PROGRAM B

Changes to the grass layer after fire in a tropical savanna

Ken Scott, Samantha Setterfield, Michael Douglas
Charles Darwin University, NT

Alan Andersen
CSIRO Sustainable Ecosystems, NT

© BUSHFIRE CRC LTD 2006

Location of research

bushfire CRC

© BUSHFIRE CRC LTD 2006

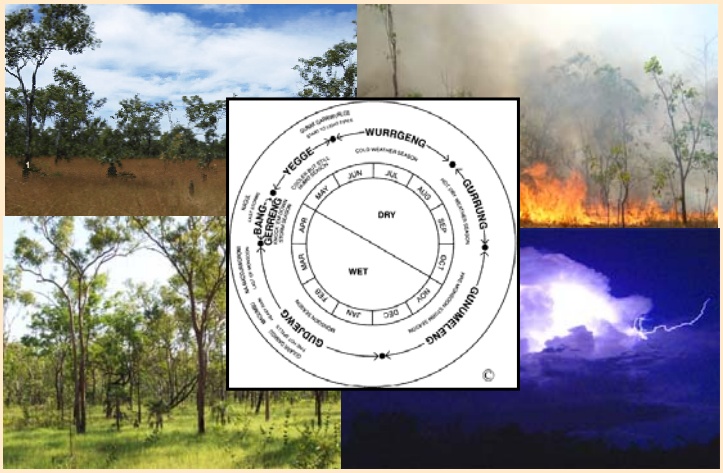
Tropical savannas

bushfire CRC

PROGRAM B: Changes to the grass layer after fire in a tropical savanna

© BUSHFIRE CRC LTD 2006

Annual cycle



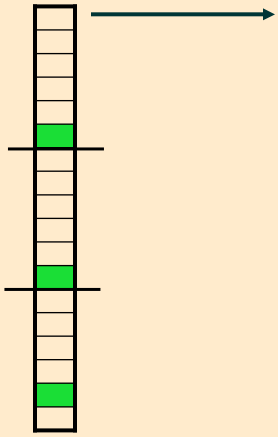
© BUSHFIRE CRC LTD 2006

Research question

- How do fire regimes affect grass-layer biodiversity?

bushfire CRC
PROGRAM B: Changes to the grass layer after fire in a tropical savanna
© BUSHFIRE CRC LTD 2006

Methods (site)



18 x 1 ha plots

"Randomised complete block design"

3 replicate plots of burning in:

season of fire	frequency
early dry season (June)	annual
early dry season (June)	every 2 years
early dry season (June)	every 3 years
early dry season (June)	every 5 years
late dry season (October)	every 3 years
no fires	-

© BUSHFIRE CRC LTD 2006

Methods (quadrats)

36 x 1m^2 quadrats per plot (648 at site)

Every year:

- Number of plants of each species
- Visual % cover of each species

bushfire CRC
PROGRAM B: Changes to the grass layer after fire in a tropical savanna
© BUSHFIRE CRC LTD 2006

Grass species composition

2004

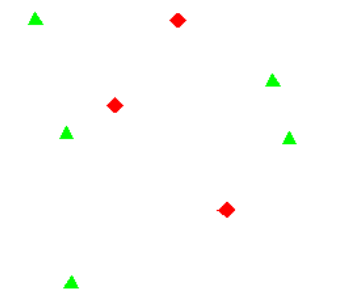
bushfire CRC

PROGRAM B: Changes to the grass layer after fire in a tropical savanna

© BUSHFIRE CRC LTD 2006

Grass species composition

2004 2005



First growing season after fire

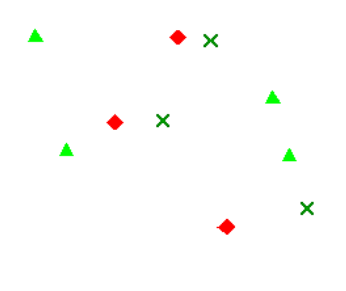
bushfire CRC

PROGRAM B: Changes to the grass layer after fire in a tropical savanna

© BUSHFIRE CRC LTD 2006

Grass species composition

2004 2005 2006

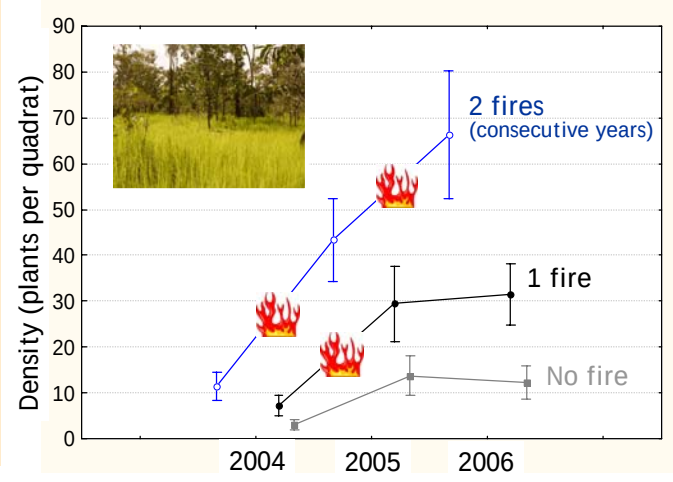


Second growing season after fire

bushfire CRC

PROGRAM B: Changes to the grass layer after fire in a tropical savanna

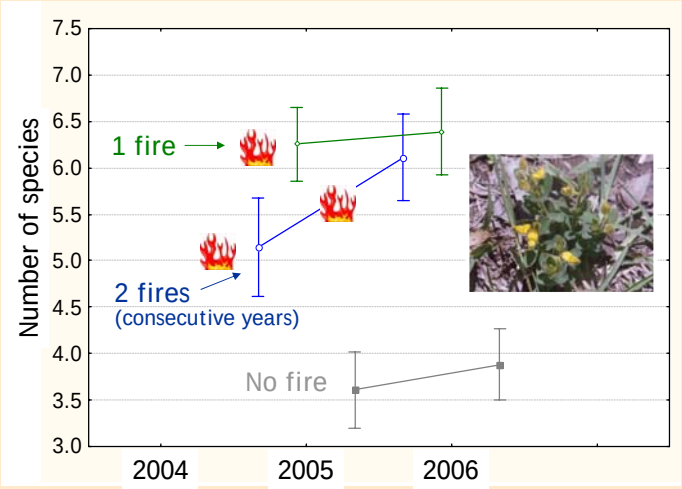
Fire increases density of annual grasses



bushfire CRC

PROGRAM B: Changes to the grass layer after fire in a tropical savanna

Fire increases number of forb species



© BUSHFIRE CRC LTD 2006

Implications - biodiversity

Burning results in a:

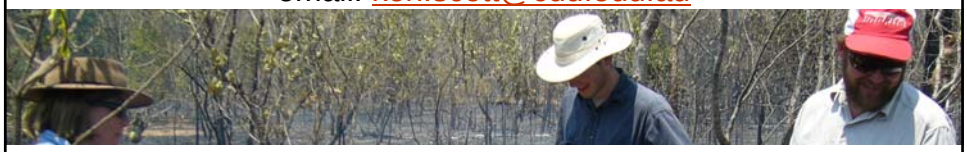
- different grass composition, but takes time
- high kill rate for perennial grasses *(see poster)*
- higher density of annual grasses
- higher number of forb species

bushfire CRC
PROGRAM B: Changes to the grass layer after fire in a tropical savanna
© BUSHFIRE CRC LTD 2006

Implications – end users (Bushfires Council NT)

- Fire removes bulky perennial grasses, 'airy' annuals colonise
  → patchy fuel layer is more continuous
- No increase in grass layer height
  → no major change in flame height and fire intensity
- Increase in forb species richness and plant abundance
  → biodiversity goals achieved

email: ken.scott@cdu.edu.au



bushfire CRC

CSIRO

Charles Darwin University Australia

Northern Territory Government
Department of Infrastructure, Planning and Environment