

PROCEEDINGS OF THE AUSTRALIAN RANGELAND SOCIETY BIENNIAL CONFERENCE
Official publication of The Australian Rangeland Society

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Anderson, L., van Klinken, R. D., and Shepherd, D. (2008). Aerially surveying Mesquite (*Prosopis* spp.) in the Pilbara. *In*: 'A Climate of Change in the Rangelands. Proceedings of the 15th Australian Rangeland Society Biennial Conference'. (Ed. D. Orr) 4 pages. (Australian Rangeland Society: Australia).

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REVIEWING WOODY VEGETATION MANAGEMENT WITH FIRE IN WESTERN NSW RANGELANDS

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INTRODUCTION

The management of invasive or thickening woody species on western NSW rangelands has a chequered history. The issue was clearly recognised in the early years of pastoral settlement, but during the first half of the twentieth century, high rabbit numbers appear to have suppressed shrub recruitment. The decline of the rabbit with the onset of myxomatosis in the early 1950s, together with several woody recruitment episodes during high rainfall years, led to a period of active research and landholder activity in the use of various measures to kill “woody weeds”, including burning (Noble, 1997).

In recent years, changing values have added to the complexity of the issue. Perceptions of the role of shrubby communities in biodiversity conservation have strongly influenced policy development, so woody vegetation management is now subject to greater legislative scrutiny (see http://www.nativevegetation.nsw.gov.au/fs/fs_09.shtml, accessed 14/04/08). Pastoral industry capacity to manage woody vegetation has also declined through the financial consequences of drought, poor returns to conventional enterprises and diminishing manpower. At the same time, agency focus on researching shrub management has also dwindled.

Other than in higher rainfall or intensive-use situations, agriculturally-based mechanical or chemical responses to controlling woody thickening are generally cost-prohibitive in proportion to the value of the land. Globally there is a wide body of evidence suggesting that changes in fire regimes associated with European pastoral colonisation have been a significant contributing factor to increasing woody cover in open woodland or grassland environments within semi-arid rangelands. It follows that prescribed fire may be a component of a more cost-effective management response.

A large body of existing research identifies the strategic use of fire as a successful low cost tool for managing shrub density (Hodgkinson and Harrington (1985), Noble 1997). Appropriate fire regimes are also known to have good biodiversity outcomes in creating habitat mosaics (Myers et al, 2004). Under recent NSW native vegetation legislation, fire management remains a flexible shrub control option. However, there seems to be very few landholders who have intentionally or successfully adopted this approach.

METHOD

Our objective has been to understand the factors currently influencing the level of adoption and success of fire to manage NSW rangelands. We sought and interviewed landholders across the region who had actively used fire in the management of woody thickening, had experienced vegetation change in response to wildfires, or were interested in burning. Discussions with these landholders were solicited through contacts made at workshops and field days, responses to newsletter articles, following up on participation in West 2000 funding programs and word-of-mouth recommendations.

RESULTS AND DISCUSSION

Of the thirty landholders that we contacted or who approached us, only ten had actually used fire as a management tool in areas affected by woody thickening. For three of the ten, their experience involved wildfires, which provided opportunities for other treatments. Two other landholders had wildfires but did not follow up with active management.. While the contacts do not comprise all of the

landholders in western NSW with experience of fire, our survey suggests that only a small minority of pastoral lessees have actively burnt their country. Our difficulty in finding landholders with experience in using fire highlights the low uptake of the recommendations of fire research conducted in western NSW two decades ago. This research was at the time well supported by a range of extension materials aimed at promoting prescribed burning to manage woody thickening.

Most of the landholders interviewed who had used fire or been affected by wildfire reported good results in decreasing the density of woody growth and were interested in burning again for this reason. However, none had utilised burning other than as a one-off treatment to control woody weeds. This is despite previous research that concluded that fire alone can be a cost-effective shrub management tool, but that a program of sequential burns is essential for long-term success in reducing woody plant density.

Instead, burning was commonly used in conjunction with other measures involving mechanical or chemical treatments. Most of the fire-savvy landholders relied on mechanical operations such as chaining to initially knock down shrub growth and then used fire as a follow-up method to control regrowth or to clear debris. Several years of rest from grazing are commonly required to build up adequate fuel for burning in this situation. The cost of mechanical treatments is high in relation to land value, so landholders adopting this approach were generally in the higher rainfall parts of the NSW rangelands, such as around Cobar or Walgett.

Landholders attribute their poor uptake of fire as a result of unfavourable seasonal conditions, a lack of appropriate skills in prescribed burning, its limited effectiveness in mature or thick woody cover, uncertainty or resistance to regulatory requirements and a perception of variable results depending on the species treated. But not surprisingly, the key factor remains the influence of total grazing pressure in suppressing fuel loads.

Total Grazing Pressure

The impact of high levels of total grazing pressure on western NSW rangelands is well documented. Pasture (and ground fuel) utilisation is exacerbated by feral goat and kangaroo populations which share the landscape with domestic stock. These non-domestic herbivores thrive through the absence of dingo predation and abundance of open water sources. Their movement is not constrained by conventional fencing, so they are able to fully exploit available pastures regardless of domestic grazing management. Consequently, without specific grazing management measures, adequate fuel loads for prescribed burns only develop in the best of seasons. Landholders also expressed the concern that uncontrolled herbivores rapidly migrated to burnt areas to graze any subsequent green pick response, suppressing pasture recovery and favouring less palatable species including shrub growth.

Fortunately, many landholders are now upgrading fences with mesh products such as Hingejoint™ and controlling access to waterpoints, assisted by natural resource management incentive funding. These infrastructure improvements provide the means to manage ground fuel levels, so burning can become a management option.

Seasonal Conditions

Uncontrolled total grazing pressure compounds the impact of variable and periodically dry seasonal conditions on fuel loads in western NSW. The net result is that in the absence of adequate herbivore control, many landholders have few opportunities to burn. Long-term residents believe that they have only had an opportunity to burn perhaps three times in the past fifty years. Most now agree if they had of taken those opportunities they would be better off. They observe that many native annual and perennial grasses have disappeared due to inconsistent weather patterns and overgrazing. Spear grass (*Austrostipa spp*), now the dominant grass over most of western NSW, is reputed to break down quickly after seeding, limiting the window of opportunity to burn. Several indicated that speargrass needs to be burnt in late summer if any success is going to be achieved, but expressed concerns with the potential for hot conditions and the high chances of a fire escaping at this time.

Other Factors

Capacity factors featured strongly in landholder responses. With the low incidence of fire in western NSW, property managers have few opportunities to gain skills in organising and managing burns. A declining population density has also reduced the available knowledge-base of landholders with past experience in fire management. Additionally, many of those interviewed lacked a good understanding of the current regulatory framework, both in relation to native vegetation management and fire control, which was perceived as a significant obstacle to using fire. There were also concerns about liability issues and the insurance implications of prescribed burns escaping.

Given that the participating landholders were generally contacted in response to an expressed interest in use of fire, there were few concerns of unfavourable outcomes from burning. The concerns that did surface were mainly in relation to impacts on non-target plant groups such as perennial grasses, especially in the situation where a burn may get out of control.

CONCLUSION

Previous research and extension efforts to promote fire as a means of managing woody rangeland vegetation in the NSW rangelands have resulted in very limited uptake of this potentially cost-effective approach. The discussions with landholders have clearly indicated that the management of total grazing pressure remains the key impediment to the adoption of prescribed fire as a means of managing woody vegetation. Improving methods of total grazing pressure management are providing opportunities for a changed approach that includes the management of pastures as fuel for burning. However uptake will also be dependent on capacity building and a degree of cultural change.

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