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HISTORICAL CHANGES IN LAND CONDITION IN THE SOUTH AUSTRALIAN PASTORAL ZONE: DEVELOPING A NEW APPROACH

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ABSTRACT

We intend to provide an objective account of the history of land condition in two pastoral areas of South Australia - the North-East Pastoral and Marree Soil Conservation Districts (SCDs). We have collected information on historical land condition from a variety of sources. In order to link these diverse forms of information a new methodology was developed for the North-East SCD where each piece of information was assigned to one of five 'land condition' classes. These data were then graphed to elucidate trends over time. For the Marree SCD this approach was unsuccessful due to the size and variability of the area and the relative lack of information. We suggest that this classification technique is useful for gaining information from disparate and imprecise data sources, given sufficient data points.

INTRODUCTION

How does land condition today compare with what it has been in the past, right back to first European settlement? Are things getting better or worse? The answer to this question goes to the heart of the environmentalist versus production debate. We are attempting to answer this question for two contrasting pastoral districts in South Australia.

Other cases of historical-ecological research include that of Noble (1977), who measured successive changes in vegetation by comparison of historical photos rather than actual measurement, and thus created a data set of relative 'changes' in order to estimate plant biomass. Oxley (1987) compared similar sections of historical vegetation maps in order to create a data set of presence/absence through time. Both of these examples involved the development of techniques to extract quantitative data from qualitative sources. We have attempted to do this by:

- identifying information in the historical sources that is both reliable and relevant to the question;
- working at a scale that is both large enough to enable use of most of the information and facilitate reliability and small enough to be able to glean insights.

METHODS

This study was carried out in two Soil Conservation Districts (SCDs) in South Australian pastoral country. The North-East SCD (31,429 sq km) is principally chenopod shrubland used for sheep grazing. The Marree SCD (191,437 sq km) contains many contrasting land types such as sandhills and gibber plains, and is principally used for cattle grazing. Field trips were undertaken in 1994-5 to interview pastoralists and revisit sites in old photographs. Information was extracted from station diaries, photos and interviews as well as official archives held in Adelaide, SA.

For the relatively uniform chenopod shrublands in the North-East we decided that plant cover and its permanence would be good broadscale indicators of land condition. Plant cover was inferred from 450 pieces of historical data as follows:

- Class 1 - bare ground, soil drift;
- Class 2 - Very sparse cover, no drift;
- Class 3 - Moderate plant cover, not permanent;
- Class 4 - Good plant cover, little permanent growth;
- Class 5 - Very good, permanent plant cover.

RESULTS

North-East SCD

Results are presented for the three decades which contained the most information and where much of the information was from sources that were relatively unbiased and included most of the stations in the area. Information from the 1890s indicated a mixture of land classes (Figure 1). Most of the information for the 1940s was classified in the lower land classes, whereas the opposite was the case for the 1990s.

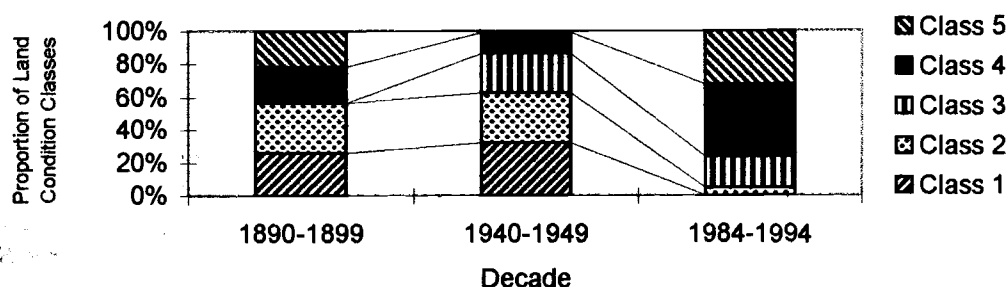


Figure 1. Proportion of land condition classes for three decades.

Marree SCD

Information from the Marree SCD was collected with the intention of adapting the technique developed for the North-East SCD. However, this was unsuccessful because:

- the many and varied land types precluded the use of a single classification scale;
- the size of the stations coupled with their environmental variability meant that many pieces of information across the area would need to be provided in order to obtain a clear picture of land condition - and these were not available.

DISCUSSION

The method described here has clarified the general historical conditions as indicated by information found for the North-East SCD. Most information indicating good plant cover in the 1890s came from areas where herbivores were restricted by lack of permanent water. This leads to the postulation that land condition decreased around the turn of the century where herbivores were present, was very low in the 1940s and has since increased to its relatively good present condition.

The inability to adapt the North-East technique to the Marree SCD indicates the importance of developing the scale for the particular land type and also the need for a large amount of information to increase the confidence in the results - particularly as the size of the area increases.

In the area for which the technique was developed (the North-East SCD), the method used allowed qualitative data on land condition to be summarised graphically to produce useful insights. This method is successful providing the area is not too large and there are sufficient data.

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