Mammals of
Stirling Range National Park
Past and Present

B.G. Muir and G. Harold
Drawings by M. Cavana

Western Australian Heritage Committee

Department of Conservation and Land Management, W.A.

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INTRODUCTION

Stirling Range National Park, 200 km south-east of Perth, was created in June 1913. At the centre of the Park stand the Stirling Ranges, a 60 km long chain of mountains. The highest is Bluff Knoll, which rises 1073 m above sea level and about 800 m above the surrounding plain. The mountains are ancient, composed mostly of quartzites and sandstones about 1.2 million years old. These steep and rugged mountains harbour a complex mixture of forests, mallee, shrublands, heaths and swamps rich in plant species, many found nowhere else in the world.

The Ranges have attracted the attention of biologists since the early days of settlement. Botanist William Baxter visited the area in 1829 and James Drummond, the first Government Botanist, came in 1844 and in 1846. Many zoologists also explored the Ranges; the mountains are unique in the southern part of an otherwise flat landscape. Despite the many visits by eminent zoologists, including J.T. Tunney in the 1900s, A.W. Milligan in 1902 and F.L. Whitlock in 1911, no organised survey of the fauna was ever done. The only information of the animals present is from anecdotal accounts and scattered records, mostly of specimens taken to the Western Australian Museum by nearby landholders, national park rangers or the public.

Stirling Range National Park is therefore an unknown quantity with regard to mammals. Early collectors such as Tunney who worked extensively from Cranbrook, recorded many species now thought to be extinct in the south-west of the State. Also, there are several species such as bats which must, by their high mobility and known distribution, occur within the Park, but have never been officially recorded.

There had never been a biological survey of Stirling Range National Park before 1984. This could be a consequence of the early gazettal of the area as a park and consequently a tendency to consider the land secure. Surveys and faunal inventories tend to be directed to less secure areas, such as land being opened up for agriculture or mining. Similar circumstances apply to other long-established national parks such as John Forrest (established 1901) and Yanchep (1905); John Forrest has never been surveyed and Yanchep was not surveyed until 1977.

PART ONE
Changes in the Mammal Fauna

An examination of the list of mammals in Table 1 shows that of the 43 species, many have not been recorded in recent years, and others are thought to be present, perhaps even common, yet sometimes not recorded. This apparent anomaly is to some extent the consequence of ignoring the common. If a farmer near the Stirling Ranges sees a grey kangaroo, he is unlikely to report it because he has seen hundreds before. Yet, if he finds a small, mouse-like animal he is not familiar with, the specimen may be handed to a national parks ranger, or sent to the WA Museum. After several years these records accumulate, and the uncommon mouse is well known and recorded, while the abundant kangaroo is absent from official records.

Despite these vagaries of observation and recording, there are some changes in fauna that are more or less well documented and the consequence of alterations to the environment.

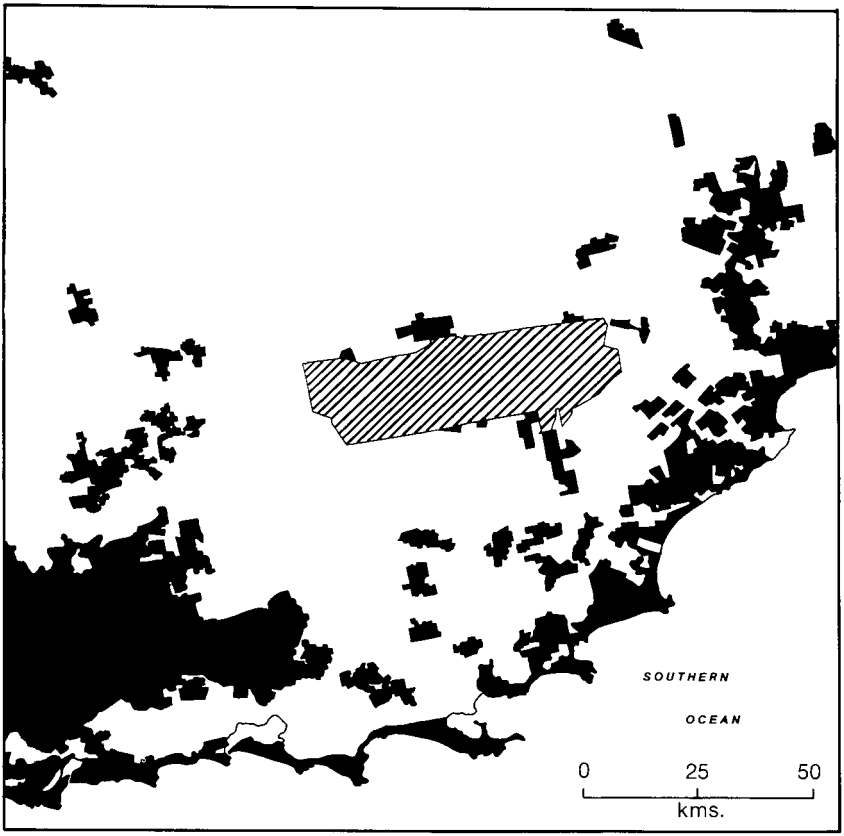
Kitchener **et al.**, 1980, presented a table which shows the status of fauna in the W.A. wheatbelt, of which the Stirling Range National Park occupies part of the southern end. This table is reproduced in part below (Table 1):

TABLE 1

SPECIES	STATUS IN WHEATBELT	SPECIES	STATUS IN WHEATBELT
Marsupialia			
Macropus fuliginosus	Common	S. murina	Common
M. robustus	Moderately common	S. crassicaudata	Common
M. irma	Uncommon	Antechinomys spenceri	Rare
M. eugenii	Rare		
Petrogale penicillata	Rare	**Muridae**	
Lagorchestes hirsutus	Extinct (1843)	Hydromys chrysogaster	Extinct (c. 1916)
Onychogalea lunata	Extinct (1908)	Leporillus sp.	Extinct (no modern specimen)
Lagostrophus fasciatus	Extinct (1906)	Rattus tunneyi	Extinct (1844)
Bettongia penicillata	Rare	Notomys longicaudatus	Extinct (1843)
B. lesueur	Extinct (1935)	N. macrotis	Extinct (1843)
Potorous platyops	Extinct (c. 1875)	N. mitchellii	Common
Trichosurus vulpecula	Uncommon	N. alexis	Moderately common
Pseudocheirus peregrinus	Rare	Pseudomys shortridgei	Extinct (1931)
Cercartetus concinnus	Rare	P. nanus	Extinct (1842)
Tarsipes rostratus	Moderately common	P. occidentalis	Moderately common
Isoodon obesulus	Rare	P. gouldii	Extinct (1842)
Perameles bougainville	Extinct (1906)	P. albocinereus	Moderately common
Chaeropus ecaudutus	Extinct (1843)	P. hermannsburgensis	Rare
Macrotis lagotis	Extinct (1935)		
Myrmecobius fasciatus	Rare	**Canidae**	
Dasyurus geoffroii	Rare	Canis familiaris dingo	Rare
Antechinus apicalis	Extinct (1843)		
Phascogale calura	Moderately common	**Tachyglossidae**	
Antechinus flavipes	Extinct (1843)	Tachyglossus aculeatus	Common
Sminthopsis granulipes	Moderately Common		

TABLE 1. Native mammal species, excluding bats, found within historic time in the W.A. wheatbelt, and status in the wheatbelt with date of last capture in the region for extinct species. It can be seen that of the 43 species listed, 18 (42 per cent) are considered extinct, and 11 (25 per cent) rare. This reflects, for the whole wheatbelt, the trends which seem to be apparent in the Stirling Ranges. Adapted from Kitchener et al. (1980).

MAP 1



MAP 1. Stirling Range National Park (hachured) and uncleared land in the vicinity (black) as of late 1976. The white is farmland with scattered or no vegetation.

The most obvious change to habitats surrounding the Stirling Range is clearing of bush for agriculture.

Map 1 shows the extent of uncleared bushland near the Stirling Range in late 1976. Firstly, little undisturbed bushland is left, secondly there are no corridors of vegetation to allow surviving mammals to move from one remaining area of bush to another. Only three native mammals (Grey Kangaroo, Fat-tailed Dunnart and Echidna) use cleared farmland.

Consequently, those surviving areas become islands of natural bush in a sea of agricultural land. In time, the population of mammals on these islands will decline until there is equilibrium between the breeding rate of the animals and the availability of resources such as food, breeding sites and protective cover. The initial population, which may be high as animals are forced into the islands as clearing continues, will decline and if few suitable habitats exist, perhaps die out altogether.

Added to this isolation or island-effect are complications arising from the introduction of exotic diseases or predators, alteration of the remnant bushland by fire, stock grazing or timber cutting, and alteration of population structures by hunting or provision of new food and water supplies for some species, for example, wheat and dam water for kangaroos.

Extinction of mammal species from the south-west of the State is part of a Western Australian, and indeed Australian, phenomenon in areas of high human use. Their disappearance was not noted by Austin who surveyed the country around Lake Cowcowing and northwards to Lake Austin and then to the mouth of the Gascoyne River in 1854, recording numbers of mammal species, including Black-footed Rock Wallaby, Crescent Nail-tailed Wallaby, Rufous Hare-wallaby, Burrowing Bettong, Bilby and Pig-footed Bandicoot (Glauert 1948), nor by Masters who recorded an impressive list of mammals from the south-west in 1866, 1868 and 1869 (see Glauert 1948). Shortridge (1910) writes that the disappearance of many species is "said to have been first noted about 1880, being most sudden and unaccountable. . . The entire disappearance of so many species, over such large tracts of country, is generally considered to be due to some epidemic or disease, which I have been told appeared to be a kind of marasmus [a wasting away, without apparent cause], perhaps brought into the country by introduced animals. It may be noted, however, that they have died out chiefly in the drier parts of the country, where, except for the introduction of sheep, there has been very little alteration in the conditions. Rabbits, although already very numerous in the Centre and South East, have not yet found their way to the North West."

"The mammals of the South West, to about as far north as the Moore River, have not disappeared in the same extraordinary way, although they are rapidly retreating before civilisation, being already very rare to the north of the thickly populated districts around the Swan River, as well as around all

the settled-in and agricultural areas. The burning of forests and general clearing of the country, together with constant raids of dogs and domestic cats, are among the chief causes."

Some species had declined in the south-west prior to Shortridge's collecting there in 1904-07. John Tunney, writing to B. Woodward on 28 June 1907, asks "did Mr Shortridge get **Perameles bougainvillei.** It was numerous in this district (Gracefield, Kojonup) 20 years ago?", and on 30 April 1900, from Baljarrup, "I have not been able to find any mice or **bougainvillei** about here" (WA Museum archives). A few years after Shortridge's survey, species he recorded as plentiful in the south-west had become scarce. On 10 May 1903, J. Tunney writing to B. Woodward from Gracefield states, "I feel that **P. lagotis (Macrotis lagotis,** the Bilby or Rabbit-eared Bandicoot) is getting scarce"; on 15 September 1911, "I have not been able to get any **B. pencillata** or **lesueuri** (Bettongs) yet the natives say there are some left about 40 miles from here (Kojonup)"; on 12 December 1911, "I have returned from a trip in the South West. I am sorry to say I have not been successful.

"Everywhere I went the Rats and Boodies have all left or died out 12 months ago, there were some about Lake Muir but now there are no traces around the burrow so I am afraid they must be nearly extinct in the district"; on 29 December, 1911, "Mr Muir of Deeside tells me all the smaller marsupials are getting very scarce in the south-west, he says five years ago the rats and boodies were a pest and during the last two years he has only seen two rats"; on 7 May 1913, "Do you want any **P. lagotis?**, there are still a few left about this locality"; and on 2 August 1914, "re **M. fasciatus** (Numbat) they are about extinct in this part (Kojonup). I have only seen one during the last couple of years around this locality. All the smaller marsupials seem to be getting very scarce, even the phalangers are scarcer now than when they were being trapped several years ago" (WA Museum archives). Other south-west mammal species declined in numbers much later. For example, White (1952) documents the decline of the Quokka in the south-west at between 1933-1939. White believes the Quokkas declined as a result of disease.

The decline in the mammal fauna of the south-west was also paralleled in South Australia. In that State, Aitken (1970) considered the most important agency to be wholesale destruction and alteration of the natural habitat, with foxes (**Vulpes vulpes**) and domestic cats (**Felis catus**) being important contributors.

Some species were greatly affected directly by man, such as fumigation of rabbit burrows exterminating Bilby (**Macrotis lagotis**) (Jenkins 1974) and commercial hunting of the Brush-tail Possum (**Trichosurus vulpecula vulpecula**) (Serventy 1954). The evidence is that many mammal species had begun to disappear long before the landscape was substantially altered by Europeans, and also before the introduction of foxes and rabbits. While introduced diseases cannot be discounted as an important agency responsible

for the disappearance of many of them, it is likely that the domestic cat, widespread throughout Australia, almost certainly played a principal role. In this regard it is of note that in 1943 Gilbert received a Red-tailed Wambenger (**Phascogale calura**) at Williams, W.A., killed by a cat (in Whittell 1954). Also, catalogues of the Western Australian Museum Mammal Department record 37 species of mammals "collected" by domestic cats.

More recent research such as Coman and Brunner (1972), Jones (1977), Swans (1980), and Muir (1982), give strong evidence that feral cats consume or kill large numbers of native fauna and almost certainly have considerable effect on mammal populations. To quote examples, a well fed domestic cat at Wahroonga, near Sydney in New South Wales, produced the following catch over a six-year period. These are the captures **taken by the cat to its owner,** and many more captures would not have been seen:

Year	Animals Captured
1969	1 skink, 3 frogs, tiger snake and house mouse
1970	4 magpie larks, 5 red wattle birds, lesser long-eared bat, common mynah
1971	2 magpie larks, 1 red wattle bird, 1 rat
1972	2 fan-tail cuckoos, common mynah, grey thrush, blue tongue skink, 3 red wattle birds, magpie lark, 3 yellow winged honeyeaters, eastern spinebill
1973	6 red wattle birds, 2 rats, 2 white-eared honeyeaters
1974	2 rats (different species), 3 red wattle birds, 2 little wattle birds, winged termites, 3 skinks
1975	2 mynahs, 1 small blue tongue skink, 1 skink, 1 little wattle bird, 4 red wattle birds, grey thrush, 1 grey butcher-bird, 1 white-eared honeyeater, 1 king cricket, 1 longicorn beetle

(Based on A.B. Rose, 1976).

As an example of capture by a single animal at one location, the following is offered: a single male tabby feral cat was shot at Frank Hann National Park, about 140 km south-west of Norseman, at 11.30 am on 15 November 1980; its stomach contained 1 Broad-tailed Thornbill, 2 **Pseudomys** (Hopping Mouse), 10 **Ctenophorus salinarum** (Western Painted Dragon), 9 **C. adelaidensis chapmani** (Chapmans Dragon), 2 **C. maculatus griseus** (Spotted Dragon), 2 **Diplodactylus granariensis** (Wheatbelt Gecko), 1 **Morethia** sp (a skink) and 2 grasshoppers.

All these animals, except the mice, were in excellent condition inside the stomach, and had obviously been captured the same day. If this represented an average morning's hunt (plus a little night prowling to get the mice), enormous numbers of native fauna must be taken over a year.

The fox, by contrast, may do less damage. It arrived in W.A. from Victoria about 1910, having been introduced there to provide blood sports. The feral cat had been around for at least 50 years before this date and many native species had already declined. Undoubtedly however the fox may have affected remaining native species, although there is some evidence that it favours insects for food over small mammals and reptiles.

Stock grazing and timber cutting undoubtedly also altered the structure of native vegetation, affecting the native fauna. Wild rabbits, introduced near Geelong, Victoria, in 1859, spread rapidly, reaching Fowlers Bay, South Australia, in 1891, Eucla in 1895, and the west coast in 1907, covering 1600 km in 16 years (Frith 1973).

They were a similar size to some of the small wallabies and undoubtedly competed fiercely and successfully for food, quickly outstripping the native fauna.

Timber cutting removed many of the tall, ancient forests, reducing the abundance of nest hollows and the number of large trees which would have eventually died to produce hollows and broken limbs on which some native mammals, for example Red-tailed Wambenger (**Phascogale calura**), were dependent. The importance of the loss of hollow trees in the wheatbelt has been studied by Saunders (1977, 1979) in relation to breeding birds, and he expresses concern for the future existence of species dependent on large, old, termite-ridden trees. Clearing, timber cutting and even the removal of dead trees because they are dangerous or unsightly to man is occurring at a far greater rate than replacement: a tree may take 100 years or more to grow to maturity, and stock and rabbits destroy seedling trees.

Fire is another factor of high impact. Fire from lightning strikes was present before Aboriginals came to Australia (30-40000 years ago) and most likely fire increased in frequency when Aboriginals arrived. Nonetheless, the intensity and frequency of those fires were probably different from today's. Lightning fires usually arise from storms, which in Australia are mostly in mid-summer. Fires from strikes could therefore be expected to be infrequent over very large areas, be very hot and occur in mid-summer.

Aboriginals, as far as can be determined, burnt only small areas at a time, firstly to attract game to the fresh shoots, and because it would be disadvantageous to him to destroy large areas. This meant burning in cooler seasons, and records suggest this was either late summer or autumn: spring was avoided because birds' nests, edible seeds and other food would be destroyed at the same time. Fire during the 30-40000 years of Aboriginal occupancy would therefore be a mixture of the infrequent, large area, very hot, mid-summer lightning fires, and the more frequent, small area, cool autumn fires of the Aboriginals.

Europeans, in contrast, came with machinery which started fires, a need to burn for agricultural clearing and, following a few holocausts, an intense fear

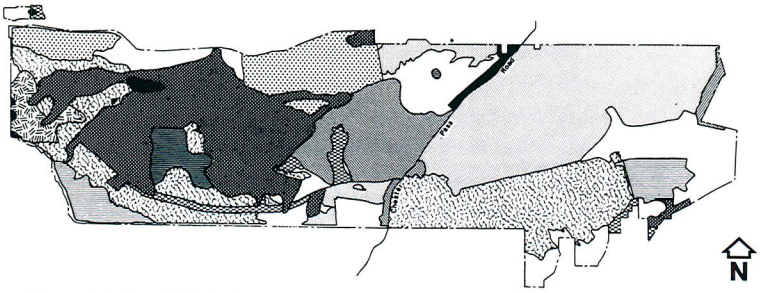
of wildfire. The practice of fuel reduction burning for safety came into being. The easiest time to burn was spring when fuels were still damp, but unfortunately it was also the fauna's prime breeding time. This introduction of frequent fire, with large areas burnt cool (deliberate) or hot (accidental) at almost any time of the year, but particularly in spring, was in contradiction to the evolution of the environment. Thousands of years of natural fires and at least 30000 years of Aboriginal fires gave way to about 200 years of very different fire regimes. It is believed many animals succumbed, and this view is supported in the south-west by the observation that tree and surface-dwelling mammals (likely to be destroyed by fire) were more affected than burrowing mammals. Thus Possums, Native Cats and perhaps Numbats declined in numbers, while Dunnarts, for example, survived.

Another possible alteration caused by fire is the burning of large areas changing the distribution of vegetation of different ages, and reducing it to one age. Mammals with highly specialised habitat or dietary requirements, for example the Bettongs (**Bettongia penicillata, B. lesueur**), and the Hare-wallabies (**Lagostrophus fasciatus, L. hirsutus**), may have been unable to cope with these uniform habitats. It would be expected that middle-sized mammals are most likely to succumb, larger ones are more mobile and able to shift outside the burnt area, and small ones being able to survive in pockets of unburnt bush. The middle-sized mammals may not be able to do either, and records show these are the ones which tended to disappear (Kitchener et al., 1980).

Map 2 and Table 2 show that although about 40 per cent of the Stirling Range National Park is less than 10 years old, about 14 per cent was older than 15 years in 1984 when this paper was prepared. There is also a good variation in times since fire: mammals needing young vegetation, those requiring middle stages of plant maturity (about 10-20 years) and those preferring very old vegetation are all catered for. This situation has been created over years of careful management and hopefully will continue in the future.

Conversely, some mammals, such as the Grey Kangaroo in the south-west, and Red Kangaroo inland, benefited from the arrival of Europeans. Crops and dams provided all year forage and water, and breeding increased rapidly, until in some places, the animals reached plague proportions. Unfortunately only the fauna which was highly mobile and flexible in its environmental requirements could take advantage of these new benefits.

MAP 2
Stirling Range National Park Fire Age Map



NUMBER OF YEARS SINCE
LAST FIRE (0 EQUALS 1984)

	0		8
	1		10
	2		11
	3		12
	4		15
	5		>15

SCALE 1:350,000

4 0 4 8 12 16 20 Km

STIRLING RANGE National Park

Fire Age Map

TABLE 2
Age of the vegetation in years as at 1984 and proportion of the Stirling Range National Park of each age

Stirling Range National Park	
Fire Age (Years)	Proportion of Park (%)
0	Negligible
1	19
2	2
3	1
4	8
5	2
8	2
10	7
11	4
12	22
15	19
15 (no data since 1943)	14
	Total 100%

TABLE 3
Mammals of the Stirling Range National Park

Monotremes	
Tachyglossidae	Short-beaked Echidna — Tachyglossus aculeatus
Marsupials	
Dasyuridae	Western Quoll — Dasyurus geoffroii
	Brush-tailed Phascogale — Phascogale tapoatafa
	Red-tailed Phascogale — P. calura
	Yellow-footed Antechinus — Antechinus flavipes
	Fat-tailed Dunnart — Sminthopsis crassicaudata
	Gilberts Dunnart — S. gilberti
	Grey-bellied Dunnart — S. griseoventer
	White-tailed Dunnart — S. granulipes
Myrmecobidae	Numbat — Myrmecobius fasciatus
Peramellidae	Southern Brown Bandicoot — Isoodon obesulus fusciventer
	Western Barred Bandicoot — Perameles bougainville
Thylacomyidae	Bilby — Macrotis lagotis
Petauridae	Western Ringtail Possum — Pseudocherirus peregrinus occidentalis
Phalangeridae	Common Brushtail Possum — Trichosurus vulpecula vulpecula
Burramyidae	Western Pygmy Possum — Cercartetus concinnus
Tarsipedidae	Honey Possum — Tarsipes rostratus
Potoroidae	Brush-tailed Bettong — Bettongia penicillata
	Burrowing Bettong — Bettongia lesueur
Macropodidae	Crescent Nailtail Wallaby — Onychogalea lunata
	Tammar Wallaby — Macropus eugenii
	Western Brush Wallaby — M. irma
	Western Grey Kangaroo — M. fuliginosus
	Quokka — Setonix brachyurus
Placental Mammals	
Molossidae	White-striped Mastiff-bat — Tadarida australis
	Little Mastiff-bat — T. planiceps
Vespertilionidae	Greater Long-eared Bat — Nyctophilus timoriensis
	Goulds Long-eared Bat — N. gouldii
	Goulds Wattled Bat — Chalinolobus gouldii
	Lesser Long-eared Bat — N. geoffroyi
	Chocolate Wattled Bat — C. morio
	King River Eptesicus — Eptesicus pumilus
Muridae	Ashy Grey Mouse — Pseudomys albocinereus
	Bush Rat — Rattus fuscipes
Leporidae	Rabbit — Oryctolagus cuniculus
Canidae	Dingo — Canis familiaris dingo
	Fox — Vulpes vulpes
Felidae	Feral cat — Felix catus

PART TWO
The Mammals

Short-beaked Echidna — Tachyglossus aculeatus

Another common name for this familiar speciès is the Spiny Ant-eater. It adorns the five cent coin and is widespread and relatively common in all Australian states. As its common name suggests, it feeds on ants and termites. It is an immensely strong animal and can rip open termite mounds and ant nests with its well-developed claws. It has no teeth. Instead its victims are gathered on a long, sticky, saliva-covered tongue, withdrawn into the mouth and crushed between two horny plates. Although rocky areas are preferred, it also occurs in a very wide range of habitats as long as a plentiful food supply is available. The Echidna and the Platypus are the only members of the order Monotremata, which reproduce by laying eggs instead of giving birth to live young. Echidnas mate in July and August and a single egg is laid about two weeks later. It hatches in about 10 days and the young remains in the pouch for about another three months until it is covered in short spines.

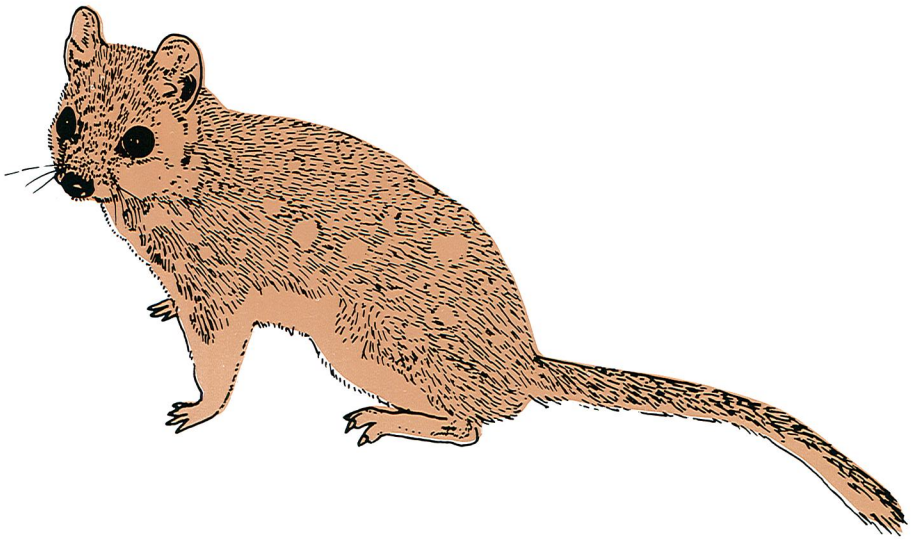
Surprisingly few records of Echidna exist for the Park. It was recorded first in 1905 and again in 1979 at Red Gum Pass. During the time of the 1984-85 surveys a Park visitor observed one on the Bluff Knoll track and several typical scratchings were also observed. Western Australian Museum records suggest that it is very scarce or absent from the wetter deep south-west. This may explain its rarity in the Stirling Range despite the vast amounts of suitable habitat.

Western Quoll — Dasyurus geoffroii

The Western Quoll is a reddish-brown, white-spotted marsupial carnivore that grows to the size of a small cat (350 mm). It feeds on a wide variety of prey including mammals, birds, insects and carrion. It has also shown a taste for poultry and in captivity will eat meat, eggs and fish. Breeding occurs between late May and early July, and after a gestation period of about 16 days up to six young are born. The young leave the pouch after about 15 weeks and remain with the family group for some time.

Before the advent of Europeans the Western Quoll occurred in many habitats across large areas of southern and central Australia. Today it is restricted to the south-west of W.A. where it is uncommon, though it appears to be making a comeback in some areas.

It was collected in the Park as recently as December 1965 and, given the vast availability of preferred habitat, that is, woodlands, scrubland and mallee, it could still survive there today.



Red-tailed Phascogale — Phascogale calura

This small squirrel-like animal is an arboreal carnivorous marsupial, mainly grey with reddish ears and basal half of tail, the tip black and brushlike. It produces six, seven or eight young which are born from mid-June to mid-August and are weaned before the end of October. Evidence suggests that males die off shortly after mating to leave the environment free from competition for the females and young. Food includes reptiles, insects, birds and small mammals, especially the introduced house mouse. Mature communities of dense Allocasuarina (sheoak) adjacent to wandoo woodland are its preferred habitat, though it has also been found in a variety of shrublands and mallee. It once was found over vast areas of Australia from western Victoria and New South Wales to the Alice Springs area and the southern Kimberleys. In all probability it was introduced predators and increased and indiscriminate use of fire that caused a severe reduction in its range. Today, it is present only in the south-west of W.A. where its status is listed as common, though in limited areas and therefore at risk. Though no specimens have actually been recorded from the Park it was collected at Cranbrook in 1929 and Cape Riche (90 km north-east of Albany) in 1905. This, plus the above habitat data, suggests that it could still occur in the Park given its large area and wide habitat diversity, though it is assumed that populations are low.

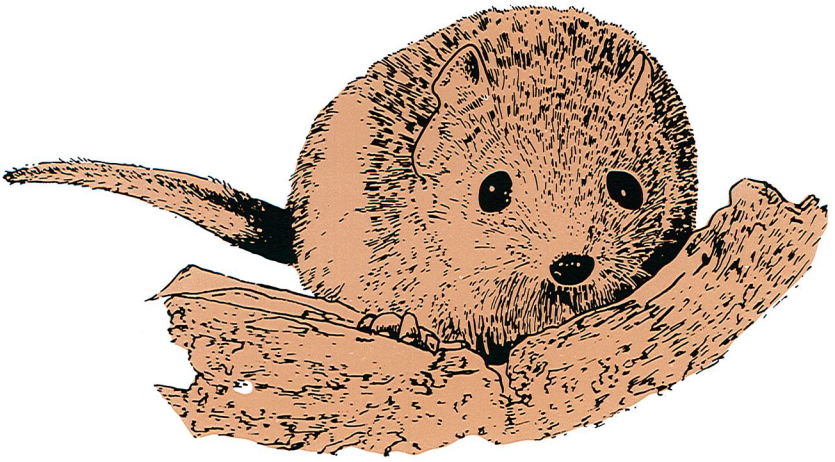
Brush-tailed Phascogale— Phascogale tapoatafa

Similar in appearance to P. calura though larger, the Brush-tailed Phascogale has a dark stripe down the forehead and has a very large black brush on the tail. Breeding biology and feeding habits are also similar. In W.A.'s South West it occurs mainly in densely forested areas and is scarce, probably as a result of land clearing. It is also found on the eastern seaboard, Cape York and the top end of the Northern Territory and adjacent areas of northern W.A.

Although it has never been recorded from the Park, a skeleton was found in 1968 from nearby Cranbrook, so the question of its presence here remains unresolved.

Yellow-footed Antechinus — Antechinus flavipes

A. flavipes is a dark brownish-grey marsupial carnivore growing to about 100 mm with a 100 mm tail. Like most other members of the genus **Antechinus,** and **Phascogale calura,** it breeds only once a year with the males dying off shortly after mating (late winter or spring) to decrease competition for the females and young. The bulk of its diet is insects though birds and house mice are eaten; it has also been known to eat nectar and flowers. It is still considered to be relatively common in the south-west.



The earliest specimens of this species from near Stirling Range National Park were collected by J.T. Tunney 1904. The locality recorded was "Cranbrook", although this probably means the Cranbrook district rather than the townsite itself. The only specimen actually collected within the Park was a female by F.R. Bradshaw in 1927.

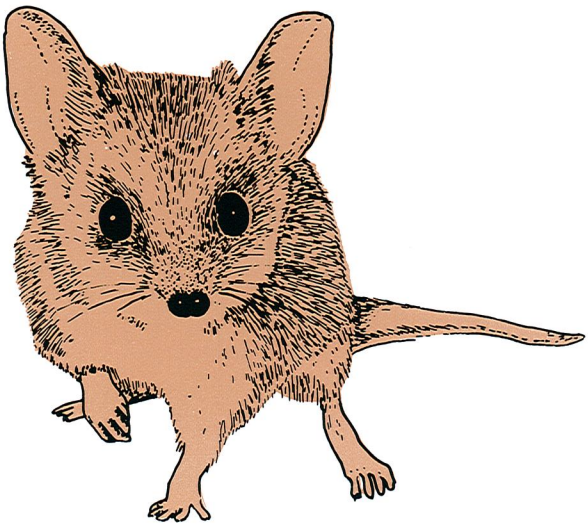
Although the Yellow-footed Antechinus occurs widely along the eastern seaboard and its hinterland plus small isolated populations in South Australia and northern Victoria, it is considered there to belong to two subspecies. Both of these eastern populations differ from the western subspecies by being more brightly coloured and ranging across a broader spectrum of habitats which include arid mulga scrub.

Its preferred habitat in W.A. is karri (**Eucalyptus diversicolor**) or jarrah (**Eucalyptus marginata**) woodland, especially near streams and rocky areas. In the drier regions of the jarrah forest it occurs on ridges and hilltops which receive a locally higher rainfall. Although not collected in the recent surveys, it is likely to survive along the jarrah-vegetated streams running off the ranges and also the higher parts of the range.

According to records from the Western Australian Museum, no specimens have been collected from the country to the north-east of the Park, which indicates that the Stirling Range is its geographical limits in the south-east sector of its W.A. distribution.

Fat-tailed Dunnart — Sminthopsis crassicaudata

The Fat-tailed Dunnart is a brownish-grey, mouse-sized marsupial carnivore. It has large ears and also a short swollen tail in which fat is stored as an energy reserve for poor seasons. It is a common species and occurs in a variety of habitats including shrubland, heath, saltland heath and mallee, as well as cultivated land. Like other Dunnarts, **S. crassicaudata** consumes a wide range of insects and spiders. Breeding occurs from July to February.



About eight young are born, though usually only about five survive to be weaned at about 10 weeks. It ranges widely over much of southern Australia as far east as central New South Wales, south-east Queensland and western Victoria. In W.A. it avoids the wet south-west, and the Stirling Range appears to be the limits of its south-western distribution.

The species has been collected regularly in the Stirling Range region since 1920 with one found in adjacent farmland in 1984. No further specimens have been collected, though the availability of large areas of suitable habitat suggests that its future is secure.

Grey-bellied Dunnart — Sminthopsis griseoventer

As with S. **gilberti**, S. **griseoventer** has recently been separated from S. **murina**. It is presumed to have similar breeding and food requirements. Its back is dark grey and underside pale grey. It prefers habitats with shrub and heath understories, usually on sandy soils. It occurs on coastal plains and adjacent laterite ranges from Israelite Bay in the south-east to Badgingarra National Park in the north-west. Throughout its range it is moderately common. As with S. **gilberti**, it is immediately distinguished from S. **crassicaudata** by its thin rather than thick tail.

Although it has not been collected in the Park it is expected to occur there as there is much suitable habitat available and it is known to occur at nearby Mt. Barker and South Stirlings. S. **griseoventer** and S. **gilberti** are very similar animals and expert opinion is a necessity in identification.

Gilbert's Dunnart — Sminthopsis gilberti

This species has only recently been scientifically described and was previously considered to belong to the species S. **murina**, which is now restricted to eastern Australia. S. **gilberti** grows to about 86 mm with a marginally shorter tail. Its back is greyish-brown and its belly white. It is relatively common and is distributed in the near coastal ranges and southern wheatbelt. In southern areas it occurs in mallee over heath on sandy loam. In the Darling Range it has been found in woodlands with a heath understorey and generally heavy soils. Specific details concerning breeding are unknown, though it possibly is similar to S. **murina** which has two litters of up to 10, usually born between August and March. Like other members of its genus, it feeds on insects and other arthropods.

During the 1984-85 surveys two specimens were collected. One came from open jarrah woodland over heath on sand, and the other from stunted jarrah-marri over banksia over heath on sand. It would appear to be moderately common and with the large amount of suitable habitat available, it must be considered secure within the Park.

White-tailed Dunnart — Smithopsis granulipes

About the same size as S. griseoventer, the White-tailed Dunnart is pale fawn above with a pale tail. Its specific name refers to the pads on the palm and sole of the foot, which are finely and evenly granulated without enlarged granules, hairs or smooth areas. It eats a wide range of insects and spiders and even centipedes. The preferred habitat is low mixed shrubland and mallee on sandy and loamy soils. There is little breeding data but records show births occur in winter. It is moderately common and is found in the drier areas of the south-west of W.A.

During the 1984-85 surveys, a pale brown **Sminthopsis** was seen but not captured in sparse mallee over a low mixed shrubland on pale brown loam, and was believed to be S. granulipes. One sighting is a poor basis for an estimation of abundance, but because of the availability of its preferred habitat in the Park, it is probably secure.

Numbat — Myrmecobius fasciatus

The Numbat is a slender diurnal animal with a head and body length of about 25 cm plus about 18 cm of brushy tail. It is rusty-red to brown, becoming darker posteriorly with six or seven white crossbands on the rump and lower back. There is also a black stripe through the eye. It feeds only on termites, which it digs out of galleries in leaf litter, small branches and larger hollow logs. Its claws are not capable of penetrating the heavily fortified mounds. Its tongue is nearly half as long as the head and body and is used in a flickering motion to lick up termites, which are swallowed whole, except for the large-jawed soldiers which are bitten first.

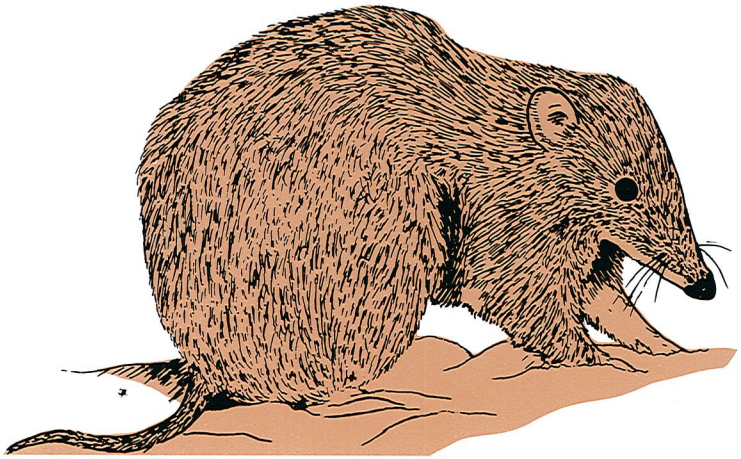
It formerly ranged widely across southern and central Australia but since the advent of Europeans its distribution has shrunk to a small area in the South West of W.A.; here it is restricted to areas of jarrah and wandoo woodland. Even within these areas it is rare and its recent dramatic decline in numbers is attributed to predation by cats and foxes, too many fires and drought or a combination of these factors.

In 1896, J.T. Tunney collected a specimen from Cranbrook and another was collected there in 1929. The most recent record was a specimen from South Stirlings in 1936, that is, 49 years ago. It is unlikely that the Numbat still occurs in the Park, despite the large amount of available habitat.

It did occur there in the past but the relentless pressure from feral cats and foxes has probably proven too great. This elimination process still continues and the Numbat seems headed for extinction unless its introduced predators are drastically reduced.

Southern Brown Bandicoot — Isoodon obesulus fusciventer

The Southern Brown Bandicoot is a medium-sized (up to 33 cm plus 12 cm of tail) marsupial with a slightly rat-like appearance. It is covered with short greyish or yellowish-brown, coarse, easily removable hair. Two or three litters of usually two to four young are produced annually with the young weaned in about 60-70 days. If a juvenile can establish a territory it will live for about three years. Earthworms and insects form the bulk of its diet, though occasionally yam-like vegetables and bulbs are eaten. It is still relatively abundant in south-western W.A. in swamps and watercourses with dense vegetation. It also occurs in Tasmania, southern areas of the Eastern States and Cape York Peninsula, but as a slightly different subspecies.



Western Barred Bandicoot — Perameles bougainville

The Western Barred Bandicoot is slightly smaller than the Southern Brown Bandicoot and has a more pointed nose. It is pale grey to brownish-grey above with a white belly and feet. There are two or three indistinct alternating pale and dark crossbands on the hindquarters. Breeding information is scanty, though on Bernier and Dorre Islands it has been recorded in autumn and winter, giving birth to two, and sometimes three young. Its diet includes insects and small animals, seeds, roots and herbs.

This species was recorded at Cranbrook in 1900 by J.T. Tunney, so probably occurred in the Park then. Formerly it enjoyed a southern Australian range as far east as central New South Wales. In W.A. it ranged northward (mainly coastal) to at least Onslow. Today it is presumed extinct on the Australian mainland and only survives on Bernier and Dorre Islands at Shark Bay. Presumably it could not compete with introduced animals, especially rabbits, cats and foxes.

Bilby — Macrotis lagotis

The Bilby, or Rabbit-eared Bandicoot as it is sometimes called, is about the size of a small cat (up to 550 mm) and is coloured grey above and brownish on the lower sides and belly. It belongs to the family **Thylacomyidae** and has a long pointed snout, long ears and soft silky fur compared to Bandicoots of the family **Peramelidae** which have coarse, stiff, bristle-like hair. The tail, which is about two-thirds the head and body length, is black near the base and white for the first half and is crested along its entire length. They give birth to usually two young that inhabit the pouch for about 75 days. Food consists of seeds, bulbs, fruit, fungi and insects and their larvae, and is gathered with its strong claws. It lives in burrow systems of up to 3 m long

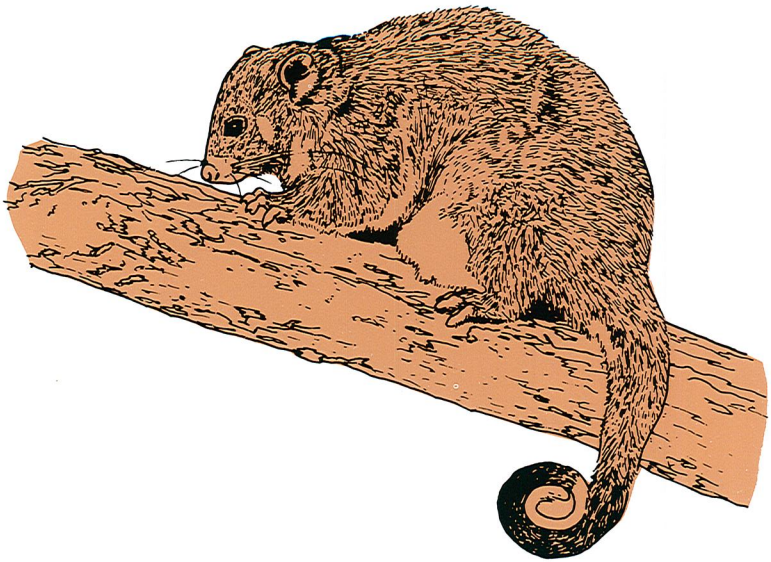
and 1.8 m deep. They are very difficult to dig out as they can dig faster than a man. The Bilby is nocturnal, remaining within the burrow until well after dark.

Prior to European settlement, the Bilby was common and ranged widely across arid and semi-arid Australia and occurred in all mainland States where it preferred areas of sandy or loamy soils. Around the turn of the century there was a sudden contraction of range. Its decline was probably caused by the deleterious effects on food by introduced rabbits and other livestock and predation by introduced cats and foxes. Today it remains only in the Tanami Desert and adjacent areas of the Northern Territory and W.A.

During the first decade of this century some specimens were obtained from the Gracefield and Kojonup areas, which indicates that it may have also occurred in the Park.

Western Ringtail Possum — Pseudocheirus peregrinus occidentalis

The Western Ringtail is about the size of a small cat (up to 35 cm) with a prehensile tail about the same length. It is pale to dark grey above with a darker head and limbs, and a white tip to the tail. The belly colour ranges from only slightly paler than the back to nearly white. It is a herbivore, feeding mainly on leaves, fruits and eucalypt flowers. Breeding data is scarce for the W.A. populations, though the eastern subspecies usually carries two young that leave the pouch at about four months but are not weaned until they are six months old. Sometimes when the mother is foraging, the juveniles are carried on her back. The Western Ringtail is restricted to the forested areas with peppermint (**Agonis**) trees where it builds nests of grass and sticks in the branches. Occasionally it rests in hollow trees. It is considered scarce, and becoming rare.

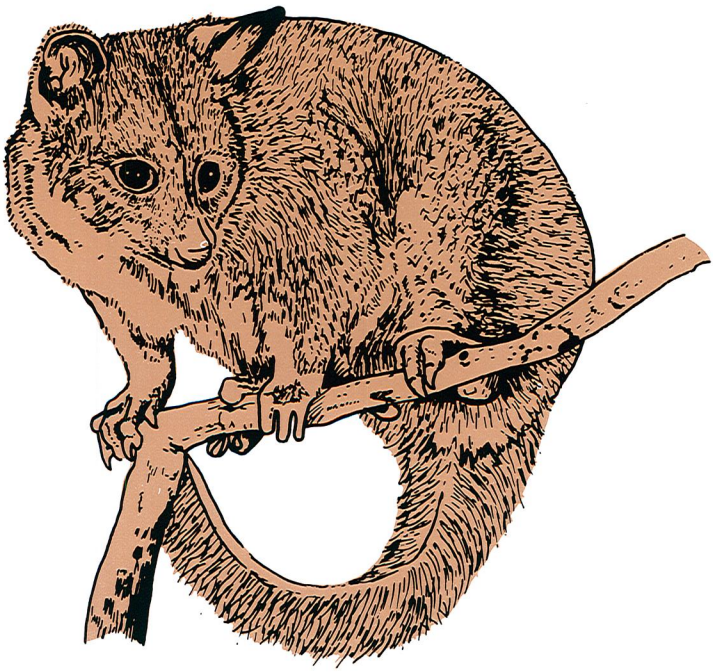


The earliest record for the Stirling Range area was a Cranbrook specimen collected by J.T. Tunney in 1905. Since then, a skeleton was found at Porongorup National Park in 1977, though habitats there are vastly different to those in the Stirling Range. No signs of this animal were found during the 1984-85 surveys, and if present (which is doubtful), it must be in very low numbers.

Despite being currently classified as a subspecies of the widely ranging Eastern States' Common Ringtail Possum, scientific opinion is that the western form is a full species. In light of this, plus its scarcity, the conservation issue of the Western Ringtail becomes even more serious.

Common Brushtail Possum — Trichosurus vulpecula vulpecula

This is a cat-sized animal varying in colour from nearly black to silver grey. The tail is bushy, usually dark, and has a naked tip and underside. It prefers open forests and woodland and is distributed in the south-west from just north of Geraldton to near Esperance in the south-east. In the early days of settlement it was very common, but since then it has declined greatly. It eats large amounts of eucalypt leaves though it supplements this diet with fruit, buds and bark. Most females breed in autumn and sometimes again in spring. The single young is born 17-18 days after mating and suckles in the pouch for four to five months and for a further one to two months it spends on its mother's back. Many juvenile males die when they leave the parent to establish their own territories. In most cases, 11 years is about the longest they live, although one individual lived for 13 years.

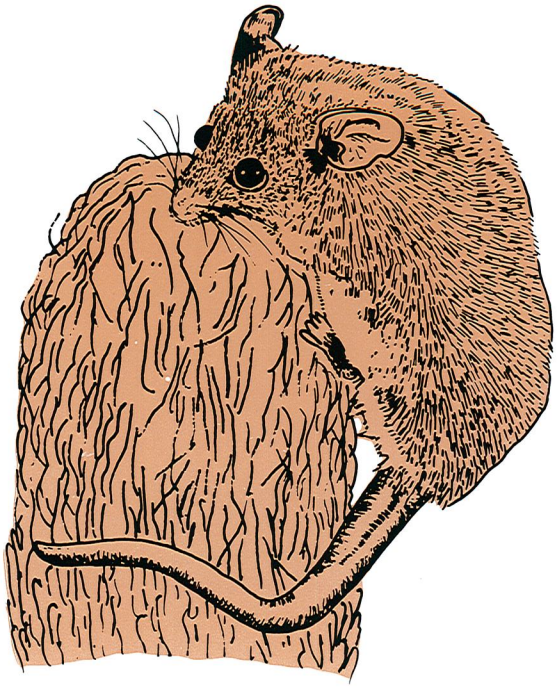


The last recorded specimen from near the Stirling Range was in 1909 with further unconfirmed sighting in late 1984, which gives hope to its continued survival there, even if in low numbers. As in the case with some other species, ample habitat is available yet the animals are scarce.

Western Pygmy Possum — Cercartetus concinnus

The Western Pygmy Possum is a tiny (80 mm) possum coloured reddish-brown to brownish-grey above and white below. Its diet is nectar and insects. Pouch young (five on average) have been found through January to September so it possibly breeds twice a year. Although not often observed due to its cryptic nature and nocturnal habits, the Western Pygmy Possum is still relatively common in the south-west of W.A.

The first specimens were collected from the Park by F.R. Bradshaw in 1927. Since then it has been recorded several times by park rangers and two were found in wandoo woodland during the recent surveys.



In the south-west of W.A. its preferred habitat is jarrah or marri woodland, or combinations of both, wandoo woodland and heath and shrublands with blackboys. Vast areas of the Park provide suitable habitat to ensure its survival and, despite only two being found in the recent surveys, it is probably relatively common in the Park. It also occurs in a disjunct population stretching from southern South Australia into arid western Victoria.

Honey Possum — Tarsipes rostratus

The Honey Possum is a grey, mouse-sized animal with a pointed nose, three dark stripes down the back and a long prehensile tail. It is highly specialised to feed only on nectar and pollen with its brush-tipped tongue. Females with pouch young have been found throughout the year but less so in summer when food is less abundant. Female Honey Possums have a well developed pouch and give birth to two or three young. At the end of the ten-week suckling period they are about half the size of the mother and spend the final

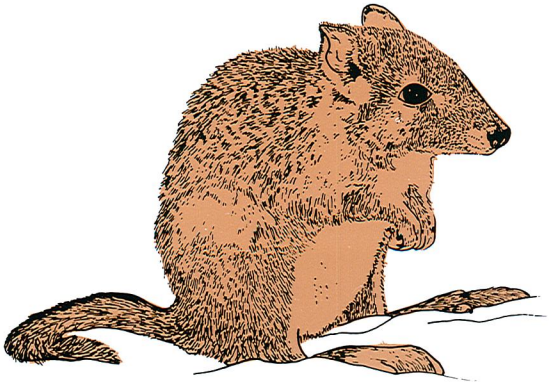
two weeks in a shelter while she forages for food. Adult size is reached at about eight months and females may breed in the first year. Some have been known to breed twice in one year, presumably in good seasons. Despite predation by the cat and fox, the Honey Possum is still common in its preferred habitat of heath and shrubland and is found throughout the south-west of W.A. and from about Shark Bay in the north-west to Israelite Bay in the south-east.

Despite being called a "possum", **T. rostratus** is the sole member of the superfamily Tarsipedoidea and is no more closely allied to true possums (superfamily Phalangeroidea) than it is to any other group of marsupials.

Specimens have been collected regularly in the Stirling Range area since 1922 though its true status was not defined until the 1984-85 surveys, which revealed that it was extremely common in all heath and shrubland habitats. These areas are extensive throughout the Park and should ensure the survival of viable populations.

Brush-tailed Bettong or Woylie — Bettongia pencillata

The Brush-tailed Bettong is similar in appearance to the Burrowing Bettong but has a black end to its bushy-tipped, prehensile tail with which it carries bundles of twigs and grass for nest building. The nest is a depression scraped under a bush and is covered by a dome of shredded bark or grass. Food is underground fungi though bulbs, seeds, tubers and insects are also eaten. Breeding regularity is similar to the Burrowing Bettong.



It once ranged widely across southern Australia and, apart from the subspecies **B. p. tropica** which occurs in two small pockets in Queensland, it is now restricted to the Perup and Dryandra forests and Tuttaning Reserve in southern W.A. Even in these refuge areas it is under severe threat from the introduced fox, especially since fox numbers increased since the early 1970s when the 1080 rabbit poisoning program declined.

J.T. Tunney collected two specimens from near Cranbrook and Gracefield in 1900, which indicates that it may have occurred in the Park once, though little hope can be held for its existence there today, especially in the presence of the fox. A 1080 poisoning program has been started in the Park, but for the Woylie it may be many years too late.

Burrowing Bettong — Bettongia lesueur

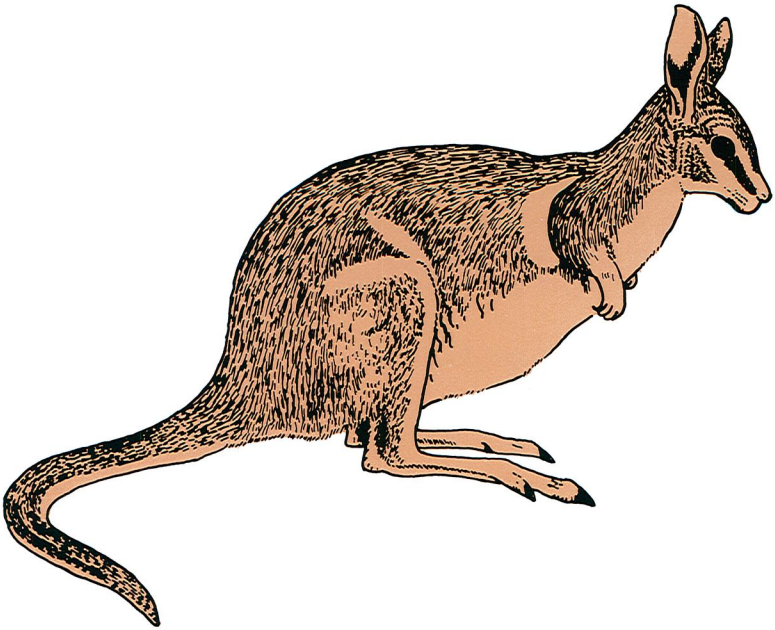
The Burrowing Bettong or Boodie, as it is often called in W.A., is a small wallaby-sized relative of the kangaroos. It is a thickset species with short rounded ears and a head and body length of about 40 cm with a 30 cm tail. It is yellowish-grey above with a paler belly. It is a burrowing animal and on the mainland its warrens were sometimes quite complex structures with multiple entrances in deep soil, especially loams. Food was mainly bulbs, seeds, tubers, nuts and some vegetation, largely obtained by digging. Up to three young can be raised in a 12-month period as breeding occurs continuously.

Despite having one of the largest geographic ranges of any Australian native mammal, **B. lesueur** is extinct on the mainland and has not been recorded in W.A. since the 1930s. It still survives on Bernier and Dorre Islands near Carnarvon and on Barrow and Boodie Islands off the Pilbara coast. According to Western Australian Museum records it once lived near Cranbrook, at least until 1913, and in all probability also occurred in the Park then.

Crescent Nailtail Wallaby — Onychogalea lunata

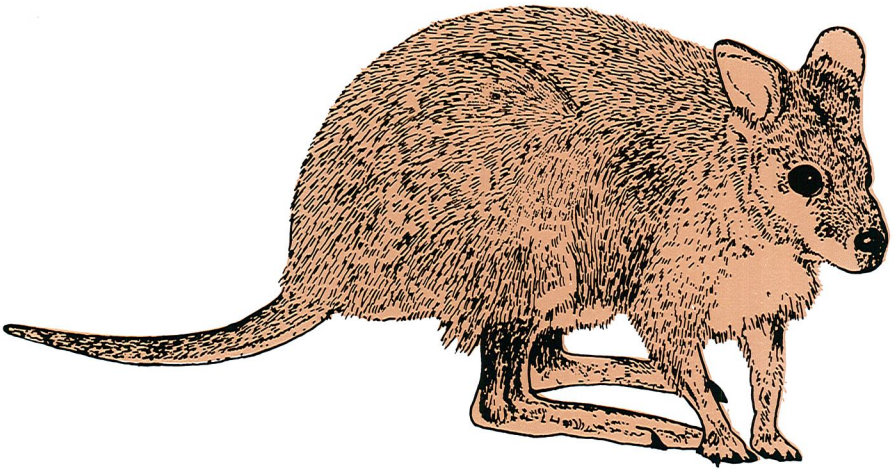
About the same size as a Quokka (please refer), the now extinct Crescent Nailtail Wallaby was generally grey above and pale grey below with a black stripe through the eye. It also had a crescent-shaped white stripe behind the arm and over the shoulder, and a poorly defined hip stripe plus a horny nail on the tail tip. Breeding biology and feeding information is lacking, though its habitat was said to have been open woodland.

It occurred in two areas: the central Australian region and the southern wheatbelt of W.A. where it was plentiful. It did perhaps occur in the Park as a number of specimens were recorded from Cranbrook and Gracefield at the turn of the century.



Tammar Wallaby — Macropus eugenii

The Tammar Wallaby, or Tammar as it is also commonly known, is a small kangaroo, coloured grey-brown above and rufous on the sides of the body and on the limbs, with an indistinct white facial stripe. Breeding in W.A. populations is not well-known, though on Kangaroo Island in South Australia most young are born in late January and leave the pouch in September or October. As is the case with all kangaroos, the Tammar is herbivorous, mainly eating grass, though it can also eat small amounts of poison bush to which it has a very high tolerance. It formerly ranged widely in the south-west of W.A. and on Eyre Peninsula in South Australia but it is now uncommon. On the mainland of W.A. it occurs in coastal shrubland and in jarrah and wandoo woodlands where there are dense thickets to provide a daytime refuge and open areas for feeding at night.

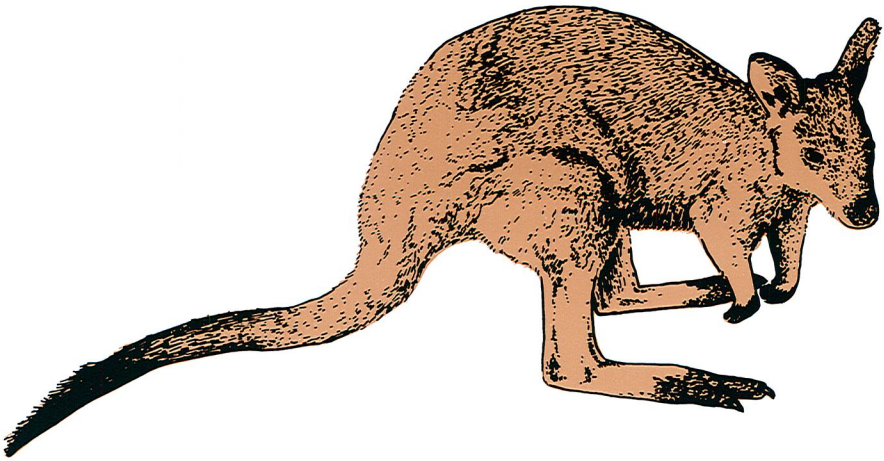


In the Stirling Range area it was first collected by J.T. Tunney at Cranbrook in 1907 and has not been recorded since. Because of the lack of habitat data for the south-east part of its range, it is difficult to know how much suitable habitat occurs in the Park. The paucity of modern records and sightings plus the recent dramatic increase in the fox population indicate its presence is doubtful.

Western Brush Wallaby — Macropus irma

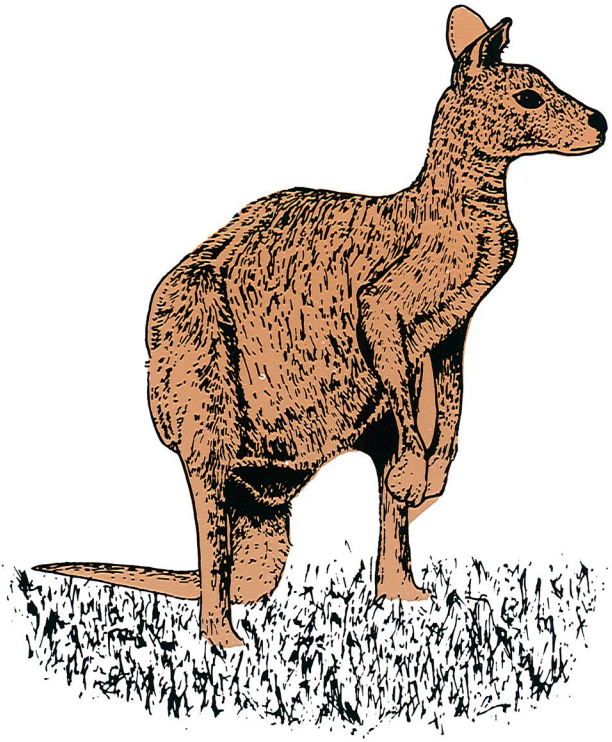
The Western Brush Wallaby resembles a half-grown Western Grey Kangaroo, though its paler coat, white facial streak, black paws and especially its longer tail, make it easily recognisable. The black forepaws are an obvious feature and it is sometimes referred to as the Black-gloved Wallaby. Apart from being herbivorous, its feeding habits have not been studied in detail, though one specimen in the Park was observed eating fungus. Its breeding biology is poorly understood, though it is known young are born in April or May and emerge from the pouch six or seven months later. Its numbers have declined since the early 1970s due to the increase in foxes in the south-west, but it is still relatively common.

Throughout the Park it is moderately common, though before the recent surveys it was regarded as having declined since the 1960s. In the Park it has been recorded occupying heath, shrubland and mallee habitats, all of which are widespread. Now that a fox poisoning campaign is under way, its numbers should stay at their current level.



Western Grey Kangaroo — Macropus fuliginosus

The Western Grey Kangaroo is the largest marsupial in the south-west of W.A. with old males growing up to a height of nearly two metres. These outsize specimens are referred to as "boomers". Although essentially a herbivore, it would appear that they consume meat on odd occasions. During the recent surveys one was seen eating flesh from a road-killed Bobtail lizard (**Tiliqua rugosa**) on Stirling Range Drive.

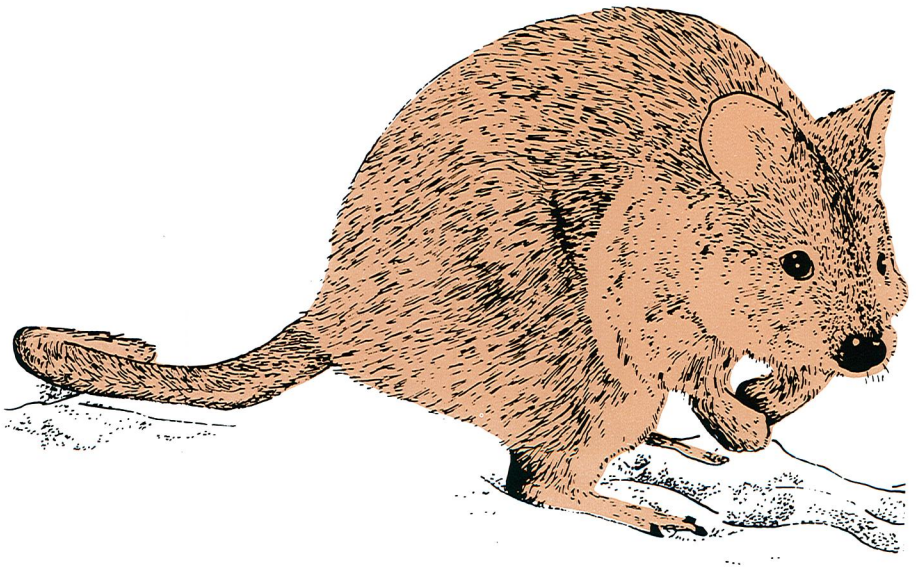


In good conditions breeding occurs at a rate of slightly over one per year with females carrying a "joey" of about 8 months old whilst suckling another of 18 months. **M. fuliginosus** occurs commonly and widely in southern W.A. and eastwards into South Australia, western Victoria and New South Wales and southern Queensland where it can be found living side by side with, but not interbreeding with, its closest relative, the Eastern Grey Kangaroo (**M. giganteus**).

Since the early days of settlement the Western Grey Kangaroo has been common and population levels within the Park are high.

Quokka — Setonix brachyurus

The familiar Quokka is a small dark wallaby up to 54 cm (head and body length) with a short tail. It is common on Rottnest Island and was also common in the south-west on the mainland until the mid 1930s. It has declined drastically since then, but recently made a partial recovery and is moderately common today in swamps and swampy thickets. It is a herbivore, eating a range of foliage, shoots and swamp herbage. Mainland populations appear to be able to breed throughout the year and produce one young.



It has been recorded infrequently (although regularly) in the Stirling Range with the most recent sighting being by a park ranger near the base of Bluff Knoll. The Quokka populations in the Park have withstood the pressures of the introduced cat and fox as well as indiscriminate use of fire. They are therefore unlikely to disappear, but their secretive habits and the difficulty of traversing the many thickly vegetated gullies makes estimates of abundance difficult.

Bats

The bats of the Stirling Range have been poorly documented, but Western Australian Museum records indicate that of the 34 Western Australian species at least eight could be expected to occur there, and they are listed below with details of roosting sites, colour and dimensions (average given in brackets).

Despite the saying, "blind as a bat", bats are not blind though many do have very small eyes. They hunt their insect prey and find their way in the dark using echo location. This is a process in which ultrasonic calls or vibrations are emitted and the resultant reflections assessed. Sometimes the high-pitched calls can be heard by humans with keen hearing. The calls are produced rapidly (up to 200 per second in some species) and are projected through the nostrils or mouth. After bouncing off objects, whether they be other bats, trees, the ground or prey, they are collected in the large and sometimes complex ears. Emissions may vary in intensity, pulse rate and frequency depending on the bat's activity, i.e. searching, homing in on prey or cruising. Echo location, especially the interpretation of returning signals, is not fully understood but it is clear that a flying bat is receiving information from all nearby sound-reflecting objects, enabling it to fly in the dark.

In southern areas such as the Stirling Range, bats become torpid or hibernate in winter. During this time, bodily activity all but stops and temperatures are usually only a few degrees higher than surroundings. In this dormant stage, stored fat is used for energy.

Name	Range of body length & average length	Roosting	Colouration
White-striped Mastiff-bat **Tadarida australis**	85-100 (92) mm	Tree hollows, under bark, ceilings	Chocolate brown above, paler below. Two white stripes at wing junctions on underside.
Little Mastiff-bat **Mormopterus planiceps**	50-65 (57) mm	Tree hollows and crevices, roofs	Grey-brown. Notably paler below ears.
Greater Long-eared Bat **Nyctophilus timoriensis**	60-75 (66) mm	Tree hollows	Dark greyish-brown overall.
Gould's Long-eared Bat **Nyctophilus gouldii**	56-65 (58) mm	Tree hollows, under bark, ceilings	Dark brown above, paler below.
Lesser Long-eared Bat **Nyctophilus geoffroyi**	40-50 mm	Under bark, in roofs and buildings	Pale grey-brown above, paler below.
Gould's Wattled Bat **Chalinolobus gouldii**	65-75 (70) mm	Tree spouts, bird nests, ceilings, rolled up canvas blinds	Black above, paler on lower back, black or brown below.
Chocolate Wattled Bat **Chalinolobus morio**	50-60 (57) mm	Tree hollows, roofs	Chocolate brown overall.
King River Eptesicus **Eptesicus regulus**	45-55 (47) mm	Under bark, in roofs and buildings	Dark brown overall.

Ashy-Grey Mouse — Pseudomys albocinereus

The Ashy-grey Mouse is a paler, though much larger, version of the House Mouse; it has a more rounded face with a branching array of whiskers. It occurs in a variety of heath and shrubland habitats on sandy soils where it digs burrows up to three to four metres long and 60 cm deep with systems of

interconnecting tunnels and nesting chambers. In winter it is herbivorous, and in summer it also feeds on insects to supplement its water intake. In the western areas of its range breeding begins in spring. In more southern areas it is probably slightly later. The gestation period is 37-38 days and two to six young are produced. Studies show the entire population is replaced every 12 months. It is distributed from Shark Bay in the north-west to Israelite Bay in the south-east and is classified as sparse though widespread.

Prior to the 1984-85 surveys it had never been recorded in the Stirling Range, the nearest locality being Mt Manypeaks, and its status was therefore unknown. The recent surveys found six individuals, all in **Banksia** woodland. Although not a widespread habitat type, it is present at several localities within the Park and hence **P. albocinereus** may be considered moderately common and its status secure.

Bush Rat — Rattus fuscipes

Despite being in the same genus as the introduced Brown Rat and Black Rat, the Bush Rat is a native species. It looks very like the Black Rat except the tail is shorter and the ears are short and rounded rather than long and pointed. It occurs commonly in swamps and wet gullies and is found from about Geraldton in the north to near Esperance in the east. It also occurs widely in the Eastern States. Breeding data for the western populations is scarce. In the east, the usual litter size is five and in good seasons several litters may be produced. Young begin an independent life at about four to five weeks and may reproduce at about four months. Its range of food is wide and includes insects, fungi and vegetation.

The only record from the Stirling Ranges was in 1936 and, although not recorded during the 1984-85 surveys, it is expected to occur in the numerous wet gullies. The Stirling Range probably represents the northernmost suitable habitat in the south-east section of its Western Australian range; the country to the north is largely cleared and is drier.

Black Rat — Rattus rattus

The name Black Rat is a misnomer as most individuals range from dark grey to pale brown, with black specimens rare. It is the common rat of the cities, though it is also found along most of Australia's coasts and adjacent areas, where it prefers swampy habitats. It was probably introduced with the first fleet in Sydney Cove and since then has become common throughout much of the agricultural country of southern Australia. It grows to about 190 mm and has about 230 mm of tail. It is distinguished from the Bush Rat (**Rattus fuscipes**) by its longer tail and longer, more pointed ears.

In good conditions it is a prodigious breeder having up to six litters of five to ten young in a year. Each young rat can reproduce after about three to four months. It is an omnivorous creature that eats just about everything man and his animals eat. Strangely enough, it seems that in undisturbed areas it does not compete with native rodents, but exploits unfilled niches. Also to its credit is that it does not often prey on native animals, only occasionally taking young birds and eggs. On the other hand it carries salmonella, leptospirosis and the plague bacillus which killed thousands of people in mediaeval Europe.

In the Stirling Range it is restricted to watercourses, where it is uncommon. It is probably more common in the surrounding agricultural country where food is abundant.

House Mouse — Mus musculus

Although usually thought of as being grey, the common House Mouse actually ranges from yellowish-brown to blackish, and grows to about 95 mm with a tail of the same length. It is an opportunistic breeder with litters of up to four to eight. Pregnancy lasts for about 19 days and sexual maturity is attained after about eight weeks. Unfortunately the House Mouse is not confined to human habitation, but is found in most habitats in the wild. It may have established itself in inland Australia at the expense of smaller native rodents. Occasionally it reaches plague proportions and causes considerable damage though only for a short duration, after which most individuals die. In farming areas its abundance has led to an increase in the numbers of poisonous snakes such as the Dugite and Gwarder.

In the 1984-85 surveys it was only moderately common. It was reported to be exceedingly common in the early 1980s.

Rabbit — Oryctolagus cuniculus

The rabbit was introduced into Australia in 1788 by Governor Phillip and his officers. They have since become established in many habitats across southern Australia, preferring sandy areas where burrowing is easy. They are

prolific breeders and in good habitats a female can produce 25 offspring per year, and in marginal areas 11. Prior to the introduction of the disease myxomatosis in 1950, rabbit populations reached astronomical numbers in good seasons and crashed in poor ones. During these plagues, competition for food and living space with native animals was overpowering. Rabbits also change the composition of plant communities as they dig up and eat the roots of the more nutritious plant species. Also in the past many native animals were killed by poison and traps set for rabbits. If rabbit numbers are not monitored carefully, especially in view of the diminishing effectiveness of myxomatosis, they could once again reach plague proportions and continue the devastation they helped begin. The rabbit is widespread in the Stirling Ranges despite continual poisoning programs and occurs in low numbers in virtually all habitats.

Dingo — Canis familiaris dingo

The dingo is doglike in appearance and habits and typically is tawny-yellow with a white tip on the tail; some specimens are black.

It was introduced into Australia between 3000 and 8000 years ago, probably by Aboriginal man. It has since established itself as part of the Australian fauna and has its own niche as our largest carnivore.

Although there are no specimens in or near the Stirling Range, it is likely they occurred there in the early days of settlement. The dingo would almost certainly not be present in the Park today.

Fox — Vulpes vulpes

The fox belongs to the dog family Canidae. It is found in most habitats and has a varied diet that includes small mammals, birds, reptiles, frogs, insects, snails, fruit and fungi. They mate in early winter and the young (usually about four) first appear in spring and disperse in late summer. The fox was introduced into Australia near Melbourne around 1868 for hunting and it spread rapidly, reaching country west of Kalgoorlie by 1917. Today the fox is very common, a fact indicated by the large numbers seen dead on country roads.

The fox has been implicated in the extinctions and range reductions of various birds and mammals, although the extent is difficult to assess. It certainly pressures native animal populations, especially when rabbit numbers decline.

It is common in the Stirling Ranges, though a 1080 poisoning program has begun. This should stabilise their numbers but complete eradication is impossible due to constant recruitment from surrounding farmland.

Feral Cat — Felis catus

The cute family cat in a bushland environment becomes the most efficient and effective killer in the Australian bush. It was introduced with the early settlers and has established itself Australia wide; it occurs in nearly all habitats and is an opportunistic predator that often kills for pleasure. It feeds on most vertebrates up to possum size and also some invertebrates. There are innumerable reports of cats bringing in dead native animals, and gut content examinations have revealed lizards in dozens. It is easy to understand the impact the cat has had in Australia, especially as in favourable areas there can be one or more per square kilometre reproducing at a rate of two litters of two to seven young per year. Unfortunately they have few enemies in Australia, though young may be taken by the dingo, fox and birds of prey.

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