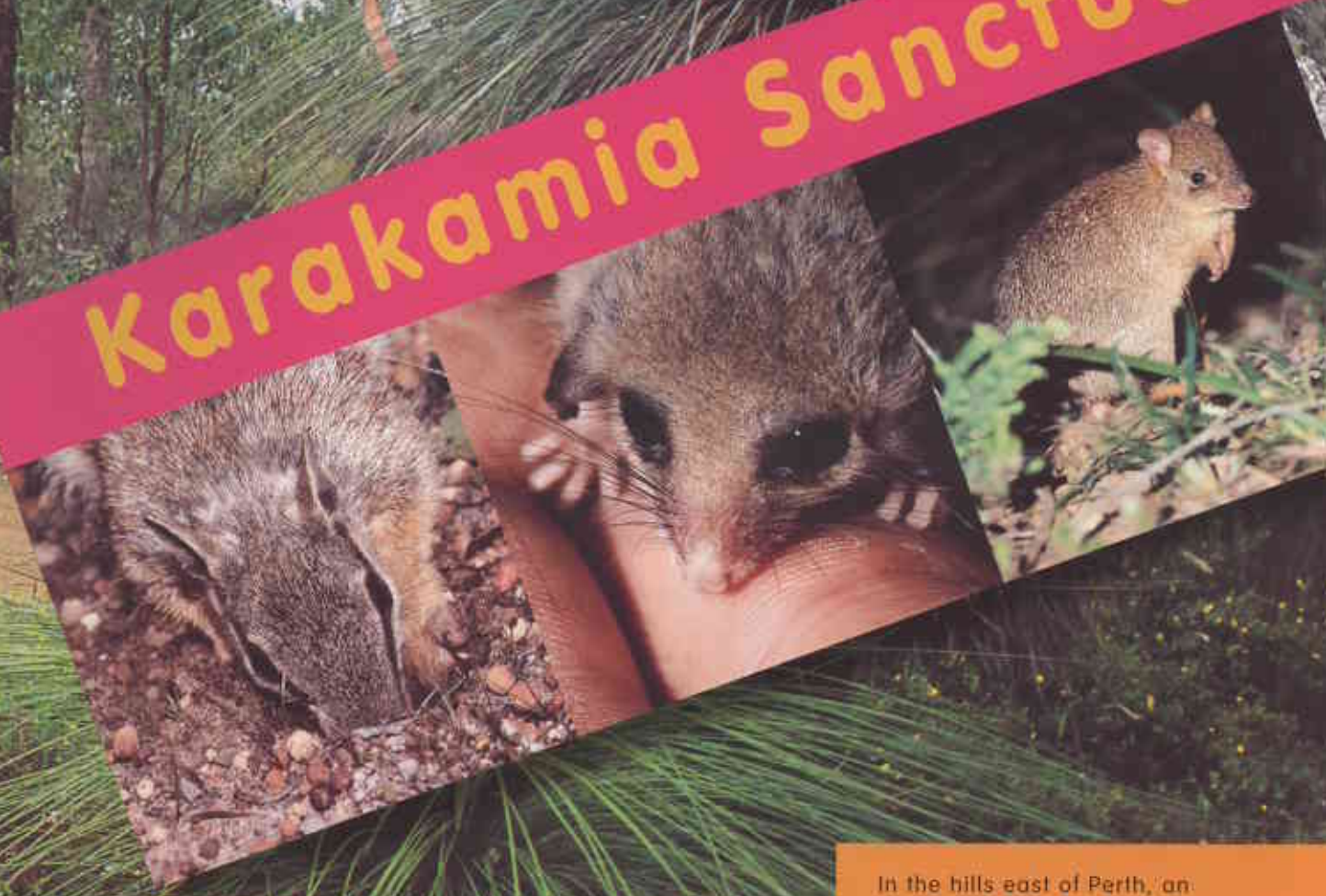
Karakamia Sanctuary



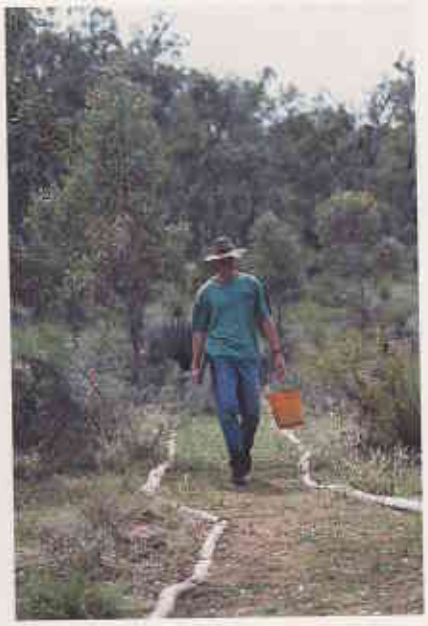
In the hills east of Perth, an exciting new conservation project is developing. With the support of the Department of Conservation and Land Management (CALM), Western Australia's first private wildlife sanctuary is being established—a place free from foxes and cats, where native wildlife can flourish.

by André Schmitz and Martin Copley

Photos by Ann Storrie

The experience of an encounter with one of Western Australia's native animals is always a memorable one. Strolling along a bush-track at night, the rustle of leaves from beneath the shrub layer makes you stop in your tracks and focus your attention. A hint of movement, and then a tiny nose pokes out, sniffing the breeze for any scent. Slowly a head appears, then suddenly disappears as the animal senses a hint of danger. In time, the quenda (*Isoodon obesulus*), commonly called the southern brown bandicoot, comes out of hiding and into the open. Keep still long enough and you may be able to watch the animal dig for earthworms. You can't hold still any longer and a sneeze or cough, or the slightest movement, sends the animal scurrying for cover, not to be seen again.

This wonderful experience is sadly now a rare event for many people. When spotting a quenda during a walk at Karakamia Sanctuary the inevitable question is asked, 'what was that?'—a sad reflection that most Western Australians these days do not know what a quenda is. Because of fairly low numbers in the wild and the fact that it is nocturnal, the species is rarely seen. This charming little animal is, in many ways, an Australian icon. Before the advent of fox-baiting programs such as *Western Shield,* (see 'Western Shield', *LANDSCOPE,* Winter 1996), it was well on the way to joining the ranks of Australian mammals threatened with extinction by introduced predators, namely the European fox and feral cat. It was for this reason that the quenda was chosen as Karakamia Sanctuary's logo: it represents a previously familiar mammal that is now still fairly rare.



Although numbers of quenda are increasing in areas where fox-baiting has occurred, Karakamia Sanctuary is attempting to help reverse their decline in the metropolitan area. And not just with quenda! A whole host of Darling Range mammal species requires intensive management to restore animal numbers to what they once were.

WA'S FIRST PRIVATE WILDLIFE SANCTUARY

The seed for Karakamia Sanctuary was first sown when Lorraine Copley organised a visit to Dr John Wamsley's Warrawong Sanctuary in South Australia in 1990. As a result, possibilities for a similar private conservation attempt in WA were considered and acted upon, using Warrawong as inspiration.

It is vital for the private sector to complement and, if necessary, challenge the conservation approach made by Government. Above all, involvement of the hearts and minds of the community is crucial.

The principal aim of Karakamia is to re-establish, within the sanctuary, Darling Range wildlife communities as

Previous page
Main: The grounds of Karakamia Sanctuary.
Insets: (from left) Numbat (*Myrmecobius fasciatus*), pygmy possum (*Cercartetus concinnus*) and woylie (*Bettongia penicillata*) – some of the native animals protected at Karakamia.

Above: The establishment of walk trails allows people to view animals within the sanctuary.

Left: Dunnarts (*Sminthopsis griseoventer*) are now common at Karakamia following the eradication of introduced predators.

The quenda (*Isoodon obesulus*), Karakamia's logo, can now be regularly seen foraging at night in the sanctuary.

they were before European settlement. Medium-sized ground mammals, have suffered most since European colonisation. The glaring difference between the hills bushland now and 200 years ago is the dramatic decline of this group of animals and their habitat. The sanctuary's objective is to provide people, especially children, with the opportunity to experience native mammals.

However, it's not just mammals that the sanctuary is concerned with, but the entire forest ecosystem. This is reflected in its name 'Karakamia', which means 'home of the red-tailed black cockatoo' in the local Nyoongah language (*karak or karrak* = red-tailed black cockatoo, *mia* = home or habitation).

ESTABLISHMENT

The search for an area suitable for the establishment of the sanctuary was much more problematic than first expected. Private land in the area had been grossly modified for commercial purposes. It came as quite a revelation when it was discovered that areas of high quality bushland were as difficult to find as a needle in a haystack! Fortunately, in 1991, the Karakamia team struck gold. A property was found near Chidlow, east of Perth, which met all the selection criteria and more. The 180-hectare bushland was in an undisturbed state. It had a variety of habitat types and was only an hour's drive from Perth, making it easily accessible to the metropolitan region. In addition, it was stunningly beautiful with spectacular views and a pristine creek.

The land consists of a variety of vegetation communities that are representative of the northern jarrah forest. It also contains a number of recognisable distinct habitats. Jarrah is found predominantly on the lateritic caps, while downslope, more marri is intermingled with the jarrah. Extensive outcropping of granite creates a different environment, reflected in the vegetation of expansive heathlands of verticordia and calytrix, and shrublands of hakea. The granite weathers into clay, and below the outcrops, wandoo woodland predominates with a distinct understorey creating a wonderful patchwork of vegetation.

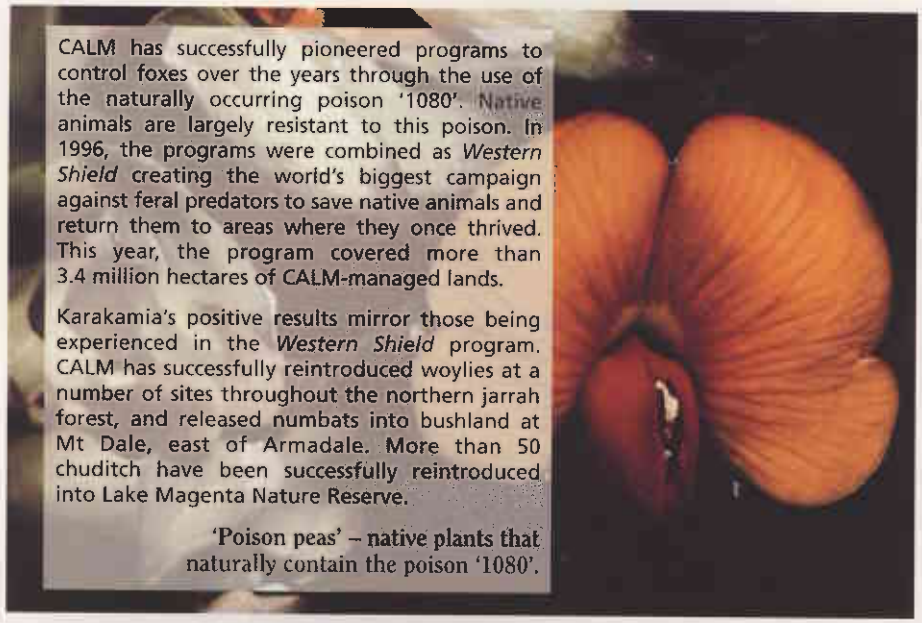
The permanent creek line, consisting of dense sedge and rush communities, provides a crucial habitat for many species. A large lake, formed when previous owners dammed the creek line, gives rise to open water habitat where water birds such as black swans and yellow-billed spoonbills are often seen.

It is extremely rare to find all these habitats in one location in the jarrah forest, and this is the fundamental reason why the site was chosen for the sanctuary project. By having a variety of habitats, it provided the best possible chance for the long-term survival of a wide range of native species.

Surveys of the sanctuary revealed a diversity of plant species, with more than 240 species identified, pressed and mounted in a herbarium. Ongoing vegetation survey work assures that management does not inadvertently compromise the flora of the site, particularly with regard to grazing pressure by animals like western grey kangaroos and especially after fire. This became an important issue after 20 hectares of Karakamia were burnt-out during the Chidlow wildfires in February 1996. Results so far show very good recovery rates compared with similar areas outside the sanctuary. In

CALM has successfully pioneered programs to control foxes over the years through the use of the naturally occurring poison '1080'. Native animals are largely resistant to this poison. In 1996, the programs were combined as *Western Shield* creating the world's biggest campaign against feral predators to save native animals and return them to areas where they once thrived. This year, the program covered more than 3.4 million hectares of CALM-managed lands.

Karakamia's positive results mirror those being experienced in the *Western Shield* program. CALM has successfully reintroduced woylies at a number of sites throughout the northern jarrah forest, and released numbats into bushland at Mt Dale, east of Armadale. More than 50 chuditch have been successfully reintroduced into Lake Magenta Nature Reserve.



'Poison peas' – native plants that naturally contain the poison '1080'.

conjunction with the vegetation work, vertebrate populations are monitored, and Karakamia now holds six years' biannual data. Surveys have revealed a rich fauna on the site, with 92 species of birds, 23 species of reptile and nine species of amphibian.

However, the surveys revealed an expected paucity of mammal species. These species were predominantly those able to persist in the face of fox and cat predation—such as bats, western grey kangaroos and echidnas. Two susceptible species, the brushtail possum and western brush wallaby, persisted in very small numbers, but all the medium-sized ground-dwelling mammals were completely absent.

OUT-FOXING THE FOXES

The key to Karakamia's success lies with the absolute exclusion of exotic predators. To achieve this, six-and-a-half kilometres of sophisticated electric fencing created a fox and cat-free haven. The fence was designed and erected with the help of Dr John Wamsley, from Earth Sanctuaries in South Australia. Dr Wamsley has many years experience excluding cats and foxes from his sanctuaries 'Yookamurra' and 'Warrawong', and in many ways is considered a pioneer of this type of fencing in Australia. The Karakamia fence uses the latest technology to prevent invasion of the enclosure by predators, as well as to monitor any breaches in the fence line. A series of alarms and back-up systems prevents the failure of the electric system in times of power loss, and the fence is checked daily for physical damage.

The Karakamia eradication program was conducted in collaboration with the former Agriculture Protection Board, now part of Agriculture WA. Foxes, cats and rabbits were removed using a variety of techniques including the use of the naturally occurring poison '1080' in baits. Native animals have a high tolerance to this poison, as it is found in the native plant genus *Gastrolobium*.

Above left: A feral-predator proof fence separates the sanctuary from farmland.

Left: Major rehabilitation work has been carried out on the Sanctuary's dammed lakes.

To assess fox and rabbit numbers, the sanctuary was divided into 50-metre grids and all vermin activity along the lines was mapped. This included all warrens and dens, scats and diggings. At the end of mapping, Karakamia staff had a very good indication of the prevalence and distribution of feral animals within the sanctuary.

Over an eight-month period, fewer and fewer locations recorded feral activity. To ensure that no foxes remained, sand pads of about one metre square were constructed throughout the sanctuary and lures used to attract foxes. Lures consisted of anything from dead rabbits to offal, while attractants such as fish oil were also used. All sand pads were visited regularly, but visitation slowly reduced over time until lures remained undisturbed. Karakamia was now ready for the next phase—the return of the mammals.

READY FOR REINTRODUCTIONS

An important aspect of the project is that only mammals known to have previously occurred in the region, and within the available habitats at Karakamia, were considered candidates for reintroduction. A provisional list of species was established with the guidance of experts from CALM's Science and Information Division. The initial releases included numbat, quenda and woylie. Subsequent reintroductions included western ringtail possums and mainland quokkas.

Monitoring of released animals involves comprehensive radio-tracking for a set period after release. This period is variable for different species and, in the case of numbats remains ongoing. After a period of radio-tracking, species such as woylies and quendas were monitored through regular surveys using cage and Elliott traps. All this information is stored in computer databases, and the sanctuary contributes to the knowledge of these species, particularly with regard to reintroduction programs. Status reports are written at regular intervals summarising information gained through fieldwork.

MANAGEMENT

Karakamia is run under a management agreement between the sanctuary and CALM, with day-to-day management coordinated through an endorsed management plan. An advisory panel, comprising two representatives from each organisation, meets at regular intervals to guide management decisions. Like all good partnerships, there are benefits to both parties. The State and wider community benefits by having another private organisation involved in the conservation and research of threatened fauna. Karakamia benefits by gaining relevant expertise from CALM with regard to both the management and research phases of sanctuary work.

Cage trapping is undertaken on a regular basis to monitor animal populations.

RESULTS

All reintroductions at Karakamia are considered to be successful and, in the case of some species, spectacular results have been achieved. Woylies and quenda increased significantly since their initial release and now occupy all areas of the sanctuary. Quenda respond particularly well to predator-free environments and breed fairly rapidly under such circumstances. Seventy-eight individual quenda were trapped during the surveys of autumn 1997, corresponding to an estimated population size (using mark-capture-release methods) of more than 160—and all this from an initial release of about 12 animals!

Numbats, too, are breeding well. As the population grows, animals are added or exchanged, to maximise genetic diversity and to reduce the likelihood of in-breeding. It seems fitting that these animals now regularly utilise abandoned rabbit warrens.

As the populations of reintroduced species have increased, individual animals have begun to occupy areas not normally associated with that species habitat. For example, quenda are normally found along creek lines or wetlands, but at Karakamia they occupy upland jarrah sites as well. It appears that fox and cat predation forces medium-sized mammals into refuge habitats; without predation, threatened native mammals can re-occupy land previously unavailable to them.

If this is the case, it is further evidence that a turnaround in the current extinction crisis facing native mammals can be achieved through fox and cat control. Another example of this is the woylie, which has recovered well at Karakamia in the absence of foxes. This mirrors the success of CALM's introduction of fox control into many areas of the jarrah forest, which has resulted in the woylie being removed from the Commonwealth and State threatened species lists.

FURTHER SUCCESS

In addition to the success of reintroduced species, there have been marked population increases in the remnant species at the site, including brushtail possums and western brush wallabies. Brushtail possums are now regularly seen on the ground—a resource that only becomes available to this opportunistic animal when fox and cat predation are abated.

Surprisingly, species not known

from the area, including pygmy-possums and dunnarts, have now appeared. These species were probably always present, but in numbers too small to sample through regular pit-trapping. Since the eradication of introduced predators, they have been recorded on a number of occasions. As these two species are generally regarded as under the critical weight range of mammals susceptible to predation by foxes and feral cats, it would be interesting to test if the correlation is genuine, or coincidental and related to other factors such as climate.

The possibility of further research at Karakamia is unlimited, particularly within the confined space of the sanctuary. For example, we can ask, 'what is the carrying capacity for individual species in the jarrah forest in the absence of cats and foxes?', or 'with the planned reintroduction of tammar wallabies, how are resources partitioned between the grazers and browsers?', or 'how do predation rates relate to habitat utilisation, and will populations be self-regulating in the long-term?'

Many questions are raised in this kind of project. Nevertheless, early results are encouraging and further demonstrate the implication of fox and cat predation in the regional extinction of medium-sized ground-dwelling mammals. Furthermore, Karakamia has already achieved an important milestone in that the populations of some species within the sanctuary already offer a source of founder stock for other areas.

THE FUTURE

Clearly, private conservation initiatives are viable and have a significant role to play in the State. But it is important to afford them appropriate legislative protection so that similar projects can follow in confidence. This, in turn, will mean that privately owned havens for local wildlife can be established in the different habitats representative of the rich and diverse biological heritage of Western Australia.

Karakamia is looking toward the future with optimism, particularly with regard to long-term viability, and the establishment of affiliated projects in other areas. The sanctuary is currently establishing an education package and interpretive walk, so that visitors will soon be able to experience encounters with local wildlife on a regular basis. Indeed, Karakamia has recently been involved in CALM's Hills Forest *Go Bush!* program, and many people have experienced a preview of things to come.

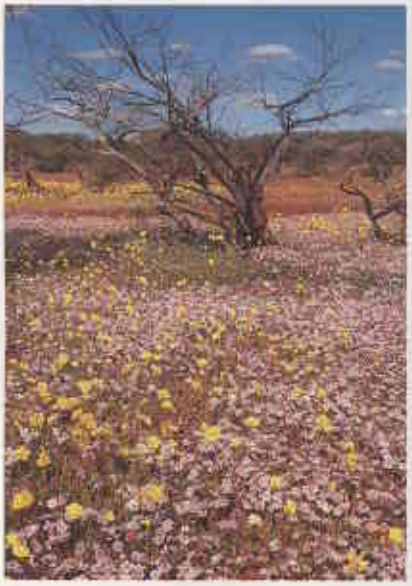
Woylie leaping to freedom after being trapped for monitoring.

Building upon its success at Chidlow, the Karakamia team is now rising to an even greater challenge of linking Walyunga and Avon Valley national parks with a privately owned and managed, predator-free wildlife corridor. The key to this project will be community involvement in fox and cat control and the revegetation of cleared areas in the scenic valleys in the hills near Perth. But that's another story for another time.

André Schmitz is the Manager of Karakamia Sanctuary and holds a degree in Environmental Management. André manages the daily operation of Karakamia. He can be contacted at the sanctuary on (08) 9572 3169.

Martin Copley is the owner and founder of Karakamia Sanctuary. He fervently believes that private sector initiatives in conservation are fundamental to preserving biological diversity and ultimately our own existence on this planet.

The waters off Western Australia's south coast are home to a rich diversity of marine plants and animals. Read about them on page 28.



Burnerbinmah Station, in WA's Murchison Region, fills an important gap in the State's flora and fauna reserve system. See page 42.

LANDSCOPE

VOLUME THIRTEEN NUMBER 2, SUMMER 1997–1998

Was it created by a meteorite crashing to Earth, or more slowly over time? Find about Curiosity Swamp on page 50.

Imagine a commercially-owned and managed sanctuary in the hills east of Perth and you have 'Karakamia Sanctuary'. Find out how it was created on page 17.

The Western Blue Gum, a commercial variety of the Tasmanian bluegum, was developed for WA conditions, but tree breeders continue to improve the strain. See page 36.

FEATURES

REGULARS

COVER

Is the forest red-tailed black-cockatoo rare or just rarely seen? Find out the answer to these questions on page 10.

Illustration by Philippa Nikulinsky

Executive Editor: Ron Kawalilak
Managing Editor: Ray Bailey
Editor: David Gough
Story Editors: Mandy Clews, Verna Costello, Carolyn Thomson, Mitzi Vance, Penny Walsh
Scientific/technical advice: Andrew Burbidge, Ian Abbott, Paul Jones and staff of CALM's Science & Information Division
Design and production: Maria Duthie, Sue Marais
Finished art: Colourbox Digital
Illustration: Gooitzen van der Meer
Cartography: Promaco Geodraft
Marketing: Estelle de San Miguel ☎ (08) 9334 0296 Fax: (08) 9334 0498
Subscription enquiries: ☎ (08) 9334 0481 or (08) 9334 0437
Colour Separation by Colourbox Digital
Printed in Western Australia by Lamb Print

Visit *LANDSCOPE* online on our award-winning Internet site *NatureBase* at http://www.calm.wa.gov.au/

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