Project Rangelands Restoration: developing sustainable management systems for the conservation of biodiversity at the landscape scale in rangelands of the Murchison and Gascoyne bioregions–managing fire and introduced predators

Ecosystem Science

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Directorate	granted

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Context

Despite the relatively pristine nature of most of the arid interior (desert bioregions) and rangelands (beyond the pastoral zone), there has been an alarming and recent loss of mammal fauna, with about 90% of medium-size mammals and 33% of all mammals either becoming extinct or suffering massive range contractions. There is also evidence of degradation of some floristic communities due to altered fires regimes. The extent and nature of change in other components of the biodiversity, including extant mammals, birds, reptiles and invertebrates is unknown. The most likely causes of the decline and degradation in biodiversity are introduced predators, especially the fox (*Vulpes vulpes*) and the feral cat (*Felis catus*), and altered fire regimes since the departure from traditional Aboriginal burning practices over much of the region. Taking an adaptive experimental management approach in partnership with Goldfields Region, this project aims to reconstruct some assemblages of the original native mammal fauna on Lorna Glen, a pastoral lease acquired by the Department. This will be achieved by an integrated approach to controlling introduced predators and herbivores, ecologically appropriate fire management, and fauna translocations.

Aims

- Develop efficient, effective and safe introduced predator (fox and feral cat) control technologies for the interior rangelands and the arid region.
- Reconstruct the original suite of native mammal fauna through translocation once sustainable feral cat control can be demonstrated.
- Implement a patch-burn strategy to create a fine-grained, fire-induced habitat mosaic to protect biodiversity and other values.
- Describe and predict pyric (post-fire) plant succession and describe the life histories of key plant species.
- Monitor the long-term trends in species assemblages and abundance of small mammals and reptiles in an area where introduced predators are not controlled compared with an area where they are controlled.
- Model the relationship between seasons (rainfall) and the frequency and size of wildfires.

Progress

- Cat, fox and wild dog aerial baiting carried out in July 2013 as part of the Western Shield program was effective with the feral cat population reduced by 62% to a Track Density Index of 7. Five of the seven feral cats that were trapped and radio-collared prior to baiting were killed by the baiting (70% mortality).
- A PhD project to investigate interactions between wild dogs/dingoes and wild cats resulted in some 16 dogs and 21 cats being trapped and fitted with GPS collars. Trail cameras (136) were located across Lorna Glen to collect additional data on the occurrence, distribution, density and activity of wild dogs and cats. The study is testing the hypothesis that there is an inverse relationship between dog and cat density. The management implication is that retaining dingoes could result in a reduction in cats.
- Mulgara (*Dasycercus cristicauda*) population size has remained stable since last year and is still relatively high.
- The fire management plan continued to be implemented, including further installation of fuel-reduced buffers around some fire management cells and some core ignition using aircraft.
- With the assistance of Martu Rangers, 32 mulga trees were mechanically extracted and processed to determine biomass and carbon stocks in mulga as part of a program to determine whether good fire management in these ecosystems can reduce greenhouse gas emissions and increase carbon biosequestration.

Management implications

- This project is providing insurance populations of threatened arid zone mammals.
- Information will inform guidelines for the proactive management of fire in the arid zone rangelands to reduce the severity (scale and intensity) of wildfires and to provide habitat choice through mosaic burning.
- Guidelines for controlling introduced predators in the arid zone rangelands will reduce this threat to native fauna. Reintroduction and protection of mammals of the arid zone rangelands, other extant fauna, vegetation and other elements of the biota will provide reconstruction of animal and plant assemblages in an arid zone ecosystem.
- A framework and protocol for assessing and reporting trends in ecosystem condition in arid zone rangelands will provide a basis for ecosystem condition monitoring.

Future directions

- Assess and report on the effectiveness of wild cat and dog baiting.
- Complete a report on 10 years of biodiversity monitoring at Lorna Glen, and a scientific paper.
- Carry out a biological survey of Earaheedy.
- Survey wild dogs, cats and mulgara on Earaheedy where there has been no introduced predator control, and compare results with Lorna Glen.
- Continue to implement the fire management plan including buffer burning and aerial patch burning.