ANIMALS
of Shark Bay

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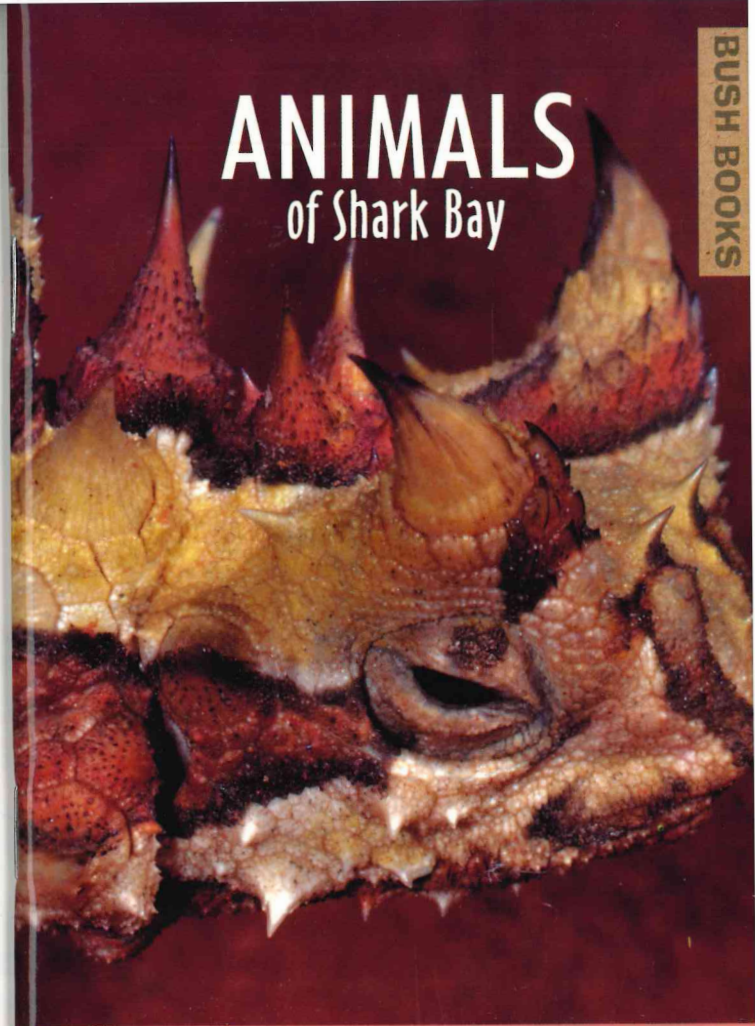

What animal is that?

Bush Books are a series of practical field guides to help you learn about and discover WA's unique plants, animals, and special features, region by region.

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Managing Editor: Ron Kawalilak.

Design and Production: Sue Marais.

Technical Advisers: Per Christensen, Keith Morris, Graeme Liddelow, Ron Shepherd, Dave Pearson, Allan Burbidge, Paul Brown and David Algar.

Illustrations: Louise Burch, Gooitzen van der Meer.

Editorial Assistance: Verna Costello.

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ANIMALS
of Shark Bay

by Carolyn Thomson

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

INTRODUCTION

The Shark Bay World Heritage Area is an extremely important area for threatened animals. Today, most of these species - be they mammals or birds - are confined to two remarkable islands. Bernier and Dorre Islands are a virtual Noah's Ark, still inhabited by species that disappeared from the rest of mainland Australia in the years following European settlement. They include the boodie, banded hare-wallaby, rufous hare-wallaby, western barred bandicoot, Shark Bay mouse and a rare form of the white-winged fairy-wren. Other unusual or threatened species, such as the sandhill frog and the thick-billed grasswren, survive on the adjacent mainland.

In 1990, the State Government purchased Peron Station and began to manage it as a national park (Francois Peron National Park was formally declared in January 1993). Huge numbers of sheep and feral goats were systematically removed and, as the heavily grazed vegetation began to grow back, the surviving native animals staged a resurgence. Animal tracks, particularly those of lizards, began to be seen everywhere and the population of endangered thick-billed grass-wren on Peron Peninsula was thriving. The community at the town of Useless Loop and the CSIRO fenced off and removed feral animals from a small peninsula known as Heirisson Prong. They have now reintroduced the Shark Bay mouse and the boodie to this area.

When the Department of Conservation and Land Management began *Project Eden* in 1995 (see page 4) wildlife conservation in the area was given an even greater boost. Because of extensive fox, cat and rabbit baiting on a huge area of the Peron Peninsula, visitors to Shark Bay are now increasingly likely to see mammals, birds and reptiles - both rare and common - roaming around in their natural state. Echidnas, thorny devils, emus and malleefowl are already becoming much more common. Woylies,

bilbies, rufous hare-wallabies and other mammals are being considered for reintroduction programs in the near future. Because of this unique project this book describes both the animals that can be seen in Shark Bay now and those that were once found there, and which may one day be reintroduced. The European fox, feral cat and feral goat are also described, to give visitors an understanding of the devastation they have caused to Australia's unique native animals.

In years to come, the Shark Bay area has the potential to be seen as one of the wildlife wonders of the world - a haven for animals that can be seen nowhere else in such diversity and abundance.

Below: *Cape Peron*

Photo – Carolyn Thomson

PROJECT EDEN

One of the first things you will notice as you approach Peron Peninsula, in Shark Bay, is an imposing fox and cat-proof fence. This is the most visible sign of *Project Eden*, one of the most exciting developments in conservation management ever to occur in Australia.

Project Eden, initiated by the Department of Conservation and Land Management, aims to remove virtually all feral cats, foxes and rabbits from a massive 1050 square kilometres of the Shark Bay World Heritage Area. If predator control is successful, *Project Eden* aims to restore the original suite of animal species to the Shark Bay area. Just imagine visiting Shark Bay to see many of Australia's endangered and unique mammals - such as chuditch, bilbies, western barred bandicoots and banded hare-wallabies - roaming around in pre-European settlement numbers!

Peron Peninsula offers the perfect site for *Project Eden* because of its unusual shape. It is virtually a large island joined to the mainland by an extremely narrow neck or isthmus. This means that migration of feral animals can be controlled by fencing and baiting. Because of its size, the peninsula could support large and stable populations of a number of species, considerably increasing their chances of long-term survival and providing the Shark Bay World Heritage Area with a major attraction.

The decline and disappearance of many of our native mammal species in the arid zone has been almost catastrophic, with numerous animals becoming completely extinct. *Project Eden* is the first attempt to tackle this problem on a large scale in the arid zone, and the first effort to deal with a number of feral species at the same time. As well as controlling feral cats and foxes, CALM aims to control rabbits, goats and feral sheep on the peninsula. Before *Project Eden* began, Peron Peninsula supported extremely high numbers of foxes and rabbits. The 2000-3000 foxes

estimated to inhabit the area have now been all but eliminated and the fence that guards the neck of the peninsula will prevent them from reinvading. CALM's efforts to remove cats have also met with considerable success.

People inevitably associate Shark Bay with the Monkey Mia dolphins, but soon the area may be just as well known for the rest of its wildlife. If the success in eliminating predators continues, and scientists proceed to the phase of reintroducing threatened animals, *Project Eden* may soon turn back the clock and reinstate the original mammal fauna to something resembling its original state.

Below: *Fitting a radio transmitter to a fox*

ECHIDNA

(Tachyglossus aculeatus)

The echidna is best known for its amazing biology. Like the platypus, this mammal lays eggs and suckles its young. The echidna and platypus are in an ancient group known as monotremes. When disturbed, the echidna either curls into a spiny ball to protect its soft underside, or digs its belly into the soil, so that only the spines are exposed.

DESCRIPTION: Long spines cover the body and fur is present between them. These slow-moving creatures have a bulbous forehead and a long snout with which to collect their food. Males have a spur on the ankle of the hind leg but, unlike that of the platypus, this is not venomous.

OTHER NAMES: Spiny anteater.

STATUS AND DISTRIBUTION: Echidnas are widely distributed throughout the Australian continent and Tasmania. Although not considered threatened, they are no longer frequently seen on the Australian mainland. However, they may be locally abundant in some areas. Before fox baiting began, echidnas were rare on Peron Peninsula, but now they are steadily increasing in number.

PREFERRED HABITAT: They may be found in any place with a good supply of ants and termites.

LIFE HISTORY: Echidnas are usually solitary. However, when they mate between July and August several males may follow a single female. About two weeks later, a single soft-shelled egg is deposited directly into the pouch. This hatches after 10 days and the young remains in the pouch, where it suckles milk exuded from the mother's mammary glands. Here it stays for about three months. Completely hairless when born, the

youngsters are covered with short spines by the time they leave the pouch. These toothless animals expose termite galleries by breaking open nests with their strong forepaws or snout or digging into soil. They then extract the termites with long, sticky tongues. Dingoes and goannas will occasionally eat echidnas. Their relative abundance on large, fox-free islands such as Tasmania and Kangaroo Island in South Australia suggests that the fox is a significant predator.

HOW TO SEE THEM: Secretive echidnas are active by day and night but are rarely seen. However, extensive diggings at the base of termite mounds and along tracks are a sure sign of their presence. If you are bushwalking and notice large excavations under a log try shining a torch inside it to see if the digger is still around. These mammals have distinctive cylindrical droppings in which termite remains are easily distinguished.

CHUDITCH

(Dasyurus geoffroii)

Chuditch became extinct from mainland Shark Bay and most other parts of Australia earlier this century. The Department of Conservation and Land Management now plans to reintroduce the chuditch to the Peron Peninsula as part of *Project Eden*, a bold plan to eliminate foxes and cats from the area in order to reinstate as much of the original fauna as possible.

DESCRIPTION: The chuditch resembles the closely-related northern quoll, but is larger and more stocky. White spots cover its body and head. The rest of the fur is brown, with a lighter belly. The black brushy tail is unspotted. Its nose is quite pointed and the ears are erect and prominent. Adult males reach about 60 centimetres long while the females are generally smaller at around 55 centimetres.

OTHER NAMES: Western quoll, native cat.

STATUS AND DISTRIBUTION: The chuditch was once widespread across much of central and southern Australia. However, like many of Australia's threatened mammals, it is now confined to the south-west of WA. A combination of factors such as habitat clearing, changed fire regimes and predation by foxes probably contributed to its decline. Where foxes are controlled, chuditch numbers have increased significantly.

PREFERRED HABITAT: Chuditch inhabit jarrah forest and remnant pockets of woodland and mallee shrubland in the southern Wheatbelt.

LIFE HISTORY: These carnivorous marsupials are swift runners and efficient climbers, and spend the night hunting for small reptiles, birds, invertebrates and small mammals. They breed

when about one year old and mate through late autumn to early winter. The young are only five millimetres long when born and remain clinging to teats in the pouch for about 60 days. Females have six nipples and generally give birth to as many young. When they become too big for the pouch they are deposited in a den (usually a burrow or hollow log) to which the mother frequently returns to suckle them.

RED-TAILED PHASCOGALE

(Phascogale calura)

The attractive red-tailed phascogale is one of WA's rarest animals. Predation by cats and foxes, destruction of habitat by grazing and clearing, and changed burning regimes may have caused its decline. Sub-fossil deposits show that this species was once found on the Peron Peninsula.

DESCRIPTION: This mammal looks similar to the brush-tailed phascogale of the south-west forests and northern Kimberley, though it is somewhat smaller. Its long, slender tail has a black brush on the lower half. Unlike the brush-tailed phascogale, this is distinctively red at the base and the brush is less bushy.

OTHER NAMES: Red-tailed wambenger.

STATUS AND DISTRIBUTION: Red-tailed phascogales were once widely distributed through southern and central Australia, but are now confined to a few bushland remnants in WA's Wheatbelt. They are endangered. The mammal may one day be introduced to Peron Peninsula, if the Department of Conservation and Land Management's *Project Eden* can successfully control cats and foxes.

PREFERRED HABITAT: In their remaining habitat in the WA Wheatbelt, red-tailed phascogales live mainly in dense sheoak vegetation, but often nest in hollows of mature wandoo trees.

LIFE HISTORY: Red-tailed phascogales are nocturnal. Extremely good climbers, they spend most of their time in trees, but also feed on the ground. They feed on insects, small mammals such as house mice and small birds. They are in turn eaten by cats and owls. Following a flurry of activity in the mating season in early July, all the male phascogales die from stress.

DUNNARTS

***(Sminthsopsis* species)**

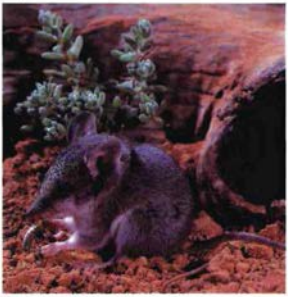
Though largely unseen, these small marsupials are numerous throughout most of the Australian bush, from the south-west forests to the deserts. In the arid regions, they have survived where most medium-sized mammals have become locally or totally extinct. The hairy-footed dunnart (*Sminthopsis hirtipes*), the fat-tailed dunnart (*S. crassicaudata*) and the little long-tailed dunnart (*S. dolichura*) live in the Shark Bay area.

Dunnarts are small marsupials about the size of a mouse, weighing up to 20 grams. They have pointed noses, large eyes and proportionally large and rounded ears. All species have dainty forepaws and quite elongated rear feet. Their fur is grey above and paler below. These nocturnal hunters will aggressively tackle prey, often large invertebrates and lizards, subduing them with rapid bites.

The fat-tailed dunnart uses its tail to store fat as a source of energy in lean times. It is widely distributed across most of the Australian mainland. The hairy-footed dunnart, found in the deserts south of the tropics, has relatively long and quite wide feet covered with fine silvery hair. The lesser hairy-footed dunnart is also found in the Great Sandy Desert and Exmouth Gulf region. The little long-tailed dunnart is well-adapted to arid and semi-arid areas but is also found in a variety of habitats throughout the south-west. The tail of this species is longer than that of most other dunnarts and is also longer than the length of its head and body.

WHERE TO SEE THEM: These small, nocturnal and secretive creatures are rarely seen.

Fat-tailed dunnart (above), *hairy-footed dunnart* (below left) *and little long-tailed dunnart* (below right).



WESTERN BARRED BANDICOOT

(Parameles bougainville)

Shark Bay is the only place in the world where the western barred bandicoot can be seen. This mammal is now found only on Bernier and Dorre islands, two important nature reserves 50 kilometres west of Carnarvon. It used to live on the Peron Peninsula and is one of the species which the Department of Conservation and Land Management hopes to reintroduce to the area as part of *Project Eden*. The name of this delightful animal is derived from two or three darker bands on its rump.

DESCRIPTION: With a head and body approximately 20 centimetres long, the western barred bandicoot is smaller than other bandicoots, and its features are more delicate. The fur is light grey to brownish-grey in colour.

OTHER NAMES: Striped bandicoot, marl, little marl, nyemmel.

STATUS AND DISTRIBUTION: Because of its restricted distribution, the western barred bandicoot is endangered.

PREFERRED HABITAT: Before European settlement, the species mainly inhabited semi-arid parts of southern Australia, in a variety of vegetation types. On the islands of Shark Bay, it shows a preference for the scrub behind dunes, but is also found elsewhere on the islands.

LIFE HISTORY: Each animal may have more than one nest, consisting of a hemispherical scrape, lined with plant material and excavated beneath a shrub. Western barred bandicoots shelter in these nests during the day, and forage for seeds, roots, herbs and small animals such as insects by night. Litters of between one and three young may be born at any time from April to October.

BILBY

(Macrotis lagotis)

This strikingly attractive and uniquely Australian mammal is fast replacing the rabbit as a symbol of Easter. Although the bilby has never been recorded on Peron Peninsula, it was probably once found there and on nearby parts of the mainland. A captive breeding program for the bilby should soon be established, so this endangered species can be returned to areas from which it has disappeared.

DESCRIPTION: Bilbies have long, rabbit-like ears, a long pointed snout and a long black tail, which is white on the latter half. They are covered with soft, bluish-grey fur. Males may grow up to half a metre long, with a tail up to 290 millimetres, but females are smaller.

OTHER NAMES: Dalgyte, rabbit-eared bandicoot, ninu, walpajirri.

STATUS AND DISTRIBUTION: Once distributed throughout arid and semi-arid Australia, the bilby is now confined to northern and central deserts, including parts of the Pilbara, the Great Sandy Desert and Gibson Desert. While it is threatened, this highly adaptable animal has survived in areas where other medium-sized mammals have disappeared.

PREFERRED HABITAT: This species inhabits open arid country with spinifex grasslands and acacia shrublands.

LIFE HISTORY: Bilbies are largely solitary, widely dispersed and found in low numbers. They are comparatively slow moving and have superb hearing. They also have strong claws and are very efficient burrowers. In sandy soil they can disappear from sight within three minutes. Their burrows go down in a steep spiral to a

depth of around two metres. The steep descent makes it very difficult for predators such as foxes and cats to unearth a bilby. Bilbies dig burrows wherever they go, and may use as many as two dozen at any one time. These nocturnal animals always feed close to a burrow, mostly within 100 metres or so, and may visit several burrows each night before choosing one in which to spend the daylight hours. The main food items are bulbs and insects such as termites, witchetty grubs and honeypot ants. Bilbies have a high breeding rate in good times and can breed throughout the year, an adaptation which allows them to quickly take advantage of good seasons in the harsh desert environment.

BOODIE

(Bettongia lesueur)

The boodie is the only member of the kangaroo family that regularly inhabits burrows. This attractive mammal species went from being exceptionally abundant and widespread to becoming completely extinct on the Australian mainland in about 50 years. It is now confined to four islands off the coast of WA - Barrow and Boodie islands in the Pilbara and Bernier and Dorre islands off Carnarvon. The main culprits in its disappearance are thought to be the introduced fox and the cat. Old boodie warrens can still be seen in the Wheatbelt and deserts, where some have been taken over by rabbits.

DESCRIPTION: These "rat kangaroos" vary considerably in size. Those on Barrow Island are noticeably smaller than those on Bernier and Dorre islands. They are grey, thickset and rounded, with a hunched posture. Their ears are rounded and their tail is quite stout.

OTHER NAMES: Burrowing bettong, Lesueur's rat kangaroo, burrowing rat kangaroo.

STATUS AND DISTRIBUTION: Boodies are regarded as endangered, because of the low number of populations. However, they are common on fox-free Barrow Island. They were once found across most of central and southern Australia and north to Broome. A population was recently established on the mainland at Heirrisson Prong in Shark Bay, in an area which was fenced off and baited for feral animals.

PREFERRED HABITAT: These mammals inhabit spinifex grasslands. They prefer areas with easily excavated, loamy soils and often make their burrow systems underneath limestone caprock.

Photo – Jiri Lochman

LIFE HISTORY: Boodies are highly social, living in complex warrens with numerous entrances and interconnecting passages. A warren on Barrow Island, for instance, has 120 entrances and at least 60 inhabitants. Within the warrens are numerous nests padded with grasses. Boodies eat roots, bulbs, fungi, seeds, nuts, termites and fruit, foraging entirely at night. They smell out the food source and then usually dig it out. They have a short gestation period and, though they only produce a single joey at a time, they may raise three young in a year.

WOYLIE

(Bettongia penicillata)

The energetic hopping marsupial known as the woylie is about to make a comeback in Shark Bay. Once found throughout Australia, it became confined to tiny pockets of the south-west forests. Now fox baiting and reintroduction programs have resulted in the woylie's removal from the list of threatened fauna, and the mammal will soon be the first to be released in Shark Bay following massive feral animal eradication from the area.

DESCRIPTION: Resembling a small wallaby, the woylie is about the size of a rabbit. It is approximately 30 centimetres high, and weighs up to 1.6 kilograms. The fur is yellowish-grey with some reddish-orange tinges, particularly on the tail, which ends in a black crest. The species bounds with head low and tail extended. The hind feet are very long. The forepaws are shorter and equipped with long, curved claws. Woylies are smaller and less rotund than quokkas and lack their wide, flat face.

OTHER NAMES: Brush-tailed bettong.

STATUS AND DISTRIBUTION: The range of the woylie has been drastically reduced since European settlement, mainly because of clearing for agriculture and predation by foxes. It became confined to small, isolated pockets in the south-west, where thick vegetation offered some protection from marauding foxes.

PREFERRED HABITAT: This hopping marsupial was once found through much of arid central Australia in a wide variety of habitats. The woylie prefers clumped, relatively open vegetation with sandy soils that are easy to dig.

LIFE HISTORY: At night woylies forage for bulbs, seeds and insects. Underground fungi form a substantial part of their diet. Nests are fairly elaborate and hidden under zamias, shrubs, blackboys, fallen logs or other debris. Shredded bark, twigs, grass and leaves used to build the nest are carried to the site in the curled tail. Like kangaroos, woylies can carry pouch young while having an embryo in the womb, awaiting birth, at the same time. This means they can give birth year round, producing three young each year throughout their lives. They live in the pouch for about 100 days and spend several more weeks at their mother's heel.

RUFOUS HARE-WALLABY

(Lagorchestes hirsutus)

The rufous hare-wallaby lives on Shark Bay's Bernier and Dorre islands in reasonable numbers, but has now all but disappeared from the mainland. It was once found across large areas of WA and the Northern Territory and the far north-west of South Australia, where early explorers commented on its abundance.

DESCRIPTION: These animals are covered with long, soft fur that is greyish-brown above and reddish below. They have a hunched posture. The females, averaging 37.5 centimetres long, are larger than the males, with a combined head and body that is about 33 centimetres long. The long and relatively slender tail is shorter than the body.

OTHER NAMES: Mala, western hare-wallaby.

STATUS AND DISTRIBUTION: This species is found only on the fox- and cat-free Bernier and Dorre islands, and in captivity at Alice Springs. The arrival of foxes and cats probably sealed its demise in the rest of its former habitat.

PREFERRED HABITAT: The rufous hare-wallaby was most common in spinifex grasslands of the arid areas.

LIFE HISTORY: Subsisting largely on grasses, herbs and seeds, but occasionally taking insects, the rufous hare-wallaby shelters during the day. Its refuge is generally a scrape or burrow under a spinifex hummock or shrub. It was a favourite food of Aboriginal people, who devised ingenious methods of capturing it. If conditions are favourable, it can breed at any time of the year.

BANDED HARE-WALLABY

(Lagostrophus fasciatus)

The banded hare-wallaby was one of the first Australian mammals ever described by Europeans. French naturalist François Péron, who saw them on Bernier Island during an expedition aboard the *Geographe* in 1801, noted that "*the striped kangaroo, the smallest and most beautiful among the species of this extraordinary kind of animal in New Holland .... breeds in great numbers on the three islands of Bernier, Dorre and Dirck-Hartighs*".

DESCRIPTION: The dark grey fur is banded on the rump, and it is the only kangaroo that has this feature. The head and body averages 43 centimetres long, with a tail about 37 centimetres long. It has short front paws and a hunched posture.

OTHER NAMES: Marnine.

STATUS AND DISTRIBUTION: While this mammal is quite abundant on the two Shark Bay islands (it is now extinct from Dirk Hartog Island), it is considered threatened, because its restricted distribution would make it vulnerable to predators or disease. It was once found in south-western Australia, but the banded hare-wallaby has never been collected anywhere else on the mainland since European settlement. However, sub-fossil remains have been found on Peron Peninsula.

PREFERRED HABITAT: They tend to favour open areas with nearby shrub vegetation for shelter.

LIFE HISTORY: Banded hare-wallabies are generally nocturnal and consume various shrubs and grasses. The males are territorial and often aggressive towards other males. Most young are born in January or February. The

mother carries a dormant embryo in her womb that begins to develop if she loses her young prematurely. The joeys spend about six months in the pouch and become independent at nine months.

EURO

(Macropus robustus)

The euro is found throughout most of arid Australia, including Shark Bay. If they have sufficient shelter from the sun, and food plants containing reasonable moisture, these desert specialists can survive for long periods without drinking.

DESCRIPTION: This small kangaroo or wallaroo has dark grey to reddish fur on their back and head, with lighter grey fur below. The end of the muzzle is bare and black. Adults measure from a little over a metre long, from nose to tail tip, to almost two metres in larger males. Mature males may weigh twice as much as females and are usually darker.

OTHER NAMES: Common wallaroo.

STATUS AND DISTRIBUTION: These mammals are common and distributed across most of the Australian continent. In Shark Bay they are found on Peron Peninsula and on adjacent stations.

PREFERRED HABITAT: Euros tend to shelter in caves, overhanging rocks and ledges within steep escarpments, rocky hills or stony rises and graze in the lower slopes and surrounding plains. Coastal mangroves are also used for shelter during the day.

LIFE HISTORY: These 'roos tend to be solitary. They feed on grasses and shrubs. Like other kangaroos, euros carrying joeys also have a dormant embryo in their womb, ready to resume development when the pouch is vacated.

WHERE TO SEE THEM: Euros are often seen at the "hot tub" at Francois Peron National Park, and in coastal parts of the park.

GREATER STICK-NEST RAT

(Leporillus conditor)

In 1990 the greater stick-nest rat, or wopilkara, was released on Salutation Island in Shark Bay. The new population has thrived in its new environment for more than six years, but it remains the State's only population. This attractive native rodent derives its name from the large nest of sticks it builds to protect itself from predators.

DESCRIPTION: Adults have a head and body about 22 centimetres long and have fluffy, yellowish-brown to grey fur, with a cream to white belly. The snout is fairly blunt and the ears are quite large.

STATUS AND DISTRIBUTION: Greater stick-nest rats were once found from Shark Bay, across central WA, through South Australia into western New South Wales. They were last found on the mainland in the north-eastern Nullarbor Plain in the 1920s. Remnants of stick-nests made by either the greater or the now extinct lesser stick-nest rat can still be found in parts of southern WA. Until recently, only one population of the greater stick-nest rat remained - on the Franklin Islands off the far west coast of South Australia. As well as Salutation Island, stick-nest rats have been reintroduced to St Peters and Reevesby islands in South Australiia.

LIFE HISTORY: Stick-nest rats eat semi-succulent vegetation, such as pigface, and depend on the foliage and fruits of perennial shrub species, rather than the seeds or grasses eaten by most native rodents, to see them through drought conditions. Unfortunately, their food species are also eaten by rabbits, sheep and cattle. The stick-nests, usually built around a bush, can measure up to a metre high and one and a half metres wide and they contain green vegetation as well as sticks and stones. Nests are added to or modified over generations and may be used by up to 10 animals.

Photo — Keith Morris

SPINIFEX HOPPING-MOUSE

(Notomys alexis)

The spinifex hopping-mouse is one of the most common mammals found in Shark Bay. Their nocturnal secretive habits mean they are rarely seen alive, but they are occasionally killed and brought in to Denham by domestic cats. These attractive native rodents have a two-footed hopping action and look rather like miniature kangaroos. Above the ground they are extremely fast, leaping high and erratically.

DESCRIPTION: These creatures have large ears, and soft fur that is light brown above and white beneath. They are about 10 centimetres long, with a brush-tipped tail up to 15 centimetres long. They have long hind legs and short fore paws.

OTHER NAMES: Dargawarra, northern hopping-mouse.

STATUS AND DISTRIBUTION: Spinifex hopping-mice inhabit a large area of arid country in WA and central Australia. They are still reasonably common, even in areas such as Denham where domestic cats frequently kill them. Seasonal factors have the strongest influence on their numbers at any given time.

PREFERRED HABITAT: Spinifex grasslands, sandflats and sandhills.

LIFE HISTORY: The spinifex hopping-mouse avoids day time heat by sheltering in a cool burrow, an elaborate network of tunnels and chambers up to a metre deep. Like many other desert mammals, this native rodent can be found in large numbers during good seasons, as it has the capacity to reproduce quickly, producing litters of between three and six young some 32 days after mating. After only 60 days these youngsters themselves become sexually mature. The diet too is very adaptable; they feed on a variety of seeds and other plant material, as well as a range of invertebrates.

SHARK BAY MOUSE

(Pseudomys fieldi)

The Shark Bay mouse, or djoongari, is now found naturally only on Bernier Island in Shark Bay. It was recorded on the Australian mainland in 1895 at Alice Springs and on the Peron Peninsula in 1858. However, efforts to make this attractive native rodent more secure have resulted in releases on Doole Island, in Exmouth Gulf, in 1993 and on Shark Bay's Heirrisson Prong. Reintroductions to other parts of Peron Peninsula are proposed.

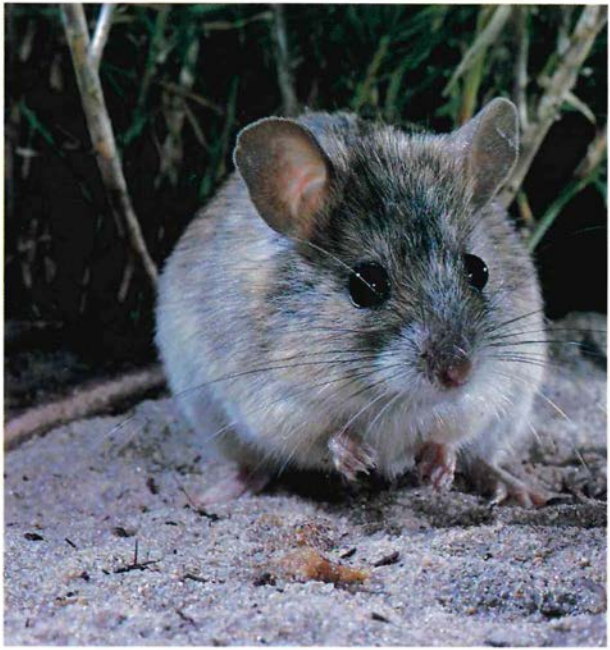
DESCRIPTION: These mammals have shaggy, dark brown fur, grading to white beneath. The head and body is generally about 10 centimetres long, and the furred tail is longer than the body. They are quite stocky.

OTHER NAMES: Shaggy-haired mouse, Alice Springs mouse.

STATUS AND DISTRIBUTION: The Shark Bay mouse is considered threatened, because of its restricted distribution. Sub-fossils indicate that it was once found over a large part of the Australian mainland, including most of southern WA, South Australia and part of the Northern Territory. The feral cat may have contributed to its decline.

PREFERRED HABITAT: On Bernier Island the species prefers the coastal fringes, tunnelling beneath dune vegetation and into piles of seagrass washed ashore.

LIFE HISTORY: The Shark Bay mouse feeds on flowers and other plant material, and on various invertebrates. It shelters in shallow burrows and nests beneath vegetation. Litters of three to four young are produced twice each year. They remain attached to the teat until weaned at 30 days.



EUROPEAN FOX

(Vulpes vulpes)

The settlers who first introduced the fox to southern Victoria in the 1860s probably had no idea of the tragic consequences their actions were to wreak on native wildlife. The fox had spread to Kalgoorlie by 1917 and arrived in the south-west by the 1930s, becoming established at about the same time that many species of native mammals disappeared. However, it was many years before this predator's real impact was understood by scientists. It was not until the 1980s that scientists showed that many species of native wildlife were able to flourish when foxes were controlled. This work has led to CALM's *Project Eden*, which aims to eradicate almost all foxes and other feral animals from Peron Peninsula, so that the original wildlife can be returned to its former abundance.

DESCRIPTION: Foxes have distinctive reddish-brown fur, with a white throat and underside. They are also easily recognised by their bushy tail, erect pointed ears and orange eyes. The paws and base of the legs are black.

OTHER NAMES: Red fox, European fox.

STATUS AND DISTRIBUTION: The fox ranges across the southern half of Australia and is absent only from tropical areas in the far north. It is not present in Tasmania.

PREFERRED HABITAT: The fox is highly adaptable and present in all areas outside the tropics. It survives in the heart of urban areas, such as bushland in the centre of Perth, to the deserts. Its distribution is very low in arid areas.

LIFE HISTORY: The species hunts by night and consumes wild fruits, insects and a huge range of small animals. Rabbits are an important

food source. Carrion is often scavenged. Foxes are territorial and spend the daylight hours in dens, which are usually built in an old rabbit burrow, or other refuge. They mate in early winter and females give birth to at least four cubs in late spring.

FERAL CAT

(Felis catus)

No-one knows for sure how long the cat has been in Australia. They may well have reached Australia as a result of Dutch shipwrecks in the early 1600s. Feral cats may even have originated from South East Asia, via the Macassan traders who came to gather trepang (sea cucumbers) from the shallow northern tropical waters. Cats are devastating destroyers of native wildlife. In Shark Bay, they are believed to have eradicated the boodie and banded hare-wallaby from Dirk Hartog Island. The Department of Conservation and Land Management is currently attempting to develop and trial a practical and efficient method of baiting feral cats. If this proves successful, it will be a major breakthrough in native wildlife conservation in Australia.

DESCRIPTION: Although lean and muscular, adult feral cats in Australia's arid zone are usually slightly smaller than the average well-fed house cat. Most adults weigh between three and four kilograms, although considerably larger individuals have been recorded, such as a male on the Peron Peninsula that weighed more than six kilograms. The most common coat colour is tabby, although a few ginger or black animals have been sighted.

OTHER NAMES: Central desert Aborigines call the cat miau, consider it a native animal and tell stories of how their fathers and grandfathers hunted cats for food. It is possible that Aboriginal people kept cat numbers at low levels, helping native animals to survive.

STATUS AND DISTRIBUTION: Feral cats are common right across the mainland and on some offshore islands, such as Dirk Hartog.

PREFERRED HABITAT: They inhabit all types of bushland, from wet forests to dry deserts.

Photo – Ray Smith

LIFE HISTORY: There is growing evidence that these supreme hunters have had a devastating effect on our unsuspecting wildlife, especially in the open vegetation of the semi-arid and arid zone. The feral cat does not need to drink; it can obtain enough moisture from the body fluids of its prey. A feral cat will kill and eat virtually any animal less than, or equal to, its own size. It spends the night hunting for reptiles, insects, birds and small mammals, killing for sport as well as food. Cats on the Peron Peninsula sometimes travel up to eight or nine kilometres each day to obtain food. Except for breeding time, they are largely solitary animals with stable territories, which they often mark with scent from cheek glands, exposed faeces or urine sprays.

FERAL GOAT

(Capra hircus)

Goats are extremely hardy animals, able to thrive in semi-arid and arid conditions. Useful for meat and milk, they were brought to Australia with the First Fleet in 1788. They are still farmed in many areas, with some breeds popular for their mohair or cashmere. However, in the wild, goats have done tremendous environmental damage. The Department of Conservation and Land Management has now removed thousands of goats from the Francois Peron National Park by means of aerial shooting. They are still present in small numbers, but a concerted effort is being made to mop up the last remnants. Since their large-scale removal the native vegetation on the peninsula has made a remarkable recovery, and native wildlife has become noticeably more abundant. Goats also lived on Bernier Island for 100 years, but were eradicated in 1984.

DESCRIPTION: Billy goats may be up to one and a half metres long and weigh 40 kilograms, while full-grown nannies are slightly shorter and weigh 27 kilograms.

STATUS AND DISTRIBUTION: The total wild population in pastoral areas is estimated to be between two and three million.

HABITAT: Their main strongholds are in pastoral areas and rugged uplands. These hoofed animals cause damage by trampling around water holes and other areas. Large numbers of goats are capable of removing almost all foliage in an area within goat height, and preventing regeneration of many trees and shrubs. On Dirk Hartog Island the vegetation has been so heavily grazed that it has become denuded, leading to extensive sandy blow-outs. These can be clearly seen from the mainland. Goats also compete with native herbivores for

food and may have contributed to the decline of many species. Goats have a high capacity to reproduce. Nannies can reproduce at six months of age, and from then on give birth to between one and three kids every eight months. A population can increase by 75 per cent in 12 months, a factor which can frustrate efforts to eradicate feral goats.

STIMSON'S PYTHON

(Antaresia stimsoni)

Stimson's python is non-venomous and harmless to people. Prey is seized with the jaws and body coils are thrown around it to constrict and suffocate. The jaws can be dislocated to permit the swallowing of larger prey. As the python's teeth are not suitable for tearing meat or chewing, prey are eaten whole and digested by strong stomach acids. After swallowing food items, a python will yawn several times to ease the jaws back into their usual position.

DESCRIPTION: This small python is up to a metre long. The scales on its head are considerably larger than those on its body, forming distinct "shields". It is covered with striking dark brown to reddish-brown markings (circular to elongated and asymmetrical), over a lighter background which varies from pale brown to yellowish-brown or whitish. There is also a pale stripe on either side of the upper body near the head. The belly is white.

STATUS AND DISTRIBUTION: Stimson's pythons are found from Perth to Derby, and east across the central desert region. They are relatively abundant.

PREFERRED HABITAT: These animals hide in hollow tree limbs, termite mounds, animal burrows or beneath rocks.

LIFE HISTORY: Stimson's pythons are generally nocturnal. They lie coiled, often concealed in vegetation, waiting for an unsuspecting bird, mammal or reptile to pass within range. The python will then strike out like a tightly coiled spring to seize its prey. The odour of prey is detected by tongue flicking. Scent particles from the air are collected on the tongue and are then transferred to a pair of pits on the roof of the mouth, known as the Jacobsen organ.

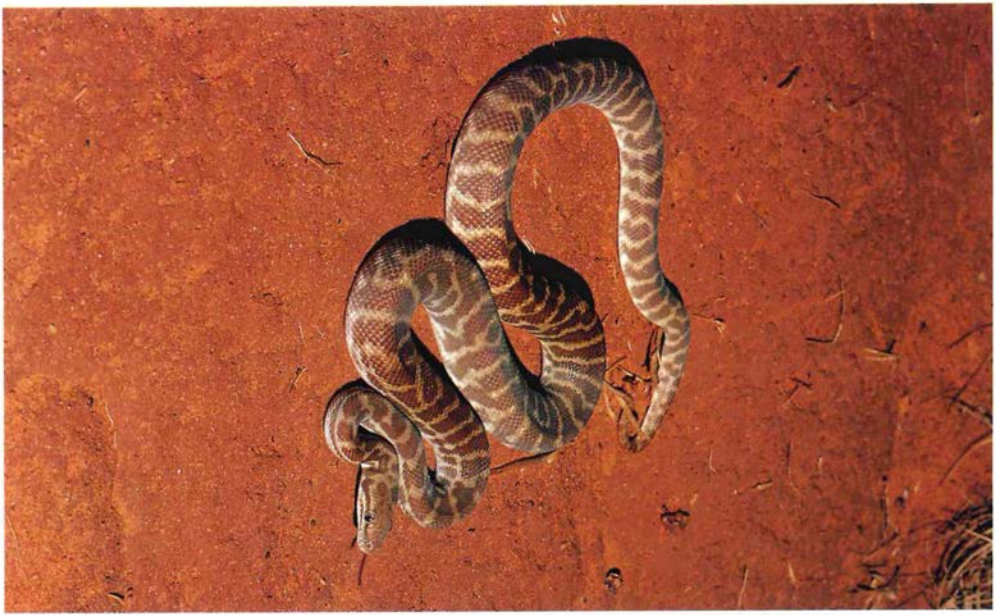


Photo – Jiri Lochman

GOULD'S MONITOR

(Varanus gouldii)

Gould's monitors are striking animals that are frequently seen sunning themselves on roads in almost all parts of the State. Adults have few natural enemies and often show little fear towards people. If approached too closely they will produce a challenging stare, raise themselves on their hind legs and tail, and hiss in warning. If startled they will flee with remarkable speed, so it is best to photograph them from a few metres away.

DESCRIPTION: The body is usually brown, dark grey or almost black, with pale cream or yellow spots or eye-like markings arranged across the back in bands. The belly is lighter in colour. The dark legs are spotted and the tail is banded with the cream or yellow colour. The elongated body, long neck and flattened head of this species are typical of the monitors. So is the rough skin, which appears to be quite loose. This species can attain a total length of one and a half metres.

OTHER NAMES: Race horse goanna, bungarra.

STATUS AND DISTRIBUTION: Gould's monitors live across most of the Australian mainland. They can be seen throughout the Shark Bay area, including Bernier and Dorre islands.

PREFERRED HABITAT: They occupy a large range of habitats, from desert to forests.

LIFE HISTORY: The Gould's monitor lives in a burrow at night and stalks the undergrowth for reptiles, mice or large invertebrates by day. It sometimes feasts on road kills such as dead kangaroos. Like snakes, monitors have forked tongues that allow them to "taste" the air in order to locate prey. They lay their eggs in a burrow, to incubate without further assistance.

LOZENGE-MARKED DRAGON

(Ctenophorus scutulatus)

One of the most common dragons in Shark Bay is the lozenge-marked dragon. Like most dragon lizards, it can move with great speed which, along with its acute eyesight, is needed to avoid predators and to capture food. Since dragons are mostly active by day and search for food in the open, birds of prey such as hawks are their main predators.

DESCRIPTION: Lozenge-marked dragons are brown or reddish-brown above, and white to creamy orange beneath. There is a stripe from eye to ear, barring on the neck and shoulders, and a broad wavy-edged, partly broken stripe on each side of the back, which runs from the neck to the tail. Males also have a dark, wedge-shaped bar on the throat and chest. There are a few spines on the folds of the neck. These lizards may reach up to 38 centimetres long and they have a dorsal keel that is most prominent on the back of the neck.

STATUS AND DISTRIBUTION: This species is common throughout many arid and semi-arid areas of the Gascoyne and Goldfields, and extends into north-western South Australia.

PREFERRED HABITAT: It prefers shrubland areas and low woodlands, avoiding spinifex grasslands, where other dragons dominate.

LIFE HISTORY: Most dragon lizards employ a sit and wait feeding strategy. They elevate their heads to get a good view of their surroundings and then wait until a suitable morsel comes into sight. They then race forward, seize their prey with their jaws and gulp them down. Ants and other insects are the main items eaten, although some of the bigger species eat large amounts of

plant material. Behaviour during courtship often involves unusual displays of head bobbing or foreleg waving.

WESTERN BEARDED DRAGON

(Pogona minor)

Western bearded dragons are often seen sunning themselves on logs, rocks or roads. Dragons like their body temperature to be about 35°C, so they are constantly either basking in the sun, seeking shade during the hot part of the day, or changing the orientation of their body relative to the sun by climbing onto a bush or rock. As the sun begins to set, they move to sites where they will receive radiated heat, such as rock slabs or hot sand.

DESCRIPTION: The western bearded dragon is recognised by its large, triangular head and stout, spiny body. A number of spines around the back of the head are particularly noticeable. It can change colour form dark grey to yellowish-brown. Adults have a head and body up to 15 centimetres long, and a very long tail. If threatened, they rely on bluff, opening their mouths to reveal an imposing yellow gape and puffing up their bodies.

STATUS AND DISTRIBUTION: Western bearded dragons are common in a wide area, from the southern Kimberley to all but the wettest parts of the south-western corner, and eastwards into the Northern Territory and South Australia.

PREFERRED HABITAT: These lizards live in a wide variety of habitats, from coastal dunes, forests and woodlands to arid and semi-arid areas. They shelter in burrows, rock crevices, hollows and in vegetation.

LIFE HISTORY: Western bearded dragons consume all sorts of insects and other small arthropods. The six to 12 eggs are laid in early summer in a shallow burrow in a bare sandy area.

THORNY DEVIL

(Moloch horridus)

The thorny devil is distinguished by its long, curved spines, attractively dappled with yellow, orange, brown and white markings. The scientific name was derived from a poem by Milton which described the Canaanite god Moloch, a "horrid king besmeared with blood of human sacrifice". However, the ferocious appearance of the thorny devil belies its nature - this lizard feeds only on ants. It is very common throughout the Shark Bay area.

DESCRIPTION: There is a large hump behind the neck and an extra large, curved spine above each eye, which further accentuates its blunt snout. The thorny devil reaches up to nine centimetres long.

OTHER NAMES: Mountain devil.

STATUS AND DISTRIBUTION: Thorny devils are found throughout the arid sandy regions of WA, the Northern Territory, south-western Queensland and western South Australia. They are often seen on the sandy tracks that traverse Francois Peron National Park.

PREFERRED HABITAT: They occupy a range of habitats in arid areas, including sand, spinifex grasslands and scrub.

LIFE HISTORY: These slow-moving, placid lizards rely mainly on camouflage and their unpalatable spines for their defence. They are seen most often in spring, when they search widely for mates. Males engage in combat, head butting other suitors to gain access to the females. Three to ten eggs are laid in late spring or early summer in a shallow, slanting burrow.

VARIEGATED DTELLA

(Gehyra variegata)

These fascinating animals come into their own at night, when they emerge from their daytime refuges under bark or rocks to hunt for small invertebrates. Like all geckos, their large eyes have no eyelids. Instead the eye is covered with a translucent scale, which is periodically wiped clean with the tongue.

DESCRIPTION: The background colour is highly variable, ranging from light grey to dark brown, with a complex pattern of black and white markings. Careful examination will reveal that this species lacks a claw on the inner toe of each foot, though the rest of its toes have tiny claws. They can reach up to 11.5 centimetres long.

OTHER NAMES: Tree dtella.

STATUS AND DISTRIBUTION: The variegated dtella is found in a wide band across most of the Australian continent, excluding most of the Kimberley, the south-west and the southern coast.

PREFERRED HABITAT: This attractive little gecko prefers arid and semi-arid areas with lower rainfall. It lives mainly in trees and shrubs, often sheltering under loose bark, but also hides beneath rocks.

LIFE HISTORY: This gecko lays a single, slightly oblong egg, about a centimetre long. It has a brittle shell, like a miniature bird egg.

KNOB-TAILED GECKO

(Nephrurus levis)

Relatively little is known about this species, though it is quite common and widespread. It has no common name of its own, as it is just one of a number of geckos with distinctive knobby tails.

DESCRIPTION: This species features a series of three light-coloured bars across the back of the head and shoulders. Other markings are usually present, although variable in colour and pattern. The main colour of the upper body is usually orange and light purplish-brown. The undersides are white. This gecko has an unusual bulbous tail that ends in a short round knob. The limbs are long and slender, and it may grow up to 15 centimetres long. White raised scales (known as tubercles) cover the back and tail.

STATUS AND DISTRIBUTION: This knobby-tailed gecko is common in a band up the central coast of WA and in the arid interior of the continent.

PREFERRED HABITAT: It seems to favour areas of sandplains and dunes, in arid and semi-arid areas.

LIFE HISTORY: This little-known gecko inhabits a burrow during the day, emerging at night to hunt in open areas for invertebrates. Despite its delicate appearance, it will mount an impressive threat display to frighten predators. The body is puffed up and lifted high on outstretched limbs, and it may leap forward and issue a shrill bark.

SANDHILL FROG

(Arenophryne rotunda)

One of the strangest creatures in Shark Bay is the rotund sandhill frog, which spends most of its days buried in the sand on the dunes of Edel Land and Dirk Hartog Island. It lives entirely in sandhills and is one of very few frogs that goes through its life without ever inhabiting water. The species makes a squelching noise.

DESCRIPTION: Sandhill frogs have very short legs and toes and the skin around the hind legs is very loose. They vary in colour from off-white to cream but may darken rapidly to a grey or brown colour. Their bodies are also spotted with green, brown or red. These diminutive animals range from 26 to 33 millimetres long, with females larger than males. They are thick set, with an evenly rounded head.

STATUS AND DISTRIBUTION: This species is confined to a relatively small area, extending from Edel Land Peninsula to Kalbarri and inland to Cooloomia. It is also found on Dirk Hartog Island.

PREFERRED HABITAT: It lives entirely in sandhills, in a burrow 10 centimetres below the surface.

LIFE HISTORY: The sandhill frog emerges to feed on ants and other insects when it rains, or when there is a night dew. It does not have tadpoles. The young frogs hatch directly from clutches of creamy white eggs laid in moist sand, some 80 centimetres below the surface.

Photo – Jiri Lochman

THICK-BILLED GRASSWREN

(Amytornis textilis)

Despite their status as endangered, thick-billed grasswrens can be seen quite easily in bushland near Monkey Mia. Sometimes they perch briefly on exposed branches, but often all that can be seen is a glimpse of a bird, with head held low, in a blurring run to the next patch of cover.

DESCRIPTION: Thick-billed grasswrens are slightly larger than the well-known splendid fairy-wrens. Their plumage is earthy brown, with fine white streaks, and the birds have long tails which are held erect.

STATUS AND DISTRIBUTION: The thick-billed grasswren has declined dramatically since the turn of the century. It was once widespread in the southern arid zone, from Shark Bay to western New South Wales. However, the three subspecies are now well-separated and confined to very small areas, in and near Shark Bay, the northern Eyre Peninsula in South Australia and the basins of Lake Eyre, Lake Torrens and Lake Frome. The reasons for its massive decline are unclear. Perhaps the species declined as a result of stock and rabbits degrading its habitat, and through cat predation. However, the bird is still found in some areas that are heavily grazed. On Peron Peninsula it is found close to Denham, even though the cat population is probably high. The birds seem to be increasing following the removal of most of the sheep and goats on the peninsula.

PREFERRED HABITAT: They prefer areas containing shrubs of the saltbush family, and shrubs of various other species that are one to three metres tall, and spreading, providing dense cover near ground level.

LIFE HISTORY: Thick-billed grasswrens eat seeds, vegetable matter and some insects. The

birds seem to eat more seeds than other grasswrens, which probably explains why they have heavier bills than these species. The birds breed in late winter and usually lay two eggs. Their cup-shaped nests have a rough hood, and are typically built in a low shrub.

WHERE TO SEE THEM: Thick-billed grasswrens can be seen on Peron Peninsula and south and east of Hamelin Pool. Their distribution is patchy but the best place to see them is Monkey Mia, where two or three birds inhabit each hectare.

MALLEEFOWL

(Leipoa ocellata)

Malleefowl construct a huge nest mound, one and a half metres high and up to five metres in diameter. The heat generated by the decomposing vegetable matter is sufficient to incubate the eggs. Malleefowl have declined seriously in Shark Bay, but extensive baiting for feral animals in the region should help them to increase in number.

DESCRIPTION: Adult birds are about 60 centimetres long. They are light grey on the head, neck and upper back, while the wings, the rest of the back and the tail are decorated with heavy chestnut, dark brown, white and grey barring. The chest and belly are a creamy white colour. The birds have strong legs, feet and claws.

STATUS AND DISTRIBUTION: Malleefowl are found across the southern half of WA and South Australia, plus some parts of Victoria and New South Wales. They are far less common than in the past, probably because of predation by foxes on eggs and young birds and extensive clearing in areas of suitable habitat.

PREFERRED HABITAT: The prime habitat of this bird is in drier areas, especially in mallee country. However, in recent years it has been recorded again in the high rainfall karri country, within regrowth forest.

LIFE HISTORY: The female helps her mate to build the mound in autumn, kicking sand, sticks and leaves backwards with powerful strokes. She returns frequently between September and April, each time laying a single egg in a chamber excavated and then filled by her lifetime partner. The intervals between laying are affected by rainfall, needed to help maintain the humidity in the nest. Between five and 33 eggs (usually 15 to 24) are eventually laid. The male remains by the

nest, defending it and maintaining the rotting vegetation at a constant temperature, just as a good gardener maintains a compost heap. When each youngster hatches after a 49-day incubation, it is completely self-sufficient, and can fly within 24 hours. In most areas vegetable material forms the bulk of the diet.

WHITE-WINGED FAIRY-WREN

(Malurus leucopterus)

Although the remarkable islands of Shark Bay are best known for their endangered mammals, they also support some interesting birds. A subspecies of the white-winged fairy-wren is found only on Dirk Hartog Island and Barrow Island, in the Pilbara. Other land birds have been isolated on the islands and have evolved unusual forms: a subspecies of the southern emu-wren is also found on Dirk Hartog Island and a subspecies of the variegated fairy-wren is found on Bernier and Dorre islands. Occasionally, very dark males are seen on Peron Peninsula, particularly at the northern end.

DESCRIPTION: Male white-winged fairy-wrens from Dirk Hartog and Barrow islands are jet black with white wings, unlike their mainland counterparts, which are cobalt blue with white and grey wing feathers. Females and non-breeding males are brownish-grey above, white on the undersides with a greyish-blue tail.

OTHER NAMES: Black and white wren, white-backed wren.

STATUS AND DISTRIBUTION: The black and white island race is found only on Dirk Hartog and Barrow Islands, while the mainland form is found in a broad band across most semi-arid and arid parts of the Australian continent.

PREFERRED HABITAT: On Dirk Hartog Island the bird inhabits low heath.

LIFE HISTORY: White-winged fairy-wrens feed on beetles, bugs and other insects. They live in small groups containing only one adult female. She lays two to four eggs in an oval-shaped nest within a metre of the ground. The others in the group gather food while she incubates the eggs and broods the young. There

is a defined pecking order among the males in the group, indicated by their plumage. Males which have developed white shoulders are subordinate to males with black breeding plumage, but superior to brownish-grey males without white shoulders.

SIGHTING RECORD

SPECIES	DATE	LOCALITY
echidna		
chuditch		
red-tailed phascogale		
dunnarts		
western barred bandicoot		
bilby		
boodie		
woylie		
rufous hare-wallaby		
banded hare-wallaby		
euro		
stick-nest rat		
spinifex hopping-mouse		
Shark Bay mouse		

SIGHTING RECORD

SPECIES	DATE	LOCALITY
European fox		
feral cat		
feral goat		
Stimson's python		
Gould's monitor		
lozenge-marked dragon		
western bearded dragon		
thorny devil		
variegated dtella		
knobby-tailed gecko		
sandhill frog		
malleefowl		
thick-billed grasswren		
white-winged fairy-wren		

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ABOUT THE AUTHOR

Carolyn Thomson is a special projects officer for CALM. She has written and edited numerous publications about WA's natural environment and wildlife, including *LANDSCOPE* magazine, *Leaf and Branch, North-West Bound, Mountains of Mystery*, and *Dive and Snorkel Sites in Western Australia,* and has also compiled, written and edited numerous Bush Books.

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