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Mesquite management in the NSW Rangelands; A history of policy, management and landholder's perceptions

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Abstract

Mesquite (*Prosopis spp.*) is a Weed of National Significance and is declared in New South Wales under the Noxious Weeds Act 1993 (Class 2). Infestations of mesquite occur in far western NSW in varying densities over an area of approximately 680,000 ha within 3 discrete management zones to the north (200km), west (<30km) and south east (150km) of Broken Hill.

The Western Catchment Management Authority has invested considerable funds in mesquite management in the region since its inception in 2005, as have previous government agencies and departments over the last 30 or so years.

This paper will explore the history of the dynamics of relationships between government led initiatives and the legislative framework surrounding mesquite over this period and the impact this has had on landholder's perceptions and attitudes towards weed management and their role in containing this weed.

Further, the paper will aim to compare these observations with the corresponding growth in both the density and extent of mesquite infestations within the region, with the aim of exposing where the legislative framework and government led control initiatives may have failed or could be improved upon.

The paper will examine three levels of evidence to suggest that community-driven initiatives offer the greatest chance of success in controlling invasive plant species. These include; a

qualitative survey of land managers (farmers) and NRM managers (government agencies) and a review of previous government and private (landholder driven) initiatives in the region; a quantitative evaluation of the actual extent of mesquite within the region, comparing age classes of untreated individuals and evidence of previously treated ‘parent’ trees and; external case studies from other regions within Australia that have taken different approaches to managing pest plants with an emphasis on community involvement.

Introduction

Mesquite (*Prosopis spp.*) is one of the most serious threats to production and biodiversity in the Australian rangelands (Condon & Alchin 1979). Introduced to Australia in the early 1900’s; mesquite infestations are estimated to occupy 800,000 hectares in Western Australia, Northern Territory and Queensland (Strategic Plan 2000). The estimated extent may be extremely conservative as there is now recognition that the plant occupies an approximate area of 680,000 hectares (pers. observation Matt Goulton 2012) in the far western region of New South Wales (NSW) (Fig. 1).

Far western NSW is predominately a semi-arid landscape receiving between 250 and 400mm rainfall annually. The region lies within both the Lake Eyre and Murray-Darling Basins, encompassing a diversity of landscapes including ephemeral creeks and wetlands, semi-arid grasslands, chenopod shrublands, sand hills, rocky ridges and floodplains. The majority of mesquite infestations within the region occur on pastoral leases administered under the *Western Lands Act 1901*, where sheep and cattle production are the predominant land uses and property sizes range from 20,000 hectares to >250,000 hectares.

Mesquite first arrived in far west NSW in the 1940’s as a measure for reducing dust in the vicinity of Broken Hill. It was utilised at homesteads and watering points for shade, fodder and as an ornamental (Condon & Alchin 1979). Anecdotal reports suggest that cuttings were introduced by paddle-steamers along the Darling River, seed was sown from aircraft to the north of Broken Hill and landholders propagated the species as an ornamental in other areas.

Infestations to the north of Broken Hill occur within the Unincorporated Area of NSW, where the Western Lands Commission (WLC) takes the place of local government as the administrative body for the region. Infestations surrounding Broken Hill and to its south are within local government areas.

This paper will explore four distinct components of mesquite management in far western NSW, including:

- 1) the pest (mesquite; historical and current extent)
- 2) the law (legislative framework)
- 3) the government (initiatives, the carrot & compliance, the stick)
- 4) the landholders (perceptions, motivation, and initiatives)

We will consider a “case study” area (Figures 2 and 3) to illustrate how these components have interacted during the recorded history of mesquite control within far western NSW. Further, twelve landholders were interviewed to gain an insight into community perceptions of the weed and its control within the region.

The pest – historical and current extent

In 1976, mesquite infestations on the case study area (mainly one property) covered 22,500 hectares (Fig. 2), increasing to over 441,000 hectares in 2012 (Fig. 1). Using the density classification devised by Western Lands Officer RW Waites in 1976 (Fig. 2), the highest density of infestation (one plant per 50 – 100 square metres) has increased in size from 3000 hectares in 1976 (Fig. 2) to approximately 105,000 hectares in 2012 (Fig. 3).

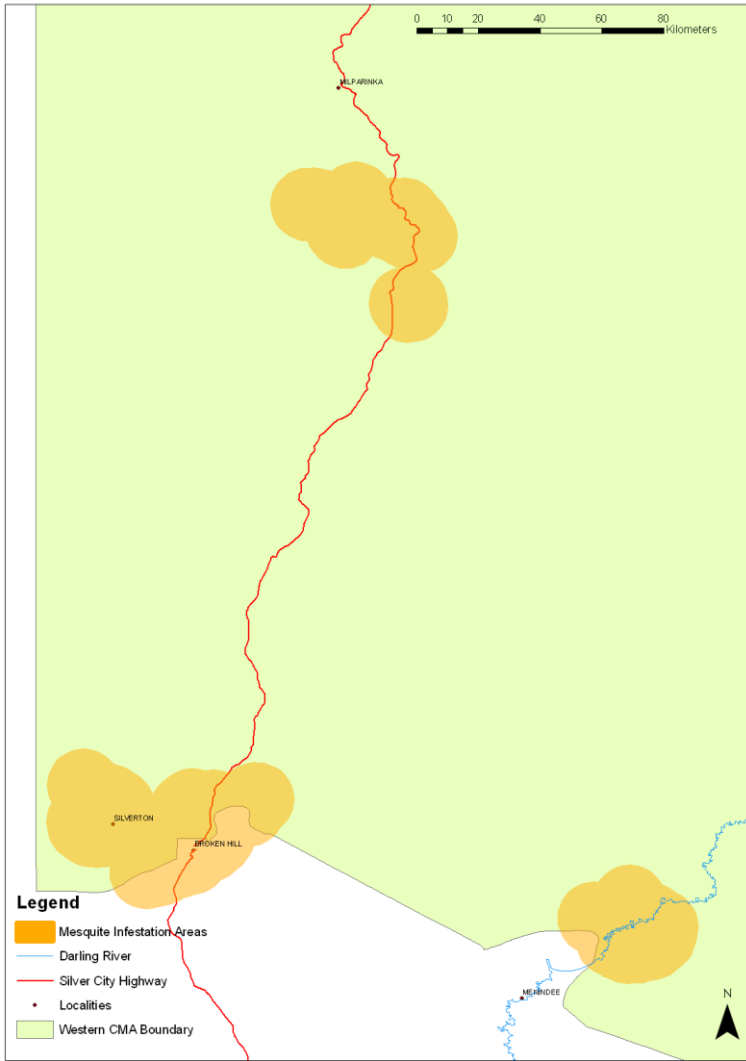


Fig. 1. Current extent of Mesquite in the far north-west of NSW

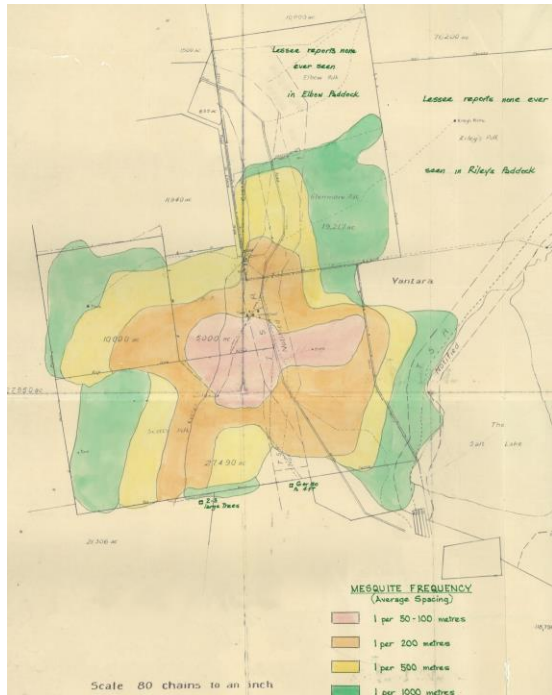


Fig. 2. Infestation of Mesquite (*Prosopis spp.*) mapped in 1976 on a case study area (one property)

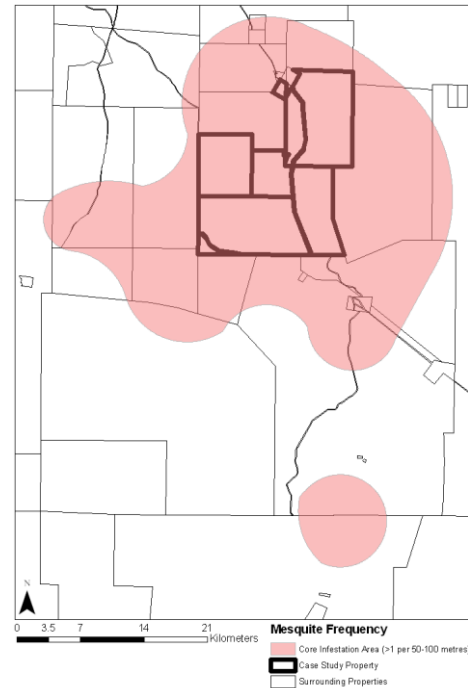


Fig. 3. 2012 Infestation of Mesquite (*Prosopis spp.*) mapped in 2012 on case study area (multiple properties)

A further increase in area and density of mesquite infestation detailed above can be attributed to recent above average rainfall summers in 2010/11 and 2011/12 that have resulted in mass germination (pers. observation Matt Goulton 2012). The full effect of these high rainfall summers will not be realised until plants become visible as they grow taller. Reports from various government agencies suggest that similar mass germination events occurred in 1974 and again in 1992/1993 after above average summer rainfall.

The law -legislative framework

Mesquite was declared a noxious plant in Queensland in 1954 and in Western Australia 1966, whereas in other states, this date has not been recorded (Strategic Plan 2000). Control efforts carried out by the WLC north of Broken Hill in the early 1970's suggest that the weed was also declared in NSW around this time. Currently, almost all states and territories have legislation pertaining to mesquite and in NSW, the weed falls under the *Noxious Weeds Act 1993*. This Act defines the roles of government, councils, private landholders and public authorities in the management of noxious weeds and lists mesquite as a 'control class 2'

noxious weed throughout far western NSW. As per the Act; “The plant must be eradicated from the land and the land must be kept free of the plant” in all local government areas within the management area as well as the Unincorporated Area.

As mesquite infestation areas occur within both Local Government Areas (LGAs) and the Unincorporated Area, administrative responsibility for the Act differs over the management area. In the case of where mesquite occurs within a local government area, a local control authority administers the Act, whereas within the Unincorporated Area, these responsibilities are devolved to the Western Lands Commissioner, under the *Western Lands Act 1901*. Although the local control authority differs between the two areas, landholder’s obligations under the Act remain the same.

The government – initiatives and compliance (the carrot and the stick)

Mesquite control initiatives were first carried out within far western NSW in the late 1960’s. Within a few years it was apparent that control of the weed was beyond the capacity of individual land managers (Condon & Alchin 1979). In 1970, NSW Government funds were allocated to the WLC in the first of many government control initiatives for mesquite control in the region, aiming to eradicate all mesquite plants within far western NSW.

From 1971 to 1979, 95,000 plants were chemically treated, and the WLC reported that “most mature plants in known infestations have been killed” and that the case study infestation “is getting very close to being brought under control”. (WLC unpublished report 1979). The WLC continued to fund and facilitate mesquite control programs throughout the 1980’s until 1991, when once again it was declared by the WLC that “all known plants had been treated” (WLC unpublished report 1996).

In 1996, an officer reported that “the number of plants now growing suggest a serious (infestation) problem is emerging and unless control measures are taken the extensive work undertaken by the WLC since 1970 will be lost.” (WLC unpublished report 1996). No further government initiatives were in place until a 1998 initiative (WEST 2000) for mesquite control was undertaken to the north of Broken Hill. From 2006 until 2012 the Western Catchment Management Authority, has coordinated, funded and implemented yearly control programs under various funding initiatives. The current programs have utilised a private contractor to carry out on-ground works.

The landholders – perceptions, motivation, and initiatives

Of twelve landholders that were interviewed, nine had mesquite on their property upon acquisition. All landholders believed to varying degrees that they were only partly, or not at all responsible for control of this weed and that government agencies should bear some of the cost of control. Many landholders attributed their awareness of the species to government led awareness and control initiatives as opposed to compliance action from a Local Control Authority, while all landholders were surprised by the level of spread on or adjacent to their properties.

The key limiting factors in controlling the weed on their property were listed as time and financial constraints, particularly while the impact on production remains negligible. All land managers interviewed indicated that they were aware of the threat that mesquite poses and rated the weed as a moderate to high priority for management on their land, however these priorities change with seasonal and financial fluctuations that affect land management. The need for a consistent and coordinated approach to management is also recognised and that the government would be best placed to provide this.

Implications for mesquite management

It appears that there is a solid legislative framework for control in place; a long history of government funded control efforts; and leaseholders are aware of the weed, its impacts and the need for control. One could clearly ask why has mesquite continued to spread seemingly unabated from 22,500 hectares in 1976 to over 441,000 hectares in 2012 on the case study property, with a similar story for other infestations within the region?

Several possibilities behind the ongoing spread of mesquite exist. A strong legislative framework is unlikely to achieve results if local control authorities are unwilling to enforce compliance. Alternately, the current and previous government-funded initiatives could be failing due to poor strategic implementation of control or awareness programs and sporadic investment. Furthermore, the landholders themselves may have become complacent when the problem appears to be ‘fixed’, as a number of ‘re-infestations’ have occurred as evident from the history of infestations and control.

It is challenging to identify the extent to which each of these individual components and their interactions have contributed to the increase in density and extent of mesquite. Significantly, when these three components of mesquite management have brought mesquite infestations under control, it appears that the community and government agencies may have not followed through with ongoing management to achieve eradication. Throughout the history of mesquite within the region, this lack of co-ordinated management has allowed mesquite infestations close to control to once again become enormous pastoral and environmental issues.

Co-ordinated management of mesquite could potentially be better achieved through a local management committee of landholders with support and representation from all relevant government stakeholders. This approach would invest landholders and government agencies in the mesquite problem with the aim of bringing the above three components: the landholders, the government and the legislative framework, together to coordinate and implement a long-term control strategy for the region.

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