A close-up photograph of a Common Ringtail marsupial, a small brown and tan animal with a white stripe on its chest, holding a red and blue striped rope. The animal is looking directly at the camera with large, dark eyes. The background is dark, making the animal and the rope stand out.

BACKYARDS FOR BATS, RATS & MARSUPIALS

COMMON RINGTAIL
HANS ERKEN

"AN UNBELIEVER ... MIGHT EXCLAIM "SURELY TWO DISTINCT CREATORS MUST HAVE BEEN AT WORK."

-CHARLES DARWIN [ON SEEING MARSUPIALS IN AUSTRALIA FOR THE FIRST TIME].

SE QLD is blessed with a fascinating variety of small mammals, and it is possible to encounter some of these in an urban setting. Bats, rats, and smaller marsupials are to be expected. To be certain that some of these animals are encountered we need to have the necessities; habitat, shelter, available food and water.



Brush-tailed Phascogale [M.Tarrant]

Australia is known internationally as the land of marsupials and our account will begin with an overview of our marsupial diversity. In south-east Queensland we have a variety of Dasyurids, essentially carnivorous marsupials. The rarest and largest is the Spot-tailed Quoll. The more common Brush-tailed Phascogale is a medium-sized arboreal species with a body length of about twenty centimetres and a tail nearly the same length. We have a variety of Dasyurid species that have been incorrectly termed marsupial mice, including Antechinuses [Brown, Sub-tropical, Yellow-footed, and Dusky], Common Dunnart, and Common Planigale. They are small, nocturnal, and very vulnerable to predation by cats. We have two bandicoot species, Northern Brown plus the Long-nosed. The former is common in lowland habitats while the latter is common on upland country, especially near rainforest or wet eucalypt forest. Both are vulnerable to dogs, cats and cars.

Arboreal [tree living] marsupials include the Koala and a range of possums and gliders. The Koala is uncommon and is threatened with land clearing, cars and dogs. To protect it we need large areas of protected habitat.



Clockwise from top left - Greater Glider, Yellow-bellied Glider, Common Brushtail, Sugar Glider [All pics by Photographersdownunder]

Gliders include **Sugar, Squirrel, Yellow-bellied, Greater and Feathertail**. Of these, the Squirrel, Sugar and Feathertail are most likely to still exist in some urban locations. **Common Ringtail Possums** and **Common Brushtail Possum** as their names suggest are both quite commonly recorded in urban backyards. The **Short-eared Possum** [formerly known as the Mountain Brushtail] is found in some hilly areas in south-east Queensland.

This is Australia, so we do have some Kangaroos and Wallabies. The three most commonly encountered species are the **Eastern Grey Kangaroo, Red-necked Wallaby** and the **Swamp Wallaby**.

Other macropods, found in south-east Queensland, include **Whiptail and Black-striped Wallabies, Rufous Bettong, Red-necked and Red-legged Pademelons** and the uncommon **Long-nosed Potoroo**.

Monotremes, egg laying mammals, include the **Short-beaked Echidna** and **Platypus**.

In south-east Queensland we have about 26 microbats [relatively small bat species who echo locate to find chiefly insectivorous prey] plus three large flying foxes [Black, Grey-headed and Little Red], the **Queensland Blossum Bat** and the crazy looking **Queensland Tube-nosed Bat**. The latter two species are basically small fruit bat species.

Finally, we have rats! There have been three rodent species introduced by Europeans to Australia. They include the **House Mouse, and the Brown and Black Rats**. All of these rodents are common and likely to be encountered in urban settings.

Native Rats are more closely associated with natural vegetation. Often their name suggests where they would be encountered. **Bush Rat and Water Rat** are both reasonably common. **Water Mouse** [uncommon in mangroves], **Grassland Melomys, Fawn-footed Melomys** [riverine habitats with good vegetation cover], **Swamp Rat, and Pale Field Rat** are less likely to be encountered. There are a few other rodent species that can be found in south-east Queensland.

To be sure that some of these animals mentioned above are encountered in our urban areas we must consider their needs and supply them.



Clockwise from top left - Red-necked Wallabies [P.Russell], Swamp Wallaby [Photographersdownunder], Fawn-footed Melomys and Bush Rat [Both pictures of the native rats - M.Tarrant],

Mammals in Australia have suffered and sadly we can boast the highest mammal extinction rate in the world. Habitat clearing, introduced predators and competitors have all led to reductions in mammal numbers.

The closer you are to remaining good areas of natural habitat will determine, to some extent, how many mammal species you could record in or near your backyard. Flowering and fruiting trees, in your backyard and bordering your street will encourage flying foxes, possums and gliders.

Many of Australia's mammals are nocturnal and take shelter through the day using tree hollows. And many will use many different hollows for shelter and to raise young. The moral of the story? It is impossible to have too many hollows for shelter for our mammals.

Brushtail Possums, Ringtail Possums, Sugar Gliders, Squirrel Gliders, Brush-tailed Phascogale plus several species of Antechinus, and all species of Microbats use hollows.

Some insectivorous bats [microbats] will use specially designed bat boxes.

Bat Boxes are a cheap way to encourage natural insect control and a way to prevent use of insecticides as these small bats can consume, a very large number of flying insects.

Many possums and gliders use many hollows, so it is very useful to make and supply nesting boxes. On the following pages are some freely available designs. Web addresses to some more information and professionally supplied nesting hollows also follow.



Yellow-footed Antechinus [P.Bender]

MAMMAL NEST BOXES

The following plan has been sourced from **Backyard Buddies** - an educational initiative of the **Foundation for National Parks and Wildlife**.

A Generic Possum Box

The plan, below, can be adapted to suit a variety of our local birds or mammals depending on the box's dimensions and, especially the entry hole.

- Ringtail Possum Nest Box: A 400, B 240, C 200, D 70
- Brushtail Possum Nest Box: A 500, B 250, C 290, D 100-120
- Rosella Nest Box: A 400, B 240, C 200, D 70
- Treecreeper Nest Box: A 400, B 190, C 170, D 45-50
- Sugar Glider Nest Box: A 400, B 240, C 200, D 32-35

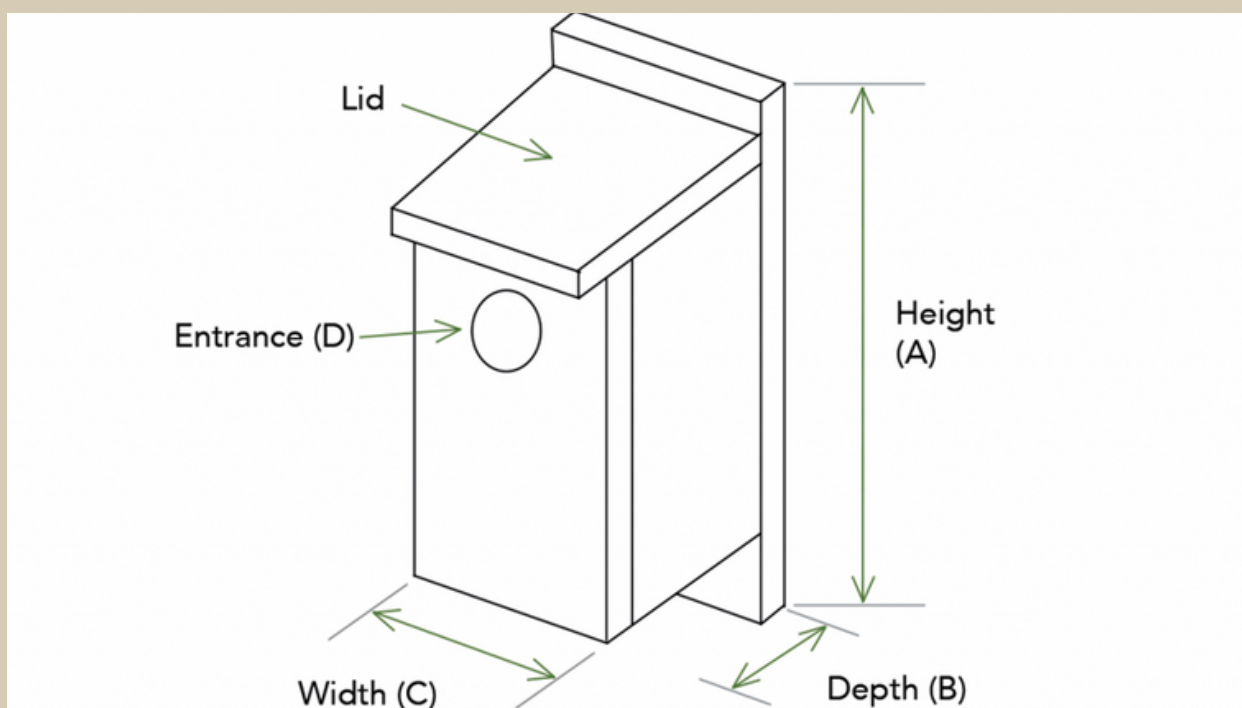
The measurements above are in millimeters and are the minimum guidelines for the dimensions of the boxes.



Ringtail Possums build a drey - a nest like structure built from sticks or they will use an artificial one like above. [S.Gillis]



Brushtail Possum at home in a nest box [G.Drady]



BATS

As stated previously there are two main types of bats; microbats and megabats. The latter group, better known as **Flying-foxes** are the bats most people are familiar with as many places in south east Queensland have their skies darkened by flocks of Flying-foxes heading off for their nightly forage.

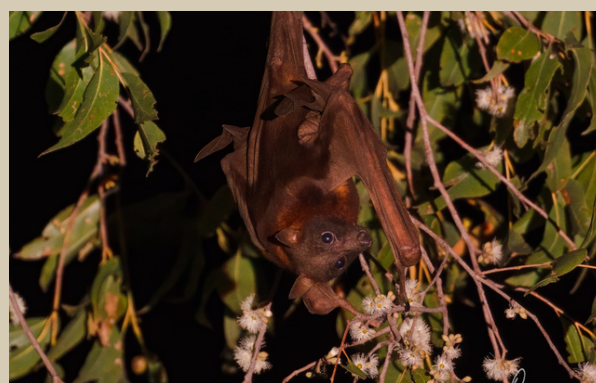
These bats suffer from a poor image, created in part, by their noisy camps. However they are an essential part of Australia's forest ecology. Their twin roles as seed dispersers and pollinators mean that the health of our forests are in their..wings? Flying-foxes spread the seeds of many tree species by carrying fruits and dropping or excreting seeds, sometimes many kilometres from the parent tree. Many trees produce more nectar through their flowers at night which attract a variety of nocturnal mammals, including flying foxes. The pollen that collects on their fur can be carried much further than flightless mammals meaning that greater genetic mixing can occur. This means that even isolated islands of forest can successfully maintain genetic diversity. In south east Queensland we have three large species of **Flying-fox: Black, Grey-headed and Little Red**. All three species are pictured to the left.

Sadly, Flying-fox numbers are in decline due to land clearing for monoculture agriculture and urban development. Land clearing leads to malnutrition and stress on the animals. During stressful periods the bats' immune system suffers and they are more susceptible to disease. Our bats are also suffering from the effects of climate change. Increasingly hotter summers and heat waves of greater frequency and length kill bats.

Conserving and restoring our forests are the key to protecting our bats. Planting more and more fruiting native trees within our suburbs and parks would also assist.

For your own safety do not handle injured or sick Flying-foxes. If you are bitten or scratched by a Flying-fox, wash the wound immediately with soap and running water for about five minutes. Do not scrub the wound. Seek immediate medical attention. If bat saliva contacts your eyes, nose or mouth, flush the area thoroughly with water and seek immediate medical attention. For the latest information on Lyssavirus and Hendra go to www.dpi.qld.gov.au.

From top to bottom - **Black Flying-fox** [L.Hall]], **Grey-headed Flying-fox**, **Little Red Flying-fox**, A camp of **Grey-headed Flying-foxes** [L.Hall]. Other pictures by Photographersdownunder.



BATS AND BAT BOXES

Our insectivorous bats are an unappreciated yet integral part of every healthy natural environment. In addition they are among the most amazing animals in the world.

Micro-bats do not rely on sight to find food. Instead they use a form of radar called echolocation. Micro-bats echolocate by bouncing sound waves off objects and listening to the echo. They emit pulses of sounds, often at frequencies beyond the range of human hearing. The echo that comes back to the bat can tell it how far away the object is, as well as its size and texture, and if it's moving!

Using echolocation to hunt insects is amazingly efficient. This is why micro-bats are such great controllers of insects and should be encouraged in both the urban and rural environments.

To demonstrate their insect controlling potential, consider these facts of one of our bats - Eastern Bentwing, lifted from [A Natural History of Australian Bats](#) by Greg Richards and Les Hall. First, one bat consumes 5 grams of insect per night. In Queensland we have 12 colonies of Eastern Bentwings, each with a minimum number of 15000 individuals. Each colony consumes, at a minimum 75 kilograms of insects per night! Total weight of insect consumption by all colonies over one breeding season? 2025 tonnes!!

Please imagine the cost of insecticides our agricultural sector could save if all croppers could spend some money in bat infrastructure and encourage this natural pest control method.

Within south east Queensland we have 26 species of microbat, with 22 of these species hollow dependent. Without decent hollows bats must move, even if plentiful food sources remain.

The four species illustrated to the right have been recorded in nest boxes within Brisbane.

Top to bottom: **Eastern Horseshoe Bat, Cave / Forest Bats** [*Vespadelus spp.*], First two pictures by M.Tarrant, **Large-footed Myotis, Eastern Bentwing**. Two pictures by L.Hall.



BATS AND BAT BOXES

The solutions to saving and perhaps restoring populations of these bats then, involve protecting natural bushland, especially old growth trees with hollows and perhaps creating artificial roosts and breeding sites.

In urban areas, due to clearing of natural forests, the provision of bat boxes and other artificial sites, might be the only short term remaining strategy to allow microbat populations to exist. Part of the trouble is that very little research has concentrated on Australian bats and there is still much to learn about bat box design and usage.

Australian bat researchers have reported that bats frequently show a high allegiance to an area but not to a particular roost site. For example, research with bat boxes at Organ Pipes National Park [in Victoria] has revealed that maternity colonies can relocate nightly between roosts. These points suggest that bat boxes would do more for bats if installed in clusters rather than singly. In other words you [and your neighbours] should all install a number of bat boxes to ensure that the bat's shelter needs are adequately catered for.

The Organ Pipes research may have interesting implications for urban design as they established a functioning and growing bat colony entirely housed by artificial nest sites within a replanted burned forest. Pleasingly, other research has suggested that provision of bat boxes does not seem to alter the overall bat diversity – something that was initially feared.

In a 2011 published study in Brisbane by Rhodes and Jones 70 nest boxes were monitored over a three year period. Only five of the 22 hollow dependent species were found in these boxes during the period and then only occasionally. Similarly, they found that clustered boxes were more successful, especially if located within five kilometres of good forest cover.



Top to bottom: Eastern Long-eared Bat [M.Pennay], Gould's Long-eared Bat, Gould's Wattle Bat, Greater Broad-nosed Bat [three pictures by L.Hall]

BATS AND BAT BOXES

Multiple Bat box designs have been trialled around the world and it seems all have had some successes. In Australia we need to have more and more trialling of a variety of bat box types and other variables, such as location, height, aspect, box colour, timber width, adjacent features, that may affect bat occupancy rates. Species preferences for different bat box designs has had little data produced in Australia.

Gathering data by monitoring bat boxes is also difficult. Inspecting bat boxes manually may disturb bats causing them to flee [and perhaps not to return]. Looking for evidence under the bat box like guano is a safer bet however it does not offer any conclusions of number of bats nor the extent in time of occupancy.

At the moment people are encouraged to offer bat boxes of a variety of designs - there are many available on the internet - and place them in a variety of circumstances.

There are a few general rules however. First place your bat box between 3 and 5 metres above ground. Too high and it may be wind affected. Place the entrance away from prevailing winds. Locate such it gains some morning sun but is protected from the mid and afternoon sun such that it does not heat up too much. The entrance to the box should be clear to allow the bats an upward swooping flight to land.

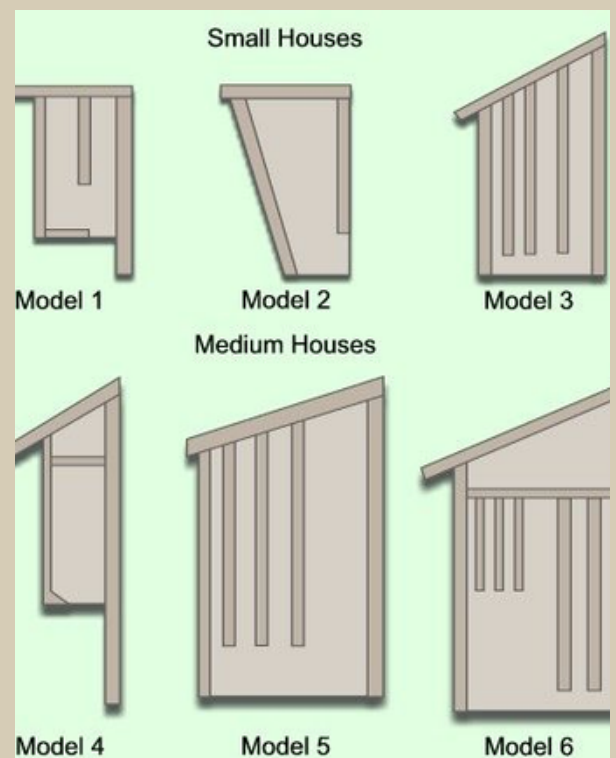
Lastly, be patient. It may take a while for local bats to discover this new shelter, although some have been recorded to become occupied in a number of weeks.

The following sites offer some important information.

[All About Bats.](#)

[Australasian Bat Society.](#)

[ABC Gardening Australia - Attract bats with DIY bat boxes.](#)



Above - a bat box and some bat designs. Note the deep incisions on the bat box landing area to assist the bat's grip. These incisions should be made on all internal timbers. Models 1 and 2 [or simple variations] are the most common in Australia. Note the floor is missing in most designs; this prevents both guano build up and ants invading. [ABC gardening fact sheet]

"THE KOALA.
IT STANDS QUITE
ALONE THE SOLITARY
SPECIES OF ITS GENUS."
JOHN GOULD

SEQ Koala Food Trees

Here is a list of Koala food trees suitable for south-east Queensland. If you are in a position to establish Koala habitat, please plant a variety of other trees within the food trees such as Acacias, Casuarinas and Melaleucas as they often use these other species for shade and shelter.

1. ***Eucalyptus tereticornis* - Queensland Blue Gum**
2. ***Eucalyptus microcorys* - Tallowwood**
3. ***Eucalyptus propinqua* - Small-fruited Grey Gum**
4. ***Eucalyptus resinifera* - Red Mahogany**
5. ***Corymbia citriodora subsp. variegata* - Spotted Gum**
6. ***Eucalyptus racemosa* - Scribbly Gum**
7. ***Eucalyptus tindaliae* Queensland White Stringybark**
8. ***Eucalyptus siderophloia* - Grey Ironbark**
9. ***Eucalyptus acmenoides* - White Mahogany**
10. ***Eucalyptus bancroftii* - Tumbledown Gum**
11. ***Eucalyptus cloeziana* - Gympie Messmate**
12. ***Eucalyptus crebra* - Narrow-leaved Ironbark**
13. ***Eucalyptus grandis* - Rose or Flooded Gum**
14. ***Eucalyptus pilularis* - Blackbutt**
15. ***Eucalyptus robusta* - Swamp Mahogany**
16. ***Corymbia intermedia* - Pink Bloodwood**
17. ***Corymbia tessellaris* - Morton Bay Ash**
18. ***Eucalyptus fibrosa* Broad-leaved Ironbark**
19. ***Eucalyptus carnea* Broad-leaved White Mahogany**
20. ***Eucalyptus major* Queensland Grey Gum**
21. ***Eucalyptus moluccana* Gum topped Box**
22. ***Eucalyptus seeana* Narrow-leaved Red Gum**
23. ***Lophostemon confertus* Brush Box**
24. ***Melaleuca quinquenervia* Five-veined Paperbark**



The Koala, it bears repeating, is an Australian endemic marsupial quite unlike any living mammal. It is clearly our responsibility to protect enough habitat for this species to survive and, hopefully, thrive.

Imagining that the Koala can survive in our urban areas, sadly, takes some imagination. Huge ribbons of habitat linking even larger blocks of habitat, fenced to keep koalas in and dogs and roads out, would be the only option.

Large areas of Eucalypt habitat need to be set aside and preserved plus keeping and restoring habitat where possible on private land.

If you live on acreage in potential or proven koala habitat you could think about increasing the number of koala food trees on your property. Encouraging neighbours to do the same would be especially useful. Koalas need an area of treed habitat between 50 and 100 hectares [the bigger the better]. Big 'blocks' of habitat are more useful than long thin sections.

Picture - Koala [K.Cross]

BANDICOOTS

If you have bandicoots living in your neighbourhood or nearby bushland you will want to create or improve habitat in your backyard for these wonderful marsupials. Bandicoots, like Kangaroos, have a pouch but it faces backwards, so during the night when they are aerating your soil looking for invertebrates, the soil does not soil their pouch.

To improve your backyard for bandicoots most of the principles remain - avoid pets that may predate them, use plants local to your area and keep your backyard nice and dark. In particular plant shrubs and tussock grasses thickly to ensure plenty of cover to allow them to seek shelter through the day-time. Low growing prickly shrubs are also useful to surround your tussock grass area. Regarding shelter some people even create a special bandicoot bungalow, check out this [short clip from ABC gardening](#).

Bandicoots are omnivorous but certainly are excited about eating invertebrates. Providing thick leaf litter, mulch and a diverse garden ground level of logs, rocks as well as a variety of native plants provide breeding opportunities for insects and so feeds the bandicoots.



Above - Home made Bandicoot shelter
[\[https://roleybushcare.com.au/\]](https://roleybushcare.com.au/)



Above - Long-nosed Bandicoot [H. Erkin]



Above - Northern Brown Bandicoot
[Downunderphotography]

MONOTREMES

Perhaps neither of these two species will be encountered in your backyards but they are both found in south-east Queensland and are both such amazing animals that they deserve a special page.

Monotremes are mammals but are of a particularly ancient lineage. They are egg layers, like birds and some reptiles, yet they suckle their young with milk.

Monotremes are only found in Australia and New Guinea. The latter is home to several echidna species. In Australia we have the Short-beaked Echidna and the Platypus.

The Platypus is such an amazing and unlikely animal that the first zoologists in the United Kingdom who encountered a specimen were convinced that it was a hoax.

With the bill of a duck and the tail of a beaver perhaps that was not surprising.

The Platypus also possesses an extraordinarily sensitive bill that can detect the electrical current within its prey, as it swims around our creeks with eyes held tightly shut.

Additionally, the male can claim a venomous spur on its hind leg; the reason for such a weapon remains unclear.

If you are yet to see a Platypus in the wild please put it on your bucket list and devote some time in the next winter to try to see one. In winter months the platypus is more likely to be seen swimming and hunting in the daylight rather than just at dawn and dusk.

Restoring our waterways by removing weeds, replanting native riparian vegetation, reintroducing submerged logs and addressing urban runoff would go a way to retain and encourage platypus. Remember whatever is in stormwater ends up in their habitat!

Echidnas are still hanging on in urban bushland. They need connecting habitat - links between bushland blocks, protection from dogs and cars, and plenty of good ground habitat with termite infested wood. Think twice before collecting fallen timber!



Above - Platypus [A. Higgins]



Above - Short-beaked Echidna [A. Higgins]



BACKYARDS FOR LIZARDS AND SNAKES

LACE MONITOR
PAUL RUSSELL

Reptiles and amphibians are sometimes thought of as primitive, dull and dimwitted. In fact, of course, they can be lethally fast, spectacularly beautiful, surprisingly affectionate and very sophisticated". --

DAVID ATTENBOROUGH

Snakes, and even some lizards, can scare people. While it is important to be cautious about snakes, we should not encourage fear nor loathing. This is not in the snake's interest nor is it in ours'. True, some of our snakes are potentially deadly. But so are traffic and chemicals in our homes. In all cases education and understanding are the keys to ensuring safety.

Regarding the fear of snakes and snake bite - the truth is that the greatest majority of people who are bitten have tried to catch a snake or kill it. So, if you avoid trying to catch it or kill it you are, in the vast majority of cases, safe. If you see a snake that snake is now safe as you can walk away and leave it in peace.

If you see a snake, you should count yourself lucky. From a safe distance admire it, as who knows when you will be lucky enough to see one again. Chances are that the snake has been living in your yard for months or years and you have only recently been lucky enough to see it. This is not surprising as snakes do not want to be seen.

The most common snakes encountered are of course non-venomous. **Carpet Python** is common and his smaller cousin, Spotted, far less so.

Common Tree Snake, sometimes green, sometimes black but with a yellow belly, is a very common non venomous snake. The **Common Keelback or Freshwater Snake** is non-venomous and a very useful snake to have around as it can safely consume Cane Toads. The **Brown Tree Snake** is also common and while venomous it is only mildly so.

There are a range of common venomous species that are considered not dangerous. They include **White-crowned Snake, Dwarf-crowned Snake, Red-naped Snake, Marsh Snake, Yellow-faced Whip Snake** and others. Potentially dangerous species include the **Eastern Brown Snake** [common], **Coastal Taipan, Death Adder, Red-bellied Black Snake, Rough-scaled Snake** and the **Small-eyed Snake**.

Below. Clockwise from top left - Yellow faced Whipsnake [J..Coborn], Common Tree Snake [P.Russell], Rough scaled Snake [J.Westacott], Brown Tree Snake [J. Westacott]



There is a large range of Lizard species from small skinks to our largest lizard, the **Common Goanna**. There are over 30 species of skink, from the abundant **Grass Skink** to the large **Common Blue-tongued Skink**. There are legless lizards, such as **Burton's Legless Lizard** and the **Common Scaly-foot**, separated from snakes by, among other things, prominent ear holes. Agamids [dragon lizards] include the abundant **Eastern Water Dragon**, **Common Bearded Dragon** and the uncommon **Frilled-neck Lizard**. Geckos include the vocal and introduced **Asian House Gecko** and the beautiful **Robust Velvet Gecko**, another species likely to take up residence in human dwellings.

Snakes and lizards are very important parts of our local ecology and are, once you establish the correct mindset, astonishingly beautiful creatures.

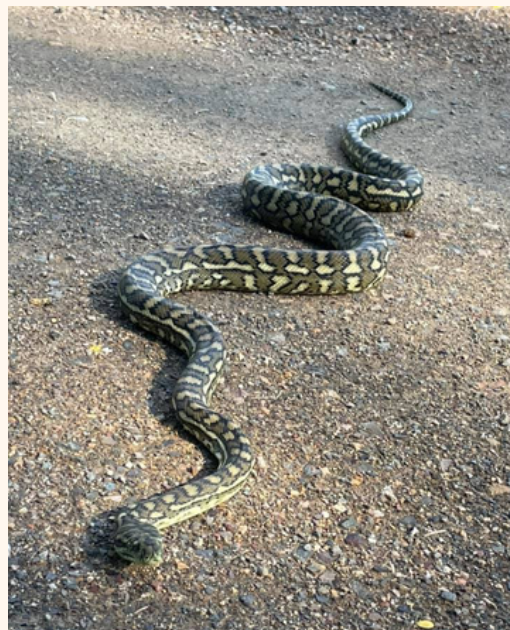
Planting your garden thickly with many low growing shrubs, dense plantings of native grasses like Kangaroo and Barbed Wire Grass, Lomandras, all surrounded with thick mulches will be the basis for a garden that attracts reptiles. Again, a great range of plant forms will provide different habitats and thus more shelter, for example, vines running over a fenced frame will offer protection for arboreal skinks and geckos. A frog pond will attract insects and frogs and this, too, will attract lizards and snakes. Create particular reptile habitat and shelter such as a 'Lizard Lounge'. This is basically a created area within your garden that allows a good variety of cover, hiding places for both the reptiles and, potentially their prey. Piles of stones, fallen branches and bark, hollow logs or branches or artificial cover like half buried PVC pipes or old terra cotta pots all will be used by reptiles and or their prey. A shallow tray filled with water in a sheltered place would be useful for lizards, especially during the hottest months.

Some sun basking sites are worth supplying as well. Large flat stones, near cover, but exposed to full sun will be used.

If your neighbour's yard is also suitable for reptiles it could be worth ensuring that there is a small hole through the bottom of the fence that lizards can travel through [4cm x 4cm] would be adequate for the larger skinks.

Watch the following two short clips from **Gardening Australia: Clip #1. - How to build a Lizard Lounge.**

Clip #2. - How to create a skink friendly garden.



Carpet Python [JMcLean]

By the way we do have a few freshwater turtle species in south east Queensland, however, it would be unusual to encounter any within a suburban backyard.



A Complete Guide to Reptiles of Australia: Sixth Edition
by Steve Wilson and Gerry Swan
November 2021

SELECTED COMMON REPTILES

Clockwise from top left - Robust Velvet Gecko [H. Erkin], Eastern Water Skink, Wall Skink, Krefts Turtle, Eastern Bearded Dragon, Eastern Water Dragon. Photos by A.Higgins]

