

A photograph of a person standing in a desert landscape. The person is wearing a dark jacket and shorts, and is looking towards the camera. In the foreground, there is a small pool of water that reflects the person and the sky. The background shows a vast, open desert with scattered trees and a cloudy sky. The title 'Desert Springs' is written vertically in large white letters on the right side of the image.

Desert Springs

An
Exceptional
Season in
the Great
Victoria
Desert

More than three
quarters of the
Australian
continent is desert,
yet remarkably little
is known about the
wildlife and flora of
the arid zone.

At the end of an
exceptionally wet year,
a *LANDSCOPE*
Expedition set out to
survey part of the
Great Victoria Desert
and found it to contain
an extraordinary
variety of life.

by
Kate Hooper and
David Pearson
Photos by Tom Keating

It is more than 150 years since white explorers first ventured into the arid interior of Australia in search of potential farmland, minerals and the fabled inland sea. The early expeditions went some way towards demystifying 'the great unknown'. They found routes through the wilderness, collected information on plants, animals and rocks, and made observations on the Aborigines they encountered. Yet the sheer size of the arid zone, and its inhospitability, mean that even now there is much to be discovered. Some plants and animals have only ever been collected once or twice. There are probably many still unknown to science.

The Department of Conservation and Land Management (CALM) is responsible for more than six million hectares of nature conservation land in the arid zone of Western Australia. To manage this estate effectively, CALM needs a better understanding of its ecology. One such arid zone nature reserve is Queen Victoria Spring, which has been little-studied because of the costly nature of field work in remote areas. However, in October 1995, the support of a group of paying volunteers enabled a *LANDSCOPE* research expedition to visit this fascinating reserve.

SCARCELY A DESERT

Queen Victoria Spring Nature Reserve lies 250 kilometres east of Kalgoorlie, where the eucalypt



woodlands of the Goldfields meet the spinifex sandplains and dunefields of the Great Victoria Desert. Because of this juxtaposition, the area contains a rich mixture of temperate and arid zone flora and fauna.

One of the State's most striking orchids, the freckled sun orchid (*Thelymitra sargentii*), can be found here, often in areas burnt by recent wildfires. The legless lizard *Delma fraseri*, an inhabitant of south-western mallee lands, reaches its eastern limit here, as do several other reptile species. The western pygmy possum (*Cercartetus concinnus*), an inhabitant of heathland and banksia woodland in the south-west, survives in shrubby spinifex country on the desert fringes, feeding on insects and on nectar from desert flowers such as the swordfish banksia (*Banksia elderiana*).

The *LANDSCOPE* expedition established its first base camp under spreading marble gums (*Eucalyptus gongylocarpa*) at Queen Victoria Spring. The 'spring' is actually a small claypan, which received its somewhat fanciful

name when the explorer Ernest Giles and his party arrived there in 1875 to find it full of water. Giles's thoughts about the place were no doubt coloured by feelings of relief, having travelled for 16 waterless days through 'probably the worst desert in the world'. However, other early explorers were also impressed by the spring. In 1891, the desperate Elder Scientific Exploring Expedition struggled to Queen Victoria Spring across 600 kilometres of dune country, only to find it dry. Despite their disappointment, the expedition's naturalist Richard Helms commented:

'Although extremely arid this tract of country is scarcely a desert. It is covered more or less with arborescent or scrubby vegetation and, although objectionable spinifex appears nearly everywhere, ...in places where fire has destroyed it, many interesting and handsomely flowering plants occur'.

Even to modern-day expeditioners, arriving there in four-wheel-drive vehicles after many hours on bumpy tracks, the landscape appeared surprisingly rich. The spring is surrounded by Rottneest Island

Previous page

Expeditioners collecting plants at Bursaria Rockhole, west of Ponton Creek.

Below: Queen Victoria Spring (actually a claypan), unusually full as a result of cyclonic rains in February 1995.





Andrew Williams capturing 'blues' on top of Streich Mound.



Daphne Edinger and Gilbert Marsh adding more plant specimens to the collection.



David Pearson checking the reproductive status of a small mammal, watched by Nixie Angeloni.

pinus (*Callitris preissii*) and wattles (*Acacia burkittii* and *A. ramulosa*), which sheltered flocks of garrulous white-browed babblers and white-fronted honeyeaters. Budgerigars and cockatiels flashed down to the water to drink, and bronzewings and galahs could be seen sidling cautiously around the edge. A pair of Major Mitchell cockatoos, a species considered rare in Western Australia, was observed one morning perched above the spring. The sandplains stretching away from the spring are covered with spinifex and low shrubs such as *Verticordia helmsii*, which was in full frothy flower, and dotted with tall *Xanthorrhoea thorntonii* grass-trees. Encouraged by recent rains, pink parakeelyas (*Calandrinia polyandra*), yellow goodenias and daisies carpeted the sand.

TRAPPING AND COLLECTING

In the past century, many biologists have visited the area around the spring, but the remainder of the reserve has been rarely studied and little is known of its ecology. The aim of the *LANDSCOPE* Expedition was to fill in gaps in this knowledge by sampling a variety of habitats for mammals, reptiles, birds, some invertebrates and plants.

The first task was to dig lines of pitfall traps in the sandplain and dune country around the spring. The traps consist of plastic buckets buried at intervals in the sand, linked by low flywire fences. Small mammals and reptiles encountering the fences tend to run along them and, hopefully, fall into a pit, from where they

can be collected. After some basic instruction, the team of willing volunteers set to with spades, and several grids of pitfall traps were established among the 'objectionable spinifex'.

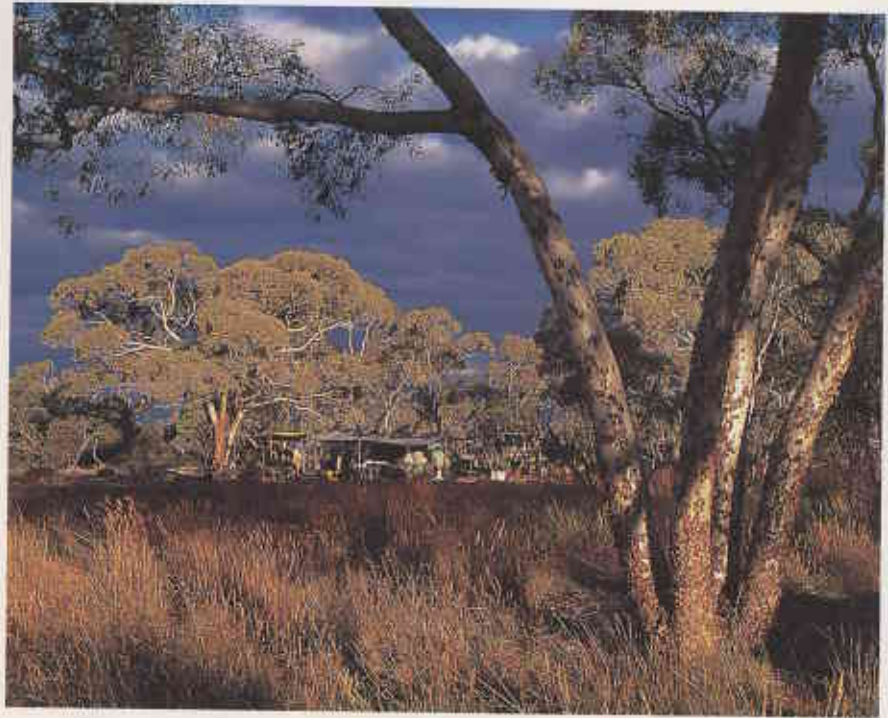
Lines of Elliott traps (a small metal box with a spring-loaded trapdoor) were also set in mallee shrubland and spinifex, in the hope of capturing the elusive sandhill dunnart (*Sminthopsis psammophila*). For 75 years, this small insectivorous marsupial was known only from a single individual, captured in 1894 near Ayers Rock [Uluru] by members of the Horn Scientific Expedition. Then, in 1969, a bulldozer driver clearing mallee on the Eyre Peninsula in South Australia caught one as it fled burning spinifex. Since then, a few individuals have been captured in the Great Victoria Desert, but little is known of the ecology of these mysterious animals. Another small mammal, the mulgara (*Dasyercus cristicauda*), has been collected only once in this part of the desert.

The traps were checked early each morning, when nocturnal mammals and reptiles such as geckoes and legless lizards would be found, and in the late afternoon for daytime-active reptiles. Any particularly interesting or unusual animals were placed in calico bags and brought back to camp for more detailed inspection and identification. Morning tea became a time for analysing the captures: counting lizards' toes and inspecting the dentition of mice (to

distinguish native species from the introduced house mouse).

Seven species of small mammal were captured, many of which were breeding. Alert hairy-footed dunnarts (*Sminthopsis hirtipes*), distinguished by their rich orange fur and the fine bristles that cover the soles of their feet, were caught at the trapping sites in the dunefields. One female had six hairless young in its pouch, each the size of a peanut. Empty egg cartons were placed in the traps to provide shelter, and some were occupied by minute grey-brown balls of fur: western pygmy possums that had settled down for a sleep. Wongai ningauis (*Ningauiridei*), with hairless pouch young, were also captured. These small marsupials have a disproportionately fearsome temperament, which allows them to subdue insect prey as big as themselves. The good season, with abundant grass seed, meant that large numbers of tarrkawarras (spinifex hopping mice) and mingkiris (sandy inland mice) were also captured. Sadly, no sandhill dunnarts or mulgaras were found. However, because the good season has led to increased numbers of small mammals, this year's *LANDSCOPE* Expedition to Queen Victoria Spring may be more lucky.

More than 45 species of reptiles had been found in the reserve previously; the expedition recorded almost half this number. Smooth knob-tailed geckos (*Nephrurus laevis*) were common at all the pitfall-trapping sites, and were active



even on cool evenings. A great variety of skinks were found, including several species of *Ctenotus* with different patterns of stripes or spots. *Ctenotus* are very diverse in the arid zone, and six or seven species may coexist in one area. Several legless lizards (*Delma* spp. and *Lialis burtonis*) were collected. They can be distinguished from small snakes by their ear-openings and a more pointed head-shape, although in the depths of a pit trap it's sometimes hard to be sure. Several large dragon lizards and thorny devils (*Moloch horridus*) were caught by hand among the spinifex. One female western bearded dragon (*Pogona minor*) was a particularly easy catch because she was so heavily laden with eggs. Once their vital statistics had been recorded, the animals were released at their site of capture, usually to beat a hasty retreat into the spinifex.

Meanwhile, Daphne Edinger, the expedition's botanist, scoured the area with the help of enthusiastic volunteers. There had been very little botanical collecting in the reserve previously, so every day brought something of interest. Several rare plant species were particularly sought. A prize was offered for the first person to find the rare lily *Caesia rigidifolia*, known only from a single collection at Queen Victoria Spring in 1875. This was no easy task, as the only guide was an enigmatic description and a black and white photograph of the somewhat tatty herbarium specimen.

On the fifth day came the high point of the expedition: a walk to the top of Streich

Above left: Many birds were raising young, like this common bronzewing chick.

Above: The campsite near Ponton Creek, shaded by marble gums.

Mound. The walk retraced the steps of David Lindsay, leader of the Elder Exploring Expedition. He climbed this 'conspicuous white sandhill' in September 1891 while in search of Queen Victoria Spring, and named it for Victor Streich, the expedition's geologist. The *LANDSCOPE* party fanned out across the rolling dunes, heading towards the mound. A button-quail burst up from its flimsy nest among the spinifex, and masked woodswallows careered overhead, swooping more insistently as their nests were neared. From the top, the green and gold of the shrubby sandhills stretched away into the distance,

punctuated with silvery marble gums. Brief patches of sunshine brought butterflies circling to the summit, where Andrew Williams, the expedition's butterfly enthusiast, and helpers brandished nets. They scooped up cyprotus blues and simplex dusky blues, which were not captured anywhere else in the reserve.

The walk yielded several important finds. The rare Victoria Desert smokebush (*Conospermum toddii*) was discovered in

A smooth knob-tailed gecko amid *Gnephosis angianthoides* at Queen Victoria Spring.



full flower on the dune crests. Two priority-listed species, the rush *Lepidobolus deserti* and the red-flowered *Grevillea secunda*, were also collected. The smokebush and the grevillea have been collected only in the Queen Victoria Spring area.

PONTON CREEK

The next day, the whole party moved north-west to a new campsite on the sandplains near Ponton Creek. On the way, a malleefowl mound was spotted beside the track. These extraordinary mounds of soil, leaves and bark are used by malleefowl to incubate their eggs, often being re-used repeatedly over the years. This one was not in use, though fragments of eggshell were scattered around it. Malleefowl have declined in numbers in the desert and are very rare in the area. Only one 'active' mound has been found in the reserve in recent years, and footprints have rarely been seen.

Ponton Creek, normally a river of sand, was flowing for the first time in 20 years following cyclonic rains in February 1995. The ephemeral lakes and billabongs along the creek provided some unique bird-watching opportunities for Andy Chapman, CALM's regional ecologist for the Goldfields and co-leader of the expedition. Few waterbirds had ever been recorded in the reserve and 11 species were observed, many taking advantage of the extraordinary conditions to breed. Black-fronted dotterels, with their waistcoat-like chest markings, ran across the mud in short bursts. A pair of black swans, followed by a flotilla of cygnets, glided across the open water, while grey teal and pink-eared ducks dabbled in the shallows with their young. Flocks of parrots were sighted, including a few princess and scarlet-chested parrots, taking advantage of the rare abundance of water and seeding plants.

The weather was cool and damp for the last few days of the expedition; perfect for digging pitfall traps, but disappointing for any avid butterfly collector. However, Andrew Williams discovered some breeding *Jalmenus* lycaenid butterflies (collectively known as 'blues' because most species are coloured blue or purple) near the camp. These butterflies have an extraordinary relationship with *Iridomyrmex* ants, which protect the larvae from other predators. The butterfly larvae secrete a sugary substance, in return for which they are protected by



the ants until they metamorphose into butterflies. However, one unfortunate emerging butterfly, which perhaps had failed to pay its rent, was found being consumed alive by the ants.

Another grid of pitfall traps yielded more small mammal and reptile data, and one particularly exciting find: a tiny slim skink with a striking orange head, was identified as the rare *Proablepharus reginae*. This diminutive lizard is sparsely distributed in central desert regions and had been found only twice before in the reserve, more than 30 years previously.

THE FRAGILE DESERT

The information gathered on this expedition will be invaluable in the future management of Queen Victoria Spring Nature Reserve. In particular, as Ponton Creek is highly prospective for a range of minerals, it will be important in the development of protocols for any mineral exploration in the area.

There is a popular perception that because desert regions are largely undeveloped and rarely visited, they will remain in a pristine state. But arid zone communities are under threat. One third of Australia's arid zone mammals have already become extinct because of predation by cats and foxes and competition from introduced herbivores. In addition, in places where the country has not been burnt for many years, there is the danger of large wildfires. Smaller reserves are especially vulnerable. Sadly, tourism can also pose a threat, as

Gimlet woodland at a breakaway west of Ponton Creek.

increasing interest in Australia's wilderness areas also means increased pressure on fragile environments. Therefore, careful management is needed to protect these special places, but with more information about their ecology, it will be easier to monitor changes and manage them for conservation.

This group of *LANDSCOPE* Expeditioners may have scrubbed the red dirt out of their fingernails, but their efforts will help ensure that future generations can continue to discover the extraordinary richness of Western Australia's arid wilderness.

Kate Hooper has been a regular a contributing editor to *LANDSCOPE* and accompanied the 1995 *LANDSCOPE* Expedition to Queen Victoria Spring Nature Reserve. She now lives in the UK.

David Pearson was co-leader of the expedition. He is a CALM senior research scientist with particular interests in small mammals, reptiles and desert flora. He can be contacted on (09) 405 5100.

A second *LANDSCOPE* Expedition in April of this year will gather more data on the area. For details of the *LANDSCOPE* Expeditions program for 1996, contact UWA Extension on (09) 380 2433.

LANDSCOPE

VOLUME ELEVEN NO. 3 AUTUMN ISSUE 1996



Thanks largely to CALM's fox-control programs, the recovery of the woylie has been so swift that the species has now been taken off the threatened fauna list (see page 10).



This killer whale, photographed at Ningaloo, is one of 36 marine mammals living off the WA coastline. Read about them on page 16.



LANDSCOPE Expeditioners made some interesting discoveries during last year's expedition to Queen Victoria Spring. Read all about them on page 23.



Spring flowers thrive on a moss carpet—one of the range of attractions on offer in the Porongurup National Park (see page 28).



The rose mallee is just one species benefiting from action by recovery teams working together for conservation (see page 36).

FEATURES

IT'S BACK: THE RETURN OF THE WOYLIE
TONY START, JACKIE COURTENAY & KEITH MORRIS 10

WHALES AND DOLPHINS OF WESTERN AUSTRALIA
CAROLYN THOMSON & DOUG COUGHRAN 16

DESERT SPRING
KATE HOOPER & DAVID PEARSON 23

PORONGURUP NATIONAL PARK
IAN HERFORD & ANN BURCHELL 28

WORKING TOGETHER
JOHN BLYTH, ANDREW BURBIDGE, ANDREW BROWN & KATE HOOPER 36

A SEASONED PERFORMANCE
TERRY JONES 43

BROOME AND BEYOND
KEVIN KENNEALLY 48

REGULARS

IN PERSPECTIVE 4

BUSH TELEGRAPH 6

ENDANGERED TUMULUS SPRINGS 47

URBAN ANTICS 54

COVER

A new book, Broome and Beyond, takes an in-depth look at the plants, such as this *Pittosporum molluccanum*, people and cultures of the Dampier Peninsula, in Western Australia's Kimberley Region. The story on page 48 takes a brief glimpse into this exciting new book.

Illustration by Philippa Nikulinsky



Managing Editor: Ron Kawallak
Editor: David Gough
Contributing Editors: Mandy Clews, Verna Costello, Debra Mayrhofer, Penny Walsh
Scientific/technical advice: Andrew Burbidge, Paul Jones, Tony Start and staff of CALM's Science & Information Division
Design and production: Maria Duthie, Sue Marais
Finished art: Gooitzen van der Meer
Illustration: Gooitzen van der Meer
Cartography: Promaco Geodraft
Marketing: Estelle de San Miguel ☎ (09) 334 0296 Fax: 334 0489
Subscription enquiries: ☎ (09) 334 0481
Colour Separation by Prepress Services
Printed in Western Australia by Lamb Print
© ISSN 0815-4465. All material copyright. No part of the contents of the publication may be reproduced without the consent of the publishers.

Published by Dr S Shea, Executive Director
Department of Conservation and Land Management,
50 Hayman Road, Como, Western Australia 6152.