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## RELATIVE PALATABILITY OF SELECTED PLANTS IN THE SHRUBLANDS OF WESTERN AUSTRALIA

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### ABSTRACT

This report outlines the methods and results of a survey of experienced rangeland practitioners undertaken in 2003, regarding the relative palatability of a number of perennial plants in the shrublands (southern rangelands) of Western Australia. Results are presented as a chart listing the 47 surveyed plants in order of relative palatability and the palatability range of each, as perceived by the practitioners. Based on mean palatability rank, the plants 'fell' naturally into five palatability classes, denoted "very high", "high", "moderate", "low" and "very low". The two most palatable plants are *Maireana platycarpa* (shy bluebush) and *M. convexa* (mulga bluebush), and the two least palatable plants are *Eremophila fraseri* (turpentine bush) and *E. crenulata* (waxy-leaf poverty bush). Many plants display narrow palatability ranges (1 or 2 classes) but most show a much broader range; the plant with the broadest range (from "very high" to "very low") is *Maireana amoena* (brittle bluebush). The survey was undertaken to test whether more definitive palatability information was contained 'within practitioner heads' than was presently available in published sources. The results, we believe, are more definitive than existing literature, providing a powerful distillation of many collective years of rangeland experience and wisdom, summarised in a concise format, easily assimilated by people of varying experience.

### INTRODUCTION

Despite its importance in understanding the impact of herbivores on rangeland landscapes, there is a paucity of concise published information on the palatability of plants occurring in the shrublands of Western Australia, apart from the general information provided in Mitchell and Wilcox (1994). In order to, at least partly, redress this shortcoming, we chose to undertake a survey of experienced rangeland scientists in 2003, with the hope of either 'extracting' better palatability information from 'within their heads' or perhaps unearthing unpublished or obscure sources. The term palatability is used here to mean the general acceptability of a plant to a herbivore, and Vesk and Westoby (2001) clearly argue that palatability is relative, not absolute.

### SURVEY AIM AND METHODS

The aim of this exercise was to produce a list of plants showing their palatability relative to each other and the palatability range of each, based on the accumulated field wisdom of experienced rangeland practitioners. Given a hypothetical grazing scenario, 17 practitioners numerically ranked a list of 47 perennial plants from most palatable (rank 1) to least palatable (rank 47). The plants, all described in Mitchell and Wilcox (1994), were selected such that each has a reasonably broad distribution, although not necessarily throughout the entire shrublands, and is reasonably common within its range. Only perennial shrubs and trees were included and the list was limited to less than 50 plants to reduce ranking difficulty. Since the survey was only concerned with palatability, rather than other related aspects such as plant response to grazing, utilization etc, the practitioners were also asked to moderate confounding influences as much as possible. The hypothetical grazing scenario consisted of a very large paddock with all listed plants present at typical densities and having just experienced a run of fair seasons. This paddock was subject to continuously increasing grazing pressure from mixed, managed and unmanaged herbivores, e.g. sheep, goats, and kangaroos.

Analysis was based on rank frequencies and means. Rank counts for each of the 47 plants were graphed against rank to produce a histogram plot, obvious outliers deleted (8% of all counts) and mean palatability rank calculated for each plant. From a plot of mean ranks, ordered from lowest to highest, against rank, five distinct palatability classes were recognised, and were given the names “very high”, “high”, “moderate”, “low”, and “very low”. A total of 787 counts were used, with individual plants having between 12 and 19 counts.

## SURVEY RESULTS

Results of the survey are presented as a chart (see poster in conference display area and also The Australian Rangeland Society website at <http://www.austrangesoc.com.au>) (Russell and Fletcher, 2003) showing each of the perennial plants:

- Listed in order of mean palatability (relative palatability),
- Palatability range of each, and
- Relative palatability classes.

The two most palatable plants are *Maireana platycarpa* (shy bluebush) and *M. convexa* (mulga bluebush), reinforcing the widely held view that they are highly desirable. The two least palatable plants are *Eremophila fraseri* (turpentine bush) and *E. crenulata* (waxy-leaf poverty bush). Many plants display narrow palatability ranges (1 or 2 classes) but most show a much broader range; the plant with the broadest range (from “very high” to “very low”) is *Maireana amoena* (brittle bluebush). Explanation for the broad ranges, particularly for the chenopods, probably lies in confounding effects such as stock water quality and quantity, and variations in plant specific characteristics. It is also possible that practitioner uncertainty, through incomplete knowledge of some species, contributed to the palatability ‘spread’.

Considering the palatability range of particular genera, both *Eremophila* and *Maireana* show very broad ranges, from “very high” to “very low” with *Eremophila* spp. tending towards the less palatable end and *Maireana* spp. towards the more palatable end of the spectrum.

## CONCLUSIONS

The results, we believe, are more definitive than existing literature (Russell and Fletcher, 2003). By tapping into practitioner perceptions of plant palatability, developed through keen observations of what animals eat, albeit often incidental to their primary field tasks, the chart provides a powerful distillation of many collective years of rangeland experience and wisdom, summarised in a concise format. People working in the field are encouraged to use the chart as a starting point on which to build personal experience, to test the validity of the collective perceptions and hence progress towards more comprehensive understanding of plant utilisation by herbivores and long-term sustainable use of our rangeland landscapes.

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## REFERENCES

- Mitchell, A. A. and Wilcox, D. G. (1994). *Arid Shrubland Plants of Western Australia*. University of Western Australia Press.
- Russell, P. and Fletcher, W. (2003). Relative palatability of selected perennial plants in the southern rangelands of Western Australia - results of a survey of rangeland practitioners. *Range Management Newsletter*, 03/3, 1-8.
- Vesk, P. A. and Westoby, M. (2001). Predicting plant species' responses to grazing. *J. App. Ecology* 38: 897 - 909.