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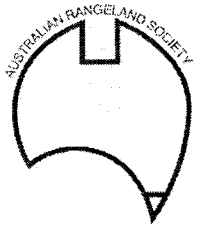

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GAWLER BIOREGION VEGETATION MONITORING

J. White and P. Gould

Pastoral Program, Dept. of Land, Water and Biodiversity Conservation
GPO Box 2834, Adelaide, SA 5001

INTRODUCTION

The Gawler Bioregion is mostly occupied by pastoral stations and is located in the southern chenopod rangelands of South Australia. The region comprises 123600km² and supports a wide variety of landforms and vegetation communities (GRSCB 1996 and KSCB 1996). This project aims to evaluate changes in land condition across the Gawler Bioregion using South Australia's existing pastoral monitoring site network. Over 1900 permanent sites were set up across this region between 1990 and 1993 to provide an effective monitoring system to determine long-term trends in land condition. This baseline site information, including plant density and cover measurements, focuses on changes to vegetation and soil resources as a result of total grazing pressure within a paddock (Tynan 1995).

METHODS

Analysis of site data was carried out on a vegetation group basis and to achieve this, sites were assigned to a vegetation group using a statistical process known as Pattern Analysis – PATN (Belbin 1994). This provided 15 vegetation groups upon which to base further analysis. A 10% random sample was taken from all quantitative sites stratified across vegetation groups and then by rangeland condition classes that were assigned at the time of site establishment. The random sites within six of the vegetation groups were visited during 2001 and is the subject of this report while the remainder of the sites will be re-visited during 2002. Plant counts within fixed belt Jessup transects (PIRSA 2000) were used to determine the density of perennial shrubs and the steppoint method (PIRSA 2000) was used to measure projected foliar cover at a site. The data from these were analysed by Biometrics SA (SARDI), for statistically significant change between the 1992/93 and 2001.

KEY FINDINGS

Analysis of the shrub density data has shown a statistically significant increase in bladder saltbush *Atriplex vesicaria,* density across three of the six vegetation groups (see figure 1). At many of these sites regeneration of this species was common but numbers of juveniles varied both positively and negatively with those counted in 1992. Within the region, this species is regarded as highly desirable and prone to decline under moderate to high grazing pressure.

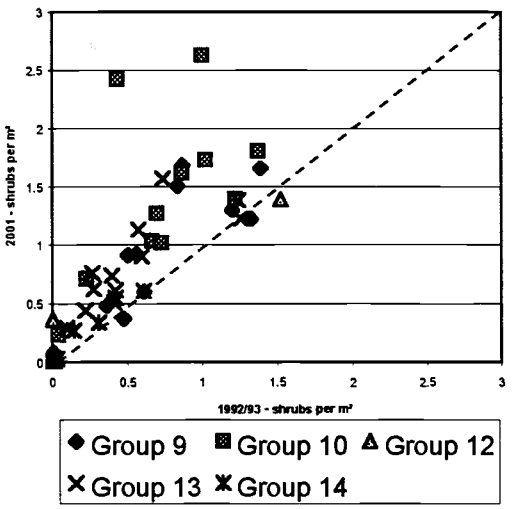

Figure 1: Jessup transect shrub density for *Atriplex vesicaria*

Other key species in the study area such as pearl bluebush *Maireana sedifolia* and blackbush *Maireana pyramidata,* remained stable. Although no significant statistical increase in bitter saltbush

Atriplex stipitata, was found, several sites showed large increases in bush density. This plant is often referred to as "recovery bush" as it can colonize areas with low perennial plant cover. This was particularly evident in the Gawler Ranges valleys and plains, which have been heavily impacted by grazing over a long period of time.

The cover (steppoint) data showed a high variation across the vegetation groups but overall, the results didn't show any significant trend except for seasonal variation. Further investigations into the statistical analysis of the steppoint data is required together with studies into it usefulness as a technique for identifying trend.

CONCLUSIONS

In detecting change over time, it is difficult to separate seasonal conditions from long-term grazing impact or other localised effects. Through combining short and long-term records, such as stock records, climatic information and observations of grazing on desirable plants, our understanding of ecosystems can be improved and future grazing practices can be adapted to suit these trends.

The methodology developed in this project will allow reporting of trend on a vegetation group basis within a given region of the southern sheep rangelands. It is not however suited to all vegetation communities regions as it is based predominantly on perennial vegetation. The grazing gradient method as described in Brook *et al.* (2001) is more appropriate in the northern areas of South Australia where vegetation response is more ephemeral.

Over the next 12 months the remaining vegetation groups will be surveyed and analysis of the monitoring techniques used will be completed. This, together with a comprehensive data base redevelopment, will form the basis from which reporting on vegetation change across a district can be carried out.

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