



The Australian Rangeland Society

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Range Assessment Newsletter

Produced by Officers of the C.S.I.R.O. Riverina Laboratory on behalf of the
N.S.W. Range Assessment Committee

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No. 74/1 March, 1974

EDITORIAL

We have pleasure in introducing to you the first "Range Assessment Newsletter". The Newsletter is an outward expression of a need felt by a growing number of widely scattered Australians, namely, to be kept fully informed of the latest developments in range assessment in Australia.

One range condition workshop was held in Alice Springs in 1972 and two workshops at Broken Hill in 1973. The reaction to these workshops by those who attended was generally one of enthusiasm, and in the concluding plenary session of the last workshop at Broken Hill in September, 1973, it was resolved that a Range Assessment Newsletter be produced for distribution to all interested people. A group of representatives of the CSIRO Rangelands Research Section and the N.S.W. Soil Conservation Service has been given the responsibility of producing the Newsletter. The group consists of William E. Mulham and Graeme J. Tupper, CSIRO, and Geoff. M. Cunningham and Peter L. Milthorpe, N.S.W.S.C.S.

The Newsletter has a wide scope. It is being distributed extensively over Australia and to people in a great diversity of positions. It will include news on subjects such as the development of Australian methods of range condition assessment, resource inventory, the use of reference areas, implementation of the management level, the use of specialised techniques such as remote sensing, news of workshops and conferences, impressions gained from visits by Australians to overseas countries and by visitors to Australia, and the special needs of managers of National Parks and other non-pastoral users of rangelands.

Contributions requested. With your participation through contributions, the Newsletter will be able to fulfil our expectations. Letters to the Editor, comments, and reports are all acceptable. The reading audience is keen to know what you are thinking and doing in the area of range assessment.

Drawings and photographs. Drawings and photographs can be printed in the Newsletter, but such contributions should be outstanding to merit serious consideration for inclusion, as space and costs are limiting.

Closing date for next Newsletter. Contributions should reach the Editor by 1st June, 1974 to meet a mailing deadline of 1st July, 1974. We are working on the basis of three issues per year, but this will depend on the response from the readers.

Mailing list. A complete mailing list for the first Newsletter is included. Please check the address on your copy and the list of names, and let us know as soon as possible if your name and/or address is/are incorrect, and of any omissions of which you are aware. We do not wish to send the Newsletter to persons who are not interested, but we are very keen that everyone who could be interested should receive it.

Motif. Several people have suggested that the Newsletter should have a motif in the letterhead. If you have a good idea, send it in with an explanation, and the committee will consider it.

Bibliography. It is hoped that future issues will contain the names of published papers and reports relevant to range assessment. Once again we are dependent on interested persons to submit items for this section.

Contributions from overseas. A few selected people in other countries are on the mailing list and we hope that they will feel free to contribute to the Newsletter also.

Thus the future of the Range Assessment Newsletter is in your hands. As members of the committee we will play our part, but we are dependent on the active participation of enthusiastic workers involved with the rangelands of Australia to make the Newsletter serve a useful purpose.

GRAEME TUPPER

On behalf of the committee

RANGE CONDITION WORKSHOP - ALICE SPRINGS. FEBRUARY-MARCH, 1972

Barney D. Foran, Range Management Section, Dept. of N.T., Alice Springs

Thirty local, interstate, and overseas range workers attended the workshop. Six methods were used on three "range sites" on good, fair and poor condition locations in each. Given below are the overall attitudes of the participants to each of the methods.

1. DEMING 2 PHASE. Well liked by most participants since it looked at the plant and soil categories as separate entities. The alternatives to be chosen were well defined and gave a reasonable separation between locations within each site.
2. HUMPEREY-FORAGE SITE POTENTIAL. Intensely disliked by most observers because of the vagueness of definitions and excessive reliance placed on the operator's experience.
3. DYKSTERHUIS-QUANTITATIVE CLIMAX. This method gave good separation of the condition classes within each site and the ecological basis of the method was appreciated by all. However, clipping of plots to obtain percentage composition turned many people against it.
4. CHIPPENDALE-PASTURE CONDITION. This method is not ecologically based, not site specific, gives too much weight to top feed and grasses, and tries to cover too broad an area on different vegetation types.
5. PARKER 3 STEP. There was little separation of locations within sites, and operator fatigue produced opposition to it.
6. CONDON-GRAZING CAPACITY ASSESSMENT. Very weak on condition but all observers liked the attempt to arrive at a stocking rate, i.e. direct management tool.

The outcome indicated that Deming's 2 Phase, combined with Dyksterhuis' Quantitative Climax Method and Condon's Assessment of Grazing Capacity had the elements of a workable system.

A REVIEW OF RANGE ASSESSMENT METHODS

A review article has been put together by C. Lendon and B. D. Foran, titled "Range Condition Assessment - the search for an Australian method". It arose out of the Alice Springs range condition workshop in 1972, when the need was felt to seek guidelines for future Australian work by searching out what has been written on the subject, not only in Australia and America

but also in other rangelands of the world. Some suggestions for the Australian approach are made. The article also aims to introduce the concepts of range condition assessment, and argue for its need and support, to fellow agricultural scientists generally. It is about to be submitted for publication.

CURRENT RANGE ASSESSMENT WORK IN CENTRAL AUSTRALIA

Barney D. Foran, Range Management Section, Dept. of N.T., Alice Springs
Colin Lendon, Land Resources Management, CSIRO, Alice Springs

Standards for Testing and Assessing Range Condition (STARC) are being formulated into a method for use on the varied range types of central Australia. At this stage of the work, it has become a three-stage system: 3 characteristics, 3 phases (consisting of 3 sections), and 3 steps in the field survey.

1. Characteristics:

- 1.1 The B.L.M. Two-Phase format of scoring is currently being used, but the method is being used site-specifically (per range site).
- 1.2 A third phase has been incorporated, to take special account of Woody Plants in Australian rangelands.
- 1.3 The ecological classification of plants according to the S.C.S. Quantitative Climax approach has been adopted.

2. Phases and Sections:

	<u>Phases</u>	<u>Sections</u>	<u>Scored out of :</u>	<u>Maximum</u>
I	GROUND PLANTS	Composition	4	
		Quantity	3	
		Vigour	3	<u>10</u>
II	SOIL & SITE	Current Erosion	4	
		Protective Cover	3	
		Surface Run Off	3	<u>10</u>
III	WOODY PLANTS	Composition	4	
		Density	3	
		Form	3	<u>10</u>

3. Steps in the field survey:

- 3.1 Describe the ecological unit (range site):
name; summary characteristics; climate; topography; soils; vegetation; history of use.
- 3.2 Select those areas of the site to be scored by the method - using aerial photographs, station maps, etc.
- 3.3 Prior to condition assessment, inspect a reference (relict-type) area - to obtain the potential for the site under the prevailing seasonal conditions.

Testing the STARC prototype is in progress on three contrasting range types (see page 4). Aspects such as repeatability between assessors and the score computation approach are being analysed. One such scoring procedure concerns the "weighting factor" given to each phase, depending on its importance in the stability, total production, and land use need for the range site under study, e.g.....

RANGE SITE	I. GROUND PLANTS	II. SOIL & SITE	III. WOODY PLANTS
Southern Bluebush (<i>Kochia astrotricha</i>) shrubland on erodible calcareous soils with some element of slope.	x 2	x 4	x 4
Open woodland over annual grasses and forbs on a young sandy alluvium.	x 5	x 3	x 2
Mitchell Grass (<i>Astrelba pectinata</i>) on heavy cracking clay soils on plains country with no trees.	x 8	x 1	x 1

The sum of the weighting factors for the 3 phases must be 10. How to apportion the relative weighting factors requires further consideration as more score-sheets are completed, e.g. the importance of Phase I GROUND PLANTS may be weighted more heavily if this phase of the ecosystem is the most sensitive to management.

This method of scoring allows us to analyse scores of individual phases separately, while also permitting their combination into one of five condition classes, if an overall name is needed for extension purposes.

A completed scoresheet for Bluebush (*K. astrotricha*) shrubland on erodible calcareous soils with element of slope

Phase	Section	Score	Sub-total x site weighting factor
I	GROUND PLANTS	Composition = 3	
		Quantity = 1.5	
		Vigour = 1	= 5.5 x 2 = 11
II	SOIL & SITE	Current Erosion = 1	
		Protective Cover = 1.5	
		Surface Run Off = 1.5	= 4.0 x 4 = 16
III	WOODY PLANTS	Composition = 4.5	
		Density = 1	
		Form = 1.5	= 7.0 x 4 = 28

The condition is thus 11/16/28: combination for sake of a name is frowned upon, but it is 55 = Fair. (Excellent: 80-100; Good: 61-80; Fair: 41-60; Poor: 21-40; Very Poor: 1-20).

1974 WORKSHOP - ALICE SPRINGS?

Each August, the A.D.A.C. Arid Zone Technical Subcommittee meets in Alice Springs and hears reports from all personnel doing studies in the central Australian region. The instigation of this subcommittee has led to collaboration between CSIRO and Department of Northern Territory workers, first in the organisation of the 1972 range condition workshop and since then to define range sites (ecological units) and a method of assessing them.

In August 1974, it is planned to present a progress report to the Technical Subcommittee, with recommendations for a follow-up workshop. It is expected that a workable STARC method (Standards for Testing and Assessing Range

Condition) will be presentable from the current trial period on three contrasting rangeland types. The next workshop should present a tried, range assessment method to range men such as pastoral inspectors, and discussions should centre not so much on its conceptual make-up as on the nitty-gritties of putting it into practice on a station-wide basis.

SOME IMPRESSIONS OF THE RANGE RESOURCE MANAGEMENT PROGRAM OF USDA SOIL CONSERVATION SERVICE IN THE NORTH-WEST U.S.

Colin Lendon, Land Resources Management, CSIRO, Alice Springs

A short, 28-day visit was made during September 1973 to Oregon and North Dakota, primarily to come to grips with the historical and developmental methodology of rangeland assessment in the U.S.A., i.e. those aspects which have not been clearly detailed in their literature on the subject. Because rangeland assessment is a field exercise (and because there are elements of art as well as science involved) most of my time was spent in the field participating in the work of experienced range conservationists, administrators and ranchers.

The rangelands I visited consisted principally of perennial bunch grasses. Other contrasts with the Australian scene... the season is an important and regular factor in the management of their northern rangelands. Winter is the tough time, when snow covers the high country and animals have to be depastured on the low lands. The growing season is always in Spring, and the melting snows make up a large part of the total annual precipitation. This is the time of year when they like to do range assessments, when the fullest expression of plant species shows and, preferably, before grazing animals have had any effect.

The S.C.S. is currently updating the National Handbook on condition and trend procedures but the basis remains the ecological approach of assessing the role of the species making up the plant communities. In practice, this has meant finding the place of each plant in its natural setting - the "range site". Great stress is put on this first, "range inventory" step: determining the ecological unit (range site). Such a way of classifying the land may or may not become the mapping unit (areas delineated on a map) or the management unit for a ranch - this depends on the extent and position of the particular range sites - but it is seen as the realistic way of determining the ecological potential of the vegetation. Each state describes its own range sites (related ones are grouped into 10 "ecological provinces" in Oregon), part of the task being the search for undisturbed communities in order to work out the proportions of species in the climax state. "Technical guides" set out this range site description information, and range assessors compare the composition of other communities of the same range site - to arrive at the "quantitative climax" assessment of range condition.

The same quantitative climax method is used in both Oregon and North Dakota, but with an interesting internal difference. Oregon, where rangelands vary from 8-inch desert brush and grassland, through bunchgrass hills to 35-inch conifer forest range, uses foliage cover to proportionalise species, whereas North Dakota's prairie grasslands (E. J. Dyksterhuis' early stamping ground) are assessed in terms of dry matter production per species. Wide areas of Oregon were overgrazed with sheep until the 1950's when a change-over to cattle occurred; the old buffalo pastures of North Dakota have been largely grazed by cattle.

What is the importance and usefulness of range condition assessment in the U.S.? It forms an integral part in adjusting the stocking rate on ranch allotments year by year. The end product of the S.C.S. advisory role to the rancher is a ranch plan in which the pattern and intensity of grazing is agreed on for the next few years. By first knowing the range sites and their condition, they have obtained the ecologically-based evidence necessary to convince the land manager of the need for adjustments to his use of the native pastures. Range condition is then used as a follow-up, extension tool with the rancher, e.g. demonstrating the effects of deferred grazing in terms of

the range condition indicators (composition changes, vigour etc.). One is left with the impression that land managers have a real appreciation of managing the vegetation resource as carefully as the animals, and that their understanding of range condition has been the means to this desirable goal.

4TH U.S./AUSTRALIA WORKSHOP ON RANGE SCIENCE, ALICE SPRINGS

MARCH 25 TO APRIL 5, 1974

The Joint U.S./Australia Rangelands Panel was formed in 1969 as part of the U.S./Australia Agreement for Scientific and Technical Co-operation.

The Panel's main activity so far has been the organisation of small workshops on specific topics, and three such workshops have been held, the first at Berkeley in 1971, the second at Adelaide in 1972, and the most recent at Tucson in 1973. These workshops have been very effective in allowing range-workers in Australia and America to gain a better understanding of the attitudes and problems which are associated with rangeland research in the two countries, and they have established a very healthy basis for continuing collaboration. Attitudes expressed by the participants at the last workshop in Tucson emphasised even more strongly the benefits that can be gained from meetings such as this, and consequently a fourth workshop is being organised in Alice Springs from March 25 to April 5 in 1974. The topic of the workshop is Rangeland Ecosystem Evaluation and Management, the objective being to review the principles of Rangeland Resource Inventories and Resource Condition and Trend Assessments, and to integrate the biological, economic and administrative aspects contributing to management of rangeland resources.

A number of Australian range scientists will be attending the workshop and contributing papers, including Mr. D. G. Wilcox of the Dept. of Agriculture, W.A., Dr. Sue Barker of the University of Adelaide, Mr. W. H. Burrows (currently studying at the Australian National University), Mr. N. M. Dawson and Mr. B. A. Woolcock, of the Queensland Dept. of Primary Industries, and Mr. R. A. Perry, Chief of the CSIRO Division of Land Resources Management.

AUSTRALIAN RANGE MANAGEMENT SOCIETY

In 1972, research workers on the Australian Arid Zone Newsletter mailing list were sent a short yes/no questionnaire which enquired as to whether they would be willing to join an Australian Range Management Society if one were to be formed.

Of the 312 who replied, a little over two-thirds were in favour of joining such a society, and this suggests that planning should continue. Mr. R. E. Winkworth, of the CSIRO Division of Land Resources Management, will be looking at the organisation of the Society for Range Management based in America, and will recommend appropriate procedures and operation for an Australian set-up. Particular aspects to be examined are the composition of membership, desirability of a journal, and organisation of meetings.

RANGE CONDITION WORKSHOPS IN THE WESTERN DIVISION OF N.S.W.

The increased attention being given to the development of sound management practices in the arid and semi-arid zones of Australia was highlighted by two workshops held in 1973 at Fowlers Gap Arid Zone Research Station, 68 km north of Broken Hill. The workshops, each of approximately one week's duration, were held during May and September. These workshops were designed primarily to assess and compare one Australian and three American methods for assessing range condition and trend with the ultimate objective of developing a method suitable for most Australian conditions.

Initially a working group comprising two representatives from the Rangelands Research Unit and two from the N.S.W. Soil Conservation Service, was established to arrange the organisation of both workshops.

A total of 58 range ecologists, administrators, economists and extension workers participated, representing 12 institutions and agencies interested in problems of the arid zone. These included the N.S.W. Soil Conservation Service; the Rangelands Research Unit of the CSIRO Division of Land Resources Management; Departments of Agriculture of N.S.W., S.A. and W.A.; the Department of Northern Territory; the Pastoral Board of the S.A. Department of Lands; the Western Lands Commission of N.S.W.; the National Parks and Wildlife Service of N.S.W.; the Bureau of Agricultural Economics; and the Universities of New South Wales and New England. A guest at the May workshop was Professor Harold F. Heady, from the School of Forestry and Conservation, University of California, Berkeley. Professor Heady is a noted authority on range condition assessment in America and his experience was of great benefit to those present at this workshop.

The workshops were completely residential with all participants residing at Fowlers Gap which is run as a research station by the University of New South Wales.

Participants were organized into four working groups and each group utilized the four methods in turn. Four contrasting vegetation types were examined, namely Mitchell grass, mulga, saltbush and bluebush communities.

Approximately half of each day was spent in the field testing the four methods with the remainder being used to work up the data collected and discussing group results. Informal evening sessions covering a wide range of topics were also a feature of both workshops.

At the conclusion of each workshop, there was a plenary session involving all groups during which the results of each group in relation to each particular range assessment method were discussed. These were generally based on questionnaires which the groups completed after using each particular method. General features of a range condition and trend assessment method suitable for Australian conditions were discussed in some detail. Already, as a result of these workshops, preliminary outlines of methods appropriate to local conditions have been drawn up by several people and these will be circulated in the Range Assessment Newsletter.

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