Is a fine-scaled fire mosaic good for avian diversity?

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FIRE MOSAICS & BIODIVERSITY

The idea that a fine-scaled fire mosaic is good for biodiversity is attractive to scientists and land managers because of the perceived benefits for fire management and conservation. However evidence in support of this view is scant. In this study we investigate how aspects of fire mosaic influence the avian diversity in mulga woodlands in central Australia.

THE QUESTIONS

How is avian diversity influenced by:

- 1. Time since fire?
- 2. Patch size?
- 3. The boundary between burnt and unburnt mulga?

METHODS: BIRD SURVEYS IN MULGA

The study was conducted in mulga woodlands at Uluru-Kata Tjuta NP in central Australia. Substantial amounts of mulga in three age classes were present (Figure 1). A total of 63 patches of mulga of different sizes were surveyed for birds. In addition surveys were conducted across 10 burnt/unburnt boundaries within mulga.

Figure 1. A mosaic of mulga of different times-since-fire at Uluru-Kata Tjuta NP.



Pink = burnt 2002 Green = burnt 1976 Black = long-unburnt



Long-unburnt mulga



Mulga burnt in 2002. Mu



Mulga burnt in 1976

RESULTS

1. Time-since-fire

A different bird community was present in mulga that was 5 years-since-fire than mulga that was 30 years-since-fire and long-unburnt. Time-since-fire had no effect on species richness or bird density. No species was at highest density in mulga that was 30 years-since-fire.

2. Patch size

Patch size had no effect on species richness or bird density. Only two out of 20 species showed an effect of patch size and both preferred large patches to small.

3. Edge effect

There was no positive effect of edge on species richness or bird density. Edge was intermediate between burnt and unburnt and had no special influence on bird diversity.

CONCLUSIONS

Fire causes a near-complete turnover in the bird community in mulga and the affects of fire last for at least 30 years. In contrast patch size and edge-effect have little influence. Whether a patch of mulga burns is far more important for avian diversity than the size or landscape context of the burn.

TAKE HOME MESSAGE

There appears to be no benefit to bird diversity of burning in a mosaic of small patches. Furthermore each species behaves differently so it is impossible to apply one fire regime that benefits all species at once. Fire management for conservation should therefore focus on maintaining suitable habitat for priority species such as those which are threatened.







(All bird photos: Geoffrey Dabb)















