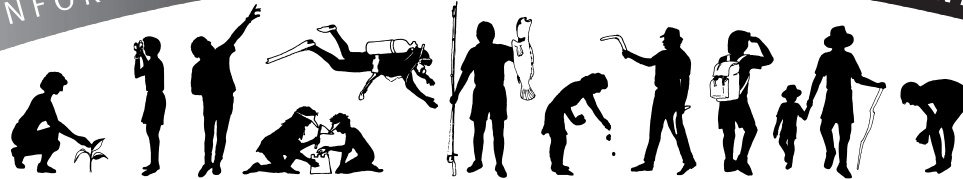


TROPICAL TOPICS

AN INFORMATIVE NEWSLETTER ABOUT THE ENVIRONMENT



Notes from the Editor

Next to birds, lizards are among the most commonly encountered vertebrate animals in the savannas. Indeed, the diversity of lizards in the tropical savannas is particularly rich, exploiting numerous habitats, from woodlands to sandstone escarpments, rainforests and semi-arid zones, many endemic to just small areas. This *Tropical Topics* looks at some of the more widespread and common species.

This issue also looks at crocodiles. Although not lizards, they are lizard-like in many respects and are important reptiles of the savanna waterways. Visitors to tropical Australia must always be aware – and beware – of these fascinating but potentially dangerous animals.

I would like to thank Russell Best, Queensland Parks and Wildlife Service and Tony Griffiths, Northern Territory University for their help with this issue.

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The diverse lizards of Oz

Australia has a great diversity of lizards – as many as 47 different species have been found living in a single sand dune. Conditions which mammals find so harsh, are apparently not such a disadvantage for reptiles.

Next to Antarctica, Australia is the driest continent on earth – 75 percent of it is arid or semi-arid. The climate is erratic, with long, irregular dry and wet cycles determined by the effects of El Nino and La Nina. Successful animals must cope with unreliable rainfall and prolonged periods of shortages, but take advantage of unpredictable times of plenty. In addition, Australia's soils are also nutrient-poor, with low productivity, and fires are frequent.

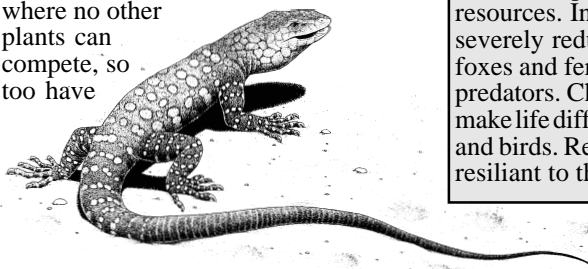
Energy-efficiency is thus the key to long-term survival. Mammals and birds generate their own heat from food, using up to 90 percent of their energy intake for this purpose. Reptiles, however, tap into the abundant solar energy to fuel their activities. They are also much more water-efficient (see p2). When times are lean, since they do not need to eat to maintain body heat, reptiles can reduce their metabolism and go into a state of suspended animation for prolonged periods.

The combination of poor soils and dry climate is believed to have led to the evolution of plants with tough, thick, chemical-laden leaves – and relatively few plant-eaters. Instead, the vegetation is broken down by termites, which thrive in Australia – providing an abundant food source for reptiles. Just as mangroves don't need salt but have developed strategies for living where no other plants can compete, so too have

reptiles exploited an environment largely uninhabitable for other animals.

The great diversity of reptile species may be due to the long-term stability, and great size, of the Australian continent. Those animals which cope well with conditions have had plenty of time to evolve into different species exploiting different ecological niches. This diversity may even be fostered by shortages. This may favour large numbers of specialist species which have adapted to localised conditions over fewer, more widely distributed, species which might have evolved in a more benign environment.

Reptiles have fared much better than mammals and birds following the arrival of Europeans in Australia. Over 12 percent of mammals have become extinct and over 17 percent have declined, compared with just one possible reptile extinction. Medium-sized mammals weighing between 35g and 5.5kg have been worst affected. During droughts, larger mammals and birds can often move to wetter areas. Smaller mammals, however, have probably always lived a boom/bust existence, those lucky enough to retreat to wetter refuges eventually recolonising areas where less fortunate animals died out. These refuges, however, now attract cattle which compete for the same resources. In addition, rabbits have severely reduced ground cover and foxes and feral cats are serious predators. Changed fire regimes also make life difficult for many mammals and birds. Reptiles seem more resilient to the same pressures.



What makes lizards tick?

Lizards are efficient creatures. Instead of consuming food to generate energy, most use solar power, basking in sunshine or sleeping in a warm spot to power up their 'batteries' for the day's (or night's) activities. Some lizards, such as dragons, are able to raise their ribs and angle their bodies to increase the body surface exposed and can become darker to absorb more heat. This strategy, known as thermoregulating, is not an option for some lizards which live in closed forests. Instead, they thermoregulate passively, or 'thermoconform', their body temperature simply conforming to that of the air around them.

Lizards are also efficient users of water. Their dry scaly skin reduces moisture loss, those living in the hottest areas tending to have compact bodies to minimise loss and/or restricting most activities to hours of darkness. In addition, reptiles do not use water to flush nitrogenous wastes from the body as urine, like mammals do, but convert them to a form which can be dumped as solid dung.

Geckos, legless lizards and skinks will

House guests

Geckos are among the most familiar of tropical animals, living in our houses, scuttling around our ceilings, swarming around our outside lights to pounce on dazzled insects and conducting their affairs behind our picture frames.

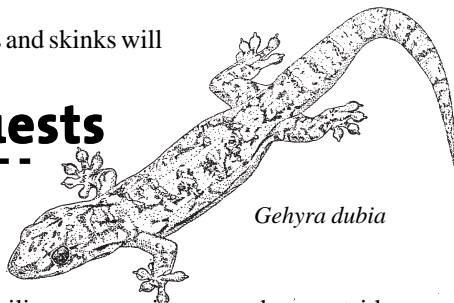
Several species of geckos qualify as 'house' geckos, having adopted humans as co-habiters. *Gehyra dubia* is found widely in Queensland and northern New South Wales. Varying in colour from pale pinkish to brown with darker markings, it can also be found in the wild on trees and in rock crevices.

Another species, *Hemidactylus frenatus*, is an import from Asia which has hitched a lift with travelling humans. It is now found at the tip of Cape York Peninsula, around Cairns and in the Northern Territory where it is spreading from Darwin to settlements along the road south towards Alice Springs. It seems to be dependent on human habitation. This gecko can change colour, becoming pale at night and dark during the day. Although similar in appearance to *Gehyra dubia*, it can be distinguished by its slightly spiny tail. It also has a distinctive loud scolding call; native house geckos make only a soft chattering call.

The nocturnal lifestyle of geckos prevents them from basking in the sun as most lizards do to raise their body temperatures. Instead, they choose daytime retreats which are warmed by the sun, particularly in the afternoon, so that they are full of energy by sunset.

Medical researchers are intrigued by how a gecko is able to grow a new tail without the fluid retention and swelling (lymphoedema) frequently associated with radical human surgery. The key seems to be a potent protein growth factor, discovered in geckos, which enables them to regenerate their lymphatic systems. It is hoped a similar product can be developed for humans.

Competition for suitable spots can be fierce, leading to fights between opponents during which they grasp each others' tails in their mouths.



Gehyra dubia

readily drop their tails when threatened, the wriggling appendage serving as a distraction while the owner makes its getaway. Fracture planes between certain vertebrae at the top of the tail allow it to detach easily when pulled apart by special muscles. This sacrificial offering is easily regrown. Tails of dragons and goannas can also break off, but do not do so as readily and tend not to regrow.

All dragons, goannas and Australian geckos lay eggs but some skinks give birth to live young. Experiments with skink eggs suggested that those kept at 'maternal' temperatures were larger and fitter than those kept at normal nest temperatures. This may be an important factor in cool, or dry, climates.

Most lizards are silent, but geckos chatter and squawk, some species making the characteristic and sometimes startling 'gecko' call which has given them their name. Legless lizards may make a high-pitched squeak and some skinks produce a soft squeak.

Frills in the fire

Fires are common in savanna woodlands so how do they affect the frilled lizards which live there? Researchers found that, on the whole, fires benefited these lizards, mainly by removing ground cover and allowing them a better view of potential prey. However, different types of fires have different effects. Fires occurring early in the dry season are less intense and do not seem to threaten the frilled lizards, which avoid them by staying in tree canopies. Late dry season fires, on the other hand, are much more dangerous killing up to 30 percent of the lizards. Many of those studied chose to leave their treetop retreats and seek shelter in termite mounds – a successful strategy which saved their lives. Many, however, stayed in the trees which was much more hazardous.

Nonetheless, areas burnt by late dry season fires seem to provide more food for frilled lizards. Generally, abundance of invertebrates in the lizards' stomachs decreases – termites by more than 40 percent – but there is an increase in numbers of ants, which seem more active and abundant in burnt areas. Importantly, however, the lack of vegetation cover means that the lizards can find more, and larger, prey.

When compared, frilled lizards from areas unburnt for many years were not in as good condition as those from regularly burnt areas; areas unburnt for prolonged periods tended to have low populations of frilled lizards. On the whole, areas which are burnt regularly in the early dry season are most likely to benefit these lizards by increasing food supplies but not threatening the animals' lives. Although late season fires seem to provide more food, they also kill off such a large proportion of the lizards that the population is unlikely to be sustainable if such fires are too frequent. Only if increased food supplies attract sufficient numbers of lizards from neighbouring unburnt areas would the population remain viable.



Crocodiles

Croc origins

Although they look similar, crocodiles and lizards have a very different ancestry.

All vertebrates evolved from reptiles, which in turn developed from amphibians. However, the branch on the evolutionary tree which was to become lizards and snakes diverged from the branch which would give rise to birds, dinosaurs and crocodiles more than 300 million years ago. Interestingly, birds, dinosaurs and crocodiles all developed the same arrangement for the joining leg and foot at the ankle. This connection in lizard legs is quite different.

Nonetheless, crocodiles share many characteristics with lizards. For example, they bask in the sun to raise their body temperature, lying sideways to give maximum exposure to the blood-rich bumpy scales which act as solar panels on their backs.

As with lizards, crocodiles can go without food for long periods. If a crocodile's body temperature drops too much,

digestive enzymes cannot work and food rots in the stomach instead. Both species decrease their food intake during the cooler months, and in more southern locations crocodiles may cease feeding altogether during winter. The growth of crocodiles during the cooler months decreases.

Big-hearted crocs

Crocodiles have four-chambered hearts, like mammals and birds, whereas all other reptile hearts have three chambers. This difference in structure ensures that the blood flow system in crocodiles is more efficient. In addition, crocodiles can control the flow of blood throughout their bodies by increasing or decreasing the heart rate or by 'shunting' the blood flow to areas of importance such as the heart, brain and muscles and restricting the flow to non-essential areas like the intestines. However, some reptilian features allow oxygenated and deoxygenated blood to mix, an advantage for a crocodile when diving.

Croc types

There are about 23 species of crocodylians in the world, two of them in Australia.

Estuarine crocodile (*Crocodylus porosus*)



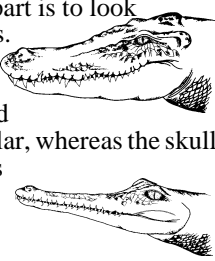
This crocodile is found not just in Australia but also in South-east Asia, India and around western Pacific islands. It is sometimes called the saltwater crocodile, but this is a deceptive name because these animals are found not just on the coast (and occasionally in the open sea) but also far upstream and in many freshwater swamps and billabongs. Almost any body of water in tropical Australia must be suspected of harbouring crocodiles of at least one species.

Young estuarine crocodiles feed on insects, crabs, prawns and shrimps, but as they grow in size the amount of vertebrate material in the diet increases. Larger animals attack sea turtles, goannas, wallabies, pigs and even cattle; estuarine crocodiles over 3m in length are a danger to people. Very strong muscles are employed for closing the jaws, which can easily crush a pig's skull – but a rubber band around the snout of a 2m crocodile is enough to keep it from using its weak 'opening' muscles. Prey, grabbed in the jaws, is usually drowned. Contrary to popular myth, crocodiles do not store uneaten food and most certainly do not prefer rotten food.

Adult male estuarine crocodiles are usually between 3.3m and 4.5m, but larger individuals over 6m have been recorded. Females grow to about 3 or 3.5m long.

Telling the difference

The best way to tell the two Australian crocodile species apart is to look at the skull and jaws. The skull of an estuarine crocodile (above) is broad and the jawline is irregular, whereas the skull of a freshie (right) is narrower and the jawline straighter.



Freshwater crocodile (*Crocodylus johnstoni*)



This species is found only in Australia. It inhabits freshwater rivers, swamps and billabongs throughout northern tropical Australia from Broome in Western Australia to Princess Charlotte Bay in Queensland – but no further south on the east coast except where it has been introduced artificially. It does occur in tidal estuaries, but tends to avoid areas inhabited by estuarine crocodiles, which sometimes eat freshies. This species is much smaller than the estuarine crocodile, males growing to about 2m in length – although a 3m male has been caught – and females to about 1.8m.

Freshwater crocodiles feed on fish, insects, crustaceans, small birds, reptiles and frogs, often grasping them with the tip of the jaw and manoeuvring them further into the mouth. They do not prey on people but will bite in self-defence. Since some large freshies take wallabies, children should always be supervised near freshwater crocodiles.

Be croc wise in croc country

Don't make a croc an offer it can't resist.

- Obey crocodile warning signs, even if you can't see crocodiles.
- Don't go swimming or paddling in areas where crocodiles live.
- Keep well away from the water's edge.
- Don't gut fish, discard food scraps or wash dishes at the water's edge.
- Don't camp within 50m of water.
- Be careful in boats; don't hang a foot over the edge.
- Don't sit in branches above the water – crocs can jump.
- Supervise children and be moderate with alcohol intake in croc country – many victims of crocodile attacks have become careless when intoxicated.

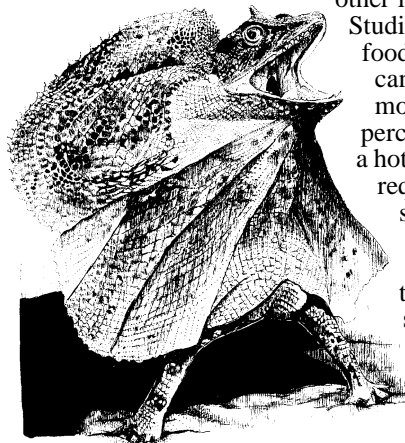
Lizards in the savanna

Dragons (Family Agamidae)

There are about 60 species of dragon lizards in Australia (330 worldwide). They are active during the day, although some in hot arid zones may come out at night. With well-developed limbs they are good runners, climbers and, in some cases, swimmers. Dragons are able to change colour, becoming dark when absorbing heat and lighter when trying to cool down. Males become more colourful at mating time.

The **frilled lizard** (*Chlamydosaurus kingii*), found throughout the forests and woodlands of northern Australia, is the only lizard in the world with a frill – a thin, but wide, scaly ruff. When not in use, it is folded loosely over the lizard's upper body, but when the animal is called upon to defend itself, it opens its mouth to unfurl the frill into a circular ruff which would have been the pride of an Elizabethan courtier. Although the frilled lizard is coloured with muted tones of browns and black, which camouflage it well in its dry woodland home, the frill, when erect, is brightly coloured with patches of yellow and orange. Its owner is now aiming to be seen and with mouth gaping, it lashes its wiry tail at the enemy. If bluff fails, the lizard takes off, running along the ground on its hind legs to the nearest tree. Although probably primarily used in defence, the frill, which has numerous blood vessels, may also help with temperature regulation.

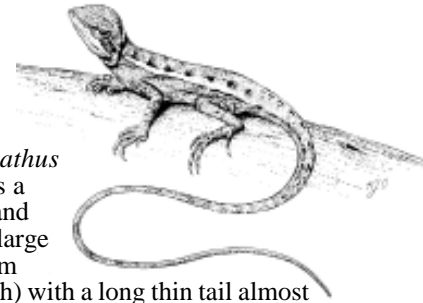
The frilled lizard spends 90 percent of its time in the trees. It is a 'sit-and-wait' predator which surveys the ground, leaping on food such as ants, termites and other invertebrates when they show themselves.



Studies have shown that in the dry season, when food is scarce, a frilled lizard will climb up into the canopy of a tree and stay there for up to three months as its metabolism drops by as much as 70 percent. The lizard is aestivating – the equivalent, in a hot climate, of hibernation. By dropping its energy requirements, it can thus survive a period of food shortage. To lower its metabolism rates the lizard must also keep cool so, instead of basking in the sun it keeps in the shade, shifting around the trunk of the tree if necessary to avoid the sun.

This impressive lizard is one of Australia's largest dragons, growing to 95cm in total length.

Gilbert's dragon or Gilbert's lashtail (*Lophognathus gilberti*) is a common and relatively large lizard (52cm total length) with a long thin tail almost three times the length of the head and body combined. It is found across the savannas, except in eastern Cape York Peninsula. Often seen in pairs, some males have a white streak on the side of the head. It likes to perch on any elevated object – trees, termite mounds, posts and so on – especially near water. It feeds on ants and any other lizard which it can subdue.

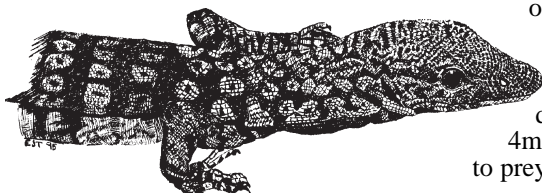


Two-lined dragons live on the ground or in low vegetation. They are named for the two pale lines along their backs. There are several species, but the northern two-lined dragon (*Diporiphora bilineata*) is one of the most widespread, found across northern Queensland and the Northern Territory. It lives in savanna woodland, sclerophyll forests and sandy country. Well camouflaged, it perches on low branches, looking out for insects to ambush.

Goannas (Family Varanidae)

Goannas tend to be large lizards (although the pygmy goanna of the central deserts is, at 25cm total length, the smallest goanna in the world). They are also among the oldest, early versions having been around to see the dinosaurs and even the modern versions dating back 15-20 million years. Although found elsewhere, Australia has the lion's share of goanna species with about 25 of the world's 30. Thought to be the most intelligent of lizards, they eat a variety of other animals, both living and dead, including other reptiles, insects, baby birds and mammals, including possums. At home on the ground and in trees, they constantly flick their forked tongues, picking up scent particles from the air and transferring them to a structure known as the Jacobson's organ, on the roof of the mouth, where they are interpreted

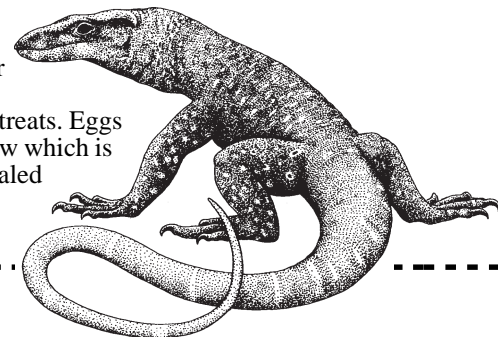
The **spotted tree monitor** (*Varanus scalaris*) is found across the northern tropics almost anywhere there are trees, darker individuals inhabiting rainforest and lighter ones in drier areas. The varied patterns of this species tend to match local tree trunk colours but most have spots of some sort, usually pale with a dark centre. This lizard hunts on the ground as well as in the trees but if disturbed on the ground will beat a hasty, and noisy, retreat up the nearest tree, disappearing into a hollow or keeping on the opposite side to its pursuer. It feeds



Spotted tree monitor illustration by Eleanor Torr

on insects, smaller lizards and baby birds and may drop as much as 4m from a tree on to prey.

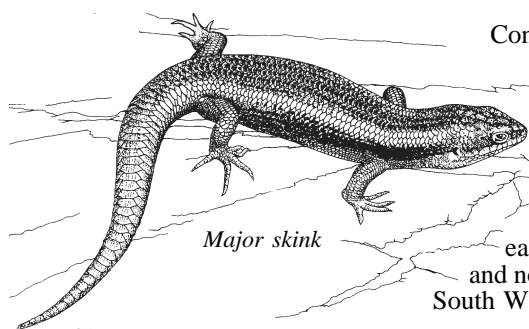
Gould's goanna (*Varanus gouldii*) is found in most parts of continental Australia, although it tends to prefer sandy areas and avoids rainforest. Reaching one and half metres in total length, and weighing several kilos, Gould's goanna is black with varying amounts of yellow. It is at home on the ground, rarely climbing trees, as it seeks prey of many types – insects, lizards and their eggs and small mammals – and scavenges for carrion. It digs holes or uses tree logs or other animals' burrows as retreats. Eggs are laid in a deep burrow which is then closed and concealed by the female.



Skinks (Family Scincidae)

These are the most numerous of lizards with 1300 species in the world and about 300 species in Australia, found in all environments. They tend to be smooth and usually glossy. Most eat insects, some eat other lizards and others eat fruits, flowers, leaves and fungi.

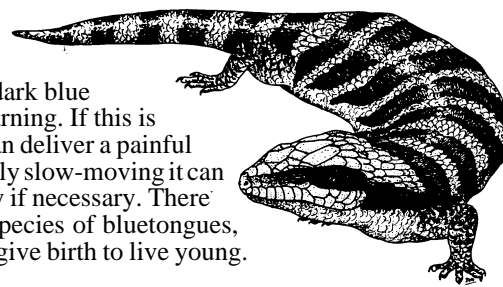
The **major skink** (*Egernia frerei*) is found along the east coast of Queensland to the New South Wales border and in Arnhemland, patterns and colouring varying according to location. It is a large skink, up to 39cm in total body length, thickset and generally glossy brown, and can be seen sunning itself at the edge of open forest or rainforest. It eats insects, snails, other lizards and vegetable material and lives in small communities in complex burrow systems.



Major skink

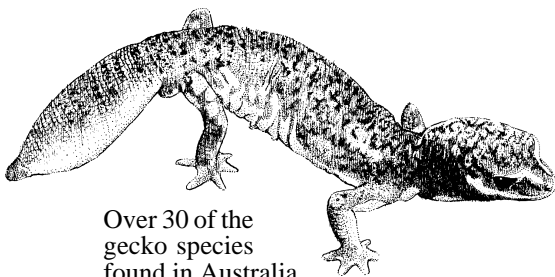
Confusingly, the related, and similar, *Egernia major* is commonly known as the land mullet. It is found in south-east Queensland and northern New South Wales.

The **common bluetongue lizard** (*Tiliqua scincoides*) at 56cm total length, is one of the world's largest skinks. It is found across the northern tropics (but not in rainforest) and along the eastern and south-eastern part of the continent. It is a thickset lizard with small legs and a more-or-less banded back which varies according to location. It can be active on warm nights as well as during the day and eats insects, snails and vegetable material such as fruits. When alarmed this skink opens its pink mouth, hisses and sticks out a dark blue tongue in warning. If this is ignored, it can deliver a painful bite. Generally slow-moving it can move rapidly if necessary. There are several species of bluetongues, all of which give birth to live young.



Geckos (Family Gekkonidae)

There are over 90 gecko species in Australia, most of them under 20cm in total length. These are nocturnal lizards although they may be active in dark places during the day. They feed only on prey which moves, such as insects and smaller geckos. A gecko's eyes are permanently covered with a transparent eyelid, perhaps to reduce evaporation. Unable to clean its eyes with tears, the gecko licks them with its tongue. Some gecko species are parthenogenetic, meaning that the females can produce offspring without male input.



Over 30 of the gecko species found in Australia belong to the *Diplodactylus* genus. The **fat-tailed diplodactylus** (*Diplodactylus conspicillatus*) is found only on the ground in stony and grassy areas across much of the top of Australia, its colour varying to match the habitat in which it lives. About 10cm in total length, it has a bulbous tail which acts as a fat storage organ, and feeds on termites and other insects.

The fat-tailed diplodactylus spends its days in underground holes, such as abandoned burrows of trap-door spiders, blocking the entrance with its fat tail to keep out predators and keep in moisture. It is sometimes called the burrow-plug gecko. Most adults have lost their original tails which are replaced with more rounded ones which make even better burrow-plugs.

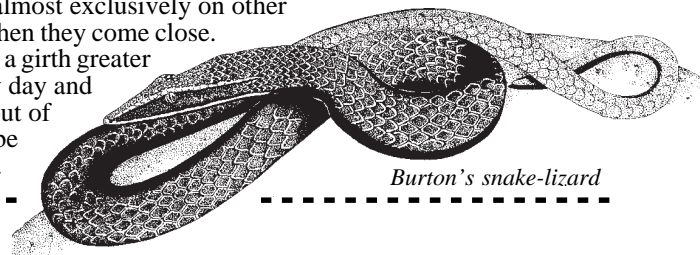
The **spiny-tailed gecko** (*Diplodactylus ciliaris*) is found in woodlands and grasslands, westwards from western Queensland, living in trees or other vegetation. It is also frequently seen on roads. This is one of 10 'tail-squirting' species. It can eject an offensive and sticky liquid from the spines of its tail. By lifting its tail it can aim the fluid accurately up to a distance of 30cm. This gecko is also particularly good at changing colour from dark to very pale.

Bynoe's gecko (*Heteronotia binoei*) is very common throughout most of the Australian mainland. Also known as the prickly gecko, because of its bumpy skin, it thrives in all types of habitat from forests and woodlands to arid areas. It shelters in crevices, under logs and in rocks, but at night searches open ground for insects – and other geckos. These geckos sometimes lay eggs in communal nests which may contain up to 150 eggs.

Legless lizards (Family Pygopodidae)

Legless lizards are quite closely related to geckos, sharing many characteristics. There are 35 species, 33 found only in Australia and two also in New Guinea. These are sometimes called flap-footed lizards because, while they lack forelimbs entirely, they still have a scaly flap where the hind legs once were. Their loss would probably have enabled these lizards to fit better into small spaces in vegetation and rock crevices and to burrow in soil. They are also called snake-lizards due to their obvious resemblance. However, they have broad, flat tongues, not forked ones, and move with more regular curving movements. They stay out of sight most of the time, basking in upper layers of leaf litter and soil and moving in the open only at night if possible.

Burton's snake-lizard (*Lialis burtonis*) is the most widely distributed of the legless lizards, living in most habitats except for rainforest. It can grow to 62cm in total length. It has a long, pointed head, quite unlike any snake's, and is very variable in colour, even within populations in small areas. Although most legless lizards eat insects, this species feeds almost exclusively on other lizards, ambushing them when they come close. It can swallow a lizard with a girth greater than its own. It is active by day and night, but prefers to keep out of sight by day and tends to be nocturnal in hotter regions.



Burton's snake-lizard

QUESTIONS & ANSWERS

Q Is it true that predator birds such as crows and hawks, will carry a live ember from burnt bush to start new fires elsewhere, so increasing their hunting opportunities?

A Black kites are sometimes called 'fire hawks' because they collect in large numbers above fires, looking for insects, small mammals and reptiles fleeing from the blaze. The idea that they also actively spread fires is often repeated. I have been unable to find anyone who has actually seen this but am assured that it has been observed by reliable naturalists in the Northern Territory and that it has also been reported from Africa – black kites are a widespread species.

Dr Penny Olsen of the Australian National University wrote in response to this query: "I have heard it but imagine its likely that the kite grabs some poor creature fleeing the flames and in doing so gets a fistful of burning grass or whatever, which it then drops. However, black kites have learnt to drop chips into water to 'fish', so who knows?"

If any readers have personally seen this behaviour, I would be glad to know about it (editor).

Crows are very clever birds, though whether they too are arsonists is thought unlikely. Certainly they are adept at using and even creating tools, though. A captive New Caledonia crow was observed bending a piece of wire to make a hook to retrieve food, repeating this many times. For more details about this see the website: http://news.nationalgeographic.com/news/2002/08/0808_020808_crow.html

Q How many species of *Eucalyptus* are now *Corymbia* and is there a list of them with descriptions? Why were they changed? Can you suggest where to get scientific names?

A In 1995, all bloodwoods and ghost gums were given their own genus, *Corymbia*. A genus is a category for grouping together species which have descended from one ancestor and, as a result, are closely related. However, differences in the DNA as well as other structural differences, such as leaf anatomy and flower structure, showed that there were actually two groups within *Eucalyptus*, which is why the change was made.

Nevertheless, *Corymbia* are still given the common name eucalypt. Initially 113 species were included, but a few more have since been added so the total is currently about 130, a number which will change as more species are described.

The decision to separate *Corymbia* was published by botanists Laurie Johnson and Ken Hill in *Telopea* 6 (2-3), a journal issued by the Royal Botanic Gardens, Sydney. Ian Brooker, author of *Eucalypts of Australia* (3 volumes) does not agree and does not include the name *Corymbia* in his books. Appendix 4 of Hill and Johnson's paper gives a table which shows how the names used by Brooker correspond to *Corymbia*. However, it may no longer be in print. A list of Queensland *Corymbia* species can be found in *Names and Distribution of Queensland Plants, Algae and Lichens*, a Queensland Herbarium publication.

Acknowledgements to John Clarkson, Queensland Parks and Wildlife Service.

Facts and stats

There are about 6,400 reptiles in the world with roughly 700 in Australia. These include snakes, lizards, turtles and crocodiles.

Goannas are also known as monitor lizards. *Varanus*, their scientific family name comes from the Arabic word for monitor, because these lizards had a reputation for warning of the approach of a crocodile – they were monitoring the situation. The word 'goanna', used only in Australia, is derived from the Spanish word 'iguana', originally used for large American lizards.

A 5.5m long *Megalania*, a goanna with ancient origins, was present in eastern Australia as recently as 30,000 years ago and would have crossed paths with Aboriginal settlers.

Largest Australian skink status is claimed for both the land mullet at 58cm total length and the common bluetongue at 56cm total length. Largest dragons are the eastern water dragon and the frilled lizard, both growing to about 95cm total length.

The largest Australian goanna is the desert-dwelling perentie which can grow to two and a half metres in total length but it is dwarfed by the massive Indonesian Komodo dragon, another goanna which reaches lengths of 3m and can weigh 250kg.

Some geckos are able to perform gravity-defying feats, walking on ceilings and on panes of glass, thanks to numerous little hooked bristles on the soles of their feet which give them an astonishing grip. Scientists in California are hoping to produce synthetic versions which could be used to improve tyres and shoes for athletes – and perhaps make ceiling-painting easier!

No Australian lizards are venomous. The only venomous lizards in the world are the Gila monster and bearded lizard of north America.

Geckos must be on guard against inadvertently sharing their hidey-holes with predatory snakes but tests with Lesueur's velvet gecko, found in south-east Queensland and coastal New South Wales have shown they are able to not only detect the odour of a snake, but distinguish potential predators from harmless snake species.

The smallest lizards in the world grow to just 16mm from snout to vent – scarcely long enough to stretch across a 10 cent coin. Two related species of geckos, they live on islands in the Dominican Republic and the British Virgin Islands.

TOURIST TALK

ENGLISH	GERMAN	JAPANESE	
lizard	Eidechse	tokage	トカゲ
diverse	vielfältig	kotonatta	異なった
reptile	Reptil	hachurui	爬虫類
solar energy	Sonnenenergie	taiyo enerugi	太陽エネルギー
hibernate	überwintern	toumin suru	冬眠する
efficient	effizient	nouritsuteki na	能率的な
frill	Halskrause	furiru	フリル
crocodile	Krokodil	kurokodairu	クロコダイル
estuarine	an der Flußmündung	kakou	河口
tail	Schwanz	shippo	尻尾

Out and about



Brilliant red flowers appear on **coral trees** (*Erythrina variegata*) during the dry season, usually sprouting from bare branches, the tree having temporarily lost its leaves. Rich in nectar, these peaflowers are popular with birds such as honeyeaters. The stems and branches are covered with small black prickles which tend to become longer when the tree is subjected to water stress but dropping off as the stems enlarge.

This tree is found in open forest and woodland often on shallow, gravelly soils and behind the beaches. It is also a native of India, Malaysia and Burma; with seeds which can float in salt water it has been able to spread by sea. In Asia, this tree is put to a number of agricultural uses – leaves provide a good fodder for stock and the wood is used for fences, light packing boxes, paper pulp and fuel. Its deciduous habit is put to good use by farmers who use the trees to support pepper, vanilla, betel and yam vines which need shade during the hot wet season, but appreciate sunshine in the cool, dry season.

Recently a ranger in **Cape Tribulation**, in north Queensland, discovered a tourist bus stopped on the road in the vicinity of Noah Creek with its hazard lights flashing. Passengers had alighted and were standing around a sub-adult cassowary. Cassowaries are large, unpredictable and potentially dangerous birds; people should not approach them. In this case the tour operator did not seem concerned that he was putting his passengers at risk. More vehicles stopped and soon the road was blocked in both directions as people wandered around a very confused cassowary.

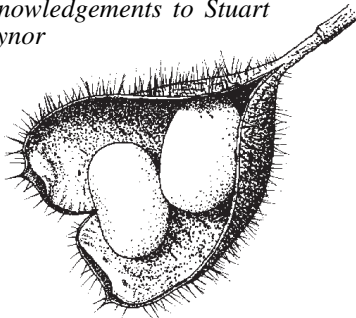
We all love to see a cassowary but the chances are strong that this particular bird will be next seen dead on the road. For the safety of both cassowaries and people, these animals should not be approached and should never be encouraged near roads.

Woodswallows

are among the many nomadic birds of the savannas which move according to food supplies. White-browed woodswallows may appear in flocks of 100 or more, following locust swarms. They tend to move north in winter, returning south in spring and summer and nesting when conditions are good, thus taking advantage of the unpredictable Australian conditions.

White-breasted woodswallows also tend to move north in winter, arriving in large numbers to feed on grasshoppers and other insects. They are usually seen high in the sky around sunset catching moths in flight. These birds are seldom found far from water and have an endearing habit of sitting side by side, snuggling together in groups and preening each other.

Acknowledgements to Stuart Traynor



Caesalpinia bonduc, is a prickly vine known as **nicker nut** and also as wait-a-while, although it is quite different from the scrambling, thorny rainforest palm of that name. It grows in monsoon vine thickets mainly near the coast, although it can also be found quite far inland, possibly where seeds have been accidentally carried. Because the seeds can float, and remain viable in salt water for several years, these plants are found in coastal regions throughout the Pacific, Asia and even America.

Scrambling or climbing to a height of 3m or more, this legume has yellow peaflowers which are followed during the dry season by oval, slightly heart-shaped, brown, woody seed capsules which are covered in dense spines. These open to drop rounded dull, olive-green seeds which resemble animal droppings or balls of plasticine rather than seeds. They are collected by great bowerbirds.

Look out for

freshwater jellyfish.

Although not exactly well-known, these creatures have been found in most parts of the world and in every Australian state except Tasmania. James Cook University researcher, Lisa-ann Gershwin, is keen to find out how widespread they are. They are likely to be found across the tropics, in any calm water bodies such as dams, fish ponds, shallow pools and slow-flowing waterways.

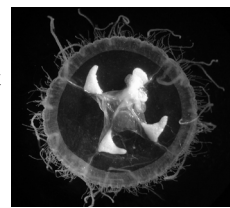
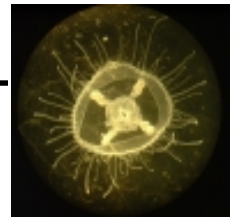
Restricted to freshwater, the jellyfish are white or colourless, delicate and lacy and about the size of a 5 or 10 cent coin. They are probably found all year in tropical areas often appearing in large numbers when they can look like drifting snowflakes in the water. They then tend to disappear within months or just weeks, not appearing again for maybe 5-10 years. It is possible they are transported on the feet of waterbirds.

These jellyfish eat small aquatic invertebrates, including mosquito larvae and are thus a potentially important mosquito control.

They may have a mild sting, but this is thought to only affect people with very sensitive skin.

If you come across these animals, Lisa-ann Gershwin would love to hear from you. You can contact her by phone: 4781 6446, or email: lisa.gershwin@jcu.edu.au There is an American website on freshwater jellies: <http://nsm1.nsm.iup.edu/tpear/thing.htm>

Male **great bowerbirds** are busy around their bowers from April until November or December emitting harsh, rasping calls and hoping to attract females. Found throughout the northern savannas, these birds can be very numerous in the denser woodlands, particularly near water. The male's bower is a dense avenue of upright twigs arranged in parallel, curving walls and decorated with white stones and shells and green fruits, glass and so on. The male tends to rebuild his bower each year, often next to the old one. After mating the female goes off to nest and raise the young on her own while the male continues to attend the bower, hoping to attract more partners.



Photos by Lisa-ann Gershwin

BOOKSHELF

Reptiles and Amphibians of Australia
Harold G. Cogger
Reed New Holland (2000)

This is the standard reference book for Australian reptiles.

Encyclopedia of Australian Animals: Reptiles
Harald Ehmann
Angus & Robertson (1992)

Each species has a brief description plus interesting information on special features and behaviour. There are also photos and distribution maps as well as a good introduction.

Australian Tropical Reptiles and Frogs
Clifford and Dawn Frith
Frith and Frith Books (1991)

Australian Crocodiles: A Natural History
Grahame Webb and Charlie Manolis
Reed New Holland (1998)

This extremely informative book looks at all aspects of crocodiles.

Lizards of Australia
Stephen Swanson
Angus & Robertson (1990)

Forty Queensland Lizards
Floyd D. Dale
Queensland Museum (1973)

Australian Journal of Ecology (1996)
21, 386-398

The effects of fire on the frillneck lizard (*Chlamydosaurus kingii*) in northern Australia
A.D. Griffiths and K.A. Christian

The Future Eaters
Tim Flannery
Reed New Holland (1997)

Tim Flannery's famous book looks at diversity and extinctions, among many other things.

Nature Australia Vol 26 No 5 Winter 1999

Home Geckonomics
Sharon Downes

This article is about Lesueur's velvet gecko.

Nature Australia Vol 27 No 6 Spring 2002

Goannas, first-class monitors
Steve van Dyck

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2003.

This newsletter was produced by the Environmental Protection Agency with funding from the Cooperative Research Centre (CRC) for Tropical Savannas Management.

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Orange (savanna) issues of *Tropical Topics* (nos. 64, 68, 71, 73 & 75) can be found on the CRC for Tropical Savannas Management website: http://savanna.ntu.edu.au/publications/tropical_topics.html



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