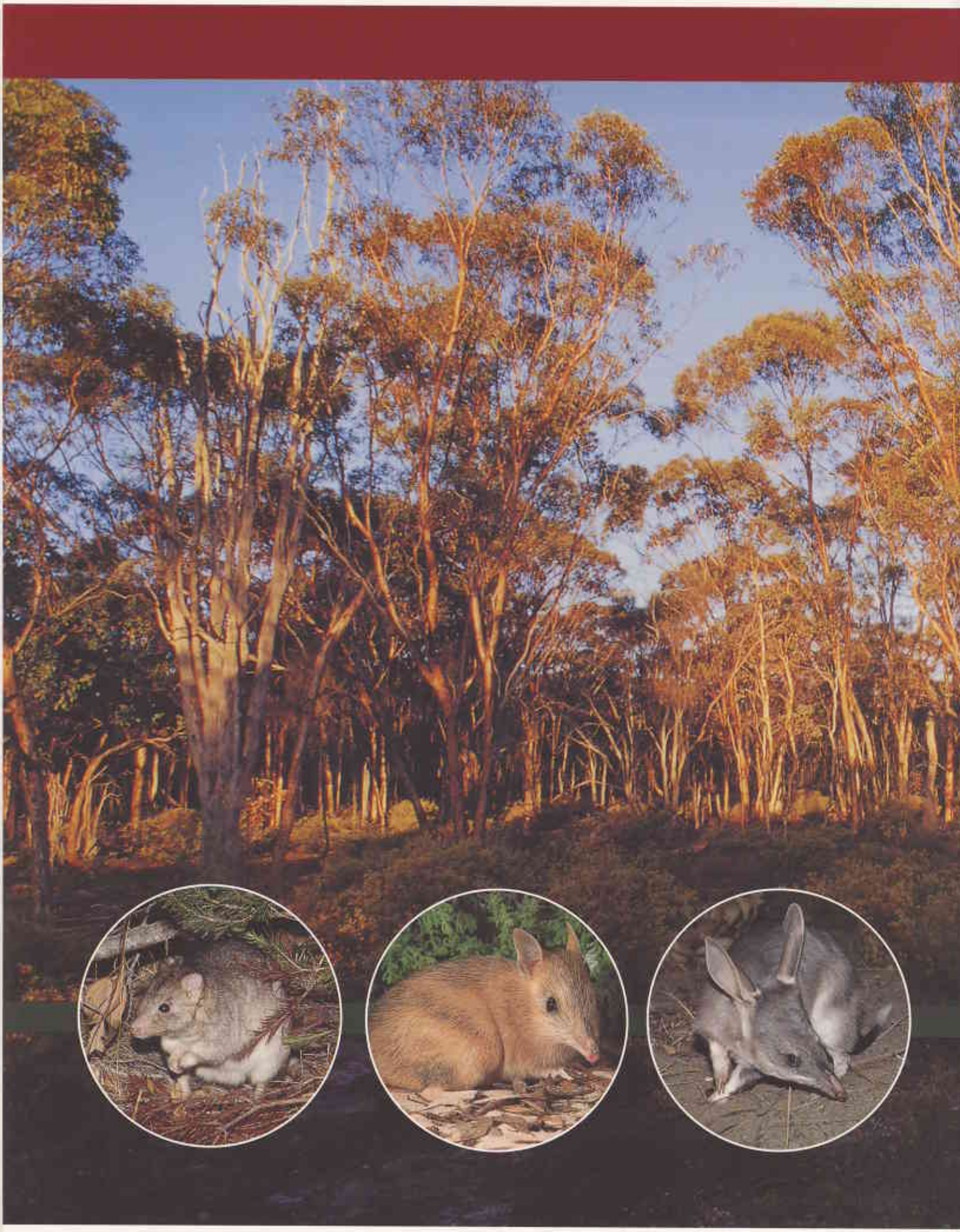
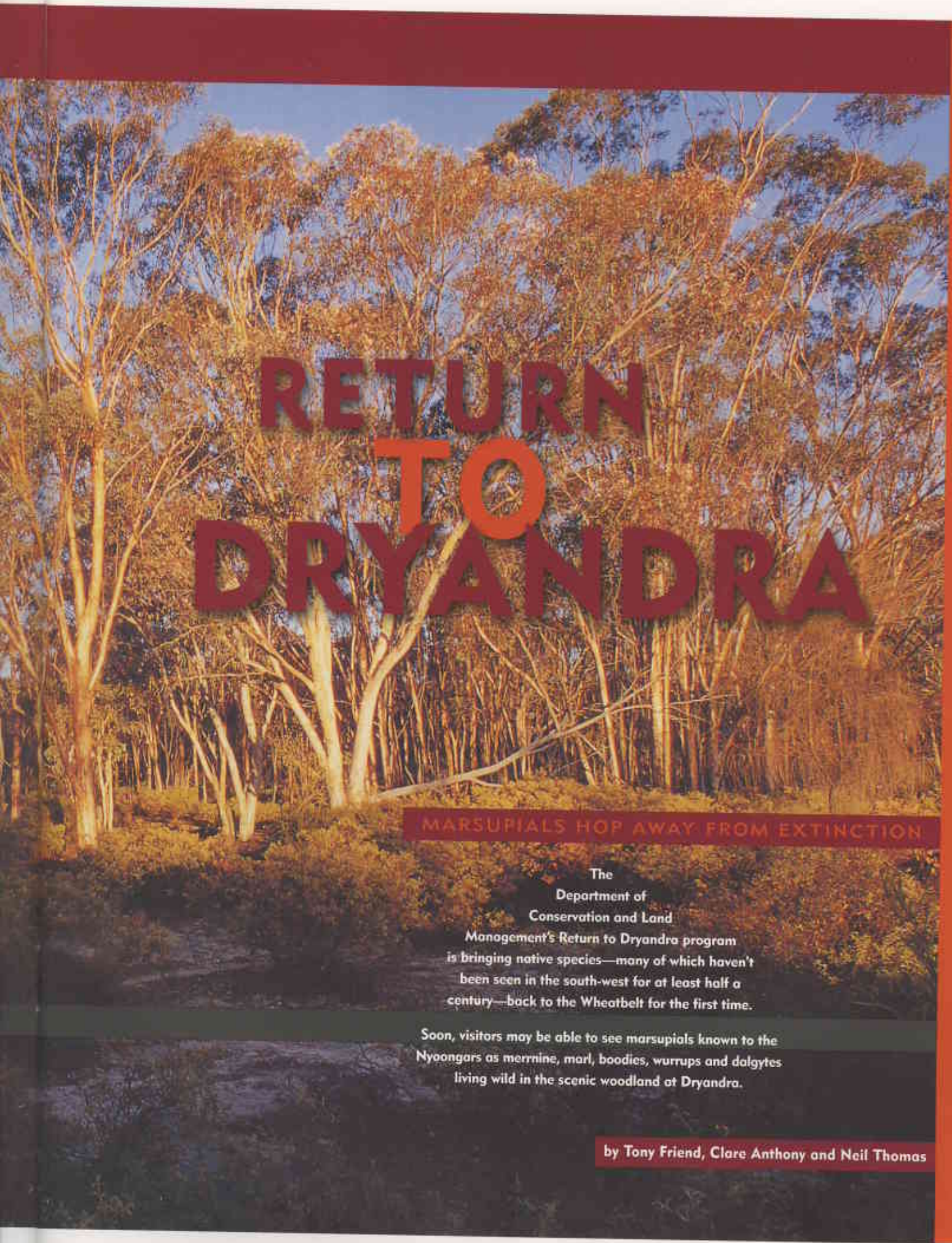




RETURN TO DRYANDRA

MARSUPIALS HOP AWAY FROM EXTINCTION

The Department of Conservation and Land Management's Return to Dryandra program is bringing native species—many of which haven't been seen in the south-west for at least half a century—back to the Wheatbelt for the first time.

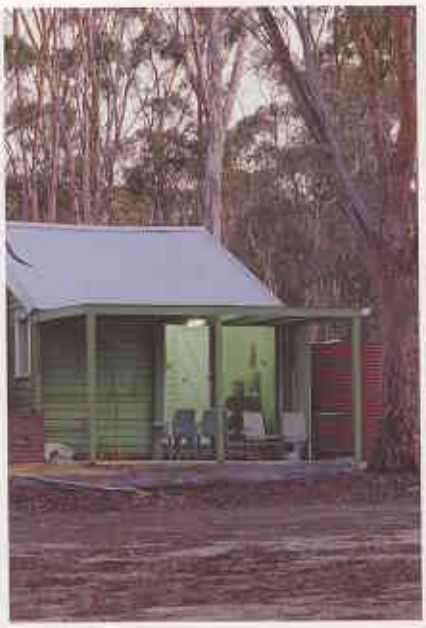
Soon, visitors may be able to see marsupials known to the Nyoongars as merrnine, marl, boodies, wurrups and dalgytes living wild in the scenic woodland at Dryandra.

by Tony Friend, Clare Anthony and Neil Thomas

In the 1800s, explorers and the first settlers travelling inland from the Swan River Colony found a spectacular array of small to medium-sized mammals they'd never seen before. Historical diaries and letters described the creatures as the most wonderful assortment they'd seen. Some were given English names, but many settlers used Nyoongar names.

Sadly, since European settlement, 11 species of native mammals have become extinct in Western Australia. Bruce Leake's *Eastern Wheatbelt Wildlife*, published in 1962, recalls 20 mammal species found in the early days on his family's Kellerberrin farm. As well as the woylie, quenda and tammar, he wrote about the bertie (pig-footed bandicoot), dalgyte (bilby), wurrung (crescent nailtail wallaby), merrnine (banded hare-wallaby) and wurrup (rufous hare-wallaby or mala).

In an environmental disaster, most of those animals had disappeared from agricultural areas by the 1950s. The clearing of native vegetation, coupled with the arrival of cats, rabbits and finally foxes, drove many medium-sized native mammals to local extinction. Although grey kangaroos, brush wallabies, brushtail possums and echidnas remained reasonably common, other species larger than a mardo (35 to 50 grams) disappeared or survived only in isolated colonies. Forever gone are the bertie, the wurrung, the broad-faced potoroo, the djooyalpi (lesser stick-nest rat) and others.



Fortunately, many of the mammals lost from the south-west agricultural areas survived in tiny parts of their former haunts. The merrnine and marl (western barred bandicoot) survived only on Bernier and Dorre Islands in Shark Bay, together with the boodie (also on two islands of the Barrow Island group) and the wurrup, which survived in the wild in the Tanami Desert until 1991. Dalgytes are still thinly but widely distributed in the Pilbara, southern Kimberley, Great Sandy Desert and Gibson Desert, where foxes and rabbits are scarce.

Previous page
Main: Dryandra Woodland.
Inserts (from left): A boodie forages in one of the breeding enclosures at Dryandra.
Photos – Michael James/CALM
Marl (western barred bandicoot).
Photo – Jiri Lochman
Dalgyte reintroduced into the woodland.
Photo – Michael James/CALM

Left: Accommodation at Dryandra Village is available in refurbished timber workers' cottages.

Below: Dryandra Woodland, as viewed from the firetower.
Photos – Michael James/CALM

Facing page, left: Early settlers in the south-west encountered marsupials such as the bertie (pig-footed bandicoot), which is now extinct.
Illustration – John Gould

DRYANDRA

Dryandra Woodland, near Narrogin, was not cleared because the land was used to grow brown mallet (*Eucalyptus astringens*) for tannin extraction, and because it was the catchment of a dam that collected fresh water for steam locomotives. Fortunately, the mallet plantation affected only a third of the area, leaving nearly 20,000 hectares of natural bush. By a lucky quirk, perhaps due to the presence of extensive thickets of *Gastrolobium* (poison plants deadly to introduced animals, but harmless to most native species), Dryandra continued to harbour a group of marsupials that had become extinct across most of the agricultural area.

In the 1980s, Dryandra was a haven for one of the last two populations of numbats and one of three colonies of woylies, as well as populations of the threatened tammar wallaby and kenggoor, or red-tailed phascogale. Even these species had fallen to very low levels by the late 1970s, after a rise in fox numbers across the south-west. The introduction of the rabbit flea to spread the fatal rabbit disease myxomatosis led to reduced use of 1080 to control rabbits. Foxes, which had been controlled because they ate poisoned rabbit carcasses, then increased in number.

In the early 1980s, Western Australian scientists began experiments to measure the effect of poisoning foxes with 1080 on native animal populations. Numbat numbers at Dryandra were monitored during one of these experiments. Sightings of numbats increased dramatically, as did the numbers of woylies, possums and tammars. Along with CALM Principal Research Scientist Jack Kinnear's ground-breaking study of rock-wallabies and fox control, the Dryandra experiment was the genesis of CALM's Western Shield predator control and reintroduction program. Because of the dramatic increase in Dryandra's marsupial populations, the woodland became the source of animals for several important translocation programs. These programs led to the removal of the woylie from the threatened species list and to the creation of seven new numbat populations in Western Australia and one each in South Australia and New South Wales.

Today, Dryandra is the focus of a burgeoning nature-based tourism industry in the Great Southern region, raising public awareness of Western Australia's fascinating marsupial fauna.

WESTERN SHIELD

The Western Shield program aims to reverse the extinction crisis facing many Western Australian mammals and birds. The concept is simple: first remove foxes by regular poisoning, then return a range of native animals to their former haunts, especially in the south-west. Since Western Shield began in 1996, 16 species have been reintroduced in 44 translocations to national parks, nature reserves, State forests and even private property, and three species have been removed from the State's threatened fauna list.

Many reintroductions involved direct transfer of animals from recovering wild populations to the destination site. Numbats, woylies, tammars and quendas have been reintroduced in this way. This method is best used when the source population is large and accessible and the destination site is close by. When source populations are remote, as in the case of the Shark Bay island mammals, it is very expensive to make repeated visits to remove translocation groups. If only small source populations are available, the removal of a group large enough for a translocation, say 20 to 40 animals, may be damaging. In the case of the dalgyte, which is sparsely distributed through remote parts of the State, both the cost and risk of damage are great. Large

Top: Twenty wurrups (rufous hare-wallabies) from the Tanami Desert were transferred to the Return to Dryandra breeding enclosure.
Photo – Jiri Lochman

Above: Merrnine (banded hare-wallabies) are vulnerable to predation by wedge-tailed eagles.
Photo – Marie Lochman

captive breeding colonies can solve these problems, but full-time staff and expensive facilities are needed to care for the animals. On release, the captive-bred animals still face a giant transition from caged life to life in the wild.

RETURN TO DRYANDRA

Return to Dryandra, run jointly by CALM's Narrogin District and CALMScience, aims to provide a cost-

effective solution to these difficulties and enable the reintroduction of marl, boodies, merrnine, wurrups and dalgytes to the south-west. These species have disappeared from the upper Great Southern region since European settlement. Dryandra Woodland, where many threatened species had successfully recovered, was a natural choice as an experimental reintroduction site.

The heart of the program is the Dryandra Field Breeding Centre—20 hectares of woodland surrounded by a 2.4-metre electrified fence. Heathland, tall shrubland, wandoo-marri and wandoo-sheoak woodlands provide a range of habitats, and predominantly sandy soils allow for burrow digging. Separated by a conventional fence, two 10-hectare compounds are set up so that mini-populations of these five endangered mammal species can be established and increase in number, eventually providing stock for release into Dryandra and elsewhere in the south-west. While the animals can find part of their natural diet in the enclosure, this is supplemented by specially formulated pellets and drinking water. This allows populations to grow to much higher numbers than resources within the 20 hectares would normally support.

Most animals released into the enclosure are fitted with radio-collars so that their movements and survival can be recorded. Any deaths can then be investigated promptly and, if possible, management changes made to reduce further deaths. Regular trapping is undertaken to monitor the condition, breeding status and numbers of each species.

HOW TO RELEASE?

One problem with reintroduction releases is the rapid dispersal of new animals away from the release site. Sometimes it causes loss of contact between members of the colony and movement away from suitable habitat.

Return to Dryandra aims to compare the release methods used for different animals, to ensure the best option is used during subsequent releases. It is an experiment that requires intensive monitoring, making Dryandra an ideal site because CALM staff are based at nearby Narrogin. The first experiment will be to compare animals released into the wild after a short period in an enclosure and animals released directly into the wild, to find out which release method results in less dispersal.

THE ANIMALS ARRIVE

Twenty wurrups were released into the Return to Dryandra enclosure on 26 March 1998. They were brought from the 'Mala Paddock', a 100-hectare enclosure near Willowra in the Tanami Desert, rather than from the Shark Bay island populations. Island animals tend to be predator-naïve and the Tanami animals were thought to be more suitable for mainland release because of their past exposure to mammalian

Above left: Tony Friend and a Kanyana volunteer release a captive-bred dalgyte inside the breeding enclosure.

Left: CALM's Clare Anthony and Tony Friend record details of one of the released dalgytes.
Photos – Michael James/CALM

predators. Subsequent genetic work has shown that the Tanami colony also has much more genetic variability than the island populations.

The Parks and Wildlife Commission of the Northern Territory (PWCNT) runs the Tanami facility with the assistance of traditional owners living in the Willowra community. Don Langford of the PWCNT carried out the transfer of the animals, which were captured over two nights. The wurrups were driven to Willowra, flown via Alice Springs to Perth, then taken by road to Dryandra. Don and CALM staff released the animals into the northern compound soon after dark on the same day. Two years later, Sandy Japangardi, the Willowra community's custodian of the mala story, and two other community members visited Dryandra to check on the animals. They left satisfied that CALM's program was in the interest of the species.

The wurrups preferred the enclosure's densely vegetated heath areas. In the desert and on the islands, they nest in a small scrape under spinifex (*Triodia* spp.) hummocks. In the enclosure they use low shrubs, the foliage of fallen branches, or vegetation resting on the ground surface.

Next to be released were three species from Shark Bay. Twenty boodies, seven marl and four merrnine were trapped over two nights in April 1998 near White Beach on Dorre Island. Each morning a helicopter took a consignment of animals to Denham where they were transferred to a light aircraft and flown to Narrogin. They were driven to Dryandra and released in the evening, less than 24 hours after capture. The boodies and merrnine were settled in the southern enclosure, which contains more woodland than heathland, while the marl were placed in the northern enclosure with the wurrups. CALM's Narrogin staff constructed eight artificial warrens for the boodies, which live communally underground in the wild.

On the first release night, 10 captive-bred marl were driven from Perth to Dryandra and released with the first of the island marl. These animals were the result of June Butcher's breeding program at Kanyana Wildlife Rehabilitation Centre—supported by CALM—that had been running in Gooseberry Hill since 1996. Since the first release, seven more Kanyana-bred animals have been released into the enclosure. The releases were carried out by CALM staff, Kanyana volunteers and local community members in an atmosphere of quiet joy and anticipation.

Top: A predator-proof fence surrounds the Return to Dryandra breeding enclosure in which breeding populations of five threatened species have been established.

Above: One of Dryandra's resident woylies is captured to check on its condition. Photos – Michael James/CALM

The marl preferred the dense heath habitat and quickly built their nests under the shrubs. The neatly-crafted nests, a mass of leaf litter in a bowl-shaped pit, were almost indistinguishable from the surrounding litter. Unfortunately, a few radio-collared marl fell victim to local owls, which quickly learned where extra food was to be found.

The boodies used their artificial homes and, while many other burrows have appeared, some original warrens, now greatly modified, are still used today. The merrnine chose two particular tall thickets in the southern enclosure under which they rest during the day. They were joined in September 2000 by another 13 merrnine from Dorre Island. Their greatest bane has been Dryandra's population of wedge-tailed eagles: at least three have been taken by these large raptors.

The dalgytes (bilbies) had a more tortuous path to Dryandra. Because

Grass trees within the proposed Return to Dryandra viewing enclosure.
Photo – Michael James/CALM

these fascinating animals live in small colonies scattered through the Great Sandy Desert, Pilbara and southern Kimberley, only small numbers could be captured at a time. Captive breeding —which avoids the inbreeding that occurs in a small colony—was needed to build up sufficient numbers to establish a colony in the enclosure. The dalgyte breeding program to supply the Dryandra enclosure is carried out at Kanyana. Frequent exchanges with CALM's Peron Captive Breeding Centre and interstate breeding programs avoid close breeding. Sixteen dalgytes were taken from the wild in Western Australia to found the Peron and Kanyana colonies, including three youngsters rescued after their mothers ended up in the cooking pot in a desert community. The others were caught by CALM staff at Shay Gap in the Pilbara, in the northern Great Sandy Desert and on Yakkamunga and Udialla stations in the Kimberley. The capture of dalgytes, captive breeding and monitoring wild populations have been supported by Coles Supermarkets' 'Save the Bilby' fund and BHP.

On 20 November 1998, five dalgytes were released into artificial burrows in the northern enclosure at Dryandra. Altogether, 31 Kanyana dalgytes have entered the Dryandra enclosure in a total of eight releases.

HOW HAVE THEY FARED?

The program to breed animals for release has had varied success. Boodies have bred up to about 40, and when eight of these were removed for an exchange with Earth Sanctuaries Limited, numbers quickly returned to that level. Most of the original animals are still present. It appears that the boodies' breeding and the survival of their young may be limited by the population size.

Marl and wurrups remain at similar numbers as were released. Wurrup numbers increased initially, but then dropped below the founder number. A change in diet formulation may have been the trigger that ended this decline and numbers are now back around their initial levels. Similarly, the number of marl fell at first, raising fears that Dryandra's resident masked owls, which were seen hunting in the enclosure on several occasions, had zeroed in on them. However, numbers have now risen again and at last trapping 20 were caught.

Merrnine have not fared very well. Despite the presence of wedge-tailed eagles on their native Dorre Island, the attractive little banded wallabies appear to be most vulnerable to their predation. Artificial shelters are being trialed to reduce their exposure to raptors.

Dalgytes have shown the most spectacular success, with more than 50 new animals captured during monitoring sessions. This success has seen dalgytes take the honours as the first species to be released from the enclosure into the Dryandra Woodland, in May 2001.

THE FUTURE

As numbers of animals in the enclosures rise, releases of further species will continue. The next exciting development in the Return to Dryandra program is the construction of an interpretive facility incorporating a viewing enclosure. Visitors will be able to walk among these rare mammals at night, recreating scenes that met the first white settlers. This project is being run by CALM Narrogin with support from a State Government Tourism Development Fund grant. Not only will Dryandra be hopping with marsupials, these engaging animals can once more become familiar to people of all ages, backgrounds and abilities.

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Winner of the 1998 Alex Harris Medal for excellence in science and environment reporting.

LANDSCOPE

VOLUME SIXTEEN, NUMBER 4, WINTER 2001

Western Australian botanists are taking part in a global plan to store seed from 10 per cent of the world's flora by 2010. See page 23.

Discover the rich bird life and tranquillity of the Canning River Regional Park on page 17.

Mushrooms the size of a dinner plate can appear within 48 hours of a fire in the karri forest. Read about forest fungi on page 48.

The Pilbara's numerous islands are rich in history, wildflowers and wildlife, with prolific marine life in the surrounding waters. See page 34.

Many of WA's threatened marsupials can be seen in the south-west for the first time in decades. Read about their return to Dryandra Forest on page 10.

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COVER

Paradoxically, the stinging tentacles of sea anemones—a group of carnivorous invertebrates that sometimes resemble colourful flowers—can also provide a safe haven for many underwater creatures. Anemonefish gain immunity to the stinging cells and live primarily in sea anemone tentacles. Other animals, such as crabs, carry a protective anemone on their backs. Turn to page 28.

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Colour Separation by Colourbox Digital
Printed in Western Australia by Lamb Print

Please do not send unsolicited material to *LANDSCOPE*, but feel free to telephone the editors.

Visit NatureBase at www.naturebase.net

Published by the Department of Conservation and Land Management, Dick Perry Avenue, Kensington, Western Australia

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA