Bilbies have returned to Matuwa

Sixteen years after their reintroduction to Matuwa, bilbies are still surviving without predator-proof fencing, the only location in Australia with a successfully reintroduced population of bilbies in an open landscape.

by Dr Cheryl Lohr and Dr Martin Dziminski

Matuwa Kurrara Kurrara National Park, 160 kilometres north-east of Wiluna in the Gascoyne Murchison region, protects Martu Aboriginal cultural values and the area's unique biodiversity. The newly established national park is jointly managed by Tarlka Matuwa Piarka Aboriginal Corporation for the Wiluna Martu people and the Department of Biodiversity, Conservation and Attractions, and is once again referred to by its traditional name, Matuwa.

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Left Rugged terrain of Matuwa.
Photo – Judy Dunlop/DBCA
Right Greater bilby (*Macrotis lagotis*).
Photo – Jiri Lochman
Inset Releasing a bilby at Matuwa.
Photo – Judy Dunlop/DBCA

Top Honeysuckle Grevillea (*Grevillea juncifolia*).

Top right Local sign made by Wiluna Martu people.

Above right Brown falcon (*Falco berigora*).
Photos – Simon Cherriman

CREATING A SAFE SPACE

Since the government acquired Matuwa, windmills have been decommissioned and stock has been removed. Transient introduced herbivores such as camels have been removed through culling programs and deterred from entering the property by a solar-powered electric fence around the boundary of Matuwa.

Volunteer caretakers inspect this fence every month repairing any breaks. Annual feral cat control using Eradicat® baits together with supplementary trapping began in 2004 and the apparent abundance of feral cats has been reduced by 60–70 per cent. After several years of threat mitigation activities, bilbies were reintroduced to Matuwa.

LITTLE DIGGER

The greater bilby (*Macrotis lagotis*) is a burrowing marsupial with distinctive large ears and a pointed snout and weighs around 1–2.5 kilograms. Wild populations are currently found in north-west and central WA, western parts of the Northern Territory and in a small, isolated area of south-west Queensland. This represents a contraction to approximately 20 per cent of their former range and the species is listed nationally as Vulnerable.

Predation by introduced predators, particularly foxes, is thought to be a primary threat for the bilby. Unsuitable fire regimes and habitat degradation by introduced herbivores and land clearing are landscape-scale factors also affecting bilby range and prevalence.

Bilbies are nocturnal animals. They dig prolifically and use burrows, which descend in a spiral up to three metres deep. Many other animal species use bilby burrows

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for shelter, including brush-tailed mulgara (*Dasycercus blythi*), spinifex hopping mice (*Notomys alexis*), echidnas, and sand goannas (*Varanus gouldii*). Bilbies may occupy very large home ranges and are rarely seen in the wild. Digging activity by bilbies also helps to restore ecosystem function by reducing soil compaction and facilitating seed dispersal.

MONITORING BILBIES

Despite the lack of historical records of the bilby at Matuwa, their broad distribution within this region would suggest they did occur there. In order to establish a viable self-sustaining population of bilbies in 2007, the Department of Biodiversity, Conservation and Attractions (DBCA) commenced reintroducing bilbies to Matuwa. If successful, this translocation would also help to restore their ecosystem function. Bilbies for the translocation were sourced from a captive breeding program at the Peron Captive Breeding Centre in Shark Bay, and the Return to Dryandra captive breeding facility, near Narrogin. Some animals were also sourced from an introduced population on Thistle Island, South Australia. In total, 144 bilbies were released in areas of Matuwa without predator-proof fencing. Around 38 per cent of the bilbies were radio-tracked using tail-mounted radio-transmitters to monitor their survival.

Despite the threat mitigation activities, the initial survival rates of the translocated bilbies, and population viability analyses, suggested that the probability of the Matuwa bilby population persisting for more than 20 years was low. Ongoing monitoring of the bilby population and feral cat control at Matuwa was prioritised as a result.

SUCCESS

In 2015 and 2016, DBCA scientists developed and used a technique to monitor bilbies by using genetic analyses to identify individuals from DNA in their scats. They found that within ten years the bilby population at Matuwa had increased sevenfold to at least 971 individuals from the original 144 founders. Similarly, the area used by bilbies increased from the three original reintroduction locations to 188,400 hectares.

"Around 38 per cent of the bilbies were radio-tracked using tail-mounted radio-transmitters to monitor their survival."

Top Bilby burrow.
Photo – Simon Cherriman

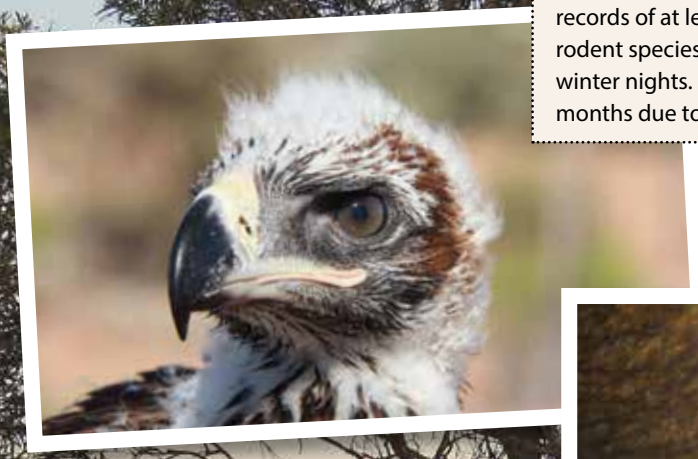
Top right Distribution map of bilbies in Australia.

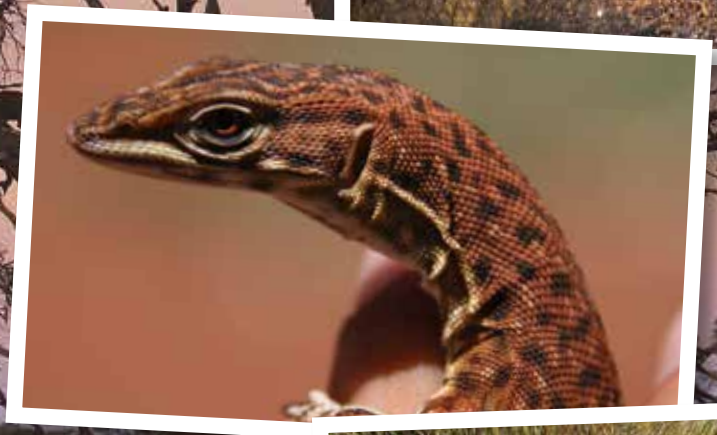
Above left Collecting bilby scats at Matuwa.
Photo – Martin Dziminski/DBCA

The magic of Matuwa

Matuwa spans 244,000 hectares and lies in central Western Australia. It contains at least 20 different land systems and vegetation types such as hummock grasslands, shrublands and mulga woodland. This diverse habitat supports a remarkable array of flora and fauna, with 480 vascular plant species and 220 vertebrate animal species occurring on the property.

The diversity of small vertebrates is one of the highest recorded in Australia, with records of at least 75 reptiles, five frogs, 133 birds, four bats, nine dasyurids and four rodent species. Matuwa has an arid climate with blistering hot summers and freezing winter nights. Rain (a mean at 262 millimetres per year) primarily occurs in the summer months due to remnant tropical low-pressure systems.





Main Matuwa at sunset.

Top Wedge-tailed eagle (*Aquila audax*) chick.

Top right Red kangaroos (*Osphranter rufus*).
Photos – Simon Cherriman

Above right Stripe-tailed goanna (*Varanus caudolineatus*).
Photo – Cheryl Lohr

Right Snow flower (*Macgregoria racemigera*) and arid zone stylewart (*Levenhookia chippendalei*).
Photo – Simon Cherriman

The Wiluna Martu Rangers have been using surveys of two-hectare track-plots to monitor the persistence of bilbies at Matuwa. Their data suggest that bilbies are continuing to persist.

In 2018, scientists set up 120 camera-traps to identify which habitats bilbies used on Matuwa. Bilbies were most common in areas with *Eucalyptus* species over spinifex hummock grasslands and sandy soils. They were less likely to be found in open mulga woodlands, on stony soils, or on salt lakes with a lot of bare ground.

Surprisingly, in 2015 and 2017, two bilby sightings, far to the west of Matuwa, were confirmed. These points were a minimum of 100 kilometres south of the nearest known naturally occurring bilby population in the Little Sandy Desert and were most likely individuals expanding out of Matuwa, 50 kilometres to the east.

Bilbies are still surviving at Matuwa without predator-proof fencing 16 years after reintroduction. Matuwa is the only location in Australia with a successfully reintroduced population of bilbies in an open landscape.

Successfully reintroducing bilbies to an unfenced area appears to hinge on effective landscape-scale control of introduced predators. Bilbies can survive and breed well when feral cat numbers are low (e.g. 0.46 cats per square kilometre). At Matuwa, the abundance of feral cats is consistently suppressed using aerial baiting.

Appropriate fire management, too, is likely a key component to the success of the bilbies at Matuwa. Since 2000, DBCA staff, together with the Martu Rangers, have been implementing patch mosaic burning. This type of fire management is similar to that used by Traditional Owners when they lived on the land prior to European settlement. This promoted the food and habitat diversity that bilbies require.

Above Predator-proof fencing.
Photo – Judy Dunlop/DBCA

Top left Bilby signs are in place at Matuwa.
Photo – Martin Dziminski/DBCA

Middle left Scientists in the field.

Below left Bilby burrow.
Photos – Martin Dziminski/DBCA

Below Bilby captured on camera.
Photo – Cheryl Lohr/DBCA

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