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Rangelands restoration: reintroduction of native mammals to Lorna Glen (Matuwa)

Animal Science

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Context

Operation Rangelands Restoration commenced in 2000 with the acquisition of Lorna Glen and Earaheedy pastoral leases by the Western Australian Government. This 600,000 ha area lying across the Gascoyne and Murchison IBRA regions is now the site for an ecologically integrated project to restore ecosystem function and biodiversity in the rangelands. This is being undertaken in collaboration with the traditional owners. In 2014 Native Title (exclusive possession) was granted over Lorna Glen (Matuwa) and Earaheedy (Kurrara Kurrara).

The area around Lorna Glen once supported a diverse mammal fauna that was representative of the rangelands and deserts to the north and east. These areas have suffered the largest mammal declines in Western Australia. This project seeks to reintroduce 11 arid zone mammal species following the successful control of feral cats and foxes, and contribute significantly to the long-term conservation of several threatened species. Mammal reconstruction in this area will also contribute significantly to the restoration of rangeland ecosystems through activities such as digging the soil and grazing/browsing of vegetation, and assist in the return of fire regimes that are more beneficial to the maintenance of biodiversity in the arid zone.

The first of the mammal reintroductions commenced in August 2007 with the release of bilby (*Macrotis lagotis*) and wayurta (*Trichosurus vulpecula*). Another nine species of mammal are proposed for reintroduction over the next ten years. Between 2010-2012, mala, Shark Bay mice, boodies and golden bandicoots were translocated into an 1100 ha introduced predator proof fenced enclosure. The intention is to use these as a source for translocations to areas of Lorna Glen outside the enclosure where cats have been effectively controlled, and ultimately the establishment of free-ranging self sustaining populations.

Aims

- Develop effective feral cat control techniques in a rangeland environment.
- Reintroduce 11 native mammal species to Lorna Glen by 2020, and contribute to an improved conservation status for these species.
- Re-establish ecosystem processes and improve the condition of a rangeland conservation reserve.
- Develop and refine protocols for fauna translocation and monitoring.
- Study the role of digging and burrowing fauna in rangeland restoration.

Progress

- Determination of Native Title to the Martu traditional owners over the Lorna Glen (Matuwa) property.
- Monitoring of mulgara populations inside and outside the enclosure.
- Widespread presence of bilbies across the bullimore sandplain land system and other habitats, and persistence of possums in core habitat.
- Monitoring of boodies and bandicoots inside the enclosure. Good population numbers and reproductive rates persist.
- Expansion of boodie presence and new warren systems within the fenced enclosure.
- Determination of home range of golden bandicoots within the enclosure.
- Eradicat baiting in 2014 only reduced cat abundance by 30-60% and wild dogs by ~ 25%, with remaining predator numbers deemed too high for successful translocations resulted in suspension of golden bandicoot release plans.
- Effects of bilby, boodie and varanid digging activity on soils and plants examined.
- A study of a boodie warren showed that soils on the warren were up to 100 times higher in plant limiting nitrogen than soils off the warren. Cotton bush (*Ptilotus obovatus*) growing on the warren had significantly more living tissue, greater leaf biomass and larger leaves.

- Experiments showed that boodies move sandalwood (*Santalum spicatum*) seed away from the parent plant and cache or bury the seed near potential host plants, which is one of the primary means of promoting sandalwood recruitment.
- Ongoing study of wedge tailed eagle ecology, reproduction and movement patterns, including satellite telemetry of 2 adult and 2 fledgling birds.
- Study into importance of bilby burrows as refuges for other vertebrate fauna.

Management implications

- Fauna reconstruction and monitoring techniques for arid zone rangelands developed by this project will have broad state and national application for the conservation of threatened fauna.
- The outcomes of the project will contribute to the management of Parks and Wildlife's rangeland properties and provide guidance for future fauna reconstruction, e.g. Dirk Hartog Island. It will also demonstrate effective partnership models with traditional owners and facilitate collaborative management with traditional owners.

Future directions

- Development of future engagement and cooperation with traditional owners in some management and monitoring activities.
- Ongoing monitoring of bilbies and possums outside the enclosure, and of bandicoots, boodies, mala and Shark Bay mice inside the enclosure.
- Develop plans for reintroductions of red tailed phascogales in 2016.
- Investigate the genetic health of possum population and assess need for future genetic supplementation.
- Undertake release of golden bandicoots in 2015, including additional feral control activities if aerial bait in 2015 fails to reduce feral cat numbers sufficiently on its own.
- Develop strategies for releases of boodies and bandicoots outside the enclosure in the presence of low densities of feral cats.
- Investigate the influence of reintroduced mammals on soils and plants and their potential to facilitate restoration.
- Commence planning and traditional owner liaison for expansion of fenced enclosure to 5,000 ha.