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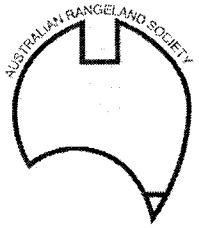

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WOODY WEED MONITORING FOR LAND ASSESSMENT

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BACKGROUND

Arid and semi-arid regions of NSW are being seriously degraded, land values are decreasing and production is being reduced by a large increase in the extent and density of woody weeds. These are native shrubs which have encroached formerly open lands of western NSW and it has been estimated that 20 million hectares are either already encroached or highly susceptible. (Woody Weeds Task Force, 1990). The major reasons for this encroachment are a decrease or removal of perennial grasses that compete with the woody weeds and a lack of fires to suppress their establishment. Land productivity and stability are vital to the agricultural industry in western NSW and landholders must be made aware of the extent of the problem, and its affects on pasture and soil degradation.

A lack of quantitative knowledge on the extent and rate of change of woody weeds has led to the need for an accurate assessment of the problem throughout western NSW. The resultant data will provide a valuable historical record and will enable advisory staff to target severely affected areas. Control measures available include burning, chemical applications, goat grazing and mechanical methods including blade ploughing and pushing. The use of these measures is dependant on the species to be controlled, environmental conditions and economic circumstances

METHODS

The project has implemented a method developed by McCloy and Hall (1991), to map the density and distribution of woody canopy cover in western NSW, and to monitor changes in cover using Landsat MSS imagery. These data will be used to develop and maintain a Geographic Information System (GIS), which can improve knowledge of the problem and aid advisory programs, such as identifying properties and paddocks that require woody weed control. The advantages of using satellite data are its cost effectiveness, spatial coverage, availability and repeated coverage, and the ability to apply a variety of processing options for information extraction.

Digital data were purchased from the Australian Centre for Remote Sensing, for each study area (Cobar, Bourke and Barnato) for the late 1970's to early 1980's and for a recent overpass. Each scene was rectified to the Australian Map Grid and subsequently classified using the Vector Classifier. The Classifier is a technique used to estimate the proportions of cover types using spectral signatures (nodes) of known cover types. Three nodes were selected from each scene, based on knowledge of the area, collection of field data and aerial photographs.

Each date was classified independently and assessed for its accuracy using the ground data. The two dates for each study area were then used to produce an image of the changes in percentage woody canopy cover (increased cover, areas of no change and decreased cover). The image data were then transferred to the GIS where digitised cadastral information, including property boundaries and roads, were overlayed.

APPLICATIONS

This information will be integrated into existing advisory programs at the property and, where possible, to the paddock levels. Printed output of the classified images is available, as is the digital information in the GIS for use by NSW State Government staff who have access to a GIS in the regional offices.

CONCLUSION

The application of the technology will enable the District Advisers to increase the pastoralist's understanding of woody weed encroachment and increase their awareness of the need to control woody weeds and adopt suitable management programs. Although the costs of supplying this information to District Advisers may be high, measured against the current costs of pastoral productivity decline it would be a worthy investment. It is hoped than an awareness of the problem in areas already affected will encourage preventative measures in the less affected areas between White Cliffs, Wilcannia and Broken Hill.

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