

Biodiversity of the Western Desert:

looking after country with the Martu traditional owners

by Alison McGilvray and Peter Kendrick

It was only 50 years ago that the Western Desert's traditional owners, the Martu, had their first encounter with European people. Now they are using western scientific methods to manage their traditional lands.



The Martu are the traditional occupants of Western Australia's remote Western Desert region. Martu is the collective name for 12 language groups of desert people whose land covers about 20 million hectares—almost the size of Victoria. Most of the Western Desert is now held by the Martu and Birriliburu under native title determinations. It extends across the Little Sandy and Great Sandy deserts, the Gibson Desert and parts of the Gascoyne and Murchison regions. These deserts—which are lucky to receive an average of 250 millimetres of rain per year—have been home to the Martu for thousands of years. Martu people are integrally linked to the health of their country.

Now, with the support of two Indigenous organisations, the Department of Environment and Conservation (DEC), CSIRO and Rangelands Natural Resource Management (NRM) Coordinating Group, Martu people are taking part in a number of land management projects that improve knowledge of the biodiversity of the Western Desert, while also providing local employment, empowerment and health benefits.

Martu country

Australia's deserts were much larger about 16,000 to 18,000 years ago, during the last glacial maximum. Rainfall was reduced, and strong winds transported sand, salts and fine sediments across the land. As Australia and the world have moved into the present, more humid interglacial period, the inland deserts have contracted to



their present extent. The vegetation on Western Desert dune systems stabilises the sand, reduces erosion and provides a rich and diverse habitat structure for animal species.

Despite its desert status, the Western Desert often abounds with life and has long provided sustenance for the Martu people. At least 10 threatened mammal and reptile species surviving in the Western Desert are listed under the Commonwealth *Environment*

Protection and Biodiversity Conservation Act 1999. These include the greater bilby (*Macrotis lagotis*), great desert skink (*Egernia kintorei*), northern and southern marsupial mole (*Notoryctes caurinus* and *N. typhlops*), mulgara (*Dasyercus blythii* and *D. cristicauda*) and the black-flanked rock wallaby (*Petrogale lateralis lateralis*). Most of these species are now extinct through the majority of their former range.

There are groves of desert oak trees and wide vistas of grassy sand plains set among vibrant iron-rich soils and brilliant skies. Some plant species have not been well recorded or collected and are poorly known to European scientists. However, the flora, together with animal species and desert places, has special significance to the Martu, who hold deep knowledge and understanding of country, and its plants and animals. This is held in the Dreaming stories of the desert peoples.

Wetlands also provide refuge habitat for aquatic flora and fauna and resting areas for migratory birds,



Above Some of the Jigalong tracking team. Photo – Joy McGilvray

Below right Parnngurr ranger coordinator Richard Goonan shows Yanjimi Rowlands and Vincent Campbell the techniques for reading the turbidity (suspended particle matter) of a water sample from Georgia Bore.

Below left Sunrise at Punmu community. Photos – Alison McGilvray/DEC

enabling them to fly long distances to move across the continent. For example, the pools of the Durba Hills and Rudall River system which flows through Karlamilyi National Park are recognised as nationally important wetlands. Freshwater rockholes, springs and soaks support ferns, sedges, rock figs and aquatic invertebrates.

Looking after country

Recently, Martu people have become actively involved in managing country to protect and maintain biodiversity through partnerships between state and Commonwealth agencies and native title and Indigenous representative groups. DEC has worked with Martu people since the late 1980s on nature conservation programs, in particular with Martu from Jigalong on a recovery project for the threatened black-flanked rock wallaby in the southern part of Martu country.

In 2009, Rangelands NRM secured Commonwealth *Caring for*

our Country funding for a two-year project entitled *Managing biodiversity on Martu lands in the Western Desert*. Project partners include Kanyirninpa Jukurrpa (KJ), Central Desert Native Title Services (Central Desert), DEC and CSIRO. KJ is a cultural and land management organisation which manages a wide range of activities, including documentation of cultural events and stories, filmmaking, ranger programs (funded by the federal *Working on Country* program) and other land management activities. The organisation represents people from the Martu native title area. Central Desert represents Martu from the Birriliburu native title determination to the south.

Both organisations have engaged and employed Martu people to undertake fauna and environmental surveys, and support fire and weed management. They facilitate inter-generational knowledge transfer between elders and young people and

increase the capacity of Indigenous people to eventually develop viable enterprises and a local workforce.

DEC helps Martu and field staff with field data collection and the provision of training, technical advice and guidance on a range of land management topics, including maps and the analysis of field-collected data. CSIRO has developed a comprehensive series of cultural maps of the desert landscapes, including fire patterns and history, food resources and waterholes.



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Main Western Desert landscapes. Photo – Alison McGilvray/DEC
Inset Birriliburu land management workers at Carnarvon Range. Photo – Mark D'Lima

Above Great Sandy Desert. Photo – Jiri Lochman

Left Marsupial mole. Photo – Stan Breeden/Lochman Transparencies





Left South Australian biologist Rick Southgate shows the gait of bilby tracks to field team leaders during a training session held at Lorna Glen former pastoral lease.
Photo – Alison McGilvray/DEC

Below left Animal tracks.
Photo – Hans and Judy Beste/Lochman Transparencies

Bottom left Martu elder Waka Taylor tells the story of a rock hole near Parnngurr community.
Photo – Alison McGilvray/DEC



Work has grown from a small sub-project in 2008, involving surveying the status of threatened fauna species in a few locations in the Little Sandy and Great Sandy deserts, to a comprehensive land management program based out of the communities of Parnngurr, Punmu, Jigalong and Wiluna. To date, KJ and Central Desert have employed more than 200 Martu field staff to track both native and introduced animals, undertake water quality monitoring and carry out weed mapping and visitor impact surveys. The information gathered is helping guide adaptive land management practices.

The project aims to manage biodiversity at a landscape scale and integrate traditional and contemporary natural resource management knowledge to help landowners and

managers protect threatened fauna species, reduce feral animals, implement prescribed burning programs and control or eradicate weeds.

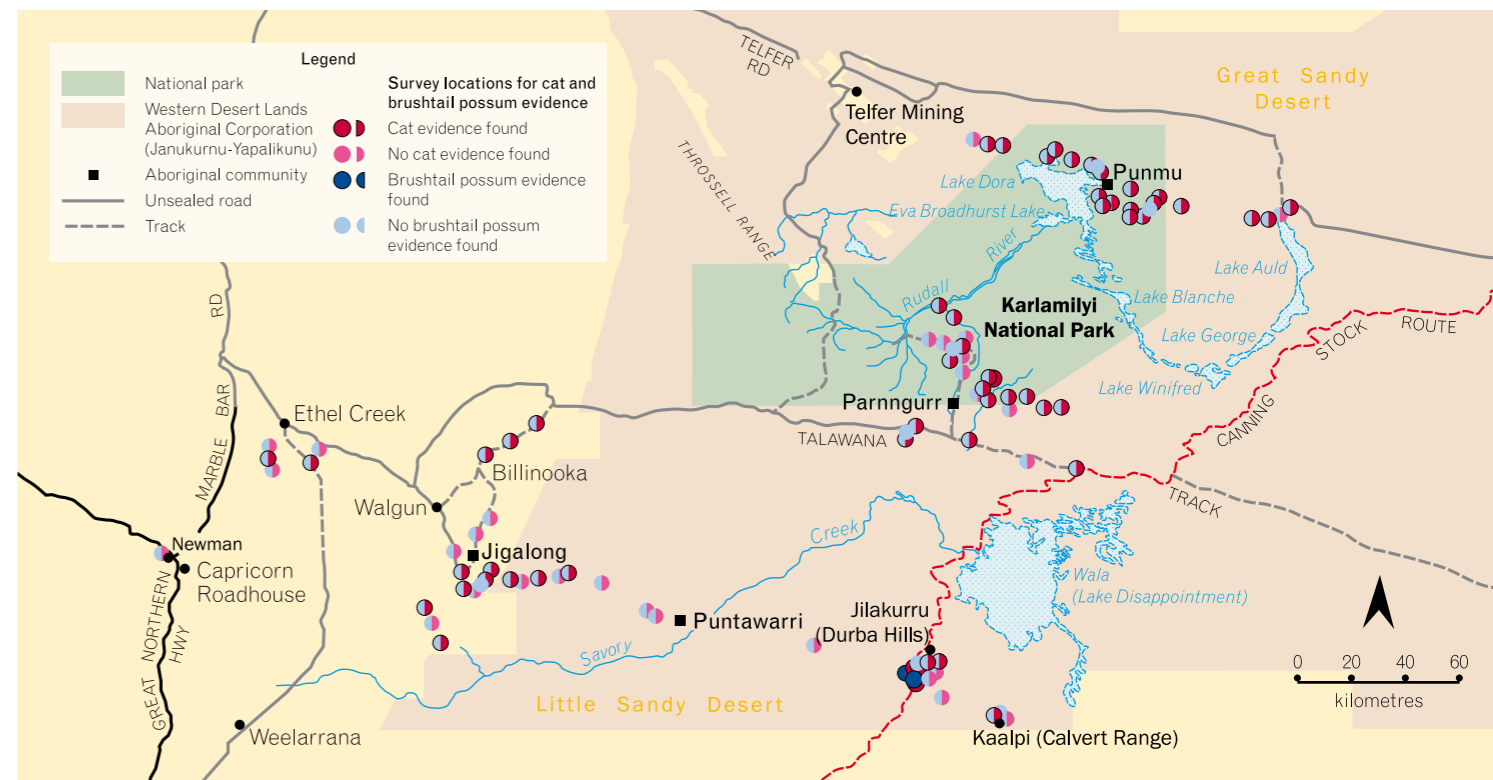
Fauna track monitoring

Project partners have implemented a random track-based plot survey method devised by rangeland ecologists to determine the distribution and abundance of animal species across sandy desert regions of Australia. These animals include threatened species such as the great desert skink and marsupial mole, game species such as the euro (*Macropus robustus*) and bustard (*Ardeotis australis*), and invasive species such as the cat (*Felis catus*), fox (*Vulpes vulpes*), donkey (*Equus asinus*) and camel (*Camelus dromedarius*).

The random plot survey method is a rapid technique which allows monitoring of populations over very large areas. The traditional tracking methods of Aboriginal people are fundamental to the accurate identification of signs which animals have made, in Martu terms, 'last night or yesterday', 'last week' or 'long time ago'. A two-hectare area is searched for a standard time period for the presence or absence of jamana (footprints), kuna (scats), pirti (burrows) and jawani (diggings).

Data are collected in the field using the freeware program 'Cybertracker'. The program is designed for field data capture, using on-screen icons, photographs and short wording. All data are geo-referenced and entered into a geographic information services program to show the distribution of species across the surveyed area.

These methods have uncovered some interesting finds. Up until now,



Above A sample of data collected in surveys: cat and brushtail possum evidence from April to June 2010.

Right Members of the ranger team Arthur Samson and Timmy Patterson on a reconnaissance flight over Jigalong country prior to aerial ignition.
Photo – Richard Boykett/DEC

distribution records for the brushtail possum (*Trichosurus vulpecula*) post European settlement have indicated that the species had disappeared from the Western Desert. However, using the plot survey method, brushtail possum signs have been discovered in several locations, though the evidence indicates that the desert possum numbers are very low. Possum claws were found in fox scats from an area near Well 29 on the Canning Stock Route in mid-2009, and tracks were discovered in a small cave at Durba Hills (known by the Martu as Jilakurru) in June 2010. In many areas where threatened native species were located, there were also abundant signs of introduced predators. This information may help to target areas for feral animal control programs in the future.

Burning traditions

Fire management is integral to both modern and traditional land management culture. It encourages the regeneration of vegetation and promotes habitat complexity, which is important to a range of animal species. Fire, introduced through prescribed burning, also reduces fuel loads and lowers the risk of a bushfire on a high fire risk day covering a large area, which simplifies habitat.

In the past, Martu people burnt country while seeking food or for other purposes as they travelled from one water source to the next. Now Martu travel in vehicles, but they continue to burn as they move along hunting tracks and between communities. These fires are usually very small: less than five hectares. However, while these transport routes are often burnt, country that was once accessed by people on foot is usually only burnt infrequently by bushfires that burn with high intensity and cover large areas.

Bushfires of high intensity that cover large areas can have devastating effects on plant and animal populations. They reduce the pockets of unburnt vegetation, important as refuges for some animals, and leave large areas exposed to wind erosion. Some weed species, such as buffel grass (*Cenchrus ciliaris*), are encouraged by fire, regenerating more rapidly than most



native grasses and dominating plant communities.

In 2009, DEC initiated aerial burning with the Birriliburu native title holders in conjunction with Central Desert. Discussions were held with Martu and DEC to determine which areas were most suitable for burning, with consideration being given to areas of cultural significance, creek lines and waterholes.

This has been followed up with prescribed burns during 2010 south-east of Jigalong community and in the Carnarvon Range, resulting in about 12,000 hectares being burnt. On both occasions, aerial burning was complemented by on-ground burning by the traditional owners.

Water sources, camels and weeds

In 2010, environmental surveys were conducted with Martu people to determine the environmental condition of places which are visited often, compared to rarely visited areas. Surveys assessed water source condition and water quality, vegetation structure and condition, and the presence and distribution of weeds.

Water sources are precious and culturally significant places in desert landscapes. Rock holes, soaks, springs and other water sources are threatened by increasing camel populations. Camel herds increase at a rate of between 10 and 12 per cent each year, and it is estimated that there are at least one million camels in the arid centre of

Australia (see 'Inland invaders: a million wild camels', *LANDSCOPE*, Spring 2010).

In 2006, an aerial survey conducted by DEC, the Department of Agriculture and Food and Newcrest Mining highlighted Karlamilyi National Park as a hot spot for camels, with densities reaching an average of about one animal per four square kilometres. The population size was then estimated at more than 21,000 over 78,500 square kilometres. Camels foul desert waterholes through excrement, and sometimes die in the water when they are unable to climb out of steep-sided rock holes. Camels, donkeys and cattle also trample riparian vegetation and muddy and churn up waters and pool sediments.

At the Western Desert Lands Aboriginal Corporation annual general meeting in 2009 (the Kalkan Kalkan meeting), Martu agreed on a broad strategy for managing camels and donkeys on their country. This included that in wirrilyi (far away) country, Martu will work with government to implement aerial control programs to help keep country strong. Following this decision, in November 2009 camel control was conducted along Savory Creek and the fringe of the pastoral and desert area. Aerial control of camels continued in November 2010, this time focusing on Karlamilyi National



Park and the surrounding areas as part of the National Camel Project, funded through the *Caring for our Country* program. Martu will work with DEC to monitor the health of the river, waterholes and important vegetation following the camel control.

Buffel grass was introduced as a pastoral species to support cattle drives on the Canning Stock Route. It has infested ephemeral water courses and many areas around soaks and rock holes. Buffel grass out-competes native vegetation and reduces habitat condition and complexity. Martu field officers are helping to map buffel grass populations, providing a benchmark to measure its spread in the future, or the effectiveness of control.

Recovery of the warru

Extensive searches through the Western Desert in the mid-1980s found living black-flanked rock wallabies, or warru, only at the Calvert Range (Kaalpi). At that time, the population appeared to be thriving and little evidence of feral predators existed. However, when the population was revisited in the early 1990s, a different story emerged. Dingoes (*Canis lupus dingo*) and feral cats were common and rock wallabies were much less conspicuous than a few years earlier.

It was clear that action was needed to conserve the supposedly last population of rock wallabies in the Western Desert. Fox baiting began in 1992. Despite this, annual monitoring of the population did not show any sign of rock wallaby recovery.

In 2002, the department's Pilbara Region, together with Martu people from Jigalong, started a cat baiting program. Baits containing the 1080 toxin were dropped across Kaalpi and the surrounding sand plain during winter and distributed along vehicle tracks by hand. Although monitoring

Above left Herds of camels, some containing up to 50 individuals, are frequently sighted in the desert.

Left A Martu traditional owner burning desert.

Photos - Jiri Lochman



effort varied, it seems that rock wallaby numbers have greatly increased. In 2008, 20 individuals were trapped and tagged for the first time, and 13 animals which had been tagged in previous years were trapped. In comparison, in 1991, a single animal was trapped and, in 2001, no rock wallabies were trapped at all.

Continuing on from the success of the population recovery at Kaalpi, KJ and DEC are now planning to re-introduce black-flanked rock wallabies from Kaalpi to Jilakurru. Before this can occur, cat baiting must be carried out at the release site. Baiting will be targeted to minimise impacts on the Jilakurru dingo population.

Benefits for all

Biodiversity conservation programs under way in the Western Desert have involved strong collaboration and goodwill between government agencies and community organisations and great steps forward are being made. This work represents a significant partnership between state and Commonwealth governments, non-government organisations and the Indigenous community.

In addition to environmental outcomes, these programs deliver employment opportunities, health benefits, and empowerment for the Martu participants. Understanding of the desert environment has increased

greatly through combining traditional knowledge with western scientific methods of data collection and processing. These data help to develop a constructive and adaptive management model that will protect and restore the desert flora and fauna, and guide their interactions with humans. The biodiversity values of the Western Desert now have a tremendous opportunity to be secure and protected for future generations, both for traditional custodians and for the greater community.

Above left Cath Rummery and Peter Kendrick, from DEC's Pilbara Region, record the body measurements and condition of a black-flanked rock wallaby from Kaalpi (Calvert Range).
Photo - Alison McGilvray/DEC

Above Members of the Jigalong ranger team Arthur Samson, Mark Jeffries and Timmy Patterson assist DEC's black-flanked rock wallaby monitoring program at Kaalpi.
Photo - Brett Lewis/DEC

Below Tracks of the munyanga, or 'mountain devil'.
Photo - Zan King



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