Visual Fuel Load Guide
for the Goldfield Region

Bush Fire and Environmental Protection Branch

GOVERNMENT OF WESTERN AUSTRALIA

FESA
Fire & Emergency Services Authority of Western Australia

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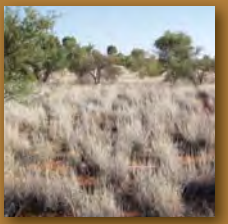

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Disclaimer

Introduction

Many factors influence fire behaviour but none is more significant than fuel. The availability, size, arrangement, moisture content and type of flammable material available all contribute to what can be considered to be fuel. An appreciation of the range of variables affecting fuels assists with a prediction of the likelihood of fire and fire behaviour under certain conditions. This enables better management of risks and assessment of the best fire suppression options.

As a fuel load increases the potential run (fire spread) and heat output (fire intensity) increases, thus increasing the risk to life, property, the environment and firefighter safety as well as diminishing control options.

Purpose of this booklet

This booklet is intended as a reference guide to enable fire managers, pastoralists and other stakeholders to visually assess fuel loads and provide an estimate of the potential fire risk. This booklet will also assist fuel load managers to prepare a fire prescription, understand risks on a given area and suggest suitable fuel load management for vegetation type.

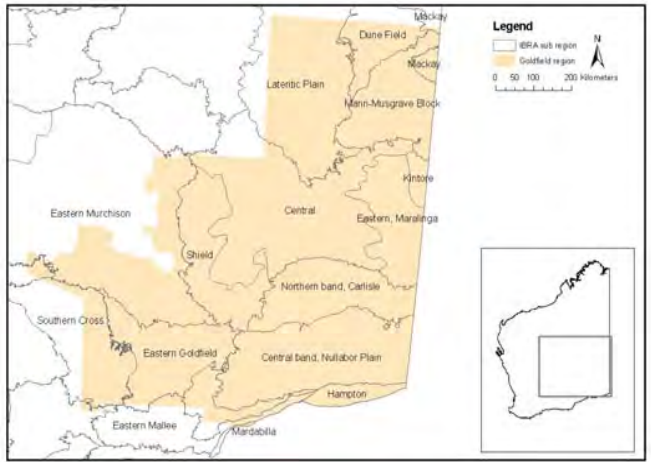
The Goldfield Region

The Goldfield region (see Figure 1) falls within the Goldfield-Esperance region as defined by the Economic Regulation Authority of Western Australia Regional Development Commissions, established under the *Regional Development Commissions Act* (1993). The Goldfield region is located in the south-eastern corner of Western Australia and incorporates seven local government areas: the City of Kalgoorlie-Boulder and the Shires of Coolgardie, Dundas, Laverton, Leonora, Menzies and Ngaanyatjarraku. Covering 700,000 km^2, the Goldfield region can be described by numerous biogeographical sub-regions which form the Interim Biogeographical Regionalisation for Australia (IBRA). These include Central, Central Band Nullabor Plain, Dunefield, Eastern Goldfield, Eastern Mallee, Eastern Maralinga, Eastern Murchison, Hampton, Lateritic Plain, Mackay, Man-Musgrave Block, Northern band Carlisle, Kintore, Shield and Southern Cross. Whilst not all fuel load samples in all IBRA sub regions in the Goldfield region were measured, fuel loads described in this booklet represent the majority of IBRA sub regions in the region. Biogeographical regions are determined by similarity of rainfall, soil types and vegetation, factors which have a direct impact on available fuel load and behaviour.

The Goldfield region is represented by a range vegetation. The Nullabor region, south of the Goldfield region is dominated by saltbush and bluebush. The Murchison is represented mostly by *Acacia* forest and woodland. In the Coolgardie region, *Eucalyptus* woodland is dominant and in the Great Victorian Desert, key vegetation include Hummock grasslands, mallee woodland and *Acacia* forest and woodlands.

Annual rainfall zones vary from 0–200 mm in desert areas to 500 mm to the west of the region (BOM, 2009 <http://www.bom.gov.au>). With an arid to semi-arid environment, high temperatures and low, irregular rainfall, the Goldfield region is susceptible to fire.

Figure 1. Goldfield Region and IBRA sub regions



Methods of fuel sampling

The method used in this guide to calculate fuel loads is based on a 1 m^2 representative fuel load sample. A one metre square is placed over an area of vegetation that is representative of the vegetation within the sample area. All vegetation from within the sample quadrat less than 10 mm in diameter is removed and oven dried to determine the dry weight of the sample. The dried weight of the vegetation is then calculated to tonnes per hectare (t/ha). The one metre white square in the photos (shown overleaf) are the areas taken as characteristic samples of vegetation at the location identified.

Fuel load calculation

Dried weight (grams per metre^2) / 100 = fuel load (t/ha)

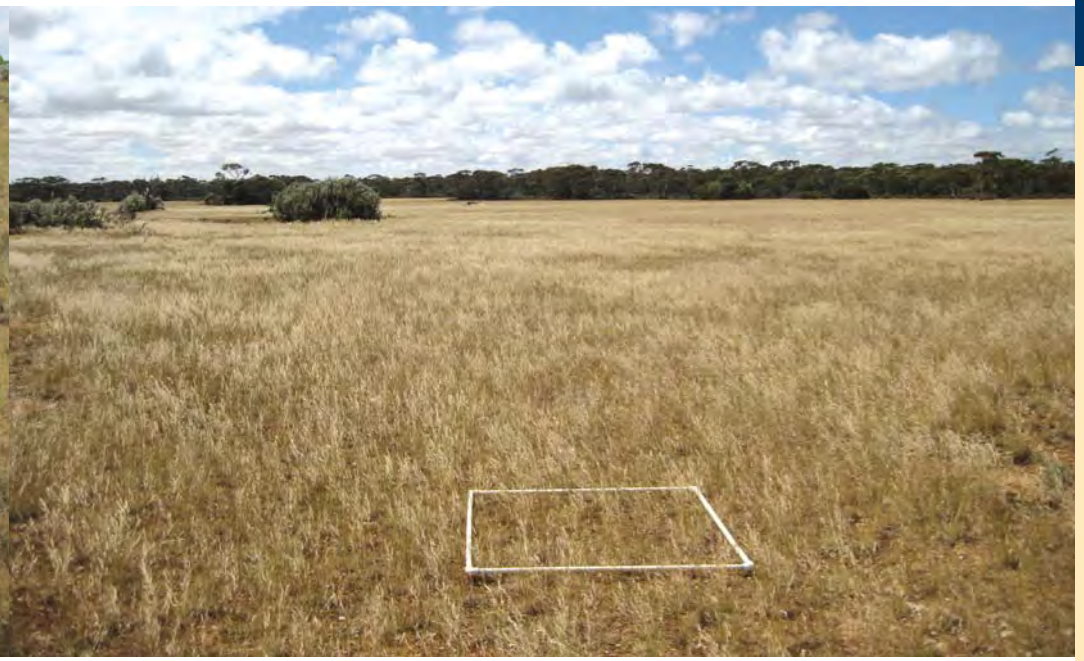
How to use this Guide

This guide is intended to assist the user in visually determining fuel loads. This is a non-destructive means of assessment, in that vegetation does not need to be removed in order to gain an estimation of the fuel load for a particular area. By visually assessing the vegetation with reference to this guide, and where possible obtaining a leaf litter depth (refer to Appendix 1), an estimation of the fuel load can be made. Although an imperfect measurement, the most applicable forest type to determine litter weight 'Jarrah dominant' is suggested for this guide.

0–5 tonnes per hectare

0.7 t/ha Central band, Nullabor Plain—Open tussock grassland.

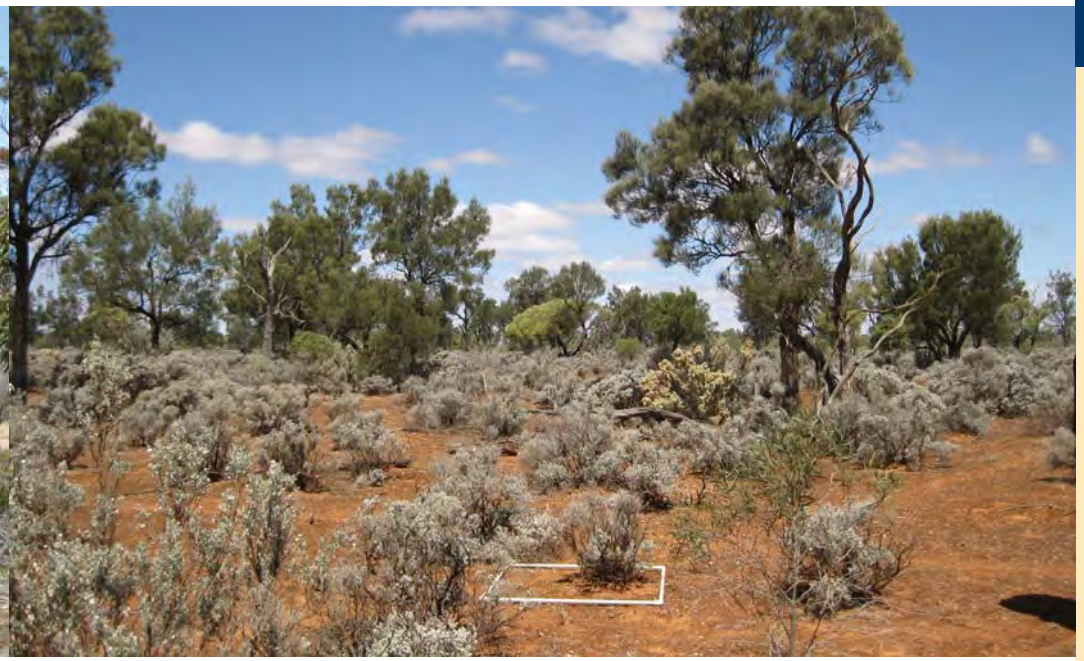
1.1 t/ha Mardabilla–Open tussock grassland.

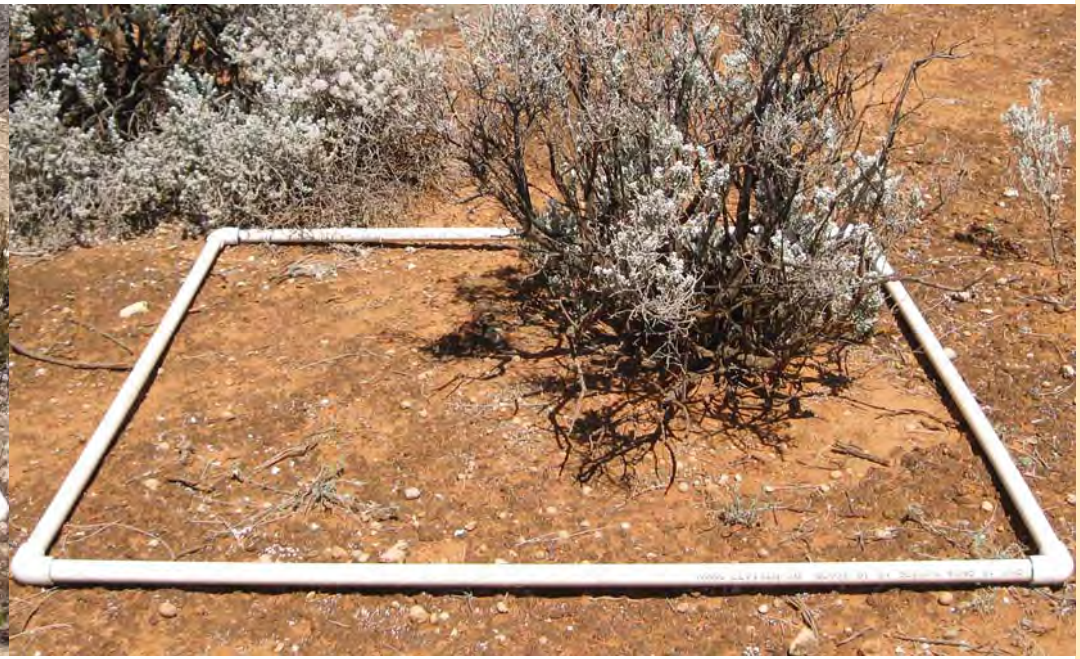


0–5 t/ha

1.1 t/ha Mardabilla – Low *Eucalyptus* woodland over shrub.

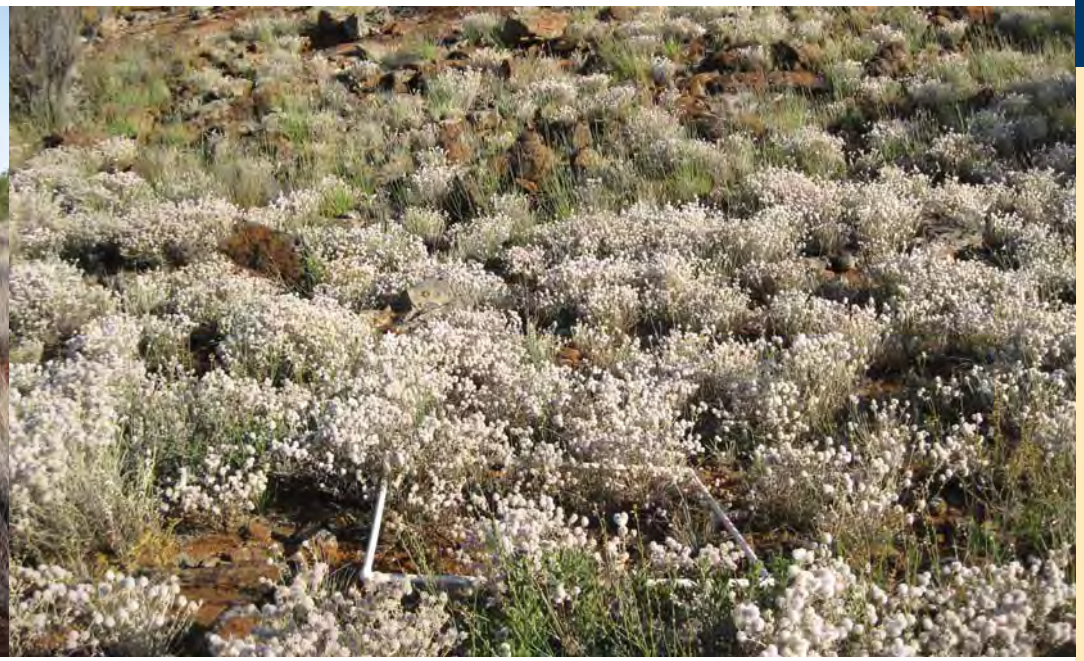
1.6 t/ha Central band, Nullabor Plain – low woodland over saltbush and bluebush.



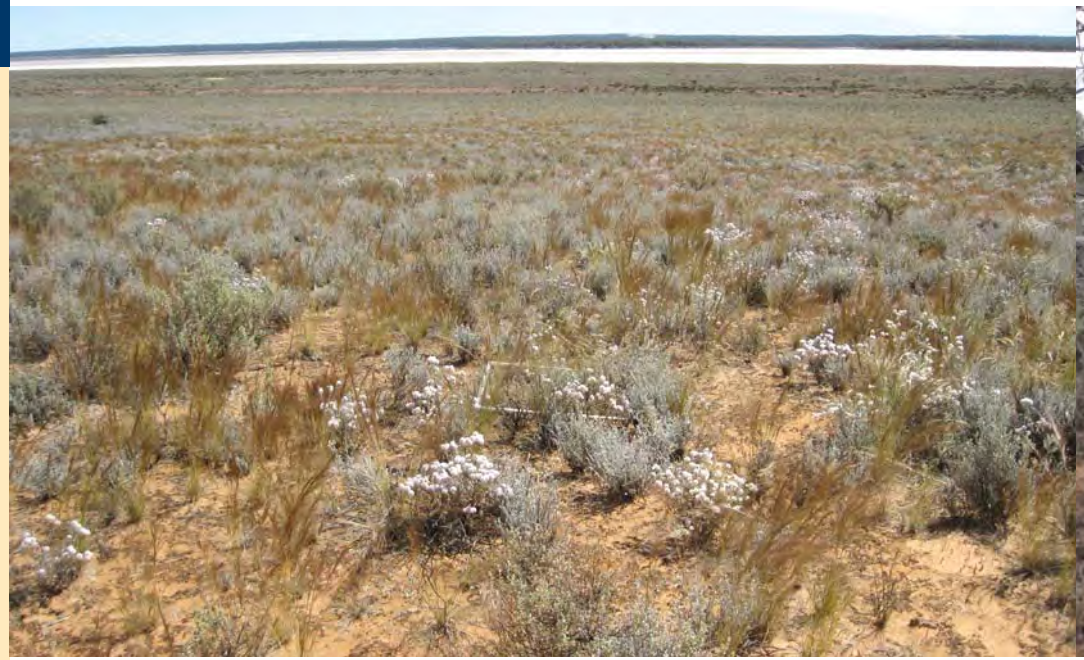


2.3 t/ha Lateritic Plain – *Acacia* shrubland over tussock grassland.

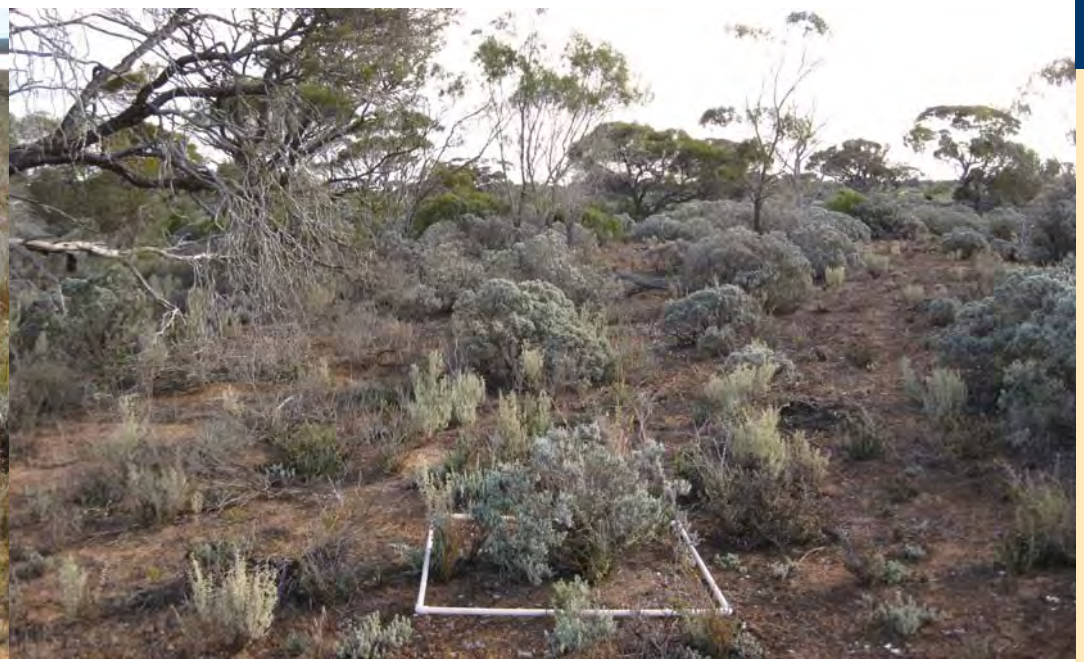
3.3 t/ha Eastern Goldfield – *Ptilotus* spp. shrubland.



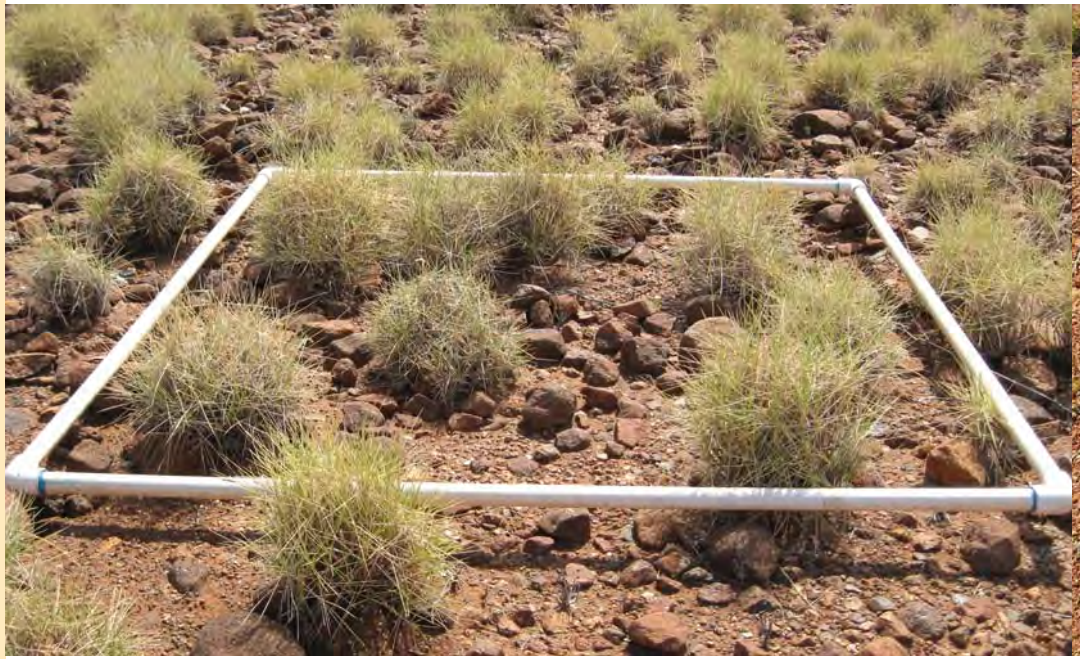
3.6 t/ha Eastern Goldfield – Open tussock plain over *Ptilotus* spp., saltbush and bluebush.



4.2 t/ha Southern Cross – Tall *Eucalyptus* shrubland over *Myoporum* spp. and bluebush.



4.2 t/ha Central – Hummock grassland.

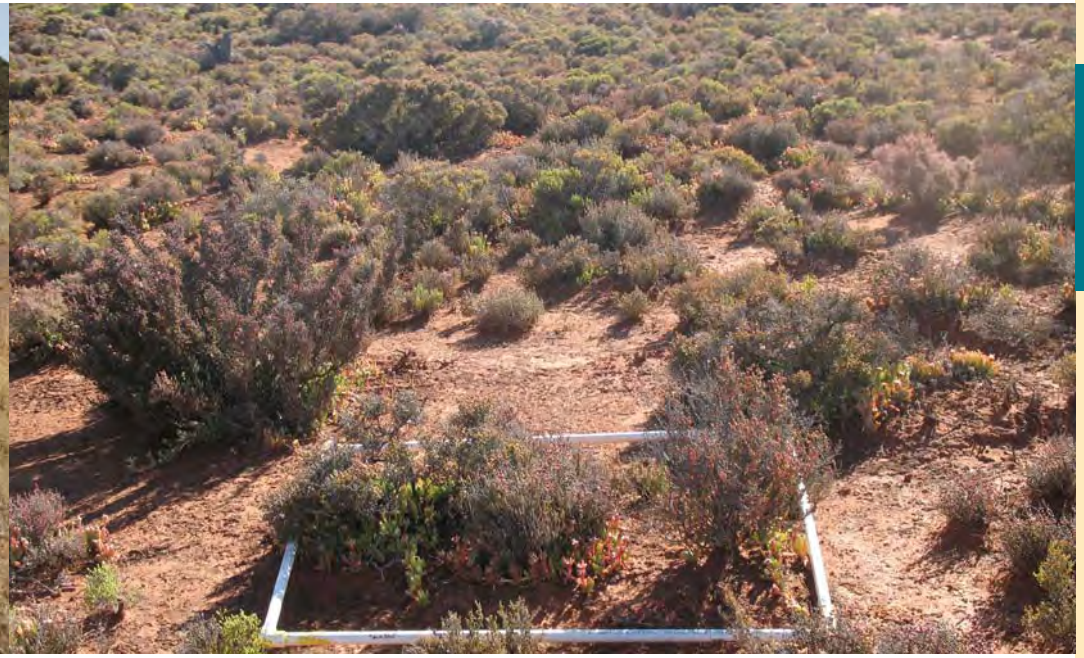


4.9 t/ha Eastern Murchison – *Ptilotus* spp. shrubland.

5–10 tonnes per hectare

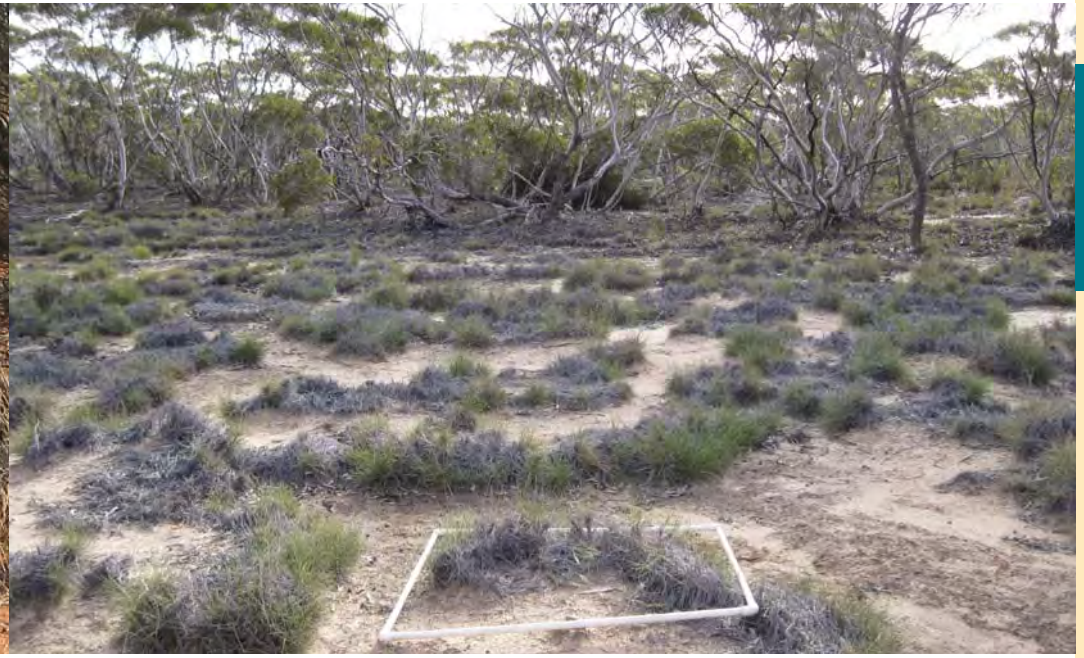
5.6 t/ha Central – Low Mulga shrubland over tussock.

6 t/ha Eastern Murchison – Samphire and saltbush mudflats.



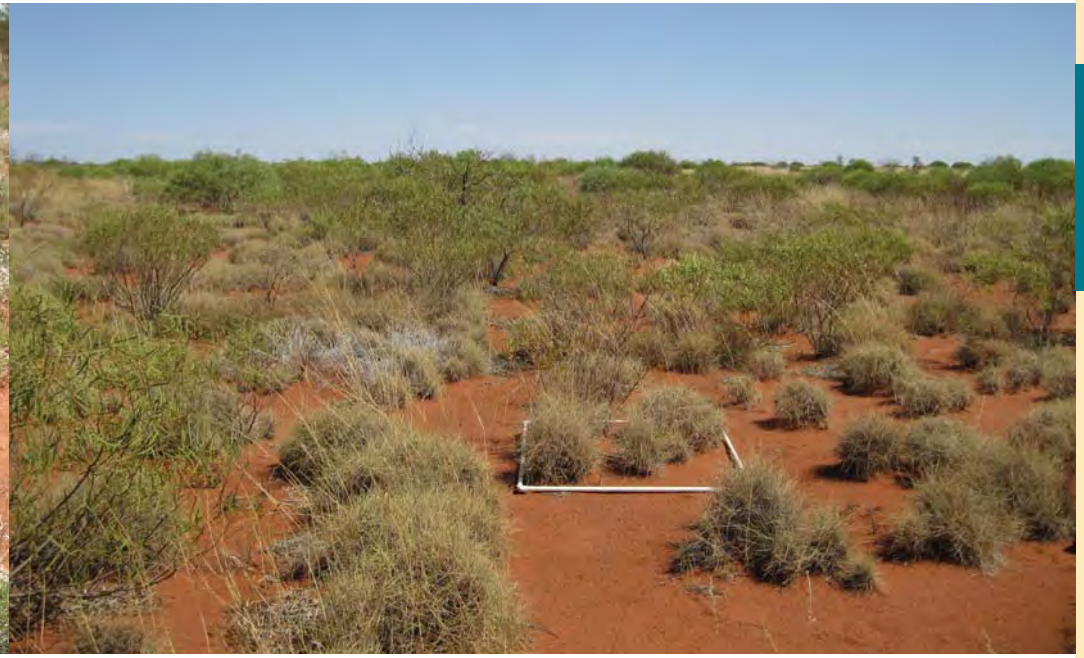
6.5 t/ha Eastern Murchison – Mulga over tussock grassland.

6.5 t/ha Southern Cross – Low *Eucalyptus* woodland over hummock.



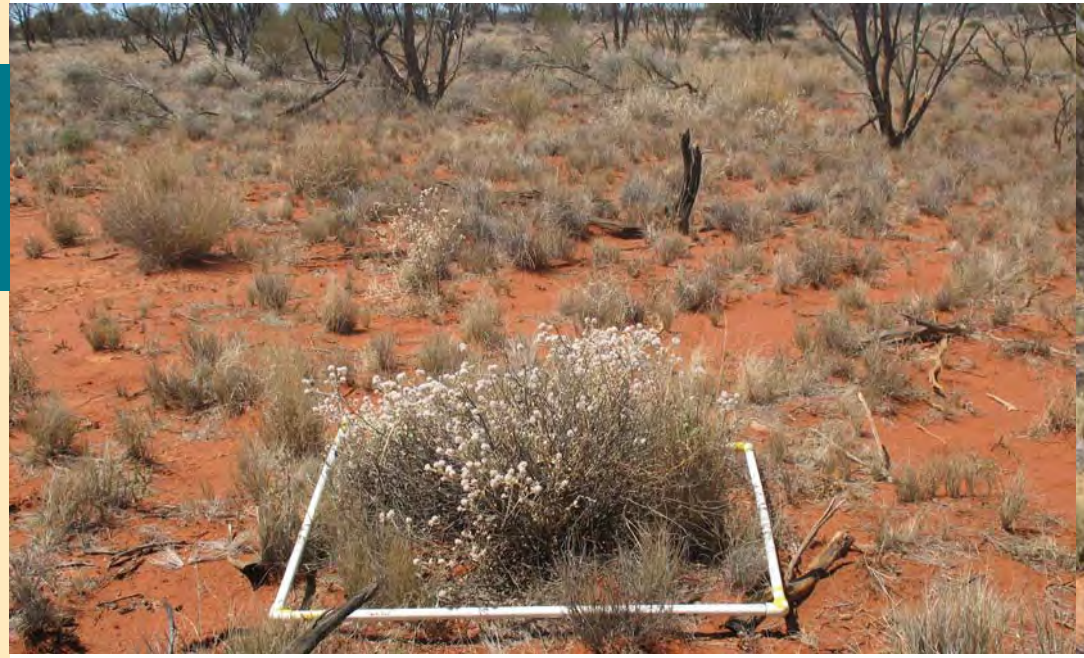
6.7 t/ha Shield – Low *Ptilolus* spp. shrubland and tussock.

8.2 t/ha Mann-Musgrove – Low *Acacia* shrubland over hummock.



5–10 t/ha

8.8 t/ha Central – Low Mulga shrubland over *Ptilotus* spp. and tussock.



9.6 t/ha Mann-Musgrove – Tall Mulga shrubland over hummock.