ANIMALS

MAMMALS

Australia is home to an astounding diversity of animals, including more than 386 species of mammals, These are a group of animals in which females, like humans, feed their young with milk, but despite the fact that some species, particularly the smallest of Australia's mammals, are facing the threat of extinction, due primarily to the loss of habitat and predation by feral carnivores, others have readily adapted to an urban environment, and that means that unique and beautiful creatures are right on the doorstep of millions of city and suburban residents.

Many of the mammals that hop, scurry, and dawdle across the landscape are marsupials, with one of the most distinctive characteristics of most of these being the fact that they give birth to relatively undeveloped young that the mother carries in a pouch as they grow. Approximately 70 per cent of the world's marsupial species are found in Australia, and that's a very good reason why this continent can lay claim to being the lucky country.

SOUTHERN BROWN BANDICOOT

Isoodon obesulus

'Bandicoot' is an Indonesian word meaning 'rat', and anyone who glimpses this tiny marsupial for a mere second or two as it scurries through the darkness of the night can be forgiven for mistaking it for a less than welcome rodent.

There are five recognised sub-species of the southern brown bandicoot, with individual sub-species found in the south-western corner of Western Australia where it's known as a 'quenda', in south-eastern Australia, including Tasmania, and in far north Queensland. The southern brown bandicoot is also found in New South Wales where it's regarded as an endangered species, and although several small groups exist in that state, there are only two major populations of this attractive marsupial - one in the southern coastal region and the other north of Sydney.

Bandicoots prefer bushland habits with long grass or other low and dense vegetation that provides them with shelter and protection from predators, and although they're generally solitary animals, both males and females lay claim to extensive home ranges that they vigorously defend from intruders.

The southern brown bandicoot is roughly the size of a rabbit, and has a pointed snout, small rounded ears, coarse dark grey to brown hair on its head, back, and sides, creamy white hair on the underside of its body, and a thin, almost hairless tail.

It's a creature of the night, and spends the day dozing in its secluded retreat that's merely a depression in the ground that's lined with leaves and grass, but when darkness descends over the landscape, the bandicoot strides into action. With its long feet and strong claws it's well equipped for digging for food that includes plant roots, tubers, and earthworms, and it supplements this juicy diet with a second course of insects and spiders.

Gardeners who awake to find holes in their lawns may not initially be enthralled at the realisation that a bandicoot has moved into the neighbourhood, but the damage these secretive creatures cause is a small price to pay for the benefits that a resident bandicoot brings. Their keen sense of smell allows them to locate and destroy the underground insect larvae that cause unsightly dieback of lawns, and they'll eagerly scoff any cockroaches or other insect pests that they discover while foraging for their favoured foods.

Southern brown bandicoots breed several times during a single year, with a female, after a gestation period of merely 12-15 days, producing a litter of up to five young, but sadly only one or two usually survive. The tiny hairless babies, which are about 12mm in length, make their way up to their mother's pouch and attach themselves to one of her teats where they remain for around seven weeks. At about three months of age the young bandicoots are ready to live on their own, and they need to make the best of their short lives, for adult females generally live for no more than 18 months, and males rarely survive for more than a year.

Owls, dingoes, and quolls prey on bandicoots, but these are not their greatest enemies, for it's introduced carnivores - cats, dogs, and foxes, that pose the most serious threat to the survival of these beautiful nocturnal creatures. Land clearing practices, which have reduced the available areas of suitable habitat for bandicoots, have also had a dramatic impact on their populations, with their numbers having fallen dramatically since Europeans first laid claim to the land. Of the estimated 12 species of bandicoots that once roamed across the continent, half are now either extinct, on the brink of extinction, or extremely rare, and what a tragic loss it would be if the southern brown bandicoot became merely another statistic, another species added to the list of animals that were once on the doorstep of so many Australians.

Opposite page: This greater glider, a member of a vulnerable species, took refuge in the author's garden after a storm brought the tree in which it had made its home crashing down to earth.

A southern brown bandicoot near a camping area in Wallingat National Park in New South Wales.

Camels near the tiny outback town of Wanaaring in New South Wales.

DROMEDARY CAMEL

Camelus dromedarius

When Europeans first settled in Australia they made themselves at home only on its coastal fringe where the land was more fertile, where fresh water was readily available from permanent rivers and streams, and where the climate was more amenable to people born in cooler regions. Men with a thirst for adventure were eager to discover what lay a little further afield, but many journeys through the harsh and arid interior required more than rugged and determined men with horses as pack animals.

In 1840 the first shipment of camels arrived in Australia from India, and a new phase of exploration of the continent began. During the next 70 years some 10-20,000 camels were imported, and these hardy animals, which could travel for several days without water, played a major role in opening up the interior of the country to settlement. They were used to transport all manner of goods, they towed wagons loaded with wool and wheat to river ports, they dragged the heavy implements required to excavate dams, and they pulled ploughs and other farm implements as settlers cleared the land for agriculture. But in the 1920s, when motorised transport became a widespread reality rather than merely a vision of the future, camels became redundant and large numbers were released into the wild.

Today, Australia is the only country in the world where wild herds of dromedary camels still roam freely across the landscape, but it's not a fact of which everyone is proud. With approximately a million feral camels thriving in the deserts and semi arid regions of the continent, and their population estimated to double every 8-10 years, these once valued beasts of burden, now in plague proportions, are regarded as a curse rather than a blessing.

Females usually give birth to a single calf only once every two years, but with individuals living for up to 50 years, and with no predators other than humans, the continual existence of large populations of these feral animals is almost guaranteed. They feed on the foliage of shrubs and trees, in preference to grasses, and there are concerns that, particularly during periods of drought, massive herds of wild camels reduce the amount of food that's available for native animals, and that their feeding habits may lead to the extinction of some plant species.

Camels' hooves cause less damage to the landscape than those of cattle, but when vast numbers of animals, which can drink 100 litres of water in merely 10 minutes, congregate to quench their thirst, they damage fences and foul waterholes with their faeces.

Unfortunately, there are no long-term solutions to address the problem of how to control or reduce the population of feral camels. Some are farmed for their meat, small numbers are used in the tourist industry, and many are shipped to Middle Eastern countries where the best are destined to become the stars of the region's important camel racing industry. But it appears that, at least for the foreseeable future, the descendants of the camels that shaped the history of Australia will continue to populate the outback and will wander past the doorstep of outback towns, remote aboriginal communities, and isolated homesteads as they have done for almost a hundred years.

DINGO

Canis lupus dingo

There's continuing conjecture about the origins of Australia's largest carnivore, the dingo, but one fact that's beyond dispute, thanks to the science of DNA, is that it's a descendant of the Asian grey wolf. Some theorists insist that the dingo was brought to Australia by adventurous Asian seafarers some 3,500 years ago, and while fossils reveal that this native dog has indeed roamed across the landscape since that distant time, recent evidence suggests that it might have arrived on the continent's shores at an even earlier date.

The dingo is the only non-marsupial carnivore in Australia, and early European pastoralists regarded it as nothing more than a savage beast that threatened their livestock and that had to be exterminated. Dingoes, which never found their way to Tasmania, are now in far lower numbers than in the early days of European settlement, particularly in many parts of New South Wales, Victoria, south-eastern South Australia, and the most southerly regions of Western Australia, but in many other areas of the continent, particularly in semi-arid inland regions, relatively large populations of these attractive canines are thriving, much to the delight of those who regard the dingo as a valuable member of the Australia wildlife community and to the displeasure of modern day graziers, many of whom hold the same negative view of dingoes as their predecessors.

A variety of methods, including hunting and the laying of poisoned baits, are regularly utilised to eradicate the animals from rural properties, and landowners in southern Australia continue to rely on a defence strategy that was conceived in the 1880s. The wild dog fence, a 5,614km long barrier that now stretches from Jimbour in Queensland west beyond the Eyre Peninsula in South Australia, is the world's longest fence, and was constructed to protect flocks of sheep in southern Australia, where dingoes had once been almost exterminated, from predation by dingoes from northern areas. Sheep now graze in relative safety south of the fence where any surviving dingoes are hunted and destroyed, but the dramatic reduction in the population of Australia's largest carnivorous predator has had its down side. Now, with no natural predators to keep their numbers in check, kangaroos, rabbits, and feral pigs, which

Opposite page: A feral camel in western Queensland.

are frequently in plague proportions, have brought landowners a range of additional problems, for excessive numbers of kangaroos damage fences, and pigs and rabbits cause considerable damage to the land with erosion an inevitable consequence, and all compete with livestock for food that, in times of drought, is in limited supply.

To the north of the dog fence the dingo roams across the landscape as it has done for thousands of years, although it's continually faced with campaigns to eradicate it or to reduce its population whenever it's regarded as posing a threat to livestock.

Dingoes, which howl rather than bark, usually live in packs. While most have golden brown hair and all have a bushy tail with a white tip, not every animal fits this mould, for their colour varies depending on their habitat and provides them with a hint of camouflage. The relatively small numbers that live in woodlands and forests tend to have darker colouring with some being almost black, while those that inhabit the most arid sections of their range are lighter, and the small numbers that are found in alpine regions have creamy white hair.

They are opportunistic carnivores, and with their diet including rabbits, kangaroos, wallabies, wombats, rodents, and reptiles, they're rarely faced with a shortage of food. They play an integral role in maintaining the balance of native animals, and a study into the diet of dingoes in Western Australia revealed that they fed primarily on red kangaroos and emus, with domestic livestock being only a minor ingredient of their diet. If their preferred food is unavailable or in limited supply, dingoes will prey on livestock, taking the easy option and hunting down the youngest and weakest of animals, and the fact that, on a few well documented occasions, they have attacked and even killed young children, does nothing to enhance the animal's reputation or to

Left: A dingo at a camping area near Alice Springs in the Northern Territory.

promote its status as a species worthy of conservation.

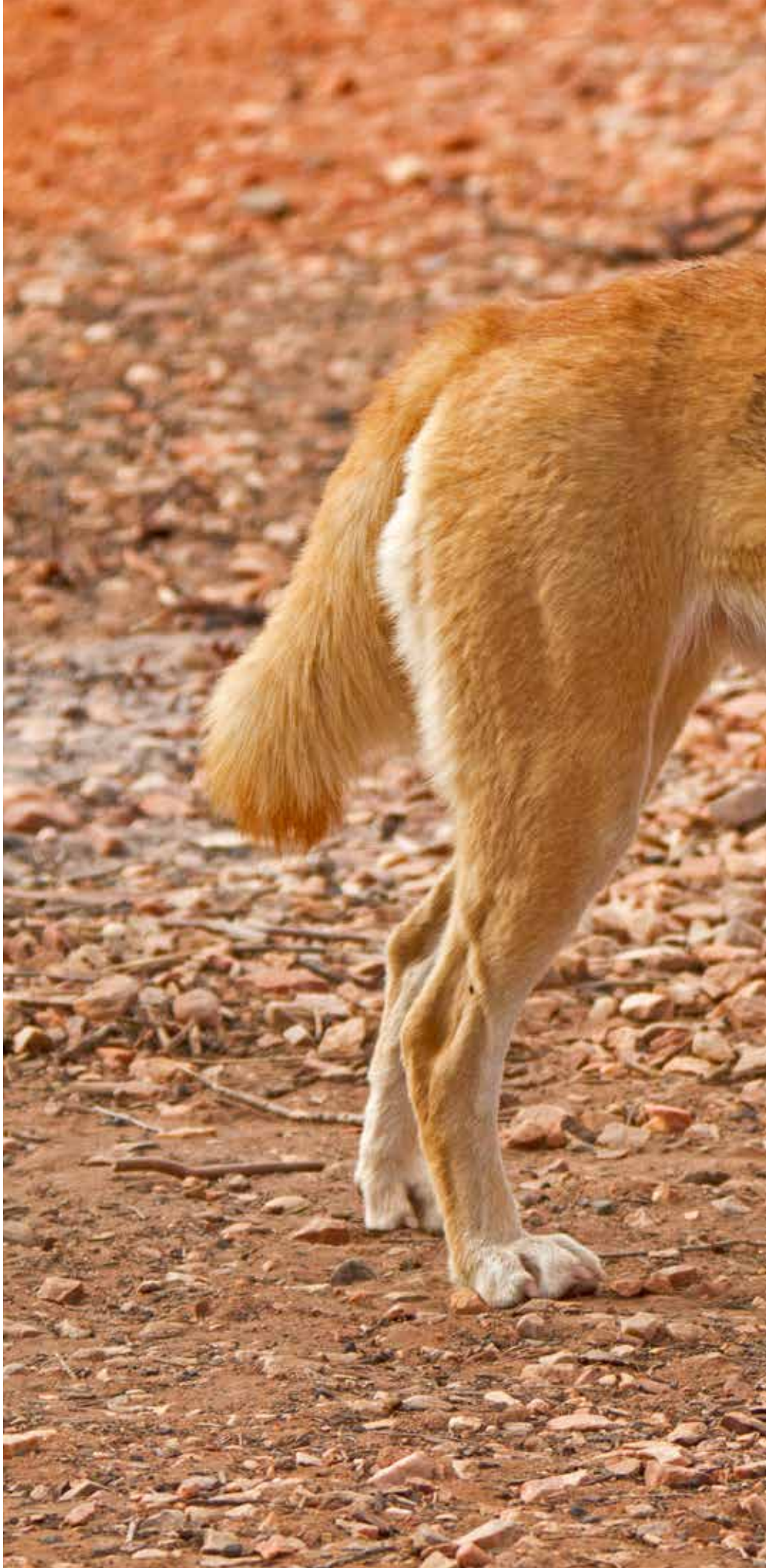
Dingoes breed once a year, with each female producing a litter of three to five pups that she raises in a sheltered retreat within a hollow log, among rocks, or in the commandeered burrow of rabbits or a wombat. With more mouths to feed, she's soon out on the hunt for food, and when sheep or calves are attacked, it's usually the dingo that's named as the culprit, but there's another carnivore that's routinely on the prowl for food, and that's often responsible for attacks on livestock.

Feral and domestic dogs readily interbreed with dingoes, and it's their hybrid offspring that are the greatest villains. Hybrids breed more than once a year, so increase their populations faster than dingoes, and with man and his dogs now inhabiting every corner of the continent, continual interbreeding between the two species is inevitable. An estimated 90 per cent of wild dogs are regarded as being hybrids, and there's justifiable concern that this situation may ultimately lead to the extinction of the pure dingo, which is currently listed by the International Union for Conservation Nature and Natural Resources as a vulnerable species.

GREY-HEADED FLYING FOX
Pteropus poliocephalus

In recent years an aura of fear has surrounded the grey-headed flying fox, for they and other Australian flying foxes are carriers of the deadly Hendra virus that made its first appearance in 1994. It's horses that are primarily at risk of contracting this usually fatal disease that can be passed onto anyone coming into contact with an infected animal. Around 70 horses and four people have died after contracting the disease, but a

Right: A dingo at a camping area in the West MacDonnell Ranges near Alice Springs in the Northern Territory.



vaccine has recently been developed to protect horses from the virus, and with no evidence of humans having been directly infected by contact with flying foxes or their secretions, there's no genuine reason to fear these creatures of the night.

Grey-headed flying foxes can be seen, and heard, in eastern Australia, from Rockhampton in central Queensland to western Victoria, and in recent years they've ventured further west towards Adelaide in South Australia. They make themselves at home wherever there's a supply of their favoured foods, which include the nectar and pollen of flowering trees, in addition to sweet and succulent fruit, and they hang around in forests, woodlands, orchards, and urban parks and gardens.

The flying fox's colloquial name refers to its facial resemblance to a red fox, and although its head is covered with grey fur, the fur that coats its chest and its back is of the same chestnut brown colouring as its terrestrial namesake. With a wing span of up to a metre, grey-headed flying foxes are the largest bats in Australia and one of the largest in the world. They are highly social nocturnal animals that, during the day, hang out together, suspended among the branches of trees, in large flocks that can contain several thousand individuals. With their dark grey wings wrapped tightly around their bodies, it's a time when workers on the night shift should be sleeping, but there's always plenty of argy bargy going on among the members of a colony of flying foxes, and peace and quiet is rarely the order of the day as they flutter and squawk in their arboreal roosts.

At dusk, there's an even greater crescendo of noise as they head off to their favoured feeding grounds. They'll travel up to 50 kilometres in search of the best place to dine, and will enthusiastically feast on the flowers of native trees, including eucalypts,

Left: Grey-headed flying foxes hanging around in trees at Hervey Bay in Queensland.

banksias, and melaleucas, and as they flutter from tree to tree, they play an important role in the environment by pollinating the flowers of each tree that they visit. And when natural foods are scarce, flying foxes, have no qualms about feeding on the sweet and succulent fruits of orchards.

As the warmth of summer approaches, females give birth to a single young that, for the first few weeks of its life, clings tenaciously to its mother's body, but when it's time for the tiny bat to taste independence, it's left to hang out for the night in a crèche with other juveniles while their parents head off to feed.

The population of grey-headed flying foxes has declined dramatically in recent decades, and they're currently listed by the International Union for Conservation Nature and Natural Resources as a vulnerable species. They once numbered in their millions, but there are now around 600,000, and while that figure may not give everyone cause for concern, these great bats could be at risk if the rate of decline that has been seen in recent years continues unabated.

There's no doubt that many people would welcome a reduction in the numbers of grey-headed flying foxes, for these are animals that are often despised, for when they congregate in immense numbers in urban areas, fouling the ground beneath their roosting sites with their faeces, creating an overpowering stench, and shattering any hint of tranquillity with their incessant screeching, they make themselves far from popular, and despite the fact that they play an invaluable role in the environment, no one wants flying foxes hanging around right on their doorstep.

GREATER GLIDER

Petauroides volans

This enchantingly beautiful marsupial is one that might be almost on the doorstep of anyone who lives in close proximity to a native forest, but it's a secretive creature that's rarely seen. It spends the majority of its life in the treetops, and as its name implies, it glides from one tree to another. It does this with the greatest of ease, thanks to the strong flaps of skin that connect its front and hind legs, and that act like wings to allow this agile aviator to move silently through its lofty realm.

The greater glider's favoured habitat includes the open woodlands and eucalypt forests that cloak much of the coast and hinterland regions of eastern Australia, from northern Queensland to central Victoria. And what they're looking for in the perfect home is not a dark and damp rainforest, but an old growth forest or woodland that has plenty of large trees with hollows in which, as nocturnal marsupials, they can spend each day in the land of nod.

The greater glider, which is the largest of Australia's arboreal gliders, has thick dark grey or brown fur covering much of its body, a light brown face, a creamy white throat and chest, a long furry tail, and enormous furry ears. And with its gliding membranes that stretch from elbow to ankle, this most stunning of animals can soar through the treetops for a distance of up to 100 metres and, if the need arises, it can change direction abruptly while in flight.

Like the more familiar koala, greater gliders feed almost exclusively on the leaves of a few select species of eucalyptus trees. They'll also scoff the trees' flowers and buds, and when they opt for a change of taste, they'll nibble on the young cones of pine trees, on the leaves of acacias, and on the parasitic mistletoe that often drapes itself across the limbs of eucalyptus trees.

These are animals that, for much of the year, live a solitary existence, but each is content to share its treetop accommodation with a mate when the breeding season arrives. Females give birth to a single young that travels with its mother, in the comfort and security of her pouch, for the first 3-4 months of its life. As it savours independence, it waits in a familiar treetop hollow or clings to its mother's back while she forages for food, but the young glider draws the line at hanging on tight while its mother glides through the air. And at about 10 months of age it takes a great leap of confidence and sets out on its own to soar through the forest where, if all goes well, it will remain for the approximately 15 years of its life.

In the greater glider's habitat there's keen competition for tree hollows, with other gliders, possums, and many species of birds all requiring similar accommodation. They'll fiercely defend their home range and any hollows to which they claim ownership from both birds and animals that might attempt to move in, but there's little they can do when a large owl, a goanna, or a carpet python arrives on the scene. These are the major predators of gliders, and with speed, silence, and deadly striking accuracy, they have all the hunting skills required to capture their furry prey.

In recent decades there's been a substantial reduction in the numbers of greater gliders, and it's a decline that's continuing unabated. The loss of habitat as a result of bushfires, land clearing, and the logging of old growth forests are to blame for the lack of food and habitat that are essential for the survival of this glorious creature, and the very real threat to its existence led to its recent inclusion on the government's list of vulnerable species.

It might be rarely seen, but simply an awareness that such a spectacular wild creature exists is surely enough to encourage everyone to do whatever they can to protect the greater glider's habitat from further destruction.

Left: Grey-headed flying foxes hanging around in trees at Hervey Bay in Queensland.

This beautiful greater glider was hiding in the author's garden after the dead tree that had been its home came crashing down to earth during a storm.

BRUSH-TAILED POSSUM
Trichosurus vulpecula

The brush-tailed possum's species name, *vulpecula* is derived from a Latin word meaning 'little fox'. It's a rather peculiar description for an animal that lives in the trees, but 'vulpecula' is also the name of a stellar constellation in the northern skies, so perhaps the possum's name is a reference to the fact that it's out and about at night with its beauty rivalling that of the stars.

Brush-tailed possums, which are found in all states of Australia, are nocturnal marsupials that live in woodlands and forests where they spend their days sleeping on shaded branches or in hollows in old trees, but they've found a new world to inhabit and have enthusiastically moved into urban environments where humans generously, although often unwittingly, provide everything that possums require for their survival. If there are no suitable trees in the vicinity, they'll frequently take up residence in a dark corner of a garden shed or garage, or become squatters in the roof cavity of a house, if they can squeeze their way in.

In the wild, they supplement their diet of fruit with snacks of leaves and flowers, but in suburbia there's a far wider range of goodies on offer than at Mother Nature's table. Fruit is still at the top of the possums' menu, and they'll happily scoff any that they find in backyards and commercial orchards. They'll feast on a range of other tasty treats too, including garden vegetables, flowers, and foliage, and are particularly partial to roses and, if undisturbed, will devour the entire plant, including its flowers, leaves, stems, and thorns. And like many wild creatures that have adapted to an urban lifestyle, they'll happily dine on less healthy food, such as bread that humans often provide.

With its body covered in grey to brown fur, and with large ears, a long furry tail, a pink nose, and pink toes

Right: A possum in a shed in the author's garden.

These twin possums were born and raised by their mother in a garden shed on the author's rural property in Queensland.

A possum peers out from among a pile of sacking in a garden shed on the author's Queensland property.

that have large claws, the brush-tailed possum is a very attractive animal. It spends much of its life alone, but when an individual discovers a convenient urban habitat, others often move in to share the accommodation. After a night of carousing and feeding they return, just before dawn, to settle down to sleep, and those that have found shelter in the roof of a house make their presence known to the building's human inhabitants with angry growling as disputes erupt over the sleeping arrangements.

There's plenty of argy bargy too when the breeding season arrives, and they hiss and growl as males fight for the right to mate with the female of their choice. Females, making themselves cosy in either a secluded hollow in a tree in their natural environment or in a dark and well hidden niche in the urban landscape, usually give birth to a single young, although occasionally twins are born. The tiny baby, with legs no thicker than a blade of straw, struggles through its mother's dense fur to reach her pouch where it remains safe and warm for several months. Later, it rides on her back, gradually acquiring all the skills it will require to survive in an urban jungle or a wild forest.

Possums were once hunted for their soft fur and were in demand by early settlers as bush tucker to add to a steaming stew, but in the modern era, with Lady Luck as their companion, a comfortable life is guaranteed if they can evade the gaping jaws of dingoes, cats, foxes, and pythons that are always on the lookout for a tasty brush-tailed possum.

KOALA
Phasclarctos cinereus

When the koala was christened with its scientific name it led to a long-term misconception regarding this iconic Australian animal. '*Phasclarctos*', the name of the genus to which the koala belongs, owes its origin to two Greek words - '*Phaskolos*' meaning a pouch, and '*arktos*' meaning a bear. Females of this native marsupial species have a pouch in which they carry their young, but despite the fact that this endearing animal is often referred to as a 'koala bear', it bears no relationship, if you'll pardon the pun, to any type of bear.

The koala's earliest ancestors are believed to have existed more than 25 million years ago, but they were twice the size of the cuddly character that, in 1798, left John Price wide-eyed with amazement. A servant of the governor of the colony, he was a member of a group that was exploring the land beyond Sydney when, in the vicinity of the modern day town of Bargo, he claimed his moment of fame as the first European to record a sighting of a koala that, he noted, was known by local aborigines as 'cullawine'.

In that distant era, immense numbers of these unique animals thrived in the continent's extensive eucalypt woodlands, but their soft fur made them a prime target for hunters. By the early years of the 20th century, koala populations had been decimated in South Australia, New South Wales, and Victoria, and Queensland became the new hunting ground for those who supplied the fur trade. In 1919, when the state government announced a six month open season on the almost defenceless animals, an estimated one million were slaughtered, and in 1927, during another open hunting season, another 800,000 were massacred in a single month. An outcry of public indignation finally led to the koala being listed as a protected species in 1937.

The koala is no longer in demand for its fur, but it's a species that remains in danger, primarily from the ongoing destruction of its habitat, and with predators including feral dogs and foxes, and diseases all putting additional pressure on their populations, there's grave concern for the remaining widely dispersed communities of these adorable animals.

Right: A koala dozing in a tree among houses on Raymond Island in Victoria.

An estimated 43-80,000 live in eastern Australia, with their sprawling range extending from northern Queensland to central and western areas of the state, and into New South Wales, Victoria, and South Australia where they inhabit eucalypt forests and woodlands.

Koalas, which are primarily nocturnal animals, survive on a diet of nothing more than eucalyptus leaves, and although there are many hundreds of species of these native trees, koalas are very selective and usually browse on the leaves of only two or three species within their home range. And with their highly developed sense of smell they have no trouble finding their favoured foliage.

Eucalyptus leaves are extremely fibrous and have low levels of nutrients but koalas are perfectly adapted to such a monotonous and low quality diet. They have a very slow metabolism that allows them to retain their food within their digestive system for a relatively long period of time, thus ensuring that every skerrick of nutrition is extracted from the leaves. But the half a kilogram or more of leaves that an adult koala eats every night provides only a minimal amount of energy, so rather than go gallivanting around, koalas settle down in high branches and sleep for around 18 hours a day to conserve their energy.

A mature male is readily distinguished from a female by the prominent brown patch on the white fur of his chest. It's a sticky substance that's exuded from his scent gland, and it's this that he rubs onto trees to ensure that other koalas are well aware that they're within his territory. A female with which he's mated gives birth to a tiny naked joey that, despite being blind and merely 20mms long, makes a miraculous unguided journey through its mother's dense fur to her pouch where it remains for approximately six months until it's confident enough to clamber outside and learn all it needs to know about its environment as it rides on its mother's back or clings to her abdomen.

Koalas rarely need to drink, except in times of drought, for they obtain sufficient moisture from their food, and usually only clamber down to the ground when they want to move from one tree to another. And it's then that they're most vulnerable to predators, and are also at risk of being injured or killed as they venture, with their curious waddling gait, across roads. Their natural predators include large reptiles, dingoes, and birds of prey, but koalas are most at risk from dogs and vehicles that are responsible for the deaths of around 4,000 animals every year. In optimum conditions koalas can live for up to 10 years, but sadly few reach that ripe old age. Some 80 per cent of Australia's eucalypt forests have been destroyed or become severely fragmented since the first days of European settlement, and as areas of suitable habitat continue to fall victim to human progress, the koala, which is currently listed as a vulnerable species, continues its dawdling journey that takes it ever closer to the brink of extinction.

NATIVE BUSH RAT

Rattus fuscipes

The native bush rat is a very widespread and common member of Australia's wildlife community, but due to its small size and the fact that it's a creature of the night it's rarely seen in the wild. It thrives in eastern Australia, from central Queensland to Victoria and south-eastern South Australia, with populations also found on the south-western tip of Western Australia. Its wide range of habitats include sub-alpine woodlands, coastal scrub, eucalypt forests, and rainforests that have dense ground cover, with shaded gullies crammed with low shrubs and ferns being among its favoured haunts.

Anyone catching merely a brief glimpse of this secretive little creature

Right: A bush rat at a riverbank camping area in Wallingat National Park in New South Wales.

can be forgiven for confusing it with the less than welcome black rat. A closer look reveals that the native bush rat, with its greyish brown fur, has feet that can be pink, white, grey, or brown. It has rounded ears rather than the pointed ears of a black rat, and while the introduced rat has a very long tail, the tail of the native bush rat is slightly shorter than the combined length of its head and body, which is approximately 16cms. And although it might be living, unseen, almost on the doorstep of many Australians, the bush rat, unlike the black rat, is not a creature that will claim squatter's rights in a house and require eviction.

These secretive little animals spend much of their time dozing in hollow logs or in burrows from which they make brief nocturnal foraging excursions for food. Insects are high on their list of favoured snacks, but bush rats are great survivors, and when bush tucker is in limited supply, particularly when a bushfire has ravaged the landscape, they'll make the best of the bad times and feast on fungi that are quick to make an appearance after an inferno.

These diminutive rodents will breed at any time, although in the southern extremity of their range they tend not to do so during the coolest months of the year. In a good season, a female may produce several litters, each of which, on average, has five minute babies, and at merely 4-5 weeks of age, the young rats become independent and set off to explore the world around them and to establish their own small territories. Each male may occupy a relatively extensive home range and, on a single night, out and about in search of food, additional territory, or a mate, he may cover a kilometre, and that's a lot of tiny steps for such a little animal as it meanders through the vegetation hoping to avoid the attentions of the many predators that see a bush rat as a delectable snack.

Right: A wombat in the Wollemi National Park in New South Wales.

COMMON WOMBAT

Vombatus ursinus

In 1797, when the Sydney Cove, a merchant vessel loaded with a cargo of 7,000 gallons of rum, together with sacks of rice, sugar, tobacco, salted meat, and other food supplies, set its course from India to the colony of New South Wales, its crew had no crystal ball to reveal that the drama that would play out in the coming months would be included in the first pages of the story of Australia. As they crossed Bass Strait the ship began to leak, wild weather destroyed some of her sails, and while five men died as they struggled to keep the ship afloat, scurvy raged among the remainder of the crew. And although tempestuous weather eventually took its toll and ruptured the ship's hull, the captain managed to beach the vessel in shallow water, and the survivors dragged themselves ashore on what was to become known as Preservation Island.

It was here that the crew of the doomed Sydney Cove became the first non-aboriginal people to see a wombat, and although they might have had access to some of the ship's provisions, they feasted on the fresh meat provided by these unfamiliar creatures and drowned their fears of the future with the rum salvaged from the wreck.

Four months after the disaster, a rescue party reached the remote island, and Lieutenant Matthew Flinders, who was among the group, captured a wombat and, on his return to Sydney, he presented it to the governor of the colony, John Hunter, who wrote in his journal that the strange animal "was exceedingly weak when it arrived, as it had, during its confinement on board, refused every kind of sustenance except a small quantity of boiled rice, which was forced down its throat. I had it frequently taken out of the box in which it was kept, that it might receive the benefit of the warmth of the sun, which, however, it did not seem to enjoy. It grew weaker every day, was exceedingly harmless, and would allow any person to carry it about. After having lived, with scarcely any kind of food, for six weeks, it died."

The year after the Sydney Cove tragedy, John Price, one of Governor Hunter's servants, was exploring the land near the present day town of Bargo. He encountered many unfamiliar wild creatures and wrote in his journal that his companion, James Wilson, referred to one of these peculiar creatures as a 'whom-batt', the name used by aboriginal people. It was, he wrote, "an animal about 20 inches (50cm) high, with short legs, and a thick body with a large head, round ears, and very small eyes," and that remains an accurate description of the animal that's known today as the bare-nosed or common wombat.

Wombats have large, strong claws, and they utilise the tools that Mother Nature has given them to excavate cavernous burrows that evolve to become a maze of tunnels up to 30 metres long and with several entrances. Their burrows undermine roads and buildings, damage crops, create gaping holes into which cattle and horses can stumble and break a leg, and pass beneath rabbit-proof fences, thus allowing rabbits to access valuable crops. Early rural settlers, unable to effectively combat the problems caused by wombats, cried out for help, and in 1906 governments responded by classifying wombats as vermin, and in 1925, with a bounty placed on their heads, land owners had an additional incentive to destroy the animals.

Hunting, together with land clearing and the destruction of the wombats' habitat, had a dramatic impact on their populations. Today, in greatly reduced numbers, wombats, which are one of only a few marsupials that remain active above the snow line of alpine regions during the winter, dawdle through the forests of south-eastern Australia, including Tasmania, and are found in scattered areas from the southern border of Queensland, through eastern New South Wales and southern Victoria to the south-eastern

corner of South Australia.

The wombat, with its course greyish brown fur, and a short stumpy tail on a stocky body that's about a metre in length, is primarily a nocturnal animal that's rarely in a hurry and that moves through the darkness of the night at a pace that's generally little faster than that of a pedal car with square wheels. It's a relatively timid creature, but despite having relatively poor eyesight, it has keen senses of smell and hearing, and the moment it senses a threat or realises that someone is approaching, it will make an unexpectedly hasty retreat, for a wombat can run at up to 40km/h for just long enough to reach the safety of its burrow.

Wombats feed on grasses and herbaceous plants, with roots, bark, moss, and even fungi also forming part of a diet that they chew with teeth that grow continuously throughout their lives.

Each wombat may have several burrows within its home range, and although they briefly share their subterranean domain with others during the breeding season, these highly territorial animals usually live alone. With scent trails and droppings, often left on a rock or a log, they mark the limits of their territory, and with grunts of displeasure, they aggressively chase other wombats away from any area that they claim as their own.

Fortunately, they're a tad more sociable during the breeding season, and each mated female eventually gives birth to a single minute baby that clambers into its mother's pouch that, by facing backwards, is perfectly designed to ensure that it doesn't become contaminated with soil while the wombat is digging.

Despite the fact that the common wombat, in most areas of its range, is now a protected species, this amazing marsupial remains in grave danger, for in eastern Victoria it's still regarded as a pest species and can legally be hunted and killed. There's little that wombats can do when threatened by hunters with guns, by the continual destruction of their habitat, and by vehicles that claim the lives of many wombats every year as they dawdle across country roads. But when the threat to their survival comes from feral dogs, dingoes, and Tasmanian devils, they rush to the safety of their burrows, and that's where these seemingly placid and harmless characters get the upper hand on their enemies. Any predator that follows a wombat into the depths of its burrow is in for an unpleasant surprise, for if it reaches over the wombat's back in an attempt to get a grip on its prey, the wombat raises its bulky body up to crush its pursuer's head against the roof of the tunnel, or kicks at it with its powerful rear legs, and only a few have a narrow escape from a wombat's lair and live to tell the tale.

This echidna was rummaging through debris on the forest floor in the Lane Cove National Park that's on the doorstep of the New South Wales city of Sydney.

ECHIDNA

Tachyglossus aculeatus

The echidna is unquestionably one of Australia's most peculiar native animals and fossils have provided irrefutable evidence that the ancestors of these prickly characters wandered across the landscape when dinosaurs ruled the earth. It's one of only two monotremes, which are egg laying mammals, that exist anywhere on earth, and it's a claim to fame that it shares only with the platypus.

The echidna, which is one of Australia's most widespread native mammals, can be found in a diverse range of environments, from snow covered mountains to semi-arid outback regions, and will settled down and make itself at home wherever there are hollow logs, rocky crevices, or burrows excavated by wombats or rabbits in which it can shelter during the most sizzling summer weather and on icy winter days. And it will often take up residence in an urban area if food and shelter are available.

Echidnas have long and sharp spines covering the back of their short and stocky bodies, and a short and inconspicuous tail. Their short legs are perfectly designed for digging, with their front feet having claws that are the perfect tools to dig into decaying logs and termite mounds in search of food, while their hind feet point backwards and enable them to push soil away when they are burrowing.

The colloquial name of 'spiny ant-eater' aptly sums up this most curious of creatures, for it's certainly a very spiny character and ants and termites are a dominate part of its diet. The echidna, which meanders through the bush both day and night, utilises electroreceptors on its long, hairless, tubular snout to detect danger, to find a mate, and to search for food as it rummages through debris on the forest floor or shuffles through the grasses of the open plains that it also inhabits. It excavates termite mounds with its strong claws, and probes every crevice with its long tongue. And at times it takes the lazy option, and after scraping away the crust of a termite mound to send its inhabitants into a frenzy, the echidna simply lies on the mound and waits for the termites to walk onto its extended tongue. It takes more than a few to satisfy its appetite, but an echidna can scoff 200 grams of its favoured insects in merely 10 minutes.

It's a timid creature that, when startled by the approach of a human or in an attempt to evade a predator, will tuck its snout and legs beneath its body to create a spiny ball, dig itself into soft soil, squeeze into a crevice among rocks, or simply waddle away in an ungainly hurry.

Echidnas, which are generally solitary animals, come together only to

mate. During the breeding season, the female develops a pouch into which she lays a single egg that eventually cracks open to reveal a tiny animal that's about 15mm long. The young echidna, which is known as a puggle, remains in its mother's pouch for about three months, sucking milk from mammary hairs on its mother abdomen, but as its spines begin to develop, it's evicted from the pouch and raised in a shallow burrow until, at about six months of age, it sets out alone to face the world.

Despite their formidable armour, echidnas are frequently stalked by hungry dingoes and foxes that have developed ways of coping with even the most prickly of prey. Many fall victim to the appetites of these ravenous carnivores but, with luck on their side, echidnas can live to the grand old age of 45.

Above: This echidna was crossing a track near the New South Wales town of Scone.

MACROPODS

1629 was irrefutably a bad year for Dutchman Francisco Pelseart, for it was then that his ship, the Batavia, was wrecked off the coast of Western Australia, but Pelseart's name lives on, not only as the man who rescued the survivors of the tragedy, but also as the first European to see either a wallaby or a kangaroo, and the creature that he spotted on the shore was a Tammar wallaby.

Captain James Cook, who also features prominently in the pages of Australia's early history, is best known as the first European to navigate and chart the continent's eastern coastline, but he too has an additional claim to fame, for it was he who added the word 'kanguroo' to the English language. It was a word he heard spoken by the indigenous people of an area near what is now Cooktown in northern Queensland, and in 1770, one of the officers who accompanied Cook on his great adventure shot and killed one of the first kangaroos they encountered, and it became the prime ingredient in a meal for Cook and his crew.

Kangaroos were a valuable source of meat for early explorers and a great curiosity for settlers in the new colony and for the residents of distant lands, and in 1791, when a live kangaroo was exhibited for the first time in London, there was no shortage of people prepared to pay the admission fee of a shilling for a glimpse of what a reporter of the day described as "the most amazing, beautiful, and tame animal from the southern hemisphere that almost surpasses belief."

Kangaroos and wallabies are among the approximately 73 species of Australian marsupials that are known collectively as macropods, a term derived from a Greek word meaning 'large footed', and that also includes smaller kangaroo-like animals such as pademelons, quokkas, potoroos, bettongs, and tree-kangaroos that literally live in the trees of tropical rainforests. And in size they range from the tiny musky rat-kangaroo, which weighs merely half a kilo and that inhabits the rainforests of northern Queensland to the iconic red kangaroo that thrives in arid outback regions.

Left: A joey peering out of its mother's pouch in the Coolah Tops National Park in New South Wales.

The kangaroo features prominently on the Australian coat of arms, and its inclusion is said to be a symbolic reminder that the nation will always move forward and never backwards, for the kangaroo, thanks to its unique anatomy, cannot walk backwards. Its rear legs always move forwards together, not independently, at least when the animal is on terra firma, but it's a different matter when one of these amazing marsupials takes to the water, as it does occasionally during floods or if there's no other way to escape from danger, for then it can move its rear legs alternately and swims surprisingly well in a relatively unfamiliar aquatic environment.

Many people know little about kangaroos and their close relatives other than the fact that they bound along on their powerful hind legs, and that females carry their young in a pouch, but there are plenty of other reasons why these beautiful animals are high on the list of the world's most amazing creatures, and one of their most astounding features is their reproduction process.

During severe droughts, when food is in short supply, the females of some species can delay the development of the embryo in their womb until environmental conditions, and thus their young's chance of survival improve. And when that time arrives, a tiny embryonic joey, that's blind and hairless, that's around 25mm long, and that weighs less than a gram emerges to begin the greatest journey of its life. Clinging to its mother's fur with its tiny claws, unaided, and using nothing more than instinct and a determination to survive, the newborn joey miraculously makes its way up over its mother's

abdomen and scrambles into her pouch. There it grasps a teat that swells inside its mouth and thus keeps the joey attached to its source of nutrients until, after several months, it's ready to venture out into the wide world beyond the warmth and security of its mother's pouch.

A joey that has vacated the pouch continues to suckle from the same teat that it used for the first few months of its life, with its mother's second teat utilised by the next joey to be born. And in an amazing feat of nature, each teat supplies milk of a different composition that's uniquely suited to the nutritional requirements of joeys that are at differing stages of development, with the milk for the youngest joey containing less fat than that provided for its older sibling that, although living outside the pouch, still requires milk in its diet.

Some species of macropods thrive in large numbers and, during the best of seasons, they breed up to a level where their populations are in almost plague proportions, but others, primarily as a result of the destruction of their habitat, have seen their numbers dramatically reduced, with some species teetering on the brink of extinction. And it's a situation that John Gould, the acclaimed 19th century English naturalist and artist, warned Australians about in his monumental work 'The Mammals of Australia'.

"Short-sighted indeed are the Anglo-Australians, or they would ere this have made laws for the preservation of their highly singular, and in many instances noble, indigenous animals," he wrote. "Let me urge them to bestir themselves, ere it be too late, to establish laws for the preservation of the large kangaroos, the emu, and other conspicuous animals; without some such protection, the remnant that is left will soon disappear," he added prophetically. But sadly his words went unheeded for many years.

Right: Female red kangaroos near a camping area in the Flinders Ranges in outback South Australia.

RED KANGAROO

Macropus rufus

The red kangaroo is not only the largest kangaroo to hop across the Australian landscape, but with adult males of the species reaching a height of almost two metres, it's also the largest marsupial in the world.

No one who's got even a few of their marbles left would call a green apple red, but logic seems to have taken flight when it comes to the colloquial name of the red kangaroo, for although males generally have reddish brown fur, many female red kangaroos are bluish grey and are consequently referred to not only as red kangaroos but also as 'blue fliers'. And just to add a little more confusion, both sexes, in some areas of their range, have undisputably red fur covering much of their bodies, with the majority of both males and females generally a lighter colour on the chest, and having greyish brown faces with a broad white stripe extending from each corner of the mouth to the each ear.

Red kangaroos are most at home in the semi-arid and arid regions of mainland Australia, and although they thrive in open woodlands, they're also commonly seen on the vast plains of the outback and among low scrub and mulga forests.

They graze primarily on grasses, but these iconic herbivores will also eat the foliage of several species of shrubs and other low growing plants, and with their food providing them not only with nutrients but also with a large percentage of their water requirements, they're well adapted for survival when, during the droughts that take a heavy toll on the environment, many sources of water have evaporated.

Red kangaroos are gregarious characters that live in family groups and large mobs, and they know exactly how to cope with the harsh climatic conditions of their natural environment. And that means that they're at their most active in the cool and early hours of the morning, at dusk, and during the night. They take life easy in the hottest

A male red kangaroo on the doorstep of a camping area in the Flinders Ranges National Park in outback South Australia.

part of the day and settle down to doze in the shade of trees or among the long grasses that, in good times, cloak the inland plains. They communicate with one another using a range of distinctive sounds, with a guttural coughing noise warning of danger, a throaty growl indicating anger, and a mother's subtle clucking voice letting her joey know that she demands its attention.

Dingoes and foxes may attack small and vulnerable joeys, but *Homo sapiens* is the red kangaroos' only serious predator, and although, if cornered, they'll vigorously defend themselves with their strong legs and their long sharp claws, they generally rely on speed and agility when threatened. With the ability to cover the ground at a sustained hopping speed of around 25km/h and able to reach 70km/h over short distances, they can easily escape from any danger, except a human with a gun.

More than two million red kangaroos are killed annually for their meat, which is exported to 55 countries, but despite the slaughter, immense numbers of these majestic animals still thrive in the wild, with their population estimated to be in excess of 11 million. In some regions, numbers of red kangaroos have increased considerably since European settlement, thanks to the provision, in arid areas, of dams, troughs, and other sources of water for livestock that kangaroos are happy to take advantage of. Their numbers fluctuate dramatically from year to year, with droughts and good seasons all having a natural role to play in their reproduction and survival, but while the climate remains unpredictable, the one certainty is that the magnificent red kangaroo will grace this great land for every day of the foreseeable future.

EASTERN GREY KANGAROO

Macropus giganteus

In Tasmania, where the eastern grey is known as the Forester kangaroo, it's seldom seen anywhere other than in the central and north-eastern regions of the island state, but it's a dramatically different situation on the mainland where this most common of Australia's many species of kangaroos and wallabies is often regarded as a pest. With more than 16 million bounding across the continent's varied landscapes, the chance of seeing one or more of these beautiful creatures is almost as much of a certainty as the possibility of glimpsing a glint of gold in the nation's mint.

They thrive on Australia's vast inland plains, although they're less common in arid areas than red kangaroos, but their habitat is not restricted to the outback, for they're also residents of the woodlands, forests, and semi-arid mallee scrub of eastern Australia, and are equally at home in sub-alpine regions. Eastern grey kangaroos have no hesitation whatsoever in settling in urban environments too, particularly during times of drought when they discover that reliable sources of food and water are on offer, but few people throw a welcome party when these iconic animals adopt golf courses, parklands, and gardens as part of their home range, and add the foliage and flowers of ornamental plants to their diet.

When large mobs silently emerge from the remnant vegetation that's dotted across many agricultural areas, farmers declare war as the roos gorge themselves on valuable crops. And in the Australian Capital Territory, the home of the nation's parliament, the battle rages on, for the extensive bushland reserves that are scattered throughout the city are ruled by more than 30,000 eastern grey kangaroos. With an estimated 150-300 animals per square kilometre, they're the territory's most prominent native residents, and they show that, at least for kangaroos, life was definitively meant to be easy as they laze on the verdant lawns of homes that they're eager to share, including the residence of the Governor General. And in recent years the annual cull of around 2,000 animals has triggered vigorous debate about the necessity to limit the population of these amazing and beautiful creatures.

The eastern grey kangaroo's species name '*giganteus*', gives a clear indication that this is a very large animal, but despite the fact that some males stand almost two metres high, most have a less imposing stature and are considerably smaller than their relatives, the red kangaroos. Its common name provides an apt description too, for the fur covering its upper body and head is light grey to brown. By contrast, its under parts and legs are light grey to white, and its thick light grey to brown tail has a conspicuous dark brown to black tip.

Although grass forms the major part of the diet of the eastern grey kangaroo, it's a highly adaptable character that will nibble on a wide range of other vegetation, and in addition to the daylilies, geraniums, and succulent plants that it feasts on when they're laid out before it in an urban garden, it will occasionally eat fungi, and has been recorded feeding on seaweed and the seeds of mangrove trees that have drifted onto ocean beaches. And that adaptability is one reason why this species is able to thrive in a great diversity of habitats and can survive prolonged periods of drought.

Eastern grey kangaroos are very gregarious characters, and although it's often just mum and dad and their joey hanging out together, with the latest addition to the family occasionally taking a peek at the outside world from the security of its mother's pouch, they often gather in large mobs, particularly when there's an abundance of food available. They communicate with one another via gentle clucking sounds, throaty growls, and harsh coughing noises, and are most active from dusk to dawn when they seek out the tastiest food that either Mother Nature or humans have generously provided.

During the day, they adopt a life of relative leisure and rest in the shade of trees or other vegetation, and as summer temperatures soar they lick

An eastern grey kangaroo at Nuga Nuga National Park in south-western Queensland.

Below and opposite page: An eastern grey kangaroo with her joey near the coastal town of South West Rocks in New South Wales.

their forearms and hold them out in a fleeting breeze to reduce their body temperature. And, like a cat, these meticulously clean animals wash their faces and whiskers by wiping them repetitively with their dampened forearms.

If danger comes their way, they're instantly alert and, able to hop across the landscape at speeds up to a staggering 60km/hr, they make a hasty retreat. In some situations they do the unexpected, for eastern grey kangaroos are not afraid of water and can swim quiet efficiently over short distances, propelling themselves steadily through the water with the use of their strong legs and their long tail which acts as a rudder. The most amazing fact however, is that when a female emerges from the water, after swimming across a river or a lake, her joey, having travelled in its mother's submerged pouch, remains completely dry and is as unaffected by the aquatic experience as by an every day journey across the arid outback plains.

WESTERN GREY KANGAROO

Macropus fuliginosus

In 1802, when the famed navigator Matthew Flinders landed on Kangaroo Island, off the coast of South Australia, he killed some kangaroos for food and believed that the meat on his plate was that of an eastern grey kangaroo, but he was mistaken. The identities of eastern and western grey kangaroos remained blurred for many years, and it's only in relatively recent times that the western grey has been recognised as a species that's distinct, in very subtle ways, from its eastern relative.

The woodlands and forests of coastal regions of South Australia and western Victoria, together with southern areas of Western Australia, western New South Wales, and the vast semi-arid plains of south-western Queensland are all part of the extensive range of western greys that, in the most easterly regions, they share with their close relatives, the eastern grey kangaroos.

While the colour of their fur is one of the most conspicuous differences between western and eastern grey kangaroos, it's a more subtle characteristic that sets the two species apart. The gestation period of a western grey female is merely 30 days, while for an eastern grey that time is extended to 37 days, and although western grey kangaroos, which often roam across the landscape in family groups of up to 25 individuals, frequently live almost side by side with mobs of eastern greys, the two species don't interbreed in the wild.

Adult males, which stand about 1.3 metres high, are considerably larger than females. Both sexes have reddish brown fur on the upper body and head, light brown to cream under parts, very large ears that share the body colour at their base but that are generally lighter at the top, and a reddish brown tail with a dark brown tip.

In common with other species of kangaroos, western greys are primarily creatures of the night that spend their days taking it easy in a shaded retreat before heading out to feed as the heat of the day dissipates and night begins to draw its ebony curtain across the sky. And although grasses are the primary ingredient of their diet, they'll also feed on the foliage of a wide selection of the shrubs and low trees that thrive within their varied habitats.

These are gregarious creatures that often congregate in relatively large groups, and with the accessibility of watering points for livestock having improved their chances of survival in arid areas, western grey kangaroos, although their numbers fluctuate with good and bad seasons, are thriving, and despite the fact that their population is considerably less than that of some other species, more than 2.3 million of these endearing animals remain part of Australia's spectacular and diverse wildlife community.

A female western grey kangaroo in Innes National Park on the Yorke Peninsula in South Australia.

Western grey kangaroos on the doorstep of a camping area at Innes National Park on the Yorke Peninsula in South Australia.

Young western grey kangaroos sparring at a camping area at Mungo National Park in outback New South Wales.

Western grey kangaroos on the doorstep of a camping area at Innes National Park on the Yorke Peninsula in South Australia.

Young western grey kangaroos sparring at a camping area in Mungo National Park in outback New South Wales.

RED-NECKED / BENNETT'S WALLABY

Macropus rufogriseus

In 1981, archaeologists who were digging in a large cavern beside Tasmania's Franklin River made a discovery that sent them into a frenzy of excitement, for in Kutikina cave they unearthed incontrovertible evidence that this had been the home of a hardy group of humans at the end of the last ice age, some 15-20,000 years ago. It was a time when the landscape was dominated by glaciers that crept down the mountain valleys and when vast mobs of wild animals fed on verdant grasses in clearings surrounded by lush forests. In addition to many thousands of stone tools, Kutikina cave contained huge quantities of the bones of animals that early Australians had hunted for food, and some 75 per cent of the remains were of red-necked wallabies that, in Tasmania, are known as Bennett's wallabies.

The red-necked wallaby still thrives on the island that it's called home for millennia, and this most abundant of all wallabies is also a resident of eastern areas of the Australian mainland, where its range stretches from central Queensland to the South Australian and Victoria border region, and its varied habitats include woodlands, both wet and dry forests with an undergrowth of low vegetation, and grasslands that are in close proximity to trees.

With the largest males being around 1.5 metres tall, and females considerably smaller the red-necked wallaby is less conspicuous than its more imposing relatives, the great kangaroos, but while Mother Nature created an animal that's relatively small in stature, she blessed the red-necked wallaby with staggeringly good looks. Reddish brown to grey fur covers most of its upper body. Its under parts are merely pale grey to brown, but with its chestnut brown neck, shoulders, and head, a dark strip running down the centre of its face, creamy white cheek stripes, a black nose, and black paws, the red-necked wallaby is one of the most beautiful of Australia's many wild creatures.

In many situations it's a solitary animal that shares its life with a mate only during the breeding season, but when there's an ample supply of food, red-necked wallabies, which are most active at night, are content to be part of a large mob that feeds on grasses and herbaceous plants. They routinely dine in open areas that are close to forests or woodlands, for these provide a shaded retreat where these appealing little animals can doze during the day and to which they can scurry back and hide if danger creeps too close for comfort while they're out in the open.

In Tasmania, Bennett's wallabies have found themselves in paradise and have taken advantage of the perfect conditions that have inadvertently been provided for them, for where forests have been destroyed, grasses have thrived, and with enough trees remaining to keep the wallabies happy, their numbers have increased dramatically in recent decades with an estimated five million currently hopping across the island state. That's not good news for many farmers however, and with tens of thousands of red-necks killed every year by landowners on whose crops they gorge, the news is not too good for the wallabies either.

On the remote and isolated islands of Bass Strait, the wild stretch of ocean between the coast of Victoria and north-western Tasmania, farmers are plagued by immense numbers of wallabies. By conservative estimates, half a million call King Island home, and on this speck of land, which is merely 64kms long and 26kms wide, that equates to around 500 wallabies per square kilometre. Farmers, rather than despairing of the situation, are reaping financial rewards from the growing populations of native animals,

Left: A red-necked wallaby on the doorstep of a camping area at Dunn's swamp in the Wollemi National Park in New South Wales.

A red-necked wallaby on the doorstep of a camping area at Dunn's swamp, in the Wollemi National Park in New South Wales.

A red-necked wallaby near a camping area in the Wollemi National Park in New South Wales.

and on the island where beef and dairy cattle once provided the main source of agricultural income, large numbers of wallabies are now culled each year for their meat, with more than 83,000 killed in 2015.

A similar situation exists on neighbouring Flinders Island, where Bennett's wallabies have thrived, in the absence of any natural predators, for more than 20,000 years. Today they graze contentedly on lush pastures that were initially intended for flocks of sheep, and here too large numbers are harvested for their meat.

Death is a sad fact of life, but despite the slaughter, the Bennett's wallaby remains one of the most commonly seen native animals in Tasmania and on its windswept islands, and there are plenty of opportunities for human residents of mainland Australia to spot the adorable red-necked wallaby in the wild too.

SWAMP WALLABY
Wallabia bicolour

The swamp wallaby is in a class of its own, and although it may have many similar physical characteristics to other macropods, it has a range of genetic, reproductive, and behavioural characteristics that set it apart from all other wallabies and kangaroos.

It's a resident of eastern Australia, and is found in Queensland, New South Wales, Victoria, and south-eastern South Australia, and despite its colloquial name, it's more often seen in woodlands and forests with dense, tangled, and almost impenetrable undergrowth, than in close proximity to swamps and wetlands.

It's a relatively small and stocky animal, with adult males reaching a height of merely 85cms, and although females are far smaller, they're just as attractive as their mates. With predominantly dark grey or reddish brown fur with chestnut brown patches on the chest and around the base of the ears, a cream facial strip on each cheek, a cream coloured belly, black paws on the forelegs, and a dark grey tail that becomes black towards the end, every swamp wallaby is a truly beautiful creature.

A common fallacy is that kangaroos and wallabies feed primarily on grass, and while that's true for most species, grass is certainly not high on the list of the swamp wallaby's favoured foods. It has a diet that's comprised of some curious ingredients, and with teeth uniquely designed to cope with coarse and highly fibrous plant material, it feasts on the bark of trees, on fallen and dry eucalyptus leaves, and on the tough foliage of many other species of trees and shrubs and, when they're within its reach, it will tuck into pine tree seedlings as a tasty dessert. To that seemingly unpalatable feast the swamp wallaby often adds some even more peculiar ingredients, including bracken, which is poisonous to cattle, the introduced weed hemlock, which contains toxins that can be fatal to both man and livestock, and some species of fungi that these curious little wallabies sniff out under the damp and decaying debris on the forest floor.

The swamp wallaby is not a fan of crowds and seems content with its own company, except when it temporarily shares its life with a mate or its joey. It scurries through the dark forest undergrowth, hopping along not in the upright manner of kangaroos and most other wallabies, but with its body and head almost parallel to the ground to enable it to spear through the vegetation as it dashes, at great speed, from one shaded nook to another, and it frequently vanishes from sight before anyone who might be in the vicinity can utter more than a gasp of wonder as this stunning and charismatic animal makes its fleeting appearance on Mother Nature's vast outdoor stage.

Left: A swamp wallaby in Bournda National Park in coastal New South Wales.

A swamp wallaby near a camping area in the Booderee National Park in New South Wales.

A swamp wallaby feeding on the leaves of a shrub near a camping area in the Mount Kaputar National Park, near the New South Wales town of Narrabri.

Right and opposite page: A female whip-tail wallaby near the town of Kalpowar in Queensland.

WHIP-TAIL WALLABY

Macropus parryi

In 1770, when Captain James Cook sailed into the gaping estuary of the Endeavour River, near present day Cooktown in northern Queensland, he spotted a curious animal that, he wrote in his journal, "was of a light mouse colour and the full size of a grey hound, and shaped in every respect like one, with a long tail, which it carried like a grey hound. In short, I should have taken it for a wild dog but for its walking or running, in which it jumped like a hare or deer." "This animal," he added, "is called by the natives, kanguroo."

Joseph Banks, a botanist who accompanied Cook on his voyage of discovery, was equally puzzled by the unfamiliar creature, but he had the opportunity to take a closer look when one of the ship's officers shot and killed the animal that, Banks noted in his journal, with a conspicuous lack of compassion, "was today dressed for our dinners and proved excellent meat." Fresh meat was in great demand by travellers on a long voyage into the unknown, and modern day experts, after analysing descriptions penned by both Cook and Banks, are confident that the kangaroo that provided them with valuable sustenance was, in fact, a whip-tail wallaby.

It's a species that's also frequently referred to as a 'pretty-face wallaby', and there's no question as to the reason behind that colloquial name, for this is a very pretty animal indeed.

Sir Edward Parry, an English naval officer and a famed Arctic explorer who arrived in Australia in 1829 to take up the role of commissioner with the Australian Agricultural Company, was the first to recognise the whip-tail wallaby as a distinct species. After capturing one of these stunning creatures, he kept it as a domestic pet, and with the species also known colloquially as 'Parry's wallaby', there's more than one reason why his name lives on in the pages of Australia's colourful history.

The whip-tail wallaby is found only in north-eastern New South Wales and eastern Queensland where, in a range that stretches as far north as Cooktown, grasslands and woodlands with an understorey of grasses, particularly those of hilly regions, are its favoured habitats.

During winter months it wears a coat of light grey fur across its back, but in summer it develops a predominantly reddish brown colouring. It has creamy white under parts, a prominent similarly coloured hip stripe, and a long slender tail with a thin whip-like end, but it's the whip-tail wallaby's face that is unquestionably it's most attractive and eye-catching feature. Although much of its face is covered with fur of a similar colour to that of its body, it becomes increasingly darker towards the nose, and has wide white cheek stripes and white fur at the base and near the top of its large ears.

This is the most gregarious of all wallabies and although it's often seen in a small family group, it's also happy to live as part of a mob of 50 or more individuals that are most active during daylight hours. In the heat of the summer, in common with most other macropods, they doze among shading vegetation in the middle of the day, but in the cooler months of the year and on overcast summer days they're out and about all day long, feasting on grasses and a wide range of herbaceous plants. They rarely need to drink, except during periods of severe drought, for they obtain all the moisture they require from the vegetation that they eat and from the early morning dew that may be scattered on verdant foliage.

Life is relatively harmonious for whip-tail wallabies, but during the breeding season there's a hint of argie bargie instigated by males as they attempt to attract a mate. The mob's dominant male quietly pursues the female that's the temporary focus of

Left: A male whip-tail wallaby near a bush camping area in central Queensland.

his passion, and aggressively chases away other males that may have similar intentions to his own, and while staring down the opposition, he rips up tufts of grass, presumably in a demonstration of his strength and superiority, and finally wins the day and the right to mate with his chosen partner.

BLACK-FOOTED ROCK WALLABY

Petrogale lateralis

Early taxonomists created the name '*Petrogale*' for the genus of Australian macropods that are commonly known as 'rock wallabies', but it's something of a derogatory title, for it's derived from a Latin word meaning a 'rock weasel'. The black-footed rock wallaby is known to aboriginal people by a more appealing name however, for they call this beautiful creature 'warru'.

Once upon on a time, long, long ago, the black-footed rock wallaby was found in every rocky landscape in Western Australia, in southern regions of the Northern Territory, and in central and northern South Australia, but time has not been kind to this attractive marsupial, for its populations have declined dramatically. It's now found in only a few remote and isolated locations, one being the West MacDonnell Ranges that sprawl across the arid outback landscape to the west of the town of Alice Springs in the Northern Territory. And while the largest community of black-footed rock wallabies thrives here, smaller groups still exist in equally arid regions in Western Australia and northern South Australia.

There's no accurate information regarding the current numbers of these elusive little creatures, but experts estimate that there are less than 10,000 in all, with the largest single community comprised of around 1,000 individuals. Each group is separated from others of its species by vast distances, and with the numbers in each segment of their shattered range continuing to decline, black-footed rock wallabies are classified as an endangered species in some parts of Australia and vulnerable in others.

There's no prize for successfully guessing what the dominant feature of the black-footed rock wallaby's habitat might be, for its name says it all. Stony outcrops, rugged and rocky hillsides, and steep gorges pock-marked with caves and shady crevices in which the wallabies can shelter from the heat of the day and hide from ravenous predators such as dingoes are the only environments in which these secretive creatures survive.

With predominantly grey to brown fur that's generally lighter and browner in summer months and that varies in colour depending on each animal's specific habitat, this relatively small wallaby is well camouflaged in its rocky surroundings. The fur of its under parts, on the back of its neck, and at the base of its ears is usually lighter than that of its back, and a thin dark brown to black stripe runs from its forehead, between its ears, and along its spine. Its face is dark grey with a darker streak from the nose to each eye, and a conspicuous and wide creamy white stripe from the side of the mouth to the base of each ear. The forearms and legs are grey with black paws and feet, and it has a tail that's longer than the combined length of its head and body and that has a dark bushy section at the end.

The black-footed rock wallaby is a creature of the night and rarely ventures out to feed before dusk. It frequently lives on its own or with a mate, but will also congregate with others of its kind in a mob of up to 100 individuals, and as it searches for the grasses, herbaceous plants, and native fruits that are all ingredients of its diet, it never travels far from the security of its daytime shelter.

It's an animal that's perfectly adapted for life in an arid environment, and by being able to obtain ample moisture from dew and from the vegetation that it consumes, it rarely needs to seek out a source of water from which to drink.

The black-footed rock wallaby has some unique physical characteristics that allow it to survive in a harsh and rugged landscape that's a forbidding environment for many other creatures. Its feet have thick and spongy pads that provide good grip on the precipitous rocky surfaces across which the wallaby leaps with astounding speed and agility. And its extremely long and highly flexible tail not only aids the black-footed rock wallaby in its balancing act on the most uneven of surfaces, but also acts as a rudder that allows it to rapidly change direction, even when it's airborne as it leaps from one boulder or cliff ledge to another.

A joey, when it first leaves its mother's pouch, has all the physical attributes of its parents, but to ensure its survival it needs to do exactly what it's told. And the message from its mother is that, unlike the young of other macropods that stay by their mother's side all day and night, it must remain at home while she goes in search of food. This unusual behaviour is perhaps due to the supposition that it takes some time for a joey to master the skills required to safely traverse the steep and rocky terrain, but some questions about this aspect of the animal's life remain unanswered. How does a mother instil in her joey the importance of remaining where she's left it, and do young wallabies always take heed of their mother's advice, or do those with a more adventurous spirit succumb to the temptation to leave home prematurely and plummet from a cliff face to their deaths? There's still much to be learnt about these secretive creatures, but one thing that's not in dispute is that by the time the morning sun takes its first peek over the horizon, black-footed wallabies are safely back in their shaded retreats where they'll doze once again until dusk returns with the hint that the security blanket of the night will soon be draped across the remote landscapes that are the home of one of Australia's most alluring creatures.

A black-footed rock wallaby in the West MacDonnell Ranges in the Northern Territory.

YELLOW-FOOTED ROCK WALLABY

Petrogale xanthopus

The yellow-footed rock wallaby might have bounded across the Australian landscape for many thousand of years, but in New South Wales it's a relative newcomer to the parade of animals that delight modern day Australians, for its presence in the far western region of the state was not recorded until 1964. Today, it remains one of the most colourful inhabitants of the Coturaundee Ranges, which are part of the remote Mutawintji National Park. In 1995, with a population of merely 100 individuals, the region's population of the species teetered on the edge of extinction, but today the situation is less dramatic, for some 300-400 now thrive in what is this stunning wallaby's only known habitat within New South Wales.

Yellow-footed rock wallabies were in great abundance prior to European settlement, and their only predators in that distant era were dingoes and aboriginal people who hunted them for their meat. It was the arrival of Europeans that signalled the beginning of a steep decline in their numbers, with destruction of the wallabies' habitat, hunting for the lucrative fur trade, competition for food from livestock and feral animals such as goats and rabbits, and predation by foxes taking a heavy toll on these attractive little animals.

Today, in addition to the community that continues to thrive in Mutawintji National Park, yellow-footed rock wallabies also inhabit other small and isolated pockets of land within their once extensive range, with the majority found in the rugged Flinders Ranges and other rocky landscapes in northern South Australia, and a few struggling for survival in western Queensland. The International Union for the Conservation of Nature lists

Right: A yellow-footed rock wallaby in the Flinders Ranges in northern South Australia.

yellow-footed rock wallabies, with their total population estimated to be merely 10,000 individuals, as a near threatened species, and although most live within protected areas, they continue to face many of the threats that brought them to their current perilous situation.

Their fragmented habitat is also an impediment to their survival, for each small colony is too remote from others to enable the animals to interbreed and thus increase their genetic diversity and prevent the detrimental affects of inbreeding among the members of small and isolated communities.

The yellow-footed rock wallaby is a highly sociable animal that lives in groups of up to 20 individuals, although they congregate in larger mobs when food is plentiful. An adult male can stand around 80cms tall, with females reaching a height of around 60cms, and with its brightly coloured garb it's one of the most attractive, and certainly the most distinctive, of all macropods. The fur of its back and its face is grey tinged with golden brown, its under parts are of a slightly lighter colouring, and it has a conspicuous white stripe on both its hips and its cheeks. Mother Nature cloaked many animals with similarly coloured fur, but none have the additional bling gifted to the yellow-footed rock wallaby, for golden yellow fur cloaks the forearms, the hind legs and feet, and the large ears of this spectacularly attractive wallaby that's also known as a 'ring-tailed wallaby'. And with the entire length of its relatively short golden yellow tail decorated with chocolate brown rings, it doesn't take a genius to comprehend the simple logic behind its alternative common name.

Colonies of yellow-footed rock wallabies generally consist of several females and their dependant joeys, together with a dominant male and a few subordinate males. With astounding speed and agility they leap among the rocks that are always a feature of their natural habitat, and hop along invisible trails on the faces of cliffs and rugged gorges in the semi-

A female euro near a camping area in Bladensburg National Park in outback Queensland.

A female euro near a camping area in the Gammon Ranges National Park in northern South Australia.

arid regions that are their home. Small caves and rocky crevices provide them with shelter from the mid-day heat, and late in the afternoon and on cool winter days they make their way to their favoured feeding grounds where they dine on the foliage of herbaceous plants, low shrubs, and grasses. And never straying far from rocky terrain, they make a rapid retreat the moment danger shows its unwelcome face.

WALLAROO /EURO
Macropus robustus

It's easy to be confused about the identification of the Australian wallaroo, for this is an animal that clothes itself in varying attire, with the two major sub-species being dramatically different in their appearance.

The eastern, common, or grey wallaroo rules the slopes of the Great Dividing Range that snakes from north to south down the eastern edge of Australia and divides the moist coastal and hinterland regions from the more arid interior of the continent, while the vast outback regions west of the ranges are the province of another prominent sub-species that's known as the euro or red wallaroo.

The eastern wallaroo, which typically has dark grey to black fur, is most at home in cool mountain woodlands and on adjacent steep and rocky hillsides. By contrast, the euro, which has reddish brown fur, thrives in arid and semi-arid environments where the stony ridges of ancient and eroded ranges are the predominant feature of the landscape and, where rocky caves and overhangs offer shelter from cold winter nights and from the searing heat of summer days. At times they inhabit dense dry scrub and occasionally forage on the plains, but they never stray far from the security of their rugged and stony kingdom.

The eastern wallaroo and the euro have many common physical and behavioural characteristics. Both have thick and shaggy fur, with the colour, which is always lighter on females,

A male eastern wallaroo near a camping area north of the New South Wales city of Bathurst.

varying considerably and that is often, particularly in the case of the euro, similar to that of the primary colour of the landscape. Adult males are exceptionally stocky with their strong and muscular forearms giving them the appearance of the tough guys of the neighbourhood. Males are considerably larger than females, and all animals of both sub-species have under parts that are lighter than the colour of the fur on their back, a hairless black nose, large pale coloured ears, and a very thick tail.

They're generally solitary creatures, with males particularly happy to spend their days alone, but when there's an abundance of food they congregate in groups and, during the coolest parts of the day and throughout the night, these hardy characters, which are well adapted to cope with foods that contain low levels of protein, graze on grasses and the foliage of a wide range of shrubs.

Euros require less water than the kangaroos of the outback plains and they know all the tricks of survival that are demanded by their often harsh environment. They seek out vegetation that has a high moisture content, and they select the coolest and most humid areas in which to wile away the hottest hours of the day. And with the ability to locate underground water in seemly dry creek beds, they scratch at the surface to reach the life-giving fluid and are thus less dependant that other species of macropods on surface water that rapidly evaporates under summer's searing gaze. And they have one other unique ploy to ensure their survival. They recycle urea through their saliva, rather than excrete it in their urine, and thus have a reduced demand for nitrogen, and with less of their body's water lost through urination, they're able to retain water to assist in keeping cool and can thrive in the most hostile environments where only mad dogs and Englishmen venture out in the mid-day sun.

An eastern wallaroo near a camping area beside the Turon River north of the New South Wales city of Bathurst.

An eastern wallaroo on a rocky hillside near the New South Wales town of Moonan Flat.

REPTILES

The word 'reptile' is derived from the Latin verb '*repere*', which means to creep, and that's one thing that most of this diverse group of creatures do to perfection.

It was around 320 million years ago that reptiles began the slow evolutionary process towards becoming the creatures that we know today, creatures that have scales and that reproduce either by laying eggs or by giving birth to live young. They are cold-blooded animals, with their bodies reacting to the temperature of their surroundings, and when they become too warm they slink into the shade, into water, or even bury themselves underground, and when they're too cold they simply laze in the sun to warm themselves.

Australian reptiles include crocodiles, snakes, lizards, and turtles, and with more than 860 species, Australia has its share of each group. The continent is also home to the world's largest reptile species, the saltwater crocodile, which can be more than six metres in length and weigh a tonne. And this fearsome beast is not a character that anyone would be pleased to see on the doorstep.

Australia can also boast of being the only continent where venomous snakes outnumber non-venomous ones, and of having more species of lizards than anywhere else on earth.

EASTERN WATER DRAGON

Itellagama lesueurii

The 22 year old artist and naturalist Charles Alexandre Lesueur must have shivered with a sense of trepidation blended with excitement as, on a winter's day in October 1800, he strode up the gangplank of a sailing ship and took the first steps on a great adventure, for he had the privilege of accompanying the French explorer Nicolas Baudin on his expedition to map the coast of Australia.

Lesueur, together with zoologist Francois Peron, collected thousands of specimens of Australian flora and fauna, and the eastern water dragon, *Itellagama lesueurii,* which was included in this vast collection, has immortalised his name.

Eastern water dragons, surprise, surprise, are found in eastern Australia in an extensive area that stretches from northern Queensland to south-eastern New South Wales and eastern Victoria. Water is central to their lifestyle, and they'll be content to spend their lives in habitats as diverse as tropical rainforests, alpine bushland, and urban areas if there's a river, a gentle stream, or a tranquil lake on the doorstep.

Fossils have revealed that close relatives of the eastern water dragon thrived in what is now the state of Queensland more than 20 million years ago, and it's easy to accept that link to the distant past, for this largest of Australia's dragon lizards, which can reach an overall length of 90cms, has a distinctive resemblance to the dinosaurs that once ruled the earth.

Its head, legs, and body are brown to grey with dark brown to black flecks, spots, and stripes, and it has a long tail with similar colouring that will regrow if severed. With spiny scales on its head and neck, a prominent jagged ridge along its back, and large claws on its toes, the eastern water dragon, particularly an adult male with its vivid orange to red chest, may appear to be a rather intimidating creature, but that's an illusion, for this relatively timid reptile poses no threat to humans.

Juveniles feed entirely on insects, but their tastes change as they develop, and although adults will happily eat insects, including cicadas that they catch while foraging among the foliage of trees, in addition to crustaceans such as yabbies, they certainly like their fruit and veggies, with leaves, fruit, and flowers accounting for more than 50 per cent of their diet.

During the coldest months of the year eastern water dragons retreat to burrows abandoned by rabbits or other animals, or excavate a shelter among boulders or logs that are close to a watercourse, and, after sealing themselves in with a barricade of dirt, they slow down their metabolism and doze in a state of brumation, the reptilian equivalent of seasonal hibernation that's practiced by some mammal species, until spring arrives.

When the weather warms up, they bask on sunlit logs and rocks, and on branches overhanging rivers and streams, and if a predator or a curious human wanders too close for comfort, eastern water dragons simply run at great speed into dense vegetation or, as efficient swimmers and with an ability to remain submerged for almost an hour, they may leap into the water and vanish from sight in less time that it takes for a flea to leap from one scratching mongrel to another. And being well camouflaged, it's often only a momentary splash and a ripple on the surface as they dive into the water that gives their presence away.

Warm weather triggers the urge to breed, and each female, after mating, eventually excavates a hole in sandy soil and lays her clutch of 6-18 eggs. The hatchlings are at the mercy of numerous predators, including snakes, and with adult water dragons occasionally harbouring cannibalistic tendencies, the life of a young eastern water dragon was never meant to be easy.

Opposite page: An eastern water dragon emerging from a lake in the botanic gardens in the Queensland city of Bundaberg.

A young eastern water dragon eating a stick insect in the author's garden.

A young eastern water dragon in the author's garden.

A young eastern water dragon shedding its skin in a pond in the author's garden.

An eastern water dragon in the botanic gardens in the Queensland city of Bundaberg.

An eastern water dragon in the botanic gardens in the Queensland city of Bundaberg.

An eastern water dragon in the botanic gardens in the Queensland city of Bundaberg.

EASTERN BEARDED DRAGON

Pogona barbata

To many people the eastern bearded dragon is an ugly and terrifying creature, but to others, particularly those whose gardens are regularly visited by this spiny lizard, it's a charismatic and charming reptile that's always a welcome sight.

It's one of six species of Australian lizards that are known as bearded dragons, and it owes its colloquial name to the spiny flap of skin under its chin that it extends, when threatened, to make it appear larger and more ferocious than it really is. And if that isn't enough to deter any threat, it inflates its body, and displays a gaping yellow mouth in a demonstration of silent aggression that generally convinces both predators and humans that this is a wild beastie that's best left alone. If its aggressive pose doesn't have the desired effect, the eastern bearded dragon has speed and agility as its ultimate survival options, and it runs at astonishing speed into dense vegetation or up the trunk of the nearest tree to escape from danger.

These lizards, which grow to a length of around 60cms, are relatively common in eastern Australia, from northern Queensland, to New South Wales, northern Victoria, and south-eastern South Australia. And with their overall mottled grey to brown colouring, they're perfectly camouflaged in the eucalypt forests and woodlands of their natural habitat where they spend much of their time sitting motionlessly on logs or rocks, warming themselves in the sunlight, or waiting for a takeaway meal to wander past.

Young eastern bearded dragons feast almost entirely on insects, but with age comes a new diet that's based primarily on fruit and vegetation, although adults add insects, small reptiles, mice, and frogs to the menu if fruit is in short supply. And they quench their thirst

Left: An eastern bearded dragon eating fallen fruit in the author's garden.

An eastern bearded dragon in the author's garden.

not by drinking from pools of water but by lapping up the cool morning dew or raindrops from leaves.

These spiny creatures pose no threat to humans, but males can be highly aggressive, particularly towards other males that may intrude into their territory. Females are welcome however and, after mating, each digs a shallow hole in the soil and lays a clutch of 10-30 eggs. When the eggs eventually hatch, the tiny reptiles are on their own, and if food and appropriate habitat are available, there's a good chance that some of these curious reptiles will make themselves at home in an urban environment.

CENTRAL BEARDED DRAGON

Pogona vitticeps

The central bearded dragon is a creature of the semi-arid inland regions of eastern Australia, western New South Wales, and northern South Australia, with its preferred habitats including open woodlands, low scrub, and grasslands with scattered trees.

Like its close relative the eastern bearded dragon, its most distinctive feature is the spiny 'beard' beneath its chin, which is a major component of its defence tactics. When threatened, it inflates both its 'beard' and its body that's embellished with rows of spines along each side, and opens its mouth wide to ensure that potential predators think again before attacking what appears to be a terrifying character.

Unlike the eastern bearded dragon, which is mostly grey, the central bearded dragon may wear more gaudy attire, with its varied colouring, which includes shades of orange, brown, and yellow, often matching the hue of the soil of its environment. The brightest area is usually the animal's head which, in this highly variable species, may have a striped pattern of alternate dark and vivid colours, with males, which are always eager to draw attention

Right: An eastern bearded dragon in the author's garden.

A central bearded dragon in the botanic gardens at Port Augusta in South Australia.

to themselves, generally being more colourful than females. And they have an amazing ability to be able to change colour very rapidly, so that within only a few minutes a gaudy yellow lizard can become a drab almost black one.

When a central bearded dragon is taking it easy and warming itself in the sunshine, its body lies close to the surface of the ground, ensuring that the animal is well camouflaged, but when it's on the move and in a hurry, it raises itself high on its legs and waddles across the landscape at an amazing pace. This unexpected speed enables it to be an efficient hunter of the small vertebrates, including other species of lizards, on which it often feeds, but other ingredients of its daily feast can be acquired with minimal effort, for ants and beetles are rarely in a hurry, and the fruits and vegetation that it routinely consumes are easy pickings.

Central bearded dragons are very agile climbers, and on the hottest of days they'll retreat to a shaded branch of a tree, and although they're primarily creatures of the day, they'll be out and about during the night when scorching daytime temperatures are too severe for even a lizard to tolerate.

As winter retreats, males fight over

Above: A central bearded dragon in the botanic gardens in Port Augusta, South Australia.

mating rights, and eventually, in spring, each female digs a shallow burrow, lays her clutch of up to 30 eggs, covers them with soil, and leaves them to their fate. With luck on their side, the hatchlings eventually emerge and face a world filled with danger, and where lizards, particularly young ones, can become a meal for goannas, foxes, dingoes, cats, and birds of prey. They'll attempt to bluff any threatening predator, but when all else fails, they do what an adult central bearded dragon does, and beat a hasty retreat to a place of safety where they can continue to live their quiet reptilian lives for another day.

EASTERN STRIPED SKINK

Ctenotus robustus

More than 430 species of skinks can be found in Australia, with some 100 of those included in the genus *Ctenotus* and thus closely related to the little lizard illustrated on the following pages. *Ctenotus* species, which are commonly referred to as 'striped skinks', are found throughout mainland Australia, with the greatest number of species inhabiting arid inland regions that are cloaked with spiny spinifex grass. This is not a habitat that's favoured by the eastern striped skink however, for it's a resident of eastern and northern Australia where it lives in woodlands and heath-

lands, among the low vegetation of coastal sand dunes, in crevices among rocks, and in cracks in sun-baked soil, and it's a frequent resident of urban parks and gardens.

The eastern striped skink is the largest of all Australian *Ctenotus* species and has a snout to vent length of around 12cm. It lives up to its common name with brown, black, and cream stripes that, together with decorative spots along its brown body, and dark brown stripes on its light brown legs, make it a very attractive creature. And it has dark brown to black stripes on its slender brown tail, which is far longer than its body and that will miraculously regrow if damaged.

Most striped skinks feed on tiny invertebrates, but some are highly selective and feed primarily on termites. Others include smaller skinks and even fungi in their diet, but the eastern striped skink is content to feed almost entirely on insects, including ants, grasshoppers, termites, beetles, and flies, with a few spiders providing an occasional change of taste.

Despite being well camouflaged, eastern striped skinks can be seen warming themselves in the sunlight or striding across a rock or the ground in search of prey. They're usually solitary animals that accept the company of others only during the mating season, and if another skink dares to infringe on its domain, this tiny reptile will wave its long tail slowly and menacingly and attack with great ferocity. If it feels threatened by the approach of a larger creature or a human, it demonstrates its incredible speed and agility as it jumps from one obstacle to another or runs to a safe location quicker than a ferret on steroids might rush down a rabbit hole.

After mating, females lay a clutch of up to six eggs in a small burrow un-

Above and opposite page: An eastern striped skink in the author's garden.

der or among rocks, and when the tiny hatchlings eventually emerge, they discover a world full of much larger creatures that guarantee that skinks will be both hunters and prey.

EASTERN BLUE-TONGUE LIZARD

Tiliqua scincoides

The eastern blue-tongue lizard, which is one of the largest of the world's many species of skinks, is also commonly referred to as the northern blue-tongue lizard as it's found in an area that stretches from the northern tip of Western Australia, through the northern section of the Northern Territory and west into Queensland. It also inhabits the eastern side of the continent, with its range extending south through Queensland, and including New South Wales, Victoria, and eastern South Australia. This distinctive reptile will make itself at home in a wide range of habitats, including woodlands, dry forests, low scrub, and urban areas that have adequate features, such as logs and rocks, that will provide it with shelter, but it draws the line at rainforests and chilly alpine regions.

The eastern blue-tongue lizard has a variable range of body colours, generally in shades of brown with broad darker stripes across both its body and its relatively short tail. Adults measure around 30cms from snout to vent and, with very short legs, they are relatively slow moving creatures that forage on the ground for fruit and flowers, and their appetite for insects, slugs, and snails ensures that these are reptiles that are always welcome in a garden.

It's a reptile that poses no threat to humans, although it can give a painful bite in its own defence, and if it sees either man or beast as a threat it will inflate its usually slender body, hiss, and stick out the blue tongue that gives it its most common name. And that's a sight that causes all but the most determined of predators to look elsewhere for a meal.

Females give birth to live young, and their 5-20 tiny offspring need all the assistance that Mother Nature can provide to survive in the wild world that's on their doorstep.

Above: An eastern blue-tongue lizard in woodlands at Nowendoc National Park in New South Wales.

SHINGLEBACK LIZARD
Tiliqua rugosa

It's hard to image that any animal could have a wider range of common names than this large and distinctive skink, for in addition to being known as a shingleback lizard, it's also frequently referred to as a bobtail, a blue-tongue, a stumpy-tail, a sleepy lizard, and a two-headed skink, and that's just for starters.

It's a lizard that inhabits the arid and semi-arid regions of the continent, with its range including inland areas of southern Queensland and New South Wales, Victoria, eastern South Australia, and southern Western Australia where its favoured haunts are in deserts and sand dunes daubed with drought tolerant grasses.

The thick scales of its armour can be in varying colours, from dark to light brown, with its under parts usually of a lighter hue. It has a triangular pointed head, a body that's around 30cms in length, and a short rounded tail that's of similar shape to its head, a feature that sometimes confuses predators that fail to recognise which end of this curious lizard is which.

With its short legs it's a reptile that usually travels at a speed rivalling that of a snake in Antarctica, and that means that it has to take the easy option when searching for food and feasts on snails, carrion, flowers, and leaves that are going nowhere in a hurry.

Dingoes, cats, foxes, and some species of snakes are not intimidated by the sight of the shingleback's armour, but when a prospective meal presents them with a gaping red mouth and a large blue tongue, most predators think again and may consider that retreat from what appears to be a terrifying creature is the best option.

When warm weather triggers an interest in the opposite sex, shinglebacks seek out a familiar companion, for these are monogamous reptiles that mate with the same partner every year. Each female gives birth to live young, with each litter comprising 5-24 babies that remain with their parents for several months.

When winter inevitably approaches once again, the slow pace of life of a shingleback lizard comes almost to a standstill as each settles into a sheltered burrow and slows down its metabolism as it enters a state of brumation, which is similar to hibernation in mammals. And, thanks to the reserves of fat that

A shingleback lizard near the homestead on Lake Everard station in northern South Australia.

A shingleback lizard near the homestead on Lake Everard station in northern South Australia.

A shingleback lizard near the homestead on Lake Everard station in northern South Australia.

are retained in their stumpy tails, they survive, concealed from the world and its countless dangers, until spring makes its welcome return.

ROBUST VELVET GECKO

Nebulifera robusta

The robust velvet gecko is one of the most familiar of the approximately 140 species of geckos that call Australia home. Rocky outcrops and eucalypt woodlands are the natural habitat of this small nocturnal lizard, which can be found in south-eastern Queensland and eastern New South Wales, and that shelters, during the day, in the hollows of tree trunks and under loose bark, but it's enthusiastically adopted an alternative lifestyle and has moved into suburbia where it's gone beyond the doorstep of the human population, and settled for an indoor life in many houses and other buildings.

Nebulifera, the name of the genus to which the robust velvet gecko belongs, gives a clue to its appearance, for it's derived from two Latin words, '*nebulo*' meaning cloud, and '*fera*' meaning 'bearer', a reference to the cloud shaped patches daubed across the lizard's pinkish brown body that, together with its tail, gives the lizard a total length of around 15cms.

Geckos have some astounding physical characteristics, one of which is their night vision that's vastly superior to that of humans, and to ensure that their lidless eyes are always clean, they wipe them with their tongues. They have uniquely designed pads on their toes, which are covered with thousands of minute bristles and that allow them to cling firmly to vertical surfaces, even to windows where, at night, they hunt for insects that are irresistibly drawn to the light. And they can run swiftly upside down along ceilings, thus being able to capture any insects that might be under the false assumption that they're well beyond the reach of these superb nocturnal predators.

Geckos are the only lizards, with the exception of legless lizards, that have the ability to make noises other than hissing sounds, and their chirping calls communicate their need for a mate and also warn other geckos that they might be unwelcome in a neighbour's territory.

Danger is ever present in the robust velvet gecko's world, but there's a surprise in store for any predator that grabs this little lizard by the tail. In such an eventuality, the tail snaps off at a specific fracture point, muscles allow adjacent blood vessels to contract, thus restricting the flow of blood, and eventually a new tail, which has no bones and that may be a different colour to the rest of the gecko's skin, begins to grow.

Breeding females generally lay a

clutch of two eggs, and a new generation of these versatile creatures finally sets off to find their own place in the world, but those that opt to set up home in a human's residence face more than the threat of a housewife wielding a broom in an effort to evict them, for most have to cope with stiff competition from another reptile species.

The Asian house gecko, which is of a similar size to the robust velvet gecko, arrived in Australia in the 1960s on board a cargo ship that docked at the port of Darwin, and the species has since spread as far south as northern New South Wales. These stealthy invaders compete with native geckos for limited sources of food, but of greatest concern are the parasites that these uninvited house guests may unwittingly spread to their indigenous and more welcome relatives.

Above: A robust velvet gecko on a wall in the author's house.

A leaf-tailed gecko on the interior wall of a toilet at a forest camping area near Dorrigo in northern New South Wales.

MORITZ'S LEAF-TAILED GECKO

Saltuarius moritzi

The Moritz's leaf-tailed gecko is a secretive creature that lives in the humid forests of north-eastern New South Wales, with its limited range, which lies to the south of the Clarence River, stretching west from the forests of the coastal zone to those of the Great Dividing Range and the New England tablelands.

Saltuarius, the name of the genus to which this peculiar lizard belongs, is a Latin word meaning 'keeper of the forest', and although Moritz's leaf-tailed gecko is the most widespread of the 16 species of leaf-tailed geckos that are found only in eastern Australia, it's not easy to see in its natural habitat for it's as perfectly camouflaged as a rusting nail in the rotting timbers of an ancient shipwreck.

Its highly variable grey to brown colouring, which is enhanced with decorative patterns in varying shades of brown, and its large and distinctive leaf-shaped tail ensure that only those who enter its dark and forested world with patience, keen eyesight, and luck as their companions will be treated to a glimpse of this elusive creature that grows to a length of around 8.5cms.

This highly ornate gecko, with its common name honouring Professor Craig Moritz for his contribution to knowledge regarding rainforest reptiles, is a nocturnal lizard that feasts on a range of smaller creatures, including insects and spiders. In common with other geckos, its tail regenerates if damaged, it uses its tongue to clean the clear coverings over its lidless eyes, and it emits a squeaking sound when threatened or when cavorting with a mate.

After mating, females each lay a clutch of two tiny eggs that, if the hatchlings survive the many dangers of the forest, will give this curious reptile another chance of survival in a world where so many unique species are in decline.

Right: A Burton's snake-lizard in the author's garden.

BURTON'S SNAKE-LIZARD / LEGLESS LIZARD

Lialis burtonis

Hopefully Edward Burton was never legless at work, for he was a 19th century British army surgeon who saw some dreadful sights that would, no doubt, have triggered the urge for a stiff drink. The Australian lizard that, for some inexplicable reason, was named in Doctor Burton's honour, is permanently legless, not as a consequence of consuming the demon drink, but as a result of evolution's handiwork, for over aeons its legs have become barely visible features of its anatomy and are now nothing more than scaly flaps. And it's these that have earned Burton's snake-lizard its alternative common name of 'flap-footed lizard'.

Burton's snake-lizard, which is the most common of the 42 species of legless lizards that are found in Australia, is the country's most widespread reptile and thrives in most regions of the mainland, with the exception of the south-western coast, south-eastern Victoria, and southern New South Wales. It makes itself at home among the sandy ridges of arid and semi-arid inland regions, on stony desert plains, and in woodlands and dry forests, and it lives on the doorstep of most Australian cities where pockets of urban bushland provide it with a suitable habitat. But rainforests, the highest and coolest sectors of the Great Dividing Range, and urban areas that have been stripped clear of all native vegetation are definitely not within its comfort zone.

Growing to a length of more than 60cms, it's one of the largest of Australia's legless lizards. With a long slender body and a long and pointed head, it's a most distinctive species, with individuals, even those living within the same area, often having dramatically different colours and patterns to those displayed by their neighbours. They can have cream to grey or even reddish brown bodies and tails with stripes, spots, or no pattern at all, other than the dark brown to black stripes that many have on their face and on the first part of their body.

Lizards of the *Pygopodidae* family to which the Burton's snake-lizard belongs are closely related to geckos, and although they have few conspicuous similarities, they have a range of

common physical features. Like geckos, they use their tongues to clean the clear coverings of their lidless eyes, and they make distinctive sounds, such as a squeaking noise, when threatened and during social encounters, and their tails will regrow if they're damaged.

A brief glimpse of this slender reptile slithering through low vegetation often leads to a moment of panic with the assumption that a snake is in the vicinity, but the distinctive shape of the head of the Burton's snake-lizard is the initial clue to its true identity. It poses no threat to humans, but it's a different story for many species of lizards however, for this is a beast from hell that feeds almost exclusively on other small reptiles.

Although it will hunt during the night, particularly during warm weather, it's usually out and about during daylight hours when the creatures that are its prey are most active. Skinks, geckos, dragons, and other legless lizards are the main ingredients of a diet to which it occasionally adds small snakes, and it has an amazing physical characteristic that enables it to get a good grip on a meal. Its head has a unique flexible hinged adaptation that allows the lizard, after grabbing its prey, to hold it firmly and completely encircle its victim with its jaws as the tips of its snout meet. It's the only Australian lizard that has been gifted with this ability, and when it's

A Burton's snake-lizard in the author's garden.

suffocated its hapless prey, the Burton's snake-lizard gulps it down head first.

When females lay their eggs, they do so on the ground, usually among rocks, logs, or leaf litter. They frequently lay more than one clutch of two eggs each year, and thus guarantee that this curious creature will continue to be one of the most common reptiles to wriggle across the Australian landscape.

GOANNA / LACE MONITOR

Varanus varius

The Australian lace monitor is most commonly known as a goanna, a name that's believed to be a derivation of 'iguana', the colloquial name of a group of unrelated South American lizards that are of a vaguely similar appearance.

These large reptiles, which can grow to a length of around two metres, are residents of the eastern Australian mainland, and inhabit dry woodlands and forests in Queensland, New South Wales, northern and south-eastern Victoria, and eastern South Australia.

The goanna's stocky body, head, long tail, and legs are dark olive grey to brown with patterns of cream coloured spots and patches, with its under parts being primarily cream. It has long sharp claws that enable it to easily climb trees, and a forked tongue that, when searching for food, it flicks from side to side like a snake.

This reptilian carnivore is a savage predator that preys on mammals, reptiles, insects, and rodents, and that will enthusiastically feast on the eggs and chicks of native birds as well as those of farmyard and domestic poultry. It's also an opportunistic scavenger that will tuck into bloodied carrion, and that haunts camping and picnic areas, and if no one is watching, it will help itself to any unattended food, and is

Left: A goanna on the doorstep of a picnic area on Fraser Island, Queensland.

Opposite page: A goanna in the author's garden.

very partial to a slab of steak, to snags, and to eggs - either cooked or still in their shell. Anything meaty is good tucker for this thieving character, and although lace monitors are usually solitary animals, several may roll up to gatecrash the party when there's plenty of food on offer.

A female, after mating, uses her strong claws to dig a hole in a termite mound, one that's on the ground or high in a tree, and she lays a clutch of up to 14 eggs. The termites repair the damage to their home and in doing so they seal the lizard's egg chamber, leaving the eggs to incubate in the warmth and darkness. Some eight to nine months later, the female goanna miraculously returns to the nesting site and digs the eggs out just as the young are about to hatch.

Only dingoes, foxes, and large birds of prey dare to attack these powerful lizards that were once among the favoured bush foods of aboriginal people who gathered together to toss a goanna on the barbecue. They are confident creatures that stride across their domain with a haughty, swaggering gait, but when any hint of danger appears, they run at an astounding speed, clamber rapidly up a tree, or dive into water to swim to safety.

They won't attack humans unless they're cornered and feel threatened, and it's then that they can become aggressive and inflict a very painful bite. Wounds caused by these great reptiles can become infected and may be slow to heal, a fact that was once attributed to the presence of bacteria in the lizard's saliva, but recent research has revealed the real reason behind the problem. Goannas, it's now known, are venomous, and although their venom has only a low level of toxicity, it's this that causes a bite from this imposing reptile to inflict more than short term discomfort.

Right: A carpet python in the author's garden.

CARPET PYTHON

Morelia spilota

The carpet python is found in many regions of northern, eastern, and southern Australia where its varied habitats include dry woodlands and forests, rainforests, coastal heathlands, farmlands, and urban parks and gardens.

This non-venomous snake, which can reach a length of four metres, is a species that has a highly variable range of colours and that wears ornate patterns in a combination of hues, including cream, light and dark brown, and black.

In the warm months of the year the carpet python is active both day and night as it hunts on the ground, in trees and shrubs, and in buildings for frogs, lizards, birds, and mammals, including possums that are routinely on the menu and that it suffocates by wrapping itself around them with an unwelcome embrace before swallowing them whole. It visits poultry sheds where it's never averse to scoffing eggs, vulnerable chicks, and adult birds, slithers through garden sheds and barns in search of rodents, and moves into houses too in search of any tasty morsels of food or a quiet and secluded place for an after dinner nap.

This is a snake that's generally non-aggressive and that will usually slither away silently if approached by a human, but some individuals are a little less easygoing and, with their forked tongue quivering and sensing the presence of a perceived threat, they may strike when approached. Fortunately the carpet python's bite, although painful, produces no long-term ill effects, but any hint of an attack by a carpet python is a reminder to exercise caution when in the presence of any serpent.

In early summer, the females of the species seek out sheltered sites among bales of hay, in hollow logs, among rocks, or in discarded car tyres or heaps of other industrial or domestic rubbish, and settle down to the serious business of reproduction. Each coils herself

A carpet python coiled up in a wheelbarrow in the author's garden.

around her clutch of eggs to keep them warm, and leaves only occasionally to soak up the warming sunlight to ensure that her body will provide the optimum temperature for the incubation of her eggs. The carpet python's maternal instinct stretches to nothing more than protecting her eggs from any threats by creatures that might regard them as a welcome meal, and when the eggs hatch and the baby pythons wriggle out into the wild world, they're on their own, with their mother demonstrating no interest whatsoever in their well-being.

Many people see any snake as a threat, but the carpet python is undoubtedly one of the good guys of the reptilian world that will do its best to avoid humans, while silently offering the benefits of its presence by controlling unwelcome vermin, such as rats and mice that do more damage to human habitats than any carpet python could ever be accused of.

RED-BELLIED BLACK SNAKE

Pseudechis porphyriacus

Anyone who takes a good look at this snake, rather than rushing away in panic the moment it slithers onto the scene, will need little more than the intelligence of a weevil to comprehend the reason behind its colloquial name.

The red-bellied black snake, which can be up to two metres in length, can be found in several separated regions of mainland Australia, including northern and central eastern Queensland, an area stretching from south-eastern Queensland and through eastern New South Wales and Victoria, and in South Australia's Mount Lofty Ranges. It's a species that's not particularly fussy about the type of habitat in which it resides, for it's equally as content among the vegetation on the banks of waterways, wetlands, and farm dams as it is among that of forests, woodlands, and grassy plains. And when the red-

Left: A red-bellied black snake near the New South Wales town of Moree.

bellied black snake is taking it easy, it may be sunning itself on open ground or dozing in a hollow log, in a rocky crevice, or in the commandeered burrow of a rabbit or a wombat.

Although it can wriggle up into trees, this is a reptile that hunts either on the ground, where its prey includes mammals, lizards, rodents, and snakes, or in water. With cannibalistic tendencies it has no reservations about eating members of its own species, and when a change of taste is the order of the day, the red-bellied black snake takes to the water where, able to remain submerged for more than 20 minutes, it hunts for fish, frogs, tadpoles, and yabbies.

As the warm weather of spring makes its welcome return, males are out and about searching for females that will ultimately give birth to 5-20 young that, in the earliest days of their lives, are around 30cms in length, and vulnerable to attacks by predatory birds and reptiles, as well as cats, foxes, and dingoes. Although adults are threatened by few predators other than humans, there's one serious risk that they continue to face, and it's all to do with their diet. They're highly susceptible to the toxins contained within cane toads, and eating one of these introduced amphibians invariably results in the snake's death. And it's the repugnant cane toad that's believed to be responsible for the considerable decline of populations of red-bellied black snakes in the northern parts of this colourful reptile's range.

Despite the valuable role that it plays in the environment in controlling the numbers of other wild creatures and rodents, this is a venomous snake that most people would never want to see on their doorstep, but it's one of the most frequently encountered snakes on the eastern coast of Australia and is no stranger to urban areas. Fortunately, it's not an aggressive creature, and will usually make a slithering retreat if anyone comes within its comfort zone, but if cornered or threatened, the red-bellied black snake will vigorously defend itself and can give a painful and potentially fatal bite. Although several people are bitten every year, the number of fatalities, thanks to prompt medical attention, is very low, with domestic cats and dogs and small children being most likely to experience a negative outcome due to their small body mass in relation to the volume of venom received through the snake's angry bite.

KREFFT'S TURTLE

Emydura macquarii krefftii

In 1871, Doctor J. E. Gray of the British Museum of Natural History became the first to describe this Australian freshwater turtle, and he named it in honour of Gerard Krefft, the curator of the Australian Museum, who had collected specimens of this aquatic creature from the Burnett River that flows through the modern day city of Bundaberg in south-eastern Queensland.

The Krefft's turtle, which is found in the wild only in Queensland, inhabits rivers, wetlands, and lakes on the eastern side of the Great Dividing Range, with its extensive range stretching north from Brisbane to Princess Charlotte Bay, which lies at the base of Cape York Peninsula.

This short-necked turtle, which has a shell that's around 25cms long, is readily recognised by its distinctive pale yellow facial stripes that stretch from the rear of each eye to the ear opening.

Thanks to the warm waters of its sub-tropical to tropical habitat, the Krefft's turtle can remain active throughout the year, and it's often seen lazing on riverbank logs or rocks, and in the calm waters of lakes in urban parks, looking up, with a pleading stare, for the food that visitors invariably toss its way.

Juvenile Krefft's turtles are carnivorous creatures that feed on aquatic insects, crustaceans, and small fish, but as they mature they adopt a more varied diet with the addition of aquatic plants and fruits that have fallen into the water from overhanging trees.

A Krefft's turtle at the Tondoon botanic gardens in the Queensland city of Gladstone.

A Krefft's turtle on the bank of a lake in the botanic gardens in the Queensland city of Bundaberg.

In late spring and early summer, each mated female digs a nesting hollow well away from the water, lays her clutch of around 16 eggs, covers them with sand or soil and, leaving Mother Nature and fate to take care of the future, she waddles back to her aquatic home. The tiny hatchlings that eventually dig themselves out of the ground and make their way to the nearest source of water are little more than 25mm in length and are easy prey for fish, snakes, and wading birds.

Turtles, in a similar form to that of the Krefft's turtle, have meandered across the earth's varied landscapes for some 200 million years, and although, particularly during times of drought, many of these dawdling reptiles are killed as they cross roads in search of a source of water, these fascinating creatures will undoubtedly remain members of the wildlife community that's on the doorstep of many Australians for aeons to come.

RED-EARED SLIDER TURTLE

Trachemys scripta elegans

This attractive freshwater turtle, a species that's native to the Mississippi River region of the USA, is one wild creature that no Australian wants to find on their doorstep, for according to the International Union for the Conservation of Nature, it's one of the 100 worst invasive animal species in the world.

The importation, possession, and sale of the red-eared slider is prohibited in Australia, yet thanks to the black market pet trade, these unwelcome immigrants now exist in every continent except Antarctica, and have been sighted, in the wild, in Victoria, Queensland, New South Wales, and Western Australia.

The red-eared slider, with its juvenile form being an attractive vivid green, is one of the most popular pet animals in the world, and a staggering 10 million are exported from the USA annually to be sold as pets, to reptile collectors, and for use in traditional medicine. Those now in the wild in Australia are thought to owe their freedom to irresponsible owners who, for varying reasons, have let them loose in an environment where the presence of the red-eared slider, particularly in large populations, would have devastating consequences.

Red-eared sliders, which have no known predators in Australia, are an aggressive species that feast on fish, frogs, and crustaceans, and thus compete with native turtles and other aquatic creatures for food, as well as for habitat and nesting sites. And to make matters worse, they also prey on the hatchlings of other turtles.

To date, only a relatively small number of these pest animals are believed to exist in the wild, but with females able to lay up to five clutches of eggs in a year, with each clutch consisting of up to 30 eggs, it doesn't require the genius of Einstein to figure out that a very small population could rapidly evolve into a large one that would have a dramatic impact on the lives of indigenous species.

With a distinctive red strip on each side of its face, very long claws, and a head that, unlike that of native turtles, can be drawn right back into the animal's shell, the red-eared slider is easy to identify, and any sighting should be reported to a local government authority or to the nearest Parks and Wildlife office so that prompt action can be taken to locate and eradicate the animal.

LOGGERHEAD TURTLE

Caretta caretta

The Atlantic, Indian, Pacific, and Mediterranean oceans are the haunt of loggerhead turtles, and when they visit Australian waters they make themselves at home among coral reefs and in the warm waters that lap at the sands of the continent's western and eastern shores.

These great wanderers rarely leave the ocean, for it provides them with all the sustenance they require, with

Red-eared slider turtles, such as this one photographed beside a lake in Singapore, could have a devastating impact on Australian wildlife.

the main course on their varied menu including shellfish, crabs, sea urchins, and jellyfish. Sponges, corals, sea anemones, sea cucumbers, starfish, and several species of fish are also among the prey of loggerheads that are not averse to eating turtle hatchlings, including those of their own species.

It's only when females are ready to lay their eggs that these marine giants, which can be up to a metre in length, leave the water and make their slow and awkward progress across deserted beaches that are often right on the doorstep of many Australians.

Above: A loggerhead turtle returning to the ocean after laying her eggs near a camping area on Lady Musgrave Island, Queensland.

Many lay their eggs, from late October to early March, on the southern islands of the Great Barrier Reef and in the sands of southern Queensland beaches, while those that prefer the western side of the continent get down to the business of nesting in the Ningaloo region of Western Australia and on beaches further to the south.

In sands well above the reach of the high tide, each female, under the doona of the night, excavates a deep nesting chamber in which she lays a clutch of around 100 eggs. It's a slow and laborious process, but an hour or two after emerging from the sea, the female, having covered her eggs and filled in the pit that she has dug to house them, makes her way back to the ocean. And she'll return again, approximately every two weeks, to deposit another clutch of eggs on the same beach where she

herself hatched many years earlier.

Female loggerhead turtles are between 17 and 33 years of age before they lay their first eggs, but they make up for lost time by laying, on average, four clutches in a single season, but they then lay no more for the next two to three years. During a life span of around 70 years, each female lays 13-20,000 eggs, but unfortunately that's where the good news ends. After an incubation period of approximately 80 days, life moves beneath the warm sand, and hundreds of tiny hatchlings emerge, usually at night when darkness increases their chances of avoiding predators. They instinctively scurry towards the brightest horizon that, if all's well, is over the ocean, and silently slip into the welcoming embrace of the water.

Death stalks loggerhead turtles from the moment a female lays her eggs. Humans carelessly destroy nests and eggs as they drive their vehicles over dunes and beaches. Foxes and feral pigs feast on the eggs, as do snakes, rats, feral cats, and dogs, and hatchlings that emerge from the sand during daylight hours fall victim to hungry birds, reptiles, and crabs. In areas with a glimmer of artificial lighting from beachfront development and coastal settlements, hatchlings that take their first glimpse of the world at night often become disoriented and wander inland, and as dawn warms the summer landscape they become dehydrated and are weak and easy prey for predators. Only one in a thousand survives to reach maturity, but even adult loggerheads are not immune from danger, for they're attacked by sharks, seals, and killer whales.

The flesh of loggerhead turtles was once a regular component of the diet of coastal aborigines, and despite the fact that the species is protected under Australian law and listed as endangered, these majestic creatures can still legally be hunted by indigenous people. Other human activities have a more dramatic impact on loggerhead populations, with commercial fishing responsible for the deaths of many turtles that drown after becoming entangled in nets, or have their mobility seriously compromised by fishing lines that become tangled around their flippers.

With approximately 24,000 tonnes of plastic dumped into the world's oceans each year, turtles face other dangers from this act of environmental vandalism. They swallow clear floating plastic that they mistakenly identify as jellyfish, one of their favoured foods, and may die as a consequence of consuming the world's thoughtlessly discarded rubbish.

Loggerhead turtles play an important role as members of the vast global community of marine creatures, for all but the tiniest of hatchlings have company on their extensive migratory journeys. They carry diverse communities of minute plants and animals on their shells, with 100 species having been recorded as living on a single turtle and hitchhiking their way to new neighbourhoods within the world's great oceans.

This green tree frog made itself at home in a spiny bromeliad in the author's garden.

FROGS

There are more than 6,000 species of frogs in the world, with the approximately 200 that are endemic to Australia ranging from the huge to the truly minute. Some are brightly coloured, others are drab and inconspicuous, and with skins that can be smooth, warty, striped, or spotted, frogs of one species or another occupy every conceivable type of habitat within this vast country.

Most lay their eggs, which are enveloped in a mass of clear jelly that's known as frog spawn, in water. Some deposit them among decaying vegetation, in damp hollows in the ground, or on foliage that's close to water, but a few have developed amazing strategies in an attempt to provide their young with the best chance of survival in a world that's full of dangers.

The gastric brooding frog, which became extinct around 30 years ago, demonstrated one of the most bizarre methods of raising its young, with the female swallowing her eggs and carrying the developing tadpoles in her stomach until the tiny froglets evolved and miraculously emerged from her mouth. Scientists, using DNA from deep frozen carcasses of gastric brooding frogs, are on the verge of bringing this unique amphibian back to life, but until this amazing creature once again struts across nature's stage, it's another curious character, the marsupial frog, that claims the starring role for its most peculiar method of protecting its offspring.

The male of the species squelches among the frog spawn that his mate has produced, and as the tadpoles emerge from their eggs, they instinctively wriggle into their father's specialised hip pouches where they remain until, some seven weeks later, they're ready to explore the world as fully developed young frogs.

While some species face the threat of extinction due to the loss of their natural habitat, others have enthusiastically adapted to an urban environment, and can be attracted to gardens that offer a suitable habitat that includes water in which they can breed, aquatic plants such as waterlilies and reeds among which they can lay their eggs, and logs and rocks that will provide them with welcoming retreats where they can rest during the day, find shelter from the summer heat, and remain well hidden from predators.

It's males, which are usually smaller than females, that are generally the most vocal and that provide a chorus of calls when, during the breeding season, they're eager to attract a mate and thus create a new generation to ensure that their species remains well away from the abyss of extinction. But frogs, in addition to the loss of habitat, face another threat to their survival, for a silent, stealthy killer, one that's invisible to all but the most dedicated of researchers, is stalking these fascinating little creatures.

In the 1970s, a fungal disease, with the barely pronounceable name of Chytridiomycosis, was discovered in south-eastern Queensland. The disease has been blamed for the presumed extinction of six species of frogs and the decline in the populations of many others, some of which were once common, and with seven additional species at imminent risk of extinction, solely as a result of the disease, Australia's amphibian community is in a far from secure state.

The loss of a single species may be considered as another small hop in the decline of the biodiversity of the region and elicit sadness at the thought that future generations will never have the opportunity to see one of nature's unique creations, but the extinction of yet another frog species may prove to be a loss not only for Australians, but for all of humanity.

The secretions that are exuded from the skins of all frogs when they are stressed or threatened have antifungal and antibacterial properties that combat fungal, viral, and bacterial infections, with each species having different compounds in its secretions to provide protection from diseases that may exist in the specific environment that it inhabits. Researchers believe that some of these secretions may aid in the creation of new drugs that will be valuable additions to the armoury of weapons required to combat human diseases. They may play a role in the effective treatment of infections, cancer, diabetes, and cardiovascular disease, and with the secretions from Australian green tree frogs having been shown, in laboratory experiments, to inhibit HIV infection and to repel mosquitos, there's every reason to be confident that miracles may not be far away.

Anyone considering kissing a frog in the hope that it might turn into a handsome prince will certainly be disappointed, but a smooch with one of the amphibians with which we share our world, although not recommended, may indeed have miraculous consequences.

GREEN TREE FROG
Litoria caerulea

The green tree frog was the first Australian frog to be scientifically described, and the honour of bringing this colourful amphibian to the attention of the world was claimed by British naval surgeon John White who arrived in Australia with the first fleet in 1788 and established the country's first hospital in the fledgling colony. Merely two years later he published his, 'Journal of a Voyage to New South Wales', that included images and descriptions of many species of flora and fauna that had never before been seen by European eyes, and one of the creatures that leapt from the pages of the book was the green tree frog.

Today, it's still occasionally referred to as 'White's tree frog', and although his experiences brought John White a touch of fame, he couldn't wait to

A young green tree frog on the leaf of a cordyline in the author's garden.

A young green tree frog on the stem of an orchid in the author's garden.

high-tail it out of Australia, which he referred to in his journal as "a country and place so forbidding and so hateful as only to merit execration and curses". He returned to England in 1794 and his original specimen of the green tree frog somehow found its way into the vast collection of the illustrious botanist Joseph Banks and, when it finally arrived in London, it was given the species name of '*caerulea*'.

Anyone with a grasp of Latin would undoubtedly be confused by this scientific name, for '*caerulea*' is a Latin word meaning 'blue', and why, you might ask, would anyone with even a touch more sanity than a demented bed bug christen a green frog with such a name? The simple answer is that the deceased creature had been preserved in alcohol that caused its skin to change colour. And strange as it may seem, living green tree frogs are occasionally blue too, due to a lack of yellow pigmentation, and others that, with no blue pigmentation, have yellow colouring, are also occasionally discovered.

The green tree frog is one of the most common of all Australian frogs and is found in most of the northern and eastern regions of the mainland, with the exception of Victoria. It lives in damp forests, woodlands, and wetlands, and has enthusiastically adapted to life in many urban environments, and when it opts to call a human's residence its home, it makes itself comfortable in gutters and downpipes, in cool and damp areas around water tanks, and under the eaves of houses where it hides in dark and shaded corners during the day.

With adults growing up to 11cms in length, it's one of Australia's largest frogs, and with its distinctively rounded head, a prominent fold of skin above each 'ear,' golden yellow eyes, typically bright green colouring, a cream belly, and thighs that, on the underside, are yellow, pink, or red, it's one of the most recognisable of all amphibians. It has the ability to change the colour of its skin from vibrant green to more drab olive hues or even brown to match its surroundings and thus adopt a hint of camouflage that allows it to remain concealed from predators. And when, in its urban home, it settles down to spend the day behind outdoor furniture, behind a hanging picture on a patio wall, among flower pots, or behind the curtains of an open window, the green tree frog is the most invisible of visitors.

On spring and summer nights males give their presence away with their loud and repetitive voices as they summon a mate, and 'croak, croak, croak' echoes from drains and downpipes, from ornamental pools, and from clumps of damp vegetation.

When it's food rather than sex that's on the green tree frog's mind, it will spend the night catching insects that are drawn to lights, and hunting its prey beside garden lighting and on illuminated windows. And when a more substantial meal comes within reach, it will enthusiastically feed on mice and small reptiles, such as geckos, that also share the homes of many Australians.

When the hunters become the hunted, green tree frogs are in danger of becoming the main course for snakes and other reptiles, but they don't succumb to such threats quietly. They let out a shrill, blood-curdling scream that does little to deter an attacker, yet brings startled humans rushing to see what all the commotion is about.

In the first months of summer, green tree frogs lay their eggs, which are encased in a mass of transparent jelly, in a body of calm water, and a swarm of wriggling tadpoles eventually hatches, with development from an egg to a tiny froglet taking around six weeks.

Australian green tree frogs are relatively long-lived, with the oldest recorded captive frog surviving to the ripe old age of 23. Those in the wild have shorter lives however, and their population, like that of many other species, has declined in recent years. Frogs play a vital role in the health and maintenance of many ecosystems, for they assist in controlling populations

This Peron's tree frog, discovered in the author's garden, fitted easily into a man's hand.

of insects and provide food for other species of wildlife that are on the doorstep of many Australians. And with a small and inexpensive garden water feature, it's easy to create the perfect environment to give these appealing little creatures a helping hand in their ongoing battle for survival.

PERON'S TREE FROG

Litoria peronii

This tiny Australian frog bears the name of Francois Peron, a youthful zoologist who accompanied Frenchman Nicolas Baudin on his expedition to map the western and southern coasts of Australia in 1800-1804. Peron eventually returned to France with a collection of more than 3,800 preserved animal specimens, in addition to several live animals, including dwarf emus that became extinct around 1836 and kangaroos that were destined to taste freedom in the vast gardens of La Malmaison, the home of Empress Josephine Bonaparte.

Peron's tree frog is found in northern Victoria, New South Wales, and southern Queensland, with its favoured habitats being within forests where it lives, often well away from any major source of water, in hollows in trees and under flaking bark, but like many other species of frogs, it's adopted urban areas as part of its habitat.

It grows to a length of merely five centimetres, but despite its small size, this diminutive amphibian packs some big surprises, for like a reptilian chameleon it can rapidly change the colour of its distinctively warty skin. During daylight hours, the majority of its body is light grey, brown, or drab olive green, with the only highlight being the black and yellow markings on its thighs and armpits, but at night it puts on its more ornate garb of reddish brown that's flecked with tiny specks of emerald green, and it's this touch of bling that has earned Peron's tree frog the alternative common name of 'emerald spotted tree frog'.

It reveals its presence, particularly when it's searching for a mate, with its curious voice, a high pitched cackling sound that has led to its other colloquial name of 'laughing frog'. When females are ready to breed, they seek out water in which to lay their eggs. The calm waters of wetlands, farm dams, isolated waterholes, and urban fish ponds are exactly what they're looking for, and in no time at all, the tiny yellowish green tadpoles of the Peron's tree frog are wriggling around in their aquatic home and, as each moment passes, the day that they will evolve into tiny froglets comes a little closer.

DAINTY TREE FROG

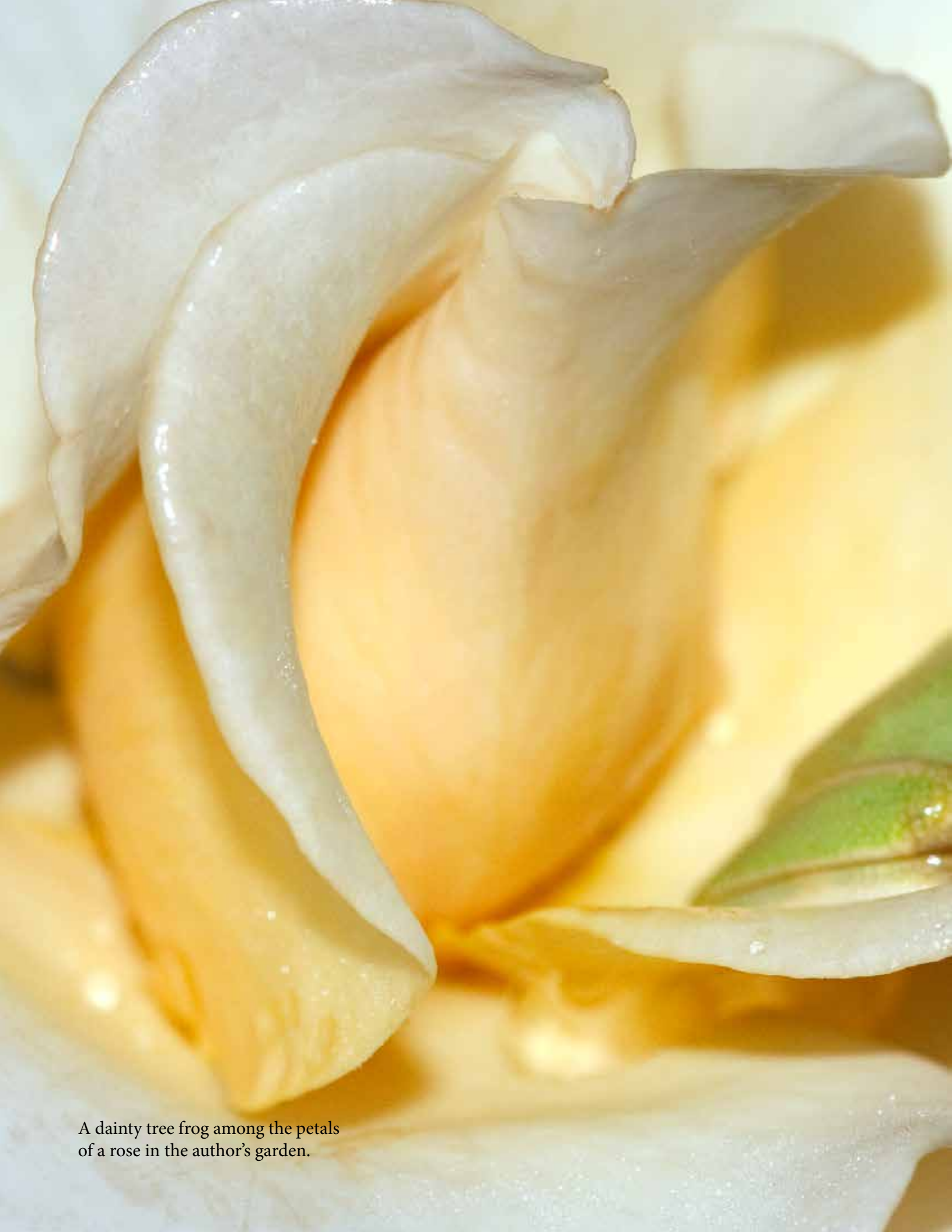
Litoria gracilenta

The dainty tree frog, which is also commonly known as the 'graceful tree frog' and the 'slender tree frog', is a resident of eastern Australia where it's found in wetlands and in moist woodland and forest environments in an area that stretches from northern Queensland to central New South Wales. And like many other species of frogs, it's more than happy to settle into an urban environment if there are cool and damp areas in which it can survive during the heat of summer, and sources of water where it can deposit its eggs.

This tiny frog, which is merely four to five centimetres in length, is one of Australia's great travellers, and it's often discovered in city fruit shops and supermarkets, far from its natural habitat, after hitching a ride among a bunch of bananas transported from northern growing areas. And it's the little stowaway's regular jaunts that have earned it the alternative colloquial name of 'banana frog'.

Although the dainty tree frog, which has rough textured skin, is often bright green, many individuals have an absence of blue pigmentation and thus have golden yellow skin, which is an obvious advantage as it provides this diminutive creature with the perfect camouflage it requires to hide among ripening fruit. Its most distinguishing feature, one that sets it apart from

A dainty tree frog on the stem of a fern in the author's garden.



A dainty tree frog among the petals of a rose in the author's garden.

other similarly coloured small frogs, is the pale yellow stripe that stretches from each nostril to each ear, and this, together with its golden yellow eyes, ensures that the dainty tree frog is among the most attractive of Australia's frogs.

Beneath the protective cloak of night, it hunts for the insects that are its primary source of food, but during the day, this colourful little frog sits silently on a leaf or on other vegetation with its legs and partially webbed feet tucked neatly into the sides of its tiny body, and in either its green or its vivid yellow attire it becomes almost invisible.

During the coolest months of the year the dainty tree frog is happy to live well away from water, but it's a different story when the mercury rises, for it's then that the instinctive urge to breed dominates the lives of these appealing little creatures. It's not vast lakes and sprawling rivers that they require however, for all the dainty tree frog needs to propagate its species is a mate and a small pool of water. Females lay their eggs, which come in protective layers of clear jelly, in lazy puddles of water in grasslands, in ephemeral waterholes that have been revived with welcome spring and summer rains, and in garden ponds, and attach their valuable deposits to the submerged stems of grasses or other vegetation that's dabbling in the shallow water. The tadpoles that hatch from the eggs, and that are dark brown with a hint of yellow, take around 14 weeks to develop into the small frogs that are the wildlife emblem of the Queensland city of Brisbane, but being so small, the dainty tree frog is a creature that many of the city's human inhabitants have never set eyes upon.

EASTERN DWARF TREE FROG

Litoria fallax

A tiny green frog might often be seen as a juvenile that would eventually become a larger and more imposing amphibian, and that misconception might be the reason behind the eastern dwarf tree frog's scientific name, for the Latin word '*fallax*' means 'deceptive', and this is a deceptive little creature in more ways than one.

It's a resident of eastern Australia, with its range extending from northern Queensland to southern New South Wales, but it often appears unexpectedly in urban areas further south, for it hitches a ride across the country in boxes of fruit, primarily bananas. This diminutive creature, which is one of Australia's smallest tree frogs, is a regular resident of banana plantations, and also makes itself at home in urban areas where it lives among the dense, damp foliage of shrubs and ferns, and in the often spiny leaves of bromeliads. But in the wild world beyond the doorstep of human habitation the eastern dwarf tree frog settles in among the vegetation that borders wetlands, watercourses, and dams, and its habit of spending its days, usually with its legs tucked into the sides of its body, clinging to the stems of reeds and sedges have earned it the alternative colloquial name of 'eastern sedge frog'.

It takes a sharp eye to spot an eastern dwarf tree frog, for females are usually no more than three centimetres in length, and males are even smaller, and with their varied colouring that changes to adapt to the surrounding environment, these attractive little characters are invariably well camouflaged.

Each individual is of a different appearance when it comes to the colour of its skin, with the upper body of the eastern dwarf tree frog being either bright green, olive green, or greyish brown, or draped with a combination of varied hues. Its underparts are pale grey, light brown, or white, and the back of its thighs are daubed with pale yellow to vivid orange. A prominent white stripe beneath the eyes and the jaw and a dark brown stripe running from the nostril to the eye provide the eastern dwarf tree frog, which

Left: A dainty tree frog on the stem of a fern in the author's garden.

An eastern dwarf tree frog on a fern frond in a damp and shaded corner of the author's garden.

An eastern dwarf tree frog on the petals of a Louisiana iris growing in a fish pond in the author's garden.

has partially webbed feet, with a very distinctive appearance. And when a male bursts into song, it reveals another dash of colour as the gaudy orange vocal sac under its throat expands and this tiny creature gives a deceptively loud and drawn out call that, if it could be put into words, might be interpreted as 'wreeeek' followed by the repetitive 'kik, kik, kik' that provides not only a prospective mate but also humans on the search for a glimpse of this beautiful frog with a hint of where to look.

Like many species of frogs, it takes life easy during the day, and only becomes active after dusk when it's out and about on the hunt for its prey that are primarily flying insects, including mosquitos.

In spring and summer females lay their eggs near the surface of water, attaching them, in their coating of jelly, to the stems of aquatic plants, and when the tadpoles eventually hatch, the eastern dwarf tree frog has another act of deception in store, for the tadpoles are considerably larger than adult frogs. They provide food for fish, and the tiny froglets into which they finally evolve are at the mercy of hungry birds and reptiles, but those that survive to maturity bring another minute dash of beauty to the natural world and to urban environments that have the aquatic habitat that these appealing little characters require for their survival.

STRIPED MARSH FROG

Limnodynastes peronii

The highly distinctive striped marsh frog is one of the most common of all the species of frogs that hop across eastern coastal regions of Australia, and it can be found from northern Queensland to northern Tasmania, although it's relatively rare in the most southerly extent of its range.

Limnodynastes, the name of the genus to which it belongs, gives a clue as to where this tiny creature resides, for it's a word that owes its origins to the Greek '*limno*', meaning a marsh, and the Latin '*dynastes*', which means a ruler. And the striped marsh frog is true to its name, for although it thrives in open forests, in rainforests, and in woodlands that are in close proximity to a permanent source of water, it's often the dominant species in the marshes and wetlands that are at the heart of its kingdom.

Almost any source of calm water, from a wetland lagoon to a farm dam, and even the stagnant water in a roadside ditch, satisfies its demands, and all are prime real estate as far as the ruler of the marshes is concerned. This highly adaptable little amphibian is also more than happy to take up residence in an urban environment, providing there's a pond that it can claim as its personal domain. But when it makes an error of judgement and dives into a backyard swimming pool, it's doomed to become a victim of the chlorinated water that's just too toxic for a sensitive little frog.

The striped marsh frog, which is six to seven centimetres in length and that spends the majority of its time in or close to water, is easily distinguished from other species. It has alternating dark and light brown stripes along the length of its body, and a narrower pale brown stripe running from its pointed head along the centre of its back. Its light brown head is adorned with a wide dark brown strip that runs from the nostril, beyond the eye, and to the top of the foreleg, with a parallel pale stripe below it. The sides of its body are light brown with irregularly shaped chocolate brown spots and patches, and its belly is creamy brown to white. Males have a yellowish throat, and all have feet that have no webbing but that have exceptionally long toes, particularly on the hind feet.

During the day, particularly in winter months, striped marsh frogs are about as lively as the participants at an annual gathering of barnacles, for they spend their time taking it easy under logs and rocks, or dozing among dense vegetation at the water's edge, but as the sun slithers towards the horizon, the urge to hunt for food prompts them into action. Although insects routinely satisfy their appetites, striped marsh frogs are skilful and efficient hunters and will eat almost anything smaller than themselves, and that includes other species of frogs.

Males have stocky muscular forearms, and in late winter and spring, when they have more than food on their minds, they get down to some serious arm to arm combat, with the strongest males defeating their rivals and winning the right to mate with the females of their choice. Each female lays several hundred eggs in a mass of jelly that she creates on the surface of the water and that's hidden among aquatic vegetation, and while the still water of a swamp, a lake, or a garden pond is usually her first choice, the striped marsh frog's less than fussy attitude sees her occasionally lay her eggs in a dog's water bowl or in a garden bird bath where the chances of survival for her young are about as slim as the possibility of seeing an elephant in a rhubarb tree. With the eggs laid in a prime location, light brown to grey tadpoles hatch after a few days and wriggle into the water where they'll spend the next 12 months as they slowly develop into frogs.

The male, after doing his bit to ensure the survival of his species, has plenty to shout about, and his distinctive nocturnal call, a loud and slowly repeated 'tok' that emanates from his aquatic habitat in the warm months of the year, is a clear indication that the striped marsh frog remains the ruler of his little corner of the world.

BROAD PALMED FROG

Litoria latopalmata

Members of the genus *Litoria* are classified as tree frogs, but the broad-palmed frog is an exception, for this unconventional character prefers to keep its feet on terra firma rather than in the trees, and it's on the ground, often

Left: A striped marsh frog on a rock beside a pond in the author's garden.

A broad-palmed frog in the author's garden.

well away from any substantial source of water, that this nocturnal frog hunts for insects in forests and woodlands, and on the river floodplains that are frequently its habitat.

It's a resident of eastern Australia, from central Queensland to central New South Wales, with its range also extending west to the northern border of South Australia.

Although the broad-palmed frog is usually smooth skinned, some individuals have a slightly warty texture to their skin that, on the upper part of the body, is reddish brown and that often has random blotches of a darker hue. One of this frog's most distinguishing features is the broad dark brown area on each side of its face that has a clearly defined line running from the nostrils, past the eye, and towards the rear leg, where it becomes an irregular mass of dark brown patches. Below this, it has lighter brown colouring stretching from the nostrils, below the eye, to the foreleg. And with a light brown to fawn belly, and rear legs that are adorned with dark brown blotches, it's a quite distinctive creature.

The broad-palmed frog is approximately four centimetres in length, and with its brown and mottled attire it has the perfect camouflage it requires for protection from predators, including reptiles and birds, that regard frogs as delicious tucker.

When warm weather triggers the urge to mate, males hop towards a source of water, which can be anything from a large lake to a roadside puddle, and advertise their amorous intentions with repetitious calls of 'quark, quark, quark,' and if all goes well, each female lays around 300 eggs in jelly that's either floating on the surface of the water or attached to vegetation.

For the tadpoles that eventually hatch there's no time to waste, and they develop rapidly so that they can hop out onto the land before the shallow pool of water in which their mother might have laid her eggs evaporates in the summer sunshine.

CANE TOAD
Rhinella marina
syn. *Bufo marinus*

For millennia, toads were not part of Australia's wildlife community, but in 1935 that fact changed with the introduction of the cane toad, a species that originated in southern areas of the USA and tropical areas of South America, and it wasn't a change for the better.

The theory was that the toad would be a valuable ally in the fight to control beetles that, with their larvae feeding on the roots of sugar cane and eventually killing the plants, were the scourge of the sugar cane industry. Around 100 toads were imported, and when the captive population had breed up to around 3,000, they were released into sugar cane plantations in northern Queensland, despite the protestations of several scientists who were adamant that the introduction of these alien creatures was not a good idea at all. Little attention was given to their concerns, but they would be turning in their graves if they could see that their worst nightmares have now come true.

The toads had no significant impact on populations of the destructive cane beetles, and it soon became evident that the amphibian that had arrived with all the promises of a miracle had become a curse of monumental intensity.

Today, cane toads thrive in a wide range of habitats, including rainforests, freshwater and coastal swamps, grasslands, and woodlands, and will set up home in any urban area that's within their ever-expanding range. This invasive pest, having spread throughout eastern Queensland, has made its way south into New South Wales, has hopped into the Northern Territory where it poses a very real threat to the wildlife of the vast World Heritage listed Kakadu National Park, and has recently arrived in the north of Western Australia. And as cane toads colonise the river systems of western Queensland, the fear is that they may eventually make their way south, via inland waterways, to South Australia.

Only another of its species could see the cane toad as an attractive creature, and most Australians regard it as a repulsive invader that they love to hate. It has dark to golden brown mottled and warty skin on its upper body, creamy brown under parts, a prominent bony ridge between its nostrils and its eyes, and webbed feet. Males have a significantly more warty appearance than females, and are also smaller, and although cane toads are generally 10-15cms in length, the most monstrous specimen recorded was 25cms long and weighed a hefty 1.3 kilos.

While most native frogs are primarily creatures of the night, cane toads are relatively active during daylight hours, particularly on warm and rainy days when they emerge from their hiding places under rocks and logs and among dense vegetation, and sit patiently, in a typically upright pose, beside tiny holes in the ground and, with a rapid flick of the tongue, they gorge themselves on hordes of flying ants that emerge from their subterranean homes. Cane toads eat a wide range of other insects too, in addition to mice, small reptiles, frogs, and carrion, and will even supplement their diet with dog food if Fido's left his meal unattended for more than a moment or two.

In common with other amphibians, the cane toad is both a hunter and the prey of other hungry creatures, but the secret to its survival is the toxin that it secretes from its skin and that, when threatened, is also released from glands at the back of its head. It's poisonous at every stage of its life, with fish that eat the toad's tadpoles enjoying the last meal of their lives, and animals that consume adult toads almost invariably doomed to die.

Although cane toads are often found well away from water, they head for a source of water when they're ready to breed, and they're very easy to please, for any still water, fresh, stagnant, or slightly saline, in anything from a shallow and murky pool to a lake or a garden pond will suit them to perfection.

It's a staggering fact that a single female can lay more than 33,000 eggs in a season, and unlike the eggs of native frogs, her brood are laid in long thin strands of transparent jelly that are tangled around aquatic plants. And with the cane toad's tadpoles evolving into adults faster than those of many native frogs, they have a head start in the search for food.

The introduction of the cane toad was unquestionably one of the worst disasters that Australians have inflicted on the environment. Its impact on many species of wildlife, particularly those whose existence is already under threat from other factors such as habitat loss, has been considerable, but some wild creatures are adapting to cope with the very real dangers that the cane toad has brought to their world. Some birds have learnt to feed on toads without suffering any ill effects, for they flip their prey onto its back and rip at the soft skin of its underbelly to expose and eat its innards, thus avoiding contact with the toad's deadly poison. And freshwater keelback snakes can scoff cane toads with what appears to be immunity.

With scientists unable to discover any safe and effective method to control the spread of this unwelcome invader, it will be left to Mother Nature to prove her resilience and ingenuity and, with her offsider Evolution, she may ultimately win the war and lead Australia's wild creatures to victory over this silent and stealthy enemy.

Opposite page: A cane toad in the author's garden.