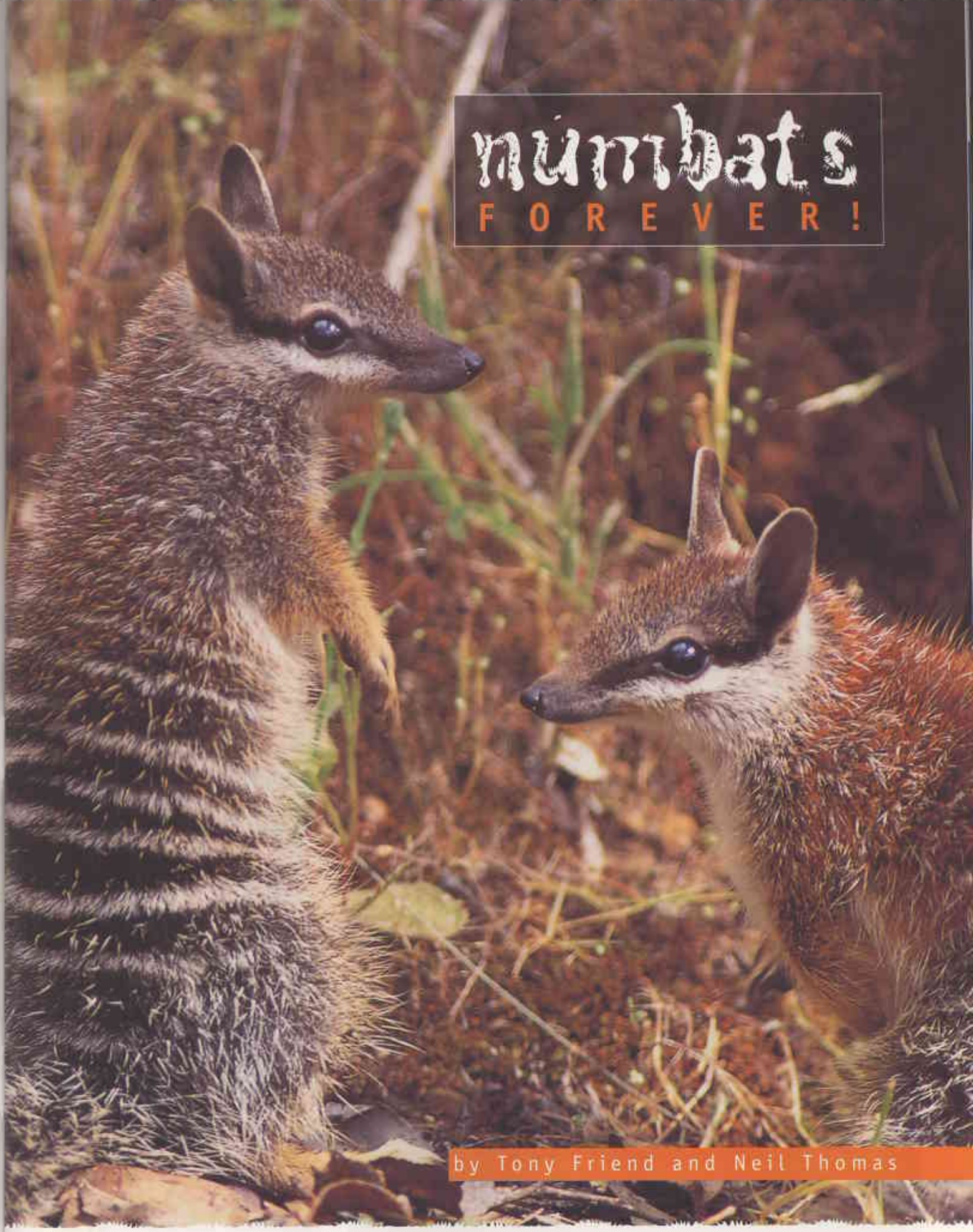


numbats FOREVER!

by Tony Friend and Neil Thomas

Just 40 years ago the numbat was common in Western Australia but, by 1985, loss of habitat and predation by introduced foxes had caused the species to dwindle to two small populations. Now, as a result of research, experimental management and collaboration between government, private and corporate sectors, there are more than 10 self-sustaining populations of numbats in three states.

In 1960, distinguished wildlife biologist John Calaby described the dainty, day-active numbat as 'among the more abundant of the small mammals of south-western Australia'. Although clearing of native vegetation was in full swing in the numbat's last stronghold, the Great Southern region of Western Australia, frequent and widespread sightings gave the impression that the termite-eating marsupials were going to survive.

ON THE BRINK

But, during the late 1970s, the rate of sightings dropped suddenly—even in the best-known numbat areas at Dryandra Woodland near Narrogin and Perup Nature Reserve near Manjimup. There was sudden, deep concern that WA's mammal emblem was on the edge of extinction. This prompted new surveys for numbats and intensive studies of numbat biology and ecology at Perup and Dryandra. Early results of the Dryandra study focused attention on the predation of numbats by the introduced red fox and led to a three-year experiment in which foxes were removed by 1080 baiting in one part of the woodland. Numbat numbers were monitored closely in baited and unbaited areas. By the end of the experiment in 1985, numbat numbers had risen rapidly in the baited area, while remaining static where foxes persisted. Following the dramatic increase in the numbat population in the baited area, 33 wild animals were transferred from Dryandra to Boyagin Nature Reserve—40 kilometres to the north—where numbats had become extinct during the early 1970s (see 'Numbat Dawn', *LANDSCOPE*, Winter 1990). This trial reintroduction was successful and numbats spread rapidly throughout the reserve.

Unfortunately, as we learned how to put numbat recovery into action in the agricultural areas, the last populations in the northern jarrah forest became extinct. Surveys during the early 1980s recorded sporadic numbat sightings in large tracts of forest between Collie and Bedfordale and even on the outskirts of Perth, near Canning Vale and Forrestdale. In 1985, a forest worker made the last verified sighting of a numbat in wandoo woodland east of Mundaring.

RAISING NUMBATS

From January 1989, monthly baiting with 1080 in dried meat was extended to cover 13,000 hectares of Dryandra Woodland. The expansion in the Dryandra numbat population stimulated a reintroduction program based on taking young animals from the wild. The box on page 19 shows the history of numbat translocation under the Numbat Recovery Plan.

From 1993, improved breeding of numbats in captivity at Perth Zoo resulted in captive-bred animals being available for release. This was fortuitous because in 1993, after 10 years of rapid growth under fox control, the numbers of numbats peaked and started to fall. A year earlier, in November 1992, numbat sightings rose to 11 for every 100 kilometres driven—about twice the calculated carrying capacity of Dryandra Woodland. By November 1993, the sighting rate had fallen to five for every 100 kilometres driven. There has been no return to the high numbers of 1992; in fact, sighting rates have tended to oscillate around lower levels. As a result, other sources of numbats, including Perth Zoo, have been used in translocations in preference to numbats from Dryandra, to reduce the impact on that precious population.

Numbats were first bred in captivity at Taronga Zoo in Sydney, New South Wales, in 1975, but the young did not survive to weaning. A captive-breeding colony was set up at the Department of Conservation and Land Management's Wildlife Research Centre at Woodvale in 1984. A female numbat with four attached young and an adult male, all from Dryandra, were maintained on an artificial diet based on eggs and low-lactose milk developed by their carer, marsupial breeding expert Dick Whitford. This is still the standard

Previous page
Young numbats in front of their burrow at Dryandra.
Photo – Jiri Lochman

Above: A numbat finishing a yawn at Alice Springs Desert Park.
Photo – Bill Bachman

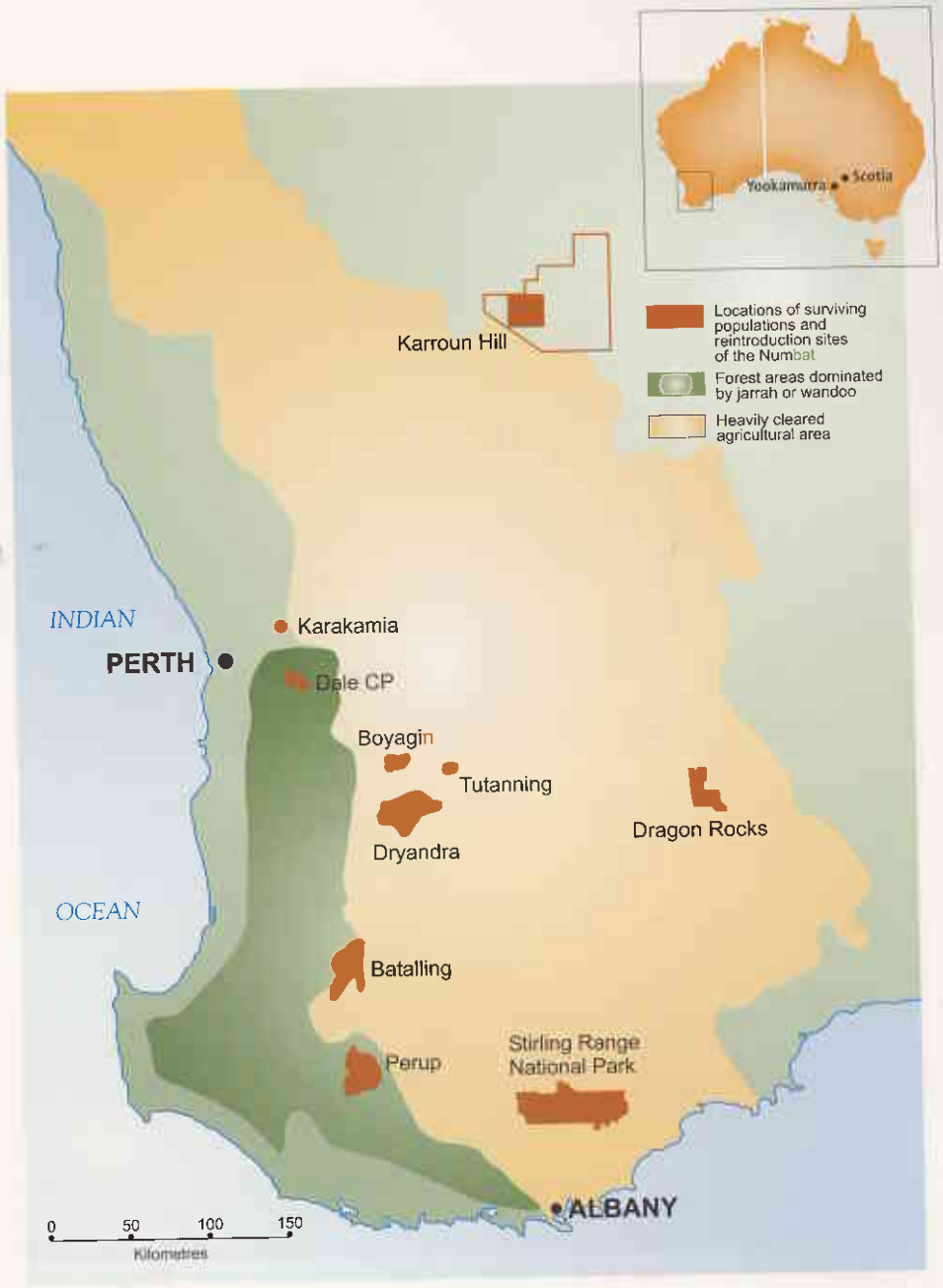
Left: Juvenile numbats emerging from their nest log, Dryandra Woodland.
Photo – Jiri Lochman

diet used in captive numbat colonies. When the two young females reached breeding age, all three females produced litters and raised them to independence under Dick's management. The World Wide Fund for Nature Australia (WWFA) funded this breeding colony for two years and, after a further year, the colony was transferred to Perth Zoo.

NEW HORIZONS

The reintroduction program continued after the success at Boyagin. This site had been chosen because its soils, climate and vegetation were similar to those of Dryandra. However, numbats previously inhabited a wide range of vegetation types across southern Australia, so the second reintroduction was to different country: woodland on the boundary between the Wheatbelt and the Goldfields, at Karroun Hill Nature Reserve in the Shire of Mount Marshall (see 'Paradise on the Edge', *LANDSCOPE*, Spring 1991). In this 300,000-hectare area, large tracts of woodland dominated by salmon gum, gimlet, York gum and wandoo are interspersed with extensive areas of acacia scrub and low granite outcrops. A translocation program between 1986 and 1993 established numbat colonies at sites where woodlands abutted dense vegetation. Numbats were able to find termites in the woodland areas and shelter from predators in the nearby thickets. This translocation tested the numbats' adaptability as they moved from Dryandra, with annual rainfall of over 500 millimetres, to a new site with less than 250 millimetres of rainfall at Karroun Hill.

Compared with the releases at Boyagin Nature Reserve, a 5,000-hectare remnant surrounded by farmland, the translocation to the vast Karroun Hill area was a whole new ball-game. Numbats dispersed widely (one male ended up 25 kilometres from the release site) and could only be found with the use of a light aircraft fitted with radio-tracking aerials. Lack of access tracks through much of the reserve necessitated long walks to check numbats and change radio-collars. A fascinating insight into the numbat's navigational abilities was



NUMBAT REINTRODUCTION SITES AND RELEASE DETAILS

Destination	Area (ha)	Release years	Number released	Source
Boyagin, WA	5,000	1985–87	35	Dryandra, Woodvale
Karroun Hill, WA	300,000*	1986–93	97	Dryandra
Tutanning, WA	2,000	1987–96	35	Dryandra, Perth Zoo, Karakamia
Batalling, WA	***	1992–95	60	Dryandra, Perth Zoo
Yookamurra, SA	1,100	1993	15	Dryandra
Karakamia, WA	250	1994, 1996, 1999	6	Dryandra
Dragon Rocks, WA	33,000	1995–96	37	Dryandra
Dale CP, WA	***	1996–98	62	Dryandra, Perth Zoo, Boyagin
Stirling Range, WA	100,000	1998–2000	48	Dryandra, Perth Zoo, Yookamurra
Scotia, NSW, Stage 1	4,000	1999–2000	43	Yookamurra

*Only 40,000 hectares baited ***Part of the 2 million hectare forest belt, now mostly under fox control

provided by an adult female found (from the air) 15 kilometres from her release site, that turned up later only 500 metres from the original site! Male numbats demonstrated their drive to reproduce, as females several kilometres from the nearest male unfailingly produced young right on schedule. Radio-tracking from the air during the brief mating period showed males making long dashes between females, in an attempt to be first on the scene at oestrus.

As the emphasis in the numbat conservation program moved from research to management, more individuals and agencies became involved. The Numbat Recovery Team was established in 1993 and now includes representatives from the Department of Conservation and Land Management, Perth Zoo, the conservation community and wildlife agencies in South Australia and New South Wales. The team produced a recovery plan, setting out broad aims and detailed actions to achieve the recovery of the species. One of the most important actions was, and is, the translocation program, the details of which are shown in the box on page 19.

Our experience in re-establishing numbat populations increased with further reintroductions to Tutanning Nature Reserve near Pingelly and Batalling Forest near Darkan; to Dragon Rocks Nature Reserve south of Hyden and Dale Conservation Park in the northern jarrah forest. Although all translocations resulted in new, self-sustaining colonies, reserves surrounded by farmland restricted the dispersal of numbats and therefore assisted in the rapid establishment of populations. Under the Western Shield program, which began in 1996, areas of conservation land baited for foxes increased and provided many new possibilities for the numbat's reintroduction.

The Dryandra population was the main source for translocations for many years because of the relative ease of capturing animals there. Recent genetic research showed this was a fortuitous choice. The Perup animals had lost more genetic variability through population bottlenecks than those at Dryandra, since the two populations had become separated by land clearing. The recovery plan proposes to incorporate Perup stock into captive breeding or reintroduction groups, to maximise the genetic variation within new populations.

MOVING INTERSTATE

In 1993, the numbat's recovery moved interstate when Earth Sanctuaries Limited (ESL) became involved. The company's founder, John Wamsley, selected an area of old mallee woodland in the Murray Mallee lands of South Australia for purchase, because of its suitability for numbats and other mammals previously recorded in that part of the continent. A 14-kilometre-long electric fence was constructed around the 1,100-hectare property, and Yookamurra Sanctuary was opened in a fence-closing ceremony in 1991. Feral animals were removed from the sanctuary during the next two years. By the time the last rabbit was ousted, with the help of a Jack Russell terrier, negotiations with the Department of Conservation and Land Management about the acquisition of numbat breeding stock were well under way.

Above left: Their eyes are still tightly closed, but at six months of age the young can move from one teat to another.
Photo – Tony Friend

Left: Female numbat, fitted with a radio-collar, at the mouth of her burrow.
Photo – Jiri Lochman

The first five numbats to enter Yookamurra were captured at Dryandra in November 1993, fitted with radio-collars and taken as accompanied air freight to South Australia. Four males and a female without young were released into specially positioned logs late in the afternoon of 9 November 1993, just 24 hours after they had been captured. During the next few days, Yookamurra staff were trained to monitor the numbats, so their progress could be followed. Using methods developed in Western Australia, all numbats were monitored regularly for the first few weeks. All went well, and on 7 December, nine females and another male made the trip from Dryandra to Yookamurra to be released into the Sanctuary.

The Yookamurra reintroduction was so successful that the rapidly growing population was able to provide stock for a transfer to another of ESL's properties. Ten numbats were released into a feral-free fenced area of 4,000 hectares at Scotia Sanctuary in western New South Wales, 100 kilometres north of the Murray River, on 25 November 1999. Feral animal eradication is being carried out in an adjacent 4,000-hectare area and will then proceed to the next 19,000-hectare block, so the prospects for expansion of the numbat colony are good. Scotia is largely dominated by east-west sand ridges, with open mallee scrub and a spinifex understorey, but the numbats were released into old mallee woodland with good shrub cover, in sites selected with the Department of Conservation and Land Management's assistance.

FURTHER RECOVERY

In WA, in another privately funded conservation project, numbats were released at Karakamia—a fenced, feral-free, 250-hectare jarrah forest area near Gidgegannup, north-east of Perth, in November 1994. Because the site could only support a small number of numbats, the occasional exchange of animals has been carried out to enable Karakamia to contribute to the translocation program and maintain genetic quality. Karakamia staff also track radio-collared numbats regularly to monitor the colony's progress.

The involvement of Perth Zoo and ESL in the numbat recovery program relieved Dryandra's wild population of its role as the sole source of numbats for translocation. The most recent new WA population, in the Stirling Range National Park, in the south of the State, illustrates this point. Three annual

Right: The founder of Earth Sanctuaries Limited, John Wamsley (left), and Department of Conservation and Land Management principal research scientist, Tony Friend, weigh a numbat before its release as part of the first numbat reintroduction to old mallee woodland at Yookamurra in 1993.

Below right: Department of Conservation and Land Management senior technical officer, Neil Thomas, releases a numbat into a hollow log at Karroun Hill Nature Reserve.
Photo – Tony Friend

Below: Karakamia Sanctuary feral proof fence.
Photo – Marie Lochman

releases there have, so far, involved 14 Dryandra numbats, 26 numbats bred at Perth Zoo and eight Yookamurra Sanctuary numbats.

But the Stirling Range reintroduction has not been free of problems. Translocated numbats have been taken by birds of prey at most sites, but this predation was particularly prevalent in the first year at the Stirling Range. To counteract the threat, staff at Perth Zoo's Native Species Breeding Program began training captive-bred numbats to be wary of raptors. The results of the release in December 2000 indicated that this training—using trained birds and alarm sounds—increased the rate of survival of numbats after release.

TWENTY YEARS OF WORK

Numbat recovery has been the result of intensive work over 20 years. A number of funding bodies supported this project for various periods: five years of support from WWFA and three years of support each from MacDonalds Family Restaurants and ANCA/Environment Australia. The institutions directly involved have provided the necessary long-term support that recovery programs need: the Department of Conservation and Land Management (and one of its predecessors, the Department of Fisheries and Wildlife), Perth Zoo and Earth Sanctuaries Limited.

In 1983, the numbat was listed in the IUCN Red List of Endangered Species as Endangered. In 1994, the criteria for listing were revised and, as a result, species with several populations in which decline had been halted for five years or more, such as the numbat, dropped down to Vulnerable. So, with the stroke of a pen, the conservation status of the numbat improved! Even so, the numbat's numbers were low—even ambitious estimates put the total world population at around 2,000. Is this enough? By comparison, the giant panda, an icon of endangerment, numbers approximately 1,500. Although the security of the numbat is now enhanced by the existence of widely dispersed populations, its persistence depends on continued fox control or fenced sanctuaries. The numbat's survival depends on continued support for conservation programs from the community, the corporate sector and from federal and State agencies across Australia.

Above left: Stirling Range National Park, site of WA's most recent numbat reintroduction.
Photo – Jiri Lochman

Above: Wedge-tailed eagles and other raptors have preyed on numbats in the Stirling Range National Park.
Photo – Marie Lochman

Below left: A numbat in old mallee woodland at Yookamurra Sanctuary.
Photo – Bill Bachman

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Within 40 years, the numbat has risen from near extinction to endangered with 10 populations in WA and interstate. See 'Numbats Forever' (page 17).

The forces that shaped the geology and landforms of the south-west began more than 3,500 million years ago. Read the facinating story on page 10.

The Marine Community Monitoring Program is a new and ambitious program to involve the community in keeping our oceans clean. See page 35.

Shark Bay Marine Park provides spectacular opportunities for divers and snorkellers. No wonder it is called Bay of Delights. See page 23.

The history of Aboriginal occupation in the Leeuwin-Naturaliste region spans 50,000 years. Find out more in 'History from the Caves' (page 40).

FEATURES

REGULARS

COVER

Leschenaultias are some of the most widely known and recognisable plants in Western Australia. They have fantastic horticultural value and provide glorious floral displays. The wreath leschenaltia is a favourite with visitors during our wildflower season. See page 23.

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