

Visual Fuel Load Guide for the Kimberley Region



Bush Fire and Environmental Protection Branch



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Fire & Emergency Services Authority of Western Australia

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This publication is intended to be a guide only and readers should obtain their own independent advice and make their own necessary enquiries.

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

The 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.

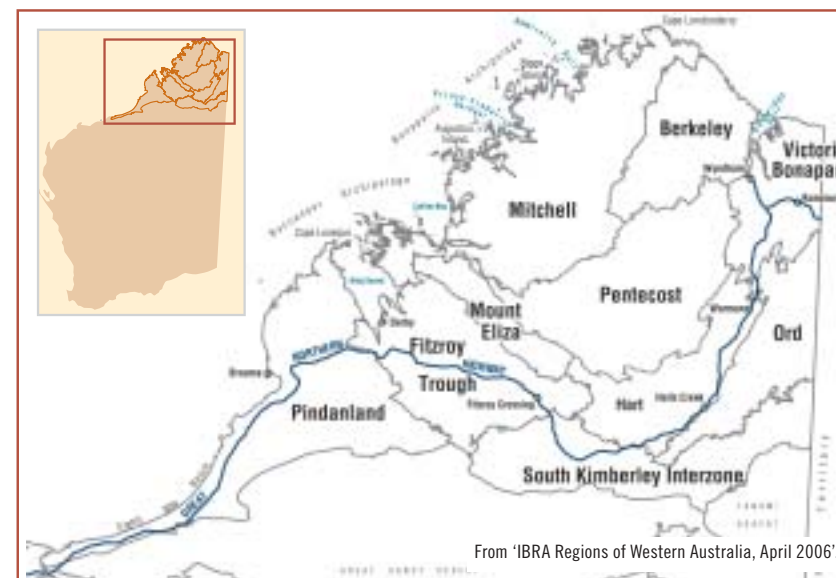
The Kimberley Region

The Kimberley is a unique region of Western Australia, consisting of 10 biogeographical regions. *Interim Biogeographic Regions of Australia* (IBRA) are zones determined by similarity of rainfall, soil types and vegetation. These factors have a direct impact on available fuel load and fire behaviour.

Annual rainfall zones vary from 500 mm – 1600 mm. Rainfall increases on a basic linear plain starting with 500 mm at the most southern region of the Kimberley increasing towards northern WA.

Biogeographical Regions include:

- Mitchell
- Berkeley
- Pentecost
- Victoria Bonaparte
- Ord
- Mount Eliza
- Fitzroy Trough
- Pindanland
- Hart
- South Kimberley Interzone.



Methods of fuel sampling

The method used in this guide to calculate fuel loads is based on a 1m² representative fuel load sample. A one metre square is placed over 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 metre²) / 100 = fuel load (t/ha)

How to use this Guide

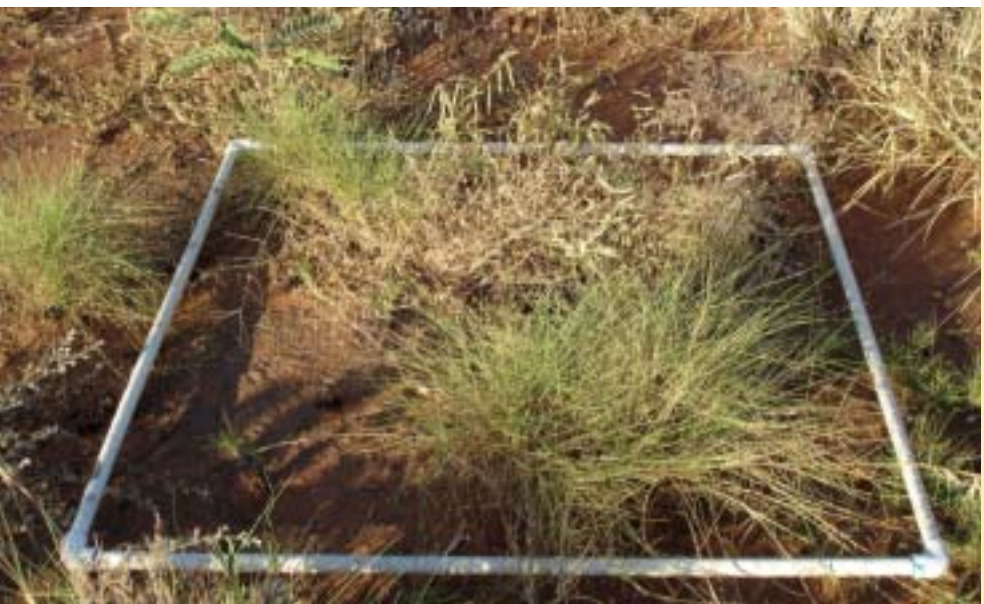
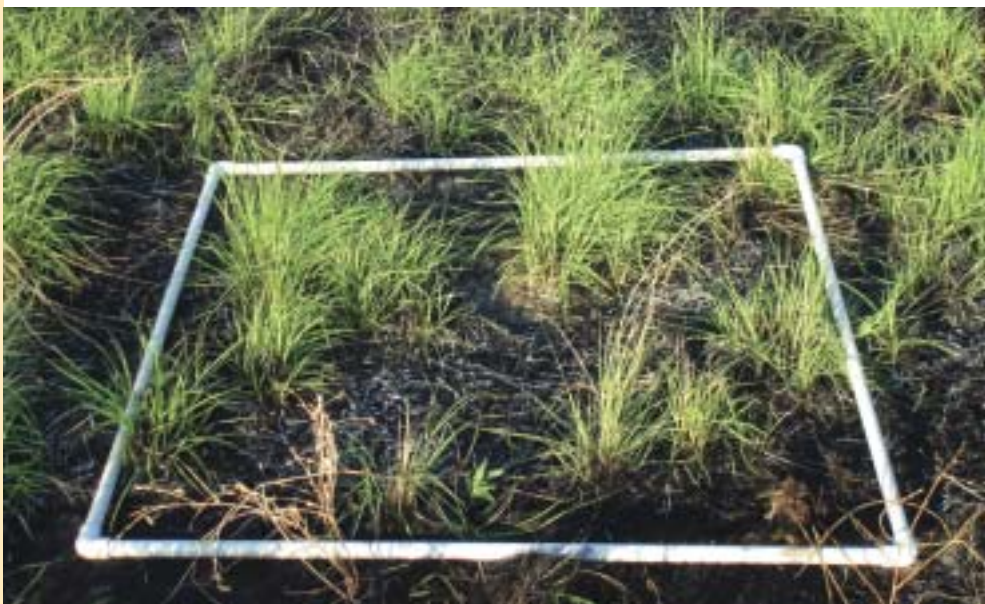
This guide is intended to assist the user in visually determining fuel loads. This is a non-destructive means of assessment, in that vegetation does not need to be removed in order to gain an estimation of the fuel load for a particular area. By visually assessing the vegetation with reference to this guide an estimation of the fuel load can be made.

0-5 tonnes per hectare

1 t/ha Tussock grass regrowth following fuel reduction burn.



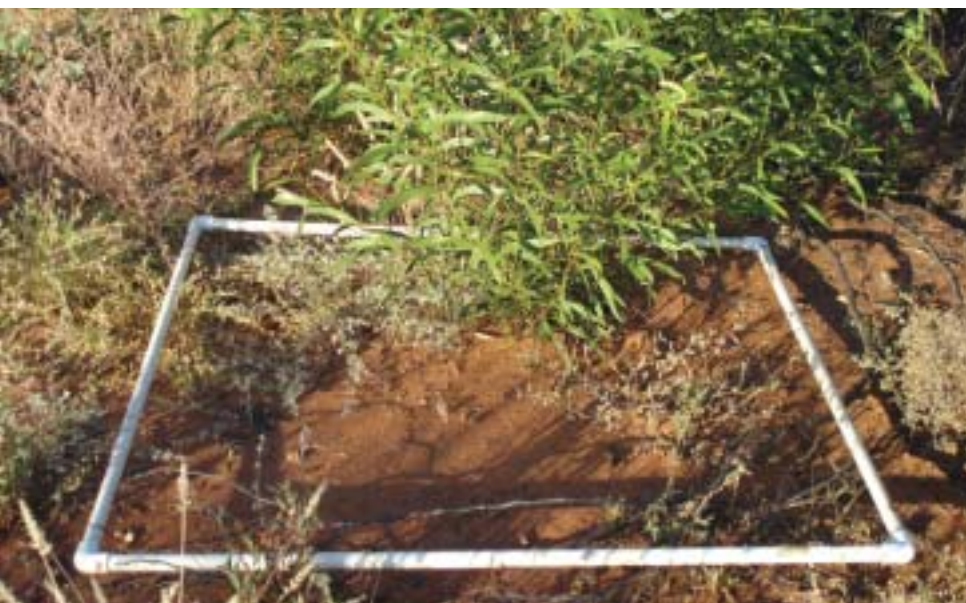
2.5 t/ha Tussock and hummock grass with acacia regrowth.



2.5 t/ha Ground-storey of tussock grass and herbs.



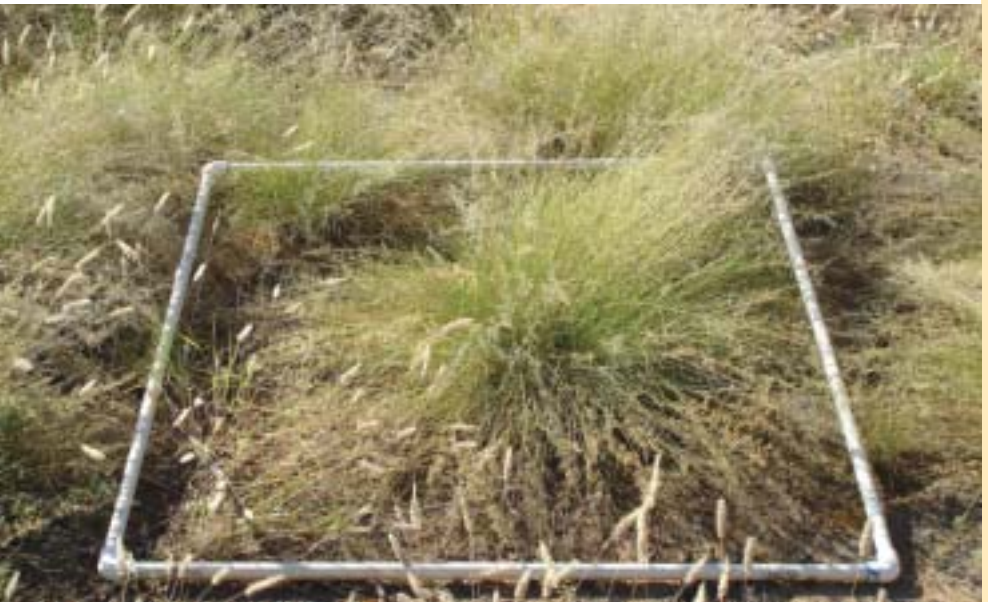
2.5 t/ha Ground-storey of acacia regrowth, grasses and small herbaceous plants.



3 t/ha Ground-storey of grass and herbs with acacia regrowth.



3 t/ha Ground-storey of open tussock grasses.



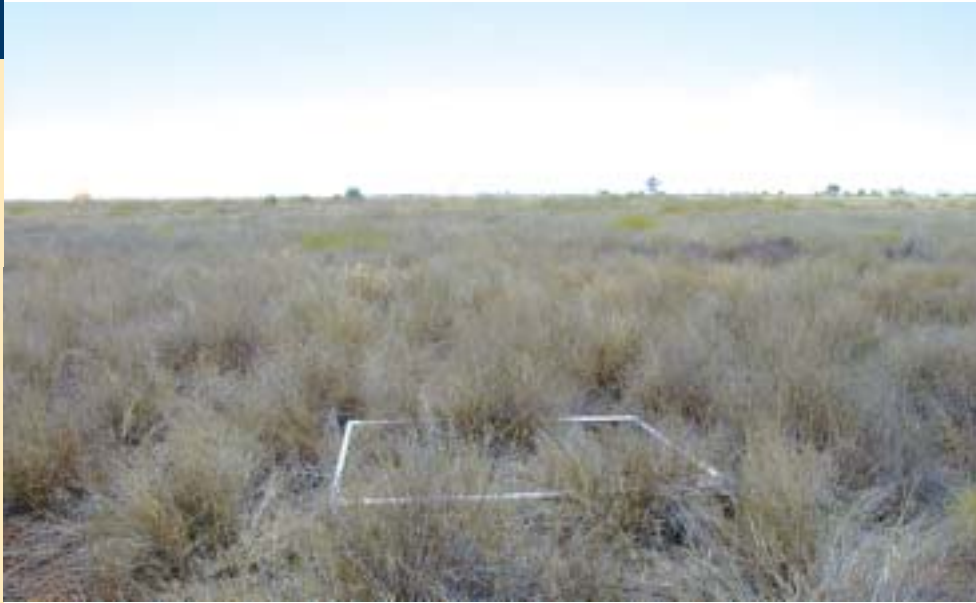
3 t/ha Tussock grass ground-storey of medium height (<45cm).



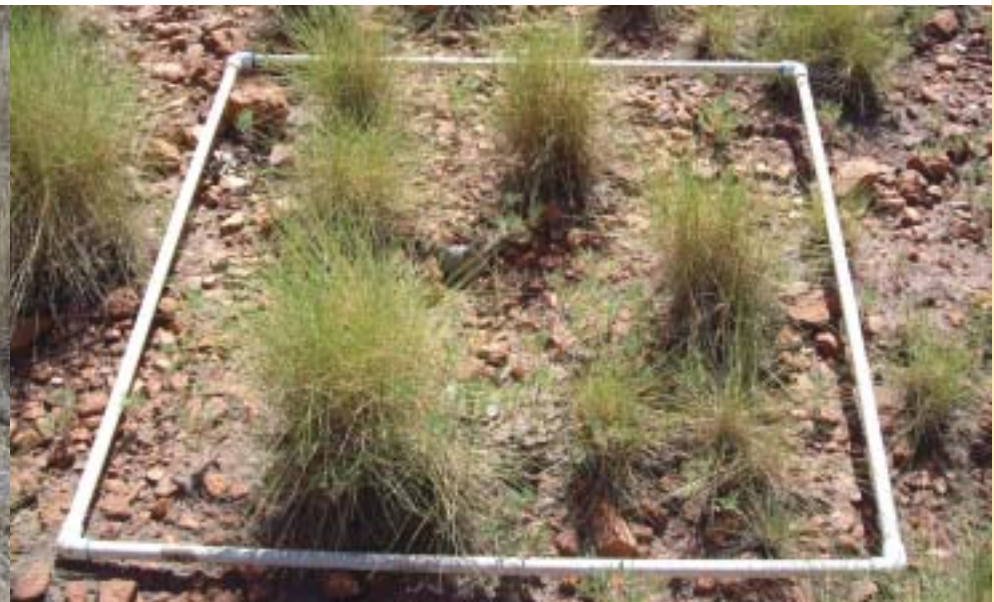
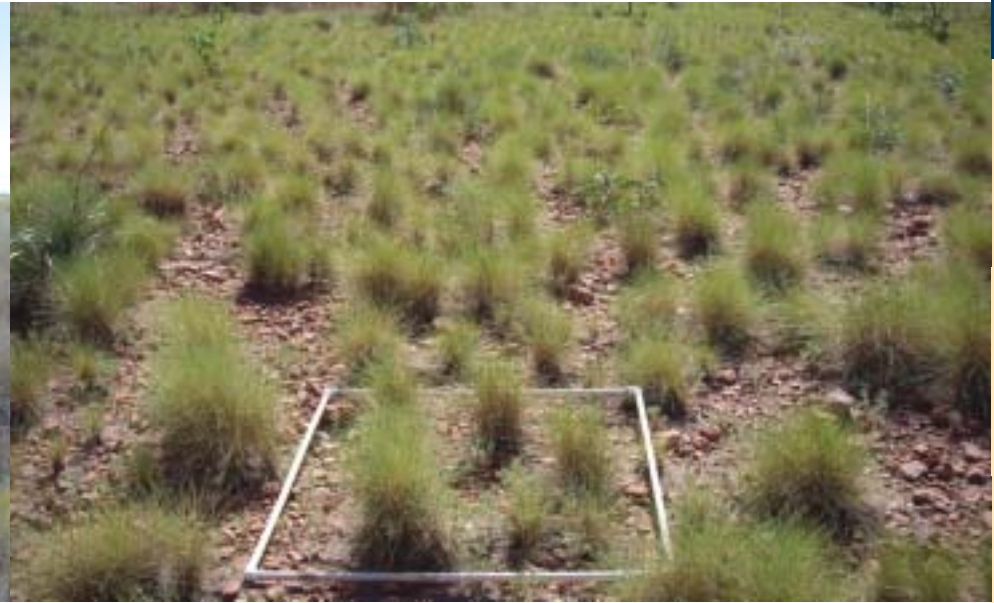
3.5 t/ha Short, dense, discontinuous tussock grass.



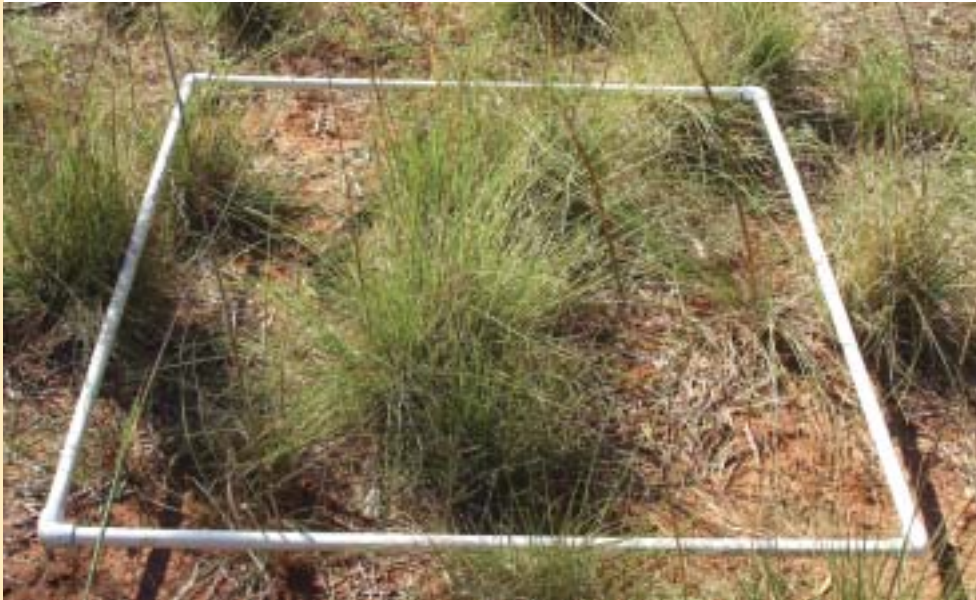
4 t/ha Ground-storey of medium density tussock grass.



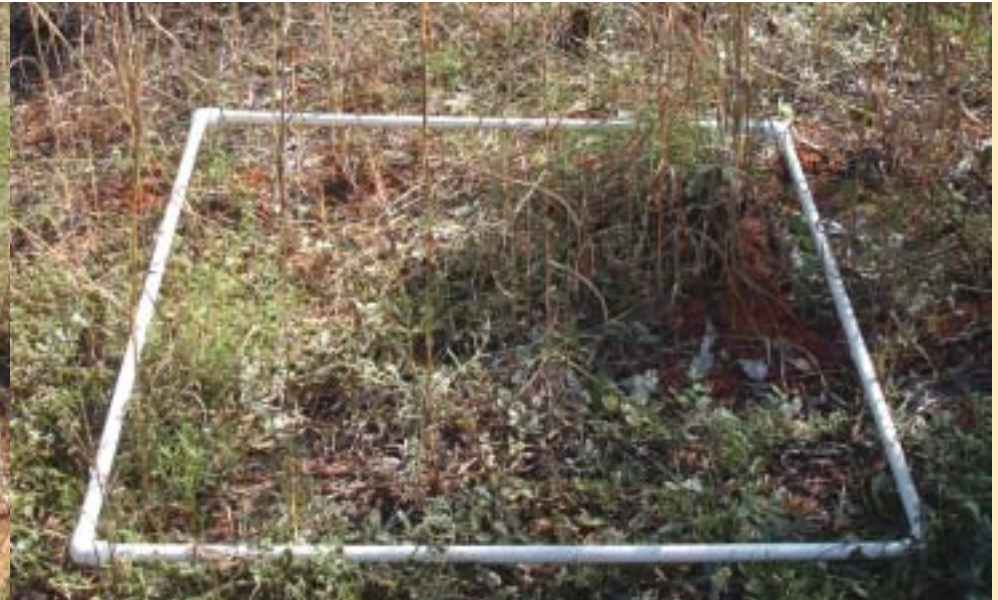
4 t/ha Sparse ground-storey of hummock grass.



4.5 t/ha Ground-storey of grasses and minimal leaf litter with over-storey of acacia and eucalypt.



4.5 t/ha Herbaceous ground-storey with tall tussock grass and acacia over storey



5–10 tonnes per hectare

5t/ha Open ground-storey of hummock and tussock grasses.



5t/ha Ground-storey of tussock and hummock grass with eucalypt regrowth.



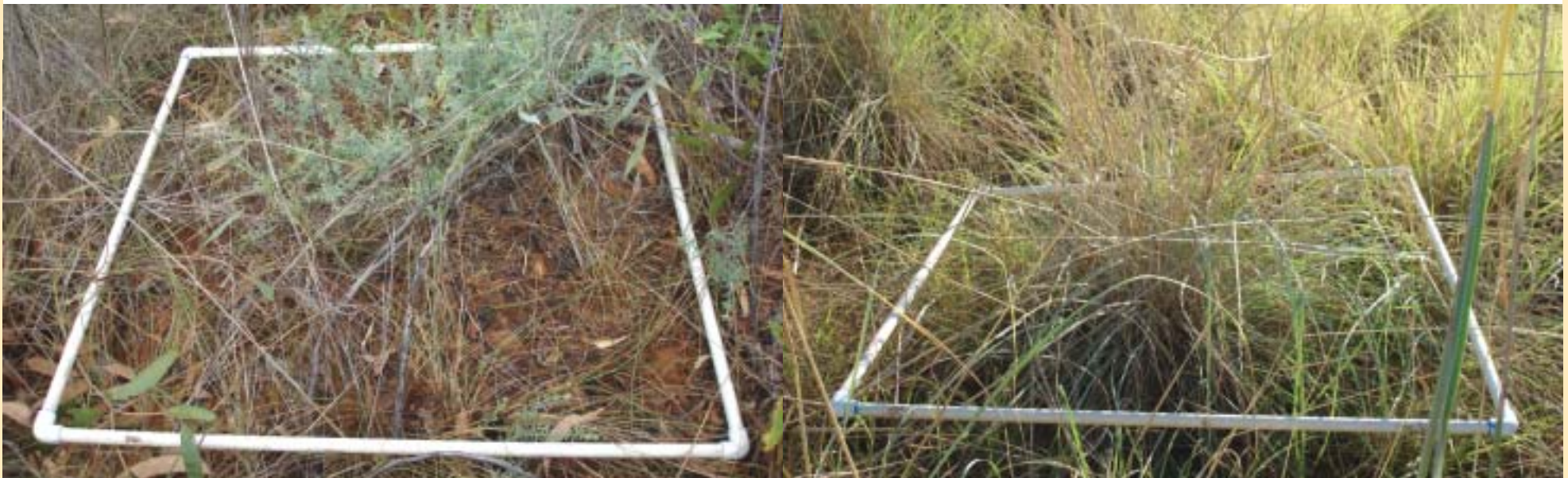
5.5 t/ha Grass and shrub under-storey with eucalypt and acacia over-storey.

5.5 t/ha Continuous ground-storey of tussock grass.

5-10 t/ha



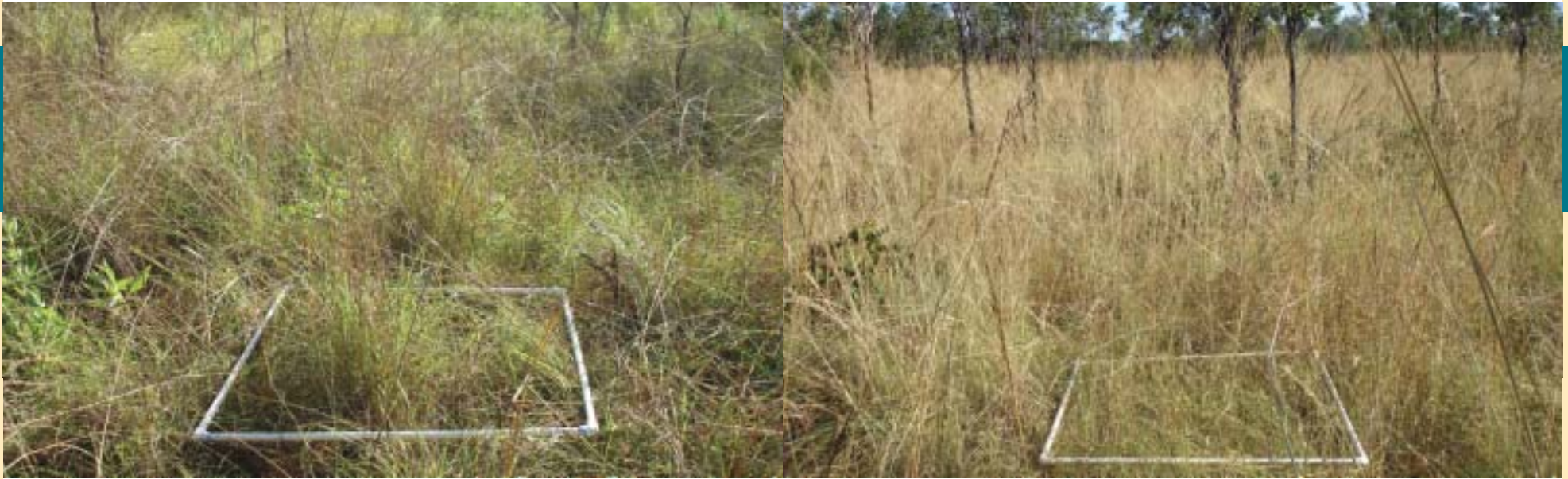
5-10 t/ha



6 t/ha Tussock grass with under-storey of shrubs.

6 t/ha Tussock grass ground-storey with eucalypt over-storey.

5-10 t/ha



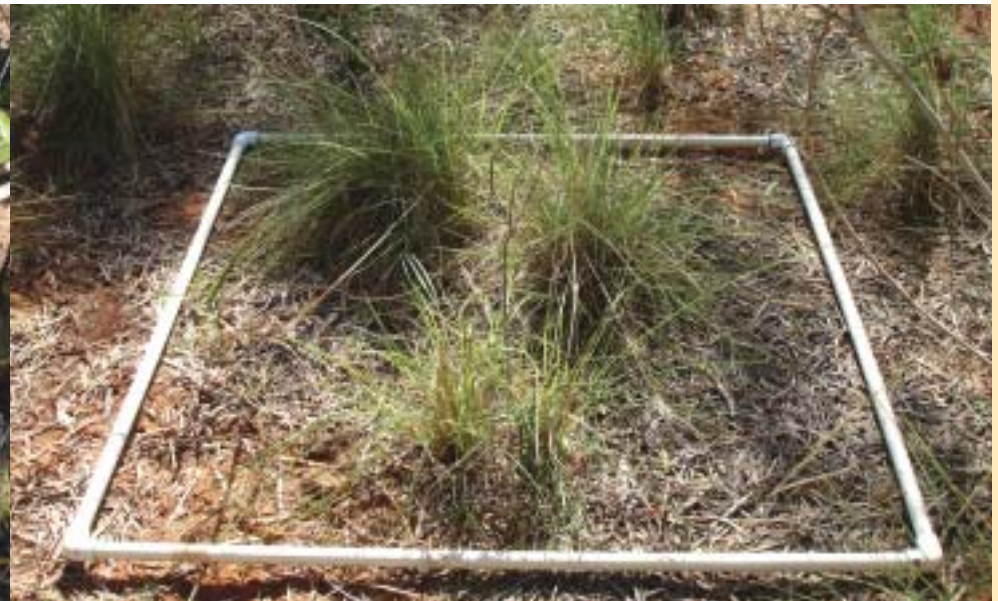
5-10 t/ha



6 t/ha Grass and litter ground-storey with Screw-pine (*Pandanus sp.*) and shrub over-storey.



6 t/ha Grass and leaf litter ground-storey with eucalypt and acacia over-storey.



6 t/ha Regenerating hummock grass.

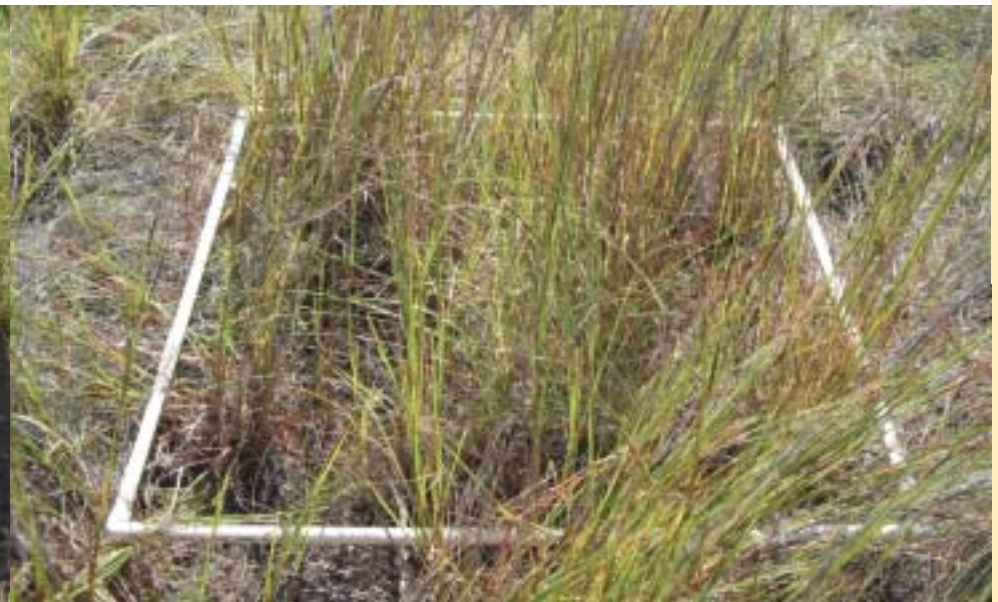


6.5 t/ha Medium density, continuous, ground-storey of tussock grass.



5-10 t/ha

5-10 t/ha



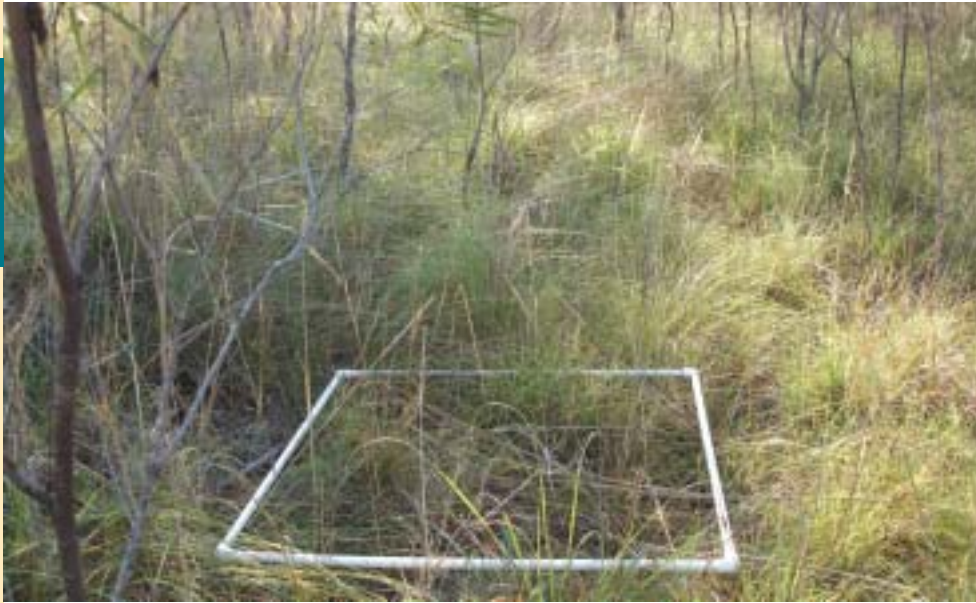
7 t/ha Tussock grass and leaf litter ground-storey, shrub understorey with eucalypt and acacia over-storey.



7.5 t/ha Continuous ground-storey of cured grasses with eucalypt and acacia over-storey.



8 t/ha Ground-storey of tussock grass with over-storey of acacia species.



5-10 t/ha

5-10 t/ha



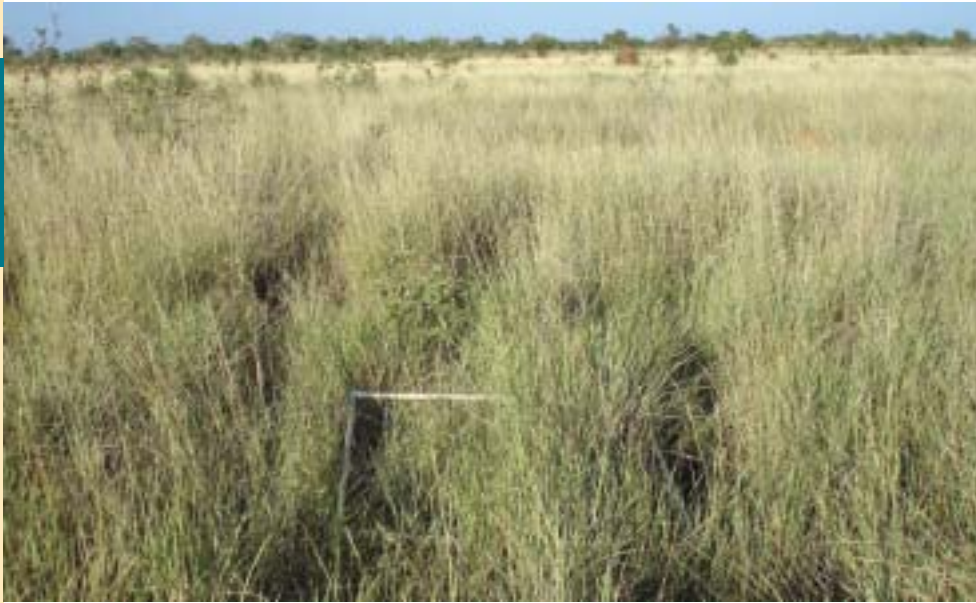
8 t/ha Herbaceous ground-storey interspersed with tall tussock grass.



8.5 t/ha Continuous tall (2.5 metres) tussock grass.



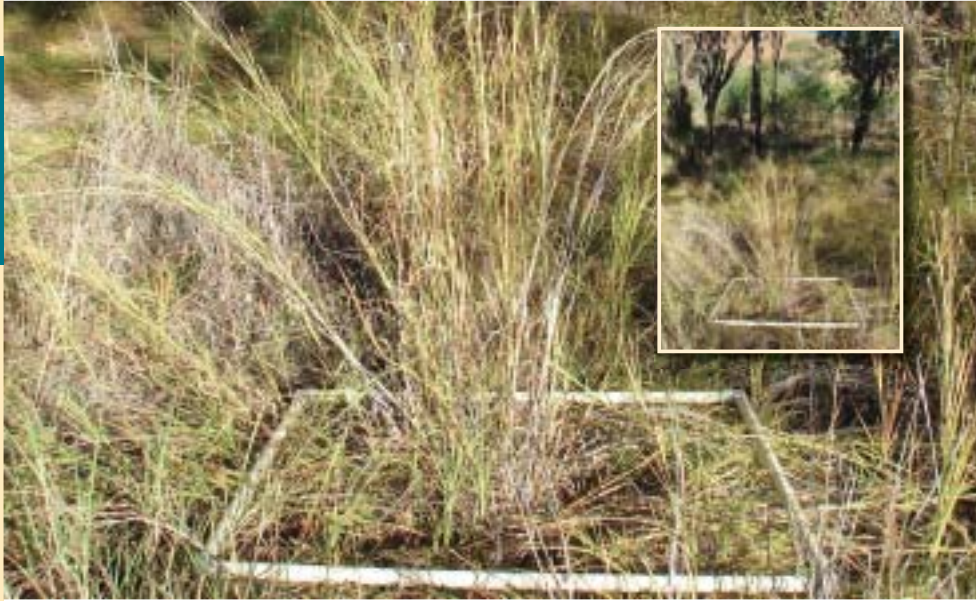
8.5 t/ha Dense tussock grass (<1m) interspersed with eucalypt regrowth.



9 t/ha Mixed grass ground-storey with leaf litter.



9.5 t/ha Ground-storey of tussock grass (<1.2 metres) with over-storey of trees.



10-15 tonnes per hectare

11 t/ha Dense ground-storey of tussock grass with regrowth of over-storey species.



11.5 t/ha Tussock grass with over-storey of eucalypt and acacia.



10–15 t/ha

12 t/ha Tussock grass (2.5 metres) interspersed with acacia over-storey regrowth.



10–15 t/ha



13.5 t/ha Continuous tussock grass ground-storey with eucalypt over-storey.



15–20 tonnes per hectare

17.5 t/ha Large, dense hummock grass.



