MANAGEMENT OF AUSTRALIA'S SPINIFEX GRASSLANDS WITH FIRE

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The spinifex grasslands cover almost a quarter of Australia, characterised by very high levels of perennial grass fuels. Fire is frequent across the ecosystem, initiated by humans and lightning. There is strong debate about the role that Aboriginals have played in manipulating the biota of the grasslands with fire; the issue remains unresolved. Dramatic range reductions or extinctions of many small native mammal species have been witnessed in the grasslands, often attributed to changes in fire regimes since European occupation. Fires are believed to be larger now and have an homogenising effect on the biota.

A general pattern of vegetation change after fire has been documented in central Australia. A flush of short-lived grasses and forbs characterises the early post-fire vegetation composition, resulting in high species diversity. Structural change follows, accompanied by strong decline in compositional diversity. The vegetation is eventually dominated by spinifex and a few tree and shrub species, when it is able to carry another fire. The rate of change in these plant community attributes is best related to cumulative rain-since-fire.

The grasslands are very sparsely populated, with few human resources to manage with fire. New technologies have been developed to accommodate the required scale of management in these remote areas. Fuel maps derived from satellite images enable regional planning. Fire behavior models and low-cost, 'natural' fire management methods have been developed. The technology can be applied at any scale.

Crucial to the use of fire is the development of appropriate management objectives. How many fire-created patches, were to locate them, what size should each be, what organisms are to be managed? Is the fire-created patch-work intended to inhibit the spread of wildfires, enhance biological diversity, or both? A theory relating patch dymanics to core habitat areas is developed to enable management strategies to be implemented.