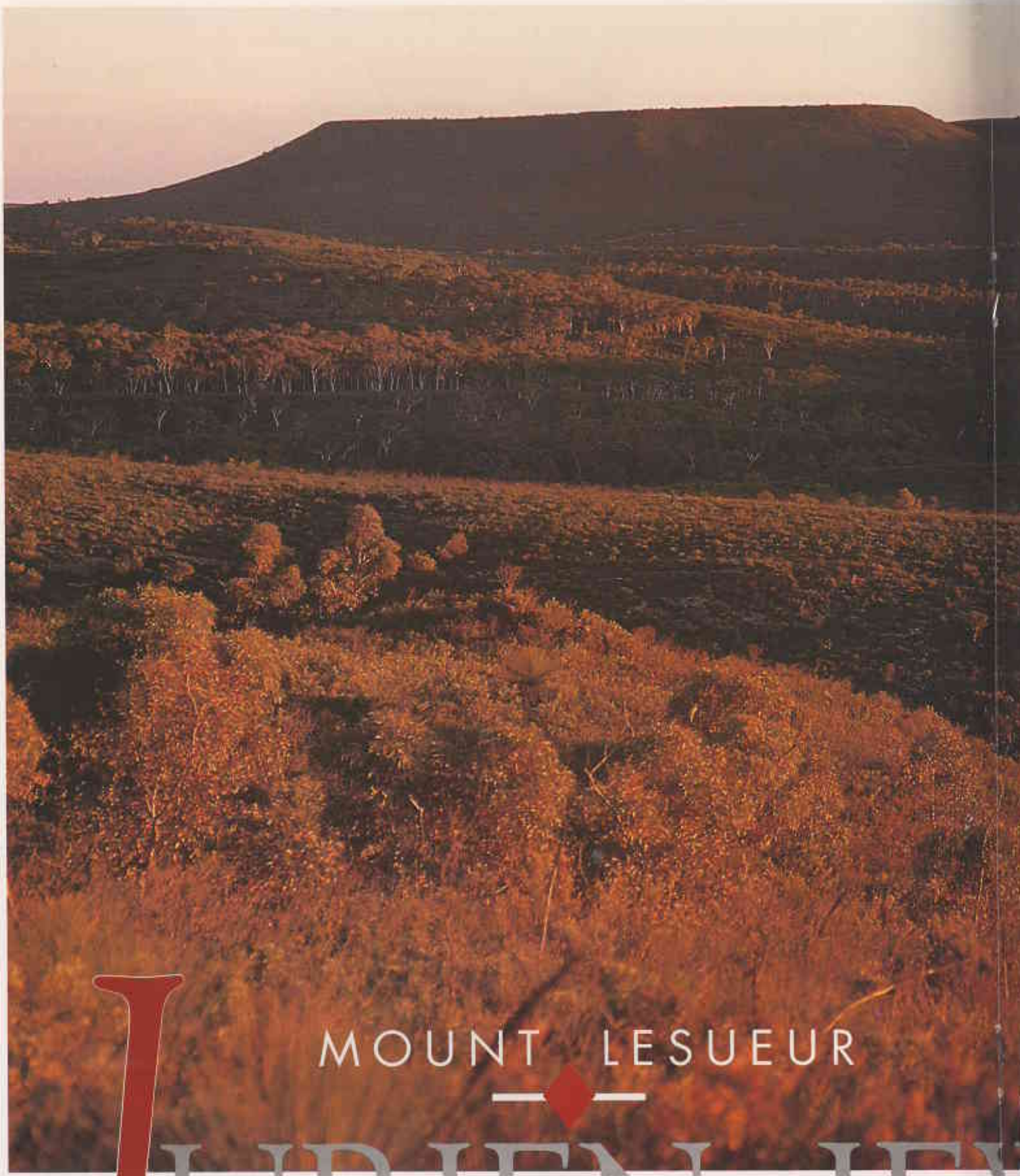

MOUNT LESUEUR

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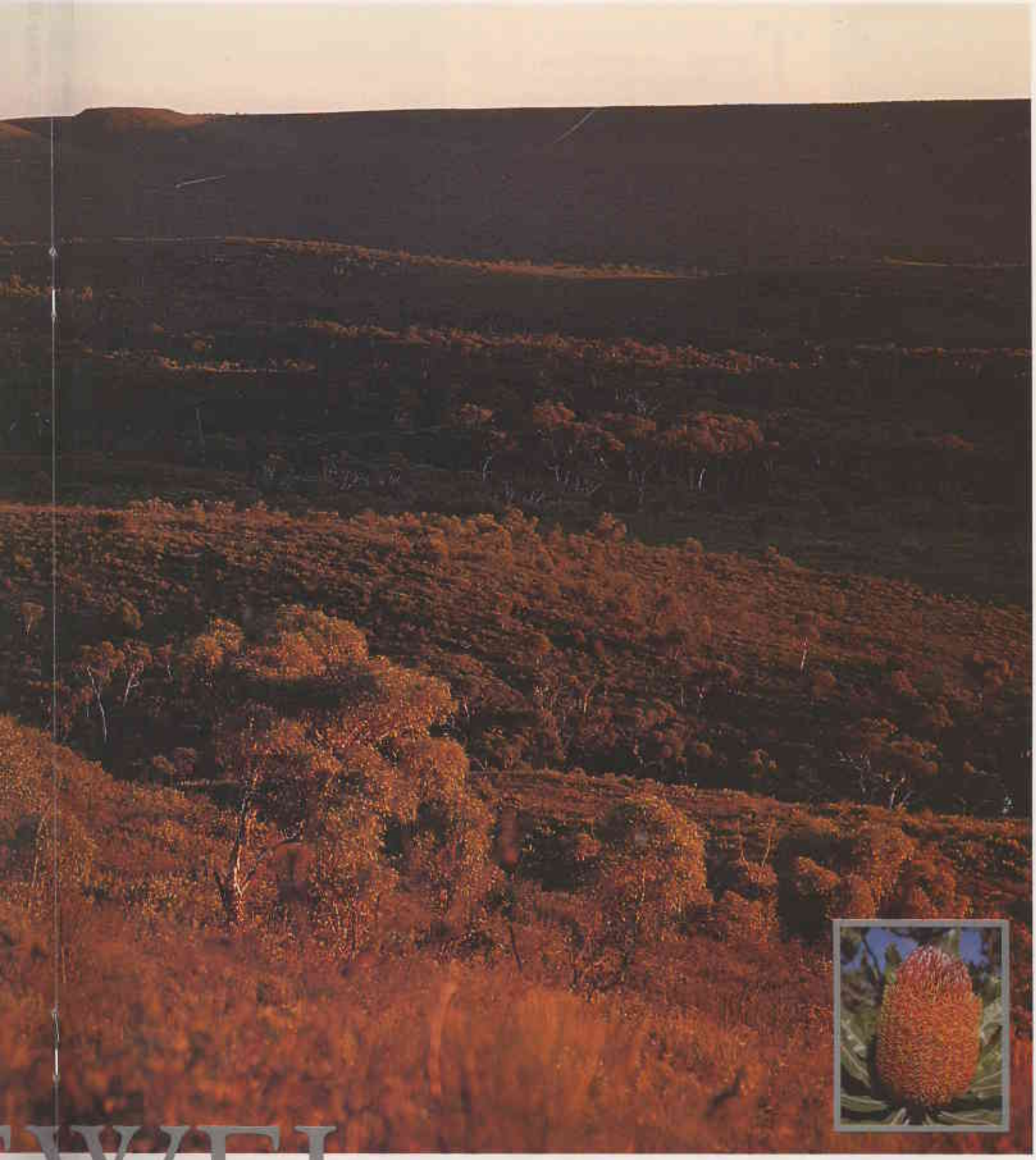

EWEL

The Mt Lesueur area's strikingly eroded laterite landscape was once dismissed as worthless scrubland, useless to farmers and pastoralists. But it has long been a mecca for botanists. **STEVE HOPPER** *and* **ANGAS HOPKINS** *describe its huge diversity of plants and animals.*

From top: kingia (*Kingia australis*), Queen of Sheba orchid (*Thelymitra variegata*, bronze orchid (*Thelymitra stellata*) and black kangaroo paw (*Macropidia fuliginosa*). Photos-Steve Hopper

THE Mt Lesueur area east of Jurien Bay, in the northern sandplains between Perth and Kalbarri, has spectacular landforms underlain by complex geological features. Its exceptionally diverse flora of over 800 species includes many plants found nowhere else and represents 10 per cent of the State's known flora. Six species are declared rare and endangered, and several more may warrant similar status. Mt Lesueur is comparable with the Stirling Range and Fitzgerald River National Parks as one of the most significant areas for flora conservation in southwestern Australia, but it is currently only a collection of unvested reserves and vacant Crown land. It is especially important because it is free of dieback disease.

The fauna is diverse, with at least 124 birds, 7 frogs and 47 reptile species. The area is also critically important to the survival of hole-nesting birds such as Carnaby's Black Cockatoo.

EARLY HISTORY

In June 1801 the French ship the *Naturaliste* sailed up the coast past Jurien Bay. A flat-topped mesa and a large rolling hill to the north were conspicuous from the sea at Jurien, and were named Mt Lesueur and Mt Peron. Charles Alexandre Lesueur, for whom it was named, was a topographical painter and natural history artist on the expedition and he later became a respected naturalist.

Captain George Grey and five others traversed the area in 1839 after being shipwrecked near Kalbarri, and other exploratory parties later followed. But when the Perth to Geraldton agricultural region was opened in 1851, the Mt Lesueur area was seen as unsuitable for pastoral use because of its rugged terrain and the abundance of poison plants. Ever since, it has been spared from agricultural clearing. James Drummond first collected plants in the area in 1850.

INTERNATIONAL ACCLAIM

The Mt Lesueur area is internationally significant. The Department of Conservation and Land Management's (CALM) recent workshop on the theme "Biological Diversity: Causes and Maintenance", held in Perth in October 1988, developed proposals for a collaborative research program to be organised through the International Union of Biological Sciences.

During a two day field trip through the northern sandplains to Mt Lesueur, overseas and interstate participants were captivated by the wealth of plant species and spectacular scenery.

Staghorn pea (*Daviesia epiphylla*) is confined to a very small area; from Mt Lesueur to about 30 km eastwards. Photo-Steve Wilke ▲

A honey possum, the most common native mammal in the Mt Lesueur area, feeds on candle banksia (*Banksia attenuata*) nectar. Photo-Steve Hopper ▶

Previous page: Mt Michaud, one of two flat-topped mesas in the area. Inset-firewood banksia (*Banksia menziesii*). Photos-Robert Garvey

The flat-topped Mt Lesueur has a brown laterite mantle overlying the pale Lesueur Sandstone (outcrop at bottom left). Photo-Robert Garvey ◄

LATERITE LANDSCAPE

The ancient sedimentary rocks of the Mt Lesueur - Cockleshell Gully area have been distorted by a series of major faults and their surfaces partially lateritized (covered by brown gravel through a process of chemical weathering). Patterns of drainage lines further dissect the country.

Mt Lesueur itself, a near-circular mesa formed from the erosion of a lateritic plain, is the area's highest feature. To the west lie sand dunes, swamps and low limestone ridges similar to those of the Swan Coastal Plain near Perth.

HEATHS AND WOODLAND

The vegetation is mainly kwongan (shrublands) like much of the northern sandplain region. Most of the shrubby species are less than a metre tall, contributing to the country's uninterrupted vistas.

The uniformity of this low vegetation is deceptive. The shrublands in the district have more species per unit area than any vegetation type known in the State. An area of 10 m x 10 m can have up to 80 different species. Moreover, the species growing together change rapidly over short distances, so that quadrats less than 1 km apart may have less than half their species in common. Such diversity is comparable to rainforest vegetation in the tropics.

Patches of mallee, conspicuous in the low heaths, are common. On the southern slopes of Mt Lesueur, jarrah grows as a shrub mallee sometimes only one metre tall. This is the extreme limit of jarrah's distribution and the next stand of jarrah lies over 100 km to the south, suggesting that the tree's general range extended much further in previous eras, presumably when conditions were much wetter. The genetic differences between the Mt Lesueur populations and those further south may prove useful in future if controlled breeding of jarrah is necessary to circumvent pests and diseases or to enhance timber production.

The northernmost known mountain marri *(Eucalyptus haematoxylon)* also grows here as a mallee. So do two rare eucalypts only named in 1986: Mt Michaud mallee *(E. lateritica)* and cork mallee *(E. suberea)*.

The Mt Lesueur - Cockleshell Gully area features small patches of low woodlands of several different types, mainly in sandy valleys and drainage lines with heavier soils. Woodland trees on the dissected uplands include powderbark *(E. accedens)*, wandoo *(E. wandoo)*, pricklybark *(E. todtiana)*, candle banksia *(B. attenuata)*, firewood banksia *(B. menziesii)* and the rare and endangered pine banksia *(B. tricuspis)*.

These woodlands are important for birds such as cockatoos and corellas which use tree holes for nests, because good stands of old trees, together with some regeneration, maintain the supply of tree hollows. Food (e.g. marri fruits, flowers of *Dryandra* species, insect grubs in banksia cones) and free water are abundant, and roosting trees grow nearby. The few woodland pockets to the east are particularly important; they are the only ones that satisfy the requirements for successful breeding of Carnaby's Black Cockatoo, one of W.A.'s declining birds.

To the north-east are the best developed areas of mixed heath sedgelands dominated by the rush-like *Ecdeiocolea monostachya*, the most extensive areas of one-sided bottlebrush (*Calothamnus quadrifidus*) heath, and small soaks containing *Melaleuca hamulosa* and *M. uncinata*.

The watershed for drainage lines flowing in three separate directions in this eastern area provides the only habitat in the area for low, open paperbark (*M. preissiana*) woodlands. The best stands of pine banksia also grow in this area. The whole area is currently free of dieback disease, although there are recent infections nearby.

VERTEBRATE FAUNA

A fauna survey by the W.A. Museum in 1973-74 found the area was rich in birds (particularly heath-dwelling species), frogs and reptiles. Mt Lesueur is the limit of many animals' geographical range.

Fifteen native mammals, including four species of dunnarts, occur in the area. The study of owl pellets in a nearby cave has shown that the mammal fauna was even richer over the past few thousand years. Woylies and several native rodents were once found here.

From top: *Daviesia* species, shell-leaved hakea (*Hakea conchifolia*), common hovea (*Hovea trisperma*) and a wattle (*Acacia latipes*). Photos-Robert Garvey

From top: kingia *(Kingia australis)*, pine banksia *(Banksia tricuspis)*, one-sided bottlebrush *(Calothamnus quadrifidus)* and honeybush *(Hakea lissocarpha)*.
Photos-Robert Garvey

BANKSIAS NEED COCKATOOS

Pine banksia was discovered by James Drummond, the first botanist to visit Mt Lesueur, in 1850. He noted that it looked like a Scotch pine.
Photo-Robert Garvey▲

The flora and fauna of the Mt Lesueur area are intimately linked. There is no better example of this than the relationship between pine banksia and another declining species, Carnaby's Cockatoo.

Pine banksia is confined to the Mt Lesueur area. It has been studied recently by Stephen van Leeuwen and Dr Byron Lamont of Curtin University, who found that only about 20 000 plants grew in a 13 km range. It is slow growing and takes at least 18 years to reach reproductive maturity. Only about 10 of its large yellow nectar-rich flower heads, pollinated by honeyeaters and honey possums, are produced per plant each season (March-September) and most are destroyed. Each year about 60 per cent of the flowers are eaten by moth larvae and a further 20 per cent are damaged by parrots searching for nectar.

Carnaby's Cockatoos consume 88 per cent of pine banksia flower heads which are infested with the moth larvae, holding the larvae in check. This enables 20 per cent of flower heads to mature and set fruit. On average, only one flower head per tree produces a fruit each season, and one fruit contains only 33 seeds.

Dr Denis Saunders, of the CSIRO Division of Wildlife and Ecology, has documented the progressive extinction of breeding populations of Carnaby's Cockatoos in the Wheatbelt, as the clearing of the native vegetation on which they fed resulted in longer and longer feeding flights away from nest hollows. Eventually, the adult birds could not find enough food for nestlings, the young birds starved, and the populations became extinct when the last adult birds died.

The Mt Lesueur area currently provides one of the last refuges for this bird. It has good nest hollows (in wandoo trees) close to free water with an adequate food supply in the adjacent heaths to sustain a breeding population. However, further clearing of the food resource or changes in the availability of nest hollows and free water may jeopardise the cockatoo's survival. If there was a reduction in the bird's population, it would cause a problem for the pine banksias, as the enlarged population of moth larvae would possibly destroy more flower heads, reducing the precious seed supplies of this species even further.

Hence, pine banksia is dependent on the survival of Carnaby's Cockatoo, a more widespread, but equally endangered, species dependent on a larger area to maintain breeding populations. There are, no doubt, many other such links between the plants and animals of the Mt Lesueur area.

Carnaby's Black Cockatoo is the largest cockatoo found in the region. It has declined seriously in both abundance and range since European settlement because of clearing of its habitat.
Photo-Michael Morcombe ◄

The area is one of few places in W.A. where the surviving fauna can be compared with a recent fossil assemblage. The changes probably resulted from a decline in rainfall, the effects of sea-level change on habitat, particularly for sand dune dwelling species and, more recently, the impact of European colonization, which caused changes in the fire regime and the introduction of cats and foxes.

More recent studies on honeyeater and honey possum pollination of banksias and kangaroo paws, conducted by postgraduate students from Curtin University, have highlighted the interdependence of plants and animals in the heathland flora.

The Mt Lesueur area is rich in bird species of the kwongan, including honeyeaters (such as this Brown Honeyeater), thornbills, fairy-wrens, White-breasted Robin, Southern Emu-wren and White-browed Scrub-wren.
Photo-Steve Hopper▲

When Captain George Grey and his party walked through the area in 1839 after being shipwrecked, he described a "red sandstone range...thinly studded with blackboy trees".
Photo-Peter Ewing▼

BOTANICAL MECCA

It is little wonder that Mt Lesueur has been a magnet to botanists since the first resident colonial botanist James Drummond collected there in 1850.

It is one of the richest sites for plant species in the world. Not only is the concentration of species at Mt Lesueur exceptional but 200 of the 800 species have special conservation significance. The Mt Lesueur populations form major breeding stocks of the 100 or so species that are confined to the Mt Lesueur - Eneabba region. The populations of many more species, such as jarrah, are outliers or end points of their geographical range. Many endangered species are concentrated at the eastern end of the area.

The Mt Lesueur flora is a mix of ancient relict plants and those that evolved more recently. The relicts have survived adverse climatic conditions over the past few million years because of microhabitats (e.g. southern slopes receiving moderately intense sunlight together with cool, moist ocean breezes). The kingia *(Kingia australis),* Lesueur hakea *(H. megalosperma)*, cork mallee and trumpets *(Conostylis androstemma)* are good examples of relict flora. Their presence indicates that the Mt Lesueur area has been a major refugial centre for a long time.

Recently-evolved plants usually have a narrow geographical range at the edge of the distribution of the species from which they arose. For example, Mt Michaud mallee is probably an offshoot from the more widespread pricklybark.

Mt Lesueur is undoubtedly one of the scenic and biological jewels of the South-West. Its diverse flora and fauna, rich in rare species, and its spectacular landforms deserve the most careful management for posterity. ⊡

From top: many-flowered honeysuckle *(Lambertia multiflora)*, a variant of mountain marri *(Eucalyptus haematoxylon)*, staghorn bush *(Daviesia epiphylla)* and Gairdner Range starbush *(Asterolasia drummondii)*.
Photos-Steve Hopper

LANDSCOPE

VOLUME 4 NO 4 WINTER EDITION 1989

Effluent disposal ponds from industry disfigure an idyllic strip of coastal land. But restoration work and a new conservation park are planned for the Leschenault Peninsula, near Bunbury. *Turn to p.8.*

Wood that was once only suitable for firewood can now be used to make high grade furniture. *Find out how on p.24.*

With spring approaching, the bush beckons...but without proper planning your walk could turn to disaster. *See p.40.*

A spectacular landscape, with an astounding array of plants and animals lies inland from Jurien Bay. *Read about the Mt Lesueur area on p.28.*

A population explosion of coral-eating snails threatens the unique reefs of Ningaloo Marine Park. How does CALM plan to counter their attack? *See p.14.*

C O V E R

In W.A.'s far north, Aboriginal rangers with ties to land now in national parks draw on the traditional wisdom of their people for use in Park management. Photo-Robert Garvey

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