Progress Report SP 2012-027

North Kimberley Landscape Conservation Initiative: monitoring and evaluation

BCS Fire Science

Project Core Team

X X **Supervising Scientist** Ian Radford
Data Custodian Ian Radford

Project status as of Oct. 3, 2022, 11:30 a.m.

X X Update requested

Document endorsements and approvals as of Oct. 3, 2022, 11:30 a.m.

X X
Project Team granted
Program Leader granted
Directorate required

North Kimberley Landscape Conservation Initiative: monitoring and evaluation

I Radford

Context

This project is a biodiversity monitoring and evaluation program to inform adaptive management of fire and cattle in the north Kimberley. The adaptive management program that forms the Landscape Conservation Initiative (LCI) of the *Kimberley Science and Conservation Strategy* commenced in 2011 in response to perceived threats by cattle and fire to biodiversity conservation in the North Kimberley. This initiative is based on the hypothesis that large numbers of introduced herbivores and the impacts of current fire regimes are associated with declines of critical weight range mammals, contraction and degradation of rainforest patches, and degradation of vegetation structure and habitat condition in savannas. This monitoring and evaluation program will provide a report card on performance of landscape management initiatives in the north Kimberley, particularly prescribed burning and cattle culling, in maintaining and improving biodiversity status.

Aims

- Inform management of biodiversity status in representative areas after prescribed burning and cattle control programs have been applied.
- Provide warning when landscape ecological thresholds have been reached, for example, decline of mammals to below 2 percent capture rate, or decline of mean shrub projected ground cover to less than 2 percent.
- Compare biodiversity outcomes in intensively managed and unmanaged areas to evaluate the effectiveness of management interventions in maintaining and improving conservation values.
- Investigate cane toad and predator interactions that may influence mammal abundance.
- Elucidate influence of different burning approaches to threatened plant taxa in the North Kimberley.
- Investigate interactions between fire and weed invasion.

Progress

- Monitoring at Wunaamin Miliwundi National Park in the west Kimberley indicates northern quolls have survived cane toad invasion starting 2019. Despite no quolls being recorded in 2021 at Bells Gorge, 3 quolls were trapped in 2022. Single quolls were captured at Mt Hart in 2021 and 2022.
- Fire and cattle management at Wunaamin Miliwundi has allowed accumulation of optimal long unburnt and undisturbed savanna vegetation, which has led to increases among threatened mammals including golden backed tree rats, pale field rats and western chestnut mice. These species are otherwise declining across most of northern Australia
- This program has provided feedback on where fire regimes have not achieved benefits to threatened mammals which has been used by fire managers to fine tune prescribed burning
- This research program has been highly productive and contributed to 16 journal publications as well as meta-analyses on trends among threatened mammals nationally

Management implications

- Analysis of the monitoring data shows that increasing patchy early dry season prescribed burning benefits most threatened species
- The fire mosaic attribute most closely aligned with high diversity and abundance of threatened mammals is percentage of long unburnt vegetation. This implies that long unburnt patches are an important target for prescribed burning in the region
- There is now strong evidence that cattle have a negative influence on threatened mammals such as the brush-tailed rabbit rat. This supports continuation of the department's feral cattle culling program for the benefit of threatened mammals and the other cattle threatened groups.

- Feral cats are strongly negatively associated with threatened mammal abundance and richness. In this context it is important to maintain vegetation cover through fire and cattle management to reduce cat hunting effectiveness.

Future directions

- Continue monitoring to evaluate management effectiveness for threatened mammals and other groups across the Kimberley region.
- Undertake occupancy modelling to determine the response of threatened species to fire regimes and other threatening processes.
- Undertake analysis of change in vegetation condition under prescribed management regimes