The Australian Rangeland Society

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Range Management Newsletter

Official newsletter of the Australian Rangeland Society

Editor — Dr. T. Fatchen, Roseworthy Agricultural College,
Roseworthy, South Australia, 5371

No. 80/1
March 1980

EDITORIAL

This is my swansong as RMN Editor. Council in 1978 decided to rotate the Editor's position between the various States, in line with the movement of the society's executive, to increase participation of members in the running of the Society. As the executive will be in the Northern Territory in 1980, the next issue of RMN will appear under the guidance of Barney Foran, of the CSIRO laboratories at Alice Springs. I wish Barney the best of luck: he'll need it! The Newsletter is, I believe, fulfilling some of its purposes but has a long way to go yet before realizing its full potential. This comes back to the standard plea - contribute! RMN is not the private preserve of the editor: it is a means for informal but wide-circulating communication within the Society. Comments, arguments, news and views are all welcome, but have been getting progressively slower in coming. Not only would more activity from members improve the scope, quality and interest of RMN, but also it would stop eruption of editors' ulcers as inexorable deadlines approach but the mail-box remains empty.

So, bear a thought for the health of the Society (and Barney Foran), resurrect your writing materials and send a contribution for the next issue to:

The Editor, Range Management Newsletter
Mr B.D. Foran,
CSIRO Central Australian Laboratory,
P.O. Box 2111,
ALICE SPRINGS, N.T. 5750

TIM FATCHEN
(Editor, Rtd.)

Deadline for next issue: June 30, 1980

AUSTRALIAN RANGELAND SOCIETY

BROKEN HILL BRANCH

COMING ACTIVITIES

The next function of the Branch is a seminar on the control of woody weeds, to be held in Broken Hill on Thursday, May 29, 1980.

The seminar will cover the major woody weeds in the West Darling, including hopbush, turpentine, and punty bush as well as various native fuchsias, sandhill and prickly wattle, boxthorn and mallee, which are all a problem in localised areas.

In recent years there has been considerable research into the control of many of these species by goats, fire and chemicals. Goats have not been successful, but fire has shown considerable promise and large scale paddock burns have been made. A new chemical has also given excellent results on all woody shrubs and trees (even mallee!). It is safe and easy to use and relatively inexpensive, so appears to have a definite place in shrub control.

The programme includes speakers involved in this research, as well as graziers who have suffered the woody weed problem. Chairman is Western Lands Commissioner, Mr R.W. Condon. The emphasis will be on "practical" aspects of the shrub problem and available control methods, and the day will not be too scientific.

SEMINAR ON PRACTICAL SCRUB CONTROL

MAY 29, 1980, BROKEN HILL CIVIC CENTRE, MAIN HALL

Chairman - R.W. Condon, Western Lands Commissioner

9.30 am	Welcoming remarks - R.W. Condon
9.35 am	Introduction - Historical and Ecological Aspects of Scrub Invasion in Western N.S.W. G. Harrington, C.S.I.R.O., Deniliquin
9.45 am	The Scrub Problem in the Western Division of N.S.W. P. Barker and C. Booth, Soil Conservation Service of N.S.W., Bourke
10.30 am	Morning tea
11.00 am	The Impact and Control of Scrub in the Scotia Country. G. Rodda "Nagaella" and N. Scadding "Belvedere"
	The Impact of Scrub Invasion on the Pastoral Industry in the Wanaaring District. R.J. Jackson "Nantilla"
12.00	Chemical Control of Scrub and Timber B.M. Alchin, Western Lands Commission, Sydney and C.K. Proude, Du Pont Limited, Sydney
12.45 pm	Lunch
2.15 pm	The Use of Fire to Control Scrub and Timber G. Harrington and J.C. Noble, C.S.I.R.O. Deniliquin, and P.J. Walker, Soul Conservation Service of N.S.W., Cobar
3.15 pm	Afternoon tea
3.45 pm	Review. A.D. Wilson, C.S.I.R.O., Deniliquin
4.00 pm	Closing Remarks - R.W. Condon

FIELD TRIP

The Western Lands Commission has established field trials, using chemical control, on Thorndale Station. For those who are interested there will be an inspection on Friday morning, May 30th.

Depart	:	9.00 am State Office Block, 32 Sulphide Street
Return	:	11.30 am (approximately)
Leader	:	B.M.Alchin, Western Lands Commission, Sydney
Transport	:	Private vehicles

XIV INTERNATIONAL GRASSLAND CONGRESS

The XIV International Grassland Congress will be held from June 15th-24th, 1981, at the University of Kentucky, Lexington, U.S.A.

Submission of scientific papers are now invited for the following sections:

i. *Plant Introduction, Evaluation and Breeding for Production, Quality and Utilization.*

ii. *Seed Production and Dissemination*

iii. *Soil Fertility and Plant Nutrition*

iv. *The Nitrogen Cycle in Grasslands*

v. *Multiple Use of Grassland Resources*

vi. *Physiological Processes in Plants*

vii. *Grassland Ecology*

viii. *New Evaluation Techniques for Pasture, Natural Grassland, and Conserved Forage*

ix. *Management of Grazed and Conserved Forages for Improved Yield, Quality and Persistence*

x. *Mechanization and Treatment During Harvest, Processing, and Storage for Improved Forage Quality and Yield*

xi. *Utilization of Pasture, Natural Grassland, and Conserved Forage in Animal Production*

xii. *Grassland Agriculture in Tropical Regions*

xiii. *Transfer of Grassland Research Findings to Farm and Ranch Practice*

xiv. *Socio-Economic Aspects of Grassland Systems and Policies*

Deadline for submission of summaries no more than 500 words is the 1st May, 1980. A strong scientific contribution from Australian, New Zealand, and Asian scientists to the Congress is hoped for.

Four pre-Congress tours are planned:

1. North-eastern U.S.A. and Ontario, Canada

2. South-eastern U.S.A.

3. Tropical (Miami)

4. Great Plains

There are to be post-Congress tours:

5. Upper mid-west

6. Pacific Coast

7. Rocky Mountain

Enquiries might be directed to the XIV International Grassland Congress, Agricultural Sciences Centre, University of Kentucky, Lexington, Kentucky, 40546, U.S.A. or to the Australian representative, Dr L.R. Humphreys, Department of Agriculture, University of Queensland, St Lucia, Qld. 4067.

NATURE CONSERVATION AND THE AUSTRALIAN RANGELAND SOCIETY

From: P.A. Keane, 12/6 Bellevue St., Fairlight, N.S.W., 2094.

I read with interest the President's remarks (Newsletter 79/4) concerning the Society's objectives and alternative land uses.

The land use "interest" about which I would like to comment is nature conservation.

James Vickery appears to be correct when he suggests that the pastoral industry is mainly involved in the Society. However, a scan of membership may find that other interests are represented, even though they are not making their presence felt. This, I feel, should be rectified.

It is pleasing to note that Mr Vickery considers, or at least appears to consider, that fauna and flora habitat conservation is a valid land use of rangelands. Perhaps somewhat cynically one could comment that some pastoralists are sympathetic, but this sympathy tends to become more apparent during droughts or times of financial difficulties, when the appropriate Government agency responsible for nature conservation may be considered a possible purchaser.

The aims of nature conservation in regard to selecting suitable areas are similar in both arid and humid zones. These aims are:

1. to conserve representative samples of vegetation communities, with duplication of the samples, preferably over their geographic range;
2. to conserve adequately the habitat of our native animals.

The two aims obviously can often complement each other, but it must be recognized that this is not always so.

Other objectives or aims (not exhaustive) concern the conservation of areas with archaeological, historical, geological, geomorphological, scenic and recreational values. All of these, too, are often complementary to the two main aims.

What does the future hold for the expansion of nature conservation areas? Growing energy costs, indeed cost rises generally may mean a fall in the profitability of the pastoral industry; but perhaps this will be balanced by recognition of the value of natural fibres and the development and use of alternative energy sources. If the first assumption proves correct, there will tend to be a gradual increase in land used solely for nature conservation.

Any increase in land used for nature conservation will be carefully planned and it will be based on the total natural resources of the rangelands with the two main aims in mind. However, the pastoral industry will always dominate the scene - it is to be hoped that the pastoralists will fully accept this alternative land use.

One final comment concerning a Government agency dealing with all rangeland land uses: this could be made to work, but would not very dominance of the pastoralist ensure that other land uses, against which Mr Vickery admits there is often conflict, lead to these uses being poorly catered for?

PERENNIAL SALTBUSH KILLED BY DROUGHT

From: Roger Stanley, Soil Conservation Service of N.S.W.
P.O. Box 459, Broken Hill, 2880

Westoby and Rice reported the death of Atriplex vesicaria during drought at Fowlers Gap (RMN 79/3), and in the following issue Silcock suggested that insects could be responsible.

While I have no proof to the contrary, I doubt that this is so. In January I had the opportunity to look at some areas of dead bush on the station. As Estoby and Rice suggested the deaths are mainly confined to the one ecotype and to clay soils in gilgai or on flats.

These would normally be considered favoured sites, as in average seasons or better they receive run-on water in addition to the rain that falls directly on them. However as the soils have finer textures than other soils on the station supporting bush, they require more water to maintain growth. During the drought it is unlikely that the gilgaiand flats received any run-on, so that while the rain that fell was sufficient to keep bush alive on the coarser soils, it was insufficient for the bushes on the clays.

Westoby and Rice said that their data did not show up any effects due to grazing, but from what I saw I cannot agree. Around Bald Hills trough, Sandstone Tank and Johnstones Tank there appeared to be more dead bush than in other areas. Although the amount of dead stick left on the bushes suggests that grazing was not heavy, it seems to have been sufficient to magnify the effects of the drought. Further evidence of this comes from the fact that bush growing on the stony inter-gilgai areas around these waters has also died, but has survived in less heavily grazed areas.

An interesting complication to this story is provided by happenings in a small exclosure quite near Sandstone Tank. In this exclosure bush in the gilgai is quite healthy while all the bush outside is dead. It is probable that heavy grazing around the exclosure resulted in some run-off during the drought and this provided sufficient increased moisture to keep the bush inside the exclosure alive.

Similar drought-induced death of saltbush in gilgai has occurred just to the south of Fowlers Gap Station.

MORE ON SHRUB AND TREE DEATHS

From: Margaret Friedel and Graham Griffin, C.S.I.R.O., Division of Land Resources Management, Alice Springs N.T. 5750

Shrub death in dry seasons has been discussed in the last two newsletters (RMN 79/3, 79/4) and Richard Silcock has suggested that the death of trees and shrubs may be due to insect attack. There are a number of reports of woody plants under stress which succumb to insect damage e.g., saltbush in S.A., attacked by borers following drought or overgrazing (Ratcliffe 1936, CSIRO, p.20); mulga in the west Darling region, attached by root borers in drought and old age (Condon 1949, J. Soil Cons. Serv. N.S.W. 5, 7 - 14); *Callitris* spp. in N.S.W., attacked by borers after fire damage (Hadlington and Gardner 1959, Proc. Linn. Soc. N.S.W. 84, 325 - 30), and eucalypts in the A.C.T., and Monaro region, infested with borers and defoliating insects after drought (Pook, Costin and Moore 1966, Aust. J. Bot. 14, 257 - 67). The C.S.I.R.O., publication "Insects of Australia" (1970) reports that the activities of the Bostrychidae (borers) are limited to moribund or freshly felled trees (p. 576) and that the eggs of the Cerambycidae (longhorn beetles) are usually laid in dead or dying trees (p.609). In other words, insect infestations appear to aggravate the unhealthy condition of trees and shrubs already under stress.

One of us (G.G.) has made careful observations in insect activity in the mulga of central Australia during the last five years of high rainfall and has not found many of the common borers at work in healthy trees. Even mulga trees under severe stress after fire have not been widely affected. However, the standing trunks of old dead mulga commonly have been channelled by borers prior to death. This suggests that these trees were, like the examples given above, under stress caused most likely by drought rather than fire, and that insect activity contributed to their loss. In our opinion, insects are often not the direct cause of tree and shrub death; rather, they attack weakened individuals and hasten their deterioration.

KANGAROO MANAGEMENT IN THE PASTORAL AREAS OF SOUTH AUSTRALIA

ADDRESS TO THE S.A. BRANCH, A.R.S., JANUARY 1980

Speaker: L.B. Delroy, Senior Wildlife Officer, S.A. National Parks and Wildlife Service.

Origins

It is generally thought that kangaroo numbers in the pastoral areas were much lower prior to the colonisation of South Australia by European man than they are now. The eradication of the dingo, provision of water and establishment of pastures have all favoured the kangaroo. This increase has been recorded in recent times with the establishment of new stations such as Commonwealth Hill where kangaroo numbers have increased dramatically while lands remaining outside of the Dog Fence support a much lower population of kangaroos.

Before the formation of the National Parks and Wildlife Division of the Department for the Environment in 1972, the Fauna Conservation Department controlled the taking of kangaroos by issuing permits to property owners. However, it is now recognised that those controls were generally ineffective. Permit numbers were not based on sound criteria and the control of the numbers taken was totally ineffective because it was impractical to supervise the commercial operation. The Fisheries and Fauna Conservation Department recognised the inadequacies, and on Kangaroo Island where there was particular concern for the harvesting of the island kangaroos for craybait, a sealed tag was introduced which effectively controlled the numbers taken. This tag was taken to the Fauna Authorities Conference and was adopted by New South Wales as the means of controlling numbers taken in that state. New South Wales improved the tag using plastic in lieu of metal.

Early Surveys

With the formation of the National Parks and Wildlife Service in 1972, the new Department recognised the fact that the kangaroo industry could not be effectively managed without a knowledge of the numbers of kangaroos occurring in the pastoral areas of the State. At the time, the general scientific consensus in Australia was that kangaroos could not be counted and that the overall population could only be monitored for trends but not for actual numbers. However, South Australia persisted with a programme of attempting to count kangaroos and establish surveys using ground counts. Basically this involved counting kangaroos for a specific distance (usually 50m, 100m or 200m) either side of little used tracks or roads in 1 km units between ½ hours before sunrise or 1 hour after sunrise, and for ½ hour before sunset to ½ hour after sunset. Repeated counts indicated that good repeatability of results could be achieved in these specific time zones but counts at night and in the day in particular were less satisfactory.

Dusk counts were found to be less satisfactory than dawn counts and were discontinued during the hotter months while all counts were found to be unsatisfactory during windy, wet or very hot weather. It was shown that it was necessary to carry out at least 150km of survey on a medium sized property for the survey to be considered reasonably precise. Properties were divided into 3 zones, those within 5 km of an effective roo proof fence such as an official Dog Fence, normal areas and areas within 1 km of a watering hole. Surprisingly it was found that the zones within 1km of a watering hole were largely unimportant at least during periods when severe heatwaves were not occurring. (Surveys were not carried out during those periods). Areas adjacent to kangaroo proof fences generally carried a much higher population of kangaroos.

There were a number of difficulties with this type of survey.

1. The relationship between the number counted and the number present could not be effectively determined. It was generally assumed that no more than 2/3rds of the kangaroos would be counted in these surveys so that an additional 50% of the number estimated would need to be added for a true estimate of the number of kangaroos occurring. However, there was no criteria for determining the actual percentage increase which should be made.

2. The survey method was very slow and costly and only a small percentage of properties could be effectively surveyed.

3. There was difficulty in effectively training staff to carry out the survey in an unbiased manner.

Current Surveys

The department arranged with the School of Biological Sciences, Sydney University to carry out a survey of the pastoral areas of the State in August and September 1978, covering the main commercial zone. Sydney University had developed aerial survey techniques which have significant advantages over the ground survey method.

1. It is less expensive

2. The relationship between numbers counted and numbers present can be determined with some degree of reliability. Surveys can be repeated on an identical basis year by year and statistically analysed.

The department now recognises that these surveys are vastly superior in practical terms to the earlier departmental ground surveys, although there is value in the ground surveys to complement the aerial surveys. From a management angle it is essential that the aerial surveys be carried out by professionals who are world-recognised authorities in this field.

Basically the survey results show the number of red and grey kangaroos which are present in 17"zones" covering most the pastoral area. The department considers that the numbers shown to be present in each of these zones is sufficiently accurate for management purposes. From a scientific angle the department uses the results in a method which can be criticised. It calculates the numbers of kangaroos present on each station by relating the area of the property to the area of the zone multiplied by the number present in the zone. In some instances a further correction is made in a largely ad hoc manner to approximately 20% of the properties which are either increased or decreased on information available from Rangers because it is known that some properties carry a higher than average population or lower than average population for the zone. The above calculations are obviously not foolproof but from a practical management point of view they give a better estimate of the population of kangaroos which are present on a property than could be obtained by other available methods.

It is recognised that this method of estimating property numbers can be considerably improved by the use of ground surveys to determine relative carrying capacities between stations within the zone. Permits are issued for 12 monthly periods and this again can be criticised because kangaroos move from one property to another but the department considers that the advantages outweigh the obious error involved. In reality the above errors cancel themselves out. While they are important to an individual property owner they have minimal effect on the overall system.

Permit allocation in relation to population size

The department now relates the permits issued to the State quota. In 1978 surveys indicated that approximately 1 200 000 kangaroos were present in the commercial zone excluding the Flinders Ranges which could not be flown, the Woomera Rocket Range and the area south of the Eyre Highway. It is considered that approximately another 200 000 are present

in these 3 additional areas, making a total of 1 4000 000. The traditional quota of 80 000 was increased to 104 000 in 1979 which represented a harvest of approximately 7% of the kangaroos in the commercial zone. Permits were issued to pastoralists for 10% of the population, approximately 20% did not apply to have their properties harvested and another 10% applied but were unable to obtain harvesters. A further survey in August/September 1979 by Sydney University showed that the kangaroo population had remained almost stationary. There was an increase of 15 000 with a significant increase in the Reds and a decrease in the Greys. It is thought that the severe heatwave of January 1979 was responsible for the decrease in the Grey kangaroo population. It is known the heatwave had a dramatic affect on the Red kangaroo population in some areas of the State such as Mulyungarie Station in the north-east.

In 1980 the quota has been increased from 104 000 to 150 000 with 4 areas of the State being opened up to new as well as eny existing processors to ensure harvesting of properties where property owners seek harvesting.

Although not researched at this stage it is now considered that the kangaroo numbers in South Australia during the past two decades have fluctuated almost entirely due to weather conditions and have not been primarily related to harvesting. It had been presumed in conservation circles and by the department that heavy harvesting in the 60's had been the cause of the decline of the kangaroo population. On the basis of the data presently being gathered from the aerial surveys it is unlikely that the harvesting rate of 80 000 would have seriously affected the population which is reported to have been very high at some stages.

If we look at the management of the kangaroos in the commercial zone in the future, the following factors become apparent:

1. The aerial survey method can establish the size of the kangaroo population sufficiently accurately for effective kangaroo management.

2. Departmental controls can effectively determine where the kangaroos are to be harvested and the numbers to be taken.

The unanswered question is the level at which kangaroos should be harvested.

Level of harvesting and associated problems

Pastoralists have complained that there has been insufficient competition in the industry, that tags should be issued directly to property owners, that the department is unable to estimate the numbers of kangaroos on a property and that property owners have lost the right to shoot kangaroos on their own property. The 1980 Kanagroo Management Programme is expected to ensure reasonable competition amonst the processors. Property owners retain the right to charge for the nomination of a processor and for this reason there would be little advantage to property owners in issuing tags directly to them. Because of the increased competition in 1980 most property owners who strongly wish to harvest their own kangaroos will be able to find a processor who will accept kangaroos on that basis. However, this department does favour professional harvesting of kangaroos as it ensures a humane kill and better quality meat.

The over-riding problem which faces pastoralists, processors and conservationists is the level at which harvesting should be permitted. Most other factors which cause concern have been overcome to a reasonable degree. However, the level at which kangaroos should be harvested is a highly emotional and controversial issue. At present the harvest of 150 000 kangaroos in a population of 1 400 000 represents a cull of 11% of the population.

There is concern by some pastoralists that the present high population level of kangaroos in the pastoral areas is having a detrimental affect on the environment. Coservationists are most concerned that the Department should not risk a high harvesting rate which may jeopardize the overall population in the future. There is an obvious need for much more research to

determine the effect of kangaroos on the environment and the effect on the gene pool of continually taking the biggest (and presumably the best) kangaroos from the population with a high ratio of males. It is essential for scientists, pastoralists and the community to discuss these matters.

The department has traditionally taken a conservative approach to harvesting because it has not had effective data available to it about kangaroo populations. With this data becoming available it has moved from a traditional harvest of 80 000 to 150 000 (subject to commonwealth approval) but it considers its primary responsibility is for the conservation of the population. It cannot afford to risk over-harvesting and risk the survival of the kangaroo populations in the wild. Property owners are very often concerned that the departmental policy does not take into account the very high level of damage that is caused by the present level of kangaroo populations throughout the commercial zone.

In this discussion it is not possible to foreshadow the long-term future of kangaroo management in the pastoral areas other than to say that the level of harvesting and the method by which the harvest is made are critical factors for future consideration. Issues such as whether the tags should be issued directly to property owners and competition within the processing industry are not the central problems although they may be important. It is necessary that all concerned recognise this situation and that future management be directed towards effectively conserving the overall population at an acceptable level which will maintain the viability of the population and its gene pool in perpetuity.

SUBSCRIPTIONS

Subscriptions to the society in 1980 have been raised to $20 for Australian subscribers and to $25 for overseas subscribers. The rise in fees is to cover increased costs of printing, branch subsidies, honorariums and auditing.

Members of the society are reminded that subscriptions fall due on January 1st and must be in by the 31st March to ensure continued membership. Those who have not paid their '79 subscription are reminded that they should forward $16 for '79 and $20 for '80, a total of $36. To facilitate payment of subscriptions there is provided at the end of the newsletter, a form to include with your remittance.

The financial health of the society is dependent upon prompt payment of subscriptions. DO IT NOW!

KANGAROOS

The above address on a most controversial issue has been published in full as it replies to many of the points and criticisms by graziers made in these pages. Inevitably, it will stir the wallaby stew once more, but I would ask that responses to it be cool and rational. Everyone within the kangaroo conflict must, sooner or later, accept that the various other groups involved also have valid viewpoints, and that the work of government instrumentalities trying to manage the species is only made more difficult by the polarisation that currently exists. Mr Delroy's address presents an honest, warts-and-all, view of South Australian activity, and I am most grateful for permission to publish it. (Ed.)

Date:

To: K. Casperson,
Hon. Treasurer,
Australian Rangeland Society
Box 667, G.P.O.
ADELAIDE, S.A. 5001

PRINT CLEARLY

Name: Dr/Mr/Mrs/Miss/Ms _____

Surname Given Name(s)

Address: _____

_____ Postcode: _____

Remittance:	1979	$16	_____
	1980 Australian	$20	_____
	Overseas	$25	_____
	TOTAL		_____

Receipts are usually not issued unless requested.