

Progress Report SP 2012-027

North Kimberley Landscape Conservation Initiative: monitoring and evaluation

Fire Science

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Project Team	granted
Program Leader	required
Directorate	required

North Kimberley Landscape Conservation Initiative: monitoring and evaluation

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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

- Latest monitoring is revealing negative impacts of cane toad invasion on quolls
- However improved fire and feral cattle management at several Kimberley Parks has improved mammal species diversity and abundance
- Modelling analysis completed using mammal data from 94 monitoring sites with multiple surveys. Manuscript submitted
- Analyses show that threatened mammals are doing best in areas with low feral cat activity. Vegetation attributes and disturbance (fire and cattle) also have a strong influence on mammal richness and abundance. Threatened mammals are positively associated with increasing site ruggedness/rockiness, increasing amounts of shrub cover and vegetation unburnt for >4 years
- The Kimberley regional monitoring program is expanding into new areas and the Kimberley Region has now taken the monitoring on as core business. Monitoring results are now routinely used in annual planning of fire and cattle management

Management implications

- Increasing patchy early dry season prescribed burning benefits most threatened species including the brush-tailed rabbit rat, northern quolls (in rocky habitats), the endemic Kimberley rock rat and the red cheeked dunnart.
- Most terrestrial rodents (e.g. *Rattus tunneyi* and *Pseudomys nanas*) are fire averse, and respond negatively to fires whether they are early prescribed burns or late season wildfires. This suggests that only by net reductions in annual burnt area will these rodents benefit.

- There is now strong evidence that DBCA prescribed patchy early dry season burning has changed fire regimes in the north and central Kimberley for the better by reducing wildfires.
- 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 other cattle threatened groups

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.