The Australian Rangeland Society

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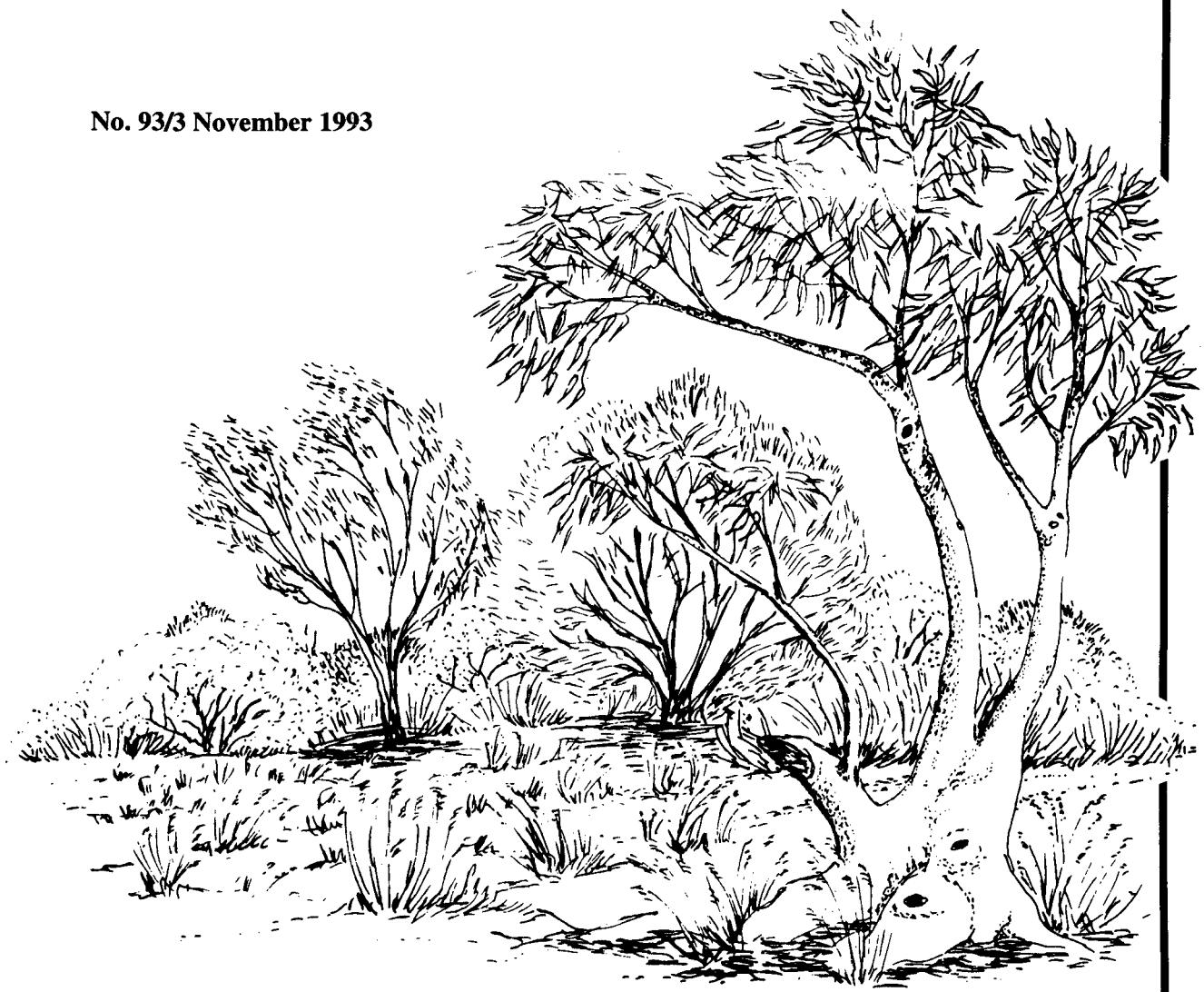

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FROM THE EDITOR

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

Lead articles in this Newsletter have overlapping themes of property planning and improving the land. The Bell family, owners of Dulkaninna station on the Birdsville Track in South Australia, were recent worthy winners of an Ibis land care award. In the first article, they describe how they have developed the station with a conscious desire to improve the land and their herd. The theme of planning is carried forward by Douglas Lillecrapp in his address to the recent Cadney Homestead (SA) Field Day on the SA Government's legislative requirement for district planning. Douglas argues that the process, although imposed, can have benefits for individual pastoralists in encouraging sensible development and management of their land, and in demonstrating to the wider community that this is happening.

Articles from SA and NT report on programs to assist pastoralists in improving the land. Vicki Linton in Port Augusta is coordinating a series of trials with participating pastoralists to demonstrate and quantify the benefits of controlling rabbits in the rangelands. I look forward to progress reports on this major work initiative. Mike Clark from Greening Australia NT reports on their success in harvesting the seed of native grasses. This seed is being made available to pastoralists and communities who wish to re-establish desirable native species in areas where these species have decreased or disappeared.

The 'Letters to the Editor' section has a response from Gordon Grigg to Grant Norbury's recent series of articles on kangaroo control and the problems that excessive kangaroo numbers cause in the rangelands. Not to be outdone, Grant (who has recently moved to New Zealand) has responded to Gordon before this Newsletter has even gone to print. Such debate is healthy for the Society and I urge any member with a point of view relevant to the rangelands to express it via a letter to the Editor.

The new Council has settled in and office bearers briefly introduce themselves in this issue. We have a report from Council on their recent Visions Workshop, and again, I would urge the membership to become involved and assist Council in implementing their far-reaching plans for the future.

In my last Editorial, I thanked Ashley Sparrow and Margaret Friedel for their editorial assistance in providing a standard format across each issue of the Newsletter. Ashley has recently joined the trans-Tasman migration to New Zealand and I would like to again formally thank Ashley for his invaluable assistance - particularly in telling me where to put the commas and semi-colons, and in correcting those dreaded split infinitives. Ashley has served the Society well in his time as Subscription Secretary, in designing the Society's new banner (*RMN* 93/1) and with editorial assistance. I wish Ashley well in New Zealand.

Stop Press!

An election is required for the position of Vice President from New South Wales. A ballot paper is included with this Newsletter. Please vote and return the form to Council by Close of Business, 3rd of December 1993.

MANAGEMENT OF A PASTORAL PROPERTY INTO THE 21ST CENTURY

George, Daryl and Sharon Bell, Dulkaninna Station, via Marree SA 5733

(Ed. The Bells were recently awarded the South Australian Pastoral Region Ibis Award for clearly demonstrating their commitment to wildlife conservation as part of the successful commercial running of their property. On behalf of RMN readers, may I congratulate the Bells in achieving this award. I am sure that they would welcome correspondence from interested people. Alternatively, additional information can be obtained from Merri Tothill, Landcare Officer, Department of Primary Industries, PO Box 357, Port Augusta SA 5700 Phone: (086) 475169.)

Introduction

George Bell came to Dulkaninna in 1932 and at that time the area was over-run with brumbies and rabbits. Four years were spent removing brumbies. Approximately 500 cattle were introduced in 1937, purchased from Moorabie at £3.15 per cow and calf. In those days Kidmans were our southern neighbour on Clayton station and we were able to use part of that block.

In 1937 Dulkaninna had two permanent waters; the bore at the house which was government owned for the stock route on the Birdsville Track and another bore at Sinclair, about 25 kms south east of the homestead. There were no boundary fences and few internal fences. When George Bell purchased the property from his father in 1966, he embarked upon an extensive plan of improvements. This included boundaries, waters, internal paddock fencing and yards.

Improvements

Today, in 1993 we have 200 km of boundary fencing to completely enclose the station and 165 km of internal fencing. Our watering facilities include over 100 km of poly pipe, 15 large tanks and troughs, 7 dams of varying size and 21 km of bore drain. All our bores (part of the Great Artesian Basin) have been through a rehabilitation program and the flow is restricted. The bores would silt up without any flow but they can support what is termed a bore drain. A well maintained, graded bore drain is really just a long trough. It allows cattle to spread out, instead of concentrating at one site, therefore grazing pressure is reduced. The location of the bore drain also encourages vegetation growth and they have become a recognised breeding site for 30-35 pairs of brolgas, as well as many other bird species. The bore drain closest to the house is a haven for frogs and can be very noisy at night! The former Minister for Water Resources in South Australia inspected our bore drains last year and gave favourable comment.

Example of a bore drain providing a wetland habitat - in this case, near the Homestead.

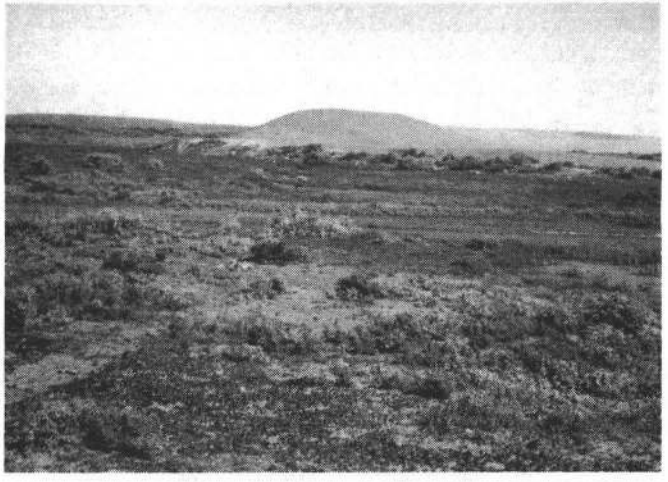
As well as fencing and waters, we have five sets of steel cattle yards. We can truck cattle from any of these yards and by minimising the distance that cattle are walked, the condition of both the cattle and the country is maintained. We also have six holding yards: these are smaller but enable cattle to be branded etc. without moving them out of their range.

Paddock Management

George's long term plan was to have plenty of waters and we now have over 30 permanent waters. He also aimed to manage the stock by controlling their movement via internal fencing. Paddock management requires a great deal of thought including:

- initial selection of paddock boundaries;
- location of waters, especially in relation to topography and vegetation;
- determining carrying capacity in relation to the condition of the land.

We have a policy of voluntarily spelling paddocks when possible. For example, Sinclair paddock, which is 450 sq km in area, was spelled for 18 months and we have had no stock in our Bullock paddock for two years. With recent good falls of both summer and winter rain, there have been good seeding opportunities for the perennial shrubs and grasses.



Good feed allows good beef production. Vegetation cover, including perennial blackbush, extends right to the dam.

The Future

Dulkaninna was originally 957 sq km in area. In 1982 we purchased 996 sq km from Murnpeowie station to the east of Dulkaninna, to give us a total combined area of 1,953 sq km. However, we are still one of the smallest cattle properties in the South Australian pastoral area.

Approximately $500,000 has been spent over the last 20 years on fences, waters, dams and yards - about $25,000/year. This does not include running costs such as wages, vehicles and fuel to carry out the work. It is important to note that this property has never been in debt and money has not been borrowed to carry out our management plan.

The improvements mean that we no longer work large mobs of cattle. We rarely work more than 200-300 at a time and it is usually less. More waters equate with small mobs which means less grazing pressure. We often use our own truck to transport cattle and we have the flexibility of shifting cattle very quickly out of one area into another.

Our long term planning includes more internal fencing, increased waters and we have started a small program of warren ripping. Initially we wish to find the best technique and then we will be looking at the costs of a long term project.

We are also committed to herd improvement and we are experimenting with different breeds. Our main herd is Herefords but we have looked at, and used, different breeds over the years. We put Santa bulls into one group and are comparing the offspring with straight Herefords in terms of weight gain, drought resistance, mothering ability and ease of calving, etc.

George Bell has done a great job and we are committed to continuing it. It is an experience to talk with him about rangeland condition. He has lived here for 60 years and his experience is priceless.

We would like to point out that this is our management plan for Dulkaninna - it has been very successful for us but it may not necessarily work for another property.

Steam from an artesian bore is used as 'clean' low cost energy to generate electricity for the station.

THE "DISTRICT PLAN" Opening Address - Cadney Homestead Field Day

Douglas Lillecrapp, Todmorden Station, via Marla SA 5724

(Ed. Dennis Barber, President of the SA Branch of the Society, provided the following transcript of Douglas Lillecrapp's opening address to the Cadney Homestead Field Day, held on 20 June 1993. Douglas is chairman of the Marla-Oodnadatta Soil Conservation Board and his address is reproduced here with his permission.

The Field Day was organised by the Marla Branch of the SA Farmers Federation and was held to celebrate their 10th anniversary. Dennis reports that he was particularly impressed with the opening address which stressed that the District Plan could be used to the landholders' advantage.

While parts of the address relate to local issues and, specifically, the requirements of South Australian legislation, much of the talk has broader relevance to property planning and improved rangeland management.)

Soil Conservation Boards and the "District Plan"

Much of the Board's activities last year were devoted to the District Plan. The end result, so far, is the Land Systems map developed by our Board, displayed here today. A lot of the work towards this map was done at Copper Hills station late last year, with the assistance of Jenny Bourne Department of Primary Industries. Most of the information is based on local knowledge, together with geological maps and satellite imagery.

One might ask why have a district plan. The short answer is, we have to. It is a requirement under the Soil Conservation and Landcare Act to do so by 1995. That being the case, how can we, as landholders, use it to our advantage?

Even though the district plan is regulatory, as with many of the provisions of the Pastoral Land Management and Conservation Act, I feel "rangeland" land users should strongly endeavour to use it to their advantage. Like it or not, we are coming ever increasingly under more "urbanite" scrutiny about our rangeland activities, especially from the conservation movement.

The conservation movement is highly organised, has excellent legal representation and has more than a sympathetic standing with State and Federal governments. Politicians act on the whim of the people, and conservation and the environment are very much the flavour of these items. I guess we too, as pastoralists, have to be a part of it. Pastoralists are, and always will be, conservationists - but we have great difficulty in getting our message across. I have a feeling we are still viewed as destroying the integrity of the land, as being reactionary rather than pro-active and of taking everything with a "bull at a gate" attitude.

The Conservation Movement and District Plans

Recent moves by the Australian Conservation Foundation in proposing to the Federal government that the whole Lake Eyre drainage basin be placed under World Heritage listing highlights what I am saying. They advocate that they should have a bigger role in the management of the rangelands but, as highlighted to me at the recent Birdsville/Lake Eyre heritage proposal meeting, such a listing would create much uncertainty.

With World Heritage Listing, the whole area would be administered under the World Heritage and Property Act, Federal legislation which would override all State legislation - like the Pastoral Land Management and Conservation Act, Soil Conservation and Landcare Act, Native Vegetation Act, Pitjantjatjara Land Rights Act and, of course, the Mining Act. There is no right of appeal to the High Court under the World Heritage and Property Act, or any claim for compensation. Management restrictions could be placed on the land user making it practically impossible to remain viable. Therefore, I feel we should use existing State legislation to the full, and take advantage of the district plan and lease assessment provisions. There may be some aspects of the SA legislation we don't like, but my feeling is that we would be a lot better off under it than under a World Heritage agreement.

The other issue which clouds our activities and which we now hear about daily is Mabo. We can be sure that the legal profession is going to make a lot of mileage out of Mabo. Whether it be pastoralists, tourist operators or miners, all need urgent clarification from the Prime Minister on where we stand.

We, as pastoralists, know this country pretty well and many of us have been through the cycle of seasons - many times over. We know that the condition of the land largely depends on what falls in the rain gauge and that 30 years ago, much of the area was ravaged by continuous dust storms. Back then, there were too few watering points, transport systems were inefficient and there were a lot more feral animals around.

A lot of the past deficiencies have changed in recent times - we now have polypipe, better roads and road trains. Unfortunately, elements in the conservation movement don't realise this (or want to believe it) and don't appreciate that things have changed for the better. However, we also have trouble in explaining that management has improved. A lot of valuable information is only in our memories and has not been properly recorded through photography and scientific evidence.

By the evolution of the district plan, more of this information will be collated now, and into the future. In many respects, it is a pity this didn't happen 100 years ago as it would demonstrate to the wider community that things generally are on the improve.

If we as pastoralists are challenged by the conservation movement, for example on what they consider to be a land management problem, we could respond by referring them to our District Plan. This would demonstrate that we are dealing with the problem, our way. We have resources available within, and outside, the government and a legislative framework to support us. We probably need to be a little cleverer with scientific language, to seek more technical advice (as one pastoral company has recently done), and be seen by the wider community to be "pro-active" towards landcare. We are sailing the boat, and the District Plan is one such vehicle for us to do just that.

Maybe some of these comments are a little unfair as we have come a long way in the last five years through Soil Boards and other landcare-related activities. However, we must not lose the momentum at this vital stage in light of, for example, World Heritage proposals.

How the District Plan Works

The district plan will classify the land within the Board area into "land systems". The land systems have already been identified by our Board, as demonstrated by the Land Systems map displayed here today. We can talk in terms of, for example, the "Oodnadatta" land system which is characterised by gilgaied gibber flats having predominantly Oodnadatta saltbush, Mitchell grass and native millet. Other country in this land system includes wide braided drainage lines, like the Neales River, supporting mainly gidgee, coolibah and cotton bush.

The district plan would then establish the best way to "sustainably" manage this land system, taking note of any land management problems associated with this system, and the best way to tackle the problem. The planning process is to be broadly based, ongoing, flexible and not specific to individual leases. In contrast, work to be undertaken shortly by the Rangeland Assessment Unit through the lease assessment process will be specific to individual leases. Their work, by the way, has to be completed by 1998 - finances permitting.

The district plan will set broad guidelines for any station owner who wants to develop an approved voluntary property plan. This voluntary plan must be consistent with the intent of the district plan. The planning process may be advantageous for an owner developing a property plan to qualify for 100% tax deductibility under Section 75D of the Income Tax Act. Components of such a plan might include fencing and water improvements which facilitate better utilisation of country and improved stock management.

There is also provision under the Soil Conservation and Landcare Act for compulsory property plans and soil conservation orders. These measures are seen as a last resort, but they too must be consistent with the intent of the district plan.

Other Advantages of the District Plan

One of the advantages of the district plan is that it is largely developed locally and uses local wisdom. The Pastoral Land Management and Conservation Act and the Soil Conservation and Landcare Act are very much complementary pieces of legislation in the rangelands.

As mentioned, all pastoral leases in South Australia have to be assessed by 1998. This has already happened in the Kingoonya and Gawler Ranges Soil Conservation Boards (SCB) and now work is being carried out in the North East Pastoral SCB. Information provided by the district plan will assist in the lease assessment process which is to be undertaken by the Rangeland Assessment Unit of the Department of Environment and Land Management.

The district plan offers other advantages. It would provide a greater understanding of the area for potential investors and would also provide valuable information to lending institutions - particularly an appreciation of the land's capability.

To sum up, I am not sure whether or not we should wholeheartedly embrace the district plan concept. However, being the dominant land users in the area, we as pastoralists should be seen by the wider community as setting definite management strategies for continued good "landcare" practices. This will, like it or not, politically become more of a necessity for our survival. By becoming involved in the district plan concept, I am sure that we are using one such vehicle to our advantage.

NEW BOOKLET ON CONTROL OF WOODY WEEDS

Russell Harland, Conservation and Land Management, PO Box 211, Cobar NSW 2835

The Woody Weeds Task Force is pleased to announce the release of their latest booklet *Managing for Woody Weed Control in Western NSW*. This booklet provides information on all methods of woody weed control and management except biological control. It will be a useful reference for landholders and all who are interested in this serious problem.

The booklet also presents a regional strategy for catchment management committees, government agencies and other groups. The strategy highlights the priority areas for woody weed control.

Funding for the booklet came from a Natural Resources Management Strategy grant (from the Murray Darling Basin Commission) and a discretionary allocation from the Western Catchment Management Committee.

The booklet is being distributed free of charge. If you would like a copy, please contact me at the above address.

RABBITS IN THE SOUTH AUSTRALIAN "ARID LANDS"

A New Initiative

Vicki Linton, Animal & Plant Control Commission, PO Box 357, Port Augusta SA 5700

Thanks to funding under the National Landcare Program, rabbit control research and extension has received a boost in the rangelands of South Australia.

The project comes under the banner of the South Australian Animal and Plant Control Commission and the Department of Primary Industries (formerly Department of Agriculture), and is titled "Rabbit Control and Rehabilitation of Arid Lands". It responds to the needs of Soil Conservation Boards and Landcare groups in pastoral areas that require more information on the types of rabbit control that will work in their districts - and of course, the costs and results.

Initially, funding was made available for three years - although five years is the expected duration of the project. It is anticipated that rabbit control demonstration sites will be set up in each of the four (predominantly) sheep pastoral soil board districts in SA, with the possibility of extending the work to the two cattle-dominated districts in the future.

The project at each site will:

- demonstrate different techniques used in rabbit control (e.g. different ripping implements and ripping patterns),
- compare costs of different techniques,
- identify success rates (and what that means for follow-up costs), and
- document the effects that rabbits (or their removal) have on the vegetation and soil resources (and productivity).

The project has been operating since the beginning of 1992 and thus far, three trial sites have been established - two in the Northern Flinders and one in the North-East Soil Board districts.

Northern Flinders Trial - No. 1

Specific aims of this major trial, near Blinman in the Northern Flinders Soil Board, can be summarised as follows:

- to demonstrate the effectiveness of warren ripping, as a primary form of rabbit control, in arid pastoral country,
- to demonstrate the effectiveness of fumigation as a follow-up control technique after ripping,
- to monitor the impact of rabbit grazing on vegetation and soil erosion,
- to monitor what effect rabbit grazing has on the grazing patterns of other herbivores in the region (i.e. sheep, kangaroos and goats), and
- to monitor the impact of the other grazing animals in relation to rabbit numbers.

A trial site of approximately 24 sq km was selected on Gum Creek station and the adjacent Flinders Ranges National Park. This location allowed a comparison between sheep-grazed and sheep-free areas. The area was further divided into eight blocks of approximately 3 sq km. The blocks were labelled W-Z on Gum Creek and A-D on the park (see Figure 1).

Within each block, all warrens were mapped (1667 in total, or 70 warrens/sq km average density), and the size class of each warren recorded based on the number of entrance holes. Relative densities of grazing animals were estimated by the amount of dung on the ground (at chosen sites) and the number of animals recorded in spotlight counts. In March of this year, warrens were destroyed by ripping on blocks W and Y (on Gum Creek) and B and C (on the park) to provide rabbit-free areas. This left blocks X, Z, A and D as control plots or rabbit-grazed areas.

Gum Creek Station

W	**Y**
X	**Z**
A	**C**
B	**D**

Flinders Rangers National Park

***Figure 1**: Diagrammatic representation of the Northern Flinders trial site. Treatment blocks:*

- *W and Y are grazed by sheep and kangaroos (and possibly goats) but are free of rabbits.*
- *X and Z are grazed by rabbits, sheep and kangaroos (and possibly goats).*
- *A and D are grazed by rabbits, kangaroos and possibly goats but are free of sheep.*
- *B and C are grazed by kangaroos (and possibly goats) but are free of rabbits and sheep.*

Ripping Results

Of the 841 warrens that were ripped, 538 were destroyed with a bulldozer (D6/7 size) having three conventional tines. These warrens were cross-ripped to a depth of 90 cm and extending to 3 m beyond the visible edge of each warren. The rate of re-opening on these warrens was 2%. Remaining warrens (303) were ripped using a smaller (D4) dozer, also fitted with three conventional tines. Tines on this smaller machine operated to a depth of 45 cm and ripping extended to the visible edge of the warren. The rate of re-opening of these warrens was 37%. Of that 37% which re-opened, 17% re-opened in the centre of the warren and 20% re-opened on the edge, so ripping depth and width appeared to be equally important for good control.

Follow-up Work

Spotlight counts were repeated across all eight blocks in the interval between ripping and follow-up fumigation. All holes that were re-opened in ripped warrens, plus a few warrens inadvertently missed in the ripping process, were fumigated in the follow-up phase. Two different techniques were used for fumigation, with treatments applied to alternate warrens. These treatments were:

- aluminium phosphide tablets (Fumitoxin^{R}) wrapped in wet paper
- chloropicrin (Lavacide^{R})/diesel gas mix pumped into warrens with a power fumigator.

Both techniques were equally effective with (approximately) one in five holes re-opening after fumigation. After a second fumigation, about one in 15 holes re-opened. For experimental purposes only, the remaining few holes were fumigated for a third, and in some cases fourth time to completely close the warrens.

An additional eight small and fairly inaccessible warrens in rocky creek banks could not be closed by ripping or fumigation and were destroyed with explosives.

Spotlight counts were repeated after follow-up fumigation. Generally very low rabbit counts on treated areas demonstrated the effectiveness of control techniques compared with no treatment (Table 1). The high March count on Block Y was attributable to the spotlight transect traversing an area which had been "shallow ripped", demonstrating the necessity for thorough ripping to achieve satisfactory control.

Table 1. Spotlight counts of rabbit activity during 1993. The March and May data for rabbit-free blocks indicate rabbit counts after ripping, and fumigation respectively. All figures are expressed as a percentage of the original numbers counted in February. For example, rabbit numbers on Block B declined by 94% in March after ripping.

Rabbit Free		
Block	**March**	**May**
B	6	0
C	0	0
W	0	0
Y	40	0

Rabbit Grazed		
Block	**March**	**May**
A	223	119
D	170	135
X	93	113
Z	89	109

Monitoring Changes

During May and June 1992, sites were established to monitor vegetation and soil erosion trends. Three permanently marked vegetation sites were established in each treatment block giving a total of 24 sites. Each site was photographed and a measure of both vegetation cover (using the step-point method), and density of perennials (in a 4 X 100 m belt transect) obtained. Six additional sites were established in each block (i.e. a total of 48 sites) to monitor soil erosion by measuring gullies and scalds of varying sizes.

It is anticipated that the vegetation sites will be monitored twice a year for the life of the project (at least 5 years). Soil erosion sites, rabbit numbers (spotlight counts) and dung patterns of all grazing species will also be monitored - probably once a year over the length of the project. Results from these sites will enable us to determine the benefits of rabbit control on vegetation and soil stability.

Northern Flinders Trial - No. 2

The second site in the Northern Flinders Soil Board district has more restricted aims than the Blinman trial. However, it still has the potential to produce some interesting results. This trial is on the Wintabatinyana lease and is located in approximately 11 sq km of sandy country where rabbits are difficult to control.

Conventional control methods in pastoral areas are based on ripping warrens when the soil is dry. However, rabbit numbers may still be high at these times and there could be an increased rate of re-opening after ripping. Another limitation to control is the problem of eliminating rabbits living on the surface under bushes and other harbour. Additionally, many warrens are located under trees and shrubs that stabilise the dunes, making ripping less desirable. Finally, to delay control until rabbit numbers crash "naturally" usually results in irreparable damage to the vegetation.

To avoid increased damage to the landscape, we are trialling poisoning in an attempt to artificially reduce rabbit numbers prior to the onset of drier conditions. This is being done by adding 1080 poison to oats - after initially offering rabbits three poison-free feeds. We hope that this baiting will assist in keeping warrens closed after ripping. Not all warrens will be ripped at once to reduce the potential for soil erosion through sand drift. This form of treatment will be compared with ripping only, and poisoning only, to determine the most effective, economical and safest control method.

To date, only one poisoning treatment has been undertaken with the results being less satisfactory than expected. Poisoning reduced rabbit numbers by only 60-70%, based on spotlight counts, in poisoned areas compared with non-poisoned areas. Ripping should have commenced earlier this year, but unseasonal rains have delayed this. Another poisoning treatment and further ripping will be carried out towards the end of the year.

North-East Trial

The establishment of a demonstration site in the North-East Soil Board district has also been delayed by unseasonal rains. The trial on Morialpa station has progressed to a stage where all warrens in an approximate 22 sq km paddock have been located. Some 1,365 warrens were mapped (averaging about 62 warrens/sq km) and size classes, based on the number of holes in each warren, were recorded.

When conditions are more suitable, the warrens will be ripped using a small, owner-operated tractor or a larger, contractor-operated bulldozer. The cost and effectiveness of each machine will be compared. Warrens will be either cross-ripped or single-pass ripped with the bulldozer allowing a further comparison of ripping techniques. The intention is to make the paddock rabbit-free and this may require complementary control techniques such as poisons, fumigants and explosives. Of particular interest will be the success of rabbit control in watercourses growing nitrebush or dillon bush (*Nitraria billardierei*): notorious rabbit country! Following on from the rabbit control work, various revegetation trials using bladder saltbush (*Atriplex vesicaria*) will be compared. Vegetation monitoring sites will also be established.

The Next Few Years

The next step in the rangeland rabbit control project is to continue monitoring existing trial sites and to establish new ones, with perhaps the Gawler Ranges district (west of Port Augusta) next in line for a demonstration site. The promotion of field days to be held by the soil boards will also be an important aspect. The trial sites in each board district are designed to answer the question "what is preventing pastoralists from undertaking rabbit control in this district?". The trials and subsequent extension work aim to provide local examples of:

- which rabbit control and revegetation techniques work,
- how these techniques work,
- how they can be adapted to different situations,
- what the costs of rabbit control and revegetation work are, and
- what the consequences of doing nothing are.

It is important that the soil boards feel that they "own" the trial sites, and derive benefit from them. The success or failure of the sites will depend on local input over future years, long after this project has finished.

GREENING AUSTRALIA NT'S 1993 NATIVE GRASS-SEED HARVESTING PROGRAM

Mike Clark, Greening Australia NT, GPO Box 1604, Darwin NT 0801

Greening Australia Northern Territory (GANT) has been concerned about the loss of valuable pasture species in some areas of the NT's rangelands and we decided to do something about it in a pragmatic fashion. Degradation of the vegetation has resulted from overgrazing by cattle and feral animals, and from weed invasion. These causes have sometimes been accentuated by drought or fire.

In the past, there have been attempts to revegetate degraded areas of rangeland but these exercises have not always been successful. One reason for lack of success is the restricted availability of seed of suitable and cheap grass species. Buffel grass (*Cenchrus ciliaris*) has been the most widely used, and successful, of the species tried. As well as being cheap, it is easy to harvest and the many cultivars are adapted to a range of soil types. In some areas, it can dominate the ground layer - as can be observed on some pastoral properties in the southern NT and also on areas surrounding Alice Springs and Tennant Creek. Thus far, the seed of good, palatable, hardy, perennial native pasture grasses has been largely ignored in revegetation and rehabilitation programs.

The restricted use of native species is surprising as they frequently establish on cultivated areas following reseeding - with this establishment often being better than that achieved by introduced species. The native species should be better adapted to the local conditions. It would also seem ecologically sensible to be using native species in revegetation programs to help maintain biodiversity.

The Conservation Commission of the NT (CCNT) has in the past few years recognised the potential of native perennial grasses for revegetation and now has a staff member investigating suitable species. It has also obtained a native grass-seed harvester which has been used to harvest seed on a few cattle stations and on Aboriginal land. Elsewhere, the land management section of the Pitjantjatjara Council have, for the past couple of years, been using native grasses for revegetation of degraded land around Aboriginal communities.

GANT's Involvement

Seeing the need for a readily available supply of grass-seed from good perennial species, GANT purchased a grass-seed harvester. I had seen a portable seed harvester, used by the Queensland Department of Primary Industry, at the Cobar Rangeland Society Conference last year. This machine was manufactured in Toowoomba by West Toowoomba Engineering Company and was specifically designed for harvesting short grasses in mulga country. At our request, the company modified the machine to include:

- a height-adjustment mechanism for the harvesting brush so that the seed from a range of grasses could be harvested,

Side view of GANT's native seed harvester showing the motor used to drive the harvesting brush and the height-adjustment mechanism. The brush is located under the shroud at the front of the machine.

Harvested seed being removed from the collection bins at the rear of the machine.

- an improved seed collection apparatus at the rear of the machine, and
- a stronger frame to allow easy towing of the harvester, as well as towing by road over long distances.

The seed harvester is essentially comprised of a 4 m wide rotating nylon brush driven by a 5.5 HP Honda motor. It is mounted on a sturdy frame which is towed behind a 4x4 vehicle. As the harvester is pulled through the grass, the rotating brush 'beats' the seed heads and portions of the seed heads are propelled into the hoppers at the rear. Only some of the available seed is harvested with the rest being left for natural regeneration.

GANT approached NT Landcare for sponsorship of the harvester and they generously contributed $5000 towards the purchase price. We also approached the Australian Trust for Conservation Volunteers (ATCV) for support and they made three people available for the seed harvesting program. Funding for the ATCV crew was provided by the National Soil Conservation Program (NSCP).

There was a delay in the manufacturing of the harvester as well as transportation to Tennant Creek, and harvesting did not start in earnest until 20th April this year. We had hoped to harvest the seed of a range of useful native perennial grasses on a number of different land types in central Australia. However, due to the late arrival of the machine, most grasses such as umbrella grass (*Digitaria coenicola*), curly windmill grass (*Enteropogon acicularis*) and naked woollybutt (*Eragrostis eriopoda*) had hayed off and dropped their seed.

Harvesting Efforts

Country surrounding Tennant Creek, and further north, received exceptionally good rainfall in the last 'wet' and we concentrated our seed harvesting efforts on black soil plains in this region. The black soil plains hold moisture for longer periods and thus extend the time available to collect seed. We started on the Mitchell grass country on Muckaty station, approximately 120 km north of Tennant Creek. This station is Aboriginal-owned and the Northern Land Council, as management advisers, are keen to improve the condition of the land. Revegetation and rehabilitation work had already been undertaken by the CCNT and GANT using barley Mitchell grass (*Astrebla pectinata*).

Seed of barley Mitchell, hoop Mitchell (*A. elymoides*) and bull Mitchell grasses (*A. squarrosa*), Flinders grass (*Iseilema vaginiflorum*), Queensland bluegrass (*Dichanthium sericeum*) and button grass (*Dactyloctenium radulans*) was collected on the undulating heavy clay soil plains. Of the 30 wool bales harvested by the ATCV crew, barley and hoop Mitchell grasses, and Flinders grass were the main species. The seed was dried, fumigated and stored at the station.

We then shifted to Walhallow and Creswell Downs, north east of Tennant Creek and towards the northern edge of the Barkly Tablelands. These properties have vast expanses of heavy clay soil plains which would be expected to grow Mitchell and other perennial grasses but now carry mainly less desirable species such as black spear grass (*Sorghum* spp.). Both stations are now owned by the Heytesbury Company and the present manager is very keen to re-

introduce seed of useful grasses to areas where they no longer grow. Cattle would then be kept off these areas for three or more seasons to give seeded grasses every chance to successfully establish.

Our harvesting program concentrated on remnant areas of Mitchell and other useful perennial grasses and some 30 wool bales of seed were collected. The main species were barley, hoop and bull Mitchell grasses, native millet (*Panicum decompositum*) and Flinders grass. Harvesting was interrupted by an out-of-season 50 mm fall of rain and the ATCV crew found themselves stranded 40 boggy black-soil kilometres from the Walhallow homestead. The sticky nature of the soils delayed further harvesting for about a week.

Further Work

We now have a useful store of seed on hand that can be used for rangeland rehabilitation. Some of the seed will be used by the stations on which it was harvested and the rest made available to pastoralists and Aboriginal landholders keen to revegetate degraded areas with native grass species. GANT has already given two bales of the seed of button grass to the Centralian Land Management Association. They are using the seed to assist in revegetating country where rabbits are being controlled by warren ripping south of Alice Springs. Further supplies of seed will be made available for field trials designed to improve the establishment success of native grasses.

GANT is keen to develop further its seed harvesting program. We hope that we are at the embryonic stage of an NT (and Australia) wide program to use useful indigenous native pasture species in rangeland revegetation programs.

Acknowledgements

GANT thanks ATCV, NSCP, Landcare NT and the land-holders of Muckaty and Walhallow-Creswell Downs stations for their support. We consider the native grass-seed harvesting program described here as a very worthwhile community-based project. It ran well because of good networking and cooperation between a number of groups and individuals.

20 YEARS EXPERIENCE WITH CELL GRAZING IN SOUTH AFRICA

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

(Ed. In the first part of this article, printed in RMN 93/2, Norman provided the background that led him into a cell grazing system. He also described some of the mistakes that resulted from inadequate information and training on how to manage such a system. This second part of Norman's talk, originally given at a field day at "Clovernook" (via Moura QLD) in March this year, describes some of the outcomes resulting from cell grazing. Further details can be obtained from Terry McCosker, PO Box 633, Yeppoon QLD 4703.)

Results

I was fortunate in that after fencing we had some good seasons, which probably helped disguise some of the mistakes I was making.

1. The first result of cell grazing appeared about six weeks after our first rain when the whole farm, every single paddock, appeared rested. Previously, only the unstocked paddocks had responded well. In our low rainfall which sometimes only falls once a year, you can well imagine the benefit of giving every plant an opportunity to propagate.

2. The next most obvious result was on the bare pans. For the first time we now saw vegetation between the ploughed strips and the disappearance of footpaths. I ascribed this to the stock being attracted by the palatable pioneers in the furrows and thus concentrating there and chipping the soil and creating the seedbed so suited for reclamation. The secret of reclamation was animal impact in a short space of time followed by rest.

Within three years, most of the ploughed furrows were no longer visible. I have seen similar areas under other grazing systems where ploughed strips have not changed over 20 years.

Our plant basal cover increased and we started seeing climax grasses for the first time. The condition of the existing palatable plants changed from short overgrazed sticks to healthy unhedged plants with long shoots.

3. River Camp: One particular area of about 500 ha was formerly a dust-bowl predominantly overgrown with weeds. We could not graze sheep with more than six months wool in this area as the fleece would be entirely contaminated with dust. Today, it is the heart of the farm and showing the most progress. We were able to increase our carrying capacity in this area threefold.

4. Effectiveness of Rainfall: We started finding litter between plants, which resulted in more effective rainfall by retarding run-off and evaporation. Our range definitely

responded better to rainfall and made many interesting boundary contrasts after the first rains of the season.

From improved plant cover, we improved the effectiveness of the flow of the water. One of the rivers that flows through a network of contours over 7 miles used to take 12-24 hours from top to bottom. The last time it flooded, it took 3.5 days. This had a marked effect on our underground waters, raising the water table by 20-50 ft. Only during the present drought has this water table dropped.

5. The Animal: The reason we are getting good animal performance from cell grazing is because the animals are getting a consistently higher plane of nutrition from the fresh regrowth, and an even plane of nutrition by moving to fresh grazing every few days. I have found that with the more constant plane of nutrition, wool break is a thing of the past and my ewes average 8 kg of wool per year.

In any grazing method, it is desirable to utilize as wide a range of plants as possible. This can be done by either lengthening the period of grazing or increasing the stock density.

(i) By lengthening the graze period, you force the animal to eat less palatable plants for a longer period. Also remember that during a long graze period, the animal will always continue to return to the regrowth of the plant it originally grazed - becauase the plant is lush and fresh. The result is twofold - you harm the very plant you are trying to promote and secondly you get poor animal performance by forcing animals to graze less palatable plants for a long period.

(ii) By increasing stock density for short periods in small paddocks, you prevent re-bite of palatable plants and still give the animal the opportunity of selection.

Incidentally, by concentrating animals, you change their eating habits and they become less selective and more competitive.

6. Cell Grazing and Droughts: To farm successfully in our drought-prone area, one's grazing method must minimise drought risk. My first drought under cell grazing took place from May 1977 to February 1979, a 22 month period in which we recorded 3.30" of rain, the highest single fall being 45 points.

During this period, we did not destock and our stock performance was superior to any neighbouring property. The best way to illustrate the performance is to give production figures over this period. Our wool and mohair production fell by 16%; between 1977 and 1979, most farms' production fell by 50%. Conception rates in our merino flock in October 1978 (17 months after rain) was 60% - most farms had nil.

Our area is blessed with some extremely drought-resistant plants which, no matter how dry it gets, continue to produce a few leaves so vital for animal survival. But tough as they are, they cannot take the abuse metered out to them during droughts, when it is common practice to open all gates and graze continuously. Imagine what happens when every new leaf is greedily taken, day after day, month after month, year after year - the plant dies.

I'm sure that this overgrazing over long periods is the reason why each drought is worse than its predecessor. We have farmed through several droughts since then and each time we are doing better.

Terry McCosker visited me in September 1991 - and you know what he said about our area (Ed. *RMN* 93/2 - "there is nothing that bad in Australia"). Well, in October we had good rains and since then virtually no rain of any consequence. Last year, our wool production increased by 16% and we had a 75% lambing rate.

During droughts, we group animals into as few herds as possible to give a better graze/rest ratio. Giving animals new grazing as often as possible definitely improves stock performance by eking out the limited forage and allowing plants to respond to small falls of rain.

The biggest problem with a drought is not knowing when it will break. Since it is impossible to know this, the next best thing is to know how long one can last in a drought. With the accurate grazing records we keep, we learn by experience to know the exact carrying capacity of each paddock worked out from its past performance. We then adjust numbers according to the season. This makes the decision of when to destock a lot easier. It takes the guesswork out of farming.

7. Economics: I wonder how often I have heard the criticism "How do you justify the fencing costs?". Many people may view range reclamation as sufficient justification. But farming is a business and any grazing method that cannot be justified economically is doomed to failure.

We paid for our initial fencing and stock-watering development from increased production in the first year. From 1974 to 1977, our fibre production increased by 40% per ha and lambs raised by 50%, with no decline in individual animal performance. This sort of improved production easily covers costs in the first few years.

In the long term, of the four factors - productive land, labour, management and capital - land is the only limiting factor. Therefore, if we can maximise returns per unit area, we have the cheapest solution to increasing turnover.

In conclusion, I want to emphasise the importance of attending courses offered. The principles of grazing and economics are extremely simple, yet putting them into practice can present difficulties. It is imperative to have proper training and follow-up contact to do this successfully. Don't try to do this on the cheap, you are bound to fail - and then blame the grazing method.

LETTER TO THE EDITOR

Commercial Value of Kangaroos

Prof. Gordon Grigg, Dept. of Zoology, The University of Queensland, Brisbane QLD 4072

In an article titled "Increasing the commercial value of kangaroos has benefits for landcare: fact or fallacy?" (*RMN* 93/1:8), Grant Norbury questions "whether increasing the value of kangaroo products by itself has major benefits for landcare".

Unfortunately, the article attacks the question only in relation to the potential landcare benefit from the removal of an increased number of kangaroos. It ignores the possibility that an increased value of kangaroos would give graziers the opportunity to reduce grazing pressure **by reducing sheep numbers**, a harvest of kangaroos providing income in their place.

Anybody can see that significant reductions in the numbers of kangaroos, enough to reduce the total grazing pressure, will not be practical at the current harvest quotas of 15-20%, even if an increased value of kangaroos means that the quotas are fully taken. And while Australians (and others) continue to wish to conserve kangaroos (as most of us think we should), it is hard to imagine the quotas being raised to levels likely to make significant and widespread landcare gains.

Yet most of Grant's article is devoted to pointing this out and he suggests that electric fencing and electrified control of watering points offer better methods of "kangaroo control" than harvesting does. In this I am sure he is right and, if "kangaroo control" becomes the national goal then he may be the expert. (But it is worth remembering that "local control" at enough localities could become "regional control" very quickly and, even though animal liberationists appear to be in support of this supposedly "humane" technique, some of us are worried about the long term implications for kangaroo conservation.)

But why ignore the idea that increased commercial value of kangaroos may enable graziers to reduce the total grazing pressure by reducing sheep numbers, without loss of income, or with increased income? Sheep numbers are, after all, much easier to manipulate than kangaroo numbers, and there will be no international outcry about our doing so. Surely, reducing sheep numbers is more sound both ecologically and philosophically. Yet Grant, in reviewing the question of potential landcare benefits from an increased commercial value for kangaroos, did not even mention it.

It is this view, however, which I have been putting forward for discussion repeatedly since about 1984 - and since 1987 particularly, in radio interviews, public lectures, in a major Royal Zoological Society of NSW symposium (Lunney and Grigg, 1988) and in scientific journals (most recently Grigg, 1989; Grigg, 1991). There is not space here for a full exposition of the proposed scenario, which has been spelled out in these venues. Suffice it to say that the idea has been given strong impetus by a recent economic study which predicts that an industry in Queensland alone, **at the present quotas** and based on meat for human consumption and hides, would be worth at least $100 million per annum. The present Queensland kangaroo industry is worth about $15 million. The sheep industry is worth about $160 million (and, it is estimated, incurs a land degradation cost of $80-90 million annually). I have been arguing that the biggest impediments have been prejudice (or conservatism) and prohibition of sale of the meat for human consumption. The latter problem either has been, or is about to be, remedied in all States. I think the former problem is a matter of economics, marketing and common sense.

Grant argued against looking at kangaroo harvesting as a "universal panacea" for landcare, but with his restricted interpretation, it is not even worth thinking about. In my scenario, however, I believe it could make a significant contribution to an economically driven reduction in overall grazing pressure by harvesting kangaroos at current rates, at a reasonable profit, and reducing sheep numbers. A "universal panacea"? That would be too much to hope for.

Grant opened his article with a plea for the Australian Rangeland Society to develop a position statement on kangaroo management. He closed it with a plea that "if we are to openly support increasing the market value of kangaroo products, we (should) have at least considered the implications for landcare". I agree with both of these sentiments BUT, in the consideration, my plea is that ALL of the implications should be discussed.

Note: This topic will be addressed further, along with similar issues, in the upcoming four-day conference "*Sustainable Use of Wildlife for Conservation*". Sponsored by ANZECC and organised by The University of Queensland's Centre For Conservation Biology, the whole breadth of this important topic will be addressed. The meeting will be held at The University of Queensland, February 8-11, 1994. Kangaroo issues will be the focus of a symposium and a workshop and we hope to attract many people who have an interest in these issues, including graziers and other landholders. If you have not yet received a brochure and registration form, write to Dr Peter Hale at the Centre for Conservation Biology, The University of Queensland, Qld 4072.

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LETTER TO THE EDITOR

Commercial Value of Kangaroos A Response to Gordon Grigg

Grant Norbury, Semi-Arid Lands Research Group, PO Box 276, Alexandra, Central Otago, New Zealand

I would like to respond to Gordon Grigg's comments on my article "Increasing the commercial value of kangaroos has benefits for landcare: fact or fallacy?" (Ed. Published in *RMN* 93/1: 8-9.)

Gordon is proposing that given the right marketing and managerial skills, pastoralists receive income from more valuable kangaroos that are already shot within the quota system. Given this extra income, pastoralists will then be in a position to reduce their overall grazing pressure by reducing the number of stock.

I see few problems with pastoralists receiving income from kangaroos but I have some major doubts as to whether most pastoralists will necessarily forgo one form of income for another, when they can get both. They are not a unique group in this regard. Pastoralists generally sell stock in response to their market value or in response to prevailing climatic conditions, or to confer some financial benefit elsewhere - not because of the income they receive from pest species. Feral goats are an example. During the 1980s when goats were more valuable than they are now, pastoralists considered them extra pocket money, not an impetus for reducing sheep numbers. Indeed, did any pastoralists reduce their stocking rates in response to the extra income from goats?

If reducing stock numbers grows fatter kangaroos, or cuts more wool from remaining sheep, or reduces overhead costs and so on, then Gordon's scenario will happen. But it will happen only if it makes them more money. How can pastoralists that have grazed "pest" species for generations be expected to forgo income from stock just when pests start to pay their way? Unless of course they have a longer-term agenda for the health of the land. Such an agenda might have long-term economic objectives that forgo income today for the sake of the land in years to come. I wonder whether this change in thinking will be rapid enough to deal with the pressing problems of rangeland deterioration today?

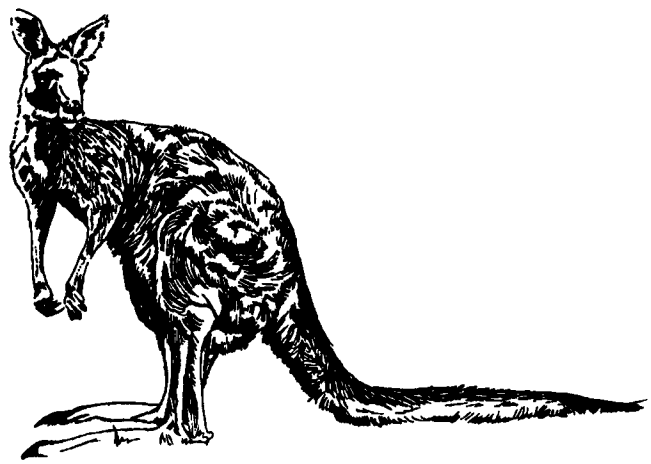
Another problem is that the value of kangaroo meat will be at the mercy of other competing meats if the domestic market is being supplied. As the value of beef, lamb and mutton declines, so will the value of kangaroo meat as cheaper meats become more popular. Domestic declines in the commercial value of kangaroo meat will be less relevant if the markets are mostly overseas. However, overseas markets face problems of continuity of supply in the face of frequent droughts in Australia and their dramatic impact on the size of kangaroo populations. An increase in the commercial value of kangaroos will depend on the regularity of supply. Significant increases in the commercial value of kangaroo meat which allows pastoralists to afford to remove stock may therefore have to stem from specialty niche markets.

Gordon points out the political advantages of achieving landcare objectives by reducing stock numbers rather than kangaroo numbers, because there will be "no international outcry about our doing so". Surely proactive marketing campaigns that promote utilisation of Australia's national symbol will attract its normal, or an even greater, share of international criticism? The landcare benefits of concurrent reductions in stock numbers cuts no ice with kangaroo liberationists.

Gordon argues the futility of developing more effective means of kangaroo control when there is little hope of persuading bureaucracies, which are dedicated to preserving unusually large kangaroo populations, to increase the quotas. I agree this poses a major impediment to implementing improved kangaroo control techniques. One solution is to make better use of the abundance of scientific literature that highlights the impact of kangaroos on the rangelands. There is little point in conducting studies unless we are prepared to proactively sell them to the decision makers in much the same way as Gordon Grigg would have us do to increase the commercial worth of kangaroos.

While I accept the difficulties of convincing bureaucracies to change their attitudes towards kangaroo management, attempts at changing human nature to forgo one income for another when they both are attainable, is certainly no easier.

I would truly love to see Gordon's vision of landcare through to reality, but question whether it is practical or indeed achievable. I am not entirely convinced that either improvements in the commercial value of kangaroos, or improvements in control techniques alone, will be answers in themselves to the kangaroo management problems in Australia. The answer probably lies somewhere in between and the issue should not be polarised.



APPLICATION ABSTRACTS
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Papers

The Distribution Of Red Kangaroos In Relation To Range Regeneration

G.L. and D.C. Norbury

The incentive for pastoralists to undertake range regeneration programs is diminished when kangaroos are observed preferentially grazing regenerating areas. This has led to growing concern among the pastoral community that efforts to rehabilitate degraded land are being thwarted by kangaroos. This paper examines the possibility that the impact of kangaroo grazing is exacerbated by an influx of kangaroos onto regeneration sites.

The amount of kangaroo dung in a 7,500 ha paddock in an arid rangeland increased six-fold over an 18-month period following the removal of sheep. This constituted an influx of kangaroos into this paddock. A similar influx was apparent in another destocked paddock that provided unusually high offtake of kangaroos by a commercial shooter. Kangaroo dung remained relatively stable in a control paddock that was stocked.

In addition to destocked paddocks, some areas subject to cultivation and reseeding with native shrubs showed increased amounts of kangaroo dung, indicating relatively intense kangaroo grazing.

Radio-tracking of 46 kangaroos showed them to be mostly sedentary, suggesting that 'invading' kangaroos emerge from the local area. This is contrary to the widespread view that kangaroos migrate from distant locations. Local invasion should provide an incentive for kangaroo control programs on sensitive areas because they are more likely to be longer-lasting if incursions are predominantly from local populations.

This study provides evidence that any impact kangaroos may be having on the regeneration of degraded arid rangelands may be exacerbated by an influx of kangaroos from locally surrounding areas. The extent of that impact is the subject of ongoing research by the authors.

Impact Of Red Kangaroos On The Pasture Layer In The Western Australian Arid Zone

G.L. Norbury, D.C. Norbury and R.B. Hacker

There is relatively little objective information on the impact of kangaroos on rangeland rehabilitation. Pastoralists generally believe that kangaroos invade destocked areas and inhibit range regeneration, and that commercial kangaroo shooting offers little respite. This study examines the effect of grazing by red kangaroos (*Macropus rufus*) on pasture biomass and species diversity over a 32-month period in destocked open shrubland in the Gascoyne region of Western Australia; and the extent to which this effect could be modified by commercial kangaroo shooting.

Grazing significantly impeded the accumulation of annual and perennial grass biomass in a degraded perennial shrub community and on denuded sites that were cultivated and reseeded with native shrubs. The accumulation of annual and perennial forb biomass was unaffected by kangaroo grazing. After 12 months, pasture species diversity was significantly greater on degraded perennial sites protected from kangaroo grazing.

At the end of the study, total grass biomass on ungrazed areas was about 40 times higher than on areas grazed by kangaroos only (all sites combined). About half of this ungrazed biomass was contributed by drought-resistant perennial species, such as *Eragrostis setifolia, E. xerophila* and *Cenchrus ciliaris*. The persistence of 'reserve' species such as these supply the maintenance diet for stock during frequent rainfall deficiencies in arid rangelands. It could be argued therefore, that in the face of infrequent drought, sustainable pastoral production in the arid rangelands is largely dependent on the maintenance of perennial species such as these. Their suppression on areas grazed by kangaroos implies greater adverse effect than is indicated by the major reduction in total grass biomass alone.

Results from this study would indicate that the recovery of degraded pastures cannot necessarily be guaranteed by destocking alone. Moreover, commercial culling of kangaroos under the current management program may provide inadequate protection for areas where regeneration is being attempted in the absence of stock. These views are supported by an abundance of anecdotal evidence from the pastoral industry. It is arguable that unless more effective methods of kangaroo control are integrated with stock reductions (e.g. intensive strategic shooting, electrified fencing, or humane use of selective watering devices that exclude kangaroos), the recovery of degraded rangeland pastures is likely to be severely limited.

The Distribution Of Caesium-137 In Rangeland Soils At Three Sites In Western Australia

R.J. Loughran, D.J. McFarlane, B.L. Campbell and R. Shepherd

Soil degradation, in the form of wind and water erosion, is difficult to assess. The isotope caesium-137 (^{137}Cs) has been used world-wide as an indicator of soil erosion status, and the project reported in this paper examined the suitability of the technique at three rangeland sites in Western Australia. The sites were east and north-east of Geraldton, in a region receiving an annual rainfall of approximately 200 mm.

Caesium-137 is a product of thermonuclear weapons tests, and fallout has distributed ^{137}Cs globally. On reaching the earth's surface, ^{137}Cs has become attached to the finer fraction

of soils and has been used as a tracer of soil movement. Most studies of soil erosion and deposition with ^{137}Cs have been carried out in humid temperate regions, and the method has become well established over the last decade.

It was thought that ^{137}Cs levels would be lower outside WA Department of Agriculture exclosures than within them, because of higher rates of soil erosion due to pastoral activities on the rangelands. The exclosures are areas of fenced-off rangeland which have the purpose of excluding all herbivores.

Secondly, it was thought that ^{137}Cs levels would be related to soil scalds and mounds under shrubs, because these are considered to be the products of erosion and deposition, respectively. If this was the case, higher levels of ^{137}Cs would be expected under shrubs than on soil scalds.

Statistical tests showed that there were no significant differences in ^{137}Cs levels between samples collected inside and outside the exclosures. On one of the three properties studied, statistical tests revealed that ^{137}Cs levels were significantly lower on scalds than under shrubs with soil mounds, indicating erosion and deposition, respectively. There was no detectable ^{137}Cs on 23% of all sites studied, but there was evidence of local sediment deposition.

Because the total number of soil samples used in this survey was small, further work will be required to confirm the suitability of the ^{137}Cs technique for measuring soil movement in arid Australia.

Diet Of Red Foxes (*Vulpes vulpes*) In South-West NSW, With Relevance To Lamb Predation

I.W. Lugton

The impact of foxes (*Vulpes vulpes*) on lambing mobs of Merino sheep was studied in the semi-arid far south-west of NSW from 1985 through to 1989.

Apparent improvements in lamb marking percentages of up to 25% were realised on some properties in which effective fox control through baiting was carried out. These improvements and other evidence of lamb predation gleaned from autopsies of available lamb carcases and observations on the lambing flocks has furnished substantial evidence that fox predation of lambs was commonplace and significant.

In common with other research, rabbits were found to be a staple prey item, being found in 34.9% of all stomachs. Kangaroos occurred in 20.3% of stomachs and are an important dietary component in areas where they are available as carrion. Insects were found in 31.1% of stomachs. Sheep constituted a large fraction of the diet with remains being found in 30.7% of stomachs. Fresh newborn lamb was identified in only 3.8% of the stomachs, a low figure which was judged to be an underestimate of the importance of newborn lamb in the diet. However, when analysis was restricted to foxes collected in the vicinity of lambing flocks, 35.2% showed evidence of newborn lamb consumption.

Several other studies, including an earlier observation of the author where 26 out of 42 foxes collected contained fresh lamb, have also shown that lamb can be common in the diet.

This research provides circumstantial evidence that fox predation on lambs is a real problem and that experienced, well conditioned, mature male foxes are implicated in much of the killing. Fresh lamb remains are not readily found in stomachs unless foxes are sampled close to flocks in which lambing is progressing rapidly and where there is at least 30% of lambs already dropped

It is concluded that lamb predation can be intense where the fox population is high and contains many older individuals, through being subject to little control. The situation will be worsened where alternative foods such as mice, certain insects and carrion are scarce.

Relict Surface-Soil Features In Semi-arid Mulga (*Acacia aneura*) Woodlands

J.C. Noble

Systematic surveys of a 200 ha study site in north-western NSW located 48 circular features of about 10 m diameter. These features occurred in a distinct pattern with none being found within mulga groves or drainage lines. Analysis of soils and surface stones, combined with historical and circumstantial evidence, suggested that they were most probably built by malleefowl (*Leipoa ocellata*), now locally extinct.

Concurrent observations carried out on larger radial features (about 30 m diameter), mostly situated on elevated ridges in a paddock adjacent to the study site, indicated that the burrowing bettong (*Bettongia lesueur*), also now locally extinct, was probably responsible for their construction.

It is postulated that patchiness induced by both malleefowl and bettong nesting activity could have enhanced herbage productivity due to discarded nests becoming fertile islands, particularly near water interception zones with relatively deep and fertile substrates. The rapid extinction of the burrowing bettong following European pastoral settlement may have been a significant, and hitherto unrecognised, contributing factor facilitating widespread shrub recruitment.

Control Of *Hakea preissii* And Associated Species By Fire In Degraded Semi-Arid Rangelands

A.McR. Holm, K.R. Shackleton and E. Jane Speijers

Hakea preissii (needle bush) is an undesirable increaser in the Gascoyne region of the Western Australian rangelands. It is a long lived, unpalatable plant which now forms dense stands on once productive pastoral lands. While grazing management

may be important in reducing the further spread of *H. preissii*, pastoralists can do little to reduce stands already present. There is some anecdotal evidence to suggest that fire may occur in this environment in exceptionally favourable rainfall years for herbage growth. Fire thus presents a possible, although infrequent, agent for the removal of *H. preissii*.

In this study, we found that *H. preissii* was susceptible to fire. About 50% of plants, particularly the plants smaller than one metre, were killed by a relatively cool fire and nearly all plants by hotter fires. However fire also killed the more palatable perennial shrubs and had no effect on other undesirable increasers such as *Senna* and *Eremophila* species. Nevertheless, the opportunistic use of fire in dense *H. preissii* stands may be advantageous for pastoralism.

Relationships Between Sheep Production, Stocking Rate And Rainfall On Commercial Sheep Properties In Western NSW

D.A. Roshier and I. Barchia

Historical sheep production records from 14 properties in the Broken Hill district were analysed for relationships between wool production, lamb marking percentage, stocking rate and rainfall.

Wool production per head was largely determined by rainfall. The response of wool production per head to rainfall was similar on most properties despite differences in land types and stocking rates. Total wool production was largely determined by stocking rate on most properties. There was no consistent relationship between lamb marking percentage and when rain fell.

It is concluded that total wool production is largely determined by stock numbers. The data suggest animal productivity is more dependent on management responses to dry periods and the rate of change in forage availability in the absence of rain.

Seventh Biennial Conference Invited Papers

Rangelands And Global Change

B.H. Walker and W.L. Steffen

The most important implications of this analysis for Australia's rangelands are:

i) Better predictions of climate change, both in spatial resolution and degree of confidence, are needed to progress beyond a broad-scale analysis of possible effects.

ii) Given that better projections of climate will become available, a "generic" rangeland model, incorporating a better understanding of system-level responses to changes in climate, atmospheric composition and management strategies, is needed to investigate the implications of global change.

iii) Based on our current state of understanding, it seems as though the changes in Australia's rangelands will be within the capabilities of managers to cope, over at least the next several decades, provided they are made aware of the likely local and regional changes as predictions improve, and provided they adopt flexible management strategies.

Vegetation Dynamics In Changing Environments

Steve Archer

Human-induced changes in atmospheric chemistry and meteorology have the potential to alter a broad array of ecosystem processes over a range of temporal and spatial scales. These may have direct and indirect effects that could influence management strategies and landscape responses to disturbances associated with natural events and land use. The extent to which forecasted global changes are effective in altering local ecosystem properties will depend upon a variety of factors. In this paper, I address species life history traits and community and landscape properties that can be used by land managers to evaluate potential manifestations of global change on a local scale.

Changes In Cropping Systems At The Boundaries Of The Pastoral And Cropping Zones In Southern Australia

R.J. French

A history of cropping at the margins between arable and pastoral lands is examined. Assessment is made of the climatic factors that caused the abandonment of cropping. These criteria are then used to assess the likelihood that future cropping will persist along the present pastoral margins in different states of Australia. A minimum requirement is that the ratio of water use to evaporation in the growing season should exceed 0.3.

An analysis of past climatic data should also be made to identify sequences of years when rainfall was both above and below average. Periods of above-average rainfall can lead to undue optimism for future cropping. Simple climatic models are required so that farmers can use them to predict the rainfall in the growing season and thereby make appropriate management decisions.

Farming is a complex technical and financial business and farmers will need skills in monitoring, measuring and recording factors that influence their livelihood.

Range Management In A Changing Environment: A Southern African Perspective

J.E. Danckwerts, P.J. O'Reagain and T.G. O'Connor

We address a number of management principles pertaining to temporal and spatial changes in rangeland systems. Both plant community composition, and availability and quality of forage, are temporally variable. The process of community change, at least in southern Africa, appears to differ between humid and arid environments. In humid environments, change follows a relatively gradual and predictable pattern, with both over- and under-grazing resulting in decreased carrying capacity. Factors other than grazing also cause change. In arid environments, change is event-driven, providing the grazier with risks and opportunities to cause or prevent community change from one state to another.

In the humid rangelands, change in forage availability and quality is relatively predictable allowing the grazier to match forage demand to supply. In arid areas, forage production is highly variable and unpredictable. Flexibility in livestock numbers is therefore essential.

In view of the complexity of rangeland systems and the lack of predictability, we suggest that formalised adaptive management - decision-making from past mistakes and successes - is the most appropriate means for graziers to cope with a changing environment.

Changing Conservation Perceptions In The Australian Rangelands

S.R. Morton

Attitudes to conservation in the rangelands are shifting rapidly as cultural change alters the ways in which Australians view their history and environment. In earlier times, pastoralists of the outback were seen as admirable pioneers; today, not all Australians hold such a view. In an effort to predict how trends in social change might affect conservation issues I review recent events in the forest and fishing industries, which like the rangeland industries are to some extent based upon public land or resources. The forest industries have been under sustained attack from conservationists, whereas pressure on the fishing industry has emanated from scientists and governments worried about sustainability. Both industries are changing in response to these pressures, and it is possible that animal production in the rangelands will eventually experience similar forces. I suggest that in the long run the rangeland industries will be unable to ignore change, and in fact the social currents may provide new opportunities.

Changing Community Attitudes

R.L. Ison

This paper was an invited keynote presentation for the "Changing Community Attitudes" session at the Seventh Biennial conference in Cobar. The paper questions both the thinking behind, and the utility of, attempting to change community attitudes. Evidence is presented that attitudes as such are not a problem for future rangeland management. It is argued instead that range scientists and advisers need to question some of the assumptions which shape how they see and interpret the rangelands and modify their practices to include pastoralists as co-researchers in a process of designing a future for the Australian semi-arid lands. A process of participative ecodesign is advocated and a number of values are proposed as a basis for designing future R&D projects.

The Impact Of The Changed Financial Environment On Rangeland Management And Ownership Structures

J.W. Chudleigh

The dramatic change in the western world's economic environment is characterised by lower inflation, unserviceable indebtedness, lower commodity prices, greater environmental awareness and a complete readjustment of values and bank lending policies as an era of greater financial conservation develops.

An understanding of this historic turning point in economic developments, especially in Australia, brings into question many established concepts of management of our agricultural resources.

This paper questions whether these changes demand a more dramatic rethink of the management of our western lands to ensure that the economic imperative of profit (the driving force for private occupancy of pastoral areas) can sit comfortably with the environmental responsibility being increasingly demanded by society.

PLANT IDENTIFICATION COURSE

Merri Tothill, Dept. of Primary Industries, PO Box 357, Port Augusta SA 5700

The Australian Rangeland Society's Plant Identification Course was held again this year at Middleback station, just west of Whyalla. The course was run over the weekend of the 10-12 September, largely at the request of students as that date enabled them to attend without compromising their work or other commitments.

The course was originally organised at the request of Mr Mike Carmody, Senior Lecturer of the Arid Zone Horticulture Course conducted through the Port Augusta TAFE. The course was very well attended by 17 eager participants, including many of the horticulture students.

Further demand for similar courses has been identified and there are plans to run courses across the pastoral region of South Australia. There is also a need to further strengthen the plant identification and utilisation components of the relevant TAFE courses run in Port Augusta.

MEET THE NEW COUNCIL

Alec Holm - President

I have worked in rangelands for the past 23 years since graduating with a BSc. (Agric) from the University of Western Australia. For the first ten years, I worked and lived in the sub-tropical grassland environments of Kununurra and Derby during which time I obtained an external MSc. (Agric). We moved to the arid shrublands of Carnarvon in 1979, which was to become home to our family for 11 years. It was in Carnarvon that I became involved in the development of WARMS (Western Australian Rangeland Monitoring System).

In 1991, I moved to Perth to take over the management of the monitoring program for Western Australia, and as an assistant to the Commissioner for Soil and Land Conservation.

The West Gascoyne Branch of the ARS was established in Carnarvon in 1982 and I was Vice President of this Branch until 1993 when it became the Western Australian Branch.

I was Vice President of the Federal Council from 1991 to June 1993 when I became President of the new Council which moved to WA in June 1993.

I look forward to redefining the vision for the ARS as it meets the challenges facing rangelands in the 1990s.

Bob Symonds - Vice President

Born and educated in Adelaide, I went to the bush as a jackeroo after completing my Leaving Certificate at school. In 1969, I came to WA as a jackeroo working in both the pastoral and wheat-sheep zones of the State. Having now worked in agriculture and associated industries for the last 25 years, my interest has moved more towards the pastoral zone and the rangelands.

Nine years ago, my wife and I bought Boologooroo Station, 80 km north of Carnarvon, where we run merino sheep. We have continued to develop the property until this time.

My involvement with the Australian Rangeland Society started with the West Gascoyne Branch where I was on the Organising Committee for the 1990 conference in Carnarvon.

My aim for the next two years on the ARS executive is to give a modern pastoralist's view to the direction and decision-making of the Society.

Sandra Van Vreeswyk - Secretary

My family came to Australia from Holland 25 years ago. We settled in Adelaide and then shifted to Western Australia in 1979.

In 1983 I completed a Bachelor of Science in Environmental Science at Murdoch University and in 1987 I did a Post Graduate Diploma in Natural Resources through Curtin University. My latter studies involved factors affecting the survival of *Banksia* species on a rehabilitated mineral sands mine at Eneabba.

Most of my working life has been with the Western Australian Department of Agriculture on several different projects including a water erosion study in Bunbury, plantago trials in Kununurra and land capability and soil survey work in Geraldton. A great way to see the state! In July 1989 I found my true calling when I joined the Department's rangeland survey team. I was involved in the north eastern Goldfields regional survey and am now working around Sandstone, Yalgoo and Paynes Find. The surveys involve detailed description and mapping of landforms, soils and vegetation in the arid shrublands of Western Australia.

I was Secretary/Treasurer of the West Gascoyne Branch from 1991 until its AGM earlier this year, and am now very pleased to be the Secretary of the national Council.

David Pearson - Treasurer

In 1979 I escaped Sydney and moved to the cool climate of Armidale to study at the University of New England gaining a Bachelor of Natural Resources. A kind invitation from Ken Johnson of the NT Conservation Commission to work on the diet of the Rufous Hare-wallaby resulted in a few months in central Australia and developed my appetite for spinifex country.

A stint as a ranger in Kakadu National Park and Cobourg Peninsula Wildlife Sanctuary was followed by a wildlife research position with the WA Department of Conservation and Land Management based in Kalgoorlie. My research concentrated on the effects of fire on plants, small mammals and reptiles in spinifex grasslands, and cooperative wildlife surveys with Aboriginal groups.

Now in Perth, I am still involved in similar arid zone research, as well as a recently commenced project on the ecology and conservation of pythons.

My ambitions this year are to finish a long-running MSc in botany before it kills me, to maintain the ARS financial position and records at the same high standards as those achieved by Bruce Strong and to assist other Council members in promoting the Society.

Subscription Secretary - Anne Stammers

I have spent most of my life in Perth. However, in the late 1980s, my husband decided to make a complete change to our lives and began looking for a property in the north west (strange things happen to men when they turn 40!). This change in direction led us both on an urgent search for

information on the pastoral industry, as neither of us had any experience in this area.

As part of the learning exercise I attended the Rangelands Conference in 1990, where I thoroughly enjoyed the lectures, poster sessions and field trip.

In March 1991, our family purchased Kooline station which is a cattle property situated along the Ashburton River in the Pilbara area of WA. The station has some badly degraded areas so I joined the Australian Rangeland Society at the end of 1992 as part of my investigation into regeneration techniques.

I trust that I can carry out my position of Subscription Secretary to the satisfaction of all members and put forward a pastoralist's viewpoint during Council discussions.

LETTER TO THE EDITOR
Connellan Airways Trust

Bob Lee, Executive Officer, Connellan Airways Trust, PO Box 2288, Alice Springs NT 0871

A recent issue of the Newsletter (*RMN* 93/1) featured a report by Greg Campbell on the 17th International Grasslands Congress, held in New Zealand and Rockhampton, which Greg attended.

It may be of interest to some members of the Society that Greg's expenses were partly funded by a grant from the Connellan Airways Trust.

The Connellan Airways Trust was the brainchild of the founder of Connellan Airways, the late E.J. Connellan, who hoped that the Trust would carry on his mission to alleviate the effects of isolation on the people of Outback Australia.

The Trust is committed to helping the people of outback Australia with financial support for any worthwhile project, particularly in the areas of education, communication, transport and health services.

There are few criteria for the awarding of grants, other than that programs must be of sufficient merit, and will benefit people in the remote areas of Australia.

Anyone who believes that they might qualify for assistance from the Trust, or would like further information, or assistance in making an application, should contact me at the above address or telephone (089) 525122, or by fax on (089) 534260.

THE AUSTRALIAN RANGELAND SOCIETY
A Vision for the Future

Alec Holm, President, PO Box 718, Victoria Park WA 6100

Australian rangelands are entering a period of unprecedented change. Environmental, social and economic forces are all at play coupled with an awakening of interest in the Australian heritage of the "great outdoors" both by urban Australians and international visitors. The Australian Rangeland Society must move with these changes to remain relevant. Already we see a decline in membership, especially of pastoralists, and there is little interest shown in the Society by the groups with either a re-awakened interest in rangelands or those with an emerging interest. For these reasons, the newly elected Western Australian-based Council of the Society decided to hold a Visions Workshop to chart a course for the next two years and beyond.

Council convened this two-day workshop in early September in the magnificent and secluded surroundings of Moondyne Farm in the Avon Valley near Perth. Participants included representatives of each Branch (WA, NSW/Western Division, SA and NT), Denzil Mills (representing Queensland), Margaret Friedel (Publications Committee), members of Council and four Society members from WA and NSW. John Riches and Terry Laidler from the WA Department of Agriculture's Community Landcare Branch facilitated the workshop. Both are leaders in the art of running effective workshops.

The main outcomes from the workshop are summarised below by our Secretary, Sandra Van Vreeswyk. Council will use these to guide its activities over the coming two years. I urge you to take an active and, if necessary, critical interest in our progress towards the achievement of these realistic, but at the same time, challenging proposed actions.

Outcomes Of The Australian Rangeland Society Visions Workshop

Sandra Van Vreeswyk, Secretary, PO Box 718, Victoria Park WA 6100

Why do people belong to the Society?

1. To learn about rangelands through written and verbal communication such as journals, newsletters, workshops, meetings and conferences, and to keep in touch with rangeland issues. The critical success factors for this are to continue current publications and meetings, and to employ a person for proactive advertising and extension.

2. Communication amongst interest groups about all aspects of rangelands to ensure their wise use. The critical success factors are to debate issues based on research and knowledge rather than emotion and tradition.

3. To create opportunities for members to meet, exchange information, generate knowledge and foster *esprit de*

corps. The critical success factors are revitalised branch or regional groupings of members and an enjoyable Katherine conference.

4. Membership of the Society is a reflection of personal or professional commitment to the rangelands and confers some status and reward. The critical success factors are to prepare a Code of Ethics and policy statements and to get the Society's journal on the International Abstract List.

The purpose of the Society:

The purpose of the Australian Rangeland Society is to promote the responsible use of the rangelands and to provide an appreciation of their contribution to Australia by generating knowledge, stimulating debate and facilitating information exchange so as to encourage appropriate policies and actions.

The Society's slogan:

"Speaking for the rangelands".

Strategic directions for the Society:

I . Make statements of authoritative opinion on rangelands.

2. Develop a synergistic relationship with the landcare movement.

3. Assist and interact with the wider community to encourage appreciation of rangeland values and issues.

4. Infuse educators with enthusiasm for rangelands and provide support.

5. Increase and maintain membership amongst all interest groups.

6. Ask what else can be done with the rangelands.

7. Compile and publish sound range management principles and practices.

The strategic directions which were seen as having most leverage to the Society were 1 and 2. Directions 3 and 4 were seen as necessary to sustain the Society while 5, 6 and 7 were considered necessary to support the Society.

Action plans to address these strategic directions:

(These were developed to be specific, measurable and achievable and were adopted by those shown against each action.)

1. Make statements of authoritative opinion on rangelands

* Develop policy statements on use and management of rangelands (Marg Friedel).

* Allocate individual policy issues to small groups for review of government policy (Alec Holm/ARS Council).

* Form policy groups and appoint leaders for different subjects by the end of 1993 (Alec Holm/ARS Council).

* Present and debate policy statements at the Katherine conference (Alec Holm/ARS Council).

* Publish and publicise policy statements by the end of 1994 (Alec Holm/ARS Council).

* Identify and seek representation or consultation with 'committees' influential in rangelands (Alec Holm/ARS Council).

2. Develop a synergistic relationship with the landcare movement

* Have a corporate membership category for landcare groups.

* Sponsor and support specific landcare group activities, e.g. seminars and field days (Denzil Mills).

* Seek ARS representation on landcare groups from local groups to peak councils (Alec Holm/ARS Council).

3. Assist and interact with the wider community to encourage appreciation of rangeland values and issues

* Branches to workshop Local Governments/Chambers of Commerce on rangeland issues (Russell Harland).

* Investigate Landcare Australia Ltd undertaking rangecare promotion and awareness (Denzil Mills).

* To have objective information on urban beliefs (Don Burnside).

* Use the network of people in the Society to comment on specific issues (David Pearson and Bob Symonds).

* By the end of 1995, to have raised cash ($40,000), outlined concepts and commissioned the work for a coffee table book titled 'The Land Within Us' (Don Burnside, Bill Low and Alec Holm).

* Publicity officer appointed for each branch who can comment when issues arise.

* Appoint a part-time professional public relations officer (Bill Low).

4. Infuse educators with enthusiasm for rangelands and provide support

* Apply for City Landcare funds by October 1993 for tours by school children into rangeland areas and for two weekends in the bush per year for educators (Ian Watson, Steven Tonkin, Dennis Barber, Helen Allison).

* Collaborate with Education Departments/Government Agencies to produce materials on ecology and management for schools (Kerry Holmes).

* Review materials potentially available to schools (Kerry Holmes and Russell Harland).

* Investigate opportunities for incorporation of rangeland concepts into school curricula (Kerry Holmes and Denzil Mills).

5. Increase and maintain membership amongst all interest groups

* Produce membership promotional kits (video, slide show etc).
* Provide free one year partial membership to targeted groups or individuals (10 per State) (Dennis Barber and Ian Watson).
* Target Aboriginal stakeholders with information about the Katherine conference (Tom Stockwell).
* Coordinate a series of media releases outlining what the Society is about (newsletters, newspapers, radio) (Kerry Holmes and Russell Harland).

6. Ask what else can be done with the rangelands

* Conduct workshops on findings from the Katherine 1994 conference onwards.
* Gain ideas for a national workshop on alternate use of rangelands at the Katherine 1994 conference (Tom Stockwell and Bill Low).
* Determine support available for alternative land uses, e.g. funds/extension.
* Produce a booklet on six case studies of financially successful alternative land uses in the rangelands (Sandra Van Vreeswyk, Helen Allison and David Beurle).

7. Compile and publish sound range management principles and practices

* Maintain current journal and newsletter publication (Marg Friedel).
* Review and reprint range management textbook by June 1995.
* Develop five local range management principles by branches by June 1995.

Summary

Implementation briefs were developed for each of these action plans and will be monitored by Council.

Please note that some of the action plans have not yet been taken up. **Are you prepared to take responsibility for any of these?** Alternatively, are you keen to be involved in any of the other action plans? Please let me know and I will assist in coordinating.

Stop Press!

Would you like to contribute to the development of the Society's statement of policy? David Beurle and Margaret Friedel need you to join them in a working group, or simply to provide ideas. Don't be shy!

Contact Margaret at CSIRO, Alice Springs.
Ph. (089) 50 0140

SOUTH AUSTRALIAN BRANCH
Report on Annual General Meeting

Merri Tothill, Department of Primary Industries, PO Box 357, Port Augusta SA 5700

The Annual General Meeting of the SA Branch of the Australian Rangeland Society was held at the Staff Club, University of Adelaide, on June 11th 1993. The meeting was opened by the President, Mr Andrew Nicolson. Andrew presented his annual report for 1992, making mention of the successful Plant Identification Course held at Middleback in September 1992. Due to public demand another course will be held this year.

Andrew also mentioned the continued depressed state of the Australian wool industry and the possible implications that the Mabo High Court decision would have on the pastoral industry in South Australia.

The following office bearers for 1993 were elected at the meeting:

President:	Dennis Barber
Vice President:	Michael McBride
Secretary:	Merri Tothill
Treasurer:	Anne Gibson
Committee:	Vicki Linton
	Martin Andrew
	Andrew Johnson
	Jenny Bourne

At the conclusion of formal business, Andrew Johnson of the Soil Conservation Branch - SA Department of Primary Industries, gave a presentation on property planning for the pastoral region of South Australia.

The new committee hopes to survey all the current South Australian members to determine new directions and possible activities for 1993-94.

WESTERN AUSTRALIAN BRANCH
Report on Annual General Meeting

Sandra Van Vreeswyk, Acting Secretary/Treasurer (1991-93), PO Box 718, Victoria Park WA 6100

Members of the Western Australian Branch travelled to Middalya station, north of Carnarvon, to look at kangaroo trial sites with Grant Norbury and Geoff Eliott. In the evening we headed back to Boologooroo for a barbecue. The Annual General Meeting was held the following morning at Boologooroo station. The two days were both enjoyable and challenging and we thank Bob and Jo Symonds on Boologooroo and the Hearmans on Middalya for their warm hospitality.

At the AGM, the motion that the name of the branch be changed from the 'West Gascoyne Branch' to the 'Western Australian Branch' was passed. All present at the meeting, and all postal votes received, were in favour of the motion.

The newly elected committee members are:

President	Don Burnside
Secretary/Treasurer	Hugh Pringle
Committee member	John Reid

The incoming President thanked John Reid, who had been the Branch President since 1989, for providing leadership and support to the branch. The West Gascoyne Branch had organised an excellent conference and provided a nucleus for ARS activities in Western Australia.

The AGM was followed by discussion of issues important to the WA Branch. At an earlier meeting, members had identified issues to be dealt with in the next two years by the branch (reported in *RMN* 93/1). Participants voted on the four most important issues and developed strategies to deal with them. These issues were:

- raising the profile of the Australian Rangeland Society,
- defining management objectives for different land uses,
- ecological and production sustainability, and
- kangaroo management.

Participants then considered how the branch could be more effective in sustaining itself over the next two years. The committee will plan its program based on the suggestions received.

BOOK REVIEW

Managing Native Pastures

Review by Isabel Hall, Oorindimindi Station, Oorindi, via Cloncurry QLD 4824

Funded by the National Soil Conservation Program and produced by the Queensland Department of Primary Industries as one in the Department's Information Series, this booklet is the first volume of a special series addressing the management of native pastures by those who graze cattle and sheep. The author, Ian Partridge, states "The basis for the information in this book has been the QDPI publication *Native Pastures in Queensland: the Resources and their Management* while many principles of range management have been gleaned from the CSIRO publication *Management of Australia's Rangelands.*

Written in non-technical language in a 'question and answer' style, the booklet is generously illustrated with beautiful photographs, simple graphs and whimsical line-drawings. The paper quality and print clarity are excellent, and the overall presentation is of a very high standard, making this an especially attractive item. Mention is made of many informative leaflets, booklets and computer programs available from QDPI, and a useful list of publications is recommended for further reading.

Managing Native Pastures should prove valuable for introducing school students and urban Landcarers to the basic principles of the subject. I should go so far as to say that every school should have a copy in its library. I found the book somewhat simplistic, and too generalised to serve experienced pastoralists as a reference book. However, the author, in his preface, promises that subsequent publications in the series will have an edition for each type of native pasture community which will be more like a field manual. If this means they will contain more specific information and fewer unsupported generalities, they will be welcomed by serious managers of native pastures.

THE FUTURE OF TROPICAL SAVANNAS: MANAGING RESOURCES AND RESOLVING CONFLICTS
17-22 July 1994
Townsville Queensland

Call For Poster Papers

This symposium is about people living in tropical savannas and how science can help resolve conflicts that arise from their activities. Resolving those conflicts will depend on how successfully different perceptions of land use and management can be accommodated. Scientific information, societal needs and values, and economic costs and benefits must all be integrated into policy if sustainable land use is to be a reality.

The meeting will consist of invited speakers on a range of topics that include pastoralism, tourism, mining, aboriginal use, cropping, parks and conservation and conflict resolution. In addition, the Organising Committee invites the submission of abstracts for contributed poster papers that address the theme of the meeting. Abstracts will be evaluated and authors notified to develop a poster paper for the meeting. Authors of selected posters will be invited to submit a two-page paper for publication in the proceedings of the meeting. Criteria for selection will include relevance to the theme of the meeting and originality. Please submit abstracts of 300 words or less by I December 1993 to:

Joel Brown
CSIRO-Davies Laboratory
Private Mail Bag
PO Aitkenvale, Queensland 4814 AUSTRALIA

PROPOSED USE OF 1080 TO CONTROL FERAL GOATS IN WESTERN AUSTRALIA

A Submission to the WA Environmental Protection Authority by the WA Branch of the Australian Rangeland Society.

(Ed. Hugh Pringle, Secretary of the WA Branch, forwarded this copy of a recent submission made by the WA Branch to the Environmental Protection Agency for inclusion in RMN. Further details can be obtained from Hugh at the WA Department of Agriculture, Baron-hay Court, South Perth WA 6151.)

The WA Branch of the Australian Rangeland Society recognises that a primary management objective in the rangeland is the enhancement of the condition and productivity of the rangeland soil and vegetation resources. The presence of a large and uncontrolled population of feral goats through the southern shrublands represents a significant obstacle to the achievement of this primary objective. Therefore the branch strongly supports the Feral Goat Eradication Campaign initiated by rangeland Land Conservation District Committees and supported by state and federal government resources. It is an important land management program. Further, in recognising the constraints to achieving the Campaign's goal of feral goat eradication, the branch supports the use of as wide a range of control measures as possible, to maximise the impact on the feral goat population. Thus, the proposal to use 1080 as a mechanism to remove feral goats within the management commitments detailed in Section 6.2 (p. 37) is supported by the WA Branch of the Australian Rangeland Society.

In WA, the unique toxicological and environmental qualities of 1080 are that it is extremely toxic to most introduced species, whereas many native species in the WA environment have a high tolerance for the chemical. This makes it particularly well suited for use against a targeted introduced species such as feral goats.

Making 1080 poisoning available as a control mechanism expands the feral goat control options available. Given the limited range of options currently available (mustering, trapping and shooting), this new technique may lead to an increased flexibility in eradication efforts, particularly in those situations where the conventional techniques will be relatively less effective (e.g. inaccessible areas, very dense vegetation). Therefore, the branch believes that poisoning will be best used strategically in such situations, and may find rather less application where existing techniques are proving to be effective. However, the precise role of poisoning within the "basket" of techniques will need to be determined through experience and evaluation in the field.

The WA Branch is happy that the management protocols 5 to 14 (p. 38) adequately address the need to minimise the risk posed by a poisoning procedure to native wildlife populations, thus removing the potential for adverse environmental impacts. However, it will still be important for those people responsible for the use of 1080 to be aware of the nature conservation status (i.e. conservation codes) for each of the species listed in Appendix Table I, and the table should be amended to show this information.

To conclude, the WA Branch of the ARS is available to provide additional expert advice in respect of the points raised in this submission should that be required.

(Signed - D.G. Burnside, Branch President)

CLEAN COUNTRY, CLEAN PRODUCT, CLEAR PROFIT

Best practice for practical rangeland management in Australia

Have You Written Your 100 Words?

Tom Stockwell, Chairman, Katherine Conference Organizing Committee, PO Box 1346, Katherine NT 0851

Interest in the Katherine Conference appears high so don't be tardy in getting your abstracts or summaries in. They are required by November 19 at the latest. They should be sent to:

Mr Neil MacDonald
Australian Rangeland Society Conference
PO Box 1346
Katherine NT 0851
Phone: 089-738747 Fax: 089-723532

If you have not received your conference brochure, or would like a few more for friends or perhaps a family member, contact either Neil, Blair Woods (089-894579) or myself.

We strongly recommend that you book your accommodation once you are certain of your travel arrangements.

We will be running workshops in line with the various session themes during the course of the conference. These workshops will be in addition to the presented papers and poster sessions. As well, the Society's Executive will take the opportunity to report on progress since the Visions Workshop held on the Avon River in the middle of a Western Australian winter.

If you have any queries regarding the conference please contact us.

See you in Katherine in June 1994.

THE HORN SCIENTIFIC EXPLORING EXPEDITION TO CENTRAL AUSTRALIA OF 1894

A Commemorative Symposium Alice Springs, September 1994

Steve Morton, CSIRO, PO Box 2111, Alice Springs NT 0871

A meeting to commemorate the centenary of the Horn Scientific Exploring Expedition to central Australia will be held from the 25-27 September 1994.

The Horn Expedition

The Horn Expedition was conducted between May and August, 1894, and travelled 2,000 camel miles from Oodnadatta to Alice Springs via the western MacDonnell Ranges and Uluru before returning to the railhead at Oodnadatta. The objective of the Expedition was to undertake a systematic appraisal of the geology, mineral resources, biota and Aboriginal culture of the Centre, and to this end it was composed of scientists with experience in each of these fields. The Expedition was financed by W.A. Horn, a wealthy pastoralist and businessman.

The members of the expedition were among the first scientists to visit the vast land of central Australia. Prominent among them were Professor Baldwin Spencer of the University of Melbourne, and Professors Edward Stirling and Ralph Tate of the University of Adelaide, together with Charles Winnecke as leader of the party and several specialist collectors. The Expedition resulted in a four-volume report, edited by Spencer, which is often considered to be the finest contribution to nineteenth-century scientific exploration in Australia, but which today is rare and difficult to obtain.

Further, the Expedition led to the meeting of Spencer and Frank Gillen, Officer-in-Charge of the Overland Telegraph Station at Alice Springs, and thereby to a series of highly significant studies of the Aboriginal people of central Australia.

Call for Expressions of Interest in the Symposium

The Symposium aims to re-assess the significance of the Horn Scientific Exploring Expedition to central Australia of 1894. It will investigate the contribution that the Expedition made to knowledge of the environment and peoples of the Centre, and re-examine that knowledge in light of current understanding of the environment and cultures of the region. It will explore the changes that have taken place in the landscape and human ecology of the region in the 100 years since that time. It will bring together a wide array of people interested in the history of both the natural and human environments at the heart of Australia.

The meeting will consist of two and a half days of spoken papers, and will begin with a special lecture by Emeritus Professor John Mulvaney, historian and archaeologist, and biographer of Baldwin Spencer. The Symposium will be divided into at least four sessions: accounts of the Horn Expedition and its social and intellectual background; the evolution and nature of the central Australian environment; the biota of central Australia; and human ecology in the Centre. All papers will reflect upon the achievements of the Horn Expedition, and on the changes in our understanding of the natural and cultural environment, or in that environment itself, since 1894. It is hoped to publish at least some of the contributions to the Symposium.

Participation

People from all backgrounds are cordially invited to attend the Symposium.

Expressions of interest are also invited from people who may wish to speak at the Symposium; a mix of invited and contributed papers is anticipated.

Facilities for poster sessions will be available.

For further information and to express interest in attending, please contact me at the following address:

Dr Steve Morton
CSIRO, PO Box 2111
Alice Springs NT 0871

Phone (089) 500143 or Fax (089) 529587

ECOLOGICAL SOCIETY OF AUSTRALIA

1994 Open Forum And Symposium Conference

Alice Springs, September 1994

Preliminary Notice

The 19th AGM and scientific meeting of the Ecological Society of Australia (ESA) will be held at the Araluen Arts Centre, Alice Springs, from Tuesday, September 27th to Friday, September 30th, 1994. All members of the ESA and interested non-members are cordially invited to attend. The meeting will consist of three days of scientific sessions, and will be followed by specially-organised, optional conference tours.

The meeting will immediately follow the Horn Expedition Commemorative Symposium (see previous article) which will re-assess the significance of the Horn Scientific Exploring

Expedition to Central Australia of 1894, and the changes that have occurred since.
Symposium sessions for the ESA meeting will focus on prominent ecological issues, and will be convened by interested members of the ESA. The Organising Committee is now seeking suggestions for topics, and volunteers interested in nominating topics are urged to contact the Committee at the address given below. The Committee is particularly keen to encourage symposia on arid zone ecology and off-reserve conservation issues.

For further information, contact:

Dr. Steve Morton
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INFORMATION FROM THE UNIVERSITY OF SOUTHERN QUEENSLAND

New Publications

Ground Rules: Perspectives On Land Stewardship

by Professor Brian Roberts

This illustrated collection of 340 pages follows *The Birth of Land Care* volume which was based on papers written before the Land Care Movement was established in 1988. That volume records the 'great awakening' of rural Australia to the need for a revision of our land management.

This second collection of papers develops the themes of Land Stewardship and Land Ethics through the early awareness phase to the acceptance and implementation phase.

Chapter contents include:

- The Dilemma of Sustainable Land Use
- Changing our View of Land as a Resource
- Advisory and Extension Services - Where To From Here?
- Social and Economic Constraints to Implementing Sound Practices
- The Pastoral Zone - Towards Sustainable Animal Production
- The Way Ahead

Copies of *Ground Rules: Perspectives on Land Stewardship* may be obtained from the Secretary, Land Use Study Centre, University of Southern Queensland, Toowoomba QLD 4350 for $24.00 (including postage and handling).

Western Grasses

by Brian Roberts and Richard Silcock

This handy book was first produced in 1982 as a landholder's guide to the feed value and identification of the most important native grasses in Western Queensland. The first edition was sold out by last year so an enlarged management edition has now been published.

This new edition contains two parts: the first on the native grasses as a natural resource which is changing, and the second on the individual grasses. The management section deals with the principles and practices of good pasture management in the Mulga and Mitchell grass regions, describing the changes in pasture condition which have occurred. It explains how to recognise the symptoms of degradation and what to do about them through better management.

The second part of the book describes each of the 52 grasses studied by the authors during their field surveys in Western Queensland. Each species is illustrated making it easy for laypeople to identify the pasture plants in the paddock. Accompanying descriptions give full details of the soil types, protein and phosphorus content and the indicator value of each species as a guide to management decisions.

The book is obtainable at $14.00 per copy (including postage and handling) from Miss Marie Schulz, Secretary, Land Use Study Centre, University of Southern Queensland, Toowoomba QLD 4350.

Homestudy Course

Fire Management: The Use And Control Of Rural Fire

This adult education course was developed by the Land Use Study Centre and the Rural Fire Division to meet the needs of land managers and fire control groups. It meets the requirements of rural fire brigades and of producers in the pastoral industries and forestry where fire is used as a management tool. Fire's role in National Parks is given special attention.

The course can be undertaken at one's convenience with most students taking four or five months. There is no residential requirement - all study can be done at home.

The course fee is $85 which includes the studybook, book of readings, mailing and administrative fees. Fees are subject to annual review.

A Certificate of Completion is provided on satisfactory completion of the three assignments. No entry qualifications or previous study are required and students may enrol at any time during the year.

For further enquiries, contact Miss Marie Schulz, Secretary, Land Use Study Centre, University of Southern Queensland, Toowoomba QLD 4350

AUSTRALIAN RANGELAND SOCIETY KANGAROO POLICY GROUP

Policy Update

Bood Hickson, 'Melinda", via Cloncurry QLD 4824

The Kangaroo Policy Group was conceived at the Cobar Biennial conference in October 1992. Since then, we have witnessed on-going policy development at State and Federal levels.

These activities have, on the whole, been encouraging and the policy group is monitoring these developments. It has been difficult to keep abreast of these changes and how they impact on the recommendations that we are developing.

Initially we only had a few contributions to the policy, but as the kangaroo issue has entered the public and political arena, additional contributions have continued to come in. As a consequence, we are still developing the policy to reflect all of this input. The policy needs to be reviewed again by the group before being forwarded to Council for approval.

The increasing interest in this policy has delayed its formulation, but I am sure that the ultimate outcome will now be more informed and will hopefully lead to improvements in macropod management and the health of our rangeland.

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AUSTRALIAN RANGELAND SOCIETY
MEMBERSHIP APPLICATION FORM

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

I, [name] .....

of [address] .....

.....

..... Postcode .....

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 1994.

* delete as appropriate

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

Membership Rates:

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