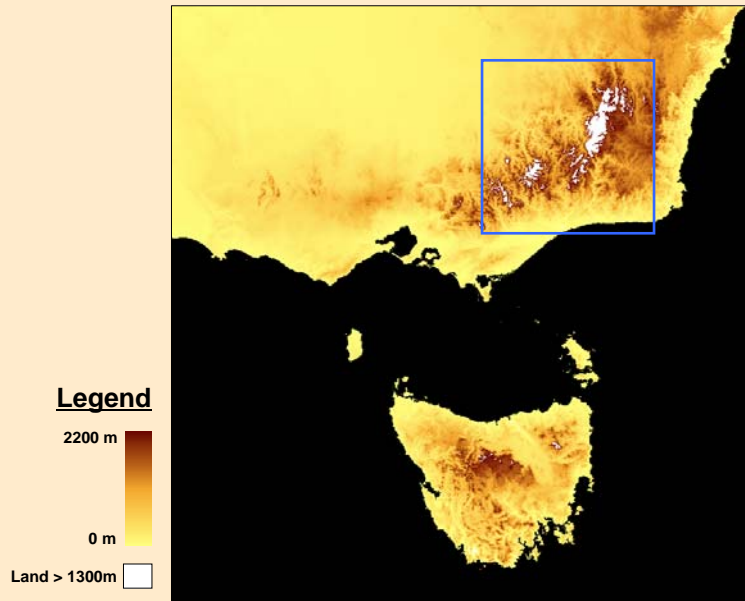


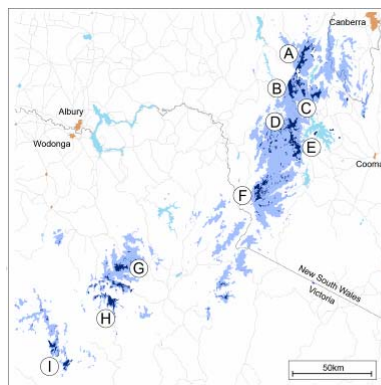
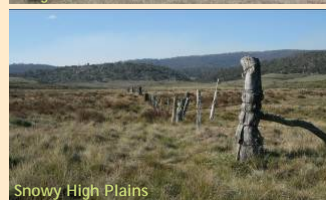
	
	
<p>PROGRAM B</p>	
	<h2>Fire, Fuel & Grazing in the Australian High Country</h2> <p>HighFire long-term grazing & fire experiments</p> <hr/> <p>Stephen Roxburgh^{1,2,3} & Maria Taranto^{1,2}</p> <p>¹Bushfire CRC; ²School of Biological, Earth and Environmental Sciences, UNSW; ³ENSIS, Canberra</p>
<p>© Bushfire CRC Ltd 2016</p>	
	

<h2>Talk overview</h2>	
	
<p>© Bushfire CRC Ltd 2016</p>	
	<h3>HighFire grazing/prescribed burning experiment</h3> <ul style="list-style-type: none"> ➤ Background and review of previous research. ➤ Project aims. ➤ Experimental design. ➤ Results from the 1st year of the experiment.
<div>     </div>	

What do we mean by 'high country?'



High Plains ecosystems



Major High Country Plains

- (A) Long Plain
- (B) Kiandra Region
- (C) Nungar & Boggy Plains
- (D) Happy Jacks Plain
- (E) Snowy High Plains
- (F) Kosciuszko Main Range
- (G) Bogong High Plains
- (H) Dargo High Plains
- (I) Wellington & Dennison High Plains

High Plains management history

- The High Plains 'snow-belt' was used seasonally for cattle and/or sheep grazing.
- Grazing commenced ~1840, and ceased in NSW ~1970, and more recently in Victoria.
- Grazing was often combined with fire to remove 'rank' pasture, and promote 'green pick'.
- Lessees sometimes required to fence + clear vegetation for pasture improvement
- The landscapes are still responding to the changed management regime.

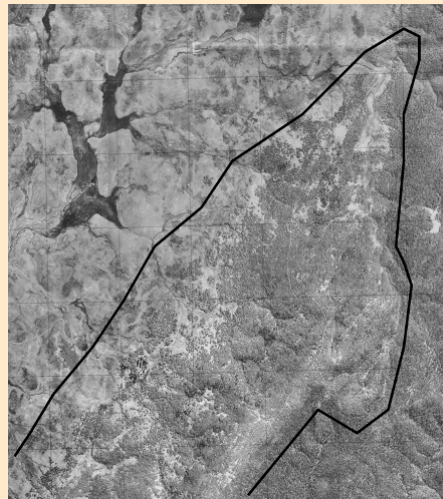


Merritt (2003), Currango Survivors, Tangle Press.

<http://na.gov.au/na/pic/vn302669>

High Plains management history




Currango Plain - 1944 vs. 2001



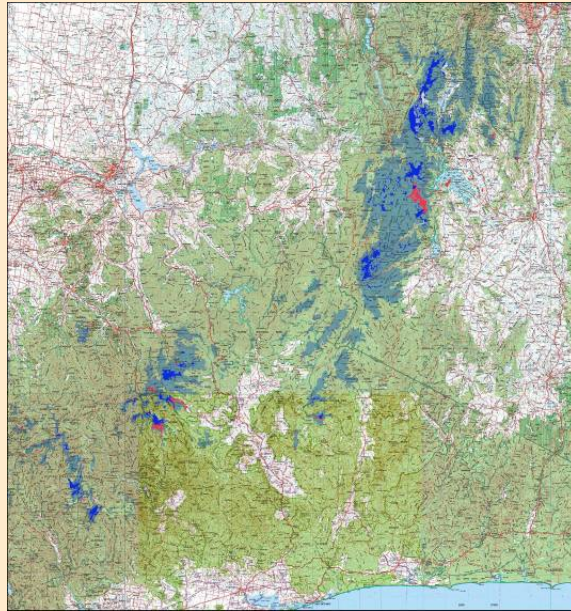
2 km

High Plains - current management

Legend

-  All land > 1300m
-  Non-forest areas within National Parks
-  Non-forest areas outside National Parks

	Area (km ²)
Total land area >1300m a.s.l.	4824
Total High Plains area.	495
Total High Plains within N.P.	407
Total High Plains outside N.P.	88

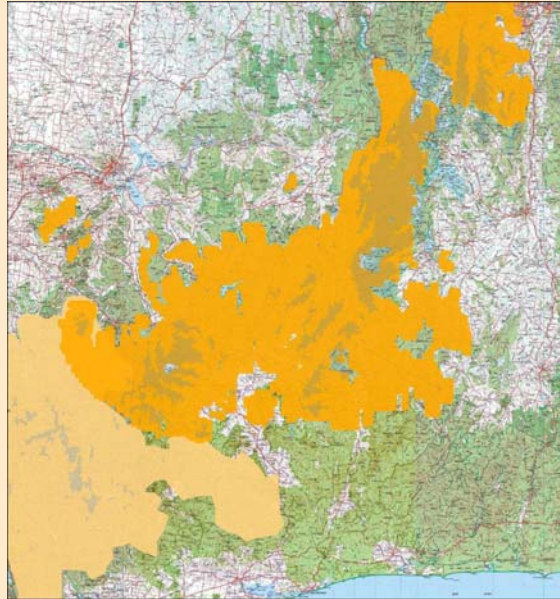
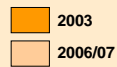


'Grazing' is more than the +/- of domestic animals ...
... you need to consider the whole management regime.



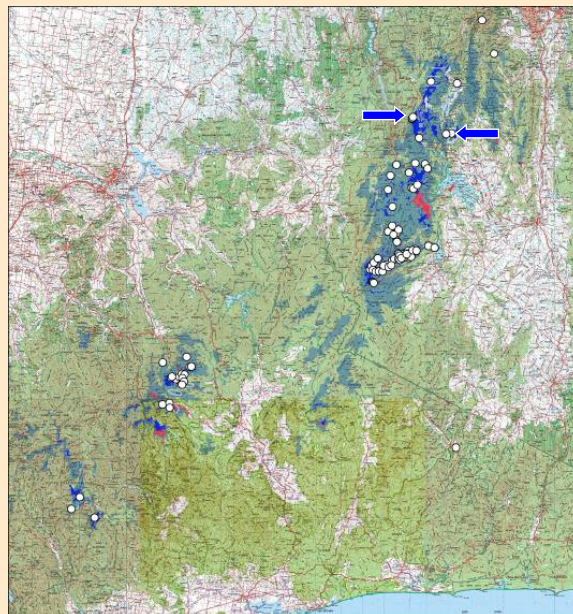
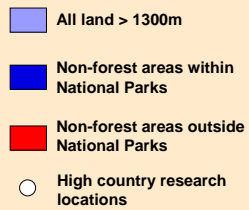
Recent major bushfires

Legend



Previous alpine research

Legend



HighFire grazing x fire experiments

→ Aims

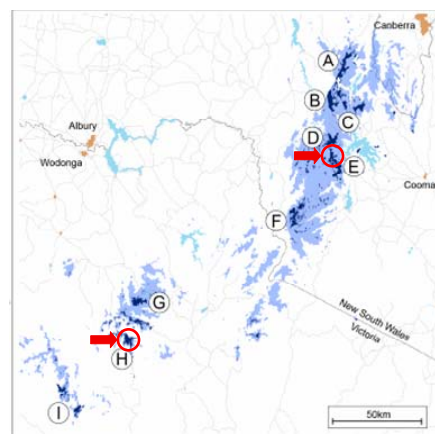


- To extend the existing research on subalpine vegetation dynamics and fire response through investigating the:
 - *Interactive* effects of fire and grazing
 - the responses of *vegetation structure* and *ecosystem physiology*, in addition to vegetation composition and biodiversity.
- To establish and sustain a long-term field experimental and monitoring program, for both research and teaching
- To provide a scientific basis for advising land owners on the implications of different grazing land management options.



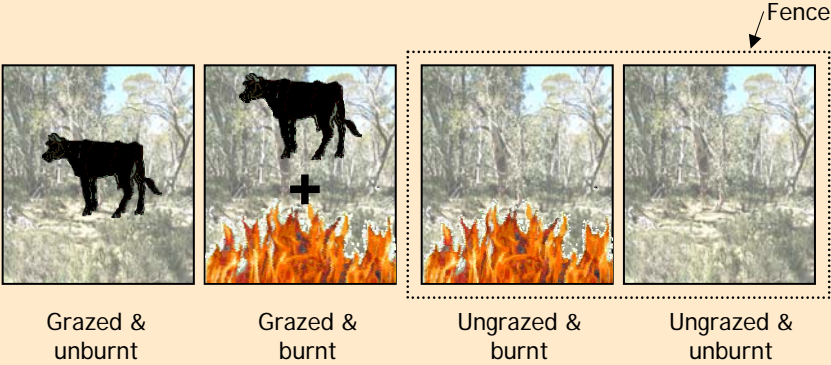
HighFire grazing x fire experiments


→ Study site locations



Major High Country Plains

- Ⓐ Long Plain
- Ⓑ Kiandra Region
- Ⓒ Nungar & Boggy Plains
- Ⓓ Happy Jacks Plain
- Ⓔ Snowy High Plains
- Ⓕ Kosciuszko Main Range
- Ⓖ Bogong High Plains
- Ⓗ Dargo High Plains
- Ⓘ Wellington & Dennison High Plains

<div>HighFire grazing x fire experiments</div> <div>bushfire CRC</div>	
<div>→ Site layout and experimental design</div> <div>  <p>Grazed & unburnt Grazed & burnt Ungrazed & burnt Ungrazed & unburnt</p> <p>Snowy High Plains, six sites (3x grassland & 3x woodland) Dargo High Plains , three sites (3x grassland)</p> </div>	

<div>HighFire grazing x fire experiments</div> <div>bushfire CRC</div>	
<div>→ Plot layout and experimental design</div> <div>  <p>Grassland experimental plot Woodland experimental plot</p> </div>	

<div>HighFire grazing x fire experiments</div> <div>  </div>	
<div>J. Gould</div> <div>  </div>	<div>  </div>

<div>HighFire grazing x fire experiments</div> <div>  </div>	
<div>Before burn</div> <div>After burn</div>	
<div>  </div>	<div>  </div>

HighFire grazing x fire experiments

→ Data collection

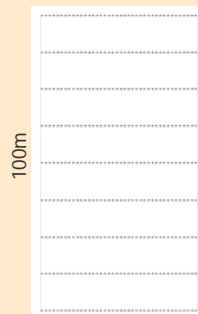
- Fine & coarse woody (dead) fuel loads (leaf, bark, fine 0-6mm; 6-10mm; 10-25mm; >25mm).
- Species cover, height and composition
- Tree mapping and diameter measurements
- Shrub understorey composition & structure
- Soil chemistry
- Permanent photopoints



HighFire grazing x fire experiments

→ Methods: Fine fuel & species cover

Cover determination by laser point-quadrat intercept
360 quadrats/plot; ~13000 overall.



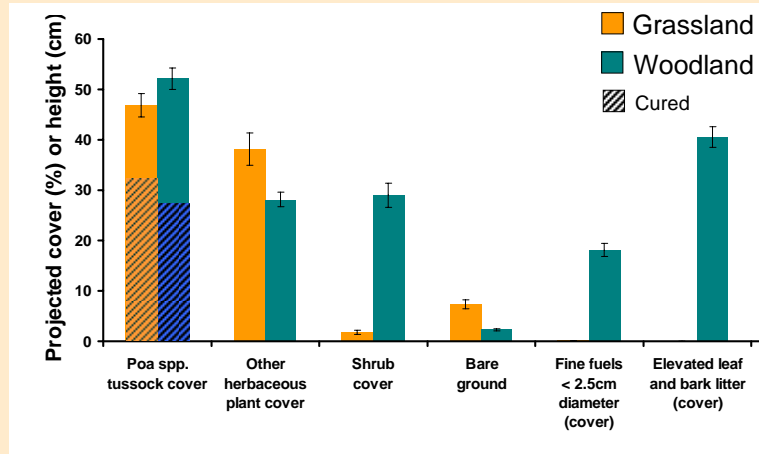
50m



<http://www.steverox.info/LaserPointQuadrat/LaserPointQuadrat.htm>

HighFire grazing x fire experiments

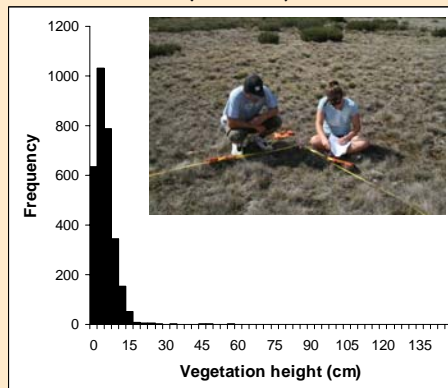
→ Vegetation structure - cover (+/- SE; n=12 sites)



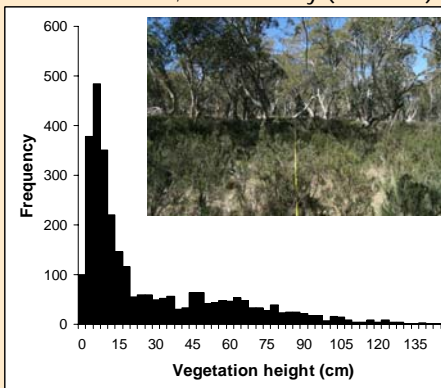
HighFire grazing x fire experiments

→ Vegetation structure - canopy height

Grassland sites ($n = 3040$)



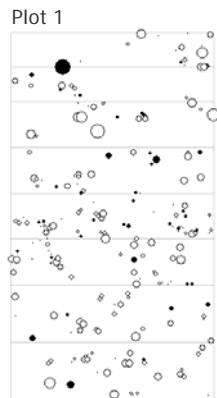
Woodland sites; understorey ($n = 2970$)



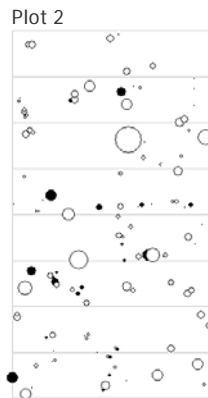
HighFire grazing x fire experiments

→ Snowgum population dynamics

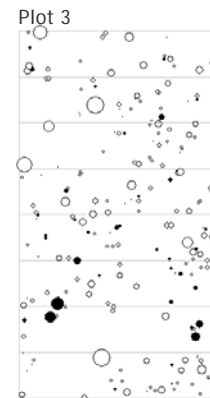
○ Live trees
● Dead trees



No. trees = 228
Biomass = 173 t/ha
Mean live DBH = 31cm
Mean dead DBH = 15cm



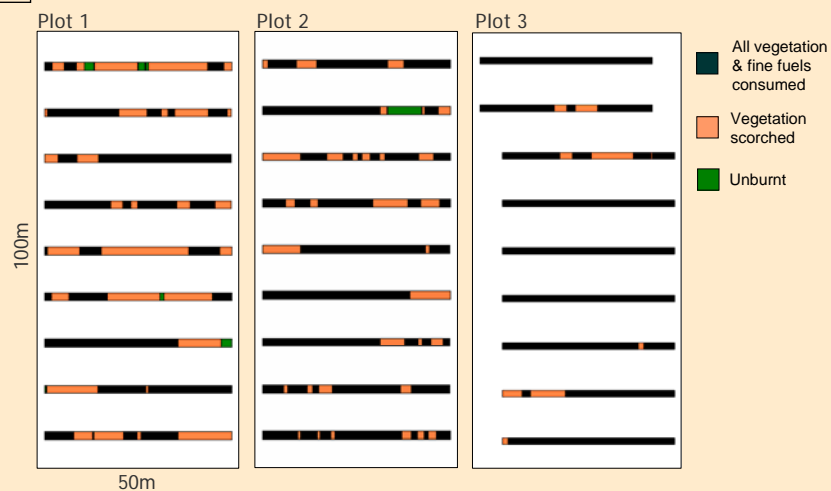
No. trees = 126
Biomass = 199 t/ha
Mean live DBH = 30cm
Mean dead DBH = 22cm



No. trees = 213
Biomass = 167.1 t/ha
Mean live DBH = 25cm
Mean dead DBH = 20cm

HighFire grazing x fire experiments

→ Fire severity (Understorey)



→ Progress summary

- Experimental plots are established, and baseline data collected.
- Cattle excluded in November 2006; First experimental burns applied in March 2007.
- The first teaching field camp was run at the Snowy Plains site (March 2007).
- Full re-survey over the 2007/2008 season, and beyond ...



Thanks to:

Barry Aitcheson
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Charlie Warren
Peter Ellis
RFS Berridale +
volunteers
NSW National Parks &
Wildlife

+ all those others who
have helped out along
the way



J. Gould

