



Fire and plants in south-west forests: A review of knowledge

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*Tingle forest, 50 yrs unburnt
(G. Liddelow)*

Presentation Structure

- Introduction
- Fire-adaptive traits of plant species
- Plant community responses to a fire
- Plant community responses to fire regimes
- Conclusions

Forests - a complex mosaic



Fire Adaptations

Regeneration Strategies: Resprouters



Fire Adaptations

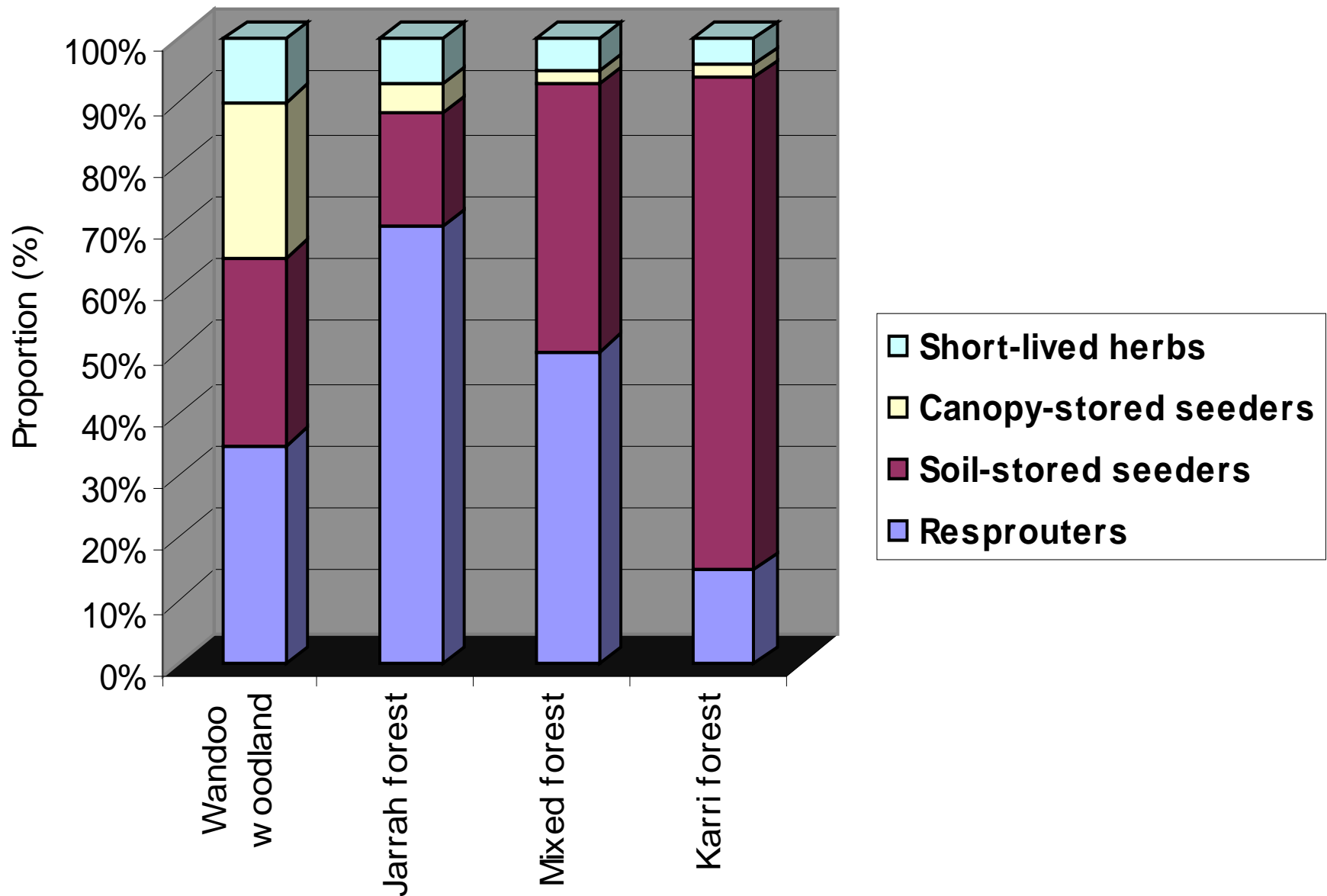
Regeneration Strategies: seeders

Canopy
stored
seed



Soil stored
seed

Composition of forest understorey species by life forms

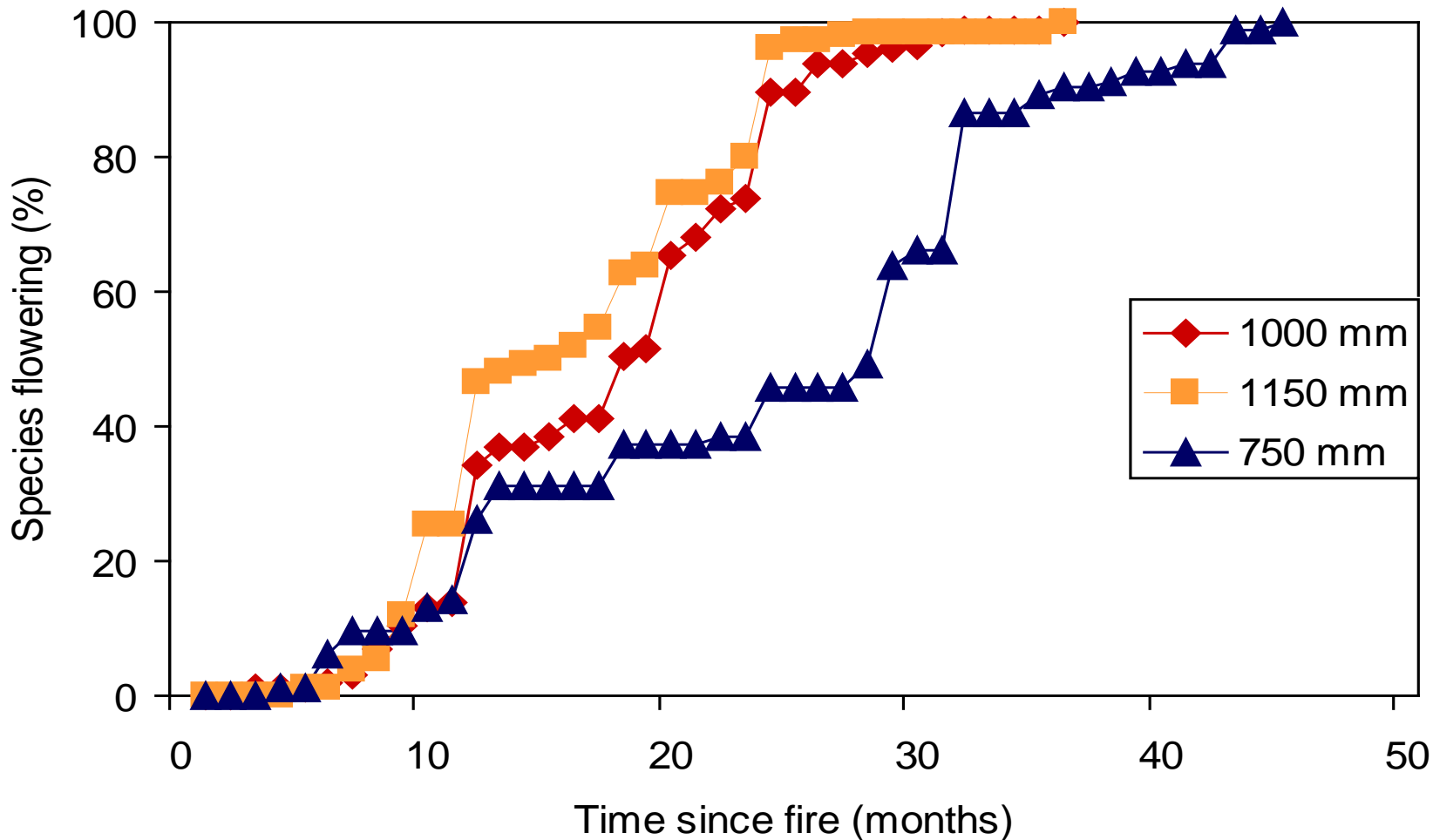


Fire Adaptations

Post-fire flowering



Time to first flower after fire (juvenile period): 3 upland jarrah forest understoreys



Setting fire intervals (using plants as indicators)

- Minimum fire interval: 2x juvenile period to allow seed-bank replenishment?
- Maximum fire interval: Less than longevity of fire sensitive, serotinous species.

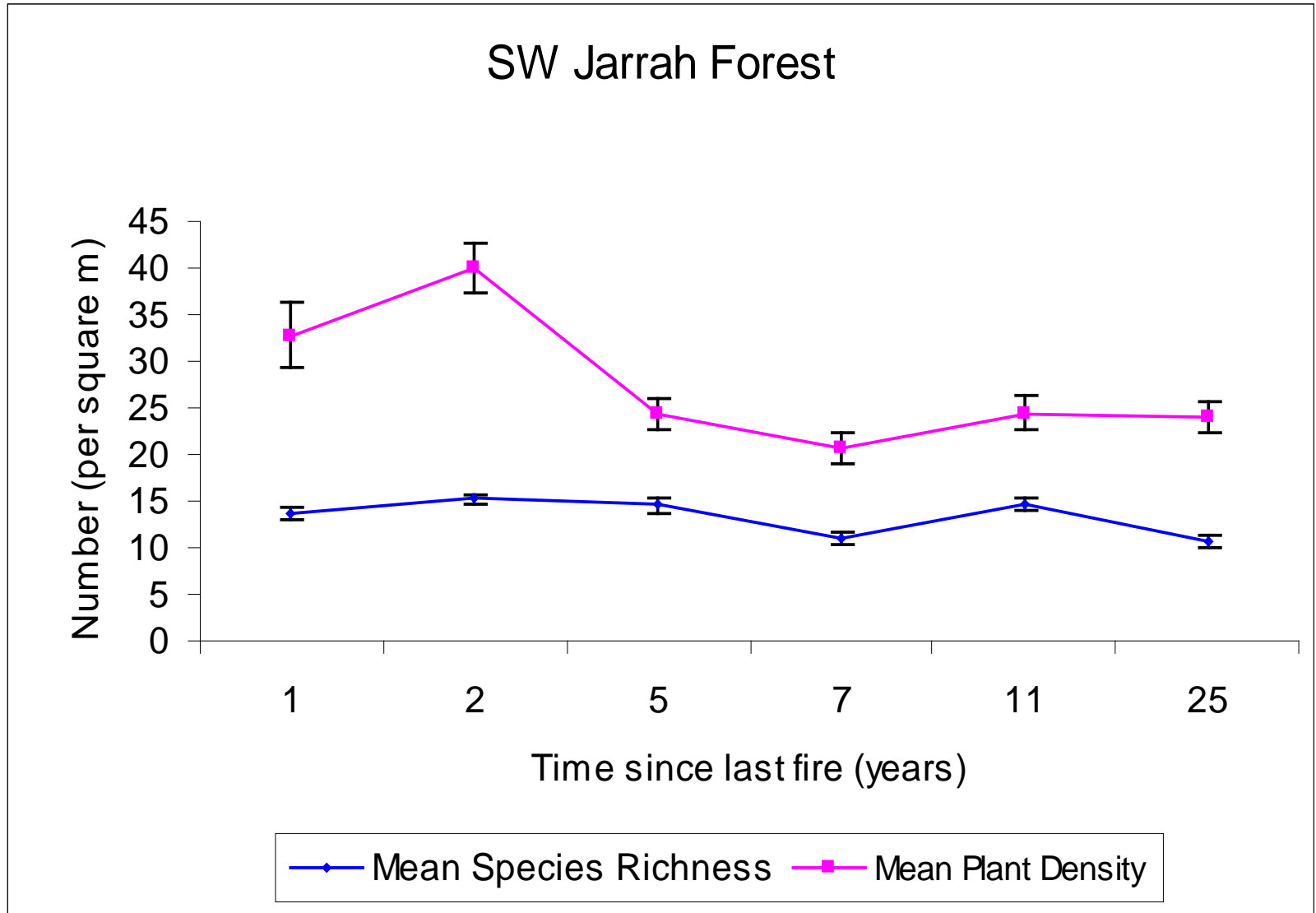


A fire - plant - animal interaction



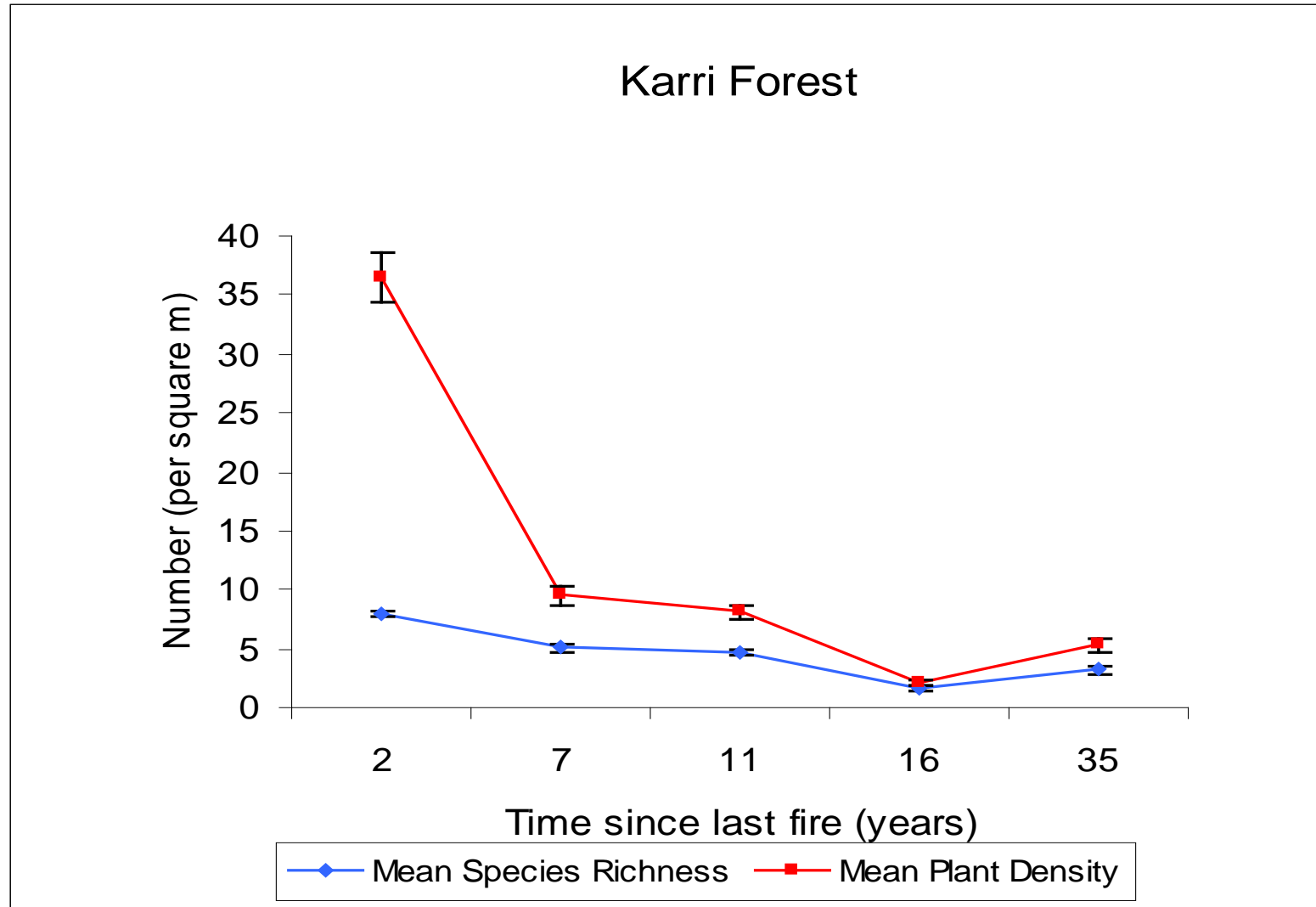
Plant community responses to a fire

Species richness & abundance with time since fire



Plant community responses to a fire

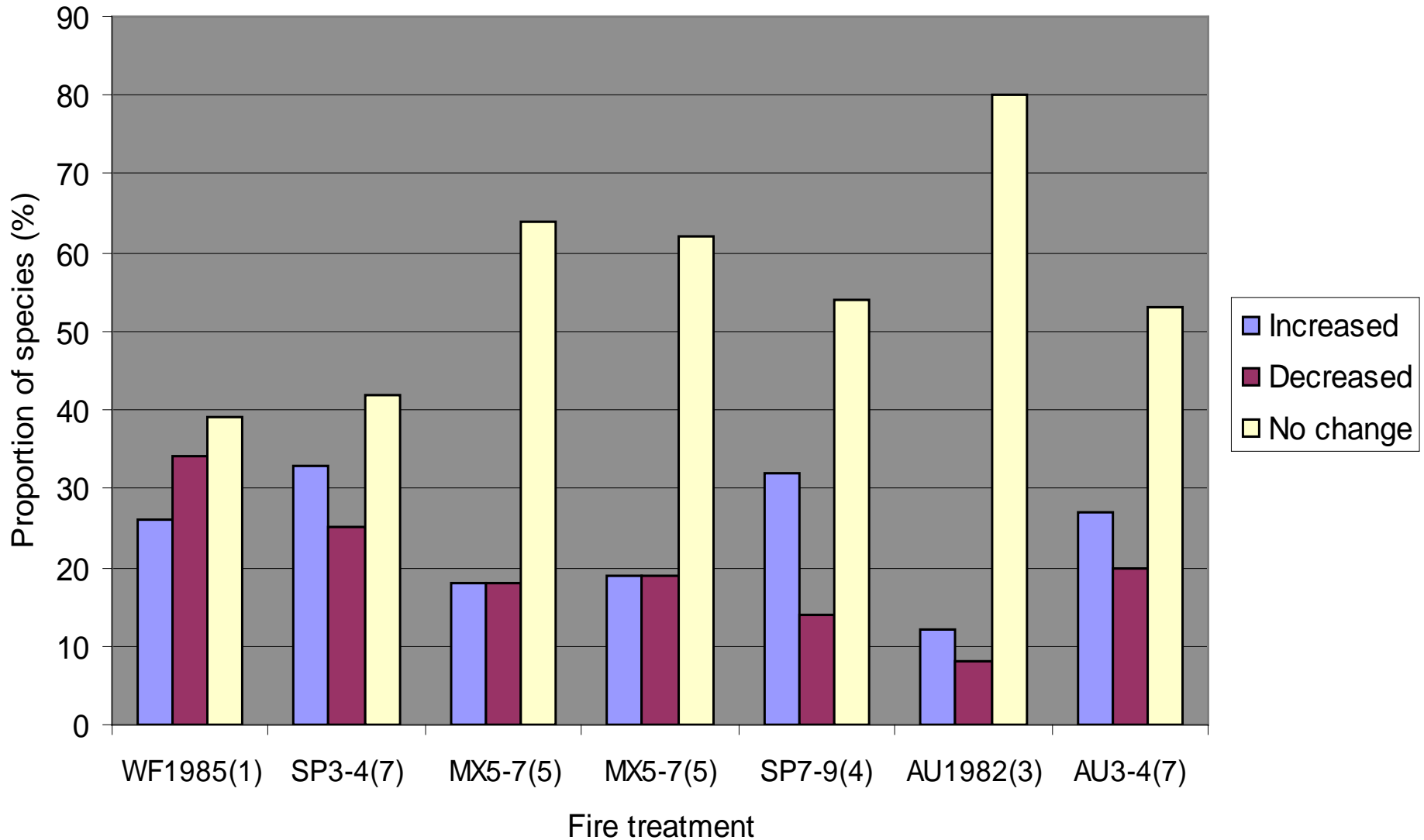
Species richness & abundance with time since fire



Long-term monitoring of fire effects on plants

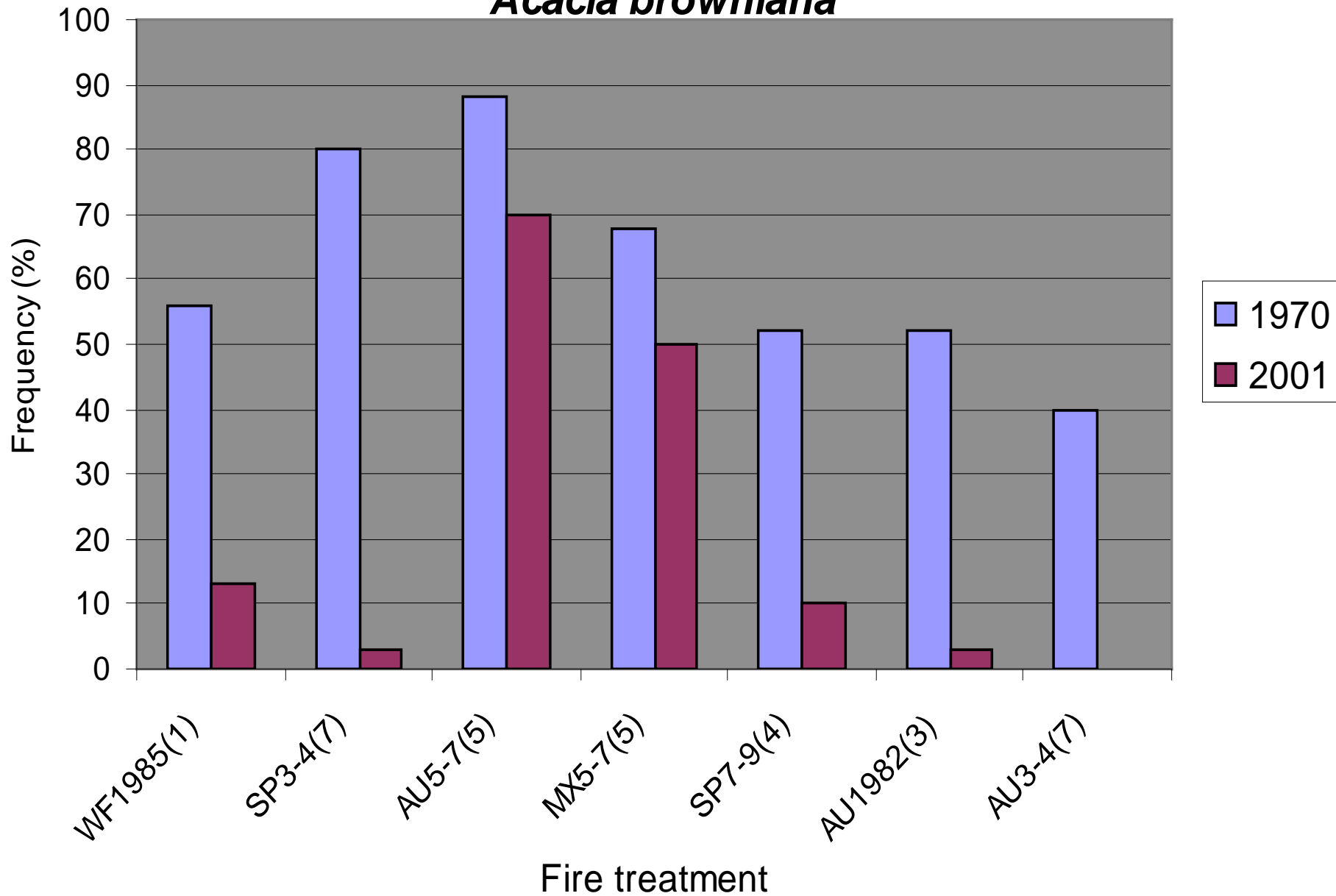
- Southern jarrah forest - commenced 1970
 - Unburnt control (Wildfire 1985)
 - Spring 3-5 yrs (7 fires)
 - Spring & autumn 5-7 yrs (5 fires)
 - Spring 7-9 yrs (4 fires)
 - Unburnt control (Autumn 1982)
 - Autumn 3-4 yrs (7 Fires)

Proportion of species that changed in abundance over the period 1970-2001



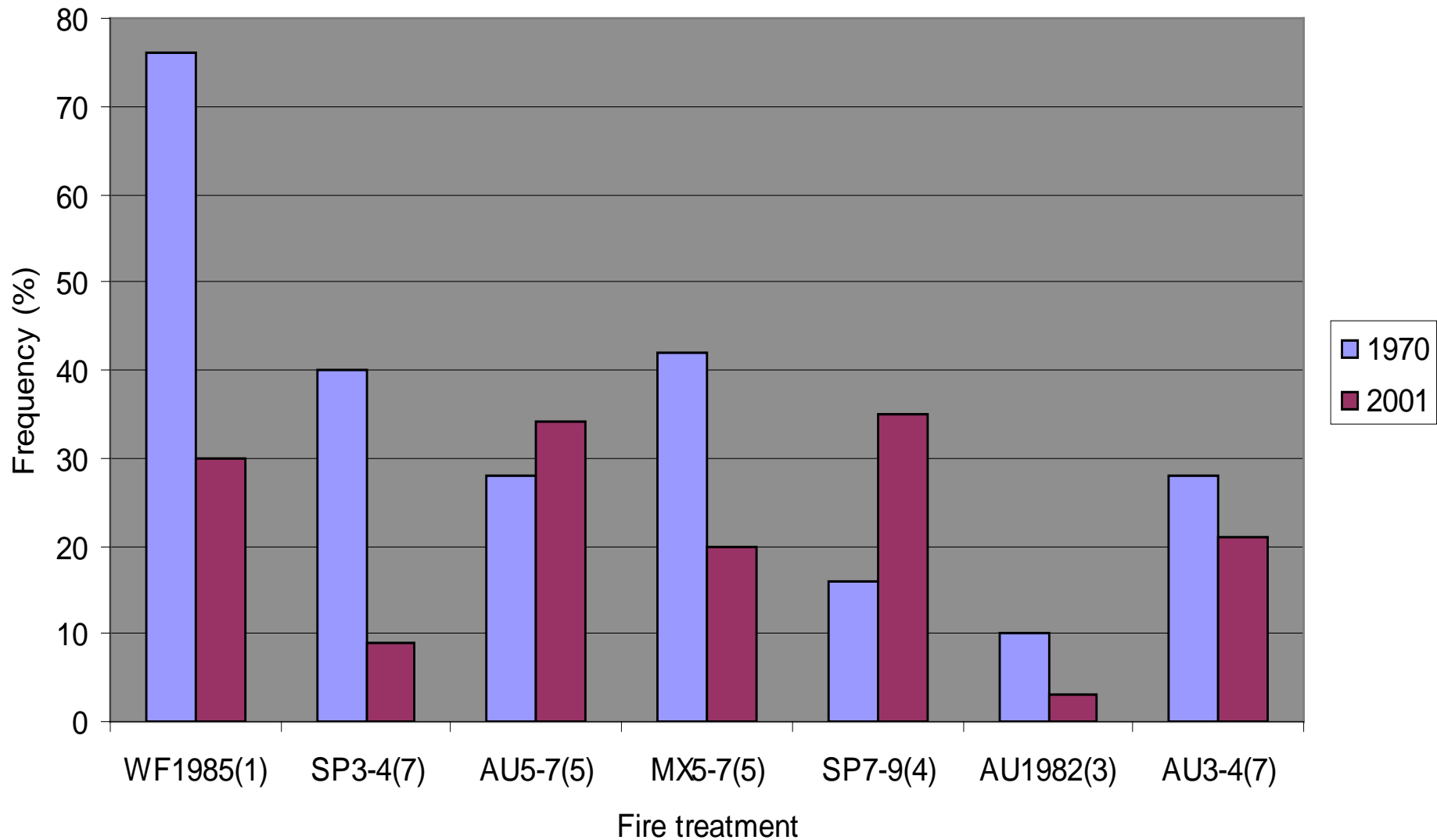
Changes in frequency of occurrence 1970-2001

Acacia browniana



Changes in frequency of occurrence 1970-2001

Crowea angustifolia



Fire & weeds

Most vulnerable to weeds:

- Remnant patches
- Road verges
- Forest edge
- Some wetlands & riparian zones



Weed invasion depends on proximity to source of weeds and frequency and severity of disturbance

To Summarise

- Forests are a complex mosaic of plant communities that vary in their response to fire.
- Forest plants display a variety of fire adaptive traits.
- Many (but not all) plants & communities benefit from fire at some stage in their life cycle to stimulate regeneration and reproduction.
- No single fire regime benefits all species.
- Diverse fire regimes at appropriate temporal & spatial scales promotes floristic and structural diversity.