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June 1998

# Western Shield

Western Australia has achieved major breakthroughs in bringing native animals back from the brink of extinction by controlling introduced predators under the *Western Shield* program.

This Department of Conservation and Land Management (CALM) project is reaping real rewards with milestone successes in its two years of operation. As more of the project's short term goals are reached and significant inroads are made into scientific research, all those involved in the project are realising the implications it has for wildlife conservation world-wide.

The knowledge gained from years of scientific research into fox-baiting enabled CALM to begin *Western Shield* in 1996. The aim of the project is to bring native animals back from the brink of extinction by controlling introduced predators—the European fox and feral cat—through baiting. Already, three native species have been brought back from the brink of extinction as a result of comprehensive predator control.

This achievement is a first for WA in restoring nature's balance and the first time in Australia that the conservation status of native animals has been improved as result of successful management. Within a few years, CALM hopes to bring at least 13 native species back from the brink.

CALM has received generous corporate sponsorship from Alcoa of Australia and Cable Sands WA (Pty Ltd) for the *Operation Foxglove* (northern jarrah forest) and *Coastal Storm* (D'Entrecasteaux-Shannon) components of the *Western Shield* program respectively.

## SCIENCE – the answer

The backbone of *Western Shield* is the ground-breaking research undertaken by CALM scientists who demonstrated that several declining mammal species could be brought back into abundance by controlling introduced predators. Through the use of the naturally occurring poison, sodium monofluorocetate, better known as '1080', which is found in the native plant

genus *Gastrolobium*, CALM has been able to achieve fox control over large areas. Though the poison is deadly to introduced species, native wildlife has evolved with this chemical and has a high tolerance to it.

A number of projects have been undertaken by CALM staff to improve the use of '1080' for predator control, including research to determine the optimum baiting regime and the size, number and structure of baits used.

In 1994, in conjunction with Alcoa of Australia, CALM embarked on *Operation Foxglove*, the first broadscale baiting program in the northern jarrah forest where approximately 550,000 hectares were baited. This resulted in a major reduction in fox numbers and an increase in the number and range of native animal species. A momentous occasion for the project was the discovery of quokka populations near Dwellingup and Jarrahdale – a species that had declined significantly on the mainland in the past 50 years.



Above: 'Poison Peas' contain the naturally occurring poison '1080'.

Photo - Bert & Babs Well/CALM

Left: Preparation of 1080 dried meat baits.  
Photo - Max Lawrence/CALM



This research in the northern jarrah forest, along with knowledge gained from earlier fox baiting research projects in other parts of the State, provided the basis for the *Western Shield* initiative – the biggest wildlife conservation project undertaken in Australia. Under *Western Shield*, CALM now aerially baits four times a year over more than 3.5 million hectares of conservation lands throughout the State. Almost 1.7 million baits have been laid since the project began.

Through ongoing scientific research, CALM aims to further develop predator control techniques and fauna recovery plans.



# Project Eden –

## predator control haven in the semi-arid zone

To complement the work being done in the northern jarrah forest in the southwest of the State through *Foxglove*, CALM embarked on a similar project for the State's arid region. Aptly titled *Project Eden*, the work aims to control all introduced predators on the 1050 square kilometre Peron Peninsula and turn it into a haven for threatened native animals.

It is the biggest semi-arid zone nature conservation program undertaken in Australia and aims to reverse the decline of a wide range of native animals caused by fox and feral cat predation.

If the project succeeds, Peron Peninsula will become the biggest conservation area in Australia to support

stable populations of a number of endangered species in the wild. It will also be a significant addition to what is one of WA's most treasured natural assets—the Shark Bay World Heritage Area—enhancing its environmental values and providing nature-based tourism attractions.

Since *Project Eden* began three years ago, CALM has all but eliminated foxes on the Peninsula through comprehensive baiting. More than 20,000 fox baits have been laid since the project began, resulting in the death of an estimated 2500 foxes. This has reduced fox numbers to virtually nil. No foxes have been seen on the Peninsula in the past six months.

While fox control alone appears to be adequate to facilitate fauna recovery in the southwest, it is not enough for the State's arid zones. Research has shown that where fox numbers are reduced in these areas, feral cat numbers may increase and, compared to the fox, the feral cat has been much harder to control.

Cats do not readily take bait when there is live prey around. To combat this, CALM scientists have



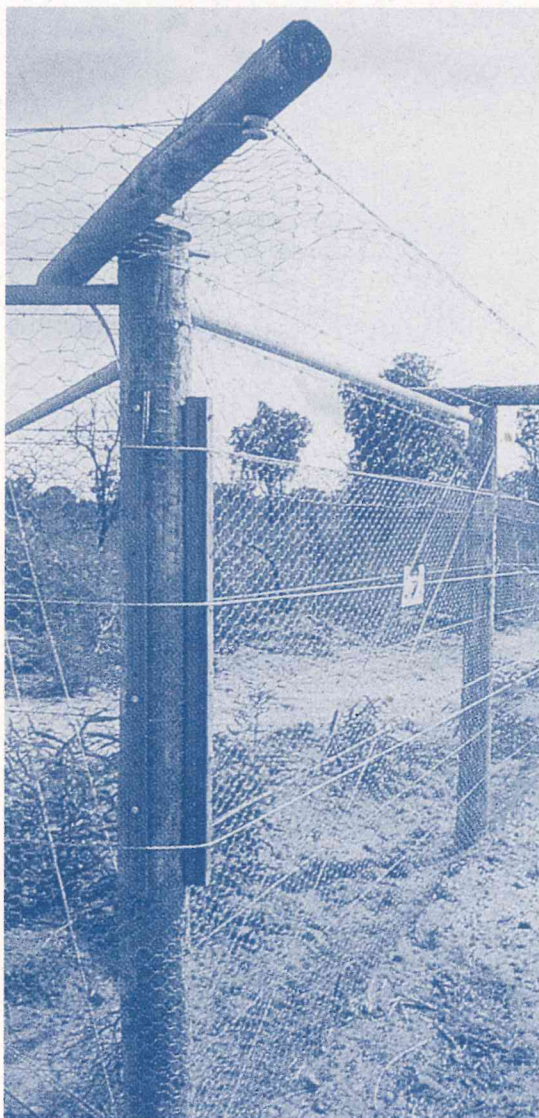
Above: Trapped feral cat.  
Photo - Ray Smith/CALM

been developing a new bait, which at certain times is proving very attractive to cats. They have also developed an innovative trapping technique involving the use of special lures. This is proving to be an invaluable tool for controlling cats.

This method has worked very well, sparking the beginning of a comprehensive continuous trapping program. It involves laying traps on every kilometre of track on the Peninsula. In a four-month period of intense trapping, a total of 261 adult cats and 171 kittens were removed, reducing the cat population to less than one cat per 10km<sup>2</sup>.

To complement the baiting and trapping and to prevent re-invasion of foxes on the Peninsula, CALM built a specially designed barrier fence across the isthmus near Shell Beach. The 3.4 kilometre electrified fence prevents animals from digging under or climbing over. A high-pitched sonar recording has been constructed at the gateway. If any foxes, dogs or cats approach the gateway, they trip the sonar, which is undetectable to human ears but scares the predators away. The fence is also intensively baited along both sides on a regular basis. All of this has played a significant part in keeping ferals out.

Restoring native fauna has begun with the successful reintroduction of malleefowl and woylies to Peron Peninsula. Plans are now under way to reintroduce other species that once occurred in the area, including the Shark Bay mouse, bilby and mala.



Above: Fox numbers have been reduced to virtually nil on the Peninsula.

Photo - Ray Smith/CALM

Left: Electrified 3.4km barrier fence assists in keeping predators out of the Peninsula.

Photo - Babs & Bert Wells/CALM



# CAPTIVE BREEDING

Tragically, many of the native wildlife species *Western Shield* aims to help recover are at very low numbers in the wild. It would take many decades for them to naturally re-establish their populations.

These species include the Mala or Rufous hare-wallaby (*Lagorchestes hirsutus*), Western barred bandicoot (*Perameles bougainville*), Greater stick-nest rat (*Leporillus conditor*) and the Shark Bay mouse (*Pseudomys fieldi*). Some other species such as Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroyi*) are still found in some areas of the southwest but have become extremely rare in the rest of the State. Some only occur on one or two offshore islands. Therefore, it has been essential to increase these species numbers in captivity before they can be reintroduced into areas where foxes and feral cats are being controlled.

A number of captive breeding programs have been established to support *Western Shield* species recovery plans. In the Perth region, seven such programs are under way. In collaboration with Kanyana Native Fauna Rehabilitation Centre, in Perth's hills, CALM has instigated Bilby and Western-barred bandicoot breeding programs. Likewise, with Perth Zoo, it has set up Chuditch, Numbat,



Above: Kanyana Native Fauna Rehabilitation Centre founder June Butcher with twin baby bilbies born at the centre.  
Photo - Ann Storrie/CALM

Greater stick-nest rat, Shark Bay mouse and Western Swamp tortoise breeding programs. Bilby, Malleefowl, Mala and Banded-hare wallaby breeding programs, complete with breeding enclosures, have been built at Peron Homestead. A similar facility has been established at Dryandra for the bilby, mala, boodie and banded-hare wallaby.

The bilbies at Kanyana and Peron's captive breeding facility were caught in the Kimberley and Pilbara. So far 10 bilbies have been born in the program.

Eggs for the malleefowl breeding program were collected from mounds near Dalwallinu in the Wheatbelt with the help of the Malleefowl Preservation Group. The eggs were transported to Peron where they were artificially incubated. More than 40 malleefowl were hatched from the eggs collected and raised to six months of age before being released. Similar success was achieved with a second lot of eggs collected in November 1997. Malleefowl Preservation Group leader Susan Dennings' advice and visit to Shark Bay have been invaluable to the breeding program. Another release of captive-bred birds is planned for later this year.

The captive breeding programs have received great support from a number of private organisations such as Coles Myer Ltd, which generously donated a percentage of the profits received from the sale of chocolate Easter bilbies for the conservation of the species.

Below: Shark Bay mouse.

Photo - Bert & Bab Wells/CALM

Right: Just hatched malleefowl chick being weighed at Peron's captive breeding program.

Photo - Colleen Simms/CALM





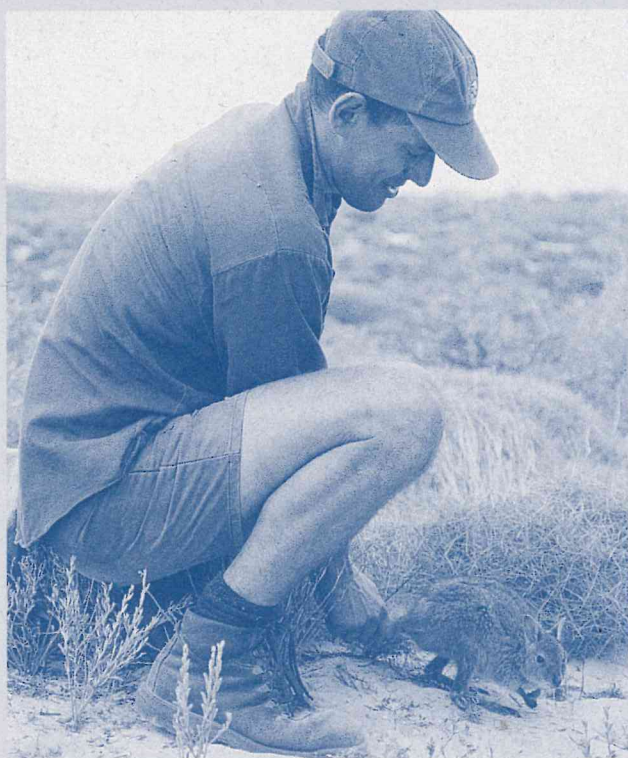


Above: CALM scientist Tony Friend with captive bred western barred bandicoot.

Photo - Mitzi Vance/CALM

Below: CALM ecologist Peter Speldewinde with a trapped banded-hare wallaby on Bernier Island.

Photo - CALM



## Return to the mainland

Two of WA's most threatened mammals have been brought back into the Shark Bay region, more than 80 years after they became extinct on the mainland.

Banded hare-wallabies (*Lagostrophus fasciatus*) from Bernier and Dorre Islands in Shark Bay, have been brought into captivity at Peron Peninsula and Dryandra, while Rufous hare-wallabies or Mala (*Lagorchestes hirsutus*) from the Tanami Desert have been brought into captivity in Dryandra.

For the last 80 or so years the banded hare-wallaby has been restricted to only Bernier and Dorre Islands in Shark Bay, while the rufous hare-wallaby or mala was restricted to these two islands and the Tanami Desert in Central Australia. In recent years the wild populations in the Tanami have become extinct and now only exist in managed breeding colonies.

The banded hare-wallaby originally occurred throughout the southwest of WA while the mala was distributed across large areas of central WA, Northern Territory and far

northwest of SA. Both species now only occur either on island nature reserves that are free of foxes and cats, or in predator-free enclosures.

During a two-week period in May, CALM staff captured western barred bandicoots, banded hare wallabies and boodies from Bernier and Dorre islands and moved them to feral predator proof enclosures on the mainland for breeding.

Twenty of each of the three species captured from the islands were flown to Dryandra in the Wheatbelt region, with another 20 banded hare-wallabies and western barred bandicoots taken to Peron Peninsula. Numbers of animals will be increased in purpose-built breeding cages 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 to feral predator-free Trimouille Island off the coast of Western Australia with the help of the NT Parks and Wildlife Commission and Apache Energy. This mala translocation to Trimouille Island—in the Montebellos Islands group—follows the transportation of 20 mala from the NT to Dryandra Woodland in March. These translocations are a significant step forward in re-establishing the critically threatened mala to its former home range.



Above: Baby woylie—numbers of the species have increased substantially as a result of fox control.

Photo - Mitzi Vance/CALM

## Fauna recovery

Once feral predator numbers are under control, the slow and careful process of restoring colonies of threatened native mammals in WA can begin.

Comprehensive research is undertaken to determine the most suitable species and the best release locations throughout the State. This includes literature searches, examination of historical accounts of species occurrences, habitat surveys, the acquisition of habitat data for selected species and many visits to locations where prospective species for re-introduction were last recorded.

Fox control has made it possible to

reintroduce native animals into areas they once thrived. These reintroductions include:

- Western ring-tail possum to Lane Poole Conservation Park and Yalgorup National park;
- Pilbara Short-tailed mouse to Serrurier Island;
- Malleefowl to Francois Peron National Park;
- Woylie to Francois Peron National Park, the Hills Forest, Batalling forest, Boyagin Nature Reserve, Julimar Conservation Park and Lake Magenta Nature Reserve;
- Chuditch to Lake Magenta Nature



Reserve and Cape Arid National Park;

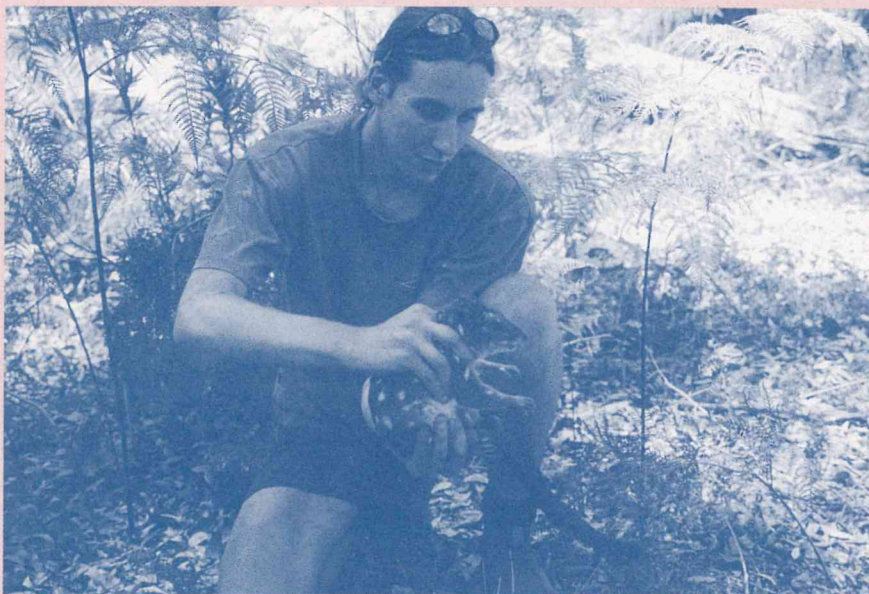
- Numbat to Mt Dale, Dragon Rocks Nature Reserve, Karoun Hill Nature Reserve, Boyagin Nature Reserve and Tutanning Nature Reserve;
- Noisy scrub-bird into the Darling Range;
- Quenda to Dongolocking Nature Reserve, the Hills Forest, Leschenault Conservation Park; and
- Tamar wallaby to Batalling forest.

All reintroduced animals are the subject of monitoring programs after release and many are fitted with radio collars.

In addition to these reintroductions, fox control has led to significant increases in populations of native animals that were existing at low levels. For example, in 1985 before fox control was implemented, one woylie was caught per 200 traps set at Batalling forest. Now it is common to catch more than 100 woylies per 200 traps. Likewise, monitoring late last year has shown that the translocation of 28 quenda to Dongolocking Nature Reserve in 1994 had resulted in the birth of 85 new individuals.

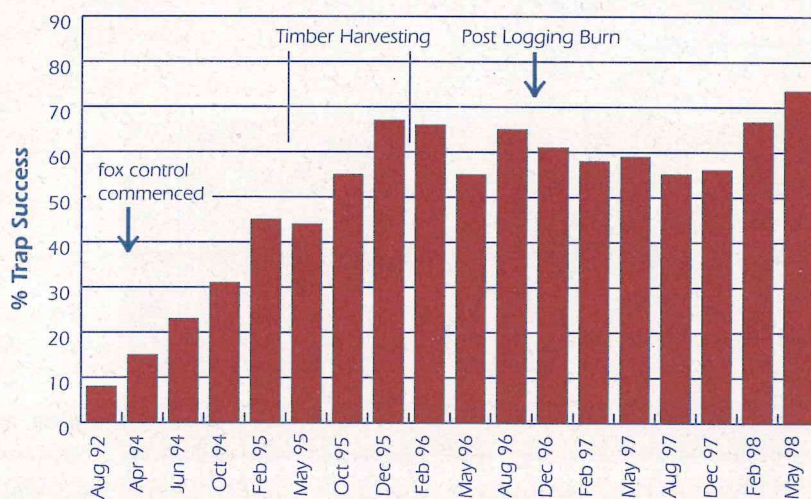
Previously unknown populations of native animals have also appeared. The most significant find to date has been the rediscovery of Gilbert's potoroo at Two Peoples Bay Nature Reserve on the southcoast. Prior to that, Gilbert's Potoroo had not been officially recorded since 1879. At Lake Magenta Nature Reserve, the Quenda and Brushtail possum 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 and echidna sightings and tracks are now common on Peron Peninsula, as are Quenda, Woylie and Possum sightings in the southwest. Malleefowl have also been spotted at Kalbarri National Park, Dongolocking Nature Reserve and Boyagin Nature Reserve. Quokkas have also reappeared around the Jarrahdale area. Chuditch have been trapped at Yalgorup National Park and Leschenault Conservation Park, the first records in that area for 50 years.



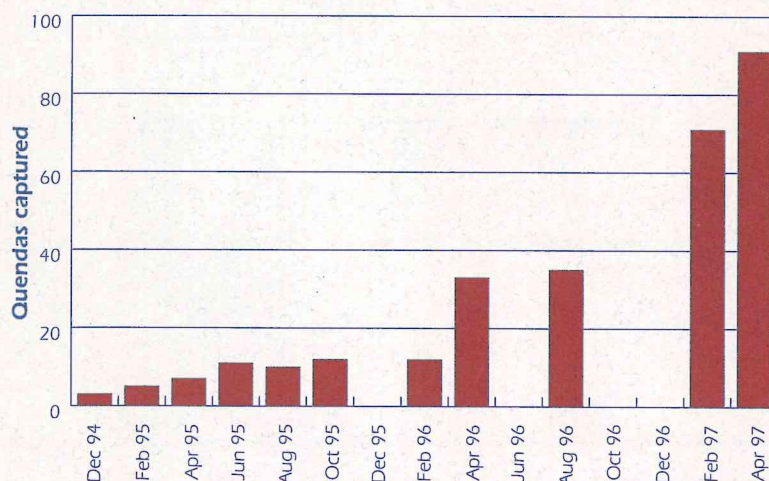
Above: CALM ecologist Jim Cocking with a trapped chuditch in the northern jarrah forest. Photo - Mitzi Vance/CALM

#### Kingston Study-Trap Success Rates for all Medium Sized Mammals



Source: CALMScience

#### Quendas at Dongolocking Nature Reserve (Note: Reintroduction in 1993/94)



Source: CALMScience





Above: Quenda.  
Below: Tammar wallaby.  
Photos - Bert & Babs Wells/CALM



## Quenda and tammar delisted

The quenda, or southern brown bandicoot, and the tammar wallaby have been delisted from the State Threatened Fauna List as a result of their recent recovery and ongoing management under the *Western Shield* program.

The removal followed a review by the Threatened Species Scientific Committee, which reviews the State's lists of threatened fauna and flora using internationally accepted criteria established by the IUCN (World Conservation Union).

The tammar and quenda are the second and third mammal species to be removed from the State's threatened fauna list as a result of successful management, since the removal of the woylie from the State, national and international lists in 1996.

Quendas (*Isodon obesulus fusciventer*) were once found throughout the southwest of the State and now exist in high numbers where fox control is in place. In Batalling, quenda trap success rates have increased more than 10-fold since the introduction of fox control in 1991. Quenda population recovery has also been achieved through animal relocations. At Dongolocking Nature Reserve, 24 quendas were reintroduced in 1994. This population has now grown to around 200 animals.

Tammar wallabies (*Macropus eugenii*) were once found across southwest WA and on some offshore islands including Garden Island. Tammars have responded very rapidly to fox control and are now increasing in abundance throughout their baited range.

Monitoring of Tutaning Nature Reserve since baiting began in 1984 has demonstrated an increase in numbers seen during standard surveys from four to more than 80.

## Banksia Environment Awards

CALM's approach to protecting native animals won the 1998 Banksia Environmental Award for flora and fauna conservation. WA Environment Minister Cheryl Edwardes accepted the prestigious national award on behalf of CALM at the presentation ceremony in Melbourne.

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.

Environment Minister Cheryl Edwardes said the award recognised the very valuable contribution this ambitious project was making to conservation in WA.

"The success of the program to date has far exceeded expectations," Mrs Edwardes said.

"Already, populations of three native animals have increased to such an extent after fox control that it has been possible to take them off the threatened species list.

"CALM expects that the successful recovery of woylies, quendas and tammar wallabies will be repeated for other species, including numbats, chuditch, bilbies and malleefowl."

Right: Environment Minister Cheryl Edwardes.  
Photo - Ernie McIntock/CALM



## Eastern States to follow WA's lead

WA's success with wildlife recovery has prompted conservation agencies in other States to follow.

Genaren Hills Sanctuary in central western NSW, with the support of the NSW National Parks and Wildlife Service, has received advice and assistance from CALM as well as a number of woylies for translocation. Sanctuary management aims to successfully re-establish the woylie by first reintroducing 12 woylies from WA into the feral predator proof Genaren Hills Sanctuary.

Twelve woylies—eight females and four males—from WA's southwest were flown to NSW in April for reintroduction at the sanctuary. CALM staff trained Genaren Hill Sanctuary staff in handling, caring and monitoring of woylies.

## National Vertebrate Pest Conference

Fox control and fauna recovery under *Western Shield* has made WA a leader in vertebrate pest management.

The program was a major focus for the 11th annual National Vertebrate Pest Conference held in Bunbury recently. It was the first time the conference focused on vertebrate pest management for biodiversity values rather than agricultural values.

CALM Project Leader Roger Armstrong gave the 150 delegates from around the nation and New Zealand an insight into the *Western Shield* program and its positive results. A tour was also taken of areas regularly fox-baited by CALM.



# 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 in the importance of our native wildlife for future generations.

To this end, CALM has created a *Western Shield* Action Pack for upper Primary School students that encourages awareness of the conservation of WA's native fauna species.

The Action Pack provides teachers with four ready-made lessons on WA's threatened native animal species and includes teachers' 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. It was written and compiled by CALM education officers in close consultation with practising teachers.

By using the pack, WA's upper primary school students have the chance to attend overnight camps or excursion days and learn first-hand about threatened native animals.

Each Action Pack contains an entry form for classes that undertake the pack's activities, with each entry going into a draw to win an overnight camp. A separate draw is also conducted for Perth metropolitan schools with the prize being an excursion day to The Hills Forest Activity Centre in Mundaring.

Eight winning classes from throughout the State are chosen for the overnight camps – 'A night with the woylies' at The Hills Forest, 'A night with the possums' at Batalling forest, 'A night with the wallabies' in Perup Forest Ecology Centre and 'A day with the numbats' at Dryandra Woodlands.

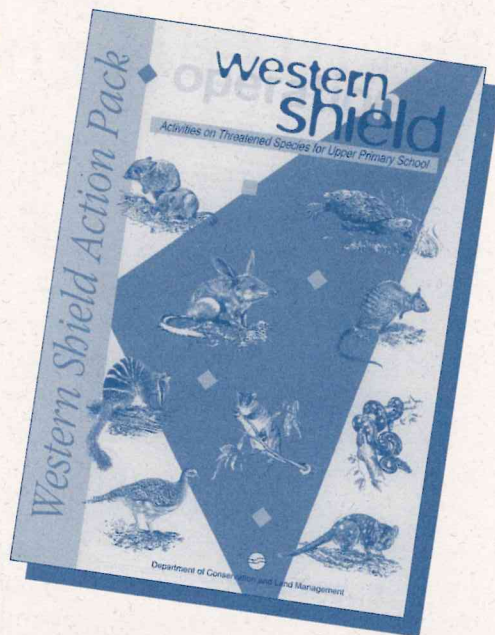
Each of the day excursions and overnight camps provides students with the opportunity to view native animals and learn about conservation methods such as trapping and spotlighting.

A total of 310 students, 25 teachers and 27 parent helpers enjoyed camps in 1997. As a result of these experiences the number of students having completed the

Action Pack that understood the impact of feral predators on native wildlife soared from 59 per cent before the camp to 81 per cent afterwards. The interest in conserving threatened animals also increased from 55 per cent to 89 per cent.

This program will be repeated in 1998 and extended to Dryandra where children can interact with very rare animals such as bilby, boodie, western barred bandicoot and mala.

The Action Pack has proven to be an excellent way to encourage and promote awareness in children about the nature of our native wildlife, the partnerships between fauna and flora and WA's environment.



*The Action Pack encourages awareness in primary school children of the need to conserve native animals.*

*Right: CALM Executive Director Syd Shea presents a gift to Applecross Primary School for its fundraising efforts for Western Shield.*

*Below: Primary school students have the opportunity to experience threatened native animals first hand through the Action Pack.*

*Photos - Ernie McLintock/CALM*





# 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 co-operative and understanding about the baiting needed to control introduced predators.

Community-based liaison between local community groups and CALM District offices, in cooperation with Agriculture WA, has been critical to facilitating and achieving local involvement and support.

Catchment groups, land conservation district committees and volunteer bushfire brigades have participated in baiting programs to protect agricultural values and conservation 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 whose land is next to or near conservation estate. In some areas the participation rate of farmers is more than 90 per cent. Two situations involving rock-wallabies in the central Wheatbelt are excellent examples of this. Tony and Marilyn Crooks helped CALM re-introduce five rock-wallabies and implement a fox and cat control program on their own farm. A thriving colony now exists with 44 fit and healthy animals. Likewise, Jan and Bevan Gardiner discovered a small colony of rock-wallabies on a rocky ridge close to their farm, near Kellerberrin. They contacted CALM and a predator control program was implemented resulting in positive signs with numbers of the species increasing.

To complement this, many landowners have registered with CALM's *Land for Wildlife* program—a voluntary program that recognises the conservation efforts of private landholders and managers. It helps them do more to conserve native plants and



Above: Malleefowl in Peron's breeding enclosure.  
Photo - Mitzi Vance/CALM

animals on their lands by protecting, expanding or creating suitable habitat.

Private landowners from Geraldton to Esperance have set aside more than 14,000 hectares for nature conservation under the initiative and 108 properties have registered with the scheme since it was launched last year.

The program aims to encourage awareness of wildlife habitat and the integral part it plays in restoring nature's balance and the need to conserve areas of biological diversity.

Through maintaining and linking native vegetation remnants and controlling foxes and feral cats, landowners are making a significant contribution to conserving native wildlife.

Likewise, local government authorities have played an important role in helping CALM facilitate its baiting programs. For example the Shire of Shark Bay, in cooperation with CALM, has embarked on the very worthy process of educating residents on the need to control stray cats and sterilising domestic cats through free clinics.

Community support for *Western Shield* extends beyond the baiting programs with many groups helping to restore native wildlife. The Malleefowl Preservation Group not only encourages farmers to bait lands areas; it also assists CALM in malleefowl captive breeding programs by helping to locate malleefowl nests and monitoring populations in the wild.

The war against the 'killing machines'—introduced foxes and feral cats—has also been greatly helped by corporate sponsorship from Alcoa 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, Selley Chemical Company, Coles Myer Ltd and Shell Australia.

Left: Environment Minister Cheryl Edwardes at the free cat sterilisation clinic in Denham  
Photo - Ray Smith/CALM



For further information please contact your nearest CALM office,  
or the State Operations Headquarters at 50 Hayman Road, Como.

Phone (08) 9334 0333