



The Australian Rangeland Society

RANGE MANAGEMENT NEWSLETTER

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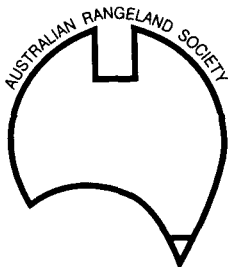
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FROM THE EDITOR

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

Welcome to the next issue of the *Range Management Newsletter* which, as usual, has a good diversity of articles. WEST 2000 has now been launched and Steve Orr tells us what this major strategy initiative hopes to achieve in western New South Wales. Bob Winkworth has been working on some of his data from days gone by in Alice Springs and in a major contribution, he describes past research activity to improve the pastoral productivity of spinifex country - and how the efforts of his team were affected by a major drought in the 1960's. Before asking "Why attempt to improve spinifex country?", we must appreciate that Bob's research was at the vanguard of rangeland research in Australia and that rangeland production was pre-eminent at that time. Despite their failure to convert the deserts to a cattleman's paradise, Bob and his team did capture valuable information about how various spinifex species respond to disturbance - be it fire, mechanical clearing or drought. Continuing with a research theme, Margaret Friedel describes collaborative research underway in the North East

Goldfields region of Western Australia to involve the community in decisions about future rangeland uses. In a separate article, David Tongway tells us about past and present CSIRO research focussed on desertification.

Moving away from rangelands research, Shona Whitfield and I describe the activities of the Australian Trust for Conservation Volunteers (ATCV) in the Northern Territory. This group has made an important contribution to improving both the environment and environmental awareness in several parts of the NT. ATCV is currently managing the Green Corps program, a major Commonwealth initiative to encourage young Australians to obtain training in, and work experience with, environmental issues.

As well as the above feature articles, we have news about past meetings, a report on an ARS travel grant and reports from the annual general meeting. Please take some time to read the various contributions in this newsletter. As usual, feel free to respond with any comments you may have and keep your contributions coming. My deadline for the next *Range Management Newsletter* is the end of October.

REMINDER

10TH BIENNIAL CONFERENCE

HAVE YOU REGISTERED YET???

THE DEADLINE FOR RECEIPT OF ABSTRACTS

29 August, 1997

Early bird Registration payments received by
31 October 1997 attract a 10% discount

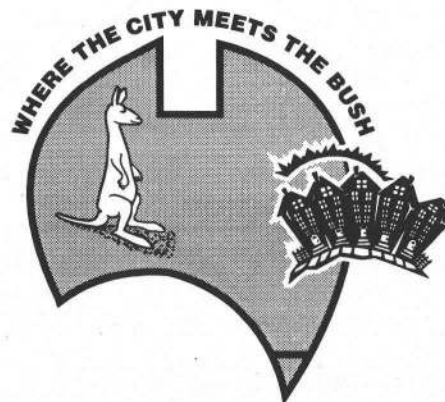
PROGRAM

- **One day SYMPOSIUM** (2ND December 1997)
*"Where the City meets the Bush:
the importance of effective communication";*
- **Two day CONFERENCE** (3rd, 4th December 1997)
on general rangeland issues

If interested please send for your 2nd Circular

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WEST 2000

An Integrated Regional Adjustment and Recovery Program for the Western Division of NSW

Steve Orr, WEST 2000 Executive Officer, c/- Dept. Land and Water Conservation, 45 Wingewarra St., Dubbo NSW 2830

Ed. WEST (Working for Equity and Sustainability Together) 2000 was outlined by Geoff Wise in RMN 95/3 (p. 10). Now that the strategy has been launched, Steve provides us with more specific information in this article.

Background

Following several years of negotiation, WEST 2000 reached a significant milestone on the 21st of February 1997 with the signing of a Memorandum of Understanding.

This agreement was signed by Rory Treweek, a landholder representing the WEST 2000 Management Board; Minister Yeadon, Minister for Land and Water Conservation, representing the NSW Government; and Minister John Anderson, Minister for Primary Industries and Energy, representing the Commonwealth Government.

Importantly the Memorandum of Understanding secures \$17.5 million of government funding over the next three years and is the culmination of several years hard work by Western Division landholders and the State and Commonwealth Governments.

WEST 2000 is a voluntary program for landholders in the Western Division and includes a range of measures to assist landholders improve the productivity of their enterprises or to assist those landholders who have taken the decision to leave the grazing industry.

To ensure that the program remains relevant to the needs of landholders, a management board has been appointed to implement WEST 2000. The twelve member board is made up of eight landholders and four state government agency delegates. Landholder representatives have been nominated from existing landholder organisations within the Western Division. The Board is chaired by Geoff Wise who is the Western Lands Commissioner and also the Regional Director of Land and Water Conservation. Other agencies represented are NSW Agriculture, Rural Assistance Authority and the National Parks and Wildlife Service.

The Board retains some autonomy to make changes to WEST 2000 over time and provides a mechanism for landholder feedback on the program. The key role of the Board is to make policy decisions on WEST 2000, which include, program objectives, eligibility criteria, evaluation processes and program administration. Decisions as to who receives support are not made by the Board but by other organisations based on the criteria set down by the Board.

What Does WEST 2000 Offer

At the time of writing this, the details of all WEST 2000 measures were not available. Outlined below are the measures to be offered and their state of development.

Interest rate subsidies

An interest rate subsidy is provided to encourage property build up and productivity improvement. The subsidy is

available over a five year period on new borrowings for activities which occur after the 21st February 1997. The total amount which can be received is \$150,000 and no greater than 80% of the interest is payable in any one year. Importantly, successful applicants can negotiate with the NSW Rural Assistance Authority as to how they would like to receive the subsidy within the above parameters.

Re-establishment grants

For those landholders who have taken the decision to leave the industry WEST 2000 provides a grant of up to \$75,000 subject to an assets test of \$75,000. Once an applicant's assets exceed \$75,000 the grant reduces by one dollar for each additional two dollars of assets.

Cap and pipe the bores

WEST 2000 provides a grant of up to 40% of the cost of piping an artesian bore. For piping associated with a bore trust, the total amount which is available is \$160,000 or 40% of the cost of piping, whichever is the lesser amount. For individuals who are not part of a bore trust, the total amount of funding which can be received is \$120,000 or 40% of the cost of piping - again whichever is the lesser. This subsidy, when combined with current programs such as the Drought Regional Initiative, means that landholders could receive a grant of up to 80% of the cost of capping and piping an artesian bore.

Woody weed and rabbit control

A range of programs will be funded which include the development of regional approaches for woody weed control, the conduct of field days and seminars, the development of appropriate cost-sharing and the provision of grants for on-ground works for woody weed and rabbit control.

Training and education

This part of the program still needs further development. However, the intent of the WEST 2000 Management Board is to provide training and information courses which are relevant to the needs of landholders and are delivered efficiently and effectively.

Alternative industries

Funding will be provided for the employment of Alternative Industry Officers to assist landholders with their alternative industry aspirations. Officers will be employed to conduct field days, seminars, provide direct advice and assist landholders to deal with significant obstacles in developing their industry.

Institutional reform

There are many government Acts, regulations, policies and processes which affect landholders in the Western Division. WEST 2000 will provide funding to undertake a review to identify significant impediments and make recommendations on how the situation can be improved.

Conclusion

While the \$17.5 million is a significant amount of money, it is important to keep this amount in context with the size of the Western Division, which occupies 42% of NSW, and the nature of the issues within the vast region. WEST 2000 cannot be everything to everyone but rather, it should offer something to most Western Division landholders,

CAN DESERT COUNTRY BE MADE INTO CATTLE COUNTRY?

Bob Winkworth, 28 Dalhousie St., Haberfield NSW 2045

This article describes research in the Alice Springs District in the 1950's and 60's which aimed to look at the prospects for pastorally improving desert country, i.e. the large expanses of hummock grasslands characterised by spinifex grasses and red sandy soils, deemed to be unable of supporting cattle breeding on their own.

How It Came About

I was appointed by CSIRO as the resident ecologist in Alice Springs in 1953. I began work in the spinifex and mulga country north of the town and on the fertile alluvial plain of the Todd River to the south. By 1957, a Canberra-based CSIRO team had completed the field work of their land system mapping throughout the district. Around the same time, geographical surveying by the Northern Territory Administration (NTA) had defined the boundaries of most pastoral properties so that it was then possible to describe and measure the area of different rangeland types within 76 stations. Sixty-two pastoral properties contained desert country which, on 55 stations, comprised more than a quarter of their area. Not surprisingly, some thought turned to grazing the desert which was largely unused.

The NTA arranged for permanent watering points (bores with windmills etc.) to be established at numerous locations in the spinifex country as part of a perceived role to supply reserve pasturage in times of drought. Also, in 1956, they began a study of continuous grazing of the desert by fencing cattle into a 128 sq. km paddock centred on one of the drought bores. They found that steers could actually grow on a diet of about 90% oat-top spinifex (*Triodia basedowii*) and 10% topfeed, but when the steers were replaced with breeders, cows, bulls and calves lost weight, mortalities mounted and the herd was removed (NTA 1957-65).

The author, anxious to adapt his meagre southern ecological experience to the arid Centralian lands, found himself making agronomic sorties to the prickly pastures - trying to replace spinifex in whole or in part with more palatable perennial grasses. Sadly, or gladly, no formula was found for a georgic conversion of desert to meadowy fields of bovine delight. This failure was mentioned in the CSIRO description of land systems (Perry 1962), perhaps a suitable burial place at the time. Now upon reflection, the story deserves telling to the wider audience interested in the environmental impact of land use on their welfare in the rangelands. Moreover, circumstances described further on in this article led us to make periodic appraisals over 17 years of the fate of the spinifex communities which we had mutilated on experimental plots and also those on untreated plots brought near to death by a drought which afflicted the whole district. The anticipation to pen a sequel called, maybe, "spinifex strikes back" was almost irresistible.

The Basis for a Plan

What did we know back then to plan for "pasture improvement" in terms of clearing vegetation, top-dressing and seeding? We saw central Australia as a sea of sand, composed of distinct dunefields and sandplains, through which protrude large and small islands of mountains, hills, valleys and plains of many sorts and combinations (Fig. 1). The "island" landforms were, and still are, the core of cattle production on the pastoral properties. Beyond the sweeps of desert captured within their boundaries lay the vast wilderness of the Simpson, Gibson and Tanami deserts.

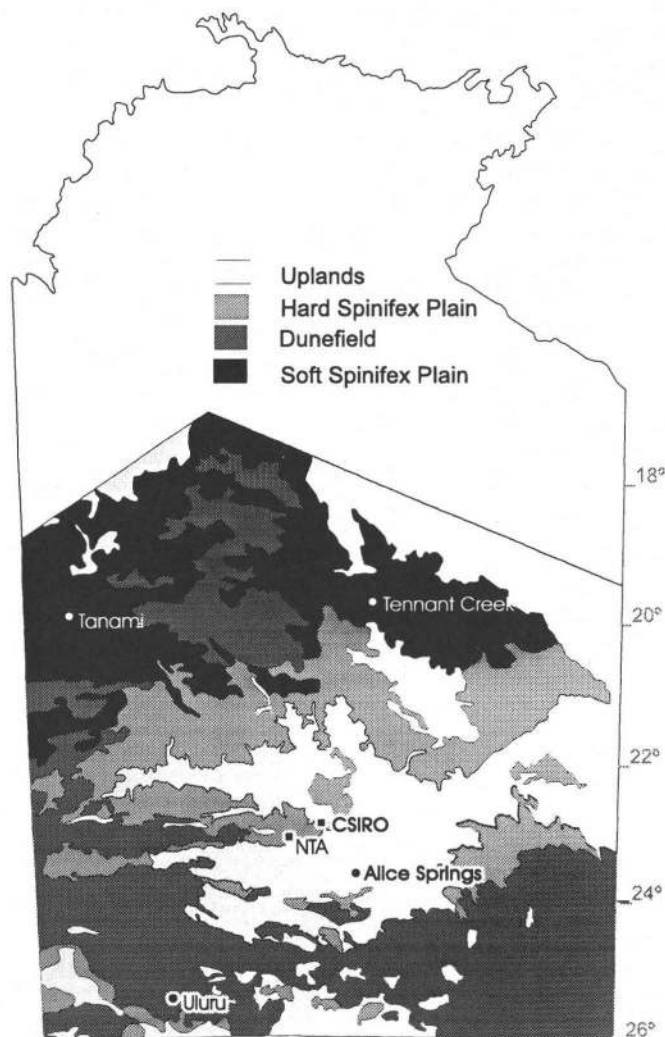


Figure 1. Desert country surrounding other rangeland types in the southern half of the Northern Territory (adapted from Perry 1960). The location of our experiment is indicated by 'CSIRO' while 'NTA' marks where the Northern Territory Administration desert grazing study was conducted.

Dunefields contain large parallel, or sometimes irregular, dunes. These dunes are difficult to traverse making cattle management very difficult and detracting from any on-ground cultural operations. These were reasons sufficient for us to defer work in this habitat.

The flat sandplains are tantalisingly traversable with views stretching to grass-top horizons interrupted only by a sprinkling of shrubs and occasional trees. They have good ground cover (up to 40% of the surface) of soft spinifex (*Triodia pungens*) mostly north of latitude 20°, feathertop spinifex (*T. schinzii*) north of lat. 22° and oat-top spinifex (*T. basedowii*) in the south. These grasses have tough, pungent pointed leaves concentrated at the periphery of the plants which roll shut and persist on the culms throughout dry periods. Soft spinifex, the least lignified species, may be grazed persistently by cattle where near a permanent source of water. Both species of hard spinifex (*T. schinzii* and *T. basedowii*), of which oat-top is the most repugnant to cattle, are eaten when no other pasture remains within walking reach of water.

Three sets of field observations guided the needs and choices of low-cost cultivation and fertiliser application.

1. Spinifex dominates the plant communities, other species contributing only a few percent to the total quantity of vegetation, except after fire. Rain on recently burnt areas promotes a temporary increase in the abundance of annuals and herbaceous perennials, often to many times their pre-burn amounts of growth. This preponderance wanes as spinifex grows back to dominance. Fires are ubiquitous in this vegetation; the 1950 Australian Survey Airphotos showed everywhere distinct patterns determined by regrowth since the fire occurred. Areas of soft spinifex were intentionally burned by graziers to replace the repulsively resinous older foliage with new growth which is more palatable to cattle. After fire, hard spinifex grows new shoots of the usual "bundle of wooden knitting needles" variety. Our impression was that spinifex plants, by keeping their basal meristems safely sand-bagged under hummocks, remained the master of fire. Cultivation would be needed to kill off buried buds and so reduce spinifex's dominance over other species.
2. The extreme sandiness and flatness of the sandplains is inimical to having patches of more lush vegetation, as occur in channels and hollows which collect runoff in uneven landscapes. However, shallow sheet runoff seen during heavy falls of rain suggested that moisture-enhanced locations might be created by collecting water in ploughed furrows; their steeper banks also might induce runoff from rainfall of lesser intensity and duration.
3. Nutrients for plant growth were thought to be in short supply; soil samples of the sandplain margin of the Simpson Desert were reported by Crocker (1946) to have N and P contents of 0.02% and 0.01% or less respectively. Such low nutrient capital could mean that the indigenous communities depend on nutrient recycling for their maintenance. An introduced pasture, of necessity more productive and nutritious to cattle will need added nutrients - at least to begin with.

How We Set Up Our Experiment

A five ha site (location shown in Fig. 1) was protected from wildfire with a graded firebreak. At the time we started, the ground cover¹ (*Ed. see end note 1*) of spinifex varied from 35% to 37% for oat-top and 1-5% for feathertop; other plants covered less than 1% and litter 3%. The soil was a red sand,

more coarse than fine, with 10% clay to a depth of 1.2 m, then clay increasing to 20% down to 1.5 m where root penetration ended and substrata were encountered. A large soil pit showed spinifex roots were spread throughout the soil between and below the hummocks to a depth of 1.5 m. The soil's capacity for holding water available to plants was about 4 ml per 100 g of dry soil, so that each 10 mm of rain would wet the soil a depth of 10-12 cm. Total N and P contents were around 0.02% and 0.01% respectively. Exploratory trials growing annuals in this soil in fully watered pots gave yields an order of magnitude less than those grown in soil with added N and P (with belated thanks to local children who brought us empty fruit tins to use as the "pots" - peaches were the favourite).

Different plots of 400 sq. m within the five ha site were:

- ploughed,
- burned,
- burned and ploughed,
- scraped and plant debris left *in situ*,
- scraped and cleared away,
- furrowed at 5 m intervals,
- burned and furrowed, or
- left untreated.

Comments on cultivation methods appear later. Superphosphate (at 124 kg/ha) and ammonium sulphate (at 62 kg/ha) were spread over half of each plot. Half of each half-plot was sown with mixed spikelets of buffel grass (*Cenchrus ciliaris*) and woollybutt (*Eragrostis eriopoda*) at rates of 6 and 1 kg/ha respectively. Seed was broadcast and raked in. Sets of plots were prepared and sown this way in May and November 1958 and February 1959.

Buffel grass was chosen as a possible exotic species to replace spinifex because it had become naturalised in many locations in Australian rangelands and experimental sowings were currently underway on various eroded lands in Western Australia, on cleared land in Queensland and on both sorts near Alice Springs. All of our sowings were problematical as there were very few reports of successful sowings outside the wet tropics. Woollybutt is a tussock grass of the mulga country where it forms extensive swards. It is also a sparse component of the desert country. In mulga country, it has a root system as extensive as that previously described for spinifex. Both species are tussock grasses which shed inflorescences and leaves bit by bit during a dry time, leaving bare culms standing above debris collected around the base.

Fate of the Sowings

Buffel grass

Seventy-two millimetres of rain fell in May 1958 (Fig. 2) right after sowing and buffel grass seedlings emerged (Fig. 3). A rainfall of 62 mm after the November sowing did not produce any seedlings but 53 mm next May caused emergence from this seed as well as that sown in the preceding February. Seedlings grew slowly and produced two to four leaves before dying; all were dead by June 1960 and no more ever appeared.

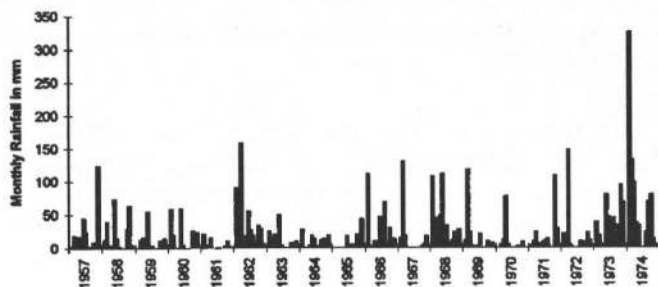


Figure 2. Pluviometer recordings of monthly rainfall at the CSIRO Experimental Desert Site.

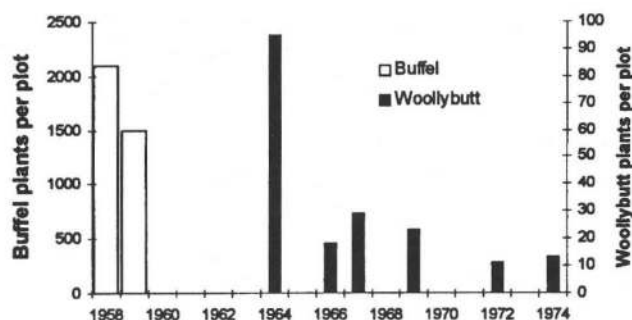


Figure 3. Counts of new seedlings of buffel grass and total number of plants of woollybutt.

The failure of young plants to establish was clear though reasons for this were not. Consider, for example, that rain on the three occasions mentioned above and twice again in 1960 was enough to wet the soil each time for two to three months growth and that the fate of buffel was the same on plots given fertiliser or not. Was it possible that the top-dressing had not been leached to the roots and/or that ammonia had volatilised or not been nitrified? Competition from spinifex, despite its massive root distribution, seemed unlikely at the time since its density was less than one tiller per square metre and was also unlikely from other plants emerging after rain as they were small and as sparsely spread as the buffel seedlings.

Despite these setbacks, we persevered. A further experiment was set up in 1960 at the same site on another cleared block where multiple rows of buffel and a dozen other foreign grasses were sown. The rows were actually furrows to enable light irrigation with fine sprays. We watered often enough to keep the topsoil moist at all times; three times a day for example when sown in late summer. An initial top-dressing of fertiliser (including nitrate-N) was followed by a second after seedling emergence. Watering stopped a month after sowing at which time the soil was saturated to a depth of 1 m. Available soil moisture was supplemented with 58 mm of rain in May 1960. As before, plants made very little growth before dying in the moist soil. If the uptake of nutrients was still a problem, then some soil-plant interaction other than supply seemed to be involved.

What is the aversion of buffel grass, and other species tried here, to growing in the acidic siliceous spinifex soils? Complete failures also occurred in mulga country on soils of this nature,

though containing more clay. By contrast, a trial conducted on the Todd River alluvium south of Alice Springs gave magnificent growth and plants persisted for years.

Woollybutt

Woollybutt seedlings first appeared in 1963, five years after sowing. This germination followed a winter rain - although soil moisture from rain in the previous summer may also have contributed to their emergence. These seedlings were counted in 1964 (Fig. 3). Presumably the seed, harvested in 1958, had lain dormant through previous rainfalls when other things germinated. Subsequent counts revealed mortalities over time plus more germination in 1967 and 1974. In 1974 the woollybutt plants were still very small and contributed only 0.2% ground cover to the community total of 40%; an insignificant degree of change in the perennial grass composition. One could speculate whether more woollybutt would have grown had spinifex regrowth somehow been minimised and if seed with a higher percentage of germinability had been sown at a much higher rate.

Clearing spinifex

Fire is a less costly method of clearing than using machinery. However, some form of mechanical treatment was thought necessary to damage the growing points left alive in the hummocks after fire. Ploughing and scraping were meant to do this in a one-pass operation. We were conscious at the time that our techniques may have been a bit feeble as the only tractor available was underpowered and the plough very lightweight - Alice Springs had yet to see big farm machinery. Even with weights and bodies added to the plough, we only managed to leave chunks of spinifex neatly sticking out of the soil. When many of these pieces began to grow soon after rain, we knew we had, in effect, replanted the plots with their indigenous species. Scraping, done by hand with square-mouth shovels, was supposed to simulate a powered steel blade such as that of a road grader. However, our efforts in achieving longer term removal of spinifex were to be seen later as very much less effective than the graded firebreaks.

Counts of living tillers after the rains of 1958 and 1959 (Fig. 4) showed that:

- regrowth was off and running despite our efforts,
- differences between the cultivation methods were slight except for the head start given to the "ploughing without burning" treatment, and
- ploughing after burning did not reduce tiller production more than burning only.

Ploughing reduced plant ground cover to 7% (Fig. 5). Methods involving burning and scraping all lowered it to 1% and, since there were no apparent differences between them, the results are lumped together here. Forming furrows did not discernibly improve the germination and growth of any species nor did they improve capture of runoff and soil water storage beyond the first rain. These plots were put to use for back-up observations.

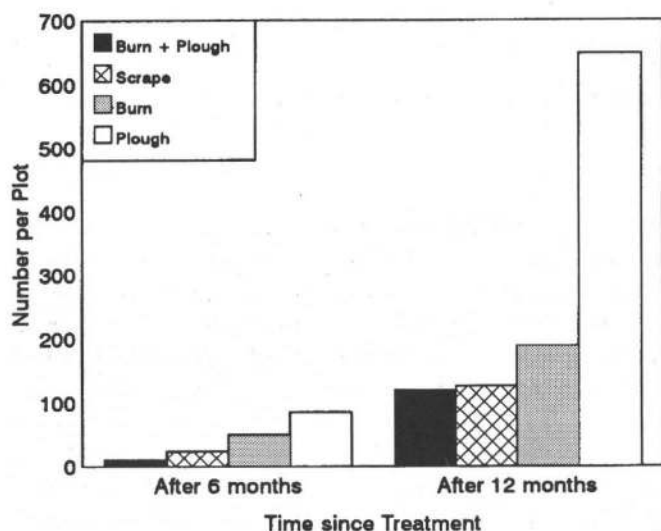


Figure 4. Counts of spinifex tillers six and twelve months after various forms of clearing.

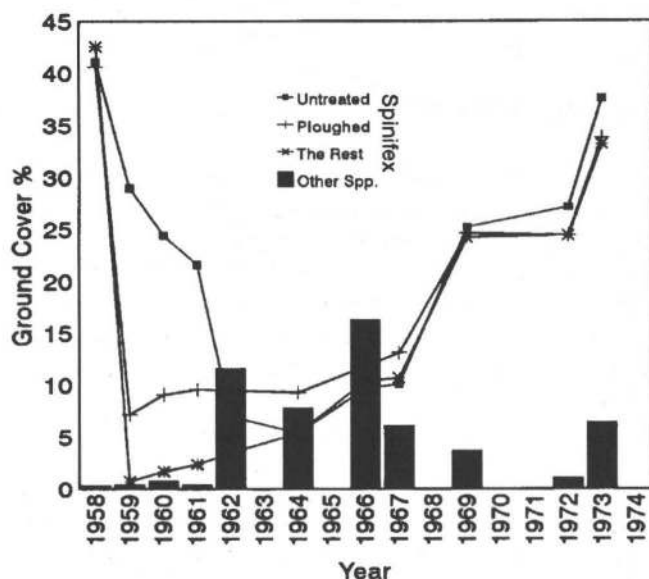


Figure 5. Percentage composition (as measured by ground cover) of spinifex and other species following various clearing treatments.

The Big Drought

We detected dead portions of mature spinifex plants on untreated plots in late 1958. The decline in living material was measured in 1959 (Fig. 5) and then routinely in ensuing years. Spinifex die-off occurred with the death of single branches (one or two on a hummock here, a few on the next one etc.), more and more dying as the months and years passed. Dead shoots were long retained by the plants, at times outnumbering the live ones², and care was needed to distinguish between the two. By 1964, the cover of live spinifex had declined to 5% (Fig. 5) and aerial biomass was reduced from the original 6,300 kg/ha to 800 kg/ha³. Die-off to this degree was seen throughout the desert country (Winkworth 1967). That this die-off was greater and more widespread than the death by drought of perennials in all other rangeland types emphasises

the susceptibility posed by the sandplain habitat to its inhabitants.

Spinifex stopped dying and began to grow in the summer of 1965-66. It continued to grow at rates reflecting the sequence of rainfall, though our inventories were too sporadic to get the details. By 1974, ground cover was 38%, aerial biomass 6,400 kg/ha and the species composition had returned to that present before the drought.

Spinifex regeneration on the cultivated plots (described in the previous section on "clearing") slowed in 1959. The initial advantage given to ploughed plots remained until the drought-breaking rains of 1965-66. At this time, the rate of regrowth shifted into top gear - giving the appearance of the exponential phase of a logistic growth curve.

On all plots, regardless of whether the spinifex was cleared or died because of drought, other species grew in the spaces between the hummocks and then disappeared. The combined cover of these species only ever outweighed that of spinifex after good rain early in spinifex's regeneration phase (Fig. 5). Fire and land disturbance triggered the growth of:

- sub-shrubs, from seeds and dormant underground rhizomes (five species on the plot area), and
- shrubs, from seeds and buds at stem bases (five species).

All woody species gradually dwindled in number over the years. Germination and growth of perennial herbs and grasses (seven species) and annuals (three species) provided flushes of growth after rain throughout the drought and beyond. These shorter-lived species varied in amount and composition according to season and length of growing period. Prominent contributors were kerosene grass (*Aristida holathera*) and the annuals, parakeelya (*Calandrinia balonensis*) and milkweed (*Euphorbia drummondii*).

On all the treated plots spinifex seed germinated in 1958, 1959 and again in 1963 (Fig. 6). All germinations were from the one soil seedbank for there was no flowering from 1957 until 1967. There was no germination after 1963, even following the good rains of 1966, suggesting that the seedbank was then exhausted. On untreated land, seedlings first emerged in 1963 and again in 1966 indicating (i) a seed longevity of no less than eight years and (ii) complete dormancy until 1963. This was also the case for woollybutt. The germination of spinifex before 1963 on treated land raises unanswered questions about:

- loss of seed dormancy being accelerated by fire and mechanical scarification, and
- the possibility of spinifex being allelopathic to its own seed.

Most regeneration of spinifex occurred through tiller growth; seedlings made up no more than 1-2% of the total spinifex at any time after 1966. The small contribution of seedlings could have been related to the drought.

We thought, but could not confirm, that a growth plateau was being approached in spinifex in 1974 before a fire burned the experiment - along with 3,000 sq. km of desert country to the west. So ended our saga of spinifex versus drought

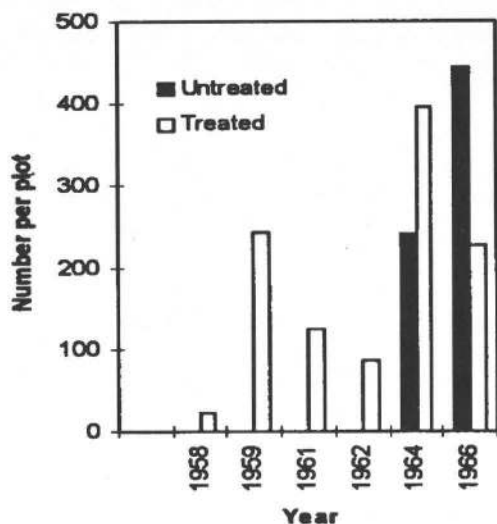


Figure 6. Counts of spinifex seedlings on cleared and non disturbed plots.

Conclusions

The best answer I have to the title question of "can desert country be made into cattle country?" is a gut feeling "no", and then to immediately say that I go along with Damasio (1994), the eminent neuroscientist of Iowa, who believes that "emotion is integral to the process of reasoning".

Range seeding is a high-risk game. World-wide experience gives about a one-in-ten chance of success for sowings made on a broadacre scale. And that figure assumes that ALL failures are known. The local pastoralist cannot invest in this sort of gamble, where costs will be many times greater than an expected annual return - yea even greater than the years in a generation. As with making a good cake where the right ingredients must be properly mixed before baking, so range seeding needs a proven recipe to sow before it rains. And clearly the incidence and amount of rain is very chancy compared to setting the heat of the oven and cooking time. Our work failed to come up with the right ingredients though we suffer no delusion it is the reason for nothing done since. Cattlemen and scientists are cannier than that and there are other ways and other rangelands with better chances to improve the pastoral enterprise. However, our experiments brought into clearer focus the nature of the difficulties associated with attempts to "pasture-ise" desert country and in doing so, lengthened the odds quoted above.

Firstly, the imported homoclimatic buffel and other grasses failed to reach the first hurdle - which is to grow well enough to persist through the first dry spell. The seedlings died with their roots wet, so pointing the finger of blame at soil factors. The attributes "acid" and "siliceous" were singled out though we know not the mechanisms involved. As far as our enquiries went, overseas rangelands are unlikely to offer up a champion pasture plant liking such soils. Presuming something was found to persist, the unmet hurdles still ahead include successful reproduction, competition with other plants (especially spinifex), nutrient cycling via local decomposer organisms, and persistence under grazing, fire and drought.

Secondly, native species endemic to these soils have a head start but remain unproven over the hurdles as pasture swards. Tussock grasses of desert country and mulga lands could be candidates, though they are never seen forming communities of their own. The same is true of browse species of the desert. Unfortunately woollybutt, our sole sward-making representative, was sown in numbers too small to gauge performance. We need to know more about how to grow our native plants. Perhaps we should have taken time out to study woollybutt and got a better stand established, even had we by then surely missed monitoring the drought of the century.

Finally, oat-top spinifex was seen as the plant attuned to the habitat, powerfully regenerating its grassland from seed and undamaged meristems after drought, fire and light cultivation. Its eradication or selective control could be the ultimate stumbling block even were other species successfully established.

Acknowledgments

The "we" of this tale includes with me, at different times, four first-rate and bush-wise technicians; Tig Donellan, Rod Hodder, Bob Millington and Peter Reece.

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End Notes

- ¹ The proportion of ground surface covered by plants was estimated using 800 point quadrats placed at random over each plot.
- ² This was reflected in the small changes in litter cover between 2% and 4% until 1966 when heavy shedding increased it to 13%.
- ³ Determined by double-sampling a set of quadrats for cover and height of spinifex and calculating regressions with weight by harvesting, drying and weighing spinifex from a subset of quadrats.

THE AUSTRALIAN TRUST FOR CONSERVATION VOLUNTEERS

Helping the Environment in the Northern Territory

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Introduction

The Australian Trust for Conservation Volunteers (ATCV) is a volunteer-based, non-profit organisation with the aim of helping to combat some of Australia's land and water degradation problems. It was formed in 1982 by a group of Victorians with a keen interest in the environment and conservation. The idea for its formation came from Tim Cox, a Ballarat farmer, who had visited England and observed the operations of the British Trust for Conservation Volunteers. Tim and the Ballarat group recognised the role that groups of motivated and well-coordinated volunteers could play in helping to combat land degradation in Australia. They saw there was a particular need for this support in the farming community because it did not have the financial support to overcome these problems. A volunteer-based organisation was considered the only solution, but for it to be effective it had to be non-profit and apolitical so that it could work in all areas of the environment.

The ATCV started out by organising volunteers to carry out work in degraded areas of the Ballarat district at minimum cost. Essential costs were recouped through basic charges for operating expenses, in-kind support from the farming community (where possible) and from grants at local, State and federal level. However, it was quickly realised that there was an Australia-wide demand for this type of program.

From this small beginning, ATCV now has a national operation with offices in all States and Territories. Close coordination is maintained with Head Office in Ballarat to ensure a national view is taken of problems identified, and so that consistent problem-solving techniques are employed throughout. Head Office also maintains a database of national activities and provides a centralised accounting service.

Method of Operation

ATCV has reached the stage where it is largely self-funded. The organisation operates on a fee-for-service basis and obtains additional monies from volunteer contributions, government grants and sponsorship for specific projects. Volunteers are asked to contribute to food, travel and accommodation costs and land owners are charged a fee for projects conducted on their land which ensures that there is a commitment to conservation on both sides.

To achieve proper on-ground management, ATCV provides an experienced leader with each volunteer team in the field. These groups are supported with administrative backup to ensure that

both the work and supply of volunteers is achieved with minimal disruption.

Volunteers come from all walks of life and from across all cultural groups; the attraction being hands-on conservation work and the satisfaction that they are helping. Their availability varies from part-time and weekends to full time, often up to six weeks at a time. Teams are frequently multicultural in nature, with volunteers arriving from many parts of the world to join Australians in environmentally-friendly conservation projects. Volunteers are of all ages, abilities and backgrounds. No special skills are required as training and direction are provided on site by qualified and experienced Team Leaders.

With the expertise gained in managing people, ATCV has in recent years been able to play a leading role in many labour market programs; e.g. the former Landcare and Environmental Action Program (LEAP) and is currently managing the environmental program known as Green Corps, a Commonwealth Government initiative for young Australians. ATCV has a broad volunteer base which includes universities via the Campus Conservation Corps and an exchange program covering both conservation and cultural areas with overseas countries.

ATCV's goal is to attract and manage a force of volunteers in practical conservation projects for the betterment of the Australian environment.

ATCV in the Northern Territory

ATCV began operating in the Northern Territory in 1988 when the first teams were sent from Adelaide and Melbourne to undertake projects in the Alice Springs and Kakadu regions. This developed to the stage where the workload was sufficient to allow for a permanent presence and in April 1991 an office was opened in Darwin. Present staffing includes the NT Manager, administrative support, a Volunteer Coordinator, a number of full-time and casual Team Leaders and Green Corps supervisors. Work projects cover the entire Territory and continue throughout the year, apart from a brief slow-down from December to February during the height of the wet season in the Top End and extreme maximum temperatures in central Australia.

ATCV carries out a broad range of activities in the NT rangelands such as harvesting seed of native grasses for revegetation purposes elsewhere, pest control, maintenance work in national parks and flora and fauna surveys. Some of ATCV's more significant contributions to landcare and conservation are described in Table 1. A major activity in recent times has been to assist in constructing the Larapinta Trail. In the following section, we draw on publicity from the NT Parks and Wildlife Commission (*The Larapinta Trail, central Australia: Background Notes*) to describe ATCV's involvement in this challenging and exciting project.

Table 1. Activities performed by ATCV in the NT rangelands

Task	Client	Location	Comments
National parks and wilderness conservation	NT Parks & Wildlife Commission Olive Pink Botanic Garden	ATCV works in close liaison with the NT Parks & Wildlife Commission and carries out projects in all Parks and Reserves throughout the NT	Volunteers have helped to construct the spectacular Larapinta Trail and the walk at Watarrka NP, elevated boardwalks at Berry Springs and Casuarina Coastal reserve, trail making at Litchfield and Gregory NPs and Alice Springs Telegraph Station. Other tasks on Parks estate include visitor surveys, flora and fauna surveys, park maintenance, weed eradication and seed collection. During late 1996, teams worked closely with botanical staff from the Alice Springs Desert Park to prepare the grounds for the park's opening. ATCV teams have undertaken work at the Olive Pink Botanic Garden. Assistance has included repair of walking tracks, weed eradication and checking grid lines. (<i>Ed. For more information about the Olive Pink Botanic Garden, see RMN 94/1, pp 7-11.</i>)
Flora & fauna surveys	NT Parks & Wildlife Commission NT University Environmental Research Institute of the Supervising Scientist (Jabiru) Posgold (Tennant Creek), Nabalco (Gove), ERA Environmental Services (Kakadu)	Finke Gorge National Park (NP), West MacDonnell NP, Watarrka NP, Barkly Tablelands, Victoria River District, Gove, Fogg Bay	ATCV assists with fauna and flora surveys in two ways, through a team approach (normal method) or when volunteers work with researchers on an individual basis. Known as volunteer research assistants, these volunteers often hold qualifications in the appropriate discipline and work directly with the researchers in the field. Volunteers have been associated with work on the central rock rat, Gouldian finch and <i>Ptychosperma bleeseri</i> .
Weed eradication	Landcare groups NT Parks & Wildlife Commission Mining companies	Many different pastoral leases in conjunction with Landcare groups and Dept. Primary Industry & Fisheries Various mining leases	Weed eradication comprises the highest percentage of work for ATCV in the NT. Work is carried out with a range of landholders. Weed eradication methods are often labour intensive and a long term approach is necessary with continual follow-up work over a number of years. Weed species have included prickly acacia, coffee bush, sida, snakeweed, calopo, centro, paddy melon, wild passion fruit, caltrop, rosy dock, Mexican poppy, hyptis, devil's claw, noogoora burr, gamba grass, para grass, buffel grass, mission grass and chinee apple.
Seed harvesting	Centralian Land Management Association (CLMA) Greening Australia Barkly Landcare group Victoria River Land Conversation Association (VRDCA)	Various stations in the Alice Springs, Barkly Tableland & Victoria River districts.	Harvesting seed of native grasses for revegetation purposes. For example, ATCV teams have assisted Greening Australia to harvest the seed of barley Mitchell grass (<i>Astrelba pectinata</i>) where it occurs in dense stands on the Barkly Tablelands. This seed has then been made available to other pastoralists who would like to increase the abundance of this valuable perennial forage species (see RMN 93/3 pp 7-9 for further information).
Revegetation	Landcare groups NT Parks & Wildlife Commission Mining companies	NT Parks including Elsey NP Landcare groups such as Hole in the Road & the VRDCA (e.g. Humbert River) Mining leases such as Pine Creek Gold Mine, Ranger Mine, Goodall Mine	Revegetation projects take many forms from planting thousands of seedlings and tubestock to direct seeding many hectares at a time. Volunteers have also assisted with establishing wetland filtration systems and planting grass runners and water plants in areas where <i>Mimosa pigra</i> has been removed.
Feral animal control	Centralian Land Management Association NT Parks & Wildlife Commission	Alice Springs cattle stations Barkly Tablelands	Volunteers have assisted in two main areas: rabbit control in central Australia and removal of sparrows in the Barkly Tableland. As well as assisting the CLMA with rabbit control, volunteers have assisted with counting of warrens and monitoring rabbit numbers. Sparrow eradication work has included working with the Parks & Wildlife Commission to raise community awareness of sparrows in the Tennant Creek area, assisting with tracking sparrows and surveying potential nesting sites.

The Larapinta Trail

The Larapinta Trail is being developed as a 220 km long walking track traversing the backbone of the western MacDonnell Ranges (Fig. 1). It has appeal to hikers more so than "wilderness" or "map and compass" bushwalkers. Trekkers are able to experience the spectacular scenery, botanical diversity and wildlife of these "desert ranges" as the trail crosses a variety of terrain from high exposed ridgelines with panoramic views to lush sheltered gorges protecting many rare plants.

ATCV crews have constructed five sections of the Larapinta Trail extending over 101 km (Fig. 1). Much of this length has traversed rugged quartzite ridges where the trail appears more as a well-used footpad or track than a cleared pathway. This work has required ATCV teams to:

- clear the route broadly defined by Parks and Wildlife Commission rangers to the required width,
- remove obstacles such as rocks and spinifex without unduly disturbing the soil surface,
- construct steps and erosion-control structures (e.g. cross drains) where required,
- construct basic overnight campsites at the approximate midpoint of each section, and
- manufacture and install route and distance markers.

Each team has generally worked on a section of the trail for ten days at a time. As each camp was in a remote part of the MacDonnell Ranges, team members had to be adequately equipped with food, camping equipment and hand tools before setting out for the site. Indeed, one section was so rugged that to expedite construction, the crew was dropped in by helicopter and then lifted out again when the job was completed. The ability of team leaders to plan and complete operations in such remote areas has demonstrated that ATCV is well equipped to work in difficult parts of the NT landscape.

While constructing the trail, ATCV crews have worked in close consultation with Parks and Wildlife Commission staff, e.g. to redefine the trail's route through particularly difficult terrain. As the Commission's Biological Records Scheme is sparse for many of the more remote areas, Team Leader Julie Trembath acted on her own initiative to implement a trapping program to learn more about the fauna and to ensure that any unknown small animals would not be harmed by the increased human presence that the Trail would bring. In the process, Julie made an important scientific find - the rediscovery of the central rock-rat which had not been seen in central Australia for nearly 40 years (see shaded box at the end of this article).

ATCV - Fostering Education About the Environment

ATCV has also been involved in promoting environmental education in schools. With programs such as "Taking Schools into the Environment" and "Envirofix - Empowering kids to lend a hand" and funding from Environment Australia, ATCV has been able to encourage children to take a greater interest in their environment. Seeding grants have enabled schools to

undertake environmental activities such as excursions, participate in research programs and establish a nursery.

One project centred at the Bradshaw Primary School in Alice Springs linked Year Six students into a threatened species research program (the black-footed rock wallaby) as part of their core curriculum. Coordination of the project was provided by the Arid Lands Environment Centre. From a small beginning, this project had a snowballing effect where a number of additional activities were undertaken by children including live theatre focussing on endangered species.

In Darwin, Year Three students from Manunda Terrace Primary School established a "Plant Trail" within their school grounds. The project involved mapping and identifying their trees (with the aid of a botanist) and then researching each species, particularly those that were of value to Aboriginal people in their traditional way of life. A database was set up for the class by a visiting computer adviser and students were "licensed" to use the computer as they became competent with the system. This activity strengthened the students' interest in their surroundings and enhanced their computer skills - as well as placing the information in an interesting format for following classes to use and add to. ATCV staff also took the children into a neighbouring area of forest to collect seeds and seedlings of native species for propagation. This material was planted in the forest margins during the following, and successive, wet seasons. The students have continued to take a keen interest in the ensuing regeneration and have labelled the plant trail for the benefit of other members of the school.

In both cases, the seed grant has produced useful educational outcomes, and particularly an interest in the environment, way beyond the small investment made by ATCV.

ATCV Now - Managing the Green Corps

Green Corps is an initiative of the Commonwealth Government which aims to give young Australians the opportunity to demonstrate their commitment to the environment by contributing to high-priority conservation projects. The program commenced in March this year and over the next 30 months it should see 180 projects, each of 26 weeks duration, completed throughout Australia. ATCV will manage the program for the first two years.

Projects commence across Australia at three-monthly intervals with the next round starting on September 15th. Each project involves a team of ten people aged 17-20 working on an environmental problem and spending at least six weeks undergoing training and education. The training includes core modules in environmental education (e.g. environmental audit, introduction to land conservation and restoration) as well as project-specific accredited training. For example, a project addressing the control of a problem weed might include training in weed biology, principles of biological control and chemical control. All participants receive training in first aid and occupational health and safety.

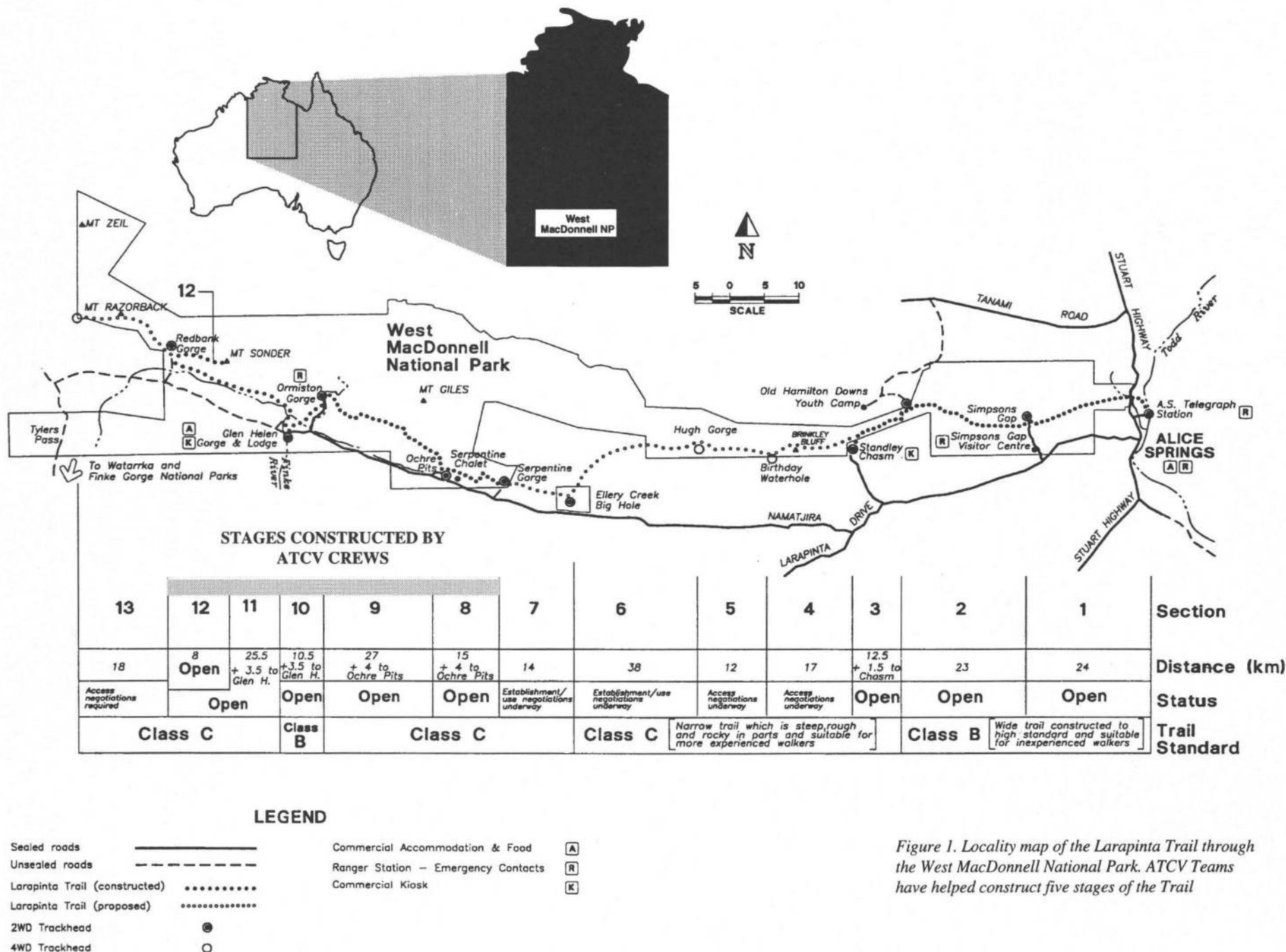


Figure 1. Locality map of the Larapinta Trail through the West MacDonnell National Park. ATCV Teams have helped construct five stages of the Trail

Each conservation project has a core project of 12-14 weeks. Some or all of this work may be in remote areas and may involve living on site for up to two weeks at a time. The core project has a specific focus and trainees are able to achieve the defined environmental goals. A further four weeks is spent on elective projects which introduce trainees to other conservation management issues. In addition, participants spend two weeks working in community-based action programs where they may, for example, become involved in environmental activities with local schools, assist with waste recycling programs or support local Landcare groups.

Green Corps projects aid in the preservation, protection and restoration of Australia's natural and cultural heritage. Typical projects include endangered species protection, fauna and flora surveys, revegetation and natural and cultural heritage restoration. Prior to the commencement of each round, applications are received from State and Territory agencies, Aboriginal Land Councils, Landcare groups and other community organisations. Applications must address high priority environmental issues at the local to regional level and comply with national objectives. Projects which meet the criteria are formally approved by the national Green Corps Advisory Committee.

Once approved, ATCV takes on the management of each program by advertising for and selecting applicants; providing an appropriately qualified and experienced supervisor; supplying a vehicle, necessary hand tools and other provisions; coordinating training and community service aspects; and supplying any additional requirements specific to each project.

ATCV Rediscovered the Central Rock-Rat

In August last year while working on the Larapinta Trail in a particularly remote part of the MacDonnell Ranges an ATCV crew found a population of the endangered central rock-rat (*Zyomys pedunculatus*), almost 40 years after it was last recorded. Under the guidance of Parks and Wildlife Commission rangers, Julie Trembath and her team established a trapping program adjacent to their work sites. Rock-rats were trapped in two different habitats, but not wishing to harm the individuals or disturb the population, the volunteers released the animals after having photographed them and recorded some data.

Julie Trembath thought that the group had trapped something unusual but a search through several mammal reference books did not yield a positive identification. Park Rangers were the first to suggest the central rock-rat but after such a long absence, who could truly believe it?

The precious film was processed and shown to a number of scientists. Their reactions ranged from pure amazement to disbelief. The central rock-rat is considered to be one of Australia's rarest rodents and is listed as critically endangered. It was first collected in 1894 and has been recorded on only five other occasions. The last confirmed sighting was in 1960 when a female was caught raiding a stockman's supplies near Haast Bluff, 300 km west of Alice Springs.

No live animals were known to exist until now and only a limited number of laboratory specimens are held in collections around the world. The most recent scientific survey of country covering the rat's probable habitat was in 1990 when 52,000 sq. kms were covered and 4650 traps set. No central rock-rats were found.

Supervisors are selected carefully - their role being crucial for the general welfare, safety and training of the participants, as well as logistical management of each project. This is especially true in remote areas such as the Northern Territory where trainees are honing their life skills while working and camping together, often under trying conditions.

To illustrate the on-the-job training aspects and more specific accredited training components of a Green Corps project, we use an example from the Alice Springs area. This project, which is sponsored by the NT Parks and Wildlife Commission, has three components:

1. Survey the extent of Mexican poppy (*Argemone mexicana*) infestations in designated parts of the West MacDonnell National Park. Having done this, develop and implement management strategies for controlling this weed.
2. Study the biology of the weed. For example, under what environmental conditions does it grow? How much seed does each plant produce and what is the viability of the seed? How are seeds spread?
3. Conduct fauna surveys in parts of the West MacDonnell National Park. The location of each survey will be selected on the basis of present faunal knowledge, landscape unit and occurrence of Mexican poppy. Tracking and monitoring feral cats will comprise a small component of the fauna surveys and through this, the trainees will be involved with wildlife biologists from the Arid Zone Research Institute in Alice Springs who are conducting a major study of this pest animal.

Mature animals are approximately 30 cm long and have a characteristic and unusual carrot-shaped tail. Under certain circumstances the tail has been recorded as having withered and dropped off. Apart from this, little more is known about the creature, including such vital information as what it eats, whether it is totally nocturnal, its preferred habitat, mating habits and lifecycle.

The Parks and Wildlife Commission has conducted further trapping to determine the probable size and extent of the population. Some individuals have been transferred to the new Desert Park in Alice Springs to allow more intensive study. This research will allow a management plan to be developed to protect the existing population.

This discovery by the ATCV brings us hope that there are other small pockets and safe havens for animal species thought to have disappeared from inland Australia. ATCV looks forward to the day when another presumed extinct species is rediscovered.



Conclusion

From small beginnings in Ballarat 15 years ago, ATCV has now grown into Australia's largest practical conservation group for volunteers. The organisation has grown because it is committed to the environment and is seen as effective managers of people and resources. In the NT, ATCV has worked closely with government departments, Landcare and community groups and other agencies to tackle some significant land degradation problems and to assist people to gain access to, understand and enjoy their surrounding environment. ATCV's growth is exemplified by the present major commitment to managing Green Corps. However, providing volunteers to work on environmental issues and improve Australia's environment remains the core business of ATCV.

NEW DESERTIFICATION PROJECT

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The term "desertification" has been with us for so long, it is ceasing to have a commonly accepted meaning. The international resolve to do something about it was ignited by the plight of the Sahelian countries in the early to mid 1970's. A major conference in Nairobi in 1977 sponsored by the UN set about defining the extent of global desertification. At that stage, criteria were so vague that self-estimates from different continents were not comparable. For example, natural, erosional landscapes in the US were defined as very severe desertification (the only continent to so rate itself). This was about as simplistic as describing the Grand Canyon as an avoidable national disgrace! There have been many attempts to define what is really meant by "desertification" and a 1991 UN-approved definition is "Desertification is land degradation in arid, semi-arid and sub-humid areas resulting from adverse human impact".

This implies that we know and understand what "degradation" really means. This word is also a moveable feast and is hotly debated between community groups who want to expose it and those who feel accused of causing it. I'm sure that among readers of this newsletter, there would be a range of opinions. The CSIRO Canberra-based Rangelands program has recently used the terms "function" and "dysfunction" to get closer to the essence of processes usually described by "degradation".

Australia has signed the UN Convention on Desertification, along with many other countries. Amongst many other things, we pledge "to increase the knowledge about processes leading to desertification and to make the knowledge available to local agencies and developing countries". One of the consequences of this treaty obligation for CSIRO is that funding to address desertification has become available.

This article describes part of our proposed response. In essence, the work that John Ludwig and I have been doing for the last ten years has been trying to understand the processes leading to desertification, rather than simply describing a desertified landscape.

Landscape ecologists tend to be "top-downers"; i.e. they look up-front for their system integration (processes and feedbacks) rather than trying to synthesise system behaviour/response from a detailed knowledge of its intimate parts. We have seen the latter approach as a "failed" method, partly because all the knowledge areas are at different stages of development, and the systems we work with are so inherently complex that we will never know all the detail. Bill Nering, the editor of *Restoration Ecology* recently said: "natural ecosystems are not more complex than you know, they are more complex than you can know". We need appropriate knowledge now!

We began our work in studying plant/soil patterns in a range of landscape types, beginning with the overtly geometrical banded mulga landscapes which are common in central and Western Australia and a minor landscape type in western NSW. Here, we were able to link spatial patterns in the vegetation to differential soil properties. At first, in a static sense, soils were shown to be much richer in nutrients and had much higher infiltration rates in the tree groves than in the sparsely vegetated inter-groves. We then went on to derive a dynamic model at landscape scale, in which scarce but vital resources such as water and nutrients were "harvested" from inter-groves and deposited in the groves with each rainfall event. This explained the high biomass and longevity of the groves despite poor soils and low rainfall. This recognised a fundamental self-organisation in the landscape whereby scarce resources are conserved within the landscape, but in patches. This had been predicted by Immanuel Noy-Meir in 1973 as essential to the sustainability of semi-arid ecosystems. We sometimes described it as the "Reverse Robin Hood" effect - resources were taken from the poor and given to the rich.

We then moved on to landscapes in which pattern was not as visually obvious as it is in mulga groves. Our techniques for integrating data describing plant and soil resources evolved into seeking to identify the manner and scale at which vital resources are shed from one area and absorbed or collected in another. We were able to recognise and capture subtle changes in topography which affected spatial resource distribution, using a simple Dumpy level. In grasslands we recognised the functional value of the grass plants themselves in absorbing resources which were flowing across the landscape as runoff. We talked interminably about "fertile patches". A Western Australia colleague was moved to write:

*Nutrient accumulation around the bushes that you see
Are assessed by David Tongway as he
strives to find the key
And he highlights in his travels fertile
patches that he meets
Sounds to me its something that you
wash out of the sheets.*

We worked at landscape scale; using local catchment boundaries to define our area of interest. We recognised that *processes* provided "connectivity" between landscape elements. Not the glue but the life blood!

About this time, we began to "see" landscapes as characterised by processes operating at different scales moving or absorbing resources: the biota were simply the outcome of differential resource availability in space and time. Heresy!

We devised the landscape functional framework which appears in our new book *Landscape Ecology, Function and Management: Principles from Australia's Rangelands* (see RMN 97/1 p. 14). This is an integrating framework whereby data from specific sites can be placed into context. This framework identifies landscape degradation as an alteration in the way resources are retained and utilised within a landscape. This might mean a change in the spatial arrangement of scarce resources so that the habitat quality for a particular plant guild is reduced (e.g. grasses) but improves for another (e.g. shrubs), or that resources are lost from the system, reducing edaphic habitat value. Both these landscapes are dysfunctional to some degree.

The conceptual models of landscape function could be represented as a two-dimensional diagram. Field data sampling strategies and landscape function are adequately represented in terms of length of slope and vertical relief. If resource regulation (a term which includes the processes of capture, utilisation and cycling) in a landscape begins to fail, such as by rill formation, key biota may die because of resource insufficiency over time, coupled with disturbance from management. Soil water recharge would be less frequent and at lower levels; coupling of nutrients and water would cease. Desertification would have begun. Our techniques and philosophy do not see desertification as an "is/is not" situation, but a gradual slide which we might well recognise at an early stage if we look for the right clues. This is the reason we have preferred to use the term "dysfunction", which is also in accord with "health" concepts: a landscape might be unhealthy but not terminal!

A shortcoming in the generality of this approach was revealed when we encountered landscapes whose response to disturbance was dominantly expressed in three dimensions, e.g. landscapes where runoff and erosion formed sinuous rills or sandy hummocks. Our line transect data did not capture the features responsible for landscape function seen with casual observations.

In our new work we want to capture the three-dimensional landscape data needed to detect early signs that the system is losing its capacity to regulate resources. We will use an electronic digital theodolite to map land surfaces in three dimensions, to capture such developing features as meandering rills. This will provide high quality data we will use to calibrate simple techniques suitable for routine monitoring purposes, as has already been done for simpler systems. (i.e. *Rangeland Soil Condition Assessment Manuals*, see RMN 94/1.)

The desertification research is mainly aimed at improving our basic understanding while not being closely constrained by immediate user needs. The ultimate development of early warning signs however is explicit as a final product. In Australia, we have the opportunity to study systems that are not far along the degradation track (compared to the Sahel). We intend working in central and northern Australia with local colleagues. Among these tasks will be that of linking our work with fine-scale remote sensing and eventually through to satellite data, so that process-based understanding is carried through to broad scale application.

We want to be able to recognise critical thresholds and define them in functional terms. Then we have the task of converting this knowledge into monitoring and management rules with broad application across continents, land uses and cultures.

RANGEWAYS Land Use Planning for Semi-Arid Australia

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Rangeways is a community-based research project, located in the North East Goldfields region of Western Australia. It is working to find better ways of using the rangelands, and better ways of involving the community in making decisions about these uses. Any changes have to improve the well being of people living in the region, and the condition of the environment.

The project evolved from various concerns, including the difficult economic conditions for the pastoral wool industry in Western Australia and the need to target research effectively. In 1993, the Land & Water Resources Research & Development Corporation (LWRRDC) began shifting its focus from production-based research to the long term ecological and economic sustainability of rangelands.

LWRRDC encouraged Alec Holm, Don Burnside (both Agriculture WA) and Margaret Friedel (CSIRO) to develop a project that would meet these needs. We wanted to research how land use planning could be done in a way that satisfied landholders, local communities and other people with interests in the rangelands, and also achieve ecologically sustainable development. One of the key elements throughout was community consultation.

By the time Rangeways began in earnest in late 1995, it had the support of a wide group of interests. The Board and the management team together included the Goldfields-Esperance Development Commission (GEDC) Chair and CEO, WA government agency heads and senior staff, and senior representatives of pastoralists, conservationists and CSIRO. GEDC went into bat for us and successfully applied for additional funding from the federal Department of Transport and Regional Development.

Rangeways is studying the North East Goldfields because it contains, in a relatively small area, most of the land uses encountered in rangelands throughout Australia. Potential for competition and conflict between land users exists as well as the opportunity for creative solutions. Some of the relationships which already exist between miners, pastoralists, Conservation & Land Management and Aboriginal people are examples of multiple land use and cooperation we can learn from and build on.

Since the beginning of the project early in 1996, the project has:

- commissioned a study by CSIRO who contacted 120 people with interests in the WA North Eastern Goldfields for their views about issues, problems and opportunities in the region;

- distributed the report, "Understanding the Community Perspective", to 450 people with interests in the region;
- investigated another land use planning project in Queensland called CYPLUS (Cape York Peninsula Land Use Study);
- begun assembling some of the basic resource information about the region; and
- commenced using the issues identified in the reports with people to develop 'guidelines' for land use allocation in the region.

Once we have enough input from different interest groups, from both inside and outside the region, we will use the LUPIS (Land Use Planning & Information System) package to draw up maps of what each 'sector group' would like. Each group will adjust its plans to its satisfaction, then the plans will be blended as a basis for negotiation. LUPIS allows ecological, economic and social considerations to be integrated, so that all community values can be taken into account together.

To ensure that the community's needs are heard, our Board remains in touch with progress and can advise decision-makers on what is required for implementation. At the same time, Rangeways will be exploring what sort of political, institutional, market and fiscal intervention might be necessary to achieve the desired land use allocations.

LWRRDC has also funded related projects in western NSW and Queensland, and has enabled the three groups to meet together to exchange ideas and develop synergies. Our first collective activity is examining what, and how, policies affect land use planning.

As a result, outcomes of Rangeways should include procedures to represent and involve both the local and wider community in land use planning, procedures to integrate diverse values, and a supportive environment for implementing the changes people want.

For further information, contact the Project Leader, Roger Jaensch, at:

Project Office: 801 Tower Street, or c/- Post Office, Leonora, WA 6438

Phone/fax: 08 90 377 177

email: rjaensch@aidpo.agric.wa.gov.au



RANGEWAYS
Land use planning for semi-arid Australia

FELLOWS OF THE AUSTRALIAN RANGELANDS SOCIETY

Rob Richards, Dept. Land and Water Conservation, PO Box 235, Condoblin NSW 2877

In keeping with other professional organisations, the Australian Rangeland Society bestows the title of "Fellow" on individuals who have given a long-term commitment and service to the rangelands, and who have had a long association with the Society. The award used to be known as "Honorary Member" but was changed to "Fellow" a few years back. Fellows of the Australian Rangeland Society are:

Dick Condon
Bill Bolton Smith
Ray Perry
David Wilcox
Joan Gibbs
Allan Wilson

Allan is the most recent recipient and on behalf of all members, I thank Allan for his past and continuing service to the Society and congratulate him on receiving this well-deserved award. The citation prepared in support of Allan's nomination follows.

Dr Allan Wilson Nomination as Fellow of the Australian Rangeland Society

Dr Wilson has had an outstanding career in arid zone ecology and in rangeland management and has contributed in a major way to the Society in his position of Editor of *The Rangeland Journal*. Throughout his professional career he has been responsible for significant advances in the science of using and managing rangeland resources through his individual achievements and through the direction, guidance and encouragement he has given to others.

Dr Wilson completed his Ph.D in animal physiology at Melbourne before joining CSIRO at Deniliquin in the 1960's. His seminal papers with John Leigh and Bill Mulham on the significance of perennial saltbush and bluebush in the diet of sheep in the Riverina paved the way for a career in arid zone ecology and rangeland management which led him to the pinnacle of his chosen profession. He is universally regarded as the most profound thinker in rangeland matters in Australia and has published numerous papers in journals and has also been author and co-author of major publications dealing with the Australian arid zone.

As Officer-in-charge of the CSIRO Riverina Laboratory he was able to lead and to combine successfully the talents of the outstanding group of rangeland scientists based there so that it became the foremost rangeland research centre in Australia and gained a very high reputation internationally

Dr Wilson had a special interest in the development of techniques to measure changes in range condition in an objective fashion. He challenged the philosophical basis of the American methods and developed a new pragmatic philosophy based on his knowledge and observations of Australian rangelands. Other Australian rangeland researchers and administrators quickly accepted his ideas and began developing rangeland monitoring methods suited to our rangelands and tenure systems. The philosophical basis developed by Dr Wilson has gained widespread acceptance in the USA and other countries.

In the lead up to the 2nd International Rangeland Congress held in Adelaide in 1984, Dr Wilson and two of his colleagues at the Riverina Laboratory conceived the idea of preparing a state-of-the-art book on the "Management of Australia's Rangelands" to be available at the Congress. Dr Wilson played a prominent part in developing the structure and content of the book, soliciting the authors for the chapters and in editing the book. He was also the co-author of seven of the 22 chapters.

Dr Wilson has been the Editor of *The Rangeland Journal* for several years and has overseen a number of changes in its format and content. He initiated the practice of invited editors on special topics, notably conservation and administration and, recently, grazing management. He has been successful in attracting a wider range of contributors so that its readership has been extended to include conservationists, sociologists and administrators.

Through his research and research leadership, Dr Wilson has been one of the most important contributors to the knowledge and management of Australia's rangelands. His successful challenge to the entrenched American philosophy behind range condition and trend is an outstanding example of his intellectual input to the debates associated with rangeland monitoring. His powerful influence on the thinking and practice of rangeland management in Australia and internationally deserve to be honoured by electing him to be a Fellow of the Society.

(Ed. Nomination supported by D.G. Burnside, A.L. Payne, A.McR. Holm, S. van Vreeswyk, J.G. Morrissey and N.J. Duckett.)



REPORT ON AN ARS TRAVEL GRANT

Dionne Maywald, c/- Department of Botany, University of Adelaide, SA 5005

I am a PhD student whose main interest is plant-herbivore interactions; specifically the way that Merino sheep graze *Atriplex vesicaria* (bladder saltbush). Bladder saltbush is "dioecious" (male and female flowers are carried on separate shrubs) and for many years it has been suspected that sheep prefer to graze female saltbushes over male ones. I have demonstrated experimentally that this is indeed the case. Now I hope to determine why the sexes are not grazed equally. I have been corresponding with scientists from the USA who are also interested in intraspecific palatability variation and I organised a study tour to visit with them and conduct some experiments.

I spent eleven weeks in the western USA between May and July 1996. The main objectives of my visit to the States were:

- to conduct a grazing study to determine if sheep and mule deer discriminate between the sexes of fourwing saltbush (*Atriplex canescens*), and
- to learn about palatability, nutrients and secondary chemistry in *Atriplex*.

Initially I spent two weeks at Utah State University (Logan, Utah) visiting Professor Fred Provenza, who is a world-renowned scientist in the field of plant-animal interactions. Most recently, his work has focussed on the dramatic effects that plant nutrients have on animal physiology and (subsequently) preference. Whilst in Logan I also got to visit the scientists at the Poisonous Plants Laboratory of the USDA Agricultural Research Service, where I learnt a lot about the chemistry of *Atriplex*.

After leaving Logan I headed to Provo (in central Utah) to undertake my grazing trials with the Shrub Sciences Laboratory (USDA Forest Service). I was hosted by Dr Durant McArthur and my field site was based in the small town of Ephraim, south of Provo. With the cooperation of the staff of the Manti LaSal Ranger office and the Utah Division of Wildlife Resources, I conducted two sets of grazing trials over the course of six weeks. Scientists in Utah have suspected that animals graze fourwing saltbush differently on the basis of - you guessed it! - shrub sex. The first set of experiments tested whether rangeland sheep discriminate between the sexes of the shrubs. Those trials were followed by similar experiments using mule deer. The results of the sheep trials confirmed the suspicions of the US scientists: sheep preferred to eat male plants over female plants. Note that this is opposite to the situation in Australia with *Atriplex vesicaria*! This finding aroused a lot of interest and discussion whilst I was in the US. The results of the deer trials were inconclusive as the deer did not utilise the shrubs to a significant degree. This was expected, as fourwing is predominantly a winter forage for deer. My colleagues at the Forest Service and Division of Wildlife will repeat the trial in the winter to add a seasonal aspect to the research.

Before I left Utah I was fortunate to take part in the Society for Range Management Summer Tour which was held over two days in late June. On the tour I met many range scientists and we visited various sites in western Utah. The main theme of the tour was range reclamation. We saw how range infested with cheatgrass and juniper is being reclaimed by various chaining, burning and seeding treatments. Some of the results were spectacular and I was impressed by the extent that agencies, universities and landholders were willing to work together.

After leaving Utah I spent two weeks at Colorado State University in Fort Collins. I was hosted by Andres Cibils, who is a PhD student in the Rangeland Ecosystem Science Department. Andres is trying to determine whether cattle discriminate between the sexes of fourwing saltbush and whether this is the cause of female-biased sex ratios in grazed stands. Andres was interested in learning about the grazing methodology that I use for *Atriplex vesicaria* as he is about to begin his first grazing trials.

My trip to the USA was rewarding both professionally and personally. My experience of the States and the work I conducted was overwhelmingly positive. Without the support of the Australian Rangeland Society Travel Grant, I would not have been able to fulfil all the aims of my study tour. I would like to take this opportunity to thank the Society for helping to make my trip so successful.

CAN ANYONE HELP?

Call For Information About Bluebush Swamps

Wendy McIntyre, CSIRO Division of Wildlife and Ecology,
PMB 44, Winnellie NT 0821

I am a PhD student from the University of Virginia, U.S., and I am initiating dissertation research with the Cooperative Research Centre for the Sustainable Use of Tropical Savannas in Darwin. The research concerns chenopod shrublands, particularly bluebush swamps (dominated by *Chenopodium auricomum*, northern or Queensland bluebush) on the Barkly Tableland. I intend to use satellite imagery combined with field data to assess the history and status of the swamps and to assess grazing impacts. Bird surveys may also be conducted to assess habitat value to birds.

There is very little literature concerning *Chenopodium auricomum* in particular. I would like to know if anyone is doing research related to this project, especially involving *Chenopodium auricomum*. If so, could you please contact me (details below) and perhaps we could share ideas:

Wendy McIntyre, CSIRO Division of Wildlife and Ecology,
PMB 44, Winnellie NT 0821
Phone: (08) 8944-8400
Fax: (08)8944-8444
email: bmm6e@virginia.edu

THE LAKE EYRE BASIN STEERING GROUP

Kate Andrews, PO Box 592, Longreach QLD 4730

The Lake Eyre Basin Steering Group was formed in 1995 at a community workshop held in Birdsville. Concerned by the conflict between different groups and the potential for World Heritage listing, community members in the basin initiated this process to bring together different interest groups and to encourage community input into the management of the basin.

The steering group includes representatives from the pastoral industry, the Queensland and South Australian State Governments, conservation groups, the mining and petroleum industries, Aboriginal organisations, Landcare groups and local government.

The steering group's terms of reference include two major goals:

- the preparation of an information paper covering areas such as the present management of, and land use in, the basin; and
- consultation with the community to develop an options paper for establishing catchment management in the Lake Eyre Basin.

To initiate action to achieve these goals, funds were raised through member contributions to establish a project officer position. The project officer joined the group in September 1996. A successful National Landcare Program application has now ensured funding for the position for one to three years.

A public meeting will be held at the end of 1997, following the completion and distribution of the above papers, to decide whether to proceed with a catchment management process, and if so, how. The steering group has a sunset clause of two years and will cease to exist at this meeting. It has no mandate to continue unless the community decides otherwise.

Fourteen public-consultation meetings and numerous discussions have been held across the basin. Several more meetings will be held and a draft options paper is being written. This will be distributed as widely as possible seeking comment and further input for the final version. Responses at the meetings towards a catchment management process for the basin have been positive and encouraging. Concerns have been expressed regarding how we can achieve fair representation across the basin and the interest groups. Participants, however, seem willing to give it a go.



AUSTRALIAN RANGELAND SOCIETY AWARDS

The Society has two awards to assist members with either:

- studies related to the rangelands, or
- with travel expenses associated with attending a conference (or some other activity).

Applications for each award close in November and any member of the Society interested in either award is invited to apply.

Australian Rangeland Society Travel Grant

This grant is intended to assist eligible persons:

- to attend a meeting, conference or congress related to the rangelands; or
- to assist eligible persons with travel or transport costs to investigate a topic connected with range management or to implement a program of rangeland investigation not already being undertaken.

The grant is available for overseas travel and/or travel within Australia. It is not intended for subsistence expenses.

Australian Rangeland Society Scholarship

This scholarship has the purpose of assisting eligible members with formal study of a subject or course related to the rangelands and which will further the aims of the Australian Rangeland Society. The scholarship is available for study assistance either overseas or within Australia. It is not intended to defray travel expenses.

How to Apply

Members interested in either grant are urged to apply by submitting a written outline of their proposed activity. Applications should clearly address how the intended activity (i.e. travel or study) meets the aims of the Society. Applications should be brief (less than 1000 words) and should be submitted to Council before November 30.

Conditions

Applications can be made at any time but will not be considered until the first Council meeting after the November 30 closing date. Applications for the **Travel Grant** should include details of the costs and describe how the grant is to be spent. Details of any other sources of funding should be given. Those applying for the **Scholarship** should include details of the program of study or course being undertaken and the institution under whose auspices it will be conducted. Information on how the scholarship money will be spent is required as are details on any other sources of funding.

Applications for either award should include the names of at least two referees.

Finally, on completing the travel or study, recipients are required to fully acquit their grant or scholarship. They are also expected to write an article on their activities or experiences for the *Range Management Newsletter*.

Eligibility

No formal qualifications are required for either award. There are no age restrictions and all members of the Society are eligible to apply. Applications are encouraged from persons who do not have organisational support.

Travel or study assistance can be made available to a non-member where Council considers that the application meets the aims of the Society, and is of sufficient merit.

Overseas Travel or Study

There is a restriction on both awards for overseas travel or study assistance in that applicants must have been members of the Society for at least 12 months. Overseas travel can be to Australia, or study within Australia, by overseas members.

So, if you need assistance with travel or study expenses next year in relation to a topic connected with the rangelands, think about applying for a Society grant. Use the above guidelines to help you frame your application and contact a Council member if you require further information (contact details inside front cover). Make sure your application reaches the Secretary before November 30.

CONFERENCE REPORTS AVAILABLE

*John Maconochie, Pastoral Management, Dept. Environment
& Natural Resources, GPO Box 1047, Adelaide SA 5001*

All delegates of the 1996 Australian Rangelands Society Conference should by now have received their copy of the Conference Report. The conference report is a compilation of various outputs from the conference. It includes the 1996 Fenner Conference Paper, the Report for Environment Australia, the presentations given on the final day by the "Super Facilitators", the "Take Home Messages" from four different perspective's, and the workshop transcripts from each of the four scenarios ("Butchers Paper").

Copies of the report are available for \$10 (postage paid) and cheques should be made payable to the "Australian Rangeland Society, South Australian Branch" and sent to John Maconochie at the above address. Finally, I would like to thank all who were involved in putting together the many pieces of the report and all delegates at the conference who provided us with the daunting task of compiling their thoughts and views.

SYDNEY SHOW OUTBACK EXPERIENCE

*Rob Richards, Department of Land and Water Conservation,
PO Box 277, Condoblin NSW 2877*

If you visited the Sydney Royal Easter Show this year and your eye happened to fall upon a patch of familiar red soil dotted with bluebush, spear grass, and a brown snake amongst other animals, you weren't dreaming of home.

More than 10,000 people visited the "virtual reality outback theatre" which was funded by landcare groups, catchment committees and the Department of Land and Water Conservation. The theatre consisted of a small area enclosed by drapes that contained 850 kg of Cobar red soil, various native grasses and shrubs, and a few of the animals that inhabit the rangelands. Visitors to the theatre could relax on hay bales or a fallen log and be immersed in the sights and sounds of western NSW. Large painted backdrops of a bush scene from Broken Hill lined each side of the theatre while a large screen at the front took people on a seven minute audio-visual visit to the rangelands. Images that city folk would not expect to see of the outback such as wetlands, majestic old rivers, carpets of wildflowers, and an array of birds, mammals and reptiles unfolded before them. Images and sounds of the softness and harshness of the west left people amazed at the diversity and beauty of western NSW. Children were most intrigued by the emu chick camouflaged in the dry grass, the shingle-back lizard half buried in the sand, and the various birds scattered throughout the scenery.

The trip to the Royal Easter Show was inspired by a similar project in 1994 to a western Sydney City Farm where graziers spoke to hundreds of school children about life in western NSW. We came away from that trip realising that our urban cousins really didn't have any idea about the existence or functioning of rangelands. Sadly, many students' perceptions of the outback were formed by movies such as "Crocodile Dundee". They asked questions such as "Do the crocodiles eat the sheep?" and "Don't you lose sheep in the jungle?". This display was organised as a sequel to our 1994 visit and landholders from the west and Departmental staff willingly manned the theatre during the 14 days of the Show to answer questions and to provide a personal touch to our display material.

We have applied for funding to continue the "outback theatre" at future shows in 1998 and 1999. I speak for all when I say that we enjoyed our time at the Show, not least because we went some way towards dispelling some of the urban misconceptions about western NSW by giving people an insight into the immense diversity, beauty and accessibility of the western half of our State.

NEW MEMBERS

Belinda Jeanes
13 Bangalay Crt
Halls Head WA 6210

Julie Frousheger
DPI
PO Box 282
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Justin Costelloe
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Clarence Park SA 5034

Tim Ferraro
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Mildura VIC 3500

Dr Lewis Kahn
"Airlie"
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Dr Fleur Tiver
School of Environmental
Management
Uni of South Australia
The Levels SA 5095

Greg Jones
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Armidale NSW 2350

Lauren Bennett
Plant Sciences
Faculty of Agriculture
University of WA
Nedlands WA 6907

Maree Bowen
6/77 Sir Fred Schonell Drv
St Lucia QLD 4067

Queensland Herbarium
Department of Environment
Gate 1 DPI Complex
Meiers Road
Indooroopilly QLD 4068

Marion Murphy
PO Box 2411
Mount Isa QLD 4825

Librarian
Northern Land Council
PO Box 42921
Casuarina NT 0811



The Australian Rangeland Society

REPORTS FROM THE ANNUAL GENERAL MEETING

A.C.N. 008 784 414

PRESIDENT'S REPORT

Ron Hacker, NSW Agriculture, Trangie Agricultural Research Centre, PMB 19, Trangie NSW 2823

The year 1996-97 has been one in which the Society has played a prominent role in rangeland affairs nationally and in which our business affairs have been further consolidated and simplified. Council has met six times since the 1996 AGM with a quorum present on all occasions. Average meeting attendance of the seven-member Council was 5.5. A business meeting of the Society was also convened at the biennial conference in Port Augusta, attended by 57 members.

A number of developments and activities during 1996-97 deserve special mention:

Membership of the Society remained stable with a total membership (including library subscriptions, corporate memberships etc.) of 573 as of 31/12/96 compared with 570 at 31/12/95. Although new members have been added throughout the year, these additions have been balanced by losses.

The Ninth Biennial Conference was convened in Port Augusta from 24-27 September 1996 with the theme *Focus on the Future - The Heat is On*. This was one of the Society's most successful conferences and was an imaginative departure from the conventional conference format on the part of the South Australian Organising Committee. In addition to the usual presentation of scientific material the conference undertook a large scale foresighting exercise to consider likely futures for the Australian rangelands. This proved to be a popular exercise and, apart from its primary intention, contributed considerably to a better interaction between the Society's scientific and producer membership. It also served to confirm the Society as a major forum for discussion of policy issues related to the use and management of rangelands.

The outcomes of this conference were subsequently presented, by members of the Organising Committee, to the Fenner Conference on *Sustainable Habitation in the Rangelands* in Canberra on 29-30 October 1996. This also was a significant national conference to which the Society made a substantial contribution, albeit indirectly.

The biennial conference outcomes also contributed to the Society's response to the Draft National Strategy for Rangeland

Management. This response, compiled by the Policy Working Group and ratified by Council, represented a detailed critique of the draft Strategy. While the Society supported the general thrust of the Draft, our response clearly indicated that some serious weaknesses were perceived and that improvements were required to a number of the key goal areas, particularly those dealing with socio-economic aspects of rangeland use. Parts of this response have been published in the *Range Management Newsletter* and full copies are available from the President. The Society's response to this draft, involving input from a national conference together with the deliberations of the Policy Working Group and Council, represents a thoroughly considered contribution to this important initiative.

The Society's publications, *The Rangeland Journal* and the *Range Management Newsletter* have continued to flourish during the year under the capable guidance of their respective Editors and Associate Editors. Another special edition of the Journal, on Grazing Management, was published as Volume 18, No 2 in December 1996.

On the recommendation of the Publications Committee, Council resolved to enhance the international appeal of the Journal by establishing an international Advisory Panel. The Panel will not exercise editorial control but members will promote the Journal in their home country and advise the Editor on matters such as appropriate referees for overseas manuscripts. Appointments have not yet been made.

Negotiations were completed with the Society for Range Management (SRM) for the inclusion of abstracts from *The Rangeland Journal* and *The Australian Rangeland Journal* in a bibliographic data base with abstracts from the *Journal of Range Management*. The joint production will proceed on the basis of a Memorandum of Understanding under which the Society will contribute annual updates to the SRM and will advertise the product in Australia. Marketing of the product in Australia will be handled by the SRM.

Further negotiations were initiated with the SRM to explore the possibility of reciprocal membership rights. These negotiations are still in their infancy although the SRM Board of Directors has indicated an interest, and willingness to explore options. The conclusion of these negotiations will be in the hands of the incoming Council.

Council has developed a number of administrative procedures which may facilitate the operations of the incoming Council if they are maintained. Rotation of Council on a two-yearly basis creates some difficulties with the continuity of

administration despite the provisions for some common membership between successive Councils. Administrative guidelines have been developed over the last two years in relation to:

- Regular inflationary adjustments to subscriptions (rounded to the nearest \$5).
- Management of trust funds to support Scholarship and Travel Grants and priorities for allocation of awards.
- Use of casual secretarial assistance.
- Distribution of subscription renewals, reminder notices and complimentary publications for non-financial members.
- Financial relationships with the Organising Committee of the VI International Rangeland Congress.
- Capitation fees for branches.
- Welcoming of new members.
- Payment of Honoraria for guest editors of *The Rangeland Journal*.
- Restricted distribution of the membership list.
- Disbursement of surpluses from the Biennial conference.
- Status of Fellows of the Society with respect to annual subscriptions.

Consolidation of accounts over the last two years has resulted in an easier and more mobile financial structure with the Council now operating accounts with only one bank (National Australia Bank), compared with six at the beginning of the current term of office, and with no dormant accounts in any of the States to our knowledge. Council has also initiated action, with the concurrence of the trustees, to close the deposit accounts used to support the Scholarship and Travel Grant, and re-establish fixed deposits with the current Council members as signatories.

Council has also embarked on a process to relocate the Society's registered office, at the request of Mr. David Wilcox whose private residence has served as the registered office since the incorporation of the Society in 1974. A number of possibilities have been identified and evaluated but the final location has not yet been determined. (*Since writing this report the ARS Council has accepted an offer by the Australian Institute of Agricultural Science and Technology, Melbourne, to become the registered office of the Society.*)

Competition for travel grants was less than in 1995-96, with grants being offered to the only two applicants. The total of these grants did not exceed the amount of funds available.

Council has continued to be represented by the President on the Organising Committee of the VI International Rangeland Congress. The Congress is now incorporated and the Society's claim as the major beneficiary in the distribution of any surplus assets generated by the Congress is established in the rules of the incorporated body.

It is disappointing to report that efforts to publicise rangelands, and the Society, through the provision of interpretative material to airlines and to an outback visitors centre were unsuccessful.

Likely Developments

Some developments currently in train will need to be completed by the Queensland Council. These include:

- Negotiation with the *Society for Range Management* regarding possible reciprocal membership rights.
- Re-establishment of the Scholarship and Travel Grant trust fund accounts.
- Relocation of the registered office.

In addition, some initiatives considered by the NSW Council, but not enacted, are recommended for consideration by the Queensland Council. These include:

- Development of a kangaroo management policy.
- Development of ARS merchandise and a publicity program.

The role of the Subscription Secretary in the next Council may change if it agrees to a proposal to have the current Subscription Secretary retain this function and receive an honorarium. The continuity provided by this arrangement would greatly simplify the operation of the Society's affairs.

Acknowledgments

It is with pleasure that I acknowledge the contribution of Council members over the last two years. The Society has also benefited from the part-time clerical assistance of Ms Jill Phillips and her efforts in maintaining minutes and correspondence in an orderly fashion is gratefully acknowledged. I would particularly like to record the Society's appreciation to Alex Holm who has now competed six years on Council as Vice President, President and Immediate Past President and whose term of office will end with the 1997 AGM. I also wish to extend congratulations and best wishes to the incoming Queensland Council.

TREASURER'S REPORT

Nick Milham, NSW Agriculture, Locked Bag 21, Orange NSW 2800

It is with pleasure that I present my report for the second and final year of the current NSW term for Council of the Australian Rangeland Society.

The last two years have been a most interesting and challenging experience for me as Honorary Treasurer. In particular, I have enjoyed working with the retiring Subscriptions Secretary, Rob Richards, to develop and implement cooperative arrangements to make both our jobs easier.

From my own perspective, I believe that the outgoing Council has done an outstanding job of reorganising the financial affairs of the Society in a way that will benefit future Councils and the Society as a whole. Activities in this regard included establishing credit card facilities, closing old (unused) branch accounts, consolidating all Council operating accounts into

one account, and gradually shifting investment accounts to the same institution.

Council has also reaffirmed or put in place policies on capitation grants, membership renewals/subscriptions, travel and scholarship grants, and the disbursement of biennial conference profits, that clarify (for both Council and members) some previously ambiguous points.

The financial position of the Society continues to be sound. Membership fees for the Society have been kept at a low level relative to most professional associations, yet we are still able to produce a very high quality Journal, an equally high quality Newsletter, and to maintain a substantial travel and scholarship grant program, all without eroding our reserves.

I commend the draft financial statements to 31 December 1996 to the attention of members. The final audited accounts will be presented in the next Newsletter. It is not anticipated that there will be any differences between the draft and audited accounts, it was just not possible for a full audit to be completed before the Annual General Meeting.

I would like to take this opportunity to formally acknowledge the outstanding work of the auditors Michael Boyce and Co., in the persona of Patsy Cross and Tony Quirk, for once again producing a very clear yet concise record of the Society's financial affairs. We have been fortunate to have the services of auditors who have taken a personal interest in the affairs of the Society.

A motion is before the Annual General Meeting to amend the Memorandum and Articles of Association to remove the requirement for the registered office of the Society to be in Western Australia. Carriage of this motion would allow Council the flexibility to move the registered office as and when required. The location of the registered office does not affect the operation of the Society in any practical way.

In particular, it is proposed to move the registered office from the current address of 54 Broome Street, Cottesloe WA (David Wilcox's home address) to either the office of the Federation of Australian Scientific and Technological Societies in Canberra or that of the Australian Institute of Agricultural Science and Technology in Melbourne. Both of these organisations have offered their services in this regard.

I support both the motion and the proposal. In closing, I wish the incoming Council well.

SUBSCRIPTION SECRETARY'S REPORT

Rob Richards, Dept. Land and Water Conservation, PO Box 235, Condoblin NSW 2877

Although the net membership has not risen significantly in the past year, the Society has seen the welcoming of 40 new members which is incidentally the same number that joined for the same period in 1994-95 and 1995-96 (42 members). The challenge is therefore to retain members in the Society. The table below gives a breakdown of the current membership as of 23 May 1997.

Member type				
1997	Journal & Newsletter	Journal only	Newsletter only	TOTAL
individual	288	-	64	352
company	44	2	-	46
library	23	34	4	61
TOTAL	355	36	68	459

A true figure of the Society's total membership is given by the number of members at the end of the calendar year. This was 573 members at 31 December 1996.

Membership rates were again increased this past year in order to cover increasing production costs largely associated with the journal. The increase of \$5.00 per year was applied only to those subscriptions including the journal. Newsletter-only subscriptions remained the same. The most common subscription, Individual Full, rose from \$50 to \$55.

This last 12 months has seen some changes to the subscription-renewal process. This can be summarised as follows:

- Renewal notices sent with the November newsletter and November journal to encourage members to rejoin early.
- A reminder slip sent with the March newsletter to all members who had not rejoined at that time.

Money owing from the previous year's subscription if underpaid was identified on the renewal notice sent to members. A new subscriptions secretary will be elected to form part of the incoming Queensland Council. This person's role will be more one of publicity and promotions while the Queensland Council will contract me to continue the duties of the subscription secretary.

Other issues concerning subscriptions include the involvement of the ARS in a proposed Rural-Urban Rangelands Education Program and the possibility of retaining a semi-permanent subscriptions address and subscription secretary.

I would like to thank all of the Council for their cooperative involvement and assistance in the past two years. In particular, thanks to Nick Milham who I have bothered, annoyed, hassled and very much depended upon in the last two years.

I am looking forward to working with the incoming Queensland Council and consolidating on the progress that we have made whilst Council was in NSW.

**THE AUSTRALIAN RANGELAND SOCIETY
BALANCE SHEET AT 31 DECEMBER 1996**

1995

SHARE CAPITAL AND RESERVES

131,945	Retained profits	117,592
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<u>\$131,945</u>		<u>\$117,592</u>
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Represented by:

FIXED ASSETS

2,455	Plant & equipment (at tax value)	1,473
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CURRENT ASSETS

30,162	Trading account - NAB, Orange	10,788
880	Trading account - BWA, Journal,	1,287
1,697	Trading account - WBC, Newsletter	2,820
2,153	Trading account - WBC, Conference	366
15,180	Trading account - Bank SA, Conference	11,198
1,183	Trading account - CBA, Cobar	1,208
4,707	Trading account - ANZ, Victoria Park	1,653
379	Trading account - WBC, Bourke	-
4,304	Trading account - WBC, Port Augusta	1,589
104	Cash on hand	-
60,749		30,309

INVESTMENTS

24,854	Term Deposit - BSA, Perth	-
16,192	Deposit - NM, Mortgage fund	16,828
16,195	Deposit - NM, Income fund	16,497
15,000	Term Deposit - NAB, Orange	53,500
-	Investment - 1997 IRC	1,885
72,241		88,710

135,445	TOTAL ASSETS	121,092
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CURRENT LIABILITIES

3,500	Trade creditors	3,500
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<u>\$131,945</u>	NET ASSETS	<u>\$117,592</u>
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**THE AUSTRALIAN RANGELAND SOCIETY
STATEMENT OF PROFIT AND LOSS
FOR THE YEAR ENDED 31 DECEMBER 1996**

1995

INCOME

24,076	Subscriptions	29,620
3,000	Grant - National Landcare Program	-
73	Interest - NAB, Orange	3,160
55	Interest - ANZ, Western Australia	27
23	Interest - WBC, Port Augusta	46
1,628	Interest - Sirocredit	-
1,445	Interest - Bank SA, Port Augusta	1,259
2,716	Interest - NAB, Perth	-
2,444	Interest - National Mutual	938
31	Interest - CBA, Cobar	25
175	ARS Survey	500
2,940	Plant Identification Course	-
720	Utah IRC Conference	630
(13,656)	Net profit/(loss) Journal	(13,637)
(6,658)	Net profit/(loss) Newsletter	(7,126)
15,036	Net profit/(loss) Conferences	(5,731)
<u>34,048</u>		<u>9,711</u>

EXPENSES

3,500	Accountancy & Audit	4,000
842	AGM expenses	111
364	Bank Charges	285
1,692	Depreciation	982
-	Filing fees	210
7,500	Honoraria	3,000
1,803	Loss on sale of fixed assets	-
-	Plant ID Course - SA Branch	2,752
2,831	Printing, stationary & postage	1,985
5,850	Scholarships & Grants	4,832
318	Subscriptions and donations	1,328
6,760	Survey and Research	3,450
1,664	Travel & Accommodation	-
-	Townsville Congress Expenses	1,000
5,773	Utah Congress Expenses	79
-	Hire of Venue	50
<u>38,897</u>		<u>24,064</u>

(\$4,849)

NET LOSS FOR THE YEAR

(\$14,353)

REPORT OF THE PUBLICATIONS COMMITTEE

Leigh Hunt, Primary Industries SA, PO Box 357, Port Augusta SA 5700

The production of the Society's publications, *The Rangeland Journal* and *Range Management Newsletter*, has proceeded smoothly during the last year. This can be attributed to the continuing commitment and efforts of Allan Wilson (Journal Editor), Gary Bastin (Newsletter Editor) and Malcolm Howes (Journal Production Manager) in producing these publications and in ensuring high standards of content and production quality. The Journal's Associate Editors and referees also play an important role in maintaining a high scientific standard in journal articles. Thanks are due to all these people for their contributions.

The special issue of the journal entitled *Grazing Management* that was published in December was a valuable contribution to the subject. It is certainly a credit to Allan Wilson that he was so successful in bringing together a range of interesting papers that described the current thinking (and many new ideas) in various aspects of the science and application of grazing management practices in a diversity of rangeland environments. Together with the high production standards achieved, I believe this issue represents a significant stage in the development of the Journal. Planning has commenced for the next special issue, which will be published in 1998. This will deal with the subject of the management of water resources in rangelands and Dr Phil Price of LWRDC is to be guest editor for the issue.

In the last year the Publications Committee has continued to work on several activities associated with the development of the Journal. An agreement has been reached with the USA's Society for Range Management (SRM) for the titles, abstracts and authors for papers published in all issues of *The Rangeland Journal* (and earlier issues of the *Australian Rangeland Journal*) to be included on SRM's digital database of abstracts from the *Journal of Range Management*. This database will be available for purchase on diskette. As well as being a valuable resource to ARS members, the joint database should increase our Journal's exposure and that of the ARS in North America and elsewhere. We will be promoting the database once it becomes available.

A sub-committee appointed by the Publications Committee, comprising Allan Wilson, Ken Hodgkinson and Andrew Ash, has been investigating the options for 'internationalising' *The Rangeland Journal* and also considering whether the journal is at a suitable stage of development to be successful in an approach to the Institute for Scientific Information asking that they list the Journal in *Current Contents*. We see both of these issues as being important to the long-term success of the Journal as an internationally recognised scientific publication. The sub-committee has recommended that to internationalise the Journal the current group of five Australian associate editors be expanded to include five new overseas associate editors. These new associate editors would be involved in the

reviewing of papers for the Journal and would also be in a position to solicit material for the Journal from their own country or region. North America, South America, New Zealand, South Africa and Europe have been identified as appropriate regions from which to enlist respected rangeland scientists as associate editors. It has been decided that any approach for listing in *Current Contents* be delayed until the international associate editors are in place.

A couple of changes in membership of the Publications Committee occurred during the year. Tony Pressland and David Wilcox left the Committee, while Peter Johnston and Craig James joined to fill the vacancies created. Tony and David have both had a long association with the Society's publications that stretches back over many years. They have made significant contributions to the development and success of the Journal and Newsletter both in an editorial capacity and in setting directions for the publications. On behalf of the Society, I would like to thank them for the role they have played in the production of the Journal and Newsletter, which have become important resources to those with a professional interest in the rangelands.

Since members of the Publications Committee are located throughout Australia much of the business of the Committee continues to be carried out by phone, fax, email or letter. While this is generally effective and efficient, the Committee does take the opportunity to have face-to-face meetings when the opportunity arises. Accordingly, a meeting of the Committee was held during the conference in Port Augusta last September. A meeting is also planned for the next conference at Gatton in December this year.

Finally, I would like to thank all members of the Publications Committee for their support during the year and their contributions to ensuring the continued success of the Society's publications.

AUSTRALIAN RANGELAND SOCIETY MEMBERSHIP APPLICATION FORM

Please complete and return to the Subscription Secretary, Rob Richards, PO Box 235, Condobolin 2877 NSW.

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 1997.

* delete as appropriate

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

Membership Rates:

	Australia	Surface Mail	Overseas Air Mail
Individual or Family -			
Full (Journal + Newsletter)	\$55.00	\$65.00	\$75.00
Part (Newsletter only)	\$25.00	\$30.00	\$35.00
Institution or Company -			
Full (Journal + Newsletter)	\$85.00	\$95.00	\$105.00
Part (Newsletter only)	\$40.00	\$45.00	\$50.00

Note -

Membership is for the calendar year 1 January to 31 December. All rates are quoted in AUSTRALIAN currency and must be paid in AUSTRALIAN currency.

For Office Use Only:

Membership Number.....

Date Entered in Member Register.....

Date Ratified by Council.....

