Use of ecological benchmark sites in natural pasture condition surveys in Australia

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The growing awareness of the dangers of deterioration of natural grazing land in Australia (Leigh 1974) has led to a considerably increased level of research into pasture condition assessment techniques. In arid and semi-arid regions where introduced pastures are unsuccessful, management rather than replacement of natural species is indicated. Management aims to manipulate animals so as to encourage development of the most productive successional stage of the vegetation.

Grazing land evaluation requires a knowledge of the potential botanical changes within the land system concerned. Condition assessment requires an understanding of the stages of succession possible and the relationship between present and potential condition. In the absence of reliable theoretical deductions of the vegetation potential of given soil/climate combinations, the use of relic sites (Clements 1934) is the only reliable basis for estimating site potential.

Ecological benchmarks are defined as sites which reflect site potential in terms of botanical composition and density of the vegetation. Documented site history usually indicates whether management or usage can be expected to have significantly altered potential vegetation condition. Comparison of benchmark sites with grazed sites gives an indication of the relative effects of climate, as distinct from grazing.

Roberts et al (1976) have reported on the detailed survey of 36 benchmark sties which may be summarized as follows:

TABLE 1. Analysis of benchmark sites in S.W. Queensland

Soil Type	Average number of species	Average basal (%)
Red Earth (loam)	31	3.4
Red Earth (sand)	20	4.4
Lithosols (residuals)	18	1.1
Clays	25	3.3

Orr (1979) has since indicated the order of seasonal fluctuations in the above parameters in certain of the above sites over a period of 7 years reflecting natural dynamics in the absence of grazing.

It is recommended that an intensive search be made with a view to fencing off benchmark sites in all major grazing land units as reference points for future monitoring of pasture condition. Without such reference points the on-going assessment and improvement of grazing land condition will be difficult to undertake with confidence.

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