



# bouncing back

BY KEITH MORRIS, ROGER ARMSTRONG, PETER GRELL AND MITZI VANCE

## Western Shield **UPDATE**

We are only two years into the *Western Shield* program and already three Western Australian native species have been brought back from the edge of extinction. Others are growing in abundance. Here we take a look at the successes of first two years and where we hope to be at the turn of the century.



Since 1996, Western Australia has made significant advances in native fauna recovery under the *Western Shield* program. When the program began, the aim was to capitalise on the two great natural advantages we have to reconstruct the native fauna of the State. The first of these is the ability to control feral predators with 1080 poison baits, without harming non-target species. The second is the presence of populations of threatened mammals on island nature reserves, in south-west forests and remnant vegetation, which provide the founder animals for captive breeding programs and translocations. These advantages have enabled the Department of Conservation and Land Management (CALM) to reverse the decline of many of our native animals by controlling introduced predators, the European fox and feral cat. Two years into the program, three native species have been brought back from the brink of extinction and removed from threatened fauna lists. Several other species are also

increasing in abundance and CALM hopes to recover at least 13 fauna species by the end of the century.

### THE SCIENTIFIC APPROACH

The backbone of *Western Shield* is the groundbreaking scientific research undertaken by scientists in WA.

In the 1960s, scientists in the then Department of Agriculture discovered that the native *Gastrolobium* plants in the south-west of WA contained the same '1080' poison that had been manufactured years previously as a rodenticide. In the early 1980s, scientists at the Agriculture Protection Board discovered that most native animals in the south-west had a tolerance to 1080 as they had evolved in the presence of the poisonous *Gastrolobium* plants. However, introduced species, such as foxes and rabbits, were highly susceptible to 1080 and so it was possible to manufacture poison baits that killed introduced pests, but did not harm native species. CALM scientists then demonstrated that abundances of several mammals increased in numbers when fox control was implemented.

In 1994, with funding provided by Alcoa of Australia, CALM embarked on Operation Foxglove, the first broadscale baiting program in the northern jarrah forest. Approximately 550,000 hectares of the forest was baited, and this provided the opportunity to research the most effective frequency of baiting.

The results of this work have suggested that baiting six times a year on the perimeter of the forest is optimal for fauna recovery, while four times a year in the central areas of forest is adequate. The woylie and chuditch have both benefited from this work and are now widespread throughout the northern jarrah forest. Another significant result was the finding of quokka populations in swamps near Dwellingup and Jarrahdale. This was a species that had declined significantly on the mainland over the last 50 years.

This research in the northern jarrah forest was the seed for the *Western Shield* initiative—the biggest wildlife recovery project ever undertaken in the world. Under *Western Shield*, CALM now aerial baits four times a year over more than 3.5 million hectares of conservation lands throughout the State, from Cape Range in the north-west to Cape Arid in the south-east. More than 770,000 baits are laid each year.

Control of feral cats is far more difficult and a major research program is under way at Peron Peninsula (see *LANDSCOPE*, Summer 1998) and other arid parts of WA. Until feral cats can be controlled effectively, *Western Shield* will remain focussed in the south-west of the State.

### CAPTIVE BREEDING—THE KEY

Many of the native wildlife species that *Western Shield* aims to recover

#### Previous page

Western barred bandicoot.

Photo – Max Lawrence

**Below right:** The introduced European red fox has wreaked havoc on our native fauna.

Photo – Dennis Sarson/Lochman Transparencies

**Below:** Dried meat injected with 1080 toxin is an effective form of fox control.

Photo – Max Lawrence



now occur at very low population levels in the wild—some only occur on one or two offshore islands. Their numbers need to be increased in captivity before they can be reintroduced into areas where foxes and cats are being controlled.

A number of captive breeding programs have been established to support *Western Shield* reintroductions. At Kanyana Native Fauna Rehabilitation Centre, bilbies (*Macrotis lagotis*) and marl (*Perameles bougainville*) are being bred, while at Perth Zoo, chuditch (*Dasyurus geoffroii*), numbat (*Myrmecobius fasciatus*), dibbler (*Parantechinus apicalis*), wopilkara or greater stick-nest rat (*Leporillus conditor*), djoongari or Shark Bay mouse (*Pseudomys fieldi*) and western swamp tortoise (*Pseudemydura umbrina*) breeding programs have been under way for some time. Recently, CALM has established captive breeding facilities at Peron Peninsula and Dryandra forest to breed the bilby, marl, boodie (*Bettongia lesueur*), mala (*Lagorchestes hirsutus*), banded hare-wallaby (*Lagostrophus fasciatus*) and malleefowl (*Leipoa ocellata*). Another CALM captive breeding facility was established at Two Peoples Bay Nature Reserve near Albany to breed the critically endangered Gilbert's Potoroo (*Potorous gilbertii*).

## RETURN TO THE MAINLAND

Two of WA's most threatened mammals have been brought back onto the WA mainland, after being absent for more than 80 years. The banded hare-wallaby originally occurred throughout the semi-arid parts of south-west of WA, while the mala was distributed across large areas of central WA, Northern Territory and the far north-west of South Australia. Both species now have only very restricted ranges in the wild; either on island nature reserves that are fox and cat free, or in predator-free enclosures.

Thirty banded hare-wallabies, 18 boodies and 47 marl or western barred bandicoots, have been taken into captivity at Peron Peninsula and Dryandra from Bernier and Dorre Islands in Shark Bay, while 30 mala, or rufous hare wallabies, from the Tanami

**Right:** The woylie has been removed from threatened fauna lists as a result of fox control and translocations. Photo – Anne Storrie

**Below:** Trapping is an effective way of controlling feral cats. Photo – Jiri Lochman



Desert have been moved into captivity at Dryandra. Another 20 mala will be moved to Peron Peninsula later this year. In addition, CALM staff also captured marl and boodies at Bernier and Dorre Islands and moved them to the captive breeding facilities at Dryandra. Numbers of animals will be increased by breeding in purpose-built compounds before being released at sites in the Wheatbelt and Goldfields regions and on Peron Peninsula.

Thirty mala were also flown in early June from the Tanami Desert, in the Northern Territory, to feral predator-free Trimouille Island, off the coast of Western Australia (further details of to be revealed in a future *LANDSCOPE* story). This, together with the captive breeding programs at Peron and Dryandra, is a significant step forward in re-establishing the critically

threatened mala in parts of its former range.

## FAUNA RECOVERY BY REINTRODUCTION

Once feral predator numbers are under control and sufficient numbers of animals are available either from captive breeding or in the wild, the slow and careful process of restoring threatened native mammals can begin. Comprehensive research is undertaken to determine the most suitable species and the best release locations throughout the State. Over the last two years, fox control and captive breeding has made it possible to reintroduce many native animals into areas where they once thrived. In addition to these reintroductions, fox control has led to significant increases in populations of animals that were already present, but

at low levels. For example, in 1985, before fox control was implemented, one woylie was caught per 100 traps set at Batalling forest. In 1997, six years after fox control was commenced, more than 50 woylies were captured per 100 traps set. Previously unknown populations of native animals have also

increased. The most significant find to date has been the rediscovery in 1994 of Gilbert's potoroo (*Potorous gilbertii*) at Two Peoples Bay Nature Reserve on the south coast (see *LANDSCOPE*, Autumn 1995). Prior to that, Gilbert's Potoroo had not been recorded since 1879. At Lake Magenta Nature Reserve, the

quenda and brushtail possum (*Trichosurus vulpecula*) were 'discovered' after only 12 months of fox control.

Other areas of the State have also recorded an increase in numbers of native animals that were once very low in the wild. Euro (*Macropus robustus erubescens*) and echidna (*Tachyglossus aculeatus*) sightings and tracks are now common on Peron Peninsula, and malleefowl have also been sighted at Kalbarri National Park, Dongolocking Nature Reserve and Boyagin Nature Reserve. chuditch have been trapped at Yalgorup National Park and Leschenault Conservation Park, the first records in these coastal areas for 50 years. Recently, a Chuditch road kill was collected on Kalamunda Road near the north boundary of Perth Airport.

### SUCCESSFUL WESTERN SHIELD REINTRODUCTIONS OVER THE LAST TWO YEARS INCLUDE:

- ① western ring-tail possum (*Pseudocheirus occidentalis*) to Lane Poole Conservation Park, Yalgorup National Park and Leschenault Conservation Park.
- ① Thevenard Island form of the Lakeland Downs short-tailed mouse (*Leggadina lakedownensis*) to Serrurier Island.
- ① malleefowl to Francois Peron National Park.
- ① woylie to Francois Peron National Park, the Hills Forest, Julimar Conservation Park, Lake Magenta Nature Reserve and parts of the northern jarrah forest.
- ① chuditch to Lake Magenta Nature Reserve and Cape Arid National Park.
- ① numbat to Mt Dale forest and Dragon Rocks Nature Reserve.
- ① noisy scrub-bird (*Atrichornis clamosus*) into jarrah forest near Harvey.
- ① quenda (*Isodon obesulus fusciventer*) to Dongolocking Nature Reserve, the Hills Forest, Leschenault Conservation Park.
- ① tamar wallaby (*Macropus eugenii*) to Batalling Forest.
- ① western swamp tortoise to Twin Swamps Nature Reserve.

Measurements are taken of all the animals used in captive breeding programs.

Photo - Peter Speldewinde



Echidna numbers are now increasing at Peron as a result of fox control.  
 Photo – Dennis Sarson/Lochman  
 Transparencies

## QUENDA & TAMMAR WALLABY DELISTED

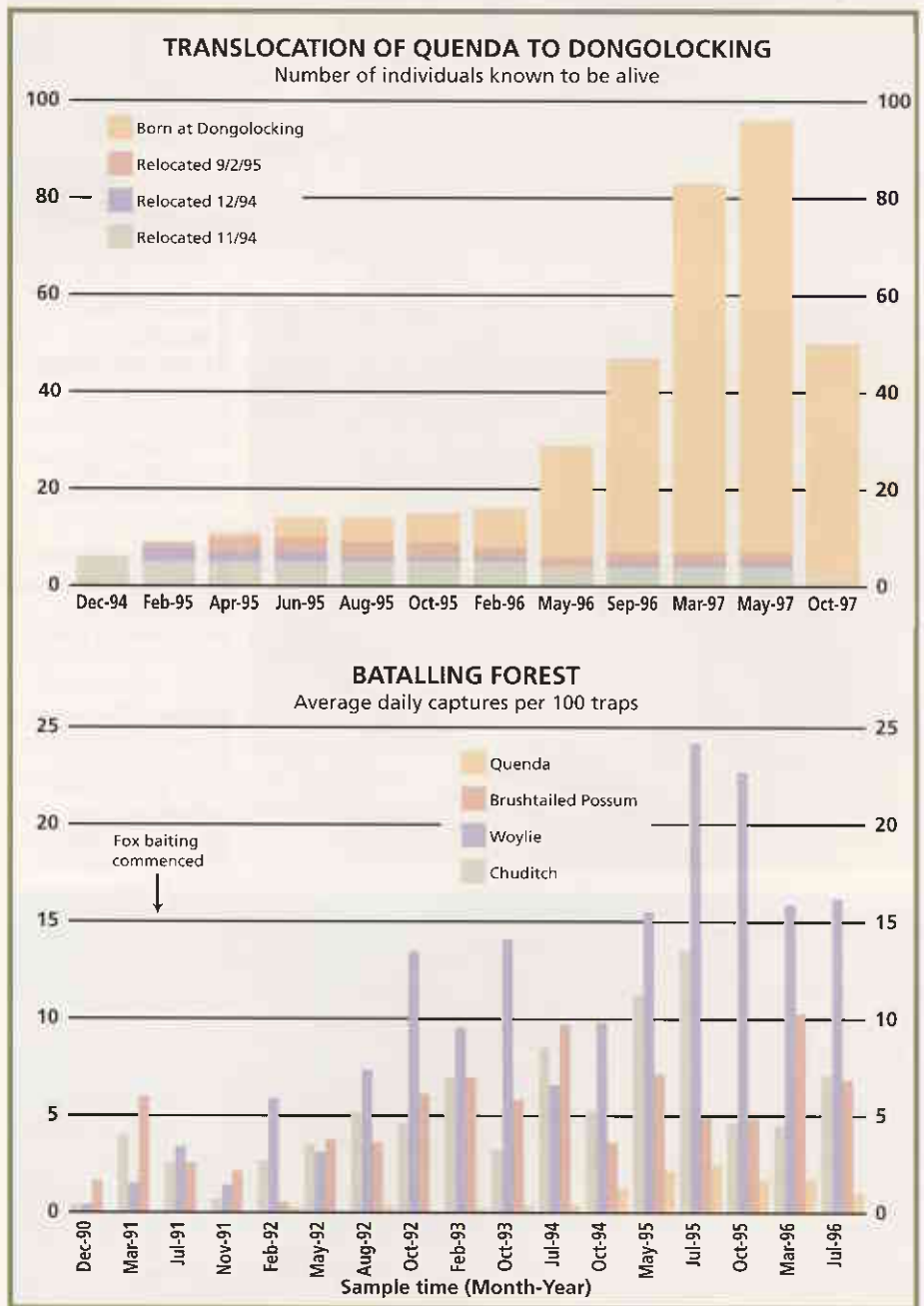
Recently, the quenda and the tammar wallaby were removed from the State's threatened fauna list as a result of their recent recovery and ongoing management under the *Western Shield* program. Their removal followed a review by the Threatened Species Scientific Committee, using criteria established by the IUCN (World Conservation Union), and they now join the woylie, which was removed from the State, national and international lists in 1996.

Quenda are found throughout the south-west of the State and now exist in high numbers where fox control is in place. In the jarrah forest, at Batalling and Kingston, quenda trap success rates have increased more than five-fold since the introduction of fox control. Quenda population recovery has also been achieved through animal relocations. At Dongolocking Nature Reserve, 24 quenda were reintroduced in 1994—this population has now grown to around 200 animals.

Tammar wallabies are found in several locations in the south-west and on some offshore islands, including Garden Island near Rockingham. Tammar wallabies have responded rapidly to fox control and are now increasing in abundance at several locations such as Perup Nature Reserve, Dryandra and Batalling. Fox control at Tutanning Nature Reserve has resulted in a 20-fold increase of tammar wallabies since 1984.

## EAST FOLLOWS WEST

WA's success with wildlife recovery has prompted conservation agencies in other States to implement similar programs. In New South Wales, there have been discussions about the development of an 'Eastern Shield' program, and fox control is now being considered as a major fauna management strategy in Victoria. In South Australia, fox control is now being implemented more widely and several threatened species such as



greater stick-nest rats and bilbies are being translocated to areas where foxes are controlled.

Genaren Hills Sanctuary in NSW, with the support of the NSW National Parks and Wildlife Service, has sought advice and expertise from CALM, as well as a number of woylies from Dryandra forest were flown to NSW in

April for reintroduction at the sanctuary. CALM staff trained Genaren Hill Sanctuary staff prior to the translocation in the handling, caring and monitoring of woylies.

### COMMUNITY INVOLVEMENT

One of the major reasons for *Western Shield's* success has been the support of the community and private

landowners. In the past three years, local communities have been extremely cooperative and understanding about the necessity to bait for introduced predator control. Community-based liaison between local community groups, CALM District offices and Agriculture WA, has resulted in local involvement and support.

Catchment groups, Land Conservation District Committees (LCDCs) and Bushfire Brigades have participated in baiting programs to protect agriculture values and wildlife values on farms.

Many residents in regional areas have also taken an avid and enthusiastic interest in predator control and been keen reporters of native animal sightings. Many landowners have embarked on baiting programs on their own properties, especially those with land adjacent to or near conservation estates. In some areas, the participation rate of farmers exceeds 90 per cent. For example, coordinated community baiting in the Jerramungup area, in the Wheatbelt, has been instrumental in the increased sightings of brush wallaby (*Macropus irma*) on farms and remnants of vegetation. Gnowangerup-Borden LCDC and the Malleefowl Preservation Group coordinate community baiting over more than 100,000 hectares, including a CALM nature reserve, which has resulted in an increase in malleefowl breeding activity and survival. The Malleefowl Preservation Group not only encourages farmers to bait land areas, it also assists CALM in malleefowl captive breeding programs by helping to locate nests and monitor populations in the wild. The North Central Malleefowl Preservation Group coordinates an annual baiting exercise in which more than 100 farmers bait almost 300,000 hectares of farmland and remnant vegetation in the Dalwallinu and Wuben areas to protect malleefowl.

The Stirling and Wellstead LCDCs undertake baiting over 20,000 hectares adjacent to Stirling Range National Park for rabbit and fox control, which has contributed to an increase in sightings of quenda, brush wallabies and ground-nesting birds, such as the banded lapwing, on their farms. Landcare



**Above:** Hare-wallabies and bandicoots being transferred by helicopter to the Peron captive breeding facility. Photo - Max Lawrence

**Left:** The bilby is one of the mammals that will benefit from *Western Shield*. Photo - Jiri Lochman

**Below:** The captive breeding enclosure at Dryandra will breed animals for release into the Wheatbelt region. Photo - Jiri Lochman



groups in the Peel Harvey area have put out 2,000 egg baits annually for the past three years to control foxes on their properties, while farmers in the Boyup Brook area have regularly baited 44,000 hectares to protect their lambs and their wildlife.

Likewise, local government authorities have played an important role in helping CALM facilitate its baiting programs.

The war against 'killing machines' has also been greatly helped by corporate sponsorship from Alcoa of Australia and Cable Sands WA Pty Ltd. Other organisations who have also offered valuable support include West Australian Petroleum Pty Ltd, Apache Energy, ACI Plastics Packaging, Crop Care Australia, Selleys Chemical Company, Coles Myer Ltd and Shell Australia.

## EDUCATION – THE KEY TO THE FUTURE

The *Western Shield* project does not stop at feral predator control and wildlife recovery. An important part of the project's success is the education of young Western Australians on the importance of our native wildlife for future generations. To this end, CALM has created the *Western Shield Action Pack* for upper primary school students, which encourages awareness of the conservation of WA's native fauna species.

The pack provides teachers with four ready-made lessons on WA's threatened native animal species and includes teacher's notes, resource sheets, activity sheets and suggestions for extension activities that all link to primary school curriculum subjects of Society and Environment, Science, Mathematics and Language. The *Western Shield Action Pack* and excursions have proved to be an excellent way to encourage and promote awareness in children about our native wildlife, the partnerships between flora and flora and WA's environment. As a result of these experiences the number of students that understand the impact of feral predators on our wildlife soared from 59 to 81 per cent. The interest in conserving threatened animals also increased from 55 to 89 per cent.

## WESTERN SHIELD FACTS

- ☉ Aerial baiting utilises a twin-engine aircraft operating at an altitude of 150 metres and 300 km/h. Baiting operations continue for more than six weeks each time, four times a year.
- ☉ 132,000 kilometres flown per annum, this is equivalent to 3.3 times around the world.
- ☉ Baiting covers 3.4 million hectares; which is equivalent to 53 per cent of the land area of Tasmania.
- ☉ The aircraft utilises a Global Positioning System (GPS) and specialised navigation software to locate the aircraft within 30 metres of its true position.
- ☉ Baits are laid at 200-metre intervals along parallel flight lines one kilometre apart resulting in five baits per square kilometre. A red light indicator prevents baits being laid outside the baiting target. The location of every bait leaving the aircraft is recorded. The aircraft flight track and bait locations are down loaded and plotted after each operation.
- ☉ 770,000 baits are laid each year (including aerial and ground baiting operations).
- ☉ Baits are laid four times per annum over the majority of the baited area, although smaller reserves are baited more frequently (monthly) by hand.

## BANKSIA ENVIRONMENT AWARD

CALM's innovative approach to fauna recovery recently won the Banksia Environmental Award for flora and fauna conservation. Run by the community-based Banksia Environmental Foundation, the Banksia Awards were launched 10 years ago and have become Australia's most comprehensive environmental awards.

The award is tangible recognition for the thousands of hours spent by hundreds of people during the first two years of the *Western Shield* program. Several major battles have already been won resulting in three native animals being taken off the threatened species list. The next two years should see that number increase. And if we are successful, the future looks very good indeed for many Western Australia's native animals.



In WA, the rufous hare-wallaby, or mala, is now restricted to two islands and two captive locations at Peron and Dryandra.

Photo – Marie Lochman

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# LANDSCOPE

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Can WA's sharefarming plantations also help fight greenhouse gases? See 'Farming Carbon' on page 17.



With increased numbers of travellers, the Canning Stock Route is in need of some TLC. See 'A Track Winding Back' on page 10.



The job of a CALM Wildlife Officer is as much about dealing with people as it is about protecting our native wildlife. See 'On the Wild Side' on page 23.



The Esperance Lakes Nature Reserves are a haven for water birds and a significant international wetland. See 'Picture the Lakes' on page 36.



There are billions of tiny white shells lining the 150-km Shell Beach in Shark Bay. But why are there so many concentrated here? Find out more on page 49.

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Two years into the Western Shield program and already three Western Australian native species have been brought back from the edge of extinction, and others are growing in abundance. 'Bouncing Back', on page 28, looks at the successes of the first two years and at where we hope to be at the turn of the century.

Illustration  
by Philippa Nikulitsky



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