

KING LEOPOLD'S TREASURES

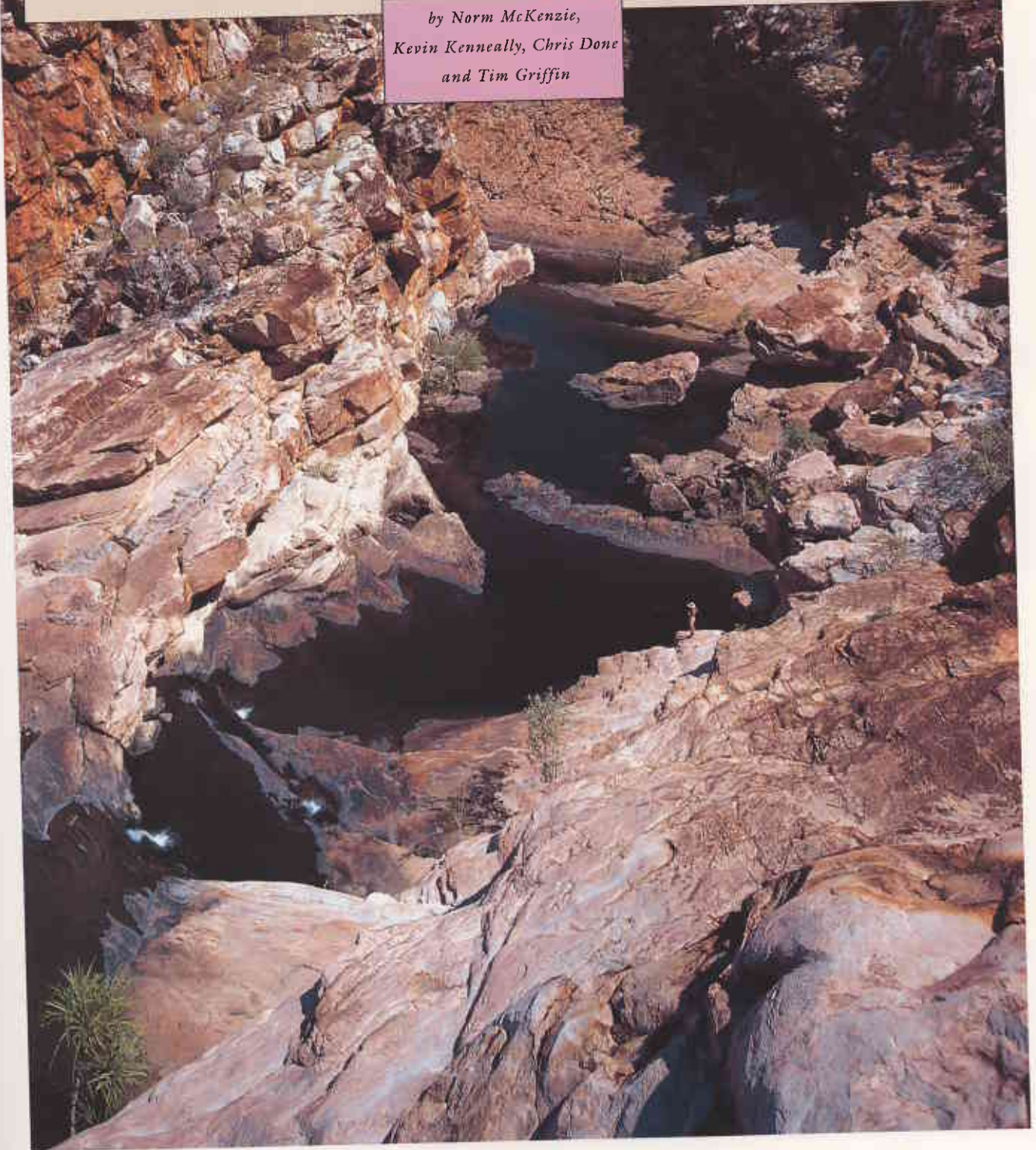
*The north-west Kimberley
ecosystems in mainland*



*supports the last intact
Western Australia.*

One part, to be added to the State's conservation estate, is a section of the King Leopold Ranges, whose jagged hogback scarps were shaped by tremendous geological forces.

*by Norm McKenzie,
Kevin Kenneally, Chris Done
and Tim Griffin*



Containing some of the Kimberley's isolated patches of remnant rainforest, the King Leopold Ranges - named in 1879 after King Leopold of Belgium - extend for some 300 kilometres from Walcott Inlet to Margaret River about 100 km west of Halls Creek.

About 350 million years ago in the Devonian times the ancient scarps were fringed by a barrier reef. Today the ridges of the King Leopold Ranges rise to 300 metres above the surrounding plains (950 metres above sea level). They overlook the Oscar and Napier ranges, remnants of the reef, and the grassed plains of the Fitzroy river valley to the south-west.

Previous page:

Bell Gorge, one of the lesser-known gorges on the edge of the King Leopold Ranges.

Photo - Bill Bachman

Previous page:

Blue water lily (*Nymphaea violacea*).

Photo - Bill Bachman

Contorted strata of the sandstone rock are clearly visible along the Gibb River Road near Mt Bell.

Photo - Norm McKenzie

Open savannah woodlands cover the sunburnt landscapes. Groves of river gum, stately paperbark trees and dense thickets of screw pine shade watercourses. Water lilies and other aquatic plants fill permanent pools in

the creeks and rivers, providing cool relief from the starkness of the harsh escarpments.

Following wet season rains, great volumes of water cascade from the ranges. In the dry, tourists are attracted to waterfalls, such as at Bell Gorge, that feed the larger creeks and rivers. Visitors also marvel at the spectacular Lennard River Gorge and the incredibly folded and faulted scenic rock formations of the ranges along the Gibb River Road.

For nearly 20 years, the Government has been trying to establish a network of reserves to represent the diversity of the north-west Kimberley, an area that comprises the only intact examples of



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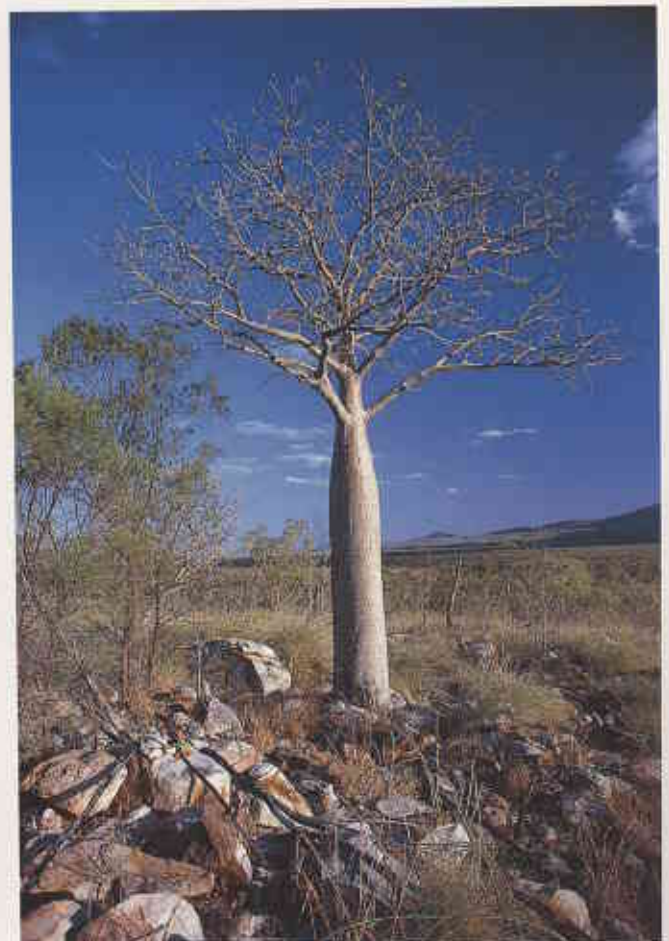
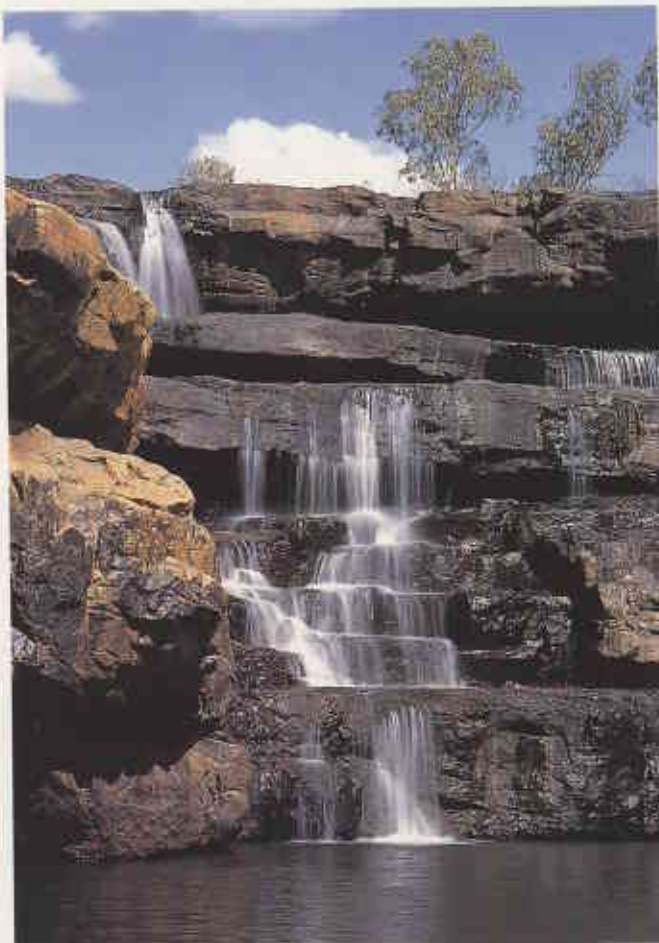
A spectacular waterfall on Bell Creek along the Gibb River Road.

Photo - Marie Lochman

Below:

A young boab tree (*Adansonia gregorii*) growing from a rock scree in the spinifex grasslands of the King Leopold Ranges.

Photo - Bill Bachman



indigenous ecosystems remaining in mainland Western Australia. It is the only part of the State in which no species are known to have become extinct in the period of European settlement. Even its rich fauna of native mammals - many of them rare species - still persists despite the recent appearance of feral cats, pigs, donkeys and cattle in its furthest corners.

Along with the Drysdale River National Park and the Prince Regent Nature Reserve, the total reserved area in the north-west Kimberley is now some 1.4 million hectares - six per cent of the district. Prince Regent was the first major conservation reserve declared in 1964, and its flora and fauna values are such that it has since been listed as a World Biosphere Reserve. The Drysdale River National Park, declared in 1974, was the next major reserve.

Last year the State Government announced plans to add a central part of the King Leopold Ranges to the conservation estate following the purchase of the 370 000 hectare Mount Hart pastoral lease.

BIRTH OF THE RANGES

The steep ridges and hills of the King Leopold Ranges are developed in a thick sequence of layered rocks. The most abundant of these are white and pink quartz sandstone, buff siltstone and brown mudstone. There are also layers of grey-green basalt that solidified from lava flows, and grey dolerite formed from similar molten rock that did not erupt at the earth's surface but invaded the older sedimentary rocks to form layers. This group of rocks accumulated in a region known as the Kimberley Basin (Figure 1).

The sequence of rocks in the Kimberley Basin is more than 5 000 metres thick. It was deposited in shallow water on a slowly subsiding large continental mass in Precambrian times, about 1 800 million years ago. After a long interval of time these rocks were partly covered by sediment associated with an ice age about 600 million years ago.

About 560 million years ago these generally flat-lying strata were thrust (pushed on flat faults) from the north-east over older granite, volcanic rocks and metamorphosed sedimentary rocks

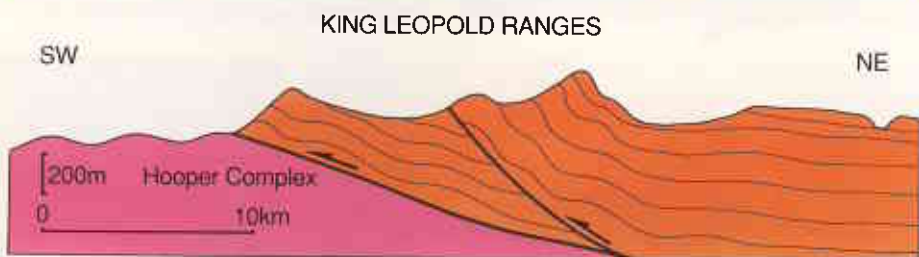
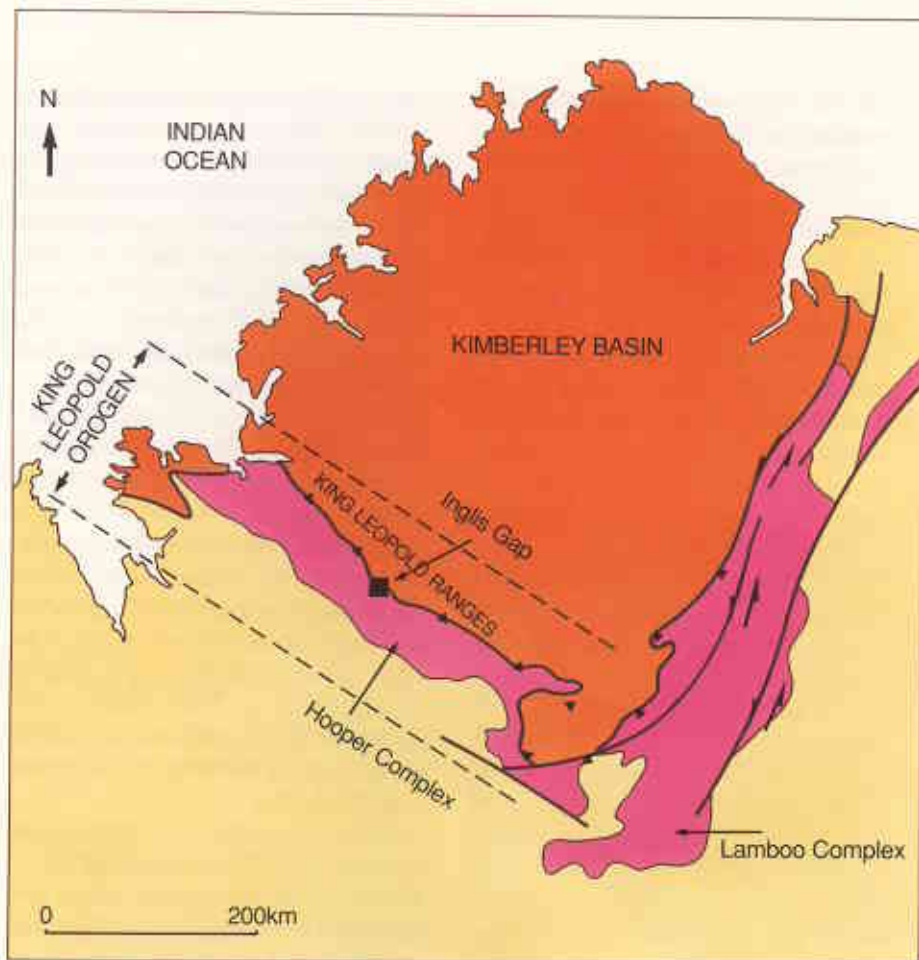


Fig 1

Map and cross-section showing the geological setting of the King Leopold Ranges.

of the Hooper Complex (Figure 1). This caused the rocks on the leading edge to crumple in a major mountain-building episode known as the King Leopold Orogeny.

Erosion of this mountain chain then led to the rugged terrain that forms the ranges, with the characteristic hogbacks, steep valley walls and often flat valley floors seen today. North of the ranges the strata of the Kimberley Basin remain flat-lying, occupying the whole of the Kimberley Plateau extending north to the coast.

Approaching the King Leopold Ranges through the foothills in the south-west along the Gibb River Road, one passes the smooth rounded pink granite,

jagged grey volcanic rock and red-brown metamorphosed sedimentary rock of the Hooper Complex. The ranges are entered through Inglis Gap, beyond which dramatic evidence of the deformation caused by the King Leopold Orogeny - the folded and faulted rock formations - become visible as the road winds its way eastwards through the valleys.

The resistant, massive, white and pink quartz sandstone strata form steep and very rugged ridges. Weathering along joints and cracks produces large angular boulders. The valleys between the ridges have been formed by erosion of the less resistant brown and purple mudstone and basalt, as well as the Hart

Dolerite, which weathers to black soil and rounded black boulders. The valleys offer the only access to this rugged country.

FLORA AND FAUNA STUDIES

The first plant specimens were collected from the King Leopold Ranges during an expedition by Alexander Forrest from the De Grey River to Port Darwin in 1879. He sent them to Baron F. von Mueller, Australia's first colonial botanist in Victoria (see also 'In the Footsteps of Giles' in this issue). Forrest named the ranges after King Leopold of Belgium in recognition of His Majesty's interest in exploration. Mount Matthew was named after his brother, and Mount Humbert after the King of Italy, who was a promoter of science in his kingdom. It's not known after whom Mount Hart was named.

In 1905, William Vincent Fitzgerald collected plants from the King Leopold Ranges during Charles Crossland's trigonometrical survey expedition. The expedition travelled from Derby to Inglis Gap, then proceeded northwards, crossing the Isdell River to reach the Packhorse Range. Many spectacular

features of the ranges, including Mounts Herbert, Broome and Vincent, are thought to have been named during this expedition. Mount Bell, Bold Bluff and Mount Ord were named during earlier explorations by Frank Hann in 1898. Fitzgerald kept a diary of the pastoral suitability and geology of the areas explored. He also collected numerous plant specimens, many of which were new to science and were subsequently described in the *Journal and Proceedings of the Royal Society of Western Australia*.

These are the 'type-specimens' of many Kimberley species. Some, such as *Eucalyptus collina* and *Eucalyptus confluens*, are now known to occur in other places throughout the region; others, such as the cycad *Cycas furfuracea* and the mistletoe *Decasynina biangulata*, are endemic to the north-west Kimberley.

Since then, only a few studies have been made into the area's flora and fauna. A general description of the area's vegetation formations and land systems was conducted by CSIRO in the early 1960s. Mammal collections were made

near Inglis Gap in the 1960s by zoologists Professor Jock Marshall, Harry Butler and others. An isolated rainforest patch at the far northern extremity of the Mount Hart pastoral lease was inventoried in 1987, and various studies on the botany and zoology of the area were undertaken by the British-Australian Kimberley Research Expedition during the 1988 dry season. Systematic collections have yet to be made in the area during the wet season.

Looking north from Napier Range, the King Leopold Ranges can be seen in the distance.

Photo - Jiri Lochman

Stripe-faced dunnart (*Sminthopsis macroura*).

Photo - Babs and Bert Wells

A cycad (*Cycas furfuracea*), one of the plants that is endemic to the north-west Kimberley.

Photo - Kevin Kenneally



Despite these promising beginnings, little is still known about the biota of the area, compared with the Prince Regent and other parts of the north-west Kimberley. But some indication of the area's biological values can be drawn from the ease with which new species records were found during brief, dry-season visits by biologists in 1988. Examples include a new eucalypt allied to *E. lamprocalyx* and several new grasses for Western Australia.

Granite outcrops, such as those that occur on the plains south of the ranges, are not represented in other Kimberley reserves or proposed reserves. Although the biology of their ecosystems is virtually unknown, scientist Marianne Sawle reported in 1988 that a distinctive small vertebrate fauna, including the stripe-faced dunnart, long-tailed planigale, Forrest's mouse and a blind snake *Ramphotyphlops unguirostris*, characterised plains closer to the ranges. Sawle also recorded the little-known rock ringtail (*Pseudocheirus dahli*) from scree slopes in the King Leopold Ranges during the 1988 studies. The red goshawk, a declared threatened species, has also been recorded on the station.

FUTURE PLANS

When the State Government purchased the Mount Hart pastoral lease, it emphasised that the boundaries of a national park in the King Leopold Ranges would be defined following investigations and consultation with pastoral and mining interests. Discussions regarding its future management would also be held with local Aboriginal communities.

The addition of the area into the conservation estate will enable its unique ecosystems to remain intact and give scientists more time to explore and learn about its biota. Its addition also represents the State Government's long-term commitment to represent fully the north-west Kimberley's diversity in our national park and nature reserve system, thereby protecting the King Leopold Ranges for future generations to admire, study and enjoy. □

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Typical rugged Kimberley landscape in the area of Bell Gorge near the old Silent Grove Homestead.
Photo - Neil Wehlack, Lochman Transparencies



LANDSCOPE

VOLUME SEVEN NO. 3 AUTUMN ISSUE 1992



Each year more people seek wilderness experiences, but many are unprepared for the difficulties they might encounter. Learn about the basics of outback safety and bushcraft on page 35.



Botanists search for a eucalypt last seen by Giles in his expedition across WA deserts 115 years ago. See page 28.



Will the honey possum become a secondary victim of dieback disease? See page 22.



Australia is a land of lizards - tough competitors evolving amid spinifex and wildfires in the Great Victoria Desert. Turn to page 10.



Straight and vigorous pines don't grow by accident. Years of research and breeding have gone into producing the perfect pine. See page 49.

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COVER

The tiny honey possum (*Tarsipes rostratus*), seen in our cover illustration by Philippa Nikulinsky, feeds almost exclusively on nectar and pollen. However, most of its important food plants are threatened by dieback disease caused by the *Phytophthora* fungi. The endangered scarlet banksia (*Banksia coccinea*) is one plant species used by the possums that is highly susceptible to the dieback disease. See story on page 22.



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