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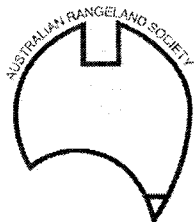
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## WEST 2000 WOODY WEEDS AND BIODIVERSITY PROJECT

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The effects of woody weeds on biodiversity have long been debated. WEST 2000 established The Woody Weeds and Biodiversity Project in response to increasing landholder pressure for this information. Project objectives include investigating change in biodiversity and landscape function as a result of different levels of shrub cover.

### Study regions and methods

Surveys were conducted during spring 1999 and summer 2000 in three regions of the Western Division known to have undergone shrub proliferation and encroachment: north of Ivanhoe, between Wanaaring and Louth, and west of Cobar. Study sites were dominated by those six woody weed species recognised under the Western Lands Act 1901: Turpentine *Eremophila sturtii*; Budda *E. mitchellii*; Narrow-leafed Hopbush *Dodonaea viscosa* subsp. *angustissima*; Broad-leafed Hopbush *D. v.* subsp. *spatulata*; Puntly Bush *Senna artemisioides* subsp. *filifolia* and Silver Cassia *S. a.* nothosubsp. *artemisioides*. Sites were chosen such that shrub cover was highly variable between sites, whilst vegetation, soil and management attributes were as consistent as possible.

Data collected at each site included: woody shrub species, cover and density; richness and abundance of vertebrates, invertebrates and flora species. Invertebrates were sorted and identified to the Order level of classification. Most ants were identified to morphospecies (similar-looking ants within each genus).

This paper and poster will focus on results from the Cobar region survey.

### Flora results

Ninety-nine plant species were recorded on the Cobar sites. Of these 10 showed a significant correlation between cover score and woody shrub cover. Five of these were negative correlations (i.e. decreased in abundance with an increase in woody shrub cover): Tar Vine *Boerhavia dominii*; Saffron Thistle *Carthamus lanatus*; Common Bottleshapers *Enneapogon avenaceus*; Wild Sage *Salvia verbenaca* and Pin Sida *Sida fibulifera*. The remainder showed positive correlations: Mulga *Acacia aneura*; White Cypress Pine *Callitris glaucophylla*; Gilgai Grass *Panicum subxerophilum*; Arabian Grass *Schismus barbatus*; and Mulga Oats *Thyridolepis mitchelliana*, a highly palatable grass.

### Vertebrate results

More than 5 700 individual fauna observations were made in the three regions. Analysis of the bird census data indicated that one species, the Splendid Wren *Malurus splendens* was significantly correlated with shrub cover in more than one region (Wanaaring  $r=0.666$ ;  $p=0.018$ ; Cobar  $r=0.509$ ;  $p=0.043$ ). Seven other species from the Cobar region showed significant correlations with shrub cover. One of these, the Blue Bonnet *Northiella haematogaster* was negatively correlated ( $r=-0.534$ ;  $p=0.028$ ), the remainder were positively correlated (Inland Thornbill *Acanthiza apicalis*; Yellow Thornbill *A. nana*; Weebill *Smicronis brevirostris*; Rufous Whistler *Pachycephala rufiventris*; Grey Shrike-thrush *Colluricincla harmonica*; and Emu *Dromaius novaehollandiae*).

No significant correlations with shrub cover were detected from the reptile census data, primarily due to limited data. Similarly, very few significant results were obtained from the vertebrate pitfall trap data (from 3 150 trap nights: 1 trap open for 1 night = 1 trap night). In the Cobar region, Mueller's Skink *Lerista muelleri* was positively correlated with shrub density ( $r=0.556$ ;  $p=0.017$ ). To overcome the problem of limited data, pooled data were also analysed. Several species additional to those listed above were positively correlated with shrub cover in the Cobar region: Striated Pardalote *Pardalotus striatus*, Mulga Parrot *Psephotus varius*, and the blind snake *Ramphotyphlops bituberculatus*. The following species were negatively correlated with shrub cover Shingleback Lizards *Trachydosaurus*

*rugosus* in the Ivanhoe and Cobar regions; the terrestrial gecko *Diplodactylus steindachneri* in the Wanaaring and Cobar regions; and Blue Bonnets *Northiella haematogaster* in the Cobar region. In addition, one species, the Rainbow Bee-eater *Merops ornatus*, was positively correlated with shrub cover in the Cobar region, and negatively correlated in the Wanaaring region.

### **Invertebrate results**

More than 253 000 invertebrate specimens from 27 Orders were collected during 3 500 pitfall trap nights. Analysis of the Order level data identified few significant relationships. In the Cobar region, scorpions and cockroaches were positively correlated, while mites were negatively correlated with shrub cover.

More than half of the invertebrate captures were ants (almost 147 000). Initial identifications recognised 118 ant morphospecies. On a regional basis, 5 of the 75 morphospecies from the Ivanhoe sites (6.7%), 5 of the 81 morphospecies from the Wanaaring sites (6.2%), and 18 of the 88 morphospecies from the Cobar sites (20.5%) showed significant correlations with shrub cover. Four of these were negative. One ant morphospecies (*Pheidole* 0009) showed a significant relationship in more than one region (Wanaaring  $r=0.860$ ;  $p=0.000$ ; Cobar  $r=0.705$ ;  $p=0.015$ ). This is an interesting result in that members of this genus are important seed harvesters which tend to be more common in open habitats (Andersen 1991).

### **Overall biodiversity results**

Biodiversity comparisons were conducted by analysing the pooled presence/absence data in each broad taxon with respect to shrub cover and density both within and across the three regions. Of all the analyses undertaken, only two significant results were obtained: vertebrate species diversity was negatively correlated with shrub cover at the Ivanhoe sites ( $r=-0.60$ ;  $p=0.04$ ); and ant morphospecies diversity was positively correlated with shrub cover at Cobar ( $r=0.64$ ;  $p=0.035$ ).

### **Management implications**

Our results show that, in contrast to widespread perceptions, 'scrubbed-up' country has no or little loss of biodiversity. Individual plant, vertebrate and invertebrate species respond in different ways, some increasing in abundance with increasing shrub cover, a few decreasing, and many showing no obvious response to shrub cover. A diversity of shrub covers, from open to very dense, are therefore necessary to provide suitable habitat for our native flora and fauna species.

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