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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 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 feral cat baiting was carried out on Matuwa (Lorna Glen) in July 2016 as part of the Western Shield and Rangelands Restoration programs. A network of 50 trail cameras was used to measure the effectiveness of baiting. The post-bait cat camera activity index (CAI) was 2.1, representing a 38% reduction in cat activity attributable to baiting. While this is a low level of knockdown, weather conditions were sub-optimal and the cat density prior to baiting was low. Expecting high levels of knockdown of an already reduced cat population is unrealistic – as the cat density decreases, baiting will be less effective unless significantly greater control effort is expended. The current cat density is about as low as we can expect to achieve with annual aerial baiting. In order to establish free ranging predator-sensitive species such as boodies, feral cats will have to be eliminated for a period of time while founder populations establish.
- The Matuwa fire management plan continued to be implemented, including further installation of fuel-reduced buffers around some fire management cells and core ignition. 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

- Given that aerial baiting has been unable to further reduce the feral cat population, ground baiting will be trialled in conjunction with aerial baiting.
- Install trail cameras on Karara Karara (Earaheedy) (unbaited), to compare feral cat densities with Matuwa (baited).
- Assess and report on the effectiveness of feral cat and dog baiting to be undertaken in July 2017.
- Continue to implement the fire management plan including buffer burning and patch-burning. Carry out further patch-burning in the predator-proof compound.