PROCEEDINGS OF THE AUSTRALIAN RANGELAND SOCIETY BIENNIAL CONFERENCE
Official publication of The Australian Rangeland Society

Form of Reference
The reference for this article should be in this general form;

Author family name, initials (year). Title. *In*: Proceedings of the *n*th 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 15th 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

REPAIRING RANGELANDS AND TRANSFORMING THE OVERGRAZING CULTURE

K.A. Shaw, B.H. English, J.W. Rolfe and R.A. Matthews

Dept Primary Industries &Fisheries, Kairi Research Station, PO Box 27, Kairi, QLD 4872

Email: kev.shaw@dpi.qld.gov.au

INTRODUCTION

It has been over 30 years since early satellite imagery illustrated serious degradation across much of the high quality savanna rangelands. It sparked a surge of research, development and extension (RD&E) activities by government agencies, CSIRO, universities, regional community bodies, private providers, producer groups, industry employees and members of the industry itself to define the extent of degradation and then to initiate a program of rehabilitation. Since then a veritable library of information packages, case studies and decision support tools have been developed to support practice change.

Generally, the community has repeatedly indicated that it is not prepared to accept the downstream environmental impacts of rangeland degradation on the Great Barrier Reef or the Gulf of Carpentaria. Improving producer capacity to manage natural resources for sustainable landscapes is a key goal of MLA's (the industry R&D Corporation) Northern Beef Program strategic Plan.

However, despite clear evidence of the negative impact of degraded resource condition on grazing industry gross margins and best efforts to promote flexible grazing land management practices, overgrazing and degradation of the extensively grazed savannas continues to be a significant issue. To an extent, it is as if information providers and industry inhabit parallel universes, unable to connect on the issue of dealing with overgrazing and resource degradation. This widespread lack of adoption of land and grazing management practices need to maintain land in good condition or rehabilitate degraded landscapes is causing many to re-evaluate the delivery of the RD&E services to the extensive grazing industry.

Why are the successes so modest and how can adoption of new information and technologies be improved? This short paper describes the chronology of information development and delivery in a range of formats across the northern savannas and looks critically at where future extension services may be heading.

WHAT HAPPENED?

It was clear by the late 1980's that pasture degradation was widespread across Bowen, Dalrymple and Etheridge Shires and on the fertile river frontages across the region. Cattle numbers had been increasing as a result of increased subdivision and provision of waters as well as the development of supplementation technologies to keep stock alive and reproducing in dry seasons when pasture nutrition was low. Stock numbers also increased from the mid to late 1970's when producers were reluctant to offload stock due to low prices (Frank, 1988).

The effects of these increases in stock numbers on the pasture resource were masked by high rainfall years despite the additional devastating loss of Townsville stylo due to a fungal pathogen (anthracnose). However, the extent of the degradation became fully apparent in drought years after 1982. This relentless, high grazing pressure in both wet and dry seasons resulted in the primary perennial grasses (principally black speargrass and bluegrasses) being lost and replaced with Indian couch or inferior perennial wiregrasses or annuals. Soil loss from increased runoff due to low ground cover was high. Woodland densities increased as fuel loads for effective fires declined further increasing competition with pasture species. (Gardener *et al.* 1990; Tothill and Gillies, 1992; McKeon *et al.* 2004).

The decade of landcare (1990 – 2000) produced a number of functional producer groups who undertook several worthwhile projects across the region. An overall change in attitudes to land degradation has occurred but, despite exceptions (Landsberg *et al.* 1998), it is difficult to see a groundswell for change in overall land condition. Scientific agencies also made a huge investment in generating irrefutable evidence of the extent (De Corte *et al.* 1993; Shaw *et al.* 2007) and the causes of land degradation (Ash and McIvor, 1998). Investment continued with the development of guidelines for sustainable management under the Ecograze project (Ash *et al.* 2002) and large commercial scale demonstrations comparing district average and safe carrying capacities were conducted across the region. These provided physical knowledge and economic analyses to stimulate change (Smith, 2000) but to little apparent effect. Furthermore, it is difficult to detect an observable difference in land condition after $3.2M of incentives and landcare grants for fencing and water projects across Dalrymple Shire over a 9 year period.

In the early 1990's, a number of producer groups were assembled to share insights into best management grazing practices. Almost all recognized that land condition had deteriorated and that increased grazing pressure was associated with that change (Kernot, 1995). Later, sustainable land management was linked with overall business management and delivered in a series of modules to groups of producers under the *FutureProfit* banner (Shaw, 2000).

State and transition models were developed and communicated to explain the process of degradation to industry (Ash and Scanlan, 1994). These were later modified into the ABCD land condition framework (Chilcott *et al.* 2003). This methodology provides an objective assessment of land condition and is also useful for routine land management planning as well as for demonstrating stewardship responsibilities under lease renewal.

The stocking rate trial at Wambiana Station, south of Charters Towers has now conclusively provided hard evidence of the increased profitability of sustainable stocking rates over those that degrade the natural resource in the long term (O'Reagain *et al.* 2008). This 11 year experiment, operating over a number of climate cycles, has demonstrated the importance of long term thinking when dealing with highly variable climatic conditions in a resilient ecological system such as native pastures.

Studies were undertaken to understand the learning processes of the grazing community (Arnott *et al.* 2001) so that information could be packaged in ways that best suited their learning styles. Others interviewed graziers across a range of regions producing booklets on case studies of successful land management (Kraatz *et al*, 2006). Educational packages were assembled, customized for the diverse regions of northern Australia and delivered to a number of groups (Chilcott *et al.* 2003). Extension workers in agencies and R&D bodies have used methodologies ranging from information access, technological development, programmed learning, consultant/mentor and group empowerment/facilitation techniques (Coutts and Roberts, 2003) to encourage change in practice. However, wide adoption of sustainable practices with a concurrent improvement in regional land condition remains patchy.

WHY THE MODEST ADOPTION OF SUSTAINABLE TECHNOLOGIES?

Record keeping of herd numbers (particularly breeder numbers) is poor on many operations in north Queensland. High labour costs and decreasing availability of labour means breeders spend a minimum period at the yards to undertake branding, weaning and culling procedures before the herd is returned to the paddock. As a result, analysis of production efficiencies (branding, death and growth rates) is rudimentary and therefore strategies to lift herd productivity are difficult to firstly identify, and then implement.

Carrying capacities of breeder paddocks are usually constant and aligned to the occasional good season. There is a reluctance to adjust breeder numbers to pasture availability in seasons with low feed supplies. Constant, high stocking rates especially during poor seasons is a significant cause of damage.

Despite the overwhelming evidence that medium stocking levels are more profitable and sustainable in the long term, there remains a perception (S. Banney *pers. com*), that high cattle numbers is the key to profitability. This is also the attitude of some major rural lenders. It appears that RD&E programs do not have sufficient relevance (real or perceived) to the day to day management of many beef businesses which prefer to retain a traditional, conservative approach to management.

Due to highly variable rainfall conditions and the buffering capacity of some land types, the signals that suggest land degradation can be well disguised in the early stages. Similarly, the signals that point to a restoration of land condition can be equally slow and disappointing in the early phases.

WHERE TO FROM HERE?

The investment that allowed for the development of a broad understanding of the scale of land degradation, how it manifested, its impact on profitability and the overall ecology of landscapes, and how these degraded lands can be restored was well spent. Further, there now exists a suite of tools enabling land managers to directly measure the impacts of their management on landscape condition. There is a solid understanding of the social contexts within which land managers receive information and convert it to knowledge for use within their businesses. These gains will remain invaluable into the future.

It is clear that many in the extension community had expectations of change way beyond the capacity of many land managers to absorb, reflect on, and translate into credible on-property practice change. The existing cultures would simply not allow the changes necessary to be taken up and indeed generational change may be needed before widespread adoption of sustainable practices are adopted as a normal aspect of day to day management in semi arid rangelands.

However, management changes are being made and information is being sought to improve the sustainability and profitability by a growing segment of the grazing community. We believe our extension activities need to be increasingly focused on this group who are determined to improve their position in the beef supply chain and can see that ongoing profitability will depend on responses to climate and pasture signals towards sustainable businesses.

REFERENCES

Arnott, A.R., Benson, R., Crawford, K., Herbert, S., Leybourne, M. and Spiers, R. (2001). More than can be said: A study of pastoralists learning. ISBN: 0-9578489-2-7. **TSCRC, Darwin**.

Ash, A.J. and McIvor, J.G. (1998). How season of grazing and herbivore selectivity influence monsoon tall-grass communities of northern Australia. *Jour. Veg. Sci.*, 9: 123-132.

Ash, A., Corfield, J. and Ksiksi, T. (2002). The ecograze project – developing guidelines to better manage grazing country. ISBN 0-9579842-0-0 **(CSIRO)**.

Chilcott, C.R., McCallum, B.S., Quirk, M.F, and Paton, C.J. (2003). Grazing land management education package; workshop notes – Burdekin. **MLA. Sydney**.

Coutts, J. and Roberts, K. (2003). Extension models and best practice in extension. Invited paper, **APEN Forum, Hobart**.

De Corte, M.W.M., Barry, E.V., Bright, M.J., Cannon, M.G. and Scanlan, J.C. (1993). Land degradation in the Dalrymple Shire – A preliminary assessment, methods and results. Project Report Series QO93023. **DPI&F, Brisbane**.

Gardener, C.J., McIvor, J.G. and Williams, J. (1990). Dry tropical rangelands: solving one problem and creating another. *Proc. Ecol. Soc. Aust.* 16: 279-286.

Frank, B.R.C. (1988). Factors influencing the adoption of selected innovations in the extensive beef cattle of the north Queensland dry tropics. PhD thesis. **JCU, Townsville**.

Kernot, J.C. (1998). Sustainable beef production on tropical tallgrass using the local best practice (LBP) approach. Final Report on project DAQ.092/NAP3.306. **MLA, Sydney**.

Kraatz, M., Sullivan, S., Tapsall, S., Tubman, W. and O'Donnell, K. (2006). Perspectives on maninging grazing country: Graziers talk about successfully managing their country, Northern Gulf Region. **TSCRC, Darwin**.

Landsberg, R.G., Ash, A.J., Shepherd, R.K. and McKeon, G.M. (1998). Learning from history to survive in the future: management evolution on Trafalgar Station, north-east Queensland. *Rangel. J.* 20: 104-18.

McKeon, G.M., Hall, W.B., Henry, B.K., Stone, G.S. and Watson, I.W. (2004). Pasture degradation and recovery in Australia's rangelands: Learning from history. **NRW, Brisbane**.

O'Reagain, P., Bushell, J.J. and Holloway, C. (2008). Testing and developing principles and management guidelines for the sustainable management of the seasonably variable tropical savannas. *Report to Meat and Livestock Australia*. **MLA, Sydney**.

Shaw, K.A. (Compiler) (2000). Planning a future in beef. *Final Report on NHT 96-2012*. **DPI&F, Brisbane**.

Shaw, K.A., Rolfe, J.W., English, B.H. and Kernot, J.C. (2007). A contemporary assessment of land condition in the northern gulf region of Queensland. *Tropical Grasslands*. 41: 245-252.

Smith, D.R. (Compiler) (2000). Northern stocking rate demonstration. *Final Report on NHT 962011*. **DPI&F, Brisbane**.

Tothill, J.C. and Gillies, C. (1992). The pasture lands of northern Australia: their condition, productivity and sustainability. *Trop. Grass. Soc. Aust.*, Occasional Publication No. 5.