

Where Have all the Quokkas Gone?

BY ELIZABETH SINCLAIR AND KEITH MORRIS



ONCE PLENTIFUL THROUGHOUT THE COASTAL PLAINS AND HIGH RAINFALL FORESTED AREAS IN THE SOUTH OF WESTERN AUSTRALIA, THE MAINLAND QUOKKA NOW LEADS A SECRETIVE AND LONELY LIFE RESTRICTED TO DENSE REMNANT VEGETATION IN SWAMPS, ALONG CREEKLINES AND IN GULLIES.

The quokka (*Setonix brachyurus*) was one of the first Australian marsupials to be recorded by Europeans. It was described by Dutch navigator Samuel Volkertszoon in 1658, as 'resembling an Asian civet cat, but with browner hair'. Another Dutch navigator, Willem de Vlamingh, described a quokka in 1696 as 'a kind of rat as big as a common cat, whose dung can be found all over the island'; not very flattering! The quokka was finally recognised as a marsupial in 1830 by two French naturalists, Quoy and Gaimard, who collected specimens during d'Urville's expedition to King George Sound in Western Australia in 1826.

Today, quokkas are familiar to most Western Australians because of their abundance on Rottneest Island. However, they were once widespread throughout the coastal plains and high rainfall western side of the forested areas of mainland south-western Australia, from Moore River in the north to Bremer Bay in the south east.

An account by John Gilbert in 1840 makes mention of 'immense numbers being killed in a few hours' by Aboriginal hunting groups. This account referred not only to Gilbert's potoroo, but also to the quokka. Shortridge reported that between 1904 and 1907 the 'quokka was very plentiful among the coastal thickets and swamps in the South-west'.

Bald Island, off WA's south coast, is the only other place where quokka numbers remain high. Both the Rottneest and Bald Island populations are safe from predation by the introduced fox; however, feral cats do present a threat on Rottneest.

There was a drastic decline in the numbers of many small marsupials in WA's south-west in the late 1930s. In fact, quokkas were thought to have become extinct on the mainland. A number of reasons were put forward to explain their apparent disappearance; these included loss of habitat through clearing and bushfires, spread of foxes, feral cats, competition with rabbits, and disease. Although there is no direct evidence of any one factor being responsible, it is clear that in combination they contributed to the species' decline.

Quokkas were rediscovered on the mainland in the late 1950s at an area near Byford, 40 kilometres south-east of Perth. They have now been identified at a few locations in the jarrah forest and on the south coast, but their numbers are apparently very low, especially when compared to those of the early 1900s.

Once frequently seen at dusk along roadsides, in paddocks and along slopes in the Darling Range, today's quokkas lead secretive lives within the protection of dense vegetation in swamps, along creeklines and in gullies. Sometimes the

only signs of their presence are the characteristic runs that dissect the swamp vegetation and their scats. The introduced fox may well be responsible for the quokkas being restricted to these habitats.

A POPULAR HOLIDAY DESTINATION

Rottneest Island is one of the most popular holiday destinations in the State for both locals and tourists. Quokkas are just one of the many attractions that the island has to offer. Thousands of years ago, though, the island was the northern tip of a peninsula, which connected many of the small islands in Cockburn Sound to the mainland. When the sea level rose, approximately 7 000 years ago, a chain of islands from Penguin Island to Rottneest Island was formed. Tammar wallabies were stranded on Garden Island, a little to the south, while quokkas were the only marsupial that survived on Rottneest Island.

Many changes have taken place on Rottneest since its settlement as a penal colony in 1838. Land has been cleared, timber felled and salt mined from the lakes. The island has also suffered three major fires. Quokka numbers fell last century, probably due to massive habitat modification, but since the 1920s their numbers have increased dramatically. Several attempts have been made to determine the size of the population on the island and estimates range from 4 000 to 17 000. Their selective grazing of palatable plants has changed the island's vegetation composition and there is some concern that the present high numbers are not sustainable. Many quokkas lose condition at the end of summer through drought, starvation and vitamin deficiencies.

Quokkas are synonymous with Rottneest: 'one cannot visit the island without encountering these endearing creatures.' They inhabit all parts of the island, but are most readily observed around settlement areas and at the tourist 'quokka stops'. Maintaining a balance



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The quokka persists despite loss of habitat, predation by foxes and feral cats, competition and disease.

Photo - Jiri Lochman

Left: The quokka was initially described as a civet cat in 1658.

Photo - Dennis Sarson/Lochman Transparencies

between recreation and conservation (of the environment and the quokkas) is an important part of the Rottnest Island Authority's management plans.

BALD ISLAND

Bald Island quokkas live a tranquil existence by comparison. Their home is one of many small islands off the Western Australian coast supporting remnant populations of marsupials. The island has had little disturbance from humans and remains in relatively pristine condition. It provides safe nesting grounds for many sea birds including shearwaters, petrels, oystercatchers, Caspian terns and fairy penguins and is now home to the recently introduced noisy scrub-bird. Several species of lizard are readily observable on the island's granite slabs. Quokkas were stranded there by the rising sea level around 10 000 years ago and their numbers on the island remain relatively high.

Following a short visit in November 1994, it was noted that the distribution of quokkas on Bald Island, unlike that of Rottnest, was very patchy. Indeed, some parts of the island showed absolutely no evidence of quokka activity at all. The steep limestone slopes on the eastern part had no ground cover and no trace of quokkas, while the grassy northern peninsula was dissected by a large number of runs. Animals could readily be seen there at dusk, feeding on grasses and succulents. Bald Island quokkas are likely to experience similar seasonal problems to those on Rottnest, including severe dehydration, starvation and vitamin deficiencies over the summer months.

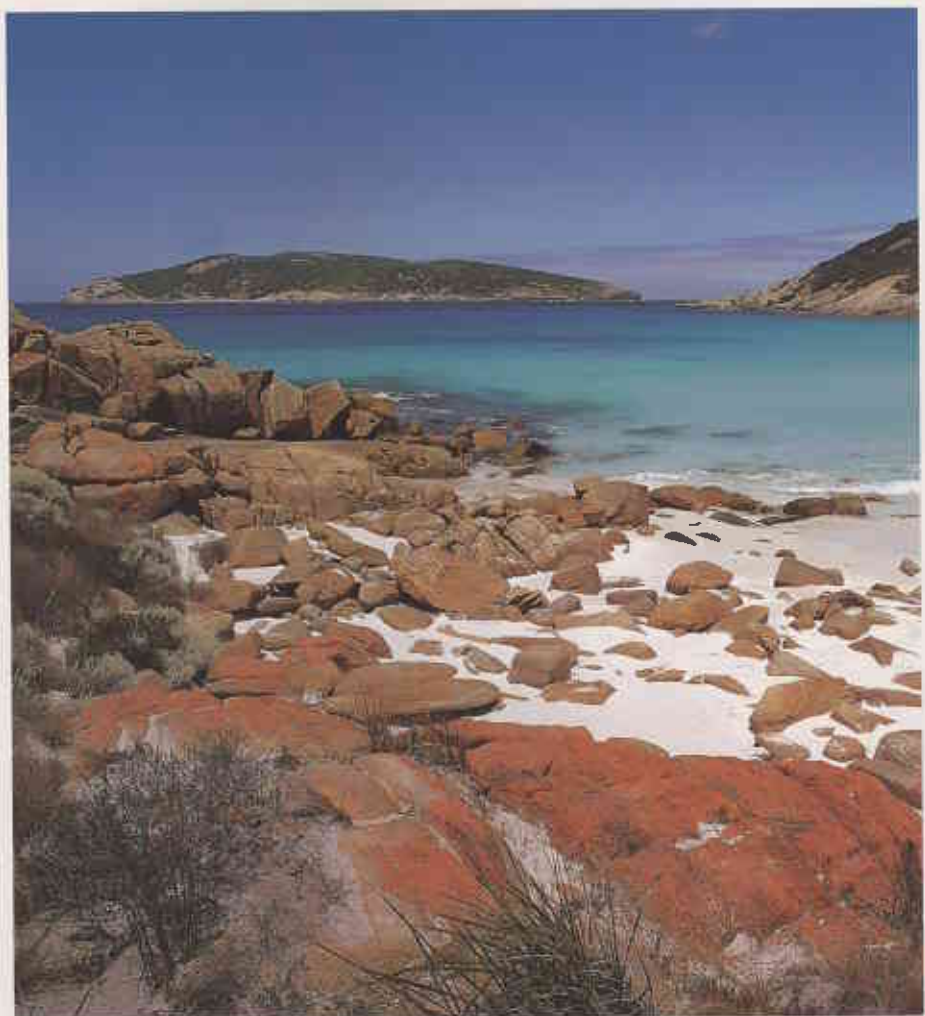
THE MAINLAND SITUATION—ARE THEY THREATENED?

Even until the early 1970s, the then Forests Department and Department of Fisheries and Wildlife surveys indicated that quokkas were reasonably widespread in forest swamps around Dwellingup and Manjimup. More recently, searches for

Above: Map showing the former and current known distribution areas of the quokka.

Right: Bald Island, off the south coast of Western Australia, where quokka numbers remain high.

Photo - Jiri Lochman





remnant mainland quokkas suggest that many of the previously known populations are now extinct. Mainland quokkas are secretive animals, not like their Rottnest relatives. The dense vegetation to which they are restricted makes it very difficult and time-consuming to detect and monitor their populations. Researchers must be guided by the presence of distinctive tunnels and scats among the vegetation.

The damaging effects of feral animals on our native fauna have been known for some time and solutions are not always easy to find (see 'Vandals in a Vulnerable Land', *LANDSCOPE*, Spring 1990). It is possible that the remaining swampy areas provide the last fox and cat-proof refuges for our quokkas. In 1994, the Department of Conservation and Land Management (CALM)—with support from Alcoa—began a program to control foxes over 500 000 hectares of the northern jarrah forest. 'Operation Foxglove' is the first time in Australia that an attempt has been made to control foxes over such a large area in order to benefit threatened species. An extensive monitoring program by CALM scientists has shown that reducing fox numbers makes it easier for medium-sized marsupials (including bandicoots, woylies, numbats and chuditch) to survive and increase their populations. Quokkas are part of this monitoring program and it is anticipated that they will also benefit from Operation Foxglove.

Quokkas are known to persist in low numbers in the creek systems of a few jarrah forests. Trapping suggests that these refuges are rarely home to more than ten individuals. Small populations

Above left: Feeding quokkas has long been a favourite pastime on Rottnest Island.

Photo – Brian Downs/Lochman Transparencies

Above: Balancing the needs of recreation and conservation is a challenge facing the Rottnest Island Authority.

Photo – Eva Boogaard/Lochman Transparencies

Below: Like all marsupials, quokkas are born in an immature state and develop in a pouch.

Photo – Babs & Bert Wells/CALM

are being monitored at sites near Jarrahdale, Dwellingup, Harvey, Collie and Two Peoples Bay. Radio tracking shows that these animals are restricted to the swampy vegetation along creeklines. They do not move across open forest areas or paddocks the way they used to. If a local extinction occurs, it is unlikely that the area would be repopulated from a neighbouring swamp unless the two were joined by a corridor of suitable habitat through which individuals could move safely.

Quokkas probably occur at other sites in the South-West and a survey by CALM is under way to determine their current distribution. Populations are thought to persist near Manjimup, Mt Manypeaks, Green Range and possibly along the Pallinup River and in the Stirling Range. Information from this survey will be used to determine the appropriate conservation status of the quokka, and whether additional management actions are required to ensure their survival.

A survey of potential quokka sites



along the south coast was undertaken in November 1994 by The University of WA. This included creeklines and swamps between Torndirrup National Park and Cape Riche, as well as many of the areas known to be inhabited by quokkas at the time of European settlement. Unfortunately, none was found. However, quokkas have been located at Two Peoples Bay.

The current restricted distribution of quokkas on the mainland makes them vulnerable to wildfires. The burning of their small, swampy refuges, particularly by intense summer fires, not only eliminates their food and cover but makes them vulnerable to predation by foxes. Known quokka sites currently gain some protection from these destructive burns through CALM's prescribed burning program; vulnerable habitats are surrounded by areas with low fuel loads that minimise the risk of wildfire.

CURRENT RESEARCH

Many aspects of the Rottnest Island quokka have been extensively studied by staff and students from the Zoology Department, University of WA. However, little is known about the biological requirements and behaviour of the Bald Island and mainland animals, or their relationship to the Rottnest animals. Due to the length of time the island populations have been separated from the mainland, and the extent to which the mainland populations are fragmented, it is possible that a significant amount of genetic differentiation has occurred. The sedentary behaviour of



Above: Coastal thickets and swamps, such as here at Two Peoples Bay, are typical quokka habitat.

Photo - Marie Lochman

Below: Are mainland and island quokkas sufficiently different to be regarded as separate subspecies?

Photo - Babs & Bert Wells/CALM

quokkas could also contribute to any differences that have evolved; they have a strict home range with limited movement between populations. Some important physiological and morphometric (shape, size, colour) variations exist. For example, mainland animals are larger. Understanding the relationships between these different groups of animals is important when considering management and conservation issues.

A FUTURE?

Little attention has been focused on mainland quokkas. While older generation forest workers and farmers can relate stories of their abundance, most people have never seen a quokka in the wild on the mainland. We believe that their numbers are extremely low and that this decline may be continuing.

However, steps are now being taken by CALM and other researchers to find out more about mainland quokkas and to implement strategies that will ensure their long-term survival.

If quokkas have, in fact, declined, they may be recognised nationally as a threatened species and mainland populations may be granted special protection. Further information is being gathered on the extent of their populations and their relationship with other quokkas.



Elizabeth Sinclair is a PhD student with the Department of Zoology, at The University of Western Australia. She is studying the genetic relationship between island and mainland quokkas, and her research is being partly supported by ALCOA of Australia. Elizabeth can be contacted on (09) 380 1468.

Keith Morris is a senior research scientist with CALM's Science and Information Division. He is working on the conservation of threatened mammals and can be contacted at the CALM Wildlife Research Centre (Woodvale) on (09) 405 5100.



Visitors can walk in the treetops along a series of walkways, platforms and stairways at the new Forest Heritage Centre in Dwellingup. (See page 10.)



A major survey of the Carnarvon Basin has recently been completed by staff from CALM, the WA Museum and the University of WA. What did they find? (See page 15.)

LANDSCOPE

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It was a very good year in the Wildflower State. Find out just how good in our story on page 38.



Australia has its own families of songbirds that are very different from their European namesakes. See 'True Blue Birds' on page 45.



Quokkas were once widespread on WA's mainland, but the most visible populations are now found on just two islands. 'Where Have All the Quokkas Gone?' (See page 49.)

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Western black-footed rock-wallabies are on the increase in Yardie Creek, thanks to a CALM fox-baiting program. Their numbers are being monitored by local tour operators Neil and Rhonda McGregor. See our story on page 36.

Illustration by Philippa Nikulinsky



Managing Editor: Ron Kawalilik

Editor: David Gough

Contributing Editors: Ray Bailey, Mandy Clews, Verna Costello, John Hunter, Penny Walsh

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