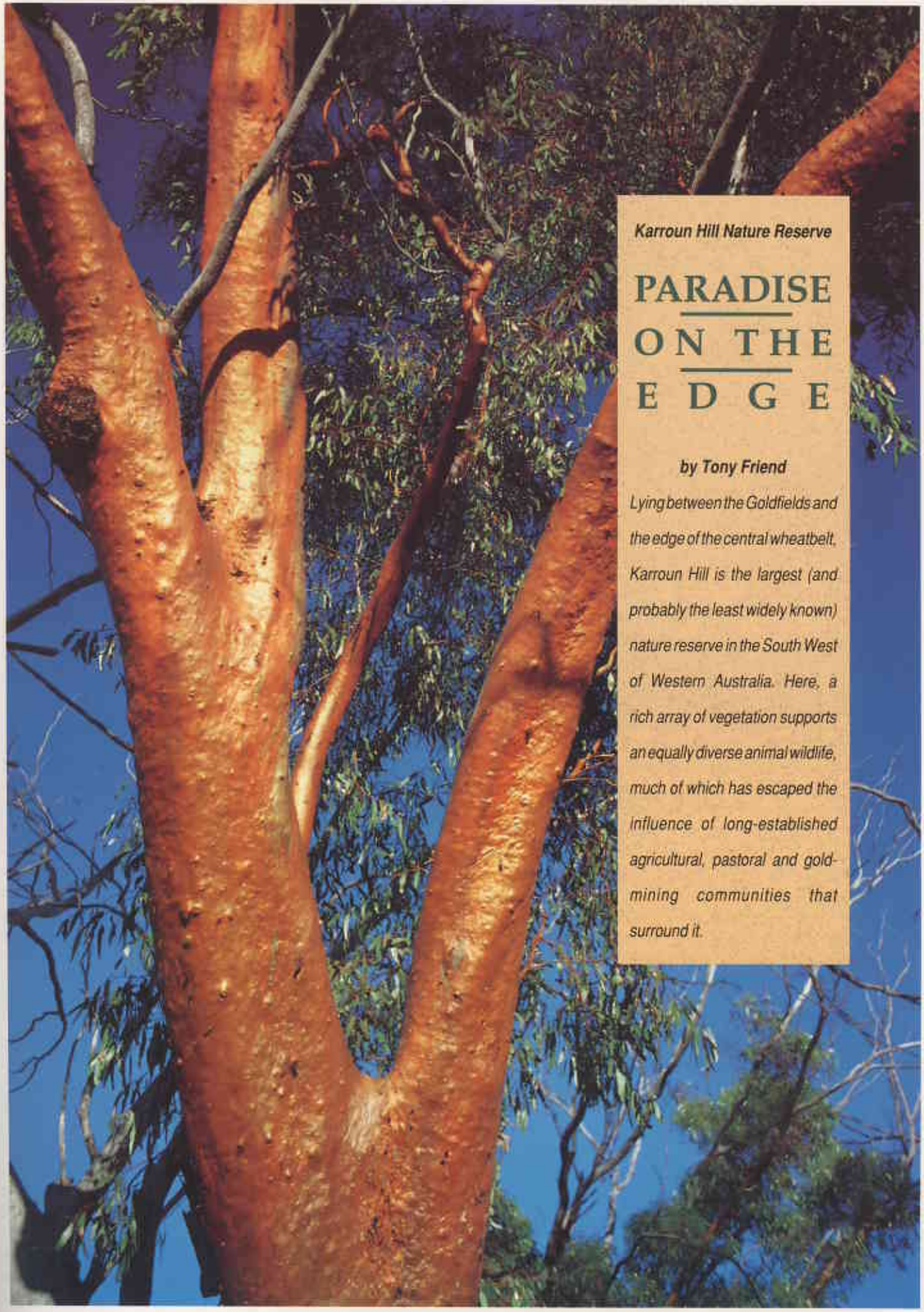

Karroun Hill Nature Reserve

PARADISE ON THE EDGE

by Tony Friend

Lying between the Goldfields and the edge of the central wheatbelt, Karroun Hill is the largest (and probably the least widely known) nature reserve in the South West of Western Australia. Here, a rich array of vegetation supports an equally diverse animal wildlife, much of which has escaped the influence of long-established agricultural, pastoral and gold-mining communities that surround it.

A travel-weary Ernest Giles painted this rather exaggerated word-picture:

'The country between the cliff and Mount Churchman was filled to overflowing with the densest of scrubs: Nature seemed to have tried [to see] how much of it she could possibly jam into this region.'

He was describing the vegetation his party encountered east of Lake Moore on his first successful attempt to reach the west coast from South Australia in 1875. This area is now part of the largest nature reserve in the south-western part of Western Australia.

Karroun Hill Nature Reserve, in the Shire of Mount Marshall, sprawls between the emu-proof fence to the south and the rabbit-proof fence to the east, and lies along the Wheatbelt's north-eastern limit, beyond which the annual rainfall is considered too low for profitable agriculture. The eucalypt-mulga line passes through the reserve and is the boundary for two botanical regions, the wattle-dominated vegetation of the arid zone and the eucalypt-dominated bush of the South West. The reserve occupies 309 678 hectares - equivalent to one-sixth of the area of state forest in Western Australia.

The earliest use of the area by Europeans was probably for sandalwood cutting. Old wheelruts can be found far from the present tracks, and former campsites can be located by telltale rusted cans or old bottles. Near Karroun Hill itself, at Wattle Soak, are the decaying remains of a courageous cattle-grazing

Previous page:
The twisted trunks of *Eucalyptus salubris* inspired such common names as 'gimlet' and 'cable gum'.
Photo - Steve Kelly

Granite outcrops provide shelter for reptiles under loose slabs of rock and for euros in crevices between boulders.
Photo - Steve Kelly ▲

venture. Here, between 1928 and 1933, George Clamp, the owner of a butcher's shop in Mukinbudin, fenced at least 2 000 acres of the granite hill and nearby natural grasslands.

Today, the post and wire fence can be traced for most of its length around Karroun Hill. The old humpy at Wattle Soak has been largely demolished; and a corrugated iron tank, used to store water collected from the granite rock, stands bottomless nearby. The most obvious result of this episode in the history of the reserve is the establishment of capeweed and other introduced plants at Wattle Soak.

LANDSCAPE, FLORA AND FAUNA

The landscape is very subdued, so the few low granite domes that protrude above ground level dominate the nearby country. Some of these, such as Mount Churchman (just outside the reserve) and Karroun Hill itself, were named by early white explorers and settlers, but most, including a spectacular high granite in the centre of the reserve, remain unnamed. Salt lakes at the western end of the reserve are an important feature as there are few in conservation areas in the region.

The lower land typically supports eucalypt woodland dominated either by York gum (*Eucalyptus loxophleba*) and the remarkable native conifer *Callitris columellaris*, or, in the broad drainage lines, by the tall and graceful salmon gum (*E. salmonophloia*). Gimlet (*E. salubris*) occurs on clay soils in narrow bands at the base of breakaways, or in extensive open stands on the flats. At the edges of the upland surface, the change in slope can be almost imperceptible, or it can take the form of a breakaway or cliff up to five metres in height. In upland sites, the vegetation often forms a mosaic dependent on soil type. The dense scrubs encountered by Giles are found here, the most impenetrable being tall shrubland of *Acacia* species near the plateau edge.

Known rare plants, mapped in 1989 by CALM botanists Steve Hopper and Andrew Brown, include the sandpaper wattle (*Acacia denticulosa*) and magnificent prostanthera (*Prostanthera magnifica*), which occur on granite rocks; jingymia mallee (*Eucalyptus synandra*) is found on pale yellow sands high in the landscape, while Southern Cross mallee (*Eucalyptus crucis*

Wandoo (*Eucalyptus wandoo*) is not common in Karroun Hill Nature Reserve but provides valuable nesting hollows for birds, bats and small marsupials.
Photo - Tony Friend ▶

The native conifer (*Callitris columellaris*) occurs in vast expanses of the open woodland shown here.
Photo - Steve Kelly ▶▶

Spectacular displays of everlasting daisies and other annuals transform woodland areas in August and September.
Photo - Tony Friend ▶▼

lanceolata) reaches its north-eastern limit on granite rocks, and the remote spider orchid (*Caladenia remota*), known only from two other localities, is also found in the reserve.

Dramatic biological events follow the annual weather cycle at Karroun Hill. Perhaps the most spectacular is the spring flowering of several species of everlasting daisy and other annuals, forming carpets of colour in the open York gum and acacia woodland. The profusion of everlastings varies from year to year, but always provides a memorable sight. As the ground dries with the arrival of hot weather in October, the everlastings fade and dry. At night and on overcast days, harvester termites (*Drepanotermes* sp.) swarm out of their underground nests through small holes in the ground, collecting the dried remains of the daisies.

Because of the lack of water, especially before the rains begin, late autumn can be the most stressful time of year. Many shrubs die, creating spectacular displays of autumn colours, sometimes rivalling those of the northern hemisphere. At this time, too, red kangaroos, euros and emus congregate around granite rocks where the last of the water is generally found.

Other significant events are related to the breaking of the annual drought. As the warm soil becomes moist, especially after summer thunderstorms, termite activity increases to fever pitch as some food sources become available for a short time. Wood-eating termites plaster the exterior of fallen branches with a mixture of faecal material and sand, creating galleries connected to their nests. These galleries have a moist environment that extends the termites' feeding time should the rain not continue. Litter-feeding termites plaster the litter and rapidly consume it. Later in winter, some termites build small towers from which their winged reproductive adults launch themselves into the air to leave the nest. As the rock-pools on the large granites fill up, the evening air comes alive with a chorus of frogs. Sediments in the larger ponds contain the dried eggs of a range of invertebrates. A swarm of life appears in the rock pools as copepods, ostracods and flatworms, as well as mosquitoes and midges, hatch soon after the pools fill. The shallow mud at the bottom of the pools turns green with the short spiky leaves of primitive quillworts, and of tiny-flowered mud mats.

MAMMALS AND MALLEE FOWL

It is clear that the mammal fauna of the area was much richer in pre-European times. In October 1836, the Surveyor General, John Septimus Roe, travelled through the present Mukinbudin-Mount Marshall district and wrote in his diary of seeing 'an increased number of kangaroos, rats, bandicoots and a burrowing animal which makes a large hole'. This last animal was without doubt the burrowing bettong, or boodie (*Bettongia lesueur*). In order to protect their crops, the early settlers in the area poisoned boodies, which were still present near the town of Mukinbudin in 1910.

Surveys by Ken Youngson and Norm McKenzie during the 1970s found 13 native mammal species in Karroun Hill Nature Reserve: three marsupials, two rodents, seven bats and the echidna. Subsequent research has shown that another marsupial, the grey kangaroo, occurs there. Fat-tailed dunnarts (*Sminthopsis crassicaudata*) are periodically found on nearby farmland, and are probably present in the reserve.

Numbats (*Myrmecobius fasciatus*) were known in the Mount Marshall and Mukinbudin Shires in the early part of

this century, and Alex Baynes found an old numbat femur just outside Karroun Hill Nature Reserve in 1975. Many overhanging breakaways preserve intact nests of stick-nest rats (*Leporillus* sp.), now extinct in the wild on mainland Australia.

The early explorers recorded the prevalence of mallee-fowl (*Leipoa ocellata*) and their large incubating mound-nests in the area. They found the eggs to be a welcome change from their expedition rations, and Giles noted that, during the laying season, these eggs were a principal dietary item of the local Aborigines. As Giles' party passed through the northern half of the present reserve they collected only 20 eggs in one day, a disappointing haul compared with their previous day's effort of 45 eggs. To achieve this last total they would have had to raid more than 10 nests. Today, while mallee-fowl are occasionally sighted, nests are not common. In more than 50 days' walking in the reserve since 1987, only one active mound has been seen.

Disappearance of mammals in arid and semi-arid zones has been linked with changing fire regimes, effects of rabbits and the effect of introduced predators like the fox and the cat. Fire in Karroun Hill Nature Reserve, however, is still mainly related to lightning strikes and does not carry through the woodland. Rabbits are certainly present throughout the reserve, as are cats and foxes, and the combined effects of these introduced species probably account for the losses of mammals. It is likely that predation by foxes, as shown by recent research in New South Wales, has caused the decline in the mallee-fowl population. The Australian bustard, still present in the reserve, nests on the ground and is also likely to be under threat from foxes.

The large size of Karroun Hill Nature Reserve makes it a suitable site for reintroducing native mammal species that still survive in other areas. Since 1987, a program has been under way to reintroduce numbats to this reserve. Fifty-seven numbats have been released there under a light regime of fox-baiting. All numbats recaptured for observation have been in good condition and breeding has been occurring at a surprisingly high rate. The third generation of reintroduced numbats has now been born there. Apparently, numbat habitat and food supplies (termites) have not deteriorated significantly, despite the changes that have occurred in the 200 years of European settlement.

Clearly, Karroun Hill Nature Reserve is an extremely valuable asset in Western Australia's conservation estate. As well as conserving a highly significant array of eastern Wheatbelt wildlife, it has the potential to provide a sufficiently large area in which to reconstruct the mammal fauna that has been lost from the region.

NATIVE MAMMALS OF KARROUN HILL NATURE RESERVE
(EXCLUDING BATS AND THE DINGO)

IN ORDER OF DECREASING BODY WEIGHT

PAST	PRESENT
Red kangaroo	Red kangaroo
Western grey kangaroo	Western grey kangaroo
Euro	Euro
Black-footed rock-wallaby	•
Crescent nailtail wallaby	0
Dalgyte	•
Rufous hare-wallaby	•
Boodie	•
Woylie	•
Chuditch	•
Pig-footed bandicoot	0
Numbat	(reintroduced)
Greater stick-nest rat	•
Red-tailed phascogale	•
Mitchell's hopping-mouse	Mitchell's hopping-mouse
Sminthopsis dolichura	*Sminthopsis dolichura*
Fat-tailed dunnart	Fat-tailed dunnart
Sandy inland mouse	Sandy inland mouse
Western pygmy possum	Western pygmy possum

• = population surviving elsewhere
0 = extinct species

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Numbats have been reintroduced by CALM to Karroun Hill Nature Reserve in a project supported by the World Wide Fund for Nature (Australia).
Photo - Jiri Lochman

A wave of colour is spreading from Shark Bay to Jurien and inland to Meekatharra. Our story on page 10 takes you into Wildflower Country.

LANDSCOPE

VOLUME SEVEN NO. 1 SPRING EDITION 1991

The WA Museum is 100 years old. It houses a staggering four million specimens of insects, marine animals, fish, birds, reptiles and frogs. Page 22.

Seven species of microscopic dieback-disease fungi are attacking WA's unique wildflowers. See page 28.

The rugged Pilbara landscape has some hidden delights. On page 16, go up hill to Hamersley Range, then down Dales and other spectacular gorges.

How does WA's conservation heritage look to the people who look after it? Turn to page 26 for some great photographs from a recent competition run for CALM staff.

F E A T U R E S

R E G U L A R S

S P E C I A L S

C O V E R

Out now! Wildflowers are blooming in the vast tracts of country north of Perth, especially in the northern sandplains and Murchison, which is experiencing a bumper wildflower season following heavy winter rains. Philippa Nikulinsky's illustration shows some of the wildflowers for which WA is justly famous: the splendid everlasting, buttercup, red leschenaultia, Sturt's desert pea, catspaw, wattle, native wisteria, black kangaroo paw, flame pea, and scaevola - all covered in the newly released book Wildflower Country. *See page 10.*

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