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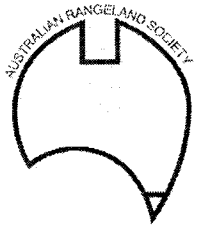

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VEGETATION MOSAICS AND UNEVEN GRAZING BY CATTLE IN EAST KIMBERLEY, WESTERN AUSTRALIA

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ABSTRACT

Variable grazing intensity within extensive paddocks in northern Australia's cattle industry is not necessarily related to the normal piosphere effect, but also to heterogeneous landscapes and pasture types. To provide management guidelines for land managers in the Kimberley Region, areas either preferred or avoided by cattle are being defined and characterised, in an attempt to understand the selection process. Initial data indicate utilisation rates are consistently higher on black soil pasture communities as compared with those on red soil. Some modification of this pattern may be possible through improved access to less preferred areas.

INTRODUCTION

Cattle graze unevenly across the landscape in the extensive conditions of northern Australia influenced not only by expected relationships such as distance from water, but by differing preferences among pasture types and differences within apparently homogeneous areas ('patch grazing') (Pickup and Chewings 1998, Mott 1991). Actual stocking rates in specific areas within paddocks bear only minimal relationship to applied stocking rates, use of available forage is inefficient and localised degradation common.

Options for managerial control once cattle are placed within a paddock are minimal. The only current managerial response is to fence along pasture type boundaries and stock each area according to its capacity. However, this can create uneven paddocks, often quite small compared to current paddock sizes, and is generally considered uneconomic. However, if the hierarchy of preference could be determined, and methods defined to reduce its influence, this could provide managerial guidelines to at least reduce, if not minimise, the problem.

METHODS

A grazing trial was established in 1993 in two paddocks (of 9000 ha and 5000 ha) on Springvale Station (E.G. Green and Sons, Harvey, WA) near Halls Creek (average annual rainfall approximately 550 mm) in the East Kimberley. Dominant land systems are O'Donnell and Richenda, both complex units. The former generally consists of rocky hill slopes, lower slopes and drainage floors dominated by soft spinifex (*Plectrachne pungens)* under snappy gum (*Eucalyptus brevifolia*). O'Donnell land system is predominantly low rounded uplands and gentle slopes dominated by ribbon grass (*Chrysopogon fallax*) and arid short grasses (*Enneapogon* spp.), with barley Mitchell grass (*Astrebla pectinata*), bluegrass (*Dicanthium fecundum*) and feathertop (*Aristida latifolia*) on the black/brown cracking clays of the lower slopes and flats.

Cattle grazing distribution was assessed during 1993-95. From mid-1994, certain modifications or inducements have been trialled in one of the paddocks, the other paddock remaining as it had been in the first year. These modifications included provision of a new waterpoint, modification to the location of supplements and the use of tracks. Fire was also proposed. The hypothesis was that such factors, by their strategic placement, could encourage cattle away from areas of high utilisation to utilise areas normally ignored or only lightly grazed.

A second aspect of the trial is to attempt to characterise those areas which cattle find either attractive or unattractive. Such a characterisation could help explain the reasons behind the hierarchy of plant

community preference and so enable a land manager to better plan the location of waterpoints, subdivisional fencing and so on to avoid inclusion of highly preferred areas within much larger areas of less preferred pasture.

RESULTS

Within the trial area, cattle prefer black soil pasture types. These exhibit higher forage utilisation indices than do the red soil pasture types (Table 1) independent of time of year. However, it appears that it is during the wet season and the very early dry season that cattle concentration on the black soil pastures is at a peak. Within the one pasture community, utilisation rates and patch development vary, depending on a series of factors. However, overall utilisation appears independent of the amount of forage available, with cattle ignoring forage types consumed elsewhere in the trial paddocks to utilise areas of black soil if these are available.

Table 1. Grass utilisation index at early, mid and late dry season sampling for 'generally' black and 'generally' red soil types, Springvale Station, 1993 to 1995.

	Early dry	Mid-dry	Late dry	Mean
Red soil	0.10	0.24	0.23	0.19
Black soil	0.41	0.54	0.51	0.49

Modification of grazing pattern, while still in the initial phase, suggests that 'ease of access' is an important factor. While access to less preferred areas in the trial did not appear difficult, cattle responded to the provision of tracks. However, habit appears to draw them back to more familiar areas in the short term. This aspect is still being assessed.

DISCUSSION

The project is beginning, at a pasture type scale, to identify the relative preferences of cattle in the Kimberley environment. Within pasture types, further data collection is beginning to identify those factors that either attract or do not attract cattle. However, this latter aspect is still in the initial stages, and considerable further data are required to define characteristics important in this regard. As a general outline, Habitat Suitability Models (US FWS 1981) will be used as a 'template' for the development of these concepts. If it does become evident that there is a possibility of defining more and less preferred habitat types, particularly within pasture types, then this will permit the development of management guidelines associated with paddock subdivision, the location of waterpoints and the assessment of carrying capacity. However, observations do suggest that 'habit' is ingrained in the trial cattle and a manager's ability to achieve permanent modification in grazing pattern distribution, even within the one paddock, may be difficult.

ACKNOWLEDGEMENTS

The cooperation of the manager and staff of Springvale Station is gratefully acknowledged, as is the financial support of the NAP2 of the Meat Research Corporation.

REFERENCES

Mott, J.J. (1991). Mosaic grazing - animal selectivity in tropical savannahs of northern Australia. Proc. XV Int. Grass. Cong. pp. 1129-1130.

Pickup, G. and Chewings, V.H. (1998). Estimating the distribution of grazing and patterns of cattle movement in a large arid zone paddock. *Int. J. Remote Sensing* 9: 1469-1490.

US Fish and Wildlife Service (1981). Standards for the Development of Habitat Suitability Models. US FWS, 103 ESM, 1981.