

**PROCEEDINGS OF THE AUSTRALIAN RANGELAND SOCIETY  
BIENNIAL CONFERENCE**

**Official publication of The Australian Rangeland Society**

**Copyright and Photocopying**

© The Australian Rangeland Society 2012. All rights reserved.

For non-personal use, no part of this item may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior permission of the Australian Rangeland Society and of the author (or the organisation they work or have worked for). Permission of the Australian Rangeland Society for photocopying of articles for non-personal use may be obtained from the Secretary who can be contacted at the email address, [rangelands.exec@gmail.com](mailto:rangelands.exec@gmail.com)

For personal use, temporary copies necessary to browse this site on screen may be made and a single copy of an article may be downloaded or printed for research or personal use, but no changes are to be made to any of the material. This copyright notice is not to be removed from the front of the article.

All efforts have been made by the Australian Rangeland Society to contact the authors. If you believe your copyright has been breached please notify us immediately and we will remove the offending material from our website.

**Form of Reference**

The reference for this article should be in this general form;  
Author family name, initials (year). Title. *In*: Proceedings of the nth Australian Rangeland Society Biennial Conference. Pages. (Australian Rangeland Society: Australia).

For example:

Anderson, L., van Klinken, R. D., and Shepherd, D. (2008). Aerially surveying Mesquite (*Prosopis* spp.) in the Pilbara. *In*: 'A Climate of Change in the Rangelands. Proceedings of the 15<sup>th</sup> Australian Rangeland Society Biennial Conference'. (Ed. D. Orr) 4 pages. (Australian Rangeland Society: Australia).

**Disclaimer**

The Australian Rangeland Society and Editors cannot be held responsible for errors or any consequences arising from the use of information obtained in this article or in the Proceedings of the Australian Rangeland Society Biennial Conferences. The views and opinions expressed do not necessarily reflect those of the Australian Rangeland Society and Editors, neither does the publication of advertisements constitute any endorsement by the Australian Rangeland Society and Editors of the products advertised.



*The Australian Rangeland Society*

# ISLANDS OF GRAZING IN SEAS OF RANGELAND WILDLIFE: A KEY ELEMENT FOR SUSTAINABLE PASTORAL MANAGEMENT

*Harald Ehmann and Rodger Tynan*

Pastoral Management Branch, SA Dept of Environment and Natural Resources,  
GPO Box 1047, Adelaide 5001

## ABSTRACT

*Rangeland wildlife dynamics are based on refuge habitats. Piospheres result from grazing impact around waterpoints and biodiversity is affected by grazing intensity. Wildlife losses have been substantial, however, pastoralism is not the major cause. Biodiversity is a health measure of the rangelands.*

## BACKGROUND

Sustainable use of the pastoral lands requires the development and implementation of sustainable management practices. This is a key State and national objective for land care practice. While we do not yet know all the requirements, some guiding information about the elements of sustainable management is now clear.

## THE PRESENT: CURRENT KNOWLEDGE

### How Stock Graze: the Piosphere

Stock graze out from water in a predictable way, and the area they usually graze is called a piosphere. A piosphere consists of concentric contours of decreasing impact as the stock graze out to their maximum dry-time distances from their water source (about 5 km for sheep and 8 km for cattle). The piosphere contours are compressed or expanded by fences, topography, soils, vegetation, prevailing winds and the availability of shade (Lange 1985).

### Biodiversity and Grazing Intensity

Biodiversity within a piosphere is affected by grazing: some animals and plants are badly affected by high and moderate grazing intensities and a few are favoured. Susceptible species survive in the relatively ungrazed parts of paddocks (James *et al.* 1995).

### Rangeland Wildlife Dynamics and Refuges

Populations of native animals and plants wax and wane through districts, time, rains and droughts. In wet years many species of wildlife proliferate in the rangelands. In drought, these species may persist in tiny refuges (Morton 1990). Most reptile and frog populations can sit out drought and many survive in refuges like deep burrows, hollows and crevices. Plants mostly hang on through drought or survive as seeds, awaiting wetter times.

### Some Critical Refuge Habitats in South Australia that Require Sensitive Management

- Areas with enhanced water retention (so called 'sweet areas': intermittent water courses, waterholes, ephemeral swamps or soaks). These are critical for mammals.
- Run-on areas around massive outcrops of impervious bedrock. These receive additional nutrients and water, have higher biodiversity, and support native species during drought.
- Rocky areas (usually in ranges) with springs and local entrapments of water in soil pockets or in rock holes (especially important for wallabies).
- Woodland vegetation with a complex understorey. This habitat has abundant resources like shelter and nesting sites (e.g. hollows) for reptiles, mammals (especially bats) and birds.
- Lunette dunes that fringe salt lakes and clay pans. The slightly elevated humidity of the burrows in the salty soils can allow humidity-dependent species to persist in drought.

### Wildlife Losses: Possible Causes

The world's worst decline and loss of native mammals since European settlement have occurred in the arid zone. The extinction of native mammals in huge areas which have never been grazed by stock suggests that stock impact alone was not the major cause. Rabbits, foxes, cats, other feral animals and possibly some diseases or parasites may well have been more significant. Changes in the nature and frequency of fire appear to have had a detrimental effect. Watering points have greatly increased the numbers of large kangaroos in sheep grazing lands and dingoes in cattle country. The impact of their now continuous presence *and* high abundance on biodiversity is probably high but not well understood.

### THE FUTURE: KEEPING IMPACTS TO ISLANDS

1. Sustainable use of the rangelands (including all the reserves) will depend largely on what happens on pastoral leases and Aboriginal lands. Supportive non-reserve management will be pivotal. Retaining biodiversity will be an important measure of the health of rangelands. Pastoralists need information to help them manage biodiversity (e.g. see Ehmann and Tynan, in prep).
2. Pastoral and other disturbance usages of the rangelands can be viewed as *islands of development (e.g. piospheres) in seas of undeveloped (e.g. relatively ungrazed) naturalness*. When adding or relocating a water point we need to consider the full impact of that action.
3. We need to reduce or eliminate the feral peril. Water points are wildlife slaughter points for cats and foxes; *their* watered areas (7+ km) are killing fields. Much research on control is in progress and as results become available control measures can be implemented.
4. We need to recognise and care for drought refuges. These areas need sensitive stocking strategies, better feral animal control and manipulation of excessive numbers of native species that 'plunder' refuges while watering elsewhere.

Pastoralists and outback-wise people are generally adaptable, resourceful and appreciate rangeland dynamics. They have a keen interest in sustainable rangelands. These attributes augur well for sustainable management of the pastoral lands and biodiversity.

### REFERENCES

- Ehmann, H. and Tynan, R. (*in prep*). Wildlife management manual: Gawler Ranges and Kingoonya Soil Conservation Districts: A handbook for managers. Pastoral Management Branch, Department of Environment and Natural Resources, South Australia.
- James, C.D., Landsberg, J., Hobbs, T. and Morton, S.R. (1995). The relationship between the provision of artificial water sources in arid and semi-arid Australia, and changes in biodiversity. A preliminary report on a consultancy undertaken for the Biodiversity Unit of the Department of Environment, Sport and Territories. CSIRO Division of Wildlife and Ecology.
- Lange, R.T. (1985). Spatial distribution of stocking intensity produced by sheep flocks grazing Australian chenopod shrublands. *Transactions of the Royal Society of South Australia* 109: 167-174.
- Morton, S.R. (1990). The impact of European settlement on the vertebrate animals of arid Australia: a conceptual model. *Proceedings of the Ecological Society of Australia* 16: 201-213.