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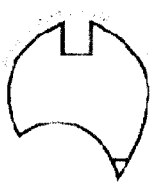

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A comparative analysis of two feral goat management methods commonly used in the Cobar district to restore native groundcover

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Abstract

Feral goats are a significant contributor to total grazing pressure in the Cobar district. The aim of this paper is to compare two methods of managing feral goats used on a Cobar district property, 'Gilgunnia', and their impact on groundcover and biomass. The two management methods discussed in this paper are a) harvesting feral goats by trapping watering points and b) a controlled situation using mesh-type fencing to eliminate all feral goats from that area. To assess the pasture biomass and the impacts of grazing, data was collected from four sites over a three-year period using the step-point monitoring method together with clippings collected in 2010. Overall, the data shows an improvement in vegetation groundcover for both harvesting and the controlled area over the three-year period, although the rate and extent of groundcover improvement was significantly higher in the area under total grazing pressure control. The landholder believes the better results in the controlled situation are due to complete control of feral goats and the rotational grazing system in place. The results cannot be achieved without the use of mesh-type fencing, which is costly. However, the harvesting operation funds the development of the total grazing pressure control

system. The two management systems on 'Gilgunnia' complement one another to achieve an ever-increasing area of high groundcover and good pasture biomass.

Introduction

Feral goats are a significant contributor to total grazing pressure (TGP) in the Cobar district. Conversations with Cobar district landholders indicate that numbers harvested per property range from 1,500 to 4,000 each harvest season, with the difference in numbers relating to whether the property lies within a goat preferred habitat. Recorded densities of feral goats are varied, with one study in western Queensland recording an average of 10/km^2 (Thompson et al. 2002) and another study during 1991/93 recording 24/km^2 near Wanaaring (Landsberg and Stol 1996). Estimates based on average densities of feral goats show that they consume between 10% and 25% of food eaten by large herbivores. (Hacker et al. 2005)

Feral goats are pests as they compete with domestic stock for pasture and some tree and shrub species. Their uncontrolled grazing depletes groundcover, which contributes to soil erosion. At the same time, feral goats are seen as a financial resource when they can be mustered and/or trapped, with prices ranging from $0.80/kg to $1.10/kg live weight in the Cobar area in early 2010. Because of this 'pest versus resource' status, management of feral goats varies considerably between properties in the district. Typically, feral goats are either managed under a harvesting operation or under total control using mesh-type fencing. The aim of this analysis is to record groundcover levels resulting from the two typical management systems on a property in the Cobar area affected by feral goats.

Property Details

The property, 'Gilgunnia', covers 11,500 ha. and has been owned by Ashley and Carolyn McMurtrie since 2004. It is located 30 km north of Cobar and has a semi-arid climate

with highly variable rainfall with a mean of 398.8mm per year. (http://www.bom.gov.au/climate/averages/tables/cw_048027.shtml)

The following information on the natural resources has been taken from the Western Lands Lease Management Plan for 'Allednub' (now 'Gilgunnia'), 1979.

The property consists of typical Cobar Peneplain type country, with hard red ridges and associated drainage flats. The hard red ridges have hard red clay loam soils with a hard surface. The main trees are mulga and red box. Shrub density is thick, with turpentine and budda being the most common. Groundcover is generally sparse, with the main species being spear grass, grey copperburr, yellow burr daisy, purple burr daisy and annual herbage.

The drainage flats consist of hard red loam to clay loam soils to depth. These flats vary from being narrow to very extensive areas. The main tree species include bimble box, white cypress pine, yarran and red box. Shrub density is thick with turpentine and budda being common. Groundcover is better than the ridge areas due to extra runoff received, with the main species being similar to the ridge country.

Management Systems

1) Harvesting operation

The harvesting operation is based on trapping water points with all nine waterpoints on 'Gilgunnia' trapped. Construction of trapyards started in December 2005 and was finished in December 2007. The area under the harvesting operation is 9,139 ha. However, feral goats are known to roam across property boundaries, making the area of influence for the trapyards larger than the property. No domestic stock are run in this area. The trapping season starts in October and ends in April. These are the warmer months of the year when feral goats are most dependent on water. Trapping started in

the 2006/2007 season and has continued for four seasons, with the last being 2009/2010.

The income from this operation is the major funding stream for the total grazing pressure (TGP) control fencing program.

2) Total grazing pressure controlled operation

The controlled area is fenced using mesh-type fencing with the objective of eliminating all feral goats and minimising kangaroo impact. Domestic stock are grazed under a rotational system. The area under this treatment is constantly increasing, and is currently at 1,185 ha. There are five TGP fenced paddocks, which are rotationally grazed with 380 commercial Boer nannies, 160 commercial Boer wethers, 32 Boer bucks and 20 Dorper ewes. The landholder describes the system as follows:

- after erection of the TGP fence, feral goats within the area are removed.
- Initial rest period of 12 months allows existing pasture to recover
- first grazing is heavy (80% pasture utilisation) to maximise animal impact on the ground and on the scrub
- after first grazing, there is a longer rest period to allow all juvenile plants time to establish and also give mature plants extra recovery time
- graze at different times of the year, allowing for germination of different plant species
- paddocks are grazed two or three times per year to 40% to 60% pasture utilisation
- paddock sizes are small for the Cobar district. The aim is for paddock sizes to be between 120 ha. and 160 ha. Small paddock sizes enable accurate pasture monitoring, are easier to keep free of feral goats and easier to maintain infrastructure.

Impact on groundcover

Groundcover was assessed in the area under the two management systems. Based on step-pointing data from four sites, vegetative groundcover is significantly lower in the areas under a harvesting operation compared to areas under TGP control. There is some improvement in groundcover under the harvesting operation management system. This may be due to: 1) improving seasonal conditions and/or 2) fewer feral goats grazing due to the harvesting operation. However, this area is not improving at the same rate or to the same extent as the area under TGP control.

	Harvesting operation area			TGP controlled area
	Site 1 – drainage flat	Site 2 – drainage flat	Site 3 - ridge	Site 4 – drainage flat
	Total % veg cover ex. litter	Total % veg cover ex. litter	Total % veg cover ex. litter	Total % veg cover ex. litter
2007	3.0 (3.0)	7.0 (6.0)	8.0 (8.0)	8.0 (8.0)
2009	6.0 (1.0)	45.0 (8.5)	28.5 (2.5)	96.0 (23.0)
2010	2.5 (1.0)	21.1 (13.6)	11.2 (10.0)	77.9 (33.5)

Table 1: shows total percent vegetation groundcover (excluding litter) over three years, with sites 1, 2 and 4 in drainage flats and site 3 on a hard red ridge. The figures in brackets indicate the percent perennial vegetation groundcover. Sites 1, 2 and 3 are in the harvesting operation area and site 4 is in the TGP controlled area. The area in site 4 has been TGP controlled since 2007.

The TGP controlled area not only has a higher percentage of vegetation groundcover, it also has a higher percentage of perennial species and higher pasture biomass. Visual assessment of pasture biomass of the area under the harvesting operation has been consistently estimated over the three years at <200 kg/ha. In contrast, the pasture biomass in the area under TGP control has been measured by clipping quadrats in 2010,

at 1,460 kg/ha. before grazing and 560 kg/ha. after grazing. This result compares favourably with pasture biomass data obtained from the Rangeland Assessment Program (Eldridge & Grant 2004) for the hard red range type (areas similar to 'Gilgunnia'). During the years 1989 to 2002, results showed a medium of 450 kg/ha with a maximum of 1,620 kg/ha and a minimum of 130 kg/ha.

Conclusion

The total grazing pressure-controlled operation as practised on 'Gilgunnia' achieves better results for native groundcover compared to the harvesting operation. The landholder believes the reason recovery has been less in the harvesting operation area is because this area never receives complete rest from grazing. Removal of goats under a harvesting operation is not complete; with the landholder estimating up to 50% of goats remain. This is due to goat behaviour with some goats shying away from trapyards. Also, trapping doesn't occur all year, leaving feral goats to graze during the cooler months.

In contrast to the harvesting area, the TGP controlled area is in good condition with a good percentage of groundcover and pasture biomass, even after grazing. The results cannot be achieved without the ability to control TGP and the most important tool to do this is mesh-type fencing. This style of fencing is costly, but the costs are highly subsidised by the money received from the harvesting operation. The two management systems on 'Gilgunnia' complement one another to achieve an ever-increasing area of high groundcover and good pasture biomass.

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