



**A New Approach in the Use of
Landsat Imagery
for Inventory of Rangeland Vegetation**

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SUMMARY

This study questioned the impression given by some earlier workers, that the different types of chenopod vegetation on arid rangeland are not generally distinguishable (separable) by Landsat.

The view was taken that separation might be accomplishable if the vegetation was first sorted into types by very strict, objective methods, and the reflectivity differences of the corresponding pixel groups compared by subtle means.

Vegetation samples corresponding exactly to Landsat pixels were drawn from a band across assorted chenopod shrubland near Whyalla, South Australia. These samples were then sorted into homogeneous vegetation types by Goodall's objective criterion. Discriminant analysis was then applied to the corresponding Landsat data, to see if the groups had distinctive reflectivities.

They did. Discriminant functions were found which allowed a key to be constructed, separating the chenopod vegetation types by Landsat data alone.

An independent band of shrubland was then studied and an attempt was made to predict the vegetation by use of the key. The results of this were encouraging but not definitive.

A third longer band of shrubland was then studied. As in the first band, discriminant analysis permitted a key to be constructed, separating the vegetation types on Landsat reflectivity. However, the relationships between vegetation type and reflectivity varied between the bands, and the key for the first locality failed to predict vegetation in the third locality.

It remains to be shown whether the vegetation-types each have only two or a few different reflectivities throughout their ranges, or whether the

relationships are more variable. If the former applies, then more progress can be made and future research plans are discussed.

DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person, except where due reference is made in the text. I consent to the thesis being available for photocopying and loan if accepted for the award of the degree.

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