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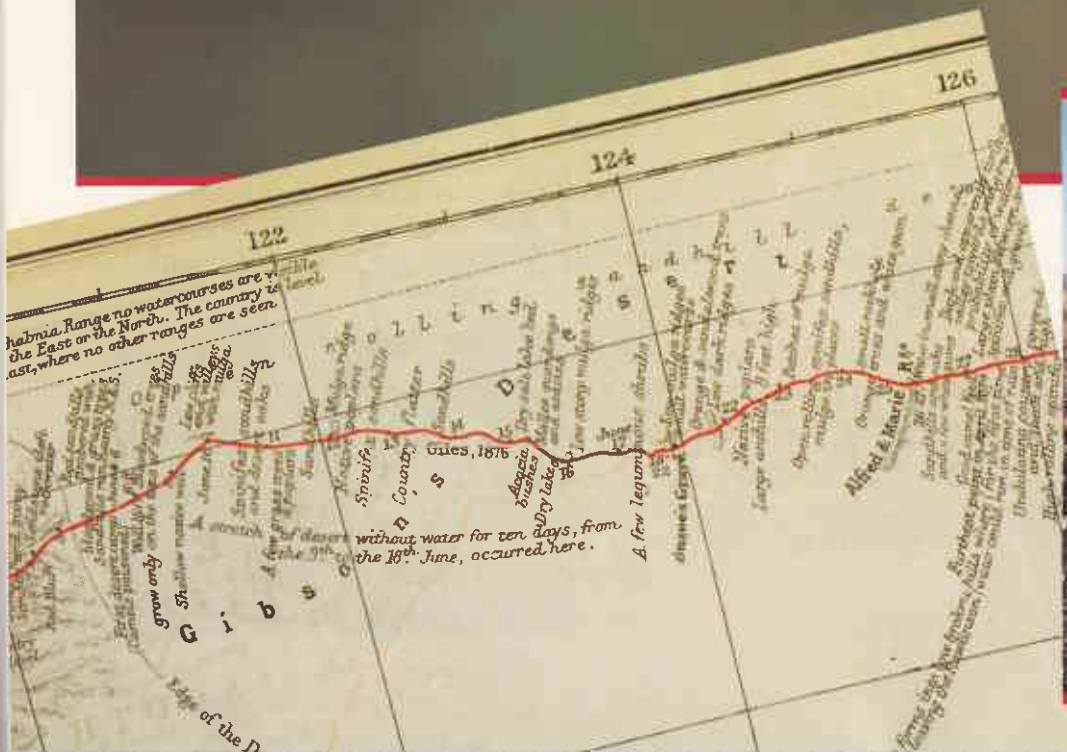

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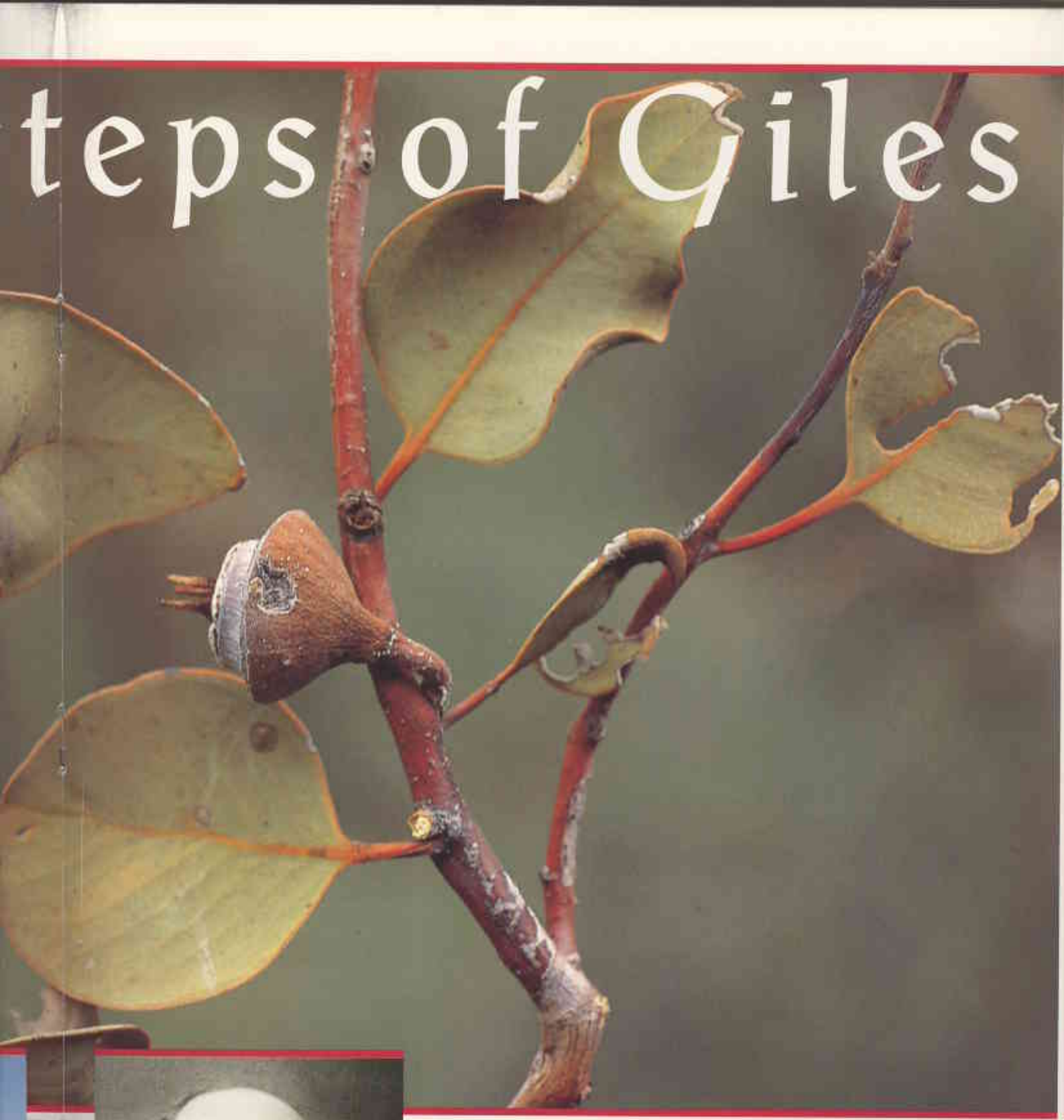
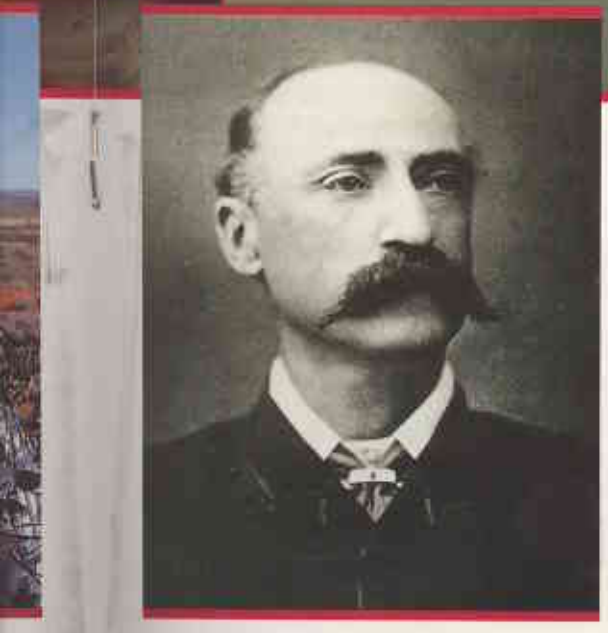


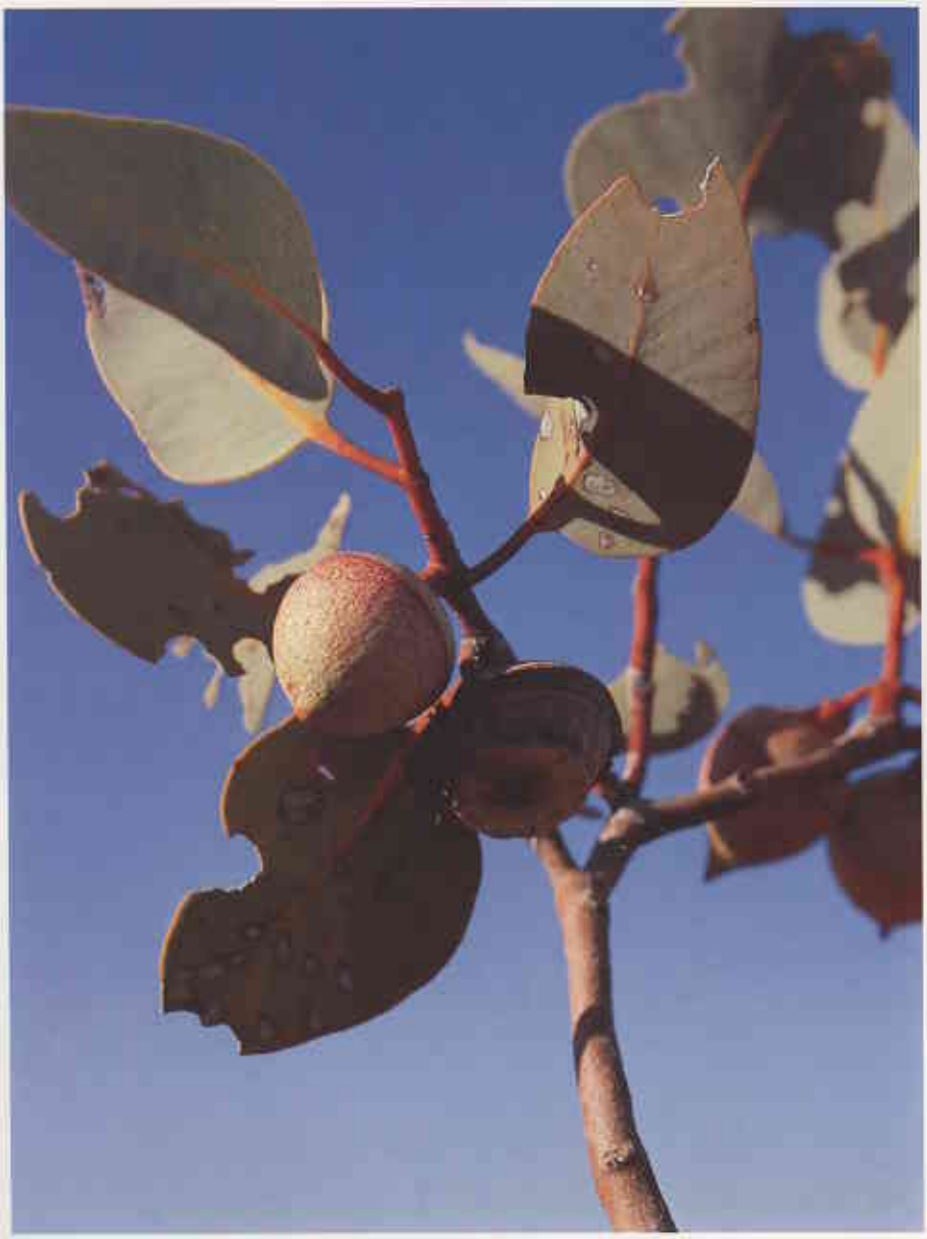


by Steve Hopper

For 115 years, Giles' mallee (Eucalyptus rameliana) was known only from a few leaves, flowers and a bud collected by the explorer Ernest Giles on his final expedition across the Western Australian deserts in 1876. It was the only one of about 800 eucalypts presumed to be extinct. Steve Hopper describes the search for the elusive species.

The original specimens of Giles' mallee (*Eucalyptus rameliana*) were handed to Victoria's government botanist Baron F. von Mueller, who immediately recognised the species as new to science. The specimens are still in the National Herbarium in Melbourne. Mueller recorded the collection locality as 'beyond the Alfred and Marie Range'. These small hills are 180 km north-north-west of Warburton, and 300 km west of the WA-Northern Territory border.

Ernest Giles named the Alfred and Marie Range on his third expedition in 1874, approaching from the east, but had to turn back with the ill-fated Gibson before reaching the Range. (Gibson, dehydrated and fatigued, became lost while riding Giles' horse back to camp, and perished without trace - Giles named the Gibson Desert after him.) Giles and company passed the northern end of the Alfred and Marie Range on his fifth expedition, two years later. His travels are documented in the two-volume work *Australia Twice Traversed*, published in 1889.



Although he diligently recorded landscape and vegetation, Giles made no reference to the handsome-flowered and large-leaved mallee, either when he was near the Alfred and Marie Range or elsewhere on the 1876 expedition. This contributed to much of the intrigue and frustration of many subsequent searches for the elusive mallee.

THE SEARCH BEGINS

Specimens of Giles' mallee have sat in relative obscurity in the National Herbarium. But interest in the mallee increased dramatically over the last decade, and several fruitless expeditions to the Alfred and Marie Range area were mounted in search of the tree. The Range, in the Gibson Desert Nature Reserve, lacks any clearly defined tracks. The Gary Highway lies 80 km to the west, and a track to the Clutterbuck Hills is 40 km to the east. In 1983 Andrew Burbidge, Phil Fuller, Ron Sokolowski and I, then staff of the former Department of Fisheries and Wildlife, explored the Clutterbuck Hills area, and travelled along seismic survey tracks to Lake Gruszka, 50 km from the Alfred and Marie Range. No Giles' mallee was seen.

Eucalypt enthusiast Peter Grayling began searching for Giles' mallee in November 1985. With local guides from Warburton, he went north of Lake Gruszka along a seismic line to its termination about 40 km from the northern end of the Alfred and Marie Range. He, like us, viewed the range in

Previous page:
Nick Foote's specimen of Giles' mallee (*E. rameliana*), the first collection made since that of Giles in 1876.
Photo - Steve Hopper

Part of the map from Giles' book *Austalia Twice Traversed* showing the route of his fifth and final desert expedition in 1876.

Nick Foote among Giles' mallees in August 1991.
Photo - Steve Hopper

Ernest Giles (1835 - 1897)

This page:
Giles' mallee differs from all other desert eucalypts in its solitary buds and fruits, its smooth bud caps, and its broad leaves. These are the first flower buds collected since 1876.
Photo - Steve Hopper

the distance, but had to turn back without the rare mallee.

Early in 1988, horticulturist Susie Bright spent some time in the area with an eye open for Giles' mallee, but to no avail. In July 1988, Andrew Chapman, Mike Tagliaferri and David Pearson of the Department of Conservation and Land Management (CALM) drove cross-country from the Clutterbuck Hills to the Alfred and Marie Range. They spent four days exploring its entire length, without finding the eucalypt.

A young eucalypt enthusiast, Dean Nicolle, and his family, also made expeditions to the Alfred and Marie Range. They travelled across trackless country from the Gunbarrel Highway North to the western side and then to the north end of the Alfred and Marie Range in 1990. Giles' mallee was again elusive, but the family became enthusiastic about a more enterprising venture.

In April 1991, the party, which now included eucalypt botanist Ian Brooker, of the CSIRO, and seed collector David Kleinig, followed the Nicolles' old wheeltracks to the north end of the Range. The next morning Bob and Dean Nicolle began a four-day 80 km walk westwards from the north end of the Range along Giles' 1876 path. Brooker and Kleinig spent a day exploring the northern end of the Range, seeing only a single eucalypt tree (appropriately, a ghost gum) before leaving empty-handed the next morning.

Bob and Dean Nicolle, however, found two smooth-fruited plants in a population of Kingsmill's eucalypt (*E. kingsmillii*) about 30 km east of the Gary Highway, and believed that at last they'd found Giles' mallee. They also found another mallee with smooth fruits and long, sharply pointed buds on slender stalks that didn't match anything previously recorded. Subsequent examinations revealed these were probably the first collections ever made of a rare hybrid of Kingsmill's eucalypt and *E. leptopoda* (the plant with sharply pointed buds) and of a poorly known Gibson Desert relative of *E. oxymitra* or Oldfield's mallee (*E. oldfieldii*).

After returning to Adelaide and sending specimens to Ian Brooker, a third expedition was mounted immediately. They drove to the Gary Highway pick-up point, and then across

The spectacular flowers of the Rose Mallee *(E. rhodantha)*, with a Yellow-throated miner probing for nectar upside down. The Rose Mallee may be the closest relative of Giles' mallee.
Photo - Babs and Bert Wells

trackless terrain east to the interesting mallees. Thousands of Kingsmill's eucalypt were seen during the search, but no plants matching Giles' single-flowered specimen were found. So exhaustive searches in this remote part of the Gibson Desert had still not located a population of Giles' elusive mallee.

As a stimulus to further exploration, on 17 May 1991 the species was officially listed on Western Australia's Schedule of Declared Rare Flora. It joined 52 other species under Item 2 of the Schedule, the inaugural listing of 'taxa presumed to be extinct'.

REDISCOVERED AT LAST?

In July 1991, three months after Dean Nicolle's collection, Nick Foote and family were searching trackless country for a well on the old rabbit-proof fenceline 100 km south-east of Newman. Foote, an intrepid prospector, wildflower picker, artisan and keen natural historian, was interested in establishing a lease over vacant Crown land in this remote part of the Little Sandy Desert. He drove over a sand dune and '...bang, there it was. It had a bluey-red look and broad leaves, a bit like seedlings of caesia (*Eucalyptus caesia*), and was growing in spinifex and low heath dune country with grass trees, a bit like Badgingarra'.

The 1-2 m high mallees looked like nothing else they had seen in the area. Nick knows his eucalypts fairly well. He noted the large solitary fruits of this mystery mallee, a feature he'd seen elsewhere only in the rose mallee (*E. rhodantha*) and mottlecah (*E. macrocarpa*) of the Wheatbelt a thousand kilometres away. He was aware that Giles had travelled near the site of the mystery mallee in June 1876. Could this be Giles' mallee?

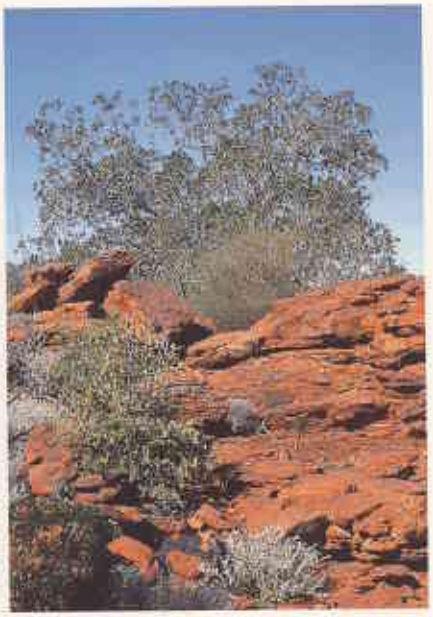
On July 15 I was working in my lab at CALM's Wildlife Research Centre when I received a broken radio telephone message via the Royal Flying Doctor Service at Meekatharra. It was Nick Foote, who excitedly recounted his discovery, and answered detailed interrogation about the mallee he'd found. Only fruits were present, not buds or flowers (Giles' specimen lacks fruits). Most of the fruits were solitary, but a few were in pairs and one plant had them in threes. The leaves were broader than those of Kingsmill's eucalypt, and the bark was smooth, not rough at the base like that tree. After a year of unrewarded searches near the Alfred and Marie Range, I was keen to establish that this was not another false alarm.

From Nick's description, knowing his expertise in finding rare and unusual wildflowers, I became increasingly confident that Giles' mallee had at last turned up. But his collection site was 500 km beyond the Alfred and Marie Range!

Nick arranged to have a few specimens sent to me via the bus service from Newman to Perth. They fitted his description perfectly - Giles' mallee at last. But without mature buds and flowers, I could not match specimens exactly with that of Giles'. I extracted seed from the fruits and saw that they were large (3-4 mm long) with a prominent basal wing, a type seen only in the large colourful flowered group of Western Australian mallees such as mottlecah, rose mallee, large-fruited mallee (*E. youngiana*) and Dowerin rose (*E. pyriformis*). The solitary fruits and broad leaves suggested a close affinity between the mystery mallee and a rare form of rose mallee (*E. rhodantha* var. *petiolaris*). Even if Nick's discovery was not Giles' mallee, it was still a remarkable find, establishing a hitherto poorly documented link between the flora of the Wheatbelt and that of the Little Sandy Desert.

I decided to mount an expedition to see the mallees myself and search for more. Giles' journal was read repeatedly to attempt to map his course through the Little Sandy Desert. He frequently determined the latitude and longitude of his campsites, but the lack of a reliable chronometer meant that only his latitude readings were likely to be accurate. These readings, combined with interpolating his landform descriptions on modern topographic maps, provided some idea of where his expedition travelled. Perhaps the distribution of Giles' mallee might help determine their route more accurately?

***Grevillea wickhamii*, a spectacular shrub seen by the CALM survey party in the Little Sandy Desert.**
Photo - Steve Hopper



A rock fig tops a red stone outcrop in the Little Sandy Desert. Such rocky ridges sometimes contain pools of water vital to desert life.
Photo - Steve Hopper

Giles wrote of his final push across the Western Australian desert: "...the country was almost destitute of timber, except that upon the tops of the parallel lines of red sandhills, a few stunted specimens of the eucalypt known as blood-wood existed..."
Photo - Jiri Lochman

CONCLUSIVE PROOF

CALM Technical Officer Andrew Brown and consultant botanist Leigh Sage accompanied me. We met CALM Karratha research staff Steve van Leeuwen and Bob Bromilow at Collier Range National Park on August 7. The next day, Nick Foote joined us, and we followed his trail into the Little Sandy Desert.

It is difficult to describe the sense of excitement and history that pervaded our first view of the mallee. Extensive vistas of spinifex plains, dunes and red gravelly ridges extended in all directions, with scattered grey-green shrubs and mallees dotted here and there. Stunted bloodwood trees stood on the dune crests and slopes, pale yellow against the red sand, their leaves few and pendulous. As we neared the site of Nick's discovery, an unusual shrub with darker foliage caught my eye.

Not only was the stunted mallee unusual (most of the 50 or so plants were 1-1.5 m tall), but it was associated with a mix of common desert plants (wattles, spinifex, grevilleas, cassias) and genera more common in the south-west (such as *Lamarchea*, a peculiar one-sided bottlebrush with one species here in the desert and the other confined to the Shark Bay region; grasstrees and an early Nancy lily).

Moving on, more and more plants not previously recorded in the Little Sandy Desert were seen. Of special interest was a new species of one-sided bottlebrush (*Calothamnus*). This genus was previously thought to be confined largely to south-western Australia - the nearest known representative is found some 600 km away, at the foot of Exmouth Gulf. The Foote's track was a

Gompholobium polyzyga, a soft shrub found growing on the slopes of red sand dunes with Giles' mallee.
Photo - Steve Hopper

Members of the CALM survey party and Nick Foote located Giles' mallee on the crest of a high dune in the Little Sandy Desert.
Photo - S.D.Hopper

botanical windfall in more ways than one!

We followed the track as far as it went, encountering the two other mallee populations found by the Foote family, and finding two more. Despite examining several hundred plants, not a single bud nor flower was seen. Life was clearly harsh on the subdued dunes favoured by the mallee, where summer temperatures often exceed 45°C. Even new vegetative shoots were scarce.

Believing we were within 10 km of the well on the old rabbit-proof fenceline, the party pushed on through trackless terrain in the darkness, until a large sand dune halted progress. The next morning, we drove round the southern end of the dune and within a few kilometres came across a clay pan and well with tall sheoaks, but found no sign of the rabbit-proof fence.

After retracing our path, we took a final look at the biggest population of Nick's mallee. Shortly before we were due to leave, an excited shout rose from the top of a distant dune. The party converged rapidly on the spot. Nick was standing beside a single flower, resplendent with pastel pink stamens. The plant had about 100 mature buds on it, and this was the first to open. It was Giles' mallee without question. The buds and flower were an excellent match with those collected by Giles 115 years ago. This great desert mystery was solved at last!

FOLLOW-UP

In response to media coverage of Nick Foote's rediscovery of Giles' mallee, I received a telephone call from Denis O'Meara, Manager of the Marble Bar nursery firm Outback Trees of Australia. He advised seeing plants very similar to the published photos of the mallee a decade ago, but to the north of Nick Foote's populations. He was not aware of their possible identity, and thought nothing more of them.

By striking coincidence, Denis was Leigh Sage's uncle. Leigh's enthusiastic recounting of our expedition led Denis to plan a trip retracing one of his previous trips. He and Leigh found two small populations of Giles' mallee, and managed to clarify where the rabbit-proof fence was in relation to the well and clay pan encountered on our earlier survey. These observations show that a population of the tree on or close to Giles' probable path has yet to be located.

Subsequently, Nick Foote and family have pushed beyond the rabbit-proof fence into the heart of the Little Sandy Desert, and found another population of Giles' mallee. This population is closer to Giles' path. In autumn 1992, a second major expedition of CALM staff will seek Giles' original collection locality, and follow up other leads generated by Nick Foote and Denis O'Meara. Giles' footsteps will no doubt be the source of interest and intrigue for intrepid modern-day bushmen for many years to come. ◻

Giles' mallee bud, and the only flower collected since those by Giles. This flower measured five centimetres across with pink stamens two centimetres long.
Photo - Andrew Brown

Steve Hopper is a Senior Principal Research Scientist at CALM's Wildlife Research in Woodvale. He can be contacted on (09) 405 5100.

GILES' MALLEE
(*Eucalyptus rameliana*)

When describing *E. rameliana* in 1876, Baron F. von Mueller pointed out its difference from all other desert eucalypts in its large smooth solitary buds on long stalks. The reproductive structures lack the prominent ribs on related desert species such as *E. kingsmilli* and *E. pachyphylla*, both of which have their buds and fruits in threes, unlike the single-flowered *E. rameliana*. Giles' mallee also has broad thick leaves and a bushy habit, which gives it an unmistakable appearance to the desert traveller, even from a few hundred metres away. Mueller dedicated the new species 'to Prospero Ramel, who introduced Australian eucalypts into southern France and Algeria'. To this day, nothing else has been published on Ramel and he remains as mysterious as his namesake eucalypt was for so long.

The species was first illustrated in Volume 2 of J.H. Maiden's monumental *A Critical Revision of the Genus Eucalyptus* (1914). Maiden was the first botanist to devote most of his career to eucalypts, and founded the National Herbarium in Sydney. He proposed that *E. rameliana* should be merely a variety of the Dowerin rose (*E. pyriformis*), but all subsequent eucalypt botanists have supported Mueller's original view that *E. rameliana* is a species in its own right.

More recently, drawings and descriptions of Giles' specimen appeared in Stan Kelly's *Eucalypts*. Vol 2 (1978), and in George Chippendale's treatments of eucalypts in the *Flora of Central Australia* (1981) and the *Flora of Australia*, Vol. 19 (1988). In addition, *E. rameliana* was featured in Anna Napier, Anne Taylor and Steve Hopper's *Survey of Rare and Poorly Known Eucalypts of Western Australia: Field Guide No. 4 Goldfields Region* (1988), a four-year project funded by the Australian National Parks and Wildlife Service. Most recently, it appeared in CALM's *Western Australia's Endangered Flora* (1990) by Steve Hopper, Stephen van Leeuwen, Andrew Brown and Susan Patrick. These works generated interest in the nation's most elusive eucalypt.

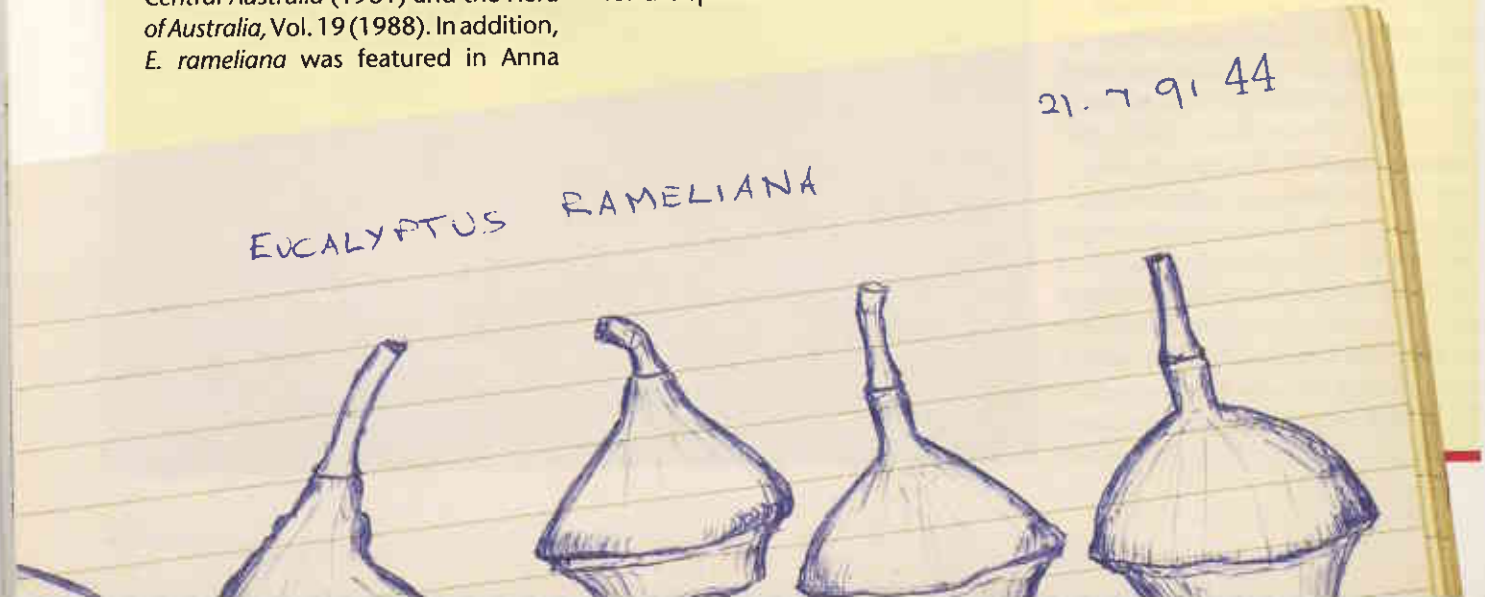
A three-year study by Dr Jane Sampson, begun in 1992, is aimed at establishing the evolutionary relationships of *E. rameliana*, and in documenting its reproductive biology. This will assist the development of a conservation plan for the species.

A flower of *E. rameliana* from Giles' original collection sitting on the label with von Mueller's intriguing inscription '. . . beyond the Alfred and Marie Range'.
Photo - Steve Hopper

A dissected bud, an intact bud and a flower provided conclusive proof that the elusive *E. rameliana* had been rediscovered.
Photo - Steve Hopper

Sketches from the author's notebook of the fruits, seed and leaves of *E. rameliana* collected by Nick Foote from the rediscovery site in July 1991.

CALM has prepared interim management guidelines to help introduce Giles' mallee into horticultural use. While the species remains listed as rare flora, seed or other material from wild plants can be taken only with a Ministerial permit. Before too long, Giles' mallee could become an attractive addition to native plant gardens and landscaped areas in Australia and elsewhere.



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.

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.

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

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

FEATURES

REGULARS

SPECIALS

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* Phytopthora *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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