



The Australian Rangeland Society

RANGE MANAGEMENT NEWSLETTER

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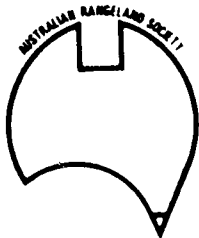
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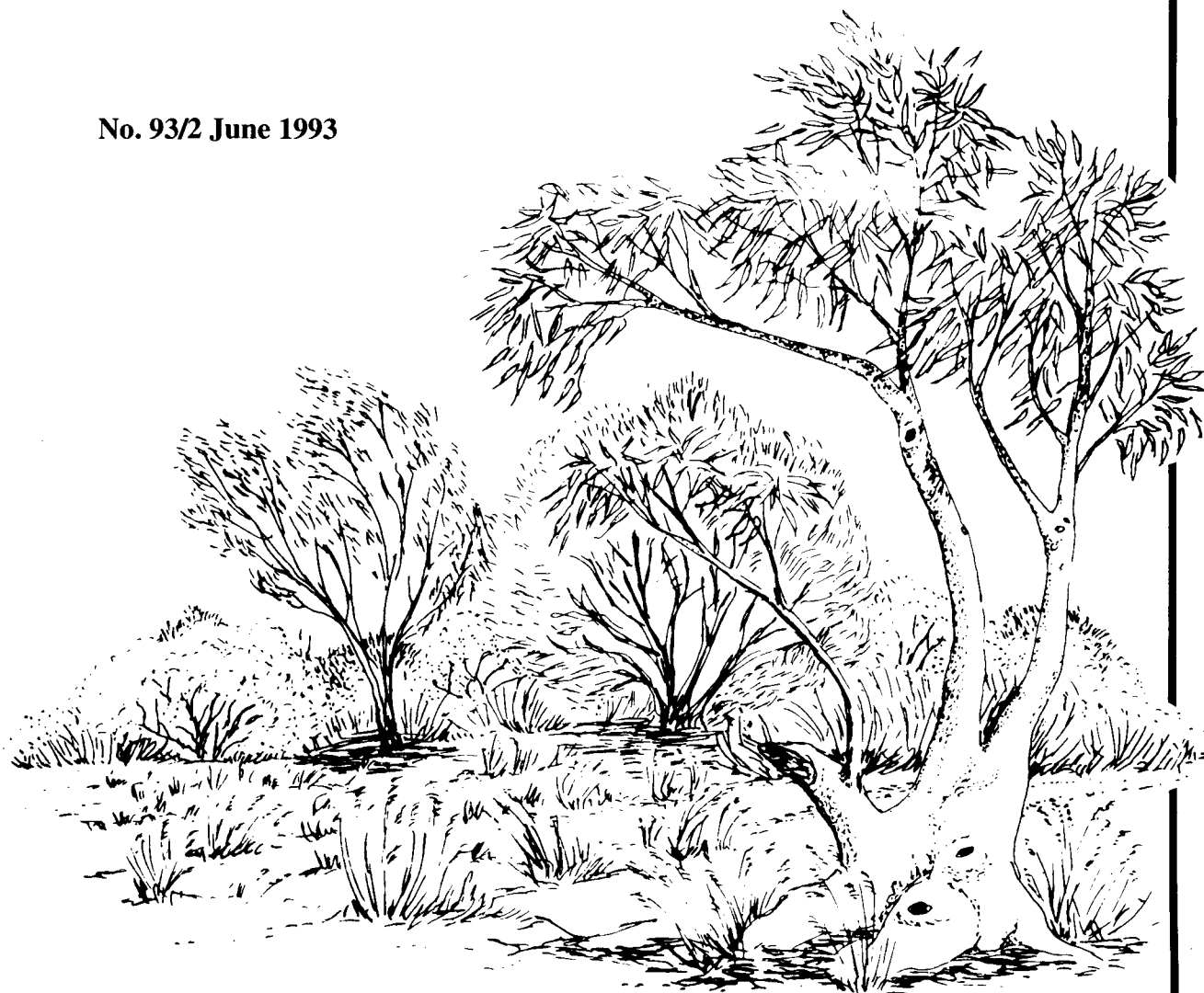


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FROM THE EDITOR

Gary Bastin, CSIRO, PO Box 2111, Alice Springs NT 0871

A brief introduction from me to the next RMN: an issue with an emphasis on the value of conservative stocking and control of pest animals, particularly kangaroos. Members on the field trip at the Cobar conference will remember David Butcher's talk on his use of the Finlayson trough to control kangaroos and goats. In this issue David, with assistance from Ron Hacker and Bob Wynne, provides further detail on how he has incorporated electrified control of waters into the conservation-oriented management of his lease. Grant Norbury follows with two articles related to use of the Finlayson trough in Western Australia. His first article provides detail on sheep drinking behaviour following electrification of troughs and the need for subsequent refinement of its design. The second article explores some of the ethical issues associated with use of selective watering devices on a regional scale.

The benefits to be gained from conservative stocking through control of total grazing pressure are further examined by Bob Wynne in a separate article. He presents data from a survey of NSW graziers which illustrates the improved animal performance and financial returns obtained by graziers with lower stocking rates.

I was most intrigued to read Danny Norris's article which describes how he brought a group of graziers and bank managers together to play roulette! The aims were twofold: to foster communication and to demonstrate the importance of assessing risk when making decisions in the rangelands. With some past experience as an extension officer, I was particularly impressed at Danny's novel approach in bringing two important decision-making sections of the rangeland community together to improve communication and understanding.

Cell grazing has been a contentious issue in recent years. Terry McCosker has provided a transcript of a talk given by a visiting South African practitioner which I have spread over this, and the next, issue. Whatever sized paddock you are in, you cannot deny the relevance of two claims made by advocates of cell grazing: that successful implementation requires thorough (and ongoing) training and that rangeland management must integrate the resource (soil and vegetation), livestock production and financial components of running a station.

Finally, this issue provides reports from the recent AGM and news from local branches and other regional centres. AGM is accolade time and I would like to genuinely thank Margaret Friedel and Ashley Sparrow for the hours of diligent proof-reading that they put into each issue. Attention to grammatical detail and readability greatly help to set a consistent standard for the *Newsletter*.

I trust that you will find much of interest in this issue. Please feel free to comment on issues raised or send news of what you are doing in the rangelands. My deadline for the next RMN is mid October 1993.

Stop Press. See page 25 for preliminary details of the next biennial conference.

KANGAROO CONTROL AT "PALAPAH"

David Butcher, "Palapah", Ivanhoe NSW 2878.

Ron Hacker, NSW Agriculture, PO Box 865, Dubbo NSW 2830

Bob Wynne, Dept. of Conservation and Land Management, PO Box 77, Condobolin NSW 2877

(Ed. This article is reproduced from the March 1993 issue of Western Division Newsletter. Society members present at the Cobar conference will remember David describing how he used electrified watering devices, including the Finlayson trough, to control kangaroos and goats.)

"Palapah" is a property of 27,500 ha in the Ivanhoe area. The country varies from heavy timber to open rosewood-belah. Woody weeds are a problem in some areas. The normal flock is about 4,500 ewes, producing wool of 23-24 microns.

In 1991-92 the seasonal conditions were poor, in keeping with most of the Western Division. The station received 200 mm of rain in 1991 compared with a long term average of 285 mm, with only a further 103 mm to September 1992. Kangaroo and goat numbers on the property had been building up for some years, again in line with the general trend in the Western Division. The continuing poor season in 1991 meant that their effect had become critical by the start of the 1991-92 summer. Total grazing pressure on the limited pastures available was well beyond what could be sustained in terms of both livestock production and land conservation.

Going into the summer, stock numbers were reduced by the normal spring turnoff of about 3,900 weaners and old ewes, but this still left the kangaroo problem plus feral goats. Control of kangaroo access to watering points using the "Finlayson trough" concept offered the prospect of at least controlling the roos, and possibly helping to muster the goats.

The "Finlayson Trough"

This trough, which was developed in Western Australia, consists of a trough surrounded by an electrified wire at a distance of 1.1 m and about 5 cm above ground level. The wire is connected to the positive terminal of an electric fence energiser while the earth terminal is connected to the trough or to a wire suspended in the water through the ball-tap cover. Sheep are able to overstep the wire but kangaroos make contact through the feet or tail and receive a shock either through the ground circuit or through the earthed trough when attempting to drink. With feed deteriorating rapidly, 16 waters were protected with electrified wires in the 1991-92 summer.

With pipeline troughs, the experience at "Palapah" was similar to early observations made in Western Australia (see articles by Grant Norbury which follow this story). Kangaroos abandoned the protected waters after 7-10 days and there was only minimal interference with sheep access.

Early attempts to apply the Finlayson trough principle to a ground tank, however, were unsuccessful. Under heavy pressure from stock, kangaroos and goats, the low-lying wire around the water's edge was soon trampled into the mud. Given the feed situation, there was not time for a lot of experimentation to get the design right. The solution was to exclude all animals from the open water and reticulate to a trough which could be protected in the normal way. A live wire about 20 cm off the ground and 30-40 cm from the water's edge proved effective in preventing access by sheep, goats and kangaroos to the dam. A couple of old galvanised iron tanks placed on the top of the bank, and filled using the station fire-fighting plant, were used to supply water to a "Finlayson trough". This arrangement proved as successful as the normal trough design in preventing kangaroo access. Movement of the wire to keep pace with the falling water level was required but involved only about an hour's work. A new installation will be required after rain but the value of the materials submerged is very small and they could eventually be recovered.

As with all electric fence developments, attention to detail is the key to successful operation. Experience at "Palapah" has shown the benefit of double-insulated cable for connections between the energiser and live wires, particularly over longer distances. A few cents spent on galvanised clamps to ensure good electrical connections will also pay dividends. Use of solar panels to maintain battery charge has not been necessary. With small (Gallagher B75) energisers, a normal car battery will last about 3-6 weeks. After this, it can be replaced and recharged although experience indicates that the local kangaroo population will have dispersed well before this time and it should not be necessary to keep the installation electrified.

Subsequent Kangaroo and Goat Control

Initially, protecting waters on "Palapah" apparently forced some kangaroos onto surrounding properties. As more waters were protected, installation was combined with a culling program to ensure the humane destruction of animals deprived of water and minimise any problems for neighbours. In the first few days after installation, kangaroos tended to hang in the vicinity of protected troughs and could be easily shot. Such (non-commercial) culling is an integral part of NSW's kangaroo management program and was carried out under a 'Section 121' licence from National Parks and Wildlife Service. Although not used at "Palapah", culling of animals on protected waters could also be done commercially if arrangements were made with a licensed trapper. Indeed, the concentration of kangaroos on protected waters immediately after installation could greatly assist commercial culling in areas where normal shooting is difficult.

As expected, Finlayson troughs did not prevent feral goats from watering. However, with access to dams prevented by a live wire, shutting off troughs for a day in summer was effective in concentrating goats in the vicinity of the water where they could be easily mustered.

With the kangaroo population on the property substantially reduced by the end of summer in 1992, all wires were switched off over the winter. Wires were reactivated again in spring in preparation for the 1992-93 summer, and a culling program implemented at the same time.

Economic Aspects

The economics of kangaroo control at "Palapah" seem to have been well worth the effort. For an existing trough, the total cost of components is about \$200, mainly for the energiser and battery. On a dam the same costs apply to the trough, plus a small extra cost to run wire around the water surface and to connect it to the energiser. Tanks and troughs used to equip dams were obtained from stock on hand or second-hand sources but if purchased new would have cost approximately \$1,500 per site. The total cost of the program (excluding labour) was approximately \$6,000 and would have been about \$20,000 if new materials had been used on the dams. Income from the sale of feral goats, mustered with the aid of protected waters, made a substantial contribution to the cost of establishment.

The return from the program cannot be calculated exactly. However, the lamb marking percentage in 1992 was 70%, only 19% down on the long term station average despite very poor seasonal conditions. Wool cut per head (for adult sheep) at the August 1992 shearing was 5.5 kg, a drop of 12% when compared with the long term average of 6.25 kg. However, wool production per hectare (at 1.39 kg) was slightly above the long term property average due to the counteracting effect of above average sheep numbers after the "boom" years of the late 1980's. This level of animal production, both per head and per hectare, is very satisfactory given the poor seasonal conditions. Lambing rates of less than 30% were not uncommon in the district in 1992.

Not all of the above-average animal performance is attributable to kangaroo and feral goat control. Other factors, consistent with good management, include a heavy classing program in recent years, fox baiting and the provision of good water supplies. The agistment of 1,600 ewe hoggets from March to August 1992 and grain-feeding of other stock also improved nutritional levels. However, the maintenance of a relatively low total grazing pressure has undoubtedly made a substantial contribution to good flock performance.

Further Modifications

Although the approach taken at "Palapah" with dams has been to exclude all animals and water stock from troughs, further development of the technique may see this requirement removed. Closer peg spacing may allow low wires to be used at the water's edge without trampling. Alternatively, a series of low wires on the top of the bank would be worth evaluating. In any event use of such devices, if humanely implemented, would seem to have a significant role to play in the management of a very significant component of total grazing pressure.

FINLAYSON TROUGHS AS A MEANS OF KANGAROO CONTROL

Research Progress in WA.

Grant Norbury, Agriculture Protection Board, PO Box 522, Carnarvon WA 6701

Background

Finlayson troughs consist of a low-lying electrified wire surrounding a watering trough at a distance of 1.1 m from the trough's edge. Preliminary trials during the summer of 1990-91 on Brickhouse station near Carnarvon in Western Australia showed that the majority of red kangaroos were denied water as they touched the wire with their feet or tail. Sheep were hardly affected because they were able to overstep the wire (see *RMN* 92/3, page 18 and *The Rangeland Journal* 14 pp 3-8).

However, the sheep studied on Brickhouse station had access to water several kilometres away and so were able to drink elsewhere if they had any problems. Since June last year, we have been looking in more detail at the impact of widespread application of Finlayson troughs on sheep and kangaroo populations on Middalya and Wandagee stations in the Gascoyne region of WA. We electrified 21 watering points over a 100,000 ha area and conducted intensive observations of sheep and kangaroo drinking behaviour, kangaroo density, kangaroo movements and susceptibility to professional shooters. Similar measurements were taken nearby from another 100,000 ha area on Lyndon station where no Finlayson troughs were installed. This was used as a control area.

Results

Observations over a three week period during November 1992 showed that Finlayson troughs successfully repelled the vast majority of kangaroos despite the absence of alternative water. This was a significant result, as we expected some degree of learned avoidance of the wire when kangaroos were pushed to the limit of their thirst tolerance. During this period and for the following two weeks, the kangaroo shooter shot 93% of his animals from the immediate vicinity of the Finlayson troughs and some adjacent non-electrified waters. While this result is ambiguous, the shooter was adamant that kangaroos were unusually concentrated around these watering points, thus enabling him to shoot greater numbers. Although it was too early to detect any impact of Finlayson troughs on kangaroo density and movements, the data collection was progressing very well.

Unfortunately, of the 10,000 or so sheep that were drinking successfully from Finlayson troughs, a few hundred became suspicious of the electrified wires and were unable to drink. This appeared to be exacerbated by hot conditions combined with high concentrations of thirsty sheep. Although only a minority of sheep were affected, it was decided to de-activate the troughs on December 9, 1992. This was a major disappointment as we felt close to obtaining a significant

result. Subsequent conversations with other people around Australia using this technology revealed similar problems, i.e. either thirsty sheep or the presence of alternative water for sheep. In other cases, inadequate observations of drinking behaviour may have explained the apparent lack of a problem.

Further Developments

We are now testing a new device on Brickhouse station that is designed to reduce the number of shocks to sheep. Most of the shocks from Finlayson troughs were received on the hocks either as sheep backed into the wire or by kicking the wire as they stepped over. Geoff Eliot, the Department of Agriculture technician working on the project from Carnarvon, suggested reducing this side-on contact by replacing the wire with star pickets, welded together to form a rectangle around the trough and encased in 1.5" polypipe. The polypipe is split lengthwise so that only 1 cm of picket is exposed (Fig. 1). Side-on contact is prevented by the polypipe so that most of the shocks result from stepping on top of the picket. This vertical contact is partly insulated by the sheep's hoof. We have termed this new design a "Kangaban".

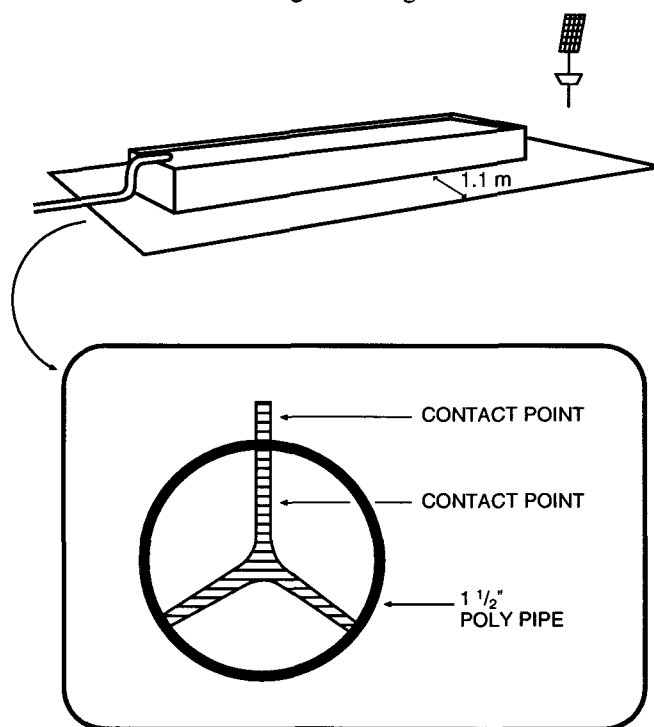


Figure 1. Schematic view of a Kangaban. The electrical current is conducted through welded pickets encased in polypipe and this protects against side-on contact to sheep drinking at the trough. Most shocks are received by contact from above.

The results so far show that of 567 sheep drinking from a Kangaban, 17% received mild shocks that had no obvious impact on drinking behaviour. This compared with 42% of 417 of the same sheep receiving more intense shocks from a standard Finlayson trough. Only nine red kangaroos have been observed so far attempting to drink from the Kangaban. None were successful. While these results are promising, the

Kangabans need a thorough evaluation on a range of sheep classes, on more kangaroos, and under varying temperatures. These tests are currently under way. If Kangabans prove successful, we will install them over the 100,000 ha study area on Middalya and Wandagee stations. Detailed observations of sheep and kangaroo drinking behaviour, kangaroo density and movements, and susceptibility to professional shooters will continue.

Kangaroo Management

It should be pointed out that selective watering troughs are not intended to perish kangaroos from thirst, but rather to concentrate them around watering points over a 6 to 7 day period to facilitate commercial shooting (see following article). Once numbers are reduced below commercial levels from targeted watering points, the electrified troughs could be deactivated to allow the local population to recover while shooters concentrate on other electrified watering points. This rotational shooting regime should satisfy:

- the shooters' needs of sustained, more efficient offtake,
- the pastoralists' needs to reduce kangaroo numbers, and
- conservation objectives of maintaining viable kangaroo populations across their range.

Conservation objectives should be met anyway because non-electrified troughs are sure to out-number electrified ones, and dams and natural watering points will still be available.

Conclusion

Despite the problems, we have already learned quite a lot about this technology. Selective watering devices have the potential to offer an effective means of kangaroo control in pastoral areas. Consequently, we remain determined to develop the technology for humane and practical use in the rangelands.

SOME IMPLICATIONS OF SELECTIVE WATERING DEVICES FOR KANGAROOS, THE COMMERCIAL KANGAROO INDUSTRY AND PASTORALISM

Grant Norbury, Agricultural Protection Board, PO Box 522, Carnarvon WA 6701

There has been a great deal of interest in recent developments of electrified watering devices that selectively deny kangaroos access to water while allowing stock to drink. Depending from which side of the fence you view kangaroos, technology such as this has either aroused keen interest or intense disgust. Expressions of delight such as "the best option for kangaroo control in decades" are obscured by acrimonious cries of "disaster for wildlife management".

It goes without saying that denying any water-dependent animal access to water has serious animal welfare implications. This article examines some options for minimising animal suffering. It also looks at the benefits of selective watering devices for the commercial kangaroo industry and pastoralism.

What are Selective Watering Devices?

The maintenance of populations of kangaroos, like those of all large herbivorous vertebrate pests in the arid zone, is dependent on surface water. Controlling their access to water should therefore confer some control over their population levels.

The selective watering devices examined so far consist of some form of low-lying electrified conductor that surrounds a watering trough 1.1 m from the trough's edge. Sheep are generally able to overstep the conductor but most kangaroos contact it with their feet or tail. These devices, known as Finlayson troughs and Kangabans (see preceding article), require further evaluation of their impact on stock and kangaroos. Nevertheless, it is opportune to debate their potential impacts on animal welfare, the kangaroo industry and pastoralism.

Why Should Kangaroo Populations be Reduced?

The answer to this question is the first logical step in discussing an option for controlling kangaroo populations. I can present apparently scientific arguments that rationalise kangaroo control in my mind. However, these arguments will not necessarily diminish the highly revered status of kangaroos in other people's minds. I base my justification for kangaroo control on a total land management ethic. While I would like to persuade those that argue against kangaroo control on the basis of an animal preservation ethic, I do not presume that my philosophical viewpoint is superior to those of the animal preservationists. Both are value-based and merely reflect personal opinion.

There is no denying that the vast majority of rangeland degradation has been caused by a lack of understanding, and infrastructure, to properly manage stock in an ecologically sustainable manner. The past two decades have seen a realisation by the pastoral community and government authorities that repair of damaged land and prevention of further decline is in the long-term interests of the pastoral industry from ecological, economic and political points of view. There are now genuine efforts to manage the land better.

If one accepts that grazing by domestic stock is a legitimate use of arid lands, then management of the total grazing pressure, be it by sheep, cattle, kangaroos or goats, is vital for sustainable production and conservation of the rangelands. This means that efforts to reduce grazing by stock must be accompanied by prevention of any increase in grazing by non-domestic herbivores.

There is now abundant evidence that strategically spelling areas from stock attracts unusually high concentrations of kangaroos. Kangaroo grazing alone can inhibit the regeneration of perennial grasses and some shrubs. Commercial kangaroo harvesting in its present form appears to offer little respite. This is important because pastoralists are reluctant to reduce grazing by domestic stock when there is no adequate means of preventing an increase in grazing by non-domestic herbivores.

While members of the Australian Rangeland Society have probably heard these arguments before with regard to pest control, it is important that they be emphasised, because the animal welfare lobby argues that pastoralists are all too willing to blame feral animals for their rangeland degradation problems. Pest control, concurrent with sustainable management of stock, is the key point.

What are the Implications of Selective Watering Devices for Animal Welfare?

Selective watering devices have the potential to perish kangaroos from thirst. In anyone's view, this must be considered unacceptably cruel. The most humane and effective way of using this technology to control kangaroo numbers is for professional shooters to take advantage of the concentrations of kangaroos that appear around selective watering devices over a 6-7 day period after they are activated. Access to unusually concentrated kangaroo populations should facilitate offtake by professional shooters (see below).

Another means of humanely reducing kangaroo numbers with selective watering devices is to install them in, and around, paddocks that have been spelled from stock. Kangaroos will eventually disperse in search of non-electrified watering points nearby. Local eviction is likely to be effective only during hot, dry summer months when kangaroos require water.

In the extremely unlikely event that selective watering devices are installed on all watering troughs across a pastoral district,

the response of a diminished kangaroo population to fewer watering points will to some extent reflect the situation that existed before the advent of pastoralism. A return to a more or less "natural" situation may be acceptable in some people's minds.

What are the Implications for the Commercial Kangaroo Industry?

The animal control benefits of commercial kangaroo harvesting in its present form are restricted by shooters having limited access to widespread kangaroo populations, and by the low commercial value of kangaroo products. The availability of concentrated kangaroo numbers around watering points will improve access to populations and reduce the overhead costs that currently restrict the activity of many professional shooters.

There are concerns that selective watering devices will damage the kangaroo industry as kangaroo populations decline below commercially viable levels. I doubt whether this will be the case on a regional scale because not all pastoralists will be interested in the technology nor able to afford the approximate \$300 per trough (including solar panels). Dams and pools will still be available as water sources to kangaroos. I accept that significant reductions in kangaroo numbers may be achievable at targeted watering points, but these waters could be de-activated to allow the local kangaroo population to recover while shooters move onto other electrified watering points. This rotational shooting regime should satisfy the shooters' needs of sustained, more efficient offtake.

What are the Implications for Conservation of Kangaroo Populations?

There are a number of reasons why selective watering devices should pose little danger to the maintenance of kangaroo populations across their range:

- It will be in the shooter's interest to adopt a rotational shooting regime that allows kangaroo numbers to recover at targeted watering points. This will mean that shooter-induced gaps in kangaroo populations will be temporary.
- For reasons discussed above, non-electrified watering points are sure to out-number electrified ones.
- Dams, ground tanks and permanent and semi-permanent pools will still be available as sources of water.
- The wildlife management agencies in each state will continue their monitoring programs to ensure that kangaroo populations are in no danger of shooter-induced deterioration. Regulations will still apply to restrict shooters' offtake in accordance with population levels and seasonal conditions.

What are the Implications for the Pastoral Industry?

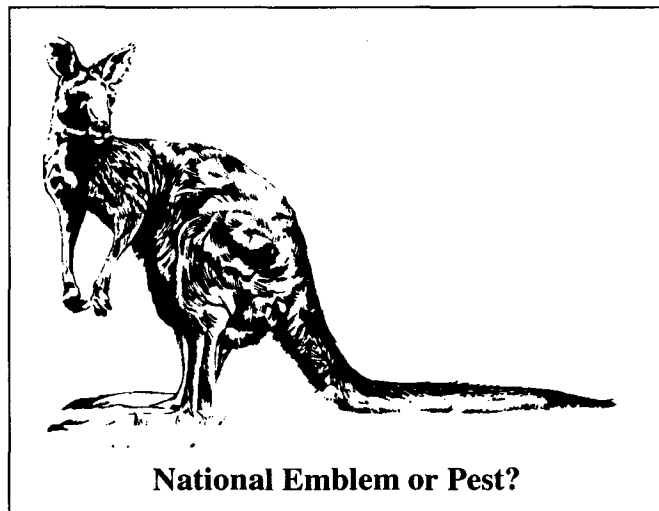
Selective watering devices should enable greater numbers of kangaroos to be removed by professional shooters than is currently the case. Although pastoralists may wish to keep electrified watering devices activated during an entire summer, it will be in their long-term interests to maintain good relations with their kangaroo shooters by allowing them to adopt rotational shooting. Shooting may still be required on dams and soaks, and during the cooler months of the year when selective watering devices are ineffective. In any case, given the limited time that most pastoralists now have for maintenance of improvements, it is unlikely that all selective watering devices would be constantly operational.

Rotational shooting has added benefits for stock. There is some evidence that hot conditions combined with high concentrations of thirsty sheep can reduce their tolerance to occasional electrical shocks. This risk can be minimised by activating selective watering devices only while the shooter is operating in the area.

Conclusion

The animal welfare implications of using selective watering devices to control kangaroos require careful consideration. A rotational shooting regime, fostered by close cooperation between pastoralists and shooters, is a step in this direction. It is the government's role to oversee the establishment and enforcement of guidelines that will ensure the humane use of this technology.

The arguments I have presented paint a rosy picture of harmonious compromise between the vested interests in kangaroos. Given the tumultuous history of kangaroo management, I have grave doubts about such a compromise. While this discussion is not exhaustive, it does provide a basis for improvements in kangaroo management using selective watering devices.



National Emblem or Pest?

DO LESS MOUTHS = MORE PASTURE = MORE PROFIT?

Bob Wynne, Regional Economist, Department of Conservation & Land Management, PO Box 77, Condobolin NSW 2877

(Ed. This material was presented at the recent NSW Grasslands Society Annual Conference in Orange and is reproduced here in a modified form with the permission of the Conference organizers.)

Introduction

Managers in the rangelands only have stocking times and rates available to manipulate their pasture management. The term **Total Grazing Management (TGM)** is used to describe how this is done. TGM is essential to economical and sustainable grazing. This has become extremely relevant to all graziers as a result of the Federal Government's policy of self-reliance against drought.

The failure to manage pastures and the animals (domestic, feral and native) grazing them correctly has received little whole-farm research anywhere in Australia. Exceptions are work at the Hamilton Research Institute in western Victoria (Patterson 1992) and information for the Monaro region of southern NSW (Boyce & Co. 1993) which show better returns from increased stocking rates on highly improved pastures. A major part of NSW's sheep and cattle population don't have access to the luxury of improved pastures that are regularly fertilized. Instead, most stock graze native pastures of the rangelands or pastures that regenerate after cropping. In the rangelands, very limited work has been done at either the scale of small plots or whole properties. Plot work, where conducted, has generally been of limited application as it hasn't adequately targeted:

- longer term wool production,
- lambing percentages and consequent genetic gain,
- stock turnoff figures,
- drought resistance (now very important due to the Federal Government's self-reliance policy), and
- the interaction of the whole-farm management package.

Survey of Graziers

I undertook a financial and production survey to test the hypothesis that **conservative stocking in semi-arid rangelands is both ecologically and economically advantageous**. This view is widely held by extension officers but has rarely been tested. The survey involved 21 landholders in the rosewood-belah rangetype in the Ivanhoe - Balranald - Wentworth area and a further 13 landholders in the bladder saltbush-whitotop grass areas around Hay in south western NSW. Many of the latter landholders had some irrigated pastures.

The following **long term** results were observed:

1. Conservative stocking was more profitable (see Fig. 1).
2. Wool production per hectare for both conservative and heavy stockers was similar. The heavy stocker's long term production was more prone to highs and lows (crashes) than the more stable production of the conservative stocker.
3. Costs were lower for the conservative stocker as they were shearing fewer sheep for similar production. For example, using a \$3.00 per sheep contract shearing rate:
 - 1,000 wethers cutting = \$3,000/7,000 kg
7 kg wool/head = \$0.43/kg to shear
 - 1,272 wethers cutting = \$3,816/7,000 kg
5.5 kg wool/head = \$0.55/kg to shear

Over a 200 bale wether clip, the savings in contract shearing alone are \$4,400 - enough to cover an average family's household costs for approximately 3 months.

4. Conservative stockers' adult ewes cut 6.5 kg or better per head of 23-24 micron wool.
5. Conservative stockers had lambing rates above 85%.
6. Conservative stockers had annual sales of 35-40% of the flock.
7. Conservative stockers made 30-40% of their annual income from stock sales compared to 5-20% for heavy stockers. Poor stock sales resulted from low lambing percentages, heavy losses and poor condition of sheep.
8. Control of feral and native animals as part of Total Grazing Management resulted in better returns and significant drought mitigation on conservatively stocked properties.
9. In the Hay area, the two producers without irrigation (both conservative stockers) had higher production levels and income than those with irrigation. This may indicate that it is better to manage what you have better, than to spread yourself too "thinly" just because irrigation is available.

Evidence from the Wheat-Sheep Zone

Conservation & Land Management staff at Wagga used landholders' data to simulate the effects of a reduced stocking rate to examine:

- the economics of reducing stocking rates on improved pastures, and
- the encouragement of more vigorous and deep-rooted pastures to prevent salinity.

The results (Table 1) show that the lower income and costs associated with a reduced stocking rate actually resulted in a higher gross margin.

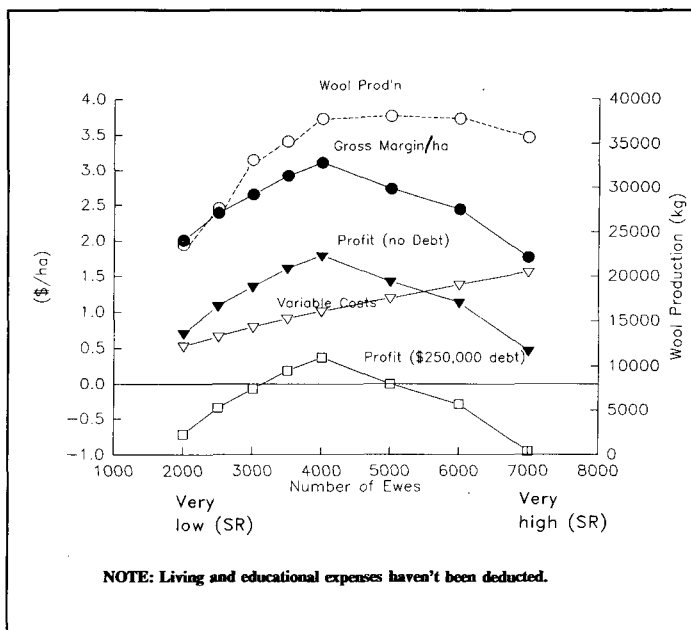


Figure 1. Gross margins and profit at various stocking rates for a 26,315 ha property with a Western Lands Commission Rated Carrying Capacity of 7,500 flock sheep (based on Wool Market Indicator price of 500 cents/kg clean).

Table 1. Gross margins for three different stocking rates at Wagga based on November 1992 prices.

| | Stocking Level (No. ewes) | | |
|------------------------------|---------------------------|---------------------|----------------|
| | High (2,250) | Moderate (2,000) | Low (1,750) |
| Total income (=a) | \$ 85,754 | \$ 81,743 | \$ 80,918 |
| Total variable costs (=b) | 26,946 | 23,890 | 20,379 |
| Other costs (=c) | 5,625 | 5,000 | 4,375 |
| Gross margin (a-b-c) | 53,183 | 52,853 | 56,164 |
| Gross margin per ewe | 23.64 | 26.43 | 32.09 |

Stocking Levels and Drought Management

The above information shows the economic benefit of conservative stocking. Conservative stocking and control of native and feral animals (i.e. TGM) is also integral to good drought management. Man-made droughts are induced by poor TGM and result in major economic and ecological costs. Walker (1993) estimates the 1981-82 drought cost Australia \$7.5 billion.

At a district level, the benefits to be gained from TGM are supported by examining three graziers' management strategies at Ivanhoe in the 1991-92 drought:

1. **Landholder A:** With a long-term management package of rabbit control, fodder storage and reasonably conservative stocking, this grazier achieved wool cuts of 7 kg per ewe (24 micron) and 50% lambing (at the tail end of the drought in July-August). Average long-term wool production is 1.7 kg/ha. This increased to 2 kg/ha in 1992 while the mortality rate was low.

2. **Landholder B:** This grazier is in the process of developing a good overall management package which also involved a large-scale kangaroo and goat control program in 1991. Wool production last year was 1.65 kg/ha compared with a long-term average of 1.4 kg/ha for the property. The impact of goats and kangaroos had been severely underestimated. An April/May lambing rate of 70% was recorded, while adult wool cut was 5.4 kg of 23 micron wool. Annual losses were approximately 8% of ewes.

Other strategies included fox baiting, agistment and grain feeding. This landholder had nearly 4,000 sale sheep and obtained \$18 per head for wethers offshears when the rest of the district was restocking or trying to breed up due to high losses and very low (< 30%) lambing rates.

3. **Landholder C:** This property was overstocked with sheep, goats and kangaroos and had severe water supply problems. The grazier lost 82% of his flock resulting in wool production of 0.15 kg/ha (compared with an average of 1.2 kg/ha). This has severely affected the financial position of this landholder.

Conclusion

A strategy of running less stock better on the extensive areas of NSW's rangelands (i.e. unfertilized native pastures) can result in:

- improved profitability
- better drought mitigation
- better perennial pastures.

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WOODED RANGELANDS IN THE DECADE OF 2040

A Letter to the Editor

Free Range - Harvesting The Bounty

David Freudenberger, CSIRO Division of Wildlife and Ecology, PO Box 84, Lyneham ACT 2602

How might the rangelands be managed in 50 years? This is the final vision of three scenarios offered by David. The first, essentially dealing with the 'status quo' situation, appeared in RMN 92/3 while the second, describing a Landcare approach to station management, was printed in RMN 93/1.

Whew! - what an amazing 50 years it has been. You may think the fall of the iron curtain was dramatic - that was only the beginning. The changes to our rangelands have been profound.

So what happened?

It started back in the late 90's. The urban population finally realised they had all the power - after all, Australia is still one of the most urbanised countries in the world. The Crown Lands of this vast continent were resumed - lock, stock and barrel. As one of the politicians of the day said, "If you can routinely lay-off 2000 car-assembly plant workers, then a few thousand uneconomic graziers is no big deal. After all, they cost more to service than they produce in taxes". A deal was worked out - all grazier debts were wiped from the books (banks were used to bad debts in those days) and families were given enough to buy a house in town. This was a better deal than most redundant workers got in those days.

A way of life died with the resumption of leases - but then, permanent settlement on the wooded rangelands was a foreign concept forced on the land. Permanent settlement was an idea from the swamps of Europe. No indigenous rangeland culture, anywhere in the world, has ever evolved a system based on a nucleus family permanently settled on the land they use. Permanent settlement was about as absurd as trying to make a living fishing from a boat permanently anchored. Sure, at first the fishing can be great if you're lucky. Then it slowly declines until it collapses, with only an intermittent school of fish passing by to provide the occasional feed - like the occasional rain cloud passing the homestead.

A concept of harvesting has slowly evolved over the past 50 years to replace untenable permanent settlement. A single, but dramatic, change in land tenure has made rangeland harvesting sustainable and profitable. As we knew back in the 90's, productivity of the rangelands is rainfall driven. Without rain, plants senesce and animal production declines to a very low level. When the unpredictable rains come, production resumes and a harvest of the surplus grass and/or animals is possible.

So how does this work in practice?

It's a lottery. A sheep cocky like myself puts in for the use of a block of land that remains closed until our friendly "eye in the sky" satellite indicates that there is sufficient feed to carry an economically viable flock for at least six months. Once the season has opened, we drove or truck in our 6,000 joined ewes with the confidence that we have at least enough feed to lamb and wean. Alternatively, another grazier might move in with 10,000 wethers. If the rains continue, we can hold the ewes and what replacements we want until shearing. After that, the block is closed and we either sell all stock and take a well earned holiday, or move to another block if the lottery and rains have been kind. Agistment fees pay for the necessary government monitoring system and maintenance of watering points. We're like fisherman - we leave port with our road trains and return with a catch of wool and lambs.

It's a system that is fair. No one is trying to pay massive debts. Most of us have a modest overdraft arrangement to finance the purchase of stock - or we have properties in higher rainfall regions to carry our breeding nucleus. With a reasonable 6-month supply of feed on hand, servicing such an overdraft is assured. Wool harvesting works much like roo harvesting worked back in the 80's and 90's. In those days, roo shooters made a modest living since they had low overheads and an assured supply up to a year in advance. Sure, a long drought still affects everyone - but sheep don't starve since they are shifted off the land and the range consequently doesn't suffer.

There's not many ways to cheat. The Land Commission opens a block by opening watering points - and these are checked by air at least once a month. If someone tries to cheat by opening a watering point and moving stock onto a closed block, the thief sticks out like a sore thumb - there's no grass around the watering point!

It's a bit hard on the family when I'm away droving and settling in the mobs - but at least they are in town, have good schools and neighbours to help look after things. During the school holidays, we make a family adventure out of it. When the kids are a bit older, it shouldn't be hard for the spouse to find some work in town. It's a pretty busy place these days with the extra families around.

Speaking of holidays - there's a good stream of tourists coming out this way. The old homesteads that are in better condition have been fixed up for retreats and hunting parties. There's a great demand from all over the world for pig and goat shoots in our wild open country. There's not many other places left where you can go blasting-up the countryside and not worry about seeing anyone else, closing gates or avoiding stock. Like all the other multiple users of our outback, blocks are closed from shooters at times so that others can run stock or harvest roos.

If I get sick of sheep (easily done!), I can put in for a block or two requiring goat harvesting. There's good money in that. The goats thrive and the land doesn't suffer so long as roo and rabbit numbers are kept down. It's straightforward work - all the waters are fenced with one-way spear gates and holding

paddocks. During a dry spell, we can trap what we need. We arrange an order with the Goat Marketing Scheme which dictates the class of animal they want and when they want it. Animals that don't meet export requirements are ground into protein meal. The system works well for all parties concerned. There is now a well-developed market because of a steady supply. Overall, goat numbers are kept in control since we muster and trap from blocks that are coordinated within regional areas. Few goats are left behind since it's my only income when I draw for a goat block. No one has ever managed to trap or shoot all goats in a big enough area - so in 10 to 15 years, a solid trapping season is required again.

Depending on wool prices, roo harvesting is as profitable as sheep. The meat marketing characters finally got behind roo meat and hides and turned them into first-class products. Roo meat is marketed as venison to rival Kiwi deer meat. We usually beat the Kiwis since our venison is 100% organic; it's never been drenched or vaccinated and the beasts are humanely killed as they graze in their paddocks.

Rabbits are just about extinct. The CSIRO's myxo/sterility fix helped a lot and coordinated ripping of all warrens has just about finished them off. Any new or re-opened warrens are picked up by the annual aerial surveys which keep tabs on the land and her resources. Again - it's all paid for by the fees for harvesting rights of roos, goats, cattle or sheep.

Range rehabilitation has made great strides. The reduction in total grazing pressure made the greatest difference. Woody weeds are well under control. Following a wet year, closed blocks are burnt for 100's of square kms for weeks on end. Regrowth is now patchy - and it gets torched by aerial incendiaries. With so few people about, wildfires are no big deal - besides, they are few and far between with so much controlled burning going on.

With fuel prices so high, we drove our stock to rail heads that have been re-opened after many years of neglect. Most shearing is done near town at state-of-the-art sheds with 30 to 40 stands and enough cover for 20,000 sheep. This centralised system reduces the number of people running across the country burning up fuel. The sheep come to the centralised shearing - and the wool is classed, cleaned and sold right off the boards instead of being triple- and quadruple-handled as in the past. A few mills are even springing up in the bigger towns to finish the wool into its final product. Shipping of raw materials doesn't pay any more.

The spin-offs from this single change in land tenure keep growing. Ironically, the urban political decision to reclaim crown land has resulted in a great deal of wealth and influence being shifted back inland. The wealth of the land remains in country towns instead of being used to pay off loans to big-city banks and investors. Kids stay in town for school and work, instead of joining the old migration to the coast.

In fact, all round, few of us have any regrets.

PASTORALISM: A GAME OF CHANCE OR A BUSINESS OF PLANNING?

Outcomes of a Workshop for Bankers and Pastoralists

Danny Norris, District Agronomist, NSW Agriculture, PO Box 531, Bourke NSW 2840

Pastoralism: A Game of Chance or a Business of Planning?

A lot of the work of an agronomist in semi-arid NSW is centred on activities such as range condition monitoring and providing input into grazing management decisions - areas where resource-based decisions must be made. These issues, however, cannot be divorced from the broader context of finance. Conservative management is an ideal to which many graziers are receptive, but many feel constrained by other pressures. For someone such as myself to have any impact in resource management, it is important to reconcile those financial issues which are a significant factor in decision making.

The concept of "risk" is applicable to any sort of decision making; e.g. in semi-arid and arid areas, the chance of rain and hence availability of adequate feed for livestock is the most significant probability-based event controlling pastoral production. With less than 150 years of pastoralism in western NSW, the information needed to give important decisions a value of risk is largely lacking or, if available, is difficult to interpret.

From this perspective, I was particularly interested in developing an approach which might help to characterise attitudes to risk. Simulation models are an excellent extension tool if the barriers of "computerphobia" and perceived lack of local relevance can be overcome. In my case, inexperience with computers led me to work with alternative simulations. Pastoralism is akin to games of chance in that large amounts of money and other resources are required which are largely "wagered" against the probability of certain outcomes. At various times in the past, I have used dice throwing as a way of demonstrating simple probabilities - usually in the context of a given quantity of rain in a particular month. This can be extended to simulate a sequence of seasons for discussion of such things as the number of ewes to join or feed-year planning in drought management.

Pastoralists and bank managers are two important elements of the decision-making process in the management of rangelands. To really explore each participants' attitudes to risk, I decided to try an activity based on roulette. Roulette has a wide range of probabilities and provides players with many choices based on risk. The exercise that I conducted was a form of "discovery learning", an approach which I was familiar with in a previous life as a school teacher. Discovery learning allows groups to share their learning and allows me to learn about the participants as well.

Roulette - The Game of Chance

Four pastoralists and four local bank managers were invited to participate in the workshop. Three of each group accepted.

Bringing the two groups together was a lot easier than it might seem. Officers of NSW Agriculture and the Department of Conservation and Land Management at Bourke had previously run seminars on land management issues (e.g. stocking rates on different land types, district economic profiles, typical gross margins) for local bank managers. This meant that an established forum for bringing pastoralists and local bank managers together already existed. This exercise only required a written invitation from me, with a brief outline of my reasons for asking them to participate in such a workshop.

Pastoralists and bank managers were split into pairs and each team was asked to set their goals and to devise a strategy to play 20 rounds of roulette and achieve the financial goals they had set themselves.

Aims of the Exercise

The primary aim for playing roulette was to examine the strategies that pastoralists might use to achieve their goals.

Other aims were to examine the effect of debt or savings on:

- the risks that the pastoralists were prepared to take to achieve their goals, and
- the bank managers' perception of those risks

A discussion session followed to gauge the response of the participants.

How the Game was Played

We played a modified form of roulette (see box on the following page) so that some rough analogies could be drawn between the game and pastoral production. Each pastoralist was given a \$50,000 chip to wager on the first round (a rough approximation of a year's property running costs). Each had a bank account with a \$50,000 overdraft facility. This meant that a pastoralist could lose two rounds before he had to approach his bank manager for a loan (at 10% interest).

Players could only wager \$50,000 per game and the wager could not be split to spread risk. If the player accumulated a stake of \$500,000 (about what they would need to buy more land to increase flexibility), they could then wager more than \$50,000 and spread their wager across the board to "hedge their bets".

Each bank manager was asked to keep a running record of the team's fortunes. They were also asked to give a character assessment of the pastoralist they were teamed with following the discussion of goals and strategies.

RULES OF ROULETTE

1. Wagers on single numbers (1 - 36) paid at 35 to 1.
2. Wagers on two numbers paid at 17 to 1.
3. Wagers on three numbers paid at 11 to 1.
4. Wagers on four numbers paid at 8 to 1.
5. Wagers on six numbers paid at 5 to 1.
6. Wagers on columns paid at 2 to 1.
7. Wagers on groups paid at 2 to 1.
8. Wagers on:
 - red or black,
 - even or odd,
 - low (1 - 17) or high (18 - 36)
paid at even money.

NOTE: If the ball lands on 0 or 00, the wager is in "jail". This means the wager is not lost but must stand until the next round (casinos are not this generous!).

The odds that are paid reflect the risk of losing, i.e. the even-money bet is safer than the single-number bet. One stands to win more with the single-number bet but the chances of losing are much higher.

Bank managers were also asked to give an assessment of risk on a scale of 1 to 10 (1 being low risk, 10 being high risk) for each decision made by the pastoralist, i.e. the odds that he wagered on.

It was made clear to participants that, while the game was not intended to simulate actual management, they should have in mind how each decision related to their role in land management. This enabled discussion to focus on resource management issues and the implications of risk as well as financial issues.

The Outcomes:

1. *An Analysis of the Results of the Game*

Two of the teams lost heavily - more than the value of their assets. One stayed comfortably in front, but did not achieve their goal of making the \$500,000 needed to diversify and spread the wager across the board.

Interest payments played a major role in keeping the bank accounts "in the red". This surprised the participants, all of whom would have been familiar with the process of interest.

The results are shown (next page) in graphical form. The running bank balance of each team is plotted with the odds and assessment of risk superimposed on this. The difference between the trend line for the odds wagered, and that for the risk value, should give some indication of the effect of the bank balance on the bank manager's perception of risk.

Looking at the graphs, it appears that the important factors influencing the bank managers' perception of risk were:

- the current bank balance
- the result of the previous round
- the odds

The conservative strategy adopted by Station A partnership saw risk value increasing despite the fact that wagered odds remained constant.

Station B partnership followed a generally similar trend, although risk increased at constant odds from Round 5 to Round 7. The perception may have been that the more often a player won, the more likely the "run" would end.

Station C partnership maintained a healthy bank balance and this is probably why the risk value reflected more closely the odds at which the pastoralist wagered. It appeared that the result of the previous round was less important in determining the perception of risk.

At the completion of 20 rounds, the pastoralists were given \$250,000 to bet as they wished for one spin of the wheel. Risk minimisation was a major consideration with all pastoralists spreading their wagers across the board to hedge their bets. All increased their stake beyond the starting \$250,000.

In the early stages of the game, a learning factor (both about roulette and attributing a risk value to decisions) may have affected some of the results.

One adjustment I would make in future workshops is to reduce the stake required to "diversify" from \$500,000 to \$250,000 as this was more likely to be achieved by a fortunate player.

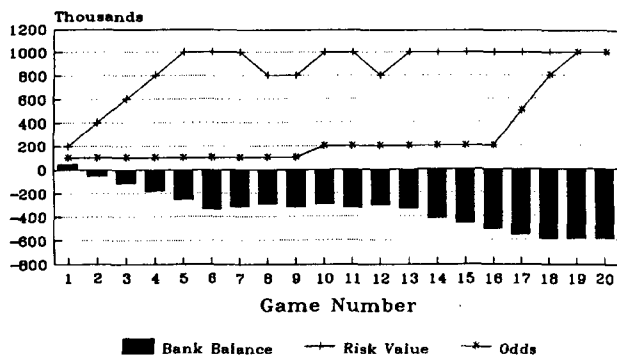
2. *Ensuing Discussion*

Being a small town, bank managers and graziers are likely to have met socially or dealt with each other through a bank. So, although not all participants were known to each other, the two groups became increasingly comfortable with each other as the exercise progressed. This was probably assisted by the way in which I ran the exercise - on a Friday night, with the wife of one pastoralist actually running the game, leaving me free to encourage participation and discussion (with the help of a little alcoholic refreshment).

The exercise was loosely analogous to pastoral production, a point which I continued to reinforce where I felt appropriate. This allowed the bank managers to have an active role in decision making. I think that this particularly improved their understanding of the difficulty of making decisions in a risky environment.

The importance of interest rates, and other issues relevant to the game, were willingly discussed by the participants. In fact, I became less important as an atmosphere developed that the game was a "fun" thing to do which appeared to have a purpose.

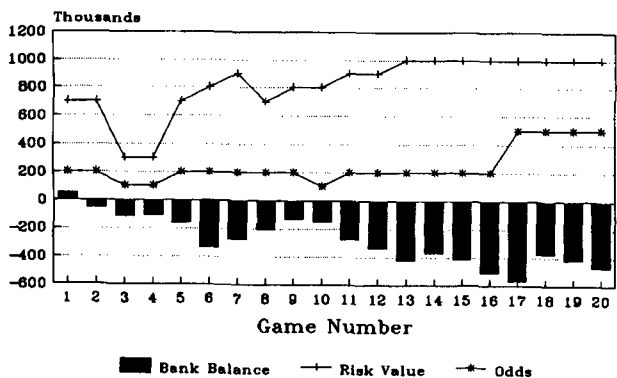
STATION A



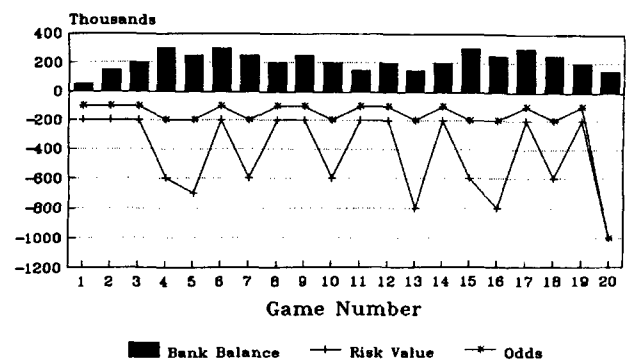
Running bank balance, assessment of risk and odds wagered by three pastoralists over 20 rounds of roulette

Note that the lines for odds and risk were put below the X axis for Station C partnership to avoid confusing the graph, the behaviour of the lines relative to each other being the important feature. The scale for risk and odds was from 0 to 10. The Y axis scale is in thousands. The values for risk and odds have been multiplied by 100,000 to allow them to be superimposed over the running bank balance.

STATION B



STATION C



Conclusions

The conclusions which can be drawn from the "data" generated from such an exercise are limited for obvious reasons. Some "agronomist's licence" is required to place the results into the context of risk management.

The implication for the business in debt is that enterprise performance in the previous season can significantly influence the perceived risk of decisions. The assessed risk may not be a true indication of the probability of success or the suitability of the tactics. Risk is gauged largely by the consequences of loss, despite the relative likelihood of success.

The business in credit is more likely to be judged objectively. The assessed risk is more isolated from the results of previous seasons.

As pastoral enterprises are businesses, it is reasonable to expect that such things as debt levels be taken into account when reviewing decisions. However, from a resource management point of view, it is important that risk assessment reflects the suitability of the decision given the probability of success or failure.

For example, odds of 1:1 (50% chance of failure) was seen as having the same risk as odds of 2:1 (66.66% chance of failure) when the business was well in debt. The fact that a decision may have a significantly higher chance of failure may assume

less importance. The decision-maker will be more likely to choose the option which will improve his situation most if it succeeds. The higher risk of failure is outweighed by the potential benefits.

When risky decisions succeed, the benefits are often long term, especially when they allow a business to consolidate. However, the greater chance of failure may place a larger proportion of the resource at risk of degradation if fortune is not favourable.

The social benefits of the exercise were difficult to quantify. Various barriers to communication inevitably exist between bank managers and pastoralists. However, this focussed activity provided participants with the opportunity to share ideas and opinions in a different environment than normal.

The activity reinforced the need for risk management in decision-making and participants were interested in extending the activity. Diversification and the need for flexibility when making decisions was a theme which was expressed both in the way the game was played and in discussion.

The current economic circumstances in the wool industry have imposed a restrictive framework for the decisions made by pastoralists. Potential exists for the participants in the workshop to examine the possibilities to develop business structures with the flexibility to account for risk and to present decision-makers with options.

20 YEARS EXPERIENCE WITH CELL GRAZING IN SOUTH AFRICA

Norman Kroon, Kariegasfontein, PO Box 161, Aberdeen 6270, Republic of South Africa

(Ed. Terry McCosker provided the following transcript of a talk given by Norman at a field day at "Clovernook", via Moura QLD on 2/3/93. Due to space limitations, I have condensed the article and spread it over two issues of RMN. Anyone requiring further details about Norman's talk should contact Terry at PO Box 633, Yeppoon QLD 4703.)

A few months ago, I asked Terry McCosker if he could put me in touch with Australians who farm in country similar to mine. His reply was that there was nothing that bad in Australia!

From his remark you can gather that my farming conditions are vastly different from yours, being very low rainfall and bush and shrub vegetation. But these different conditions are really irrelevant as we are talking about grazing principles that are applicable anywhere.

In spite of our agricultural departments and universities having put tremendous time and effort into range management, our range in general is still in a shocking condition. We will have to revise our approach to range management if we want to reverse the downward trend and leave something for succeeding generations.

I am not familiar with the Australian situation, but am sure that it is heading in the same direction. It may not be as obvious here, as yours is a relatively young country and sparsely populated. That is no reason to be complacent, as the task of reversing range deterioration will increase immensely every year. Do not wait until you have lost all of your topsoil and good species before you start range improvement.

I'm sure several of the tell-tale signs of range retrogression are here - you have only to ask yourselves:

- How many watercourses have deep gullies or are assisted by erosion walls and contour banks?
- How much agriculture can be sustained from springs and streams without the help of large storage dams?
- Are the dams silting up?
- Is the saline problem increasing?
- Are insect and locust plagues on the increase?
- Is each drought worse than the previous one?
- Is the carrying capacity of the land decreasing?
- Are rural areas becoming depopulated?

This range retrogression is slow and we tend to accept the present condition as normal, but historical records prove otherwise. In South Africa, it is estimated that our range once carried three times the biomass of antelope and big game than it can at present with domestic stock.

The origins of cell grazing were born out of the frequency of droughts and decreasing carrying capacity of the range. The technique is remarkable in that it did not emanate from research stations but from trials of practical farmers who had to pay for their own mistakes.

The crux of range management lies in improving the effectiveness of our rainfall, i.e. that proportion of rainfall that penetrates the soil where it falls. This can only be achieved by improving plant density, mainly with grass, and having the bare areas between plants covered with plant litter.

I became interested in cell grazing in 1972, via my late brother who was a client of Allan Savory in Namibia. It appealed to me above other grazing methods because it adopts a holistic approach to farming by considering the plant, the animal, the management and the economics. Results are judged in all four facets jointly. No matter what grazing system you follow, it will fail in the long run if it cannot satisfy these factors.

So in 1973, I subdivided both my properties with an additional 75 kms of fencing. My home farm, Kariegasfontein - which I will refer to as Farm A, is 12,000 ha and has an annual rainfall of 7.5". This is boosted by flooding of a large proportion of the farm during good years. Farm B is 3,000 ha in a 12" rainfall belt. I run mainly sheep and goats on Farm A, and cattle and sheep on Farm B.

I fenced these farms into the wagon wheel fencing layout with 8-10 paddocks per herd. I then grazed each paddock for about 7 days and rested it for about 60 days.

Of course, charging off and doing this in one year was a big mistake as I had not had any training in cell grazing. In fact, I had only met Allan Savory and Stan Parsons in 1977 and attended their first course in South Africa in 1978.

Obviously, I made many costly mistakes in not catering for large herds, not understanding the importance of time control and generally being too rigid in my approach. I would therefore advise anyone interested in cell grazing to attend courses and follow-up training in order to save money and time in the long run.

After about four years, I realised that I needed more paddocks to improve flexibility of grazing and to increase stock densities to create a better seedbed by chipping the soil with animal impact. Though I had obtained fairly good results production-wise, the range was not regenerating. I then subdivided most paddocks to give about 16 paddocks per herd and subsequently combined cells to have 30-50 paddocks.

Both properties had a history of poor range management and Farm A had 4,000 hectares of hard pans with gullies up to 15' deep eroded through the watercourses. The soil was capped and small falls of rain could result in tremendous run-off. The previous owner had done a tremendous job of reclamation by building erosion walls and contour banks - but with limited results as it did not go to the root of the problem; the earthworks only treated the symptoms. Effective water penetration when it falls should be the aim.

I had also gone to the expense of strip ploughing 6' apart on the pans to retard the run-off. This also produced poor results as a response only occurred in the ploughed furrows.

(Ed. In the next issue of RMN, Norman goes on to describe specific responses to the soil, vegetation and animal performance on his farms as a result of his cell grazing system.)

TOTAL GRAZING MANAGEMENT AND BLADE-PLOUGHING

A Field Day Back O' Bourke

David Robson, *Department of Conservation and Land Management, Bourke NSW 2840*

On 16 March, over 100 people converged on Mr. Guy Fitzhardinge's property "Wapweelah" (about 130 km north of Bourke) for a field day. Guy is helping the Bourke CaLM office to conduct a range rehabilitation experiment at Wapweelah. After three years, it's starting to tell an interesting story.

Most of the guests were landholders, but about 20 agency people from CSIRO, NSW Agriculture, NSW CaLM and QDPI also turned up. We started by inspecting an experimental site and ended by listening to graziers who are using Landcare as a vehicle to control feral goats, and the Finlayson trough to deter kangaroos.

Background

The experiment is located in mulga woodlands, on sandplains of calcareous red earths. The land suffers severe perennial pasture depletion, soil productivity loss and dense shrub encroachment. Rehabilitation programs in semi-arid NSW have normally focussed on the control of "woody weeds" such as *Eremophila* spp. and hopbushes (*Dodonaea* spp.). People have often viewed program success purely in terms of shrub kill and have overlooked the importance (and difficulty) of re-establishing perennial pasture. Various control methods offer short-term increases to production but often fail to deliver long-term improvement.

One of the objectives of our work is to identify management factors which are important to the process of range rehabilitation. We aim to formulate a package whereby the land manager can be more confident of re-establishing perennial pasture whilst concurrently improving soil condition and controlling shrub populations over the long term.

The Experiment

The experiment involves three replicate blocks, each with an area of 400 m². At present, each block consists of four treatments imposed in a 2 X 2 factorial arrangement. The treatments are:

1. Business as usual (Control),
2. Blade-ploughing,
3. Exclosure from all large herbivores, and
4. Blade-ploughing followed by total exclosure.

In future, any treatments which yield sufficient pasture will be split and one half will be burnt. We want to know how effectively fire controls future shrub regeneration.

Vegetation Responses So Far

Pasture

Treatment 1. As expected, there has been no noticeable change in the untreated areas since the commencement of the experiment.

Treatment 2. Despite two successive good summers (>200 mm rain), pasture biomass is low in blade-ploughed areas. Grass butts are being grazed to ground level and unpalatable plants such as paddy melons, pussytails, chinese lantern, rice flower, buckbush and sida make up the bulk of ground species in this treatment.

Treatment 3. In the exclosed areas there are good swards of perennial grasses such as woollybutt, mulga mitchell, kangaroo grass, curly windmill grass and mulga oats. While pasture composition is good, abundance is highly variable. Interestingly, shrubs and pastures are growing together in many places. In this treatment, I suspect that variation in soil surface condition and shrub competition are of similar importance to pasture growth.

I often wonder whether exclosure, on its own, will ever be sufficient to bring about recovery. Will pasture ever respond sufficiently to enable burning and will burning have the power to drive the system back over some "threshold" from shrubland to grassland? I have doubts but must wait to find out.

Treatment 4. The substantial pasture response in the blade-ploughing/total exclosure treatment was clear for all visitors to see. We estimated the mean total pasture biomass within this treatment to be a little over 1 tonne/ha in January this year. This was significantly greater than all other treatments. A high proportion of the pasture is made up of desirable grasses, but there is a mix of unpalatable and ephemeral species as well. I predict change in pasture composition to be greatest within this treatment over the coming years. So far, this is the only treatment where fire could be contemplated. The possibility of fire was keenly debated by guests but with no consensus. We will probably give burning a go in the near future.

Shrubs

Not surprisingly, shrub populations haven't changed in the two unploughed treatments within the last three years. However, a comparison of the two ploughed treatments reveals that there has been significantly less shrub regeneration in the ploughed/exclosed treatment than in the treatment where grazing has occurred after blade-ploughing.

Seeing is Remembering ...

Settlement has favoured kangaroos and brought pests like goats and rabbits. Graziers are rarely in the position to reduce stock numbers when it is needed. As a result, high grazing pressure and the damage that it causes (particularly to

sandplains) are the status quo in north western NSW. It's hard to gauge the land's potential or to separate the effects of degradation from those which are due to "drought". We often have trouble even knowing what good land condition looks like.

The Wapweelah experiment helped people to review their perceptions. Responses could be compared, side-by-side, with the certainty that there has been no real difference in rainfall or variation in land type between treatments. The treatment areas are a vivid demonstration that total grazing management is fundamental to range management and a prerequisite to intensive forms of rehabilitation like blade-ploughing. I am confident that the field day provided guests with clear images and hope that they will serve as meaningful standards on which to base future decisions.

... and Participation leads to an Understanding

High netting fences are experimental expediencies but are not a realistic solution to widespread uncontrolled grazing. There are smart alternatives to fences and two were examined at the field day.

Feral Goats

Local graziers Peter Bryant and Jim O'Shannessy told of the recent formation of their Warrego/Kulkyne Landcare group. The group's first objective is to eradicate feral goats in the Wanaaring region of NSW. The group believes that feral goats are a threat to sustainable pastoralism and that the only dinkum way to achieve their aims is to pool resources and cooperate as a community - common sense really. Importantly, they recognise goats as a pest and not as a commercial opportunity of any long term benefit.

Kangaroos

The Finlayson trough is by no means a new idea and it's good to see a resurgence of interest in this innovative and ecologically sound idea. We set up a hot wire around an existing trough on Wapweelah as a static display. David Butcher, a landholder from Ivanhoe in south western NSW, kindly spent the time and effort to come and explain how he is using the trough on his property. I think I detected considerable interest in the idea by visitors at the field day. As with feral goats, there is a need for community cooperation in the use of these troughs if they are to be truly effective.

Completing the Equation

We concentrated on feral goat and kangaroo control as starting points for total grazing management. We couldn't include any more items in the program, but the field day would have been incomplete had we not mentioned the need for conservative sheep/cattle grazing and rabbit control.

Fenceline differences signal that wild herbivores are not totally to blame for high grazing pressure. Guy Fitzhardinge

is, by choice, running far fewer stock than is profitable in the short term and actively conserving his resource for the long term. His mulga country has suffered degradation for a long time and will not improve quickly, but his floodplains are benefiting and so are his stock.

Rabbits are insidious and their impact is presently underscored in northern NSW. There are no definitive solutions and, in the long run, I believe that rabbits will prove to be the most difficult grazing component to control.

Concluding Remarks

The rangeland rehabilitation paradigm is gradually shifting. Some managers are discarding superficial management which seeks to control the symptoms. These have generally proven to be blunt and inadequate tools for rangeland improvement. The better managers are standing back from the more graphic forms of land degradation such as "woody weeds" and are approaching the underlying causes.

Pastoralists like Guy Fitzhardinge, David Butcher and those in the Warrego/Kulkyne Landcare group are probably pre-empting the conclusions which are likely to be drawn from our experiments. I will be satisfied when the Wapweelah experiment ultimately becomes redundant.

ARS COUNCIL ASSISTS NATIVE VEGETATION DISPLAY

*Russel Harland, Dept. of Conservation & Land
Management, PO Box 307, Cobar NSW 2835*

Cobar members have long had a vision of a native vegetation display in the grounds of the Cobar museum. It was not until Tony Grice left Cobar that the project built sufficient momentum to actually happen. This is in no way a poor reflection on Tony, as he was one of the project's strongest advocates. In fact the concept could be viewed as a testimonial to Tony and his work at Cobar. Research Agronomist, Cathy Torpy, has since played a pivotal role in coordinating the project.

Briefly, the project involves sowing beds of local grass and shrub species in an attractive arrangement while accompanying display boards explain the principles of rangeland management. The Cobar museum is a popular tourist destination with over 12,000 visitors annually. The display will also have a valuable role in local education.

Following the successful staging of the biennial conference in Cobar, funds were sought from Council to assist the project. A grant of \$1,000 was generously offered. The design has been completed and signs etc. are now being compiled. The project should be completed by September 1993.

GRASSHOPPERS EATING MULGA AND GIDGEE IN SOUTH WEST QUEENSLAND

Paul Jones, QDPI, PO Box 282, Charleville QLD 4470

An estimated one million hectares of mulga (*Acacia aneura*) has had the foliage consumed by grasshoppers in south west Queensland. One Adavale grazier estimated that the quantity of mulga foliage consumed by grasshoppers on an average property during February and March 1993 would have drought-fed the equivalent of 20,000 sheep. An area 400 kms north to south and 200 kms east-west, with Quilpie as the central point, has been affected. This has concerned several graziers as they see their drought resource dwindling. It is possible that a lot of the mulga will die due to severe defoliation and ringbarking of small twigs leading to destruction of the growing points.



Paul Jones (left) of QDPI, Charleville, and Keith Shephard of "Avonvilla", Adavale, inspecting mulga attacked by grasshoppers.

The grasshopper activity was first brought to the attention of the QDPI in April 1992 by a grazier at Adavale. At that stage, several thousand hectares of mulga and gidgee (*Acacia cambagei*) were affected between Adavale and Quilpie. The grasshoppers operated in either strips or clumps that were several hundred hectares in size. About 95% of the trees present in the strips were affected. The grasshoppers were inactive during the day and fed at night. Only after a tree was almost completely defoliated would they move to the next tree and they appeared to travel in whatever direction the wind took them. Swarming was never observed and thus it seemed that they were native to the area.

Grasshopper Species

The grasshopper feeding on the mulga and gidgee was identified as *Adreppus* species 6, a large dark grey grasshopper. It is a relatively new species which has not yet been fully classified and has also only previously been reported in coastal areas.

Other trees affected by *Adreppus* species 6 included leopardwood (*Flindersia maculosa*), mimosa (*Acacia farnesiana*), fuchsia (*Eremophila maculata*), bloodwood (*Eucalyptus terminalis*), poplar box (*Eucalyptus populnea*) and coolibah (*Eucalyptus tessellaris*). The degree of damage by grasshoppers had never been previously reported, however several people had noticed the presence of *Adreppus* species 6. Several hundred hectares of dead gidgee in an area 50 kms west of Quilpie is reported to have died in the 1930's. This is suspected of being killed by grasshoppers, particularly the spur-throated locust.

Adreppus species 6 has been the most dominant and widespread species while *Macrolobalia ocellata* has occurred with it in most locations. *M. ocellata* is a similar size to *Adreppus* species 6, however it has a green antenna, body and wings, with red spots on the wings. Other species found at Adavale on the mulga and gidgee include *Goniae vocans*, *Coryphistes interioris*, a new species yet to be identified, the spur-throated locust (*Austracris guttulosa*) and the wingless grasshopper (*Monistria pustulifera*). *G. vocans* is a large light grey grasshopper with a crest on its back. *C. interioris* is a small light grey grasshopper easily confused with the spur-throated locust. It is most likely that the *M. ocellata* and the *C. interioris* are responsible for the ringbarking of the small twigs on the mulga. The spur-throated locust appeared to favour gidgee trees, and the wingless grasshopper was also found on ellangowan (*Myoporum desertii*). The wingless grasshoppers *M. pustulifera* and Genus Nov. 54 species 1 were found feeding on sandalwood (*Eremophila mitchellii*).

Grasshopper Activity

As temperatures began to drop in April and May 1992, so did the grasshopper numbers. Live *Adreppus* species 6 were observed during winter and it is quite possible that the species is self regenerating.

Grasshopper densities peaked in February and March 1993 covering the areas described earlier. Since April (1993), declining temperatures have again seen a drop in the grasshopper population - to a level where they are now ineffectual. While older mulga trees were targeted in 1992, this year all age groups were affected. Most of the mulga affected the previous year showed no sign of recovery.

Public Meeting

Due to the extent of the problem, a meeting of concerned graziers was held in the Adavale area with the purpose of discussing problems caused by the grasshoppers and to commence gathering facts related to the grasshoppers. There was consensus among participants that recent apparently milder winters were partly responsible for the increased grasshopper population. During ensuing discussions, it was realised that spraying was not economically feasible and that in some areas, there were benefits to be gained from the

thinning of mulga and gidgee; resultant grass growth in some previously affected areas was quite astonishing. The meeting resolved that the most helpful information would be that which allowed future prediction of grasshopper activity enabling management plans to be adjusted accordingly. It was also decided to examine the possibility of engaging a masters' student to study the lifecycle of grasshopper species. All graziers present offered assistance to a suitable student in the form of accommodation and on-property transport. A letter from the group describing the problem was also drafted to both the Minister for Primary Industries and the Premier.

Conclusion

This year, the grasshoppers appear to have been limited to Queensland. In 1994, if suitable conditions again prevail (whatever these conditions are), it would not be ridiculous to presume that all the mulga in eastern Australia could be affected by grasshoppers.

LETTER TO THE EDITOR

Society Policies and Positions

Ray Perry, Natural Resource Consultant, 34 Chipping Road, City Beach WA 6015.

I refer to the item "News from the West Gascoyne Branch" on page 25 of the March 1993 Newsletter. The item dealt with rangeland issues discussed at a meeting of the Branch on 5 Feb. 1993. I attended that meeting and agree with you that it was a thought provoking and useful exercise, although I thought that the issues selected were rather too diffuse for easy subsequent development.

However the idea behind the meeting was still in my mind when, a few weeks later, I received my copy of the December issue of "TRAILBOSS NEWS" from the Society of Range Management. In it were printed the American Society's Policy Statements and Position Statements.

It struck me that these Statements cut across many of the key issues selected at the February meeting of the West Gascoyne Branch and that all Society members would be in a much better position to discuss issues internally and publicly if we had an equivalent set of Policy and Position Statements. I say equivalent because neither the specific topics nor the content of the American statements fit the Australian situation.

Of course we could never get every member to agree with the contents of every such statement, but at least officers and members of our Society could join discussion on any of the

topics by saying "The Society's position on the subject is...." or "I don't entirely agree with it but the Society's position is...." or "I don't agree with it but the Society's position is....".

A first draft of a series of such statements could be developed fairly quickly by selecting a dozen or so individuals or pairs of individuals and asking each to prepare a draft for one specific topic within a specified time, say a month. The drafts could be put together in a sort of "green paper" for circulation and comment by the membership at large and then refined in the light of the comments. The resulting "white paper" would need to be approved at a general meeting or by a vote of members. Apart from speeding up the process, such an approach has the advantage of involving more of the membership in the Society's activities and of taking some of the load off an always overworked Council.

I realise that such sets of statements don't fully achieve the objectives of the February meeting of the West Gascoyne Branch, but they would be a good starting point.

(Ed. Ray supplied a copy of the Society for Range Management's Policy Statements and Position Statements.

The Policy Statements cover such issues as:

- education
- livestock grazing on rangelands
- multiple use of rangelands
- research needs funding and implementation
- wildlife management.

Position Statements include (amongst others):

- fire management
- integrated pest management
- off-road vehicle use
- professional qualifications.

These Statements were printed in a condensed form in RMN 90/3 (December 1990), while the complete document can be found in TRAILBOSS NEWS, December 1992.)

WARMS AT THE CROSSROADS

Alec Holm, WA Department Of Agriculture, Baron-Hay Court, South Perth WA 6151

(Ed. Alec was guest speaker at the recent AGM of the Society in Alice Springs. He kindly provided this transcript of his talk on the Western Australian Rangeland Monitoring System.)

The Western Australian Rangeland Monitoring System (WARMS) has been under review over the past two years and is now emerging in its revised form.

Prior to the review, the WA Department of Agriculture was committed to establishing and monitoring 10,000 WARMS sites on pastoral properties in Western Australia by the year 2000. By 1993 the Department was spending \$300,000-\$400,000 per year on the monitoring program and had established sites on about 200 of the 500 pastoral leases in Western Australia. There are now 3,727 monitoring sites.

Early development of monitoring concentrated firstly on developing reliable monitoring techniques and then on installing sites. There was no serious thought given to:

- who should receive the information; and
- how best to present the information.

In addition, Government resources allocated to rangelands were diminishing and by 1992 early monitoring targets were seen to be unattainable.

This forced a review of the monitoring program and an attempt to clearly identify clients for monitoring information. A workshop between pastoralists, Departmental officers, environmentalists and other stakeholders in the rangelands was held in 1992 where several legitimate clients for monitoring information apart from the immediate pastoralist, were identified. There was seen to be a need to tailor monitoring techniques to provide useful information to the two main groups, namely pastoralists and Government instrumentalities. Until the workshop, WARMS was designed to provide information to both pastoralists and Government. However, it was apparent that in the main, pastoralists viewed the system as a Government system and of little relevance to their management. The decision has now been taken that monitoring will comprise:

1. a pastoralists' Photographic Monitoring System (PMS); and
2. the Western Australian Rangeland Monitoring System (WARMS).

The purpose of PMS is to provide the means for pastoralists to record the effects of their management on the vegetation and soil over time. The recommended PMS system is based on a photographic technique, involving a census of perennial shrubs within the photographic site (shrublands only).

The system will be handed over to pastoralists to be used as an integral part of their management program. The Department is available to assist with photography and re-assessment but is no longer managing the system. PMS sites are seen as providing seasonal feedback to pastoralists on the effects of their management on the vegetation within management units. The exact visual cues, to establish the link between excessive stocking pressure and negative vegetation response, remain largely unknown and this is an area for further development.

The purpose of WARMS, on the other hand, is to inform Parliament, its agencies and the community on changes in condition of the State's pastoral rangelands. It is based on the existing Western Australian Rangeland Monitoring System, and incorporates a photographic approach, shrub cover estimates, and counts of plant density in shrublands and plant frequency in grasslands. This is a Government supported and managed system designed to provide information for four groups.

Incoming pastoral lessees

Lease-specific information on changes in monitoring sites, set in the regional/district context, will be incorporated into standard Range Condition Assessments required by the Pastoral Board for potential purchasers of the lease, prior to sale of the property.

Pastoral Board

The Pastoral Board has requested five-yearly assessments from the Department of Agriculture, on the condition of pastoral leases throughout the State. It is anticipated that monitoring site information will be included in these five-yearly assessments, but this has not been formalised.

The lessee

Site specific information, including a site photograph, both from the initial assessment and each re-assessment, will be provided to the lessee. The information will be interpreted in relation to change on other sites in the district.

The wider community

Aggregated change information will be provided in the Commissioner's Annual Report to Parliament and through the National Rangeland Monitoring Program to funding bodies and other organisations who influence policy on the management of rangelands.

These are the expectations of WARMS, but what is the current state of development?

The Department now aims to install (or convert existing) sites to provide a total of 2,000-3,000 WARMS sites across the pastoral leases of Western Australia. Grassland sites are expected to be more dynamic and will be re-assessed every three years, while shrubland systems will be recorded every five years. A crucial part of the process is stratifying the sites across the landscape to obtain the most from them. We have first partitioned the State's rangelands into 12 major vegetation

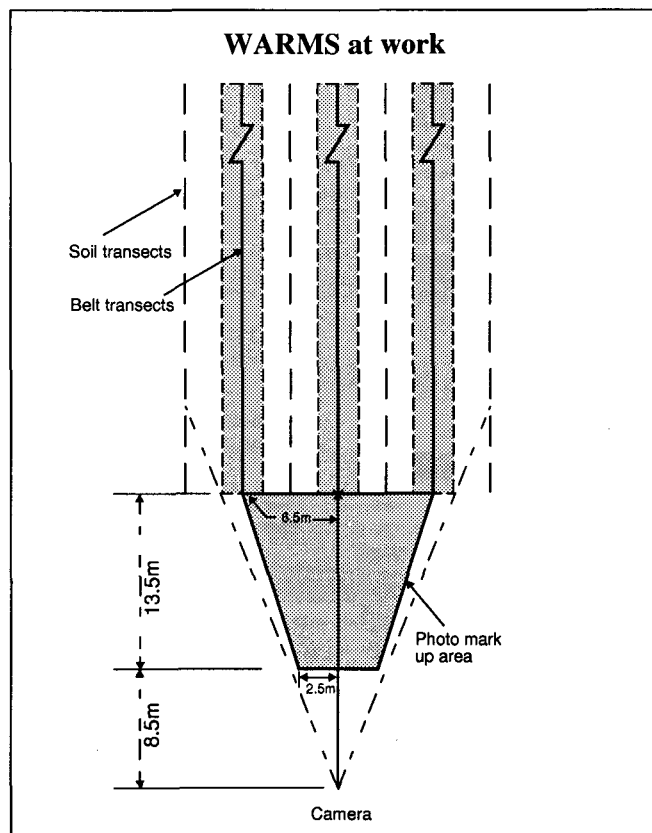
classes and then stratified the sites in accordance with the productive potential of these classes. A further adjustment has been made to reflect the inherent stability or fragility of the vegetation classes so that the more fragile systems have been allocated proportionately more sites and the stable systems less sites. No sites have been allocated to unproductive pastoral land. The final location of the site on the ground will be decided in accordance with guidelines which recognise variations in, and patchiness of, the vegetation, range condition and grazing distribution.

The object of the measurements on-site is to assess vegetation change. It is not to assess causal factors. Ancillary data will also be collected, including: dates of fires and floods (if applicable), stock numbers on the lease (a statutory requirement), and climatic history (classified as exceptional, average or drought from NOAA satellite imagery). These data will be used to assist in interpretation of the site data both as input into multivariate analysis and by Departmental officers in preparing reports.

Part of the development of the new WARMS is the enhanced assessment of soil condition, especially the identification of landscape processes which may indicate the early stages of condition change. The Department is working with Mr David Tongway, to develop useful procedures for soil assessment to be used in conjunction with the WARMS program (see RMN 93/1 pp 7-8).

Our immediate challenge is to develop useful products from this information - products which can be readily understood by the identified client groups.

We are now poised to initiate the new monitoring program which has been tailored to meet the needs of both pastoralists and Government within a realistic budget allocation.



“WOODY WEED MANAGEMENT IN WESTERN QUEENSLAND”

**A QDPI Project Funded by the
Wool Research and Development Corporation
Aimed at Improving the
Woody Weed Situation in
Western Queensland.**

*Paul Jones, Project Leader, QDPI, PO Box 282,
Charleville QLD 4470*

Background

Wool production in the rangelands of western Queensland is being reduced by a developing woody weed problem. Woody weeds also increase management costs; for example, by increasing mustering difficulty and by reducing the effectiveness of ectoparasite treatments. The woody weed species involved are both native and introduced. They are affecting all major pasture communities, e.g.:

- 6.7 M ha of Mitchell grass is currently invaded by prickly acacia (*Acacia nilotica*);
- 1.7 M ha of the mulga region has a substantial shrub coverage (mostly native, for example *Eremophila*, *Senna*, *Dodonaea* spp);
- gidgee problems occur in central western Queensland;
- 300,000 ha of mulga country is affected by mesquite (*Prosopis* spp). Additional areas of mesquite infestation occur in the Winton - McKinley area in north west Queensland.

More recently, concern has been expressed (e.g. Roberts 1990, by Land Care Groups) on the spread of gidgee (*Acacia cambagei*) and mimosa (*Acacia farnesiana*) into grasslands of the central west. False sandalwood (*Eremophila mitchellii*) also concerns a significant number of graziers (AMLRDC Survey 1990). Costs associated with woody weeds are not well documented, although it was estimated in 1990 that woody weeds and erosion were costing approximately \$32 M annually in the mulga region alone. Economically feasible control methods and management systems that initially contain, and then regain, these losses in production are needed for problem woody weed species.

Management of invasive and problem plant species (including woody plants) was given a high priority in “A Review of Research for the Australian Sheep Industry” (AWC 1990). Control of such species can potentially be by chemical or mechanical means, but these are generally too expensive for use in the rangelands. Biological measures are generally not feasible for native species while investigations into control agents for introduced species have not yet produced many successes. Work done overseas, interstate and in western Queensland highlights the use of fire and grazing management

as the lowest-cost options for the control of invading woody species in the rangelands. They also emphasise the need for sufficient biological background on the species involved. Such information includes factors influencing establishment and regeneration, the effect of woody species on forage production and when the most economically feasible time for management intervention might be.

Principal Aims:

The principal aims of this major study into woody weeds are:

1. to work with grazer groups to develop low-cost control and management strategies for containment of the main woody weed species in western Queensland, targeting the principal locations (listed above);
2. to promote adoption of these strategies by land users (graziers and others) and administrators; and
3. to undertake research pertinent to (1) where the existing information base is found inadequate.

Methodology

The project will develop and encourage adoption of tactical woody weed containment practices as an integral part of property planning and management. It will commence with problem species in the mulga area (e.g. *Eremophila gilesii*) and prickly acacia in Mitchell grass areas. Adoption of the practices developed in this project is the only successful outcome.

1. The first action will be the bringing together (by invitation) of groups of graziers (6 - 8) to operate with QDPI staff (2 - 3). The group is based on each individual's defined real need for woody weed control. Each member will contribute to the development of control measures and the group will be assisted by a trained facilitator (a member of QDPI staff). These groups will form the foundation for the extension of the project's outcomes to other land users. They will work with Land Protection branch personnel with similar needs and they will complement and reinforce other research and extension activities.
2. Information pertinent to devising tactical, low-cost management practices for mesquite, gidgee, prickly acacia (mainly fire effects), mimosa and sandalwood will be sought where the existing information base is defined as inadequate in (1). Problem areas will be defined and management tactics devised and extended as in (1).

Expected Outcome and Benefit to the Wool Industry

It is expected that outcomes and benefits will be in the areas of:

1. Wool production losses from the effects of woody weeds reduced by the adoption of containment and control practices.

2. Annual management costs to the wool industry reduced by adoption of (1).
3. Improved rates of adoption of control measures achieved by the integration of research and extension. Inputs will come from producers, Land Care groups, and research and extension officers.
4. Woody weed control coming to be treated as an integral part of property management.

References

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NEW BRANCH OF THE AUSTRALIAN RANGELAND SOCIETY

*Russel Harland, Dept. of Conservation & Land
Management, PO Box 307, Cobar NSW 2835*

Members in the Western Region of NSW recently met to form a local branch of the Society. The meeting elected a committee and discussed suggestions for worthwhile activities which the branch could pursue at a local level. The range of options discussed included field days, interest tours, seminars and sponsoring visits by specialists to remote areas. As Cobar was the venue for the recent biennial Conference, it was thought by many that another western NSW centre should host a major event for this year. As yet, we have not decided what this might be but the local membership will be consulted and an activity planned for later this year.

The inaugural committee consists of:

- Russel Harland, CaLM, Cobar - Chairman
- James Gardiner, "Bulgo", Cobar - Vice Chairman
- Ruth Barclay, NSW Agriculture, Cobar - Secretary/
Treasurer
- Norman Crossley, "Yandilla", Cobar - General Committee
- Rob Richard, CaLM, Hay - General Committee
- Greg Curran, NSW Agriculture, Cobar - General
Committee

Any inquiries may be directed to Russel Harland on (068) 366632 or PO Box 307, Cobar NSW 2835

RESOLUTIONS FROM THE AGM

Greg Campbell, Secretary, PO Box 596, Alice Springs NT 0871

The following motions were put to, and accepted by, members attending the Annual General Meeting of The Australian Rangeland Society held in Alice Springs on 28 May 1993:

1. Change in the Articles and Memorandum of Association to alter the title of **Honorary Member** to **Fellow of The Australian Rangeland Society**.
2. Pursuant to the above motion, give current Honorary Members the option of adopting the title of **Fellow of The Australian Rangeland Society**.
3. Change in the Articles and Memorandum of Association to replace the West Australian Companies Act 1961 with **Corporations Law 1991**.
4. Change in the titles and guidelines for awards formerly known as ARS Travelling Fellowship and Overseas Conference Scholarship.

(Ed. Details of the revamped awards are presented in the following article.)

The new Federal Council, based in Western Australia for the next two years, comprises:

| | |
|------------------------|--------------------------|
| President | - Mr Alec Holm |
| Vice President | - Mr Bob Symmonds |
| Honorary Secretary | - Ms Sandra van Vreeswyk |
| Honorary Treasurer | - Mr David Pearson |
| Subscription Secretary | - Ms Helen Allison |
| Past President | - Dr Bill Low |

The new Council will need to obtain a further Vice President from the next host State.

(Ed. I will ask the new Council members to introduce themselves in the next RMN.)

AUSTRALIAN RANGELAND SOCIETY AWARDS

(Ed. A proposal to accept new guidelines and titles for the ARS Travelling Fellowship and Overseas Conference Scholarship was accepted at the recent AGM. Complete details of the new awards follow.)

Australian Rangeland Society Travel Grant

Name

1. It shall be known as the Australian Rangeland Society Travel Grant (ARSTG).

Purpose

2. The Grant is intended to assist an eligible person or persons to attend a meeting, conference or congress which deals with the art or science of managing rangelands; or to assist an eligible person or persons with travel or transport costs to investigate a topic connected with range management or to implement a program of rangeland investigation not already being undertaken. The Grant is available for overseas travel and/or travel within Australia. It is not intended for subsistence expenses.

Determination

3. The Grant will be awarded, or not awarded, by Council on the merits of a written application (not exceeding 1000 words) clearly setting out the relevance of the applicant's proposal in meeting the aims of the Society. Failure to comply with these guidelines may mean rejection of an application.

Conditions

4. Applications may be submitted at any time but will only be considered by Council at the first scheduled regular Council Meeting after the closing date for applications of 30 November each calendar year, to be granted in the following calendar year.
5. One or more Travel Grants can be awarded in a calendar year. The maximum amount available for distribution in a calendar year is \$2000.
6. Applications should include details of costs and set out precisely how the grant is to be expended. Details of any other sources of funding must be given.
7. Successful applicants are required to submit an article reporting on their activities, suitable for publication in the Society's *Newsletter* or *Journal*, as appropriate, within six months of completion of travel.
8. Applications should include the names of at least two referees.

Eligibility

9. No formal qualifications are required. There are no age restrictions and all members of the Society are eligible to apply. Applications are encouraged from persons who do not have organisational support.
10. **Overseas travel:** Only members of the Society with more than twelve months membership will be eligible for overseas travel assistance. Overseas travel can include travel to Australia by overseas members.
11. **Travel in Australia:** Travel assistance within Australia can be made available to any non-member where Council considers that an application meets the aims of the Society, and is of sufficient merit. It is also available to members who are foreign nationals residing in Australia and who wish to undertake travel in Australia.

Acquittal

12. Any grant awarded must be properly accounted for by the recipient who will provide to Council full details of expenses incurred within four weeks of completion of travel. Unexpended funds will be refundable to the Society.
13. The recipient will submit their written report to Council within six months of completion of travel.

Miscellaneous

14. Interpretation of these guidelines is at the discretion of the governing Council in office at the time.
15. These guidelines may be altered by a majority vote at a special general meeting or an Annual General Meeting after notice has been duly served.

Australian Rangeland Society Scholarship

Name

1. It shall be known as the Australian Rangeland Society Scholarship (ARSS).

Purpose

2. The Scholarship is an annual award intended to assist an eligible person or persons to undertake formal study of a subject or course which will enable the recipient to pursue the art or science of rangelands management and further the aims of the Australian Rangeland Society. The Scholarship is available for study assistance either overseas or within Australia. It is not intended to defray travel expenses.

Determination

3. The Scholarship will be awarded, or not awarded, by Council on the merits of a written application (not exceeding 1000 words) clearly setting out the relevance of the applicant's proposed course of study to rangelands management and in meeting the aims of the Society. Failure to comply with these guidelines may mean rejection of an application.

Conditions

4. Applications may be submitted at any time but will only be considered by Council at the first scheduled regular Council Meeting after the closing date for applications of 30 November each calendar year, to be granted for the following calendar year.
5. One or more Scholarships can be awarded in a calendar year. The maximum amount available for distribution in a calendar year is \$2000.

6. Applications should include details of the program of study or course to be undertaken and the institution under whose auspices it will be carried out. It should state precisely how the Scholarship is to be expended. Details of any other sources of funding must be given.
7. Applications should include the names of at least two referees.
8. Upon the conclusion of a course of study a recipient of a Scholarship will be required to write an article on their experiences, suitable for publication in the Society's *Newsletter*.

Eligibility

9. No formal qualifications are required. There are no age restrictions and all members of the Society are eligible to apply. Applications are encouraged from persons who do not have organisational support.
10. **Overseas study:** Only members of the Society with more than twelve months membership will be eligible for overseas study assistance. Overseas study can include study in Australia by overseas members.
11. **Study in Australia:** Study assistance within Australia can be made available to any non-member where Council considers that an application meets the aims of the Society, and is of sufficient merit. It is also available to members who are foreign nationals residing in Australia and who wish to undertake study in Australia.
12. A recipient who has received a Scholarship in any one calendar year, if undertaking a continuing course of study, can apply for a further Scholarship, provided that the person has satisfied Council as to the proper acquittal of any previous monies and has demonstrated satisfactory progress. Notwithstanding, such a person will not necessarily be given preference over other applicants.

Acquittal

13. Any Scholarship awarded must be properly accounted for by the recipient who, depending upon the length of the course undertaken, will be required to report to Council on the progress of study at a regular interval as determined by Council. Unexpended funds shall be refundable to the Society.
14. The recipient will submit their final written report to Council within six months of completion of study.

Miscellaneous

15. Interpretation of these guidelines is at the discretion of the governing Council in office at the time.
16. These guidelines may be altered by a majority vote at a special general meeting or an Annual General Meeting after notice has been duly served.

REPORT ON THE AUSTRALIAN RANGELAND SOCIETY OVERSEAS CONFERENCE SCHOLARSHIP

Peter Wandera, c/- CSIRO Division of Tropical Crops and Pastures, Cunningham Laboratory, 306 Carmody Road, St Lucia QLD 4067

(Ed. Peter received \$1,000 through the ARS Overseas Conference Scholarship to attend the recent International Grasslands Congress. He provided the following report as a condition of receiving the travel grant.)

17th International Grassland Congress Palmerston North (New Zealand) and Rockhampton (Australia)

The opening congress was held at Massey University, Palmerston North, New Zealand. It ran for five days and covered a total of 24 sessions on a variety of topics. These included: applications of genetic engineering to pasture science; agronomy of temperate, subtropical and tropical pasture; and development and application of computer-based decision support packages for pasture management.

The closing session was at Pilbeam Theatre in Rockhampton and extended over three days. This section of the congress emphasised production systems for the tropics and subtropics, including rangeland management. Sessions on small-holder systems, advances in tropical legume research and agroforestry were most relevant to my African background.

The mid-congress tour to Hamilton (New Zealand) visited commercial sheep and beef cattle properties, agroforestry development, an intensive deer and beef-finishing farm, and a thoroughbred horse stud. A significant feature of New Zealand livestock production has been the removal of farm subsidies. Additionally, most research is industry funded. We were given the impression that agroforestry, based on *Pinus radiata*, is quite profitable and that a huge potential market exists in southeast Asia. It was interesting to see deer farming and to learn of research into the medicinal attributes of velvet obtained from the deer.

Discussion sessions at Waikato University, Hamilton, were centred on soil science, the development of grassland management systems and plant toxins. Of particular interest to me was a good discussion on "patch" phenomenon in rangelands under the title of "soil characteristics and processes in the dry environment". The main point to emerge from this discussion was that patches bring about heterogeneity within a grassland. In some cases, this spatial variation is now being regarded as necessary for a sustainable system. However, in other cases, patches may signify lost production and an increased rate of degradation. This highlights the need to define the importance of patches in the grasslands. Good points were registered that may be useful in my PhD work.

The organisation of the whole congress, and particularly the plenary sessions, was excellent. There were two philosophical/policy plenary papers for each session, followed by poster

presentations on specific topics related to the session. Each session then concluded with a one hour discussion. To me, this was just about the best way to present and discuss the large amount of information coming from the huge number of delegates (over 1400 from 80 countries).

Lastly, my attendance at this congress (my first IGC) presented an invaluable opportunity to make contact with scientists having similar interests. This, more than anything else, will have a lifetime impact on my career. Thanks to the Australian Rangeland Society for according me this opportunity. I look forward to a fruitful membership.

Draft NATURE CONSERVATION STRATEGY for WESTERN AUSTRALIA Overview of a Response by West Gascoyne Branch of The Australian Rangeland Society

Submitted to RMN by Hugh Pringle, WA Department of Agriculture, Baron-Hay Court, South Perth WA 6151

ARS recognises the enormity of the task that has been confronted in the development of this draft Strategy document and commend the Department of Conservation and Land Management (CALM) for addressing this very important issue. However, ARS believes that while there is much good material in the draft, there are fundamental flaws in both the philosophical approach and structure of the proposed Strategy, and that it needs substantial restructuring and modification.

The main philosophical deficiency in this Report concerns the perspective of CALM within the wider context of nature conservation and the nature conservation estate of Western Australia. It is quite apparent that this report approaches the issue from the starting point of what should CALM do, what does CALM do, and what is CALM's estate. In short, this is an excellent review of CALM's activities in nature conservation, but it is an inadequate Strategy for nature conservation in Western Australia.

ARS recognises that the focal authority for policy in nature conservation in Western Australia is the National Parks and Nature Conservation Authority (NP & NCA). It is rarely referred to in this document whilst "CALM" occurs several times on most pages. The ARS believes that the NP & NCA, as the peak representative advisory council, should become more visible in the nature conservation arena; how many people know anything about their membership or responsibilities?

ARS would like this report to primarily focus on nature conservation issues such as biological diversity and ecologically sustainable development. These are the concepts

relevant to nature conservation. The concepts relevant to nature conservation should then be put into the perspective of the Western Australian context. This would involve documenting what is known about the nature conservation estate from a biogeographic perspective rather than whether the land is vested in CALM or not (this consideration should be some distance downstream if nature conservation, rather than CALM, is to be the focus).

The process of documenting the nature conservation estate will expose the serious deficiencies in our knowledge base. At this juncture, perhaps the Strategy should split into two in order to:

1. act upon the existing knowledge base, and
2. evaluate the approaches needed to improve the knowledge base.

In dealing with the current knowledge base, important issues such as the adequacy of the nature reserve system and identification of ecosystems and populations which have high conservation values but are under threat from current land use will need to be addressed urgently. In these considerations, nature conservation planning and management should be seen firstly in terms of what is required, and secondly in terms of the roles different organisations (under a co-ordinating NP & NCA) can play in achieving the associated goals. It is here that CALM may become the central agency in many of the activities or programs.

ARS does not believe nature conservation planning should wait for the gaps in the knowledge base to be filled, rather it should remain flexible to accommodate increased knowledge and use caution where knowledge is lacking or inadequate.

Improvement of the knowledge base should include the following key components:

1. Identification/documentation of what data are required to provide the biophysical inventory basis for nature conservation planning. For leased rangelands in Western Australia, the main repository and source of such data are the survey data collected by the WA Dept. Agriculture - Dept. Land Administration - WA Herbarium natural resource surveys.
2. By biogeographical regions, identify which regions meet these requirements and at the same time make an inventory, by region, of what data are missing.
3. An inter-organisational (GO's and NGO's) working party should be set up to investigate the possibility of closer links between organisations conducting biophysical inventory surveys. In particular, the working party should concentrate on evaluating how the different programs can complement each other towards filling the gaps on a regional basis (as defined in the previous component 2). Involvement of LCDC's may facilitate the process by providing local input and support for future field exercises.

Conservation planning and the management objectives for CALM land should largely be the preserve of CALM. However CALM should consult other organisations before it details how it plans to manage land vested in it in the Strategy. CALM does not have exclusive ownership of knowledge on nature conservation planning and management in Western Australia.

Nature conservation planning and management of those parts of the nature conservation estate outside of CALM reserves for which there are no immediate plans to alter their current tenure need to be addressed quite differently - as recognised in the Report. The ARS believes there is considerable potential for the satisfying of specified conservation objectives in lands used for pastoralism. Achievement of this could serve as a model for similar developments in agricultural environments.

ARS believes that the process of nature conservation planning and future management of these lands should primarily involve a multi-organisational working group coordinated by CALM and reporting to the NP & NCA. In this forum, objectives can be set and mechanisms to achieve them developed directly by the organisations involved, rather than by CALM after a consultation process. Quite possibly, CALM could provide technical input and guidance to other organisations who may have control over the land and eventually have to put programs and management plans into practice.

Thus, ARS recommends that this Report and the Strategy be restructured to:

1. focus primarily on nature conservation issues and the nature conservation estate in Western Australia; and
2. put CALM into the context of a key player rather than the focus of the Strategy.

(Ed. Hugh advises that he can supply copies of the full ARS submission if required. He can be contacted at the above address.)

SPECIAL ISSUE OF THE RANGELAND JOURNAL

Invitation to Contribute

Prof. John Holmes, Dept. Geographical Sciences & Planning, University of Queensland, QLD 4072

A special issue of *The Rangeland Journal* is planned for December 1994 on the theme: **Contemporary Explorations: Values, Perceptions and Actions Shaping Australia's Rangelands**. The issue will explore the perspectives and needs of the major interest-groups and how these are impacting on the use and management of rangelands.

Articles are sought focussing on any of the major interest groups, including the two main users of the rangelands, Aboriginals and pastoralists, as well as other influential groups. These include administrators, scientists, extension workers, recreationists, conservationists, the media and, possibly, contemporary literature.

Society members are invited to offer contributions to this special issue. Please send proposals, with title and abstract of no more than 200 words, to me, as editor of the special issue:

Professor John Holmes
Department of Geographical Sciences & Planning
University of Queensland QLD 4072

Ph (07) 365 6515 or 371 2638
Fax (07) 365 6899

to be received no later than 31st August. Please note that accepted papers will be refereed in the customary way. I will be pleased to respond to any enquiries.

Australian Rangeland Conference
Katherine - 21 to 23 June, 1994
Katherine High School
Auditorium

**CLEAN COUNTRY, CLEAN PRODUCT,
CLEAR PROFIT**

**Best practice for practical rangeland
management in Australia.**

Committee

| Business Unit | Manager |
|---------------------------------------|----------------|
| Chairman | Tom Stockwell |
| Venue Equipment and Technology | Reg Andison |
| Accommodation/Transport | Wolf Sievers |
| Tours | The Sullivans |
| Finance/Registration | Neil MacDonald |
| Advertising and Sponsorships | Blair Wood |
| Social and Catering | John Pitt |
| Editorial & Publishing | Bill Low |
| International/national guest speakers | Marg Friedel |
| Industry Liaison | Julian Stefani |

The next conference of the Society will be held in Katherine, Northern Territory between 21-23 June, 1994.

The conference theme focuses on best practice in the use of Australian rangelands - clean country, clean product and clear profit.

Sessions will revolve around management, research, extension and marketing for pastoral and other rangeland-based enterprises and land uses.

The aims of the conference are:

- To host an informative and productive three day conference including a tour on the second day and pre- and post-conference tours.
- To encourage best practice in Australian range management and science by:
 1. focussing attention on rangeland issues,
 2. sharing knowledge and ideas, and
 3. promoting current good range management practice.
- To compile, edit and distribute a set of conference papers to each delegate.

Tours a Highlight

Pre-conference tours have been arranged from Adelaide through central Australia, from Broome through the Kimberley and Victoria River District, and from Charters Towers through the Queensland and Northern Territory Gulf country.

Post conference tours are planned for the Victoria River District and Kakadu.

Registration Fee Frozen

Costs for the conference have been maintained at the same level as for Cobar. Full registration will be \$220 and \$170 for students. Discounts for early payment will apply.

A range of good accommodation has been secured and the Katherine climate is at its most benign in June with warm sunny days and cool crisp nights.

Conference information will be available shortly.

For further information or expressions of interest contact:

Chairman Tom Stockwell
DPIF, PO Box 1346
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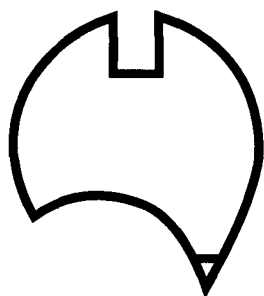
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The Australian Rangeland Society

A.C.N. 008 784 414

REPORT OF THE ANNUAL GENERAL MEETING OF THE AUSTRALIAN RANGELAND SOCIETY

*Held at CSIRO, Heath Road, Alice Springs
1.30 pm on Friday 28th May 1993*

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PRESIDENT'S REPORT

Bill Low, PO Box 596, Alice Springs NT 0871

Welcome to the 17th AGM of the Australian Rangeland Society.

It is a pleasure to be able to hand the reins of the Society over to the incoming West Australian Council with the Society's records and business in a fine state.

The Council in Alice Springs has, I feel, conducted itself well over the last two years and completed a number of items of business that will help to ensure the Society continues to lead and assist in promoting wise and appropriate use of Australia's rangelands. The work has certainly exposed us to the broader needs of Australian rangelands and rangelanders. It has also allowed us to bring the special problems and opportunities of multiple use of central Australia into sharper focus nationally. Unpredictable productivity, ballooning tourism, Aboriginal homeland reservation, localised mining, recreational needs and conservation needs for endangered flora and fauna all initially appear to compete but potentially offer opportunities for diversification and cooperation. Council has also initiated some items which will require the incoming council to complete or promote.

Development of policy statements by the Society is starting to gather a little speed. At the Cobar Conference, Ken Hodgkinson provided the stimulus and Bood Hickson got us moving to form the Kangaroo Group to develop a policy on use of kangaroos. Denzil Mills has been spearheading a move to encourage government controlling bodies to integrate the many present and proposed uses of water in the south Queensland rivers so legitimate users and the environment do not miss out. It is proposed that the Society develop an Australia-wide policy. Marg Friedel has suggested it is time we formalised our approach by undertaking to develop a full set of policy statements similar to that of the American Society for Range Management recently published in their "TRAILBOSS NEWS". This task will fall to the incoming Council to keep the ball rolling.

Membership of the Society continues to be a major concern. The decline is associated with the rural recession but it appears that we need to raise our profile to compete with the burgeoning number of other special-interest groups. There was an increase following the Cobar Conference. There has also been an increase in new members signing on as a result of the display organised by Subscription Secretary, Ashley Sparrow, for the International Grasslands Congress. Branch activities, policy statements and old fashioned hard-sell are required to promote awareness of the Society. Every member can do their bit by signing on a new member and taking every opportunity to promote the Society. Treasurer Bruce Strong's suggestion that the Society should spend perhaps 10% of its budget on advertising and promoting the Society is an idea the incoming council should seriously consider. Ashley Sparrow has suggested the Society get its own computer and software to keep the membership records in a form which is transportable with the Council on its biennial migration.

The Publications Committee under the stewardship of Margaret Friedel has continued to lead the Society by developing our flagships, the *Journal* and the *Newsletter* (edited by Allan Wilson and Gary Bastin), to ever higher levels of recognition. The new format *Journal* has been well received. The special edition of the *Journal* on "Wildlife and Conservation in Rangelands" edited by Steve Morton promoted alternative land uses. Plans are already afoot for the next special issue in 1994 or 1995 with John Holmes of Queensland to develop a theme dealing with social issues. Three years ago, Gary Bastin took over as editor of the *Newsletter* and his efforts and his numerous contributions have ensured the continuing success of the *Newsletter*. Through his constant stimulation and badgering, a wide variety of members are now contributing to the *Newsletter*. There is, as ever, a need for contributions and members are urged to use the *Newsletter* as a discussion platform. It is a pleasure to have David Wilcox join the Publications Committee to represent the West Australians. International and national recognition are desirable attributes for membership of the Publications Committee and David easily meets the "requirement".

The organising committee for the 1992 Biennial ARS Conference at Cobar, in addition to hosting a well organised conference, were successful beyond expectation as they managed to make a profit of over \$21,000. Most of this will go towards swelling the capital used to support the annual scholarships. Part of the profits will be used to assist in establishing an outdoor native plant display at the Cobar Museum aimed at educating the public about "increaser and decreaser" plants. Signs stating the role of the Society could result in additional members. Another part of the profits will go to assisting the activities of a Branch which is in the process of forming in the Cobar region. Branches are also active in South Australia and Perth with an informal branch in Alice Springs.

The organising committee for the 1994 Biennial ARS Conference in Katherine is chaired by Tom Stockwell with sub-committees located in Katherine, Kidman Springs, Darwin and Alice Springs. Size of venue will probably restrict the numbers to about 250 people. The conference will be held from June 21 to 23 based on a theme of "Clean Country, Clean Product and Clear Profit" with a special intent to encourage application of research to rangeland management. The program will specialise in Tropical Rangeland issues and include all the recognised issues in modern rangeland use and management.

Bruce Strong has worked the financial records into top shape as he will present in his Treasurer's Report. To ensure financial viability and equality of contribution from overseas members, there has been a slight increase in subscription fees during the year. The Treasurer has played a strong role in modifying the names and guidelines for the ARS Travelling Fellowships and the ARS Scholarships. The Society awards aim to assist members to meet travelling costs, mainly to attend conferences, or to undertake studies related to rangeland science and management. These awards have suffered from lack of promotion to the general membership and the incoming council will need to look at ways of bringing these awards to

public attention. The fellowships are now worth up to \$2000 depending on merit, need, competition and available funds and are funded from "trust" accounts set up with surplus funds from the 4th International Rangelands Congress in Adelaide and subsequent biennial ARS Conferences. Winners for 1993 are students Sally Claymore from VRD and Peter Wandera from Brisbane. Grant applications for 1994 may be submitted at any time up until the end of November this year.

Greg Campbell has performed a strong role as Secretary of the Society over the last two years. One of his many contributions was putting together the case for hosting the 1999 International Rangelands Congress in either Perth or Townsville. There has been no development on this front yet from the IRC Committee but competition from South Africa is rumoured to be fierce. Between Greg and Bruce, we are now aware of our responsibilities to the Australian Securities Commission. We now have six Directors; three permanent (Allan Payne, David Wilcox and Malcolm Howes) and three changing Council members (the President, Secretary and Treasurer). A Statutory Records File required by the Auditors was set up by the Treasurer and this will complement the Secretary's "Manual" as a source of official documents and procedures. Council concluded there was little to gain in using the Australian Institute of Agricultural Science as a permanent business office. There is discontinuity in changing the Society's address every two years but retention of the retiring Council's post box for two years after expiration of their term and having a permanent Business Office at David Wilcox's address help to alleviate the problem.

Alteration of the Constitution to change the name of Honorary Member to Fellow will be voted on at this AGM. Vice-President David Liddle of CCNT, Darwin has led the organisation and assessment of the need to change the name of this honorary position. Following the suggestion from our elder statesman in WA, Ray Perry, it was apparent at the general meeting in Cobar that the change would be welcomed.

FASTS (Federation of Australian Scientific and Technological Societies) continues to play a role in assisting the development of national science policies and education. Ken Hodgkinson, assisted by Jim Noble, have represented the Society.

It has been a pleasure to work with Council, proxies and Publications Committee in Alice Springs over the last two years and I thank each of them for their unstinting efforts. Greg Campbell, Bruce Strong, Ashley Sparrow, David Liddle, Alec Holm, Martin Andrew, Gary Bastin and Marg Friedel all contributed significantly to the team effort. The incoming Council will have to work to make things happen and I wish them success.

TREASURER'S REPORT

Bruce Strong, PO Box 596, Alice Springs NT 0871

I am pleased to present the Audit Report and Annual Financial Statements for the year ended 31 December 1992. The Society is in a sound financial position. Income from subscriptions returned to a more satisfactory level during the

year. The Cobar Conference provided a major boost to income - giving a profit of \$20,990. However, income from interest saw a 35% decline and with continuing falls in interest rates this trend will continue. Council has ensured that funding of the Travelling Fellowship and the Overseas Scholarship has kept pace with or bettered inflation.

In accordance with the requirements of the Australian Securities Commission, the Society now has a Statutory Records File and it will be the duty of future Treasurers of the Society to maintain this file to the satisfaction of the Auditors.

Mr President I move that the Audit Report and Annual Financial Statements for 1991 be accepted.

THE AUSTRALIAN RANGELAND SOCIETY AUDIT REPORT FOR THE YEAR ENDED 31 DECEMBER 1992

*Wolstencroft & Co, Chartered Accountants, PO Box 1970,
Alice Springs NT 0871*

We have audited the accounts of The Australian Rangeland Society for the year ended 31 December 1992. The members of the governing body are responsible for the preparation and presentation of the financial report and the information contained therein. We have conducted an independent audit of the financial report in order to express an opinion on it to the members.

Our audit has been conducted in accordance with Australian Auditing Standards to provide reasonable assurance as to whether the accounts are free of material mis-statement. Our procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the accounts, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the accounts are presented fairly in accordance with Australian accounting concepts and standards and statutory requirements so as to present a view of the Society which is consistent with our understanding of its financial position and the results of its operations.

The audit opinion expressed in this report has been formed on the above basis.

It was not practicable to establish control over income, other than interest, prior to its initial entry into the accounting records. Our audit of this income was therefore limited to the amounts recorded.

Subject to the above, in our opinion, the accounts of The Australian Rangeland Society present a true and fair view of the Society's financial position at 31 December 1992 and of its operations for the year then ended and have been prepared in accordance with Statements of Accounting Concepts and applicable Accounting Standards.

WOLSTENCROFT & CO **J WOLSTENCROFT**
Chartered Accountants Register Company Auditor
4 May 1993

**THE AUSTRALIAN RANGELAND SOCIETY
STATEMENT BY DIRECTORS
FOR THE FINANCIAL YEAR ENDED 31 DECEMBER 1992**

In the directors' opinion:

- (a) The attached profit and loss account of the Society gives a true and fair view of the Society's profit for the financial year ended 31 December 1992;
- (b) The attached balance sheet of the Society gives a true and fair view of the Society's state of affairs as at 31 December 1992; and
- (c) There are, when this statement is made out, reasonable grounds to believe that the Society will be able to pay its debts as and when they fall due.

The attached accounts of the Society have been made out in accordance with all applicable accounting standards.

The accounts have been properly prepared by a competent person.

Signed in accordance with a resolution of the directors made pursuant to section 303(2) of the Corporations Law.

On behalf of the Directors

W.A. Low
Director

B. Strong
Director

Alice Springs

May 4 1993

**THE AUSTRALIAN RANGELAND SOCIETY
PROFIT AND LOSS ACCOUNT
FOR THE YEAR ENDED 31 DECEMBER 1992**

| | Note | 1992 \$ | 1991 \$ |
|---|------|------------|------------|
| Operating Profit | | 25,624 | 8,810 |
| Abnormal items before income tax | | | (500) |
| | | ----- | ----- |
| Operating Profit after income tax | | 25,624 | 8,310 |
| | | ----- | ----- |
| Retained Profits at the beginning of the financial year | | 114,793 | 106,483 |
| | | ----- | ----- |
| Total available for appropriation | | 140,417 | 114,793 |
| | | ----- | ----- |
| Accumulated losses at the end of the financial year | | \$140,417 | \$114,793 |
| | | ----- | ----- |

**THE AUSTRALIAN RANGELAND SOCIETY
BALANCE SHEET
AS AT 31 DECEMBER 1992**

| | Note | 1992 \$ | 1991 \$ |
|----------------------------|------|------------|------------|
| CURRENT ASSETS | | | |
| Cash at Bank | 2 | 14,794 | 7,321 |
| Receivables | 3 | 21,326 | 1,310 |
| Investment Deposits | 4 | 111,519 | 111,253 |
| | | ----- | ----- |
| | | 147,639 | 119,884 |
| | | ----- | ----- |
| CURRENT LIABILITIES | | | |
| Creditors & Borrowings | 5 | 7,222 | 5,091 |
| | | ----- | ----- |
| NET ASSETS | | 140,417 | 114,793 |
| | | ----- | ----- |
| SHAREHOLDERS EQUITY | | | |
| Retained Profits | | 140,417 | 114,793 |
| | | ----- | ----- |

These accounts are to be read in conjunction with the accompanying notes which form part of the accounts.

**Notes to, and forming part of, the accounts for the
year ended 31 December 1992**

1. Summary of Significant Accounting Policies

(a) Basis of accounting

The financial statements of the Society have been prepared in accordance with Australian Accounting Standards. The financial statements have been prepared under the historical cost convention and have not been adjusted to take account of changing values in the Australian Dollar due to exchange rates.

(b) Income from Membership Fees

Membership Fees are accounted for in the year in which they are received.

(c) The accounting policies adopted are consistent with those adopted in the previous year.

| 2. Cash at Bank | 1992 | 1991 |
|------------------------------------|-----------------------|-----------------------|
| | \$ | \$ |
| General Account | 14,025 | 6,847 |
| Publication Account | 315 | 302 |
| Newsletter Account | 454 | 172 |
| | <u>14,794</u> | <u>7,321</u> |
| | <u><u>14,794</u></u> | <u><u>7,321</u></u> |
| 3. Receivables | | |
| Interest | 336 | 1,310 |
| Conference fees | 20,990 | - |
| | <u>21,326</u> | <u>1,310</u> |
| | <u><u>21,326</u></u> | <u><u>1,310</u></u> |
| 4. Investment Deposits | | |
| General Funds | | |
| Unsecured Notes | 7,000 | 17,000 |
| | <u>7,000</u> | <u>17,000</u> |
| Travelling Fellowship Funds | | |
| Term Deposit | 26,937 | 25,000 |
| SBSA Term Investment | 20,872 | 5,000 |
| | <u>47,809</u> | <u>30,000</u> |
| | <u><u>47,809</u></u> | <u><u>30,000</u></u> |
| Overseas Conference Funds | | |
| Cash Management | 28,799 | 27,282 |
| Management | 27,911 | 21,971 |
| SBSA Term Investment | - | 5,000 |
| | <u>56,710</u> | <u>54,253</u> |
| | <u><u>56,710</u></u> | <u><u>54,253</u></u> |
| Special Projects Funds | | |
| SBSA Term Investment | - | 10,000 |
| | <u>-</u> | <u>10,000</u> |
| | <u><u>111,519</u></u> | <u><u>111,253</u></u> |
| 5. Creditors and Borrowings | | |
| Postage | 1,214 | - |
| Audit & Accounting Accrual | 1,700 | 1,650 |
| Subscriptions in Advance | 4,308 | 3,441 |
| | <u>7,222</u> | <u>5,091</u> |
| | <u><u>7,222</u></u> | <u><u>5,091</u></u> |

**THE AUSTRALIAN RANGELAND SOCIETY
INCOME & EXPENDITURE STATEMENT
FOR THE YEAR ENDED 31 DECEMBER 1992**

| | 1992 | 1991 |
|--------------------------------|---------------|--------------|
| INCOME | \$ | \$ |
| Conference Fees | 20,990 | 7,001 |
| Subscriptions | 20,053 | 16,723 |
| Reprint Sales | 310 | 388 |
| Interest | 7,482 | 11,519 |
| Other Income | 921 | 25 |
| Sale Carnarvon Proc. | 59 | - |
| | <hr/> | <hr/> |
| | 49,815 | 35,656 |
| | <hr/> | <hr/> |
| LESS EXPENSES | | |
| Accounting | 516 | 560 |
| Audit Fee | 800 | 930 |
| Bank Charges | 100 | 470 |
| Conference Expenses | 1,000 | 1,000 |
| Freight & Postage | 3,519 | 1,514 |
| Honoraria - Production Manager | 3,000 | 2,500 |
| Honoraria - Others | 1,000 | 5,750 |
| Production of Journal | 3,990 | 5,807 |
| Production of Newsletter | 5,475 | 4,201 |
| Fees Paid | 30 | - |
| Publications Committee | - | 15 |
| Subscriptions | 253 | 399 |
| Travel | 500 | 730 |
| Scholarships & Grants | 2,000 | 900 |
| SA Secretary & Accountant | - | 205 |
| Stationery | 1,294 | 1,128 |
| Petty Cash | 342 | 350 |
| Reimbursements | 372 | 387 |
| | <hr/> | <hr/> |
| | 24,191 | 26,846 |
| | <hr/> | <hr/> |
| SURPLUS FOR YEAR | 25,624 | 8,810 |
| | <hr/> <hr/> | <hr/> <hr/> |

SECRETARY'S REPORT

Greg Campbell, PO Box 596, Alice Springs NT 0871

It has been a formative and informative two years for me as Secretary of this Society. The joys and trials of office have put me in touch with a great diversity of people and activities within Australian rangelands. The contacts I have made, and the awareness I now have of issues and activities within our rangelands, will stay with me and be of lasting benefit personally and professionally. I recommend a similar period of duty to anyone with a modicum of spare time and an interest in rangelands. There will be numerous opportunities within branches and committees or as Council moves to each state in turn. If you haven't before, then take an opportunity to be involved.

If the Secretary's report is merely to fill any gaps left in the President's address, then my report will be a short one.

Our bid to host the 1999 International Rangelands Congress still lies in the lap of the gods. As yet, the Chairman of the International Continuing Committee has not forwarded our bid, nor any other bids, on to the Committee members for consideration. In the normal course of events, the 1999 venue would be announced at the 1995 IRC but some contact and additional support material for bids would normally be envisaged well prior to the Committee's deliberations. We wait.

The promotion of the Society went very well at the International Grasslands Congress early this year. We have received early international, and indeed some Australian, subscriptions as a result. We also have a new promotional brochure and a durable fabric display as a result of the design effort put into this promotion.

Several suggestions for the further promotion of the Society have been received. Paid advertising in international journals has already been undertaken by the Publications Committee. David Eldridge's suggestions for a new Society logo and for monogrammed T-shirts, caps, mugs etc. need following up. David's suggestion of a certificate of merit for members who put considerable effort into Society activities such as conferences or committees also needs further consideration.

One such committee, the Kangaroo Policy Group, was formed after recommendations arising from the Cobar conference. This committee has made good progress on a difficult issue and should enable the Society to develop firm policies on kangaroo management.

The Cobar conference also provided an opportunity for Council to survey members' opinions on a range of topics requiring decisions. A questionnaire distributed at the conference elicited a high number of responses and provided Council with valuable feedback on decisions taken or required. On behalf of the outgoing Council, I would like to thank all who provided their views and thoughtful comments.

Two of our branches, South Australia and West Gascoyne, remained vibrant and active during the year. A new branch

has formed in western New South Wales following their success in hosting the conference at Cobar. Although there is no formal branch in Alice Springs, the numerous members here continue to be strong supporters of the Society.

Finally, in preparing records for handing over to the new Council in Western Australia, the office holders have summarised their roles and duties as they currently exist. This should assist in the smooth transfer of management of the Society to the west.

I wish to sincerely thank the other members of the outgoing Northern Territory Council for their considerable support and for the close working relationship we have maintained over the last two years.

I wish the new Council the very best in their endeavours.

SUBSCRIPTION SECRETARY'S REPORT

Ashley Sparrow, CSIRO, PO Box 2111, Alice Springs NT 0871.

As at 27 May 1992, the membership of the Society stood at 487. This figure includes five Honorary Life Members, four Society Officers, the Auditor, three statutory library deposits of publications and 474 ordinary members. The ordinary membership may be broken down by whether they are individuals, companies or libraries and by their subscription type as follows:

| MEMBER TYPE | SUBSCRIPTION TYPE | | | Total |
|----------------|---------------------------|-----------------|--------------------|------------|
| | Journal and Newsletter | Journal Only | Newsletter Only | |
| Individual | 339 | - | 35 | 374 |
| Company | 16 | 1 | 4 | 21 |
| Library | 40 | 37 | 2 | 79 |
| Total | 395 | 38 | 41 | 474 |

There have been 43 new members join the Society in the 12 months from June 1992 to May 1993. There are still 71 memberships which have not been renewed from 1992 into 1993; almost all are individual members. A few members who were reported as unfinancial last year have regained interest and paid their memberships in arrears. However, the net result is a continuation of the decline in total membership as reported last year*, although losses and gains are now more nearly balanced. To encourage new members, a revamped publicity brochure and membership application form was produced - it seems to be working well.

As recommended at the last AGM, a more efficient membership renewal scheme was instigated for 1993. Instead of relying on the goodwill and personal organisation of members to renew before the 31 March deadline for payments, all members who had not paid early were sent a renewal notice (virtually an invoice) in the first week of January. The response has been good, although renewals are still coming in after almost five months. In the future, it would be ideal to send renewal notices in the preceding December.

Membership rates were increased for 1993: \$40 for full membership (up from \$38), but no change for partial membership (\$20). However, the early payment discount was discontinued because of the change in renewal notification policy.

* Note that these figures do not add up with the reported total of 554 members last year (1992). I seem to have been a little generous in counting members who did not renew from 1991 into 1992.

PUBLICATIONS COMMITTEE REPORT

Margaret Friedel, CSIRO, PO Box 2111, Alice Springs NT 0871

The Publications Committee is responsible for *The Rangeland Journal* and the *Range Management Newsletter*, and both publications have been of a high standard during the last year.

The highlight was the appearance of the first Special Issue "Wildlife and conservation in the rangelands", guest edited by Dr Steve Morton of CSIRO. The purpose of Special Issues is to address a topic not commonly featured in the *Journal*, in order to attract a wider audience and a different pool of potential contributors. Only time will tell if those goals have been met but the quality of the papers was very good, as was the quality of the production. Thanks go to Steve Morton and to the Production Manager, Mr Malcolm Howes of the WA Department of Agriculture.

The development of the next Special Issue is already in train. Suggestions as to themes were sought from the attendees at the Biennial Conference at Cobar. With the twin needs of addressing a "different" topic and matching it with an available guest editor, *Journal* Editor Dr Allan Wilson and I chose a social theme as a starting point. Prof John Holmes of the University of Queensland has agreed to take on the editorship, I am pleased to report, and is currently exploring possible topics and authors for papers. Current indications are that the Issue will appear in December 1994.

Malcolm Howes has continued to aim for a good production standard whilst keeping costs at a modest level, and we greatly appreciate his efforts. He was not entirely satisfied with the print quality of earlier issues and so we sought and

gained the approval of Council on his behalf to outlay more on printing for a trial period of two issues. While the print quality of the Special Issue was good, Malcolm is trying an alternative for the mid-year issue to reduce costs.

This issue is currently in press, and will be large. It contains seven papers from the Cobar Conference and seven contributed papers. The flow of manuscripts for the end-of-year issue is also very good.

For some time, the Committee has concerned itself with ways to promote the Society's publications. Proposals have included promotions at international conferences, production of flyers and advertising in international journals. Some of these were the business of the Council and the promotional activities of the Society will have been reported elsewhere. Council gave approval for the Publications Committee to pursue advertising in international publications, specifically for the Special Issue. Paid advertisements were placed in *Conservation Biology* and *Journal of Arid Environments* at a cost of about \$600. Free advertising in a reciprocal arrangement was generously provided by the Society for Range Management who placed the advertisement twice in *Trail Boss News*, by the Grassland Society of Southern Africa in their *Bulletin*, and by the Ecological Society of Australia in their *Bulletin*. We are most appreciative of their assistance and look forward to returning the compliment. I am particularly grateful to Council member Dr Ashley Sparrow, who was largely responsible for the development of the advertising copy.

Requests for the Issue continue to come in but I perceive the value of this advertising to be also in increased awareness of the Society in the longer term.

As reported last year, the Committee has been investigating the possibility of closer contact with national and international societies, and the potential for amalgamated publications. The latter has been of lower priority in the last twelve months because our publications appear secure, as do those of other groups. Closer contact through exchange of referees lists has been developed with the Grassland Society of Southern Africa as previously reported, and is proceeding well. The Society of Range Management Editor advised that individual Associate Editors kept their own personal lists and any exchanges should be made directly with them. This has yet to be followed up. The Tropical Grassland Society advised that they could not see any advantages for their Society in trying to work together in producing our respective journals and that they did not maintain a referees list nor find it useful to make use of referees outside Australia, so the matter has been left to rest.

The *Range Management Newsletter*, edited by Mr Gary Bastin of CSIRO, has been an excellent forum for informal communication. Gary has developed such a large pool of contributors and drawn out such a wide breadth of topics that every issue has been most interesting as well as substantial. Style and production standards are high and overall the *Newsletter* is a credit to both Gary and the Society.

The Committee met over portions of two days, at the end of the Cobar Conference. The meeting included all available Associate Editors and the Council President, Dr Bill Low. Absent members and Associate Editors had been canvassed for opinions on various agenda items prior to the meeting, ensuring a full discussion of all matters. The reports of the two Editors and the Production Manager were received and General Business included consideration of the *Journal* Special Issues, *Journal* standards and the rejection rate. Allan Wilson presented a Guide to Authors and a modified Notice to Contributors for discussion, and both are now in use. Two Associate Editors offered to write articles on writing style, the editorial process and rejection criteria and it is hoped that these will appear in the last *Newsletter* for 1993.

The meeting recognised that the Committee lacked a representative WA rangelander, with the move of Dr Ron Hacker to the NSW Department of Agriculture & Fisheries. We welcome Mr David Wilcox of David Wilcox & Associates to the Committee and look forward to renewed association with our inaugural Society President.

In completing this report, I want to thank our Editors and Production Manager, and our team of Associate Editors. I also want to thank the Committee members, who continue to direct our publications with enthusiasm and professional skill. Finally, I acknowledge with gratitude the outgoing Council, who have given the Committee and the Society's publications tremendous support. I am optimistic that the incoming Council will do likewise.

AUSTRALIAN RANGELAND SOCIETY

MEMBERSHIP APPLICATION FORM

Please complete and return to the Subscription Secretary, Helen Allison, PO Box 718, Victoria Park WA 6100.

I, [name].....

of [address].....

.....Post Code

apply for membership of the Australian Rangeland Society and agree to be bound by the regulations of the Society as stated in the Articles of Association and Memorandum.

I enclose \$..... for full/part* membership for an individual/institution* for the calendar year 1993.

* delete as appropriate

Signature..... Date.....

Membership Rates:

| | Australia | Overseas | | Australia | Overseas |
|-------------------------------|-----------|----------|---------------------------------|-----------|----------|
| Individual or Family - | | | Institution or Company - | | |
| Full (Journal + Newsletter) | \$40.00 | \$50.00 | Full (Journal + Newsletter) | \$55.00 | \$65.00 |
| Part (Newsletter only) | \$20.00 | \$25.00 | Part (Newsletter only) | \$25.00 | \$30.00 |

Note -

Membership is for the calendar year 1 January to 31 December. For overseas airmail delivery, add \$10 for full membership and \$5 for part membership. All rates are quoted in Australian dollars.

For Office Use Only:

Membership Number Date Entered in Member Register Date Ratified by Council.....