# Predicting Factors Affecting Fire Behaviour in Heathland Vegetation



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Sydney

Sandstone

Basin

Study Site

Little Forest

Plateau

Moreton

National Park

bushfire CRC

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#### Fires in Heathlands

Australia has some of the most fire prone vegetation in the world. Generally regarded as the most volatile fuels are heathlands (shrublands) and sparse dry-sclerophyll eucalypt woodland with a heath understorey. In these fuel types up to 80% of fuel burnt can be live fuels.

The Sydney Sandstone Basin has vast areas of these vegetation types close to its 6,500km of urban interface. Fires in heathland and heathy woodland surrounding Sydney have caused millions of dollars of damage and claimed the lives of a number of people. Following the death of 4 National Parks and Wildlife Service staff in Kuring-Gai-Chase National Park (Jun 2000) a key recommendation of the State Coroner was that there be a burn guide formulated for the Sydney Basin.

A prescribed burning guide is formulated by measuring fires in a given vegetation type and modelling the relationship between the Rate of Spread (ROS) and Dead Fine Fuel Moisture (FFM), Live Fine Fuel Moisture (LFM), fuel characteristics, topography and wind speed at the fire.



#### **Project Overview**

Fire behaviour in heath & heathy woodland is governed by a number of factors including:

- Dead fine fuel moisture (<6mm diameter)
- Live fine fuel moisture (<3mm diameter)</li>
  Sedge live:dead ratio

In this project field and laboratory data will be collected and used to investigate, develop and test methods for predicting these factors for Sydney Sandstone Basin heathy fuels.

3 year PhD initiated January 2004. Poster details progress at May 2005 (15 months).

### Dead Fine Fuel Moisture (FFM)

#### Lab: Controlled Field: Compare FFM in heath **Environment Chamber:** with adjacent heathy woodland: Samples exposed to a Drying after rain & diurnal FFM range of RH's for · Flat site adsorption and • 5 x 3 day sets, hourly sampling desorption at a standard • 2 autumn & 1 spring completed: temperature Periodically weigh samples to determine drying curves Woodland: Surface litter Elevated litter • Duff Sedge Heathland: Sedge • Duff

#### Live Fine Fuel Moisture (LFFM)

CSIRO Forestry and Forest Products -Bushfire Behaviour and Management Unit

Field: Measure	Banksia ericifolia	Hakea teretifolia	"Leptospermum poligalifolium	Allocasuarina littoralis	Sedge spp.		
LFFM of 4 common		Rain - (mm)     Hakea terestfolia - Combined     New shoots     On - Hakea terestfolia - Juvenile     2	Rain - (mm)     - ← Leptospermum polygalifolium - Combined     Sol - (0-5cm)	Rain - (mm) → Allocasuarina litoralis - Combined Δ Soil - (0-Som)	Rain - (mm)           -←-Sedge spp Combined           250         Δ Soil - (0.5cm)		
shrubs, one sedge		-▲-Hakea terestfolia - Mature ▲ Soil - (0-5cm) →-Soil - (5-20cm)	-X-Soil - (5-20cm)	-X-Soi - (5:20cm)	- <del>X</del> -Soil - (5-20cm)		
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The University of New South Wales





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Field: Measure the live:dead ratio of sedge (grass like vegetation) seasonally :

- Last week in each season
- 3 Transects, each 10 x 0.05m<sup>2</sup> quadrants
  Sort samples into live and dead, herbs &
- sedge then oven-dry and weigh

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