Progress Report SP 2003-004

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

Project Core Team

Supervising Scientist	Neil Burrows
Data Custodian	
Site Custodian	

Project status as of Sept. 27, 2017, 9:22 a.m.

Approved and active

Document endorsements and approvals as of Sept. 27, 2017, 9:22 a.m.

Project Team	granted
Program Leader	granted
Directorate	granted

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

N Burrows, G Liddelow

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 Matuwa (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

- Aerial cat baiting was carried out on Matuwa in July 2015 as part of the Western Shield and Rangelands Restoration programs. To measure the effectiveness of baiting, remote cameras were used in conjunction with traditional track counting as part of a program to move predator surveys to using remote cameras only. Baiting was moderately successful with the cat track activity and camera activity indices showing reductions due to baiting of 50% and 60% respectively, resulting in a post-bait cat track activity index <10. This trial demonstrated that cameras can be reliably used to survey cat density and are a significant cost saving. The track activity index in the unbaited control (Earaheedy - Kurara Kurara) was 26, indicating that cat control continues to be successful on Matuwa.
- The Mulgara (*Dasycercus blythii*) population on Matuwa has declined, but is still significantly higher than before baiting commenced in 2003 and is about double the population on the nearby unbaited Kurara Kurara.
- The Matuwa fire management plan continued to be implemented, including further installation of fuel-reduced buffers around some fire management cells and core ignition using aircraft. Some small patch-burning was carried out inside the predator-proof compound for wildfire mitigation and to create habitat diversity.

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 monitoring of cat density and baiting effectiveness on feral cats can be achieved through the use of cameras alone, delivering a significant cost saving for management.

Future directions

- Assess and report on the effectiveness of wild cat and dog baiting to be undertaken in July 2016.
- Prepare a paper for publication reporting on 10 years of biodiversity monitoring on Matuwa.
- Survey wild dogs, cats and mulgara on Karara Karara where there has been no introduced predator control, and compare results with Matuwa.
- Continue to implement the fire management plan including buffer burning and aerial patch burning. Carry out patch-burning in the predator-proof compound.