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THE USE OF RESOURCE REGIONS FOR DATA COLLECTION, POLICY PLANNING AND EXTENSION IN RANGELANDS.

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Abstract

Land system surveys have described the biological characteristics of significant areas of Australian rangelands. For full use to be made of this information it needs to be complimented with property level data on financial and animal performance and management constraints. Findings drawn from the assembled data need to be presented in a form readily understood by various land users such as pastoralists, extension officers, research planners and land policy administrators.

In far south-west Queensland resource regions have proved to be a convenient basis for the collection of the property level data and the communication of findings to land users. Resource regions are geographic areas within which properties have the same mixture of land systems and the same climate and so carry on similar types of grazing enterprises with similar management options.

Background

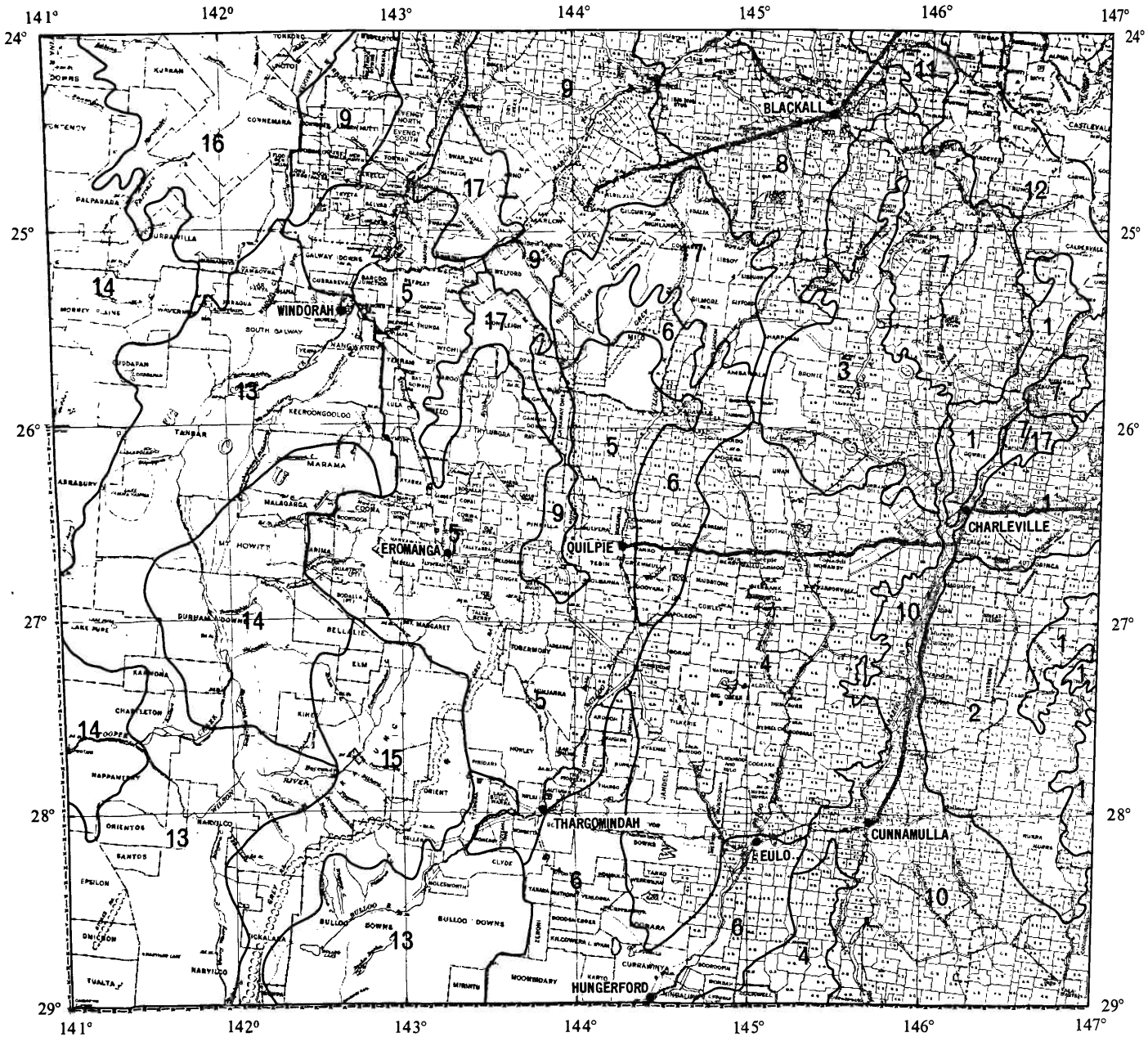
Land systems surveys are available for pastoral lands throughout Queensland and for a number of other areas in Australia. These surveys provide a detailed description of the biological resources of these areas and their characteristics and problems. The overall objective of the land systems mapping program in south-west Queensland was the evolution of principles of land management which would maintain or improve the condition of the country while maintaining adequate financial returns.

To achieve this objective, information such as financial data, animal performance figures, management constraints and other property level data had to be collected and assessed. It was not convenient or even possible to collect this property level data on a land system basis and it became evident that a broader classification which could still be closely related to land systems was needed to bring biological and other parameters together. This information then had to be synthesised into management recommendations.

The Resource Region approach has been used as this basis for data collection and determination of management programs. Information presented on this basis has been seen as relevant and useful by extension staff specialising in other fields who play a major role in the promotion of land management programs because of their frequent contact with the rural community.

Fig. 1

BY J.R.MILLS



SCALE 1:3 500 000

KILOMETRES 40 20 0 40 80 120 160 200 240 KILOMETRES

REFERENCE

RESOURCE AREA	LAND TYPE	CURRENT ENTERPRISE	RESOURCE AREA	LAND TYPE	CURRENT ENTERPRISE
EASTERN MULGA LANDS			WARREGO PLAINS		
1 EASTERN MULGA	Mixed hard and soft mulga.	Cattle breeding and bullock depots; wethers and limited sheep breeding.	10 CUNNAMULLA	Open Mitchell grass plains, gidgee, sandhills, drainage lines and flooded areas.	Sheep breeding; cattle breeding and fattening
2 NEBINE	Soft mulga.	Cattle breeding and bullock depots; limited number of wethers.	EASTERN RANGES AND DESERT		
3 LANGLO	Soft mulga and alluvial plains. Minor ranges.	Cattle breeding and wethers; cattle breeding and eventual fattening or fattening of older stock in above average seasons.	11 EASTERN DESERT	Eucalypt woodland and spinifex desert.	Cattle breeding, turning off store weaners; limited number of wethers.
WESTERN MULGA LANDS			12 CARNARVON	Eucalypt woodland, brigalow and ranges.	Cattle breeding, turning off store weaners and young steers.
4 PAROO	Hard mulga and associated alluvial plains. Minor ranges.	Wethers and sheep breeding on better types of country; cattle breeding and eventual fattening of older dry stock or younger stock in above average seasons.	CHANNEL COUNTRY		
5 QUILPIE	Principally hard mulga, with alluvial plains, ranges and areas of stony gidgees.	Sheep breeding and wethers; cattle breeding and fattening in average or above average seasons.	13 TANBAR	Spinifex sandplain and seasonally flooded channel country.	Cattle fattening on channel country following floods; minor breeding.
6 EULO	Mulga sandplain and sandplain overlying alluvia. Minor areas of hard mulga.	Sheep breeding and wethers; cattle breeding and eventual fattening of older dry cattle or younger cattle in above average seasons.	14 DURHAM	Stony downs, ranges and seasonally flooded channel country.	Cattle fattening on channel country following floods; some breeding on the stony downs areas.
DOWNS			WESTERN RANGES		
7 TAMBO	Mitchell grass downs, with associated wooded downs and areas of gidgee.	Sheep breeding; cattle breeding and fattening in average or above average seasons.	15 NOCCUNDRA	Low ranges, hard mulga and alluvial plains.	Cattle breeding and fattening in above average seasons.
8 BLACKALL	Mitchell grass downs, with associated wooded downs and extensive areas of gidgee.	Sheep breeding; cattle breeding and fattening in average or above average seasons.	16 FARRAH	Ranges, hard mulga and alluvial plains.	Cattle breeding.
9 BIMERAH	Mitchell grass downs, wooded downs and occasional areas of gidgee.	Sheep breeding; cattle breeding and fattening in average or above average seasons.	17 SWANVALE	Ranges, hard mulga and areas of stony gidgee.	Cattle breeding and wethers.

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BASE MAP supplied by Department of Mapping and Surveying and reproduced by permission of the Surveyor General, Brisbane.

The Resource Region approach has been used by the Soil Conservation service of the United States Department of Agriculture for a number of years to develop and coordinate soil and water conservation programs, and present a broad synthesis of current knowledge about the land resources of the United States (Austin, 1965).

Definition

The Resource Region is defined as a geographic area within which properties have a similar mixture of land systems, similar climatic patterns, and hence in pastoral lands carry on much the same type of enterprise. These regions have similar problems, characteristics and management options, and can be regarded as broad management units. The size and extent of a Resource Region is flexible depending on the degree of detail required. Resource Regions with important similarities may be grouped into the broader classification of Resource Areas (eg. Eastern Mulga Lands).

In south-west Queensland the Resource Regions shown in Fig. 1 were defined firstly on the basis of industry type, with the Western Dingo Barrier fence dividing the cattle country from the mixed sheep and cattle country to the east (ie. the management constraint of dingoes exercised a major influence on the break-up). Next the Mitchell grass breeding areas in the north and south were separated from the mulga lands. The northern Mitchell grass or 'Downs' area was further subdivided into three Resource Regions because of the decreasing rainfall from east to west across this area.

The remaining mulga lands were subdivided into Eastern and Western areas on the basis of rainfall, with the Warrego River forming a convenient and locally recognised division between the two. The Eastern and Western mulga lands were each further subdivided into three Resource Regions on the basis of land systems and related enterprise type. This separated the properties where limited sheep breeding and cattle fattening is possible, from the wether and cattle breeding enterprises.

Extensive use was made of local adviser's knowledge of properties in the area for compiling the map. A number of the regions correspond to localities previously recognised by people familiar with the area. Childs (1974) used a similar grouping which he referred to as vegetative zones for a property management survey in the south-east of the area.

The map is compiled by first noting on a cadastral map the enterprises carried on on each aggregation. This map is then over-laid with a land system and land zone map and tentative land use patterns are marked out. Further

overlays showing climatic features can also be used to further subdivide these land use patterns into resource regions. In far south-west Queensland 17 resource regions were recognised in an area covering 30 m hectares.

Description of Resource Regions

Resource Regions were defined on a 1:1 000 000 scale map using a cadastral base with the names of holdings shown wherever possible. The legend provides a brief description of the land systems involved and type of enterprise carried on, and clearly shows the grouping of Resource Regions into Resource areas.

For detailed biological descriptions users are referred to the relevant land systems maps and reports (Queensland Department of Primary Industries, Division of Land Utilisation Technical Bulletins Nos. 12, 22, 23 and 29*).

The main biological characteristics and problems can be drawn from these reports and highlighted. Our limited experience to date indicates that land degradation problems can conveniently be defined in terms of type of problem, area affected and severity, on a resource region basis. This allows initial prioritising of resource regions' needs, and surveys to collect financial, animal and managerial data can be designed and implemented on this basis.

The analysis of production type information allows an objective assessment in financial terms of the success or otherwise of various types of management strategy, different enterprise sizes and structures in that resource region. The value of production lost through land degradation or other problems can be estimated from average productivity figures for various regions. The financial information also provides an assessment of the capability of graziers in an area to adopt proposed changes in management systems which involve lowering stock numbers and a possible reduction in income from wool and meat production.

Regions where problems can be solved by graziers themselves in response to an active extension program can be recognised and treated differently to areas where high debt levels, inadequate incomes and small holdings make it very difficult for graziers to adopt more conservative stocking policies without Government incentives or aid. Once a properly detailed outline of industry structure, performance and capacity for change, and the cost of biological problems has been built up, the needs of various Resource Regions can be objectively prioritised. This allows limited research and extension funds to be concentrated in regions with the greatest need for action.

* In preparation.

Table 1. Comparison of the Eastern Mulga and Paroo Resource Regions

	EASTERN MULGA (average of 7 properties 1972-3 to 1979-80)	PAROO (average of 10 properties 1974-5 to 1978-9)
Area (ha)	21 000	42 000
Sheep numbers	5 400 (3.8 ha/hd)	10 000 (4.2 ha/hd)
Cattle numbers	550 (38 ha/hd)	620 (68 ha/hd)
Net Income per property \$	13 400	34 800
Net Income per family unit \$ (after interest and capital)	9 400	13 700
Debt \$	66 000	28 000
Gross Margin/Sheep \$	4.90	7.46
% of total income from sheep	71%	83%

Source: Holmes, W.E. (1981). Eastern Mulga Land Resource Region Survey. Queensland Department of Primary Industries, Mimeograph.
Mills, D.M. (1981). Paroo Resource Region Survey of Profitability. Queensland Department of Primary Industries, Mimeograph.

The main features to note in this comparison of two resource regions are the larger areas of the Paroo properties, and their higher net income and lower debt figures than the Eastern Mulga properties. This is a result of the lower gross margin/sheep in the Eastern Mulga which in turn reflects the poor wool quality, lower wool cuts and marginal breeding performance of this region.

These figures cover a period of relatively good seasons and it is significant that the Eastern Mulga properties were unable to reduce their debt levels substantially during this period. These properties entered the current drought with a high debt load which may be expected to increase over the dry period. The slightly heavier dependence of this region on income from cattle also makes these small properties more vulnerable to fluctuations in cattle prices.

The ratio of debts to income in the Eastern Mulga shows that these properties generally have insufficient income earning capacity to withstand

short term reductions in income due to dry years or more conservative stocking rates which may be desirable to slow further land degradation. Equity and income earning capacity are insufficient to finance further expansion of area which (labour permitting) would enable stocking rates to be reduced without reduction in stock numbers and subsequent income.

Extension programs aimed at encouraging more conservative stocking rates have limited chances of success in this region where economic pressures continually force managers to keep short term production at a maximum. If the estimated costs of land degradation in this area show that changes in land use intensity are desirable in the public interest, Government intervention would seem necessary to achieve these changes.

By comparison the Paroo properties have sufficient income earning capacity and liquidity to be able to accept some short term reductions in income which are associated with dry periods or lower stocking rates. In practice however, these managers chose to acquire more land, and 90% of properties surveyed in this area planned to expand the size of their holdings as soon as the availability of suitable land and finance allowed.

Extension programs to communicate the benefits of lighter stocking rates have a reasonable chance of success in this area where managers have increased financial flexibility and consequently a wider range of management options available. These properties have the capacity to respond to land degradation problems without Government financial assistance, or at least the capacity to pay commercial rates for Government money if priorities indicate changes in land use intensity in this region are desirable.

Financial performance information presented on a resource region basis is of direct value to individual graziers by allowing them to compare their performance with averages of other similar properties. Properties within a region can be grouped according to size, profitability or other characteristics for comparison. In the Paroo resource region the smallest properties carried the highest average debt levels and the larger aggregations returned much higher profits during runs of good seasons.

Conclusion

The outline of financial, structural and management aspects of rangeland animal production is equally as important as the collection of basic land resource information. Some information of this type has previously been collected on a local authority basis. The diversity of resource regions which can occur within shires limits the usefulness of this information and can make

it misleading in some cases.

The presentation of information collected in a simple form which is seen as relevant and useful by the appropriate user, is necessary if sound land use policies of real value to graziers and the community are to be adopted. The use of a resource region approach is one way of doing this.

References

- Austin, M.E. (1965). Land resource regions and major land resource areas of the United States. Agriculture Handbook 296. Soil Conservation Service. U.S. Department of Agriculture.
- Childs, J. (1974). Sheep industry survey - south-west Queensland. Queensland Department of Primary Industries. Far South West Extension Services Technical Bulletin No. 1.