Managing fire in the Western Desert; what can 40,000 years of human occupation teach us?

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Extended Abstract

Highly flammable vegetation and long periods of hot, dry weather have ensured that spinifex-dominated ecosystems of the Western Desert have had a long association with fire. These ecosystems are not only flammable, but they are fire maintained, with plants and animals displaying a variety of physical and behavioural traits that enable them to persist with, and in many cases, depend upon a range of fire regimes. Fires have been caused by lightning and people, but since Aborigines occupied these landscapes some 40,000 years ago people have been by far the greatest source of ignitions.

Fire regimes in much of the Western Desert changed when Aboriginal people discontinued traditional burning practices. It changed from a fine scale mosaic made up of numerous patches of vegetation at different times since fire (seral stages) to a coarse grain mosaic of fewer seral stages. This pattern is consistent with that observed in other flammable landscapes around the world following a reduction in fire frequency – usually due to the departure of people, the abandonment of traditional management practices that shaped these ecosystems or partially effective fire suppression. In almost all situations where this has occurred, there are fewer fires, but the fires are larger, more intense and damaging.

Altered fire regimes have been implicated in the recent decline of arid zone fauna. While predation by introduced predators is likely the primary cause, this will have been exacerbated by highly altered fire regimes, and where it was practiced, pastoralism - processes that have simplified habitats and reduced vegetation cover over large areas, diminishing habitat quality and exposing native fauna to predation.

As has been the case for the past 40,000 years in the Western Desert, people are integral to fire management in these landscapes and today fire management is integral to ecosystem management and biodiversity conservation. Managing fire for the conservation of biodiversity *per se*, is a laudable but nebulous objective. Fire is one of a number of environmental factors acting alone or together with other factors that influences biodiversity and ecosystem condition. While fire can kill and injure plants and animals, it also stimulates regeneration and rejuvenates ecosystem processes such as nutrient cycling. Fire acts on ecosystems and species primarily through its action on the vegetation at a variety of temporal and spatial scales. At both landscape and patch scales, fire, together with rainfall, alters the structure, composition and biomass of vegetation in space and time.

Vegetation is important in its own right and plants are also the primary producers in terrestrial ecosystems, providing food and shelter (habitat) for other organisms. Vegetation provides the energy to drive ecosystems and to drive fire. The approach to fire management in spinifex-dominated ecosystems is to focus on the role of fire in managing the vegetation, which is crucial as habitat, and to emulate practices that sustained these ecosystems for thousands of years. Good fire management will maintain a variety of seral (post-fire) stages, hence diverse habitats, at appropriate scales based on the growing knowledge that diverse habitats benefit biodiversity.