcombe). It has a black hood and chest, and a darker back. It hunts from bare limbs, poles or wires, and is often seen along roads. Its habitat is open country, woodlands, semi-arid



acacia shrubs, watercourse trees, spinifex, grasslands, farms and roadside trees. Its range does not include the southern parts of SA but can be seen in the Riverland.

*Grey Butcherbird* from *The Birds of Victoria* by W Roy Wheeler, illus. By Jeremy Boot, *Pied Butcherbird* from *Field Guide to Australian Birds* by Michael Morcombe. *Maps* from *The Slater Field Guide to Australian Birds* by Peter Slater et al.

**WEED OF THE MONTH**

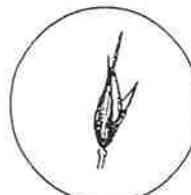
**Rice Millet (*Piptatherum miliaceum*)**

Rice Millet is a perennial grass to 1.5m high, originally native to the Mediterranean area. It can be confused with *Stipa* species. The leaves are fat, glossy and dark green, about 1/2 to 1cm wide and up to 30cm long. The seed heads open into a very large, spreading panicle on long, thin branches. It forms dense stands that exclude other vegetation, and spreads rapidly from its many seeds.

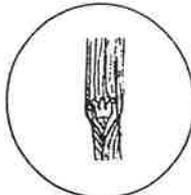


**Control**

Spot spray with Glyphosate at a rate of 5-10ml per litre of water. Spray from July to December. Can be cut back with hedge shears or a brushcutter and then spot spray the regrowth a month later. Small areas can be hand pulled. Best times for hand pulling are May to November.



spikelet



ligule

*Sources* : *Weed Control Handbook for Native Vegetation, Revegetation and Creek Lines in the Onkaparinga Catchment* by the *Onkaparinga Catchment Water Management Board*. *Illus. From Grass Identification Manual for everyone* by Joan Gibbs, artist Rochelle Gibbs. UniSA, 2001.