

## Utilisation of semi-arid scrubland by goats in the dry season

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### Introduction

The utilization of semi-arid rangelands by herbivores is driven by both temporal and spatial heterogeneity (Coughenour, 1991). Herbivores have adopted a variety of foraging strategies to cope with this variability (Coppock et al, 1986). Scoones (1995) reported on the adaptation of cattle in Southern Zimbabwe to landscape and seasonal heterogeneity in fodder availability. Goats are an important component of livestock production systems in semi-arid areas of Africa but there is limited information on their browsing strategies in relation to heterogeneity. The strategies used by goats are likely to be different from those used by cattle as the former are mainly browsers whilst the latter are mostly grazers. This abstract examines the distribution of tree species in three habitats and the feeding behaviour and tree species selection of goats during the months of July to December (dry season).

### Material and Methods

The study area was a communal area in Southern Zimbabwe. The three habitats studied were a piece of land bounded by two streams (Area I), an island in the Thuli river (Area II) and a river bank area (Area III). Assessment of tree species numbers and composition were made in 3 100-m transects set up in each habitat. Four animals (two young and two adult, with equal numbers of males and females in each age group) were observed during a feeding day (0700 to 1700 hours) thrice per month. The time the animals spent browsing, picking dry leaves, grazing, walking, resting or drinking water was recorded. Also recorded was time spent at each tree browsed. The data were summarised as percentages and subjected to analysis of variance using models that accounted for Area, month and interaction between the two in addition to sex and age of goats.

### Results and Discussion

The areas studied showed a great diversity in terms of tree species, with 15-20 different species in each area. However the top 10 trees (*Acacia galpinii*, *A. karroo*, *A. nigrescens*, *Commiphora mollis*, *Dichrostachys cinerea*, *Diospyros lycoides*, *Grewia flavescens*, *G. monticola*, *Schiberia alata* and *Ziziphus mucronata*) accounted for 95, 74 and 95 % of total tree populations in Area I, Area II and Area III, respectively. The feeding activities of goats varied with month. In the early to mid dry season (July-October), the goats mainly picked dry leaves from the ground (69 - 79 % of total feeding time). Browsing became a major activity in November and December (25 - 44 % of total feeding time) and grazing was a minor activity (0 - 8 % of total feeding time) even in December when grass was readily available. The trees most browsed varied with month and area (Table 1). *Diospyros lycoides* and *Acacia ingrescens* were the most popular species overall and this was not because of their abundance. For example *A. ingrescens* accounted for less than 5 % of the tree population in each area, yet it accounted for up to 67 %, 98 % and 52 % of browsing time in Areas I, II and III, respectively. Despite the wide variation in terms of tree types and numbers of trees in each habitat, the goats selected only a few species for browsing, depending on month. This dampened the spatial variability of available browse and points to possible over-utilization of certain species that might lead to their destruction. This is especially so in view of the fact that the preferred species were not present in large numbers. The preference of a limited number of species in an area could be due to chemical composition of the trees in relation to nutrient requirements of the goats and the seasonal changes could be in response to altering proportions of plant chemical constituents with season.

### Conclusion

Further studies to identify key resource trees in an area per season are needed. Such studies would contribute to decisions on which trees to propagate in national/regional/watershed afforestation programmes.

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Table 1. Distribution of tree species (% of total trees in leaf in area) and time spent on browsing preferred species (% of total time spent browsing in each) of the study areas in late dry season.

		September	October		November	
Area	Tree species		Tree species		Tree species	
<u>Distribution (% of total trees)</u>						
1	<i>Diospyros lychooides</i>	21	<i>Acacia nigrescens</i>	4	<i>Acacia nigrescens</i>	4
	<i>Ziziphus mucronata</i>	4	<i>Diospyros lychooides</i>	21	<i>Commiphora mollis</i>	<1
	<i>Schibera alata</i>	6			<i>Colophospermum mopane</i>	<1
					<i>Diospyros lychooides</i>	21
2	<i>Euclia crispa</i>	<1	<i>A. nigrescens</i>	1	<i>A. nigrescens</i>	1
	<i>A.nigrescens</i>	1	<i>S. alata</i>	3	<i>Peltophorum africana</i>	<1
					<i>D. lychooides</i>	3
3	<i>D.lychooides</i>	51	<i>A. nigrescens</i>	3	<i>A. nigrescens</i>	3
	<i>S. alata</i>	4	<i>A. karroo</i>	<1	<i>C. mollis</i>	<1
	<i>Acacia karroo</i>	<1	<i>Dichostachys cinerea</i>	4	<i>A. karroo</i>	<1
			<i>D. lychooides</i>	51	<i>Z. mucronata</i>	3
<u>Time spent on browsing ( % of total feeding time)</u>						
1	<i>Diospyros lychooides</i>	92	<i>Acacia nigrescens</i>	67	<i>Acacia nigrescens</i>	55
	<i>Ziziphus mucronata</i>	4	<i>Diospyros lychooides</i>	33	<i>Commiphora mollis</i>	13
	<i>Schibera alata</i>	1			<i>Colophospermum mopane</i>	5
					<i>Diospyros lychooides</i>	4
2	<i>Euclia crispa</i>	80	<i>A. nigrescens</i>	98	<i>A. nigrescens</i>	98
	<i>A.nigrescens</i>	20	<i>S. alata</i>	1	<i>Peltophorum africana</i>	2
					<i>D. lychooides</i>	1
3	<i>D.lychooides</i>	75	<i>A. nigrescens</i>	52	<i>A. nigrescens</i>	52
	<i>S. alata</i>	13	<i>A. karroo</i>	38	<i>C. mollis</i>	18
	<i>Acacia karroo</i>	8	<i>Dichostachys cinerea</i>	3	<i>A. karroo</i>	12
			<i>D. lychooides</i>	2	<i>Z. mucronata</i>	8

**References**

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