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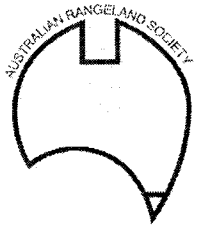


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# CATTLE GRAZING MAINTAINS OR ENHANCES PASTURE STABILITY WHEN COMPARED WITH LONG-TERM EXCLOSURES

*I.A. White*

Northern Territory DPIF, PO Box 8760, Alice Springs NT 0871

## ABSTRACT

*Nine paired sites, one grazed and the other exclosed from cattle grazing, were assessed using modified dry-weight-rank and comparative yield procedures. The enclosures were all long-term, varying in age from 15 to 30 years. They represented four different vegetation associations: mulga woodland with mixed grass pasture, mixed open woodland, shrubby annual grasslands and Mitchell grass plains. Two locations were discounted due to site factors. Of the remainder, five sites revealed little difference in vegetation composition following exclosure. The grazed components of the two final sites demonstrated an increased stability as a result of large increases in valuable perennial grass species. This shows that current grazing practices do not inevitably lead to resource degradation and can enhance both stability and productivity. Cattle grazing can be compatible with the arid rangelands.*

## INTRODUCTION

Commencing in 1965, small areas of pastoral country in central Australia were permanently fenced and had cattle grazing excluded. These exclosures were erected for a variety of reasons and as such are different sizes and shapes and were constructed at different times. They have been well maintained and if cattle have breached the fences then it has only been of short duration.

Over the years vegetation assessments have been erratic, but during 1993 and 1995 assessments of paired sites at each of the nine locations were carried out. The paired sites at each location consisted of one within the exclosure and one immediately outside in similar country. Exclosure locations could be separated into four types of country:

- mulga woodland with mixed grass pasture (3 locations),
- mixed open woodland (1 location),
- shrubby annual grassland (2 locations), and
- Mitchell grass plains (3 locations).

## METHODS

Assessments consisted of modified dry-weight-rank (Jones and Hargreaves 1979) and comparative yield procedures using photographs (Friedel and Bastin 1988) and were carried out following seasonal rainfall.

## RESULTS

Paired sites at two of the locations, one in Mitchell grass and one in annual grasslands, were discarded due to poor location of either the exclosure itself or the corresponding site outside the exclosure.

The grazed sites at five locations revealed only minor differences in species frequencies when compared with the corresponding enclosed sites. In a lot of cases these differences were in annual species such as buckbush (*Salsola kali*). Some species showed different trends at different locations. An example is cotton panic grass (*Panicum decompositum*), which had a higher frequency in the grazed area at one location but at two other locations was severely depleted with grazing.

Of significance was the result at the open woodland site. Over the period 1973 to 1995 there was a large species change, with perennial grasses increasing from less than 5% in the 1970s to an average of 44% in

the grazed area and 25% in the enclosed area in the 1990s. The species contributing most to this increase were golden beard grass (*Chrysopogon fallax)* and woollybutt (*Eragrostis eriopoda).*

## DISCUSSION

Annual yield and the proportion of species contributing to the yield are dependent on the amount and timing of rainfall and the amount of grazing immediately preceding the assessment. Exclosure did not lead to any consistent trend in either of these parameters. Frequency figures, i.e. the number of times species were recorded during the assessment, were therefore used as a more reliable long-term measure.

In the five locations showing only minor differences, those differences that were evident were often inconsistent between locations and therefore difficult to interpret. Where the differences in the frequencies between the grazed and enclosed sites were demonstrated by annual species then interpretation was generally simple. If the species was more prolific in the exclosure then it was a species preferred for grazing and had been removed in the grazed site. Frequencies of annual species, however, were not considered as significant because they were taken as being only a short-term effect of current season grazing.

Results from two of the locations of paired sites, one in the mulga woodland and the other in the open woodland, were previously reported by Foran *et al.* (1982). They concluded that after eleven years of exclosure no deleterious effects had been found and that cattle grazing should continue at current stocking levels and under similar management. Not only do the findings from these exclosures confirm these conclusions, but in two cases grazing enhanced the pasture.

At the open woodland site the perennial grasses which had increased so dramatically since the 1970s were golden beard grass and woollybutt, both of which are considered to be moderately palatable (Lazarides 1970). This change from annual to perennial pasture is generally seen as a positive change as it implies greater stability, both of soil and pasture. As the change has occurred in both areas, it appears logical that this must be as a result of the seasonal conditions. The fact that the trend is more pronounced in the grazed area (the yield of perennial grasses in 1993 was 150% greater in the grazed area, and in 1995 it was 30% greater) suggests that grazing has had a positive effect on pasture composition.

The other location where a positive effect of grazing was evident was in the Mitchell grass. This supports previous research that showed that Mitchell grass benefits from moderate grazing (Orr and Evenson 1991).

From the nine exclosed locations studied, grazing has not resulted in resource degradation and has in some instances enhanced the resource. Grazing within rangeland areas can be both compatible and sustainable.

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