HUNTING THE HUNTER

By Neil Burrows
and Per Christensen

Until recently, the disappearance of the medium-sized mammals that once inhabited Australia's arid zone had been an unsolved mystery. But scientists tracking feral cats in the Gibson Desert have identified the main suspect.

In the comparatively short period since European settlement, more than a third of arid Australia's original mammal species have vanished. Medium-sized mammals such as bandicoots, bilbies, hare-wallabies, phascogales, woylies, boodies, possums and numbats have become totally or locally extinct in Australia's arid zone.

This ecological tragedy has been the subject of much scientific interest and debate. It has been variously attributed to the introduction of an exotic disease, competition by introduced animals like the rabbit, predation by introduced predators, a changed fire regime since the Aborigines left the deserts, or a combination of all of these (see 'Vanishing Desert Dwellers', *LANDSCOPE*, Winter 1987).

There has been little direct evidence to support any of these views, but recent research in the Gibson Desert by Department of Conservation and Land Management (CALM) scientists points the finger at cats as one of the main causes of the alarming decline in arid zone mammals.

Feral cats (*Felis catus*) occur across the entire Australian continent and on some offshore islands. They are highly adaptable and inhabit all types of bushland, from cool wet coastal eucalypt forests to hot dry interior deserts. Although very little is known about cats in the wild, they are supreme hunters and there is growing evidence that they have had, and continue to have, a devastating effect on our unsuspecting wildlife, especially in the open vegetation of the semi-arid and arid zone.

DESERT CAT ORIGINS

No one knows for how long the cat has been in Australia. Cats certainly came with the first fleet, but they may well have reached Australia as a result of Dutch shipwrecks in the early 1600s, or perhaps even earlier. Feral cats may even have originated from South East Asia, via the Macassan traders who came to gather trepang (sea cucumbers) from the shallow northern tropical waters.

The cat features in the Dreaming of the central desert Aborigines. They call it *miau*, consider it to be a native animal and tell stories of how their fathers and grandfathers hunted cats, which were prized as food.

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Main: The feral cat, a supreme hunter which thrives in the harsh Australian deserts at the expense of the native fauna.
Photo – Neil Burrows
Inset: Desert cats prey on a range of animals including reptiles, insects, birds and small mammals such as this dunnart.
Photo – Ray Smith

A desert cat melts into the desert landscape after being fitted with a radio transmitter by CALM scientists.
Photo – Graeme Liddelow

Feral cats have certainly occupied the western desert for at least 100 years. The young Scottish explorer David Carnegie first reported cats in the remote Gibson Desert during his epic camel journey from Coolgardie to Halls Creek in the 1890s. The first gold prospectors and graziers into the Goldfields and Murchison regions of Western Australia in the 1890s reported numerous cats roaming the bush.

Although cats were probably present before European settlement, the feral cat population received a significant boost with the arrival of Europeans. In addition to domestic cats running wild, thousands of cats were purchased by pastoralists in the drier parts of the country and released to control the rabbit plague at the beginning of this century.

DESERT SURVIVAL

The life of a desert cat is still very much a mystery, although recent research by CALM scientists is beginning to reveal something of the ways of this remarkable creature.

Whenever or wherever it originally came from, the cat of the central Australian deserts, although physically similar to its domesticated city cousin, leads a vastly different life. Whereas tame cats are fed and sheltered by humans, the desert cat is wild, tough and self-reliant; it hunts for its food and shelters in rock crevices, hollow logs and old rabbit burrows.

Stories of ferocious feral cats the size of small tigers are rife in the Australian bush. Although lean and muscular, in the harsh environment of the Gibson Desert adult cats are usually slightly smaller than the average well-fed house cat. A very large tom (male) cat weighing 5.6 kilograms was trapped in the Gibson Desert, but most adults weigh between three and four kilograms. Small size is more efficient than large for a carnivore battling to survive in the boom and bust cycles of Australian deserts. The most common coat colour is tabby, although a few ginger animals have been sighted. Tabby coats provide the best camouflage in the sand, spinifex and mulga of the western desert.

Unlike many other introduced animals, the feral cat does not need to drink; it can obtain enough moisture from the body fluids of its prey. This capability enables cats to survive in the searing desert heat, where humans would die in 48 hours without water.

During the 1988–90 drought in the Gibson Desert, a period of 36 months when only 350 millimetres of rain fell, cats persisted when foxes, dingos and rabbits

virtually disappeared. Small native mammals, including the superbly well-adapted dalgyte or bilby (*Macrotis lagotis*), declined in numbers. Even camel numbers declined, and kangaroos died like flies. During the drought, the smaller and more agile cats survived largely on reptiles such as skinks and geckos, which are well adapted to cope with long dry spells.

Cats, the supreme carnivores, use their precious reserves of energy far more efficiently than other introduced predators such as foxes and dingoes. For example, a male fox weighing about five kilograms was fitted with a radio collar and tracked for about seven days. He travelled about five kilometres each day, presumably in search of food. A male cat, weighing about three kilograms, was tracked in a similar fashion and was found to travel less than one kilometre each day. On some days the cat moved less than 500 metres, preferring to stay curled up in a tree hollow, or beneath a spinifex clump. Clearly, the cat was able to obtain sufficient food without having to travel vast distances.

Radio-tracking of feral cats has also revealed that when prey is relatively abundant after good rains, male cats restrict their movements to within a home range of about 1 600 hectares. Although they move about during the day, they are most active between sunset and sunrise. Most nights, male cats cover less than 300 hectares while hunting for prey. The home range of females is generally less than that of males.

In the Gibson Desert, cats occur in all types of habitat, including spinifex plains, dune fields, mulga groves, breakaways and claypans. Highest densities are usually found along the trunks of ancient waterways. Except for breeding time, desert cats are largely solitary animals with stable territories, which they often mark with scent from cheek glands, exposed faeces or urine sprays.

SUPREME HUNTERS

Desert cats are far more agile and athletic than other introduced predators such as foxes and dingoes. They can dig, climb, leap, stalk and pounce, and are lightning fast over a short distance. Their hearing and night vision are acute, their stealth legendary and they are heavily armed with sharp teeth and retractable claws. Our native animals evolved in the absence of such a predator and were not equipped to cope with it when it arrived.

A feral cat will kill and eat virtually any animal less than or equal to its own size. An analysis of the gut content and faeces of desert cats shows that during dry periods reptiles and insects form the main diet. During good seasons, when native animals increase in diversity and abundance, cats hunt reptiles, birds and small mammals, including geckos, skinks, native mice, small dasyurid marsupials and ground-nesting birds such as quail. Cats swallow small prey whole and kill larger prey by biting the animal on the back of the neck. They open up the body cavity of large kills and only eat soft tissue such as liver, heart and lungs. Like their domestic cousins, desert cats kill for 'sport' as well as food.

HOW MANY CATS?

At this stage, it is impossible to estimate accurately the feral cat population of the western desert. Since 1989, CALM scientists working in the

Above right: Cats are caught in padded rabbit traps, anaesthetised, measured and fitted with radio collars so that scientists can uncover the mysteries of their behaviour.
Photo – Neil Burrows

Right: A stubble quail falls prey to this feral cat.
Photo – Evan Collis

The release in September 1992 of 40 boodies (*Bettongia lesueur*) and 40 golden bandicoots (*Isoodon auratus*) from Barrow Island into the Gibson Desert occurred amid a shower of publicity (see 'Back in the Outback', *LANDSCOPE*, Summer 1992–93).

The aim of the *Desert Dreaming* project was to find out why so many desert mammals had disappeared. By experimentally re-introducing some of the now extinct mainland species from offshore islands where they were still abundant, and carefully monitoring their every move, we aimed to find out what factors caused the animals problems in re-establishing themselves. Having identified any problems, we could attempt to control them, and so ensure the successful re-establishment of the animals.

We had expected that introduced predators would be the most likely stumbling block to the experimental re-introduction. Because of its infamous record in the disappearance of mammals from the South West (see 'Vexing the Vixens', *LANDSCOPE*, Winter 1992), and because there were few cats in the release area, the fox dominated our thinking in planning the release. In preparing for the release, foxes were virtually exterminated from an area of 1 600 square kilometres surrounding the release site.

Shortly after their release, the boodies occupied and dug out old burrow systems constructed by their predecessors deep under calcrete rock slabs. They fed nightly on green herbs, one to two kilometres from their burrows, primarily on recently burnt country.

The golden bandicoots sought out the densest areas of spinifex and fed mostly on the abundant insects and also on seed caches buried by ants, which they located using their sharp sense of smell.

The released animals all appeared healthy, with no signs of disease. Young bandicoots were conceived and born in the Gibson Desert, the first for many years, and at least two young boodies left the pouch to fend for themselves. Although the boodies often fed on recently burnt and regenerated herbs, there was no indication that either species needed fire in any way to survive. Competition from feral animals like the rabbit, mouse or camel did not seem to affect them.

In the event, it was not the fox, but another predator that moved in for the kill. Within a very short time, cats invaded the area in large numbers, especially the release area, where fox and dingo control had been carried out. This was disastrous for the newly released animals.

The boodies were particularly vulnerable to predation on their nightly forays. Eleven of the 40 boodies were recorded killed and eaten by cats. As far as we were able to tell it was the work of only two, possibly three, cats. Despite our best efforts, we were unable to trap, poison or kill the culprits.

The golden bandicoots survived a little longer than the boodies—for a while one used to come into our camp for scraps of food—but gradually their numbers dwindled. Strangely, we never recorded any kills, but we assume their disappearance, like that of the boodies, was due to predation by cats. Within six months, we could find no trace of any of the released animals or their young.

The loss of the animals was a bitter pill to swallow, not just for the scientists involved, but for the community, whose imagination the project had captured. But despite this, the project was successful in its major objectives. Fox control on a very large scale in a remote part of the continent was achieved. The native animals were transported over a distance of 1 000 kilometres and released without any losses. The fact that the animals fed, put on weight and bred successfully indicated that the desert habitat was still in good order, and by recording the animals' activities we obtained valuable information about their habitat requirements in the desert.

Thanks to the *Desert Dreaming*, project, we now know with some certainty what the limiting factors are in achieving recolonisation of the deserts by the mammals that formerly occupied them in such numbers. A solution, or at least a temporary one, is available for the fox problem; one must now be found for the feral cat.

Animals such as the boodie (left) *and the golden bandicoot* (right) *were once widespread on the Australian mainland but due to predation by cats and foxes are now restricted to a few offshore islands.*

Photo – Jiri Lochman

Photo – Ray Smith

Gibson Desert have been monitoring cats at several study sites, using techniques such as tracking, soft catch trapping, radio-tracking and baiting. This work has been assisted by members of three *LANDSCOPE* expeditions to the Gibson Desert, who have also been involved with documenting native animals, birds and plants.

The cat population fluctuates with the availability of food, which in turn depends on rainfall. During a period of severe drought, scientists recorded about one cat for each 33 square kilometres, but in the absence of foxes and dingoes and following several years of above-average rainfall, there was one cat for each eight square kilometres. Assuming an average of one cat for each 15 square kilometres, then there may be around 130 000 feral cats in the arid interior of Western Australia. A feral cat kills about three native animals each day, so in one year the total number of native animals killed by cats in the western desert alone could be a staggering 142 million.

CONTROLLING DESERT CATS

There is now strong evidence that predation by feral cats, and perhaps foxes, contributed to the sudden demise of many animal species in the semi-arid and arid zone. Foxes and cats have to be controlled if these animals are to be re-established, or if further declines are to be prevented.

Standard techniques, such as baiting with 1080 poison, are highly effective against foxes, but have had little impact on desert cats. Being supreme hunters, cats are reluctant to scavenge or to pick up baits, only doing so if they are injured and unable to hunt or are very hungry. CALM researcher Dave Algar, with financial support from the Australian Nature Conservation Agency, is currently endeavouring to develop a method of controlling feral cats that is effective, efficient and specific to introduced predators. But it is unlikely that any control method will totally eradicate cats, and further research is needed to determine what levels of control are needed to prevent further faunal declines and enable the successful establishment of re-introduced animals.

The development of an effective and practical method for controlling feral cats will be the greatest breakthrough in native fauna conservation in Western Australia since the discovery that foxes posed a serious threat to the fauna of the South West. Fox control in the South West's forests, woodlands and heathlands has seen a dramatic increase in the numbers of many threatened species.

If we can find a way to control feral cats, we could see the return of some of the unique and exquisite animals of Western Australia's dry country, and the realisation of a dream.

Top: The desert cat—a beautiful creature in the wrong place.
Photo – Babs and Bert Wells/CALM

Above: Cat tracks in the sand are an all too common sight in Australian deserts.
Photo – Babs and Bert Wells/CALM

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The golden whistler is a common forest bird. 'Forest Focus' (on page 10) discusses a five-year study into the effects of timber harvesting on forest birds, insects and mammals.

The 10th Light Horse Memorial Trail is one of two walktrails in Neerabup National Park. The story on page 22 takes you inside this little-known park in Perth's northern suburbs.

In the closing days of 1991, heavy downpours of rain flooded Rowles Lagoon in WA's Goldfields; and so began an unusual year of floods, frogs, flowers and fires (see page 42).

Aboriginal people of the northern deserts call the black-headed python 'warrurungkalpa', which roughly translates as 'grinder or crusher of rock wallabies'. See the story on page 17.

Radio collars are fitted to feral cats to help scientists track their movements. 'Hunting the Hunter', on page 36, focuses on research into the habits of these supreme desert hunters.

FEATURES

REGULARS

COVER

The majestic and graceful whale shark visits the north-west of Western Australia each year and is fast becoming a major tourist attraction. What does the future hold for the world's largest fish? See page 28.

The illustration is by Danka Pradzynski.

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