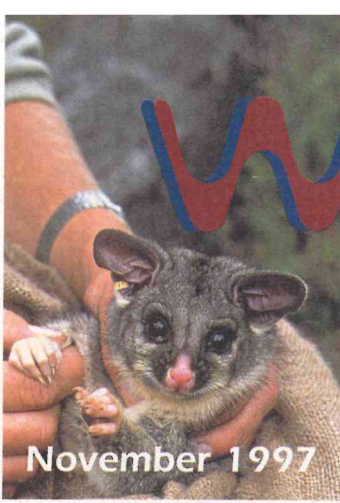


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Western Shield

November 1997

Progress report

More mammal species have become extinct in Australia over the past century than in any other country in the world. Predators and competitors introduced from overseas and loss of habitat were the main reasons for the loss of these 17 species. Changes to other habitats make some of the remaining native animals even more susceptible to predators.

There is strong evidence that further extinctions are inevitable unless action is taken.

The Department of Conservation and Land Management (CALM) has successfully pioneered programs to control foxes to prevent further extinctions, using a naturally-occurring toxin which does not harm wildlife. Early programs led to Operation Foxglove in

1994, where 500 000 hectares of the northern jarrah forest were baited regularly. In 1996, this program was expanded 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.

Western Shield has an annual budget of \$1.33 million and already covers nearly three and a half million hectares of CALM-managed lands. This area will grow to a total of more than five million hectares in areas as diverse as Cape Range National Park near Exmouth, Peron Peninsula at Shark Bay and the south-west forests. Fox control on the conservation estate is being boosted in the south-west land division by community-based baiting

programs on adjacent private property.

Under Western Shield, fox baiting will be carried out on a scale never before attempted and research into feral cat control will be substantially increased. This will allow the natural recovery of native animal populations and, as predators are controlled in target areas, allow species to be returned to former habitats. CALM has also established a number of captive breeding programs in collaboration with other agencies, for animals whose numbers are extremely low in the wild.

By the end of the century, CALM hopes to return at least 13 native species to more than 40 areas that once formed part of their habitat. Natural recovery will, of course, result in many more species increasing in range and abundance.

The science behind Western Shield

The decline and extinction of wildlife species had many possible causes: loss of habitat, human disturbance, changed fire regimes, drought, disease, genetic deterioration due to inbreeding, foxes, feral cats and competition from rabbits.

During the 1970s, CALM scientist Per Christensen studied woylies in jarrah forest at Perup, one of only three areas where the once widespread mammals survived. He found that the presence of poison bush thickets was a key factor in the woylie's survival and believed the fox was a key threat. Another scientist, John Calaby, had also suggested that woylies survived only where their habitat contained extensive thickets of poison bush.



Right: The radio collar being fitted on this European fox will allow scientists to study its behaviour.

Poison bush (species of *Gastrolobium*) contains sodium monofluoroacetate, better known as the poison 1080. Native animals have evolved a tolerance to 1080, but it is highly toxic to introduced animals.

The fact that woylies, numbats and tamar wallabies survived in reserves with extensive poison bush thickets may have been because the thickets aided escape, or because foxes died if they ate animals that fed on poison bush.

Another CALM scientist, Jack Kinnear, reasoned that if foxes were responsible for the decline of the rock-wallabies he was studying, then fox control should reverse the situation. Using 1080 baits similar to those used by pastoralists to control dingoes, he removed foxes and then checked the number of rock-wallabies in baited and unbaited areas. The number of rock wallabies increased after fox control but remained largely unchanged in unbaited areas.

Similar results after fox baiting have since been demonstrated for species including numbats, woylies, chuditch, possums, pythons, malleefowl, black-gloved wallabies, tammars and western swamp tortoises.

Further research has determined the optimum baiting regimen. A joint project between the then Agriculture Protection Board and Curtin University



has shown that 1080 breaks down quickly in the soil without causing any environmental side-effects. Scientists are now developing a microbiological process to increase the rate at which 1080 breaks down.

CALM scientist Keith Morris carried out further research into whether 1080 meat baits had any detrimental effects to populations of chuditch, a native marsupial carnivore. His experiments in

Batalling forest, near Collie, showed the baits were safe to use around chuditch. In fact, chuditch responded to fox control in the same way other species did—the population increased.

Cat numbers could increase in arid areas as a result of fox control, so Western Shield has a strategy to prevent this: the development of a special cat bait, which will significantly reduce numbers of feral cats.

Above right: Tracking animals fitted with radio collars.

Below: One of the poison peas which produces 1080 naturally.

Right: Feral cats outnumber foxes in arid and semi-arid areas.



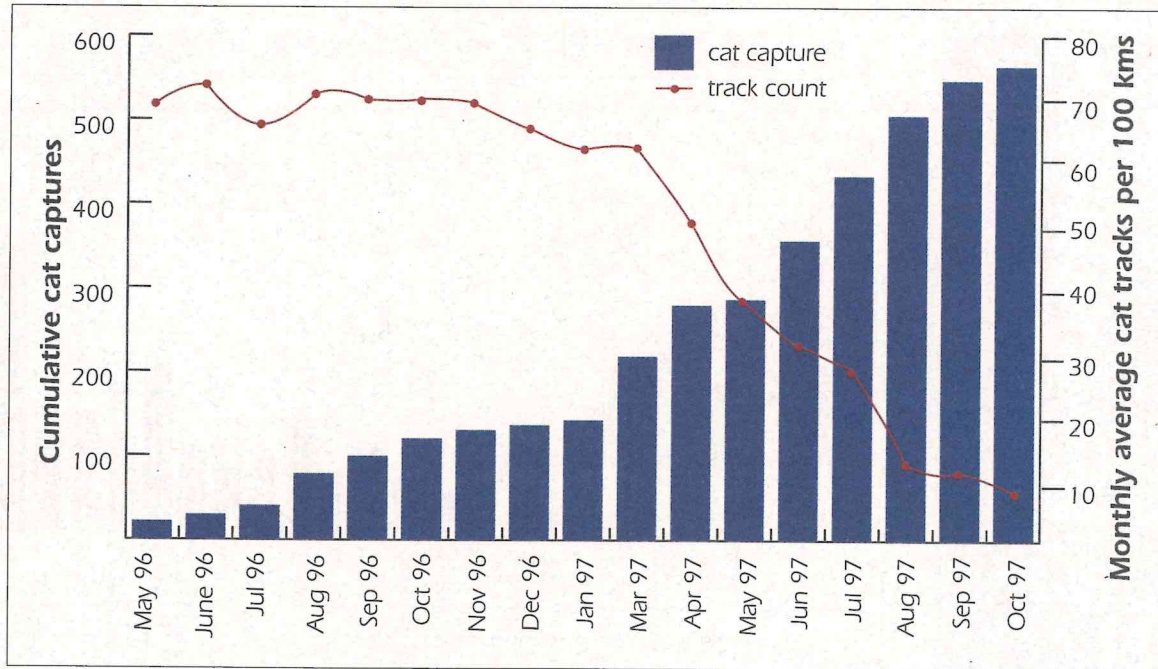
CALM scientist Dave Algar has made significant advances in developing an effective cat control technique, including the production of a cat-specific bait. Although cats are susceptible to 1080, dried meat baits used for foxes have proved unsuccessful in controlling feral cat numbers. A moist kangaroo meat sausage bait, with a number of ingredients to make it more appetising to cats, has been developed instead. Studies have also revealed that live prey for feral cats is scarce at certain times of the year and the hunters will take baits during this period.

The new baits have been used successfully in experiments on

the Nullarbor Plain and other trials are planned at Shark Bay and on the Montebello Islands. Further work is continuing to:

- develop an efficient technique to assess and monitor the number of feral cats;
- determine baiting efficiency in different geographic areas;
- determine the most effective time to carry out baiting programs; and
- examine levels of baiting intensity to provide cost effective control.

Below: Successful cat control on Peron Peninsula.



Results achieved

More than 700 000 fox baits have been laid across nearly three and a half million hectares around WA as part of CALM's Western Shield program.

Native animal numbers have increased significantly as a result of fox control. For example one woylie was caught per 200 traps set at Batalling forest in the 1980s. In 1995, four years after regular fox control began, 24 woylies were caught per 100 traps. At Perup, near Manjimup, it is now common to catch more than 50 woylies per 100 traps.

The graphs in this report are examples which demonstrate the way in which species affected by predation are responding to fox control. They show the results of monitoring populations of native animals before and after baiting

for foxes. In some cases, the initial population increases recorded two to three years after fox control began have been followed by a drop in numbers, as the animals reach a natural balance with their resources of food and shelter.

Previously unknown populations of native animals have also increased, leading to an increase in reported sightings. The most significant find to date has been the rediscovery of Gilbert's potoroo, at Two Peoples Bay Nature Reserve on the south coast. Gilbert's potoroo had not been officially recorded since 1879.

In other areas, for example, Peron Peninsula, animals such as the echidna and euro which were once in very low numbers are now common. Farmers near Manjimup have reported increased

sightings of quendas, woylies and possums. Other reported sightings include the malleefowl at Kalbarri National Park, Dongolocking Nature Reserve and Boyagin Nature Reserve and the reappearance of quokkas around Jarrahdale.

Fox control has also made it possible to reintroduce native animals to selected areas where they once thrived, such as;

- western ring-tail possum at Lane Poole Conservation Park;
- malleefowl at Francois Peron National Park;
- Thevenard Island mouse at Serrurier Island.

The conservation status listed for each species is based on the 1994 IUCN (World Conservation Union) criteria.



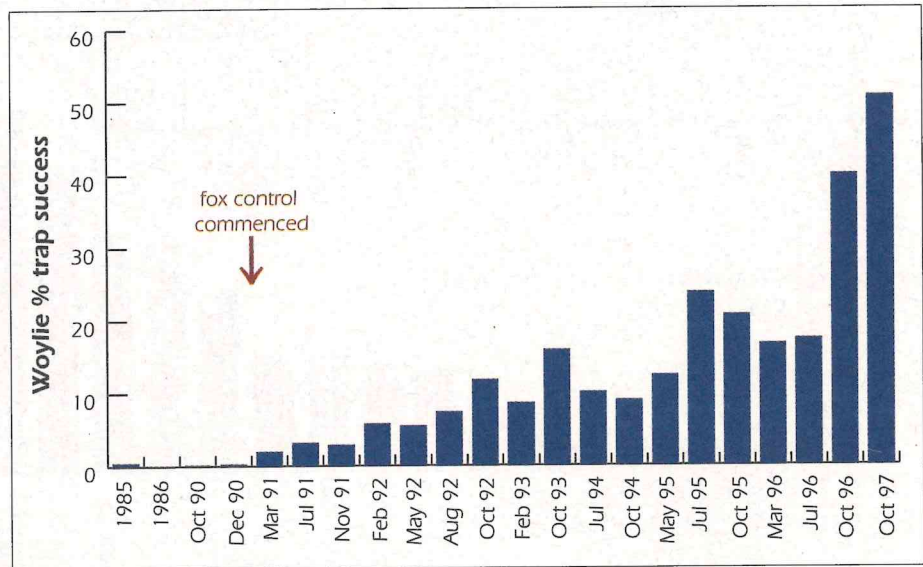
Woylie

Status: conservation dependent

Once found across most of the mainland south of the tropics, woylies were restricted to three tiny populations in WA by about 1980. Their numbers grew as a result of fox control, allowing reintroductions in Batalling forest, Boyagin Nature Reserve, Julimar Conservation Park, South Australia and 19 sites in the northern jarrah forest. Since Western Shield began in 1996, more woylies have been released in The Hills Forest, Lake Magenta Nature Reserve and Francois Peron Nation Park.

The success of the Woylie Recovery Plan enabled the species to be removed from the State and Commonwealth threatened species lists in 1996, the first time the lists have been amended as the result of a recovery plan.

Below: Woylie response to fox control in Batalling forest.



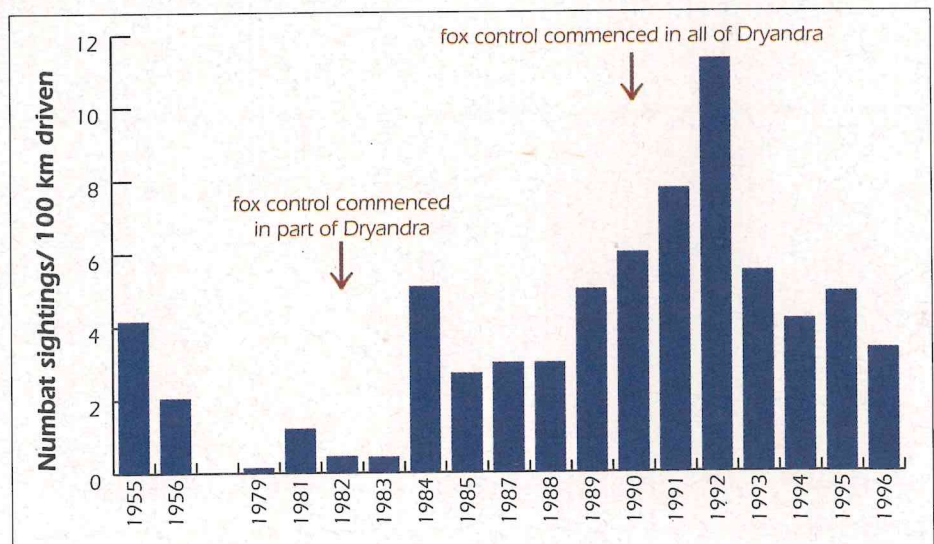
Numbat

Status: vulnerable

Numbats were once found from the south-west of WA through Laverton and the Warburton Range, the Everard Range in northern SA, to south-western NSW. However, by the 1970s, numbats were limited to a few pockets of WA's south-west.

Fox control has brought the State's mammal emblem back from the brink of extinction. Since January 1996, numbats have been reintroduced to The Hills Forest, outside Perth, and previously unknown populations have been reported at Toodyay, Jarrahdale and Tone River.

Below: Numbat response to fox control in Dryandra Woodland.



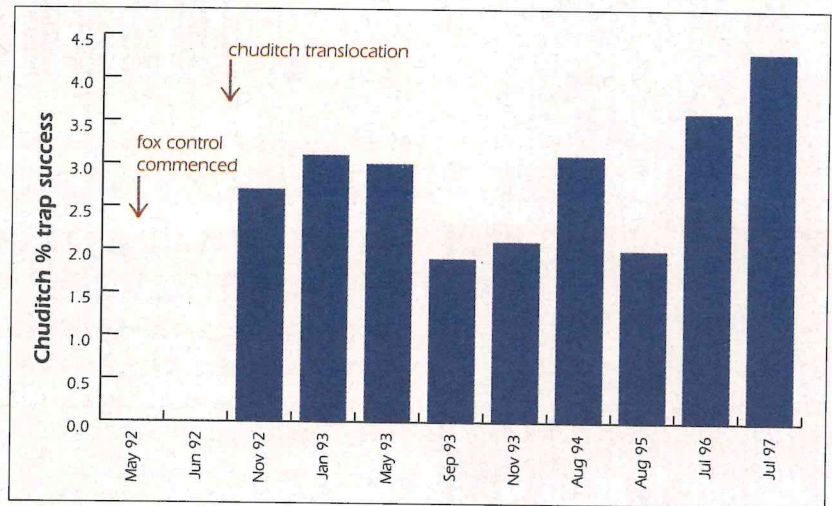
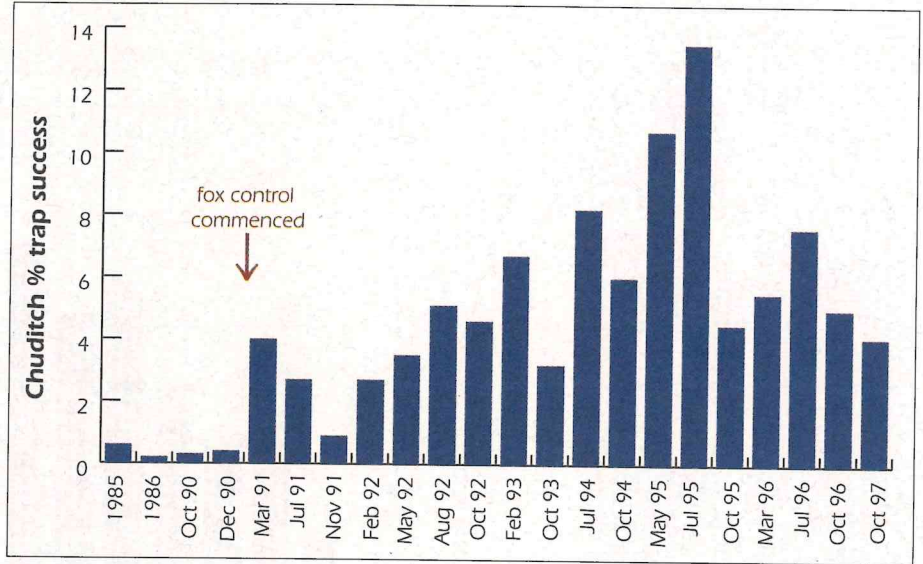


Chuditch

Status: vulnerable

Chuditch formerly ranged over about 70 per cent of Australia, but are now found only in south-western WA - about five per cent of their former range. In 1991, it was estimated that chuditch numbers had dropped to less than 6000.

Since January 1996, chuditch have been reintroduced at Lake Magenta Nature Reserve, in the wheatbelt, and previously unknown populations have been reported at Armadale, Mundaring, North Bannister, Boddington, Australind and Moora. Fox control in Batalling forest has produced a 10-fold increase in chuditch abundance (*below*).



Above: Chuditch recovery following translocation to Julimar Conservation Park.

Tammar wallaby

Status: conservation dependent/vulnerable

The tammar wallaby was once widespread across WA and SA, with additional populations on islands off the two States. Most of the island populations survive, but the mainland populations have been reduced significantly.

Under Western Shield, tammar wallabies have been reintroduced at Batalling State forest, near Collie.





Quenda

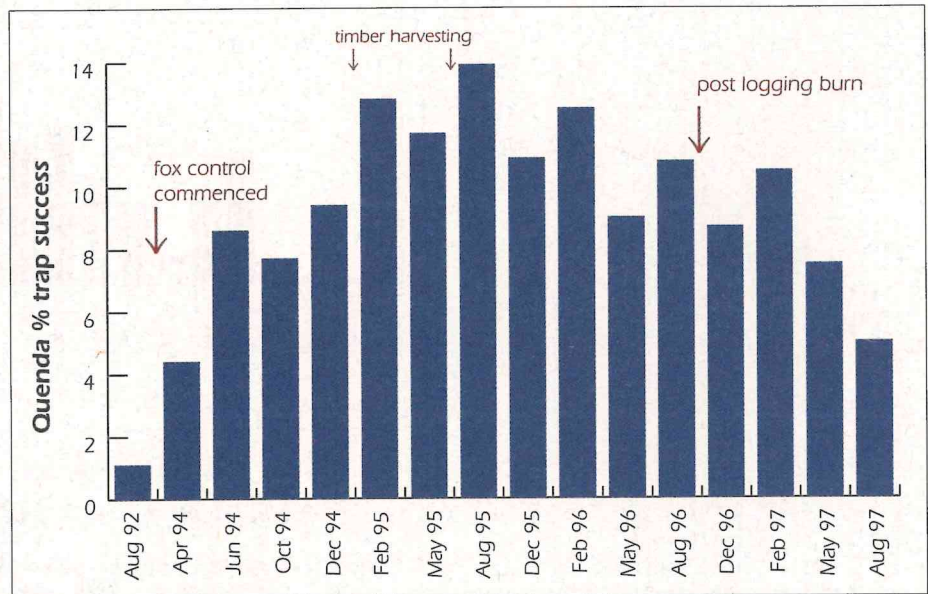
Status: conservation dependent/vulnerable

Quendas are not restricted to WA, but are under pressure both from introduced predators and land clearing.

A total of 28 quendas have been translocated to Dongolocking Nature Reserve, near Wagin since 1994, following baiting on the reserve. There has since been a massive population increase. A trapping run to monitor the quendas' progress, carried out in March, caught 73 individuals. Five were from the original translocation, 38 were new individuals and 30 were recaptures, but born at Dongolocking. A further trapping run in June caught 92 quendas, of which 85 were new individuals born at Dongolocking.

Since January 1996, quendas have been reintroduced at Leschenault Conservation Park and The Hills Forest, Perth, and regular sightings are being recorded again at Mundaring, Kelmscott, Collie and Lake Magenta Nature Reserve.

Below: Quenda response to fox control in Kingston forest. The Kingston study is also monitoring the impact of timber harvesting and control burns.

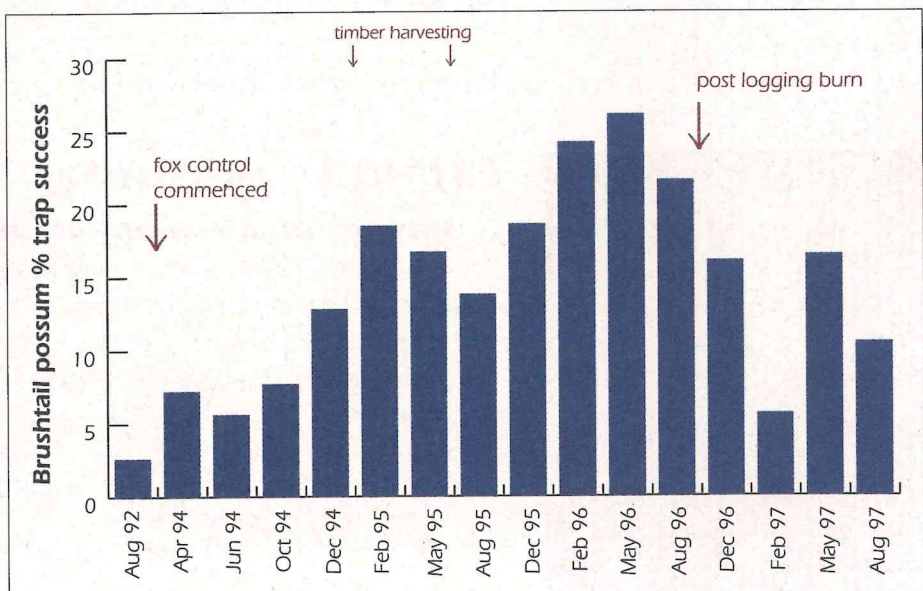


Brushtail possum

Status: not threatened

The brushtail possum has disappeared from more than half its former habitat, but remains common in its present range.

Below: Brushtail possums are more abundant in Kingston forest since fox control began.



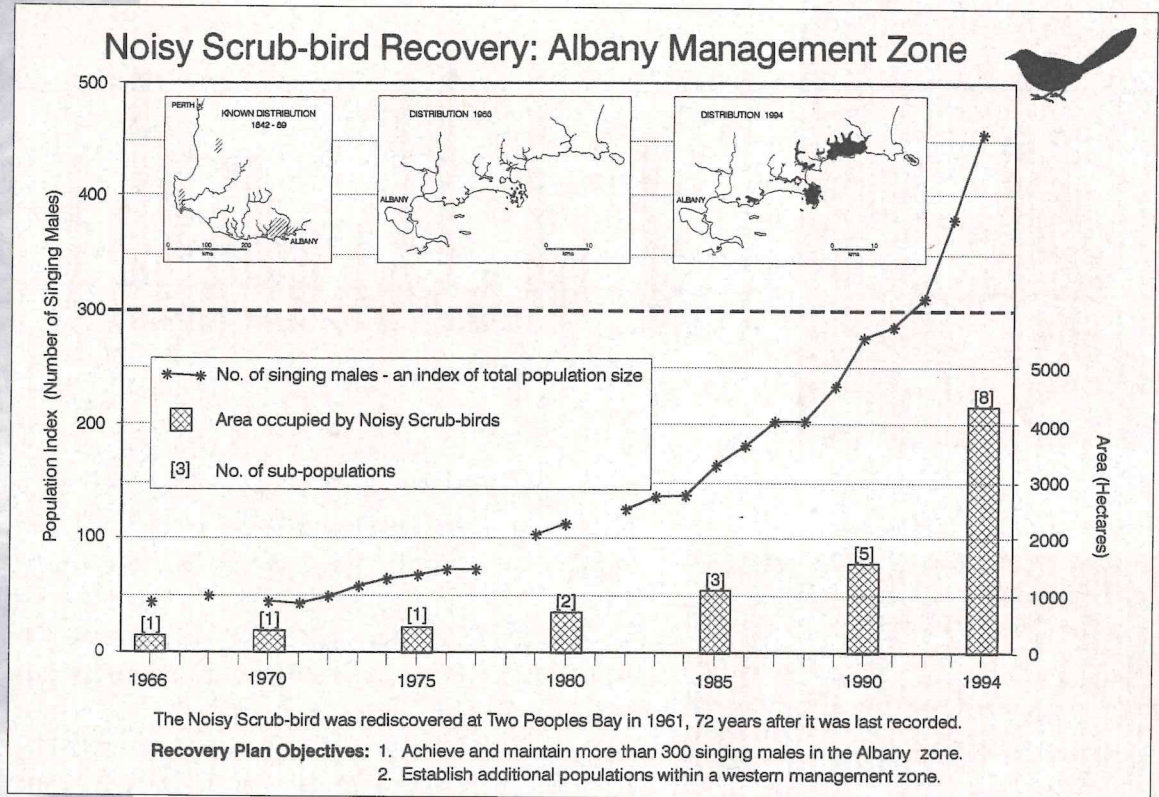


Noisy scrub-bird

Status: vulnerable

The noisy scrub-bird is one of WA's rarest animals—in fact it was presumed extinct until it was rediscovered at Two Peoples Bay, near Albany, in 1961. Habitat management is crucial to the noisy scrub-bird's recovery, but fox control has made the growing Albany population more secure, as well as making it possible to return noisy scrub-birds to former habitats.

Earlier this year, noisy scrub-birds were reintroduced into the Darling Range, near Harvey, close to the area where the species was first discovered by Europeans.



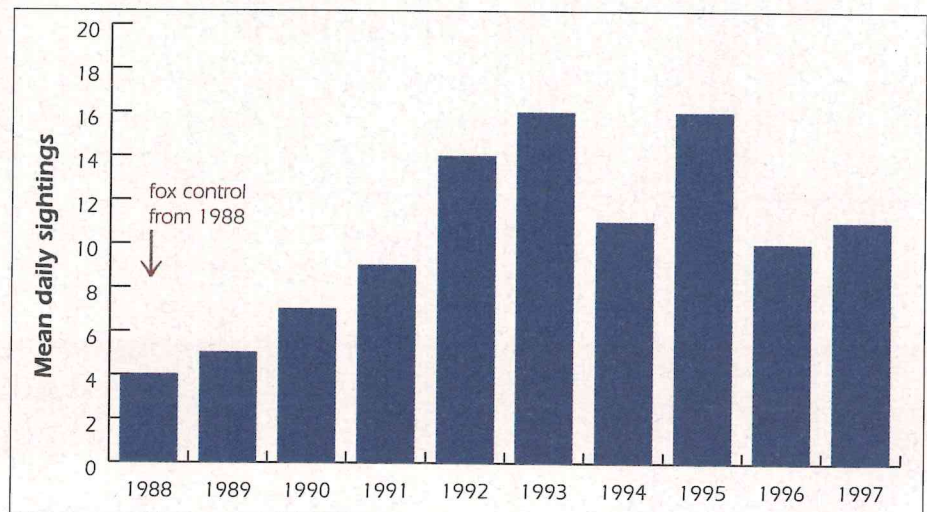
Black-flanked rock wallaby

Status: threatened

The rock-wallaby was once found in a wide range of rocky habitats across WA and coastal islands. Many of these populations are now extinct and only isolated colonies survive.

In the past 12 months, rock wallabies have been reported in Kalbarri National Park, an area from which they were thought to have disappeared.

Below: Rock-wallaby sightings at Yardie Creek reported since fox control began.

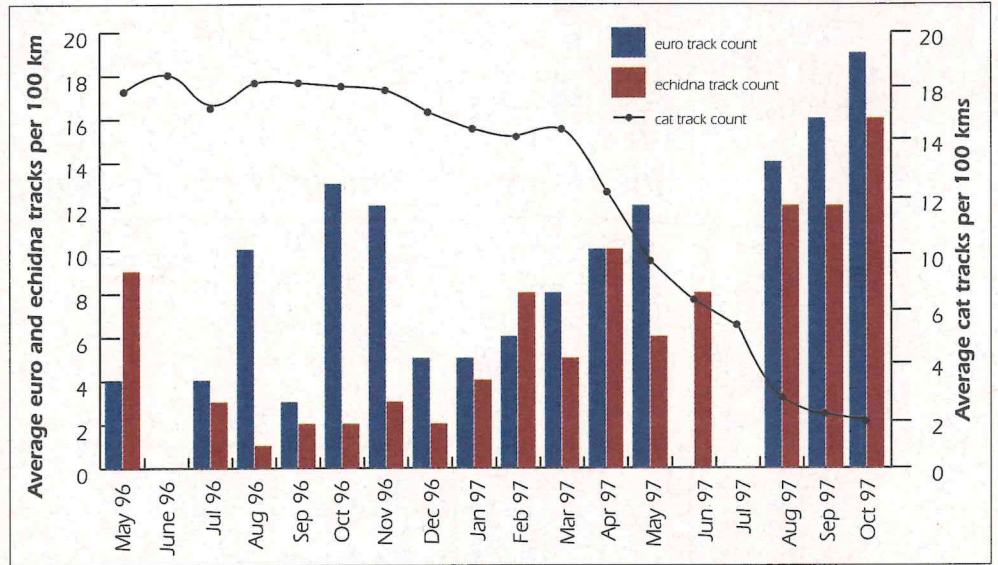
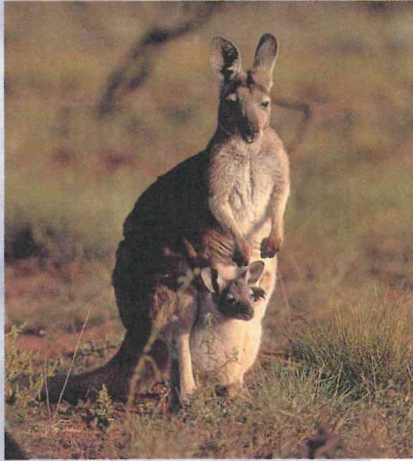




Euro and echidna

Fox control over the past three years in Francois Peron National Park appears to have led to increases in euro and echidna numbers. This is based on counts of tracks along standard driven transects (*below*).

The number of feral cats on the peninsula has also decreased as a result of control programs, including trials with the new cat-specific bait developed by researchers.



To prevent reinvasion from other areas, CALM has built a 3.4 km electrified feral animal barrier across the peninsula's narrow neck at Taillefer Isthmus, near Shell Beach.

Francois Peron National Park is part of the Shark Bay World Heritage Area and a key focus for Western Shield. Project Eden, which operates under the umbrella of Western Shield, is rejuvenating the 105 000 hectare Peron Peninsula. The project will include the reintroduction and recovery of about 12 native species, including the banded-hare wallaby, bilby, chuditch, mala (rufous hare-wallaby), malleefowl (shown left), Shark Bay mouse, greater stick-nest rat, red-tailed phascogale, woylie and the western barred bandicoot.

After a three-year program to control feral predators on the peninsula, the first native animal reintroductions began in September. Nearly 60 woylies and 36 malleefowl have been released in the area and are being monitored closely.

The malleefowl were reared in captivity on the peninsula—one of several captive breeding programs initiated under Western Shield.

SPONSORS

Western Shield is made up of individual projects in target areas around the State. The following projects have received valuable support from these sponsors:

- Operation Foxglove: Alcoa Australia Limited
- Coastal Storm: Cable Sands (WA)
- Montebello Renewal: West Australian Petroleum Pty Ltd, Apache Energy, ACI Plastics Packaging, Crop Care Australia and Selley Chemical Company

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

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