Long-Term Effects of Multiple Wildfires and Management on the Arid Lands Ecology Reserve

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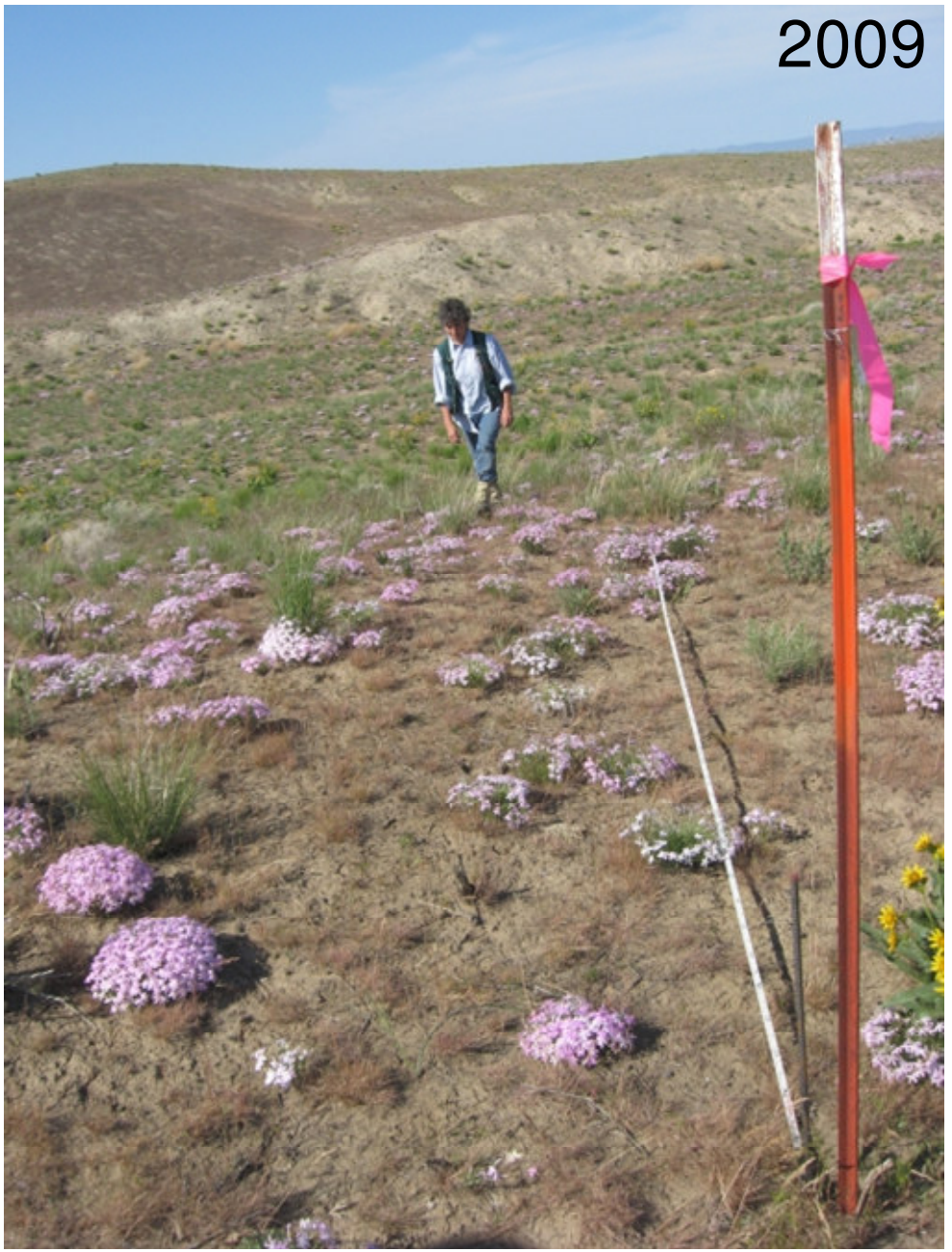
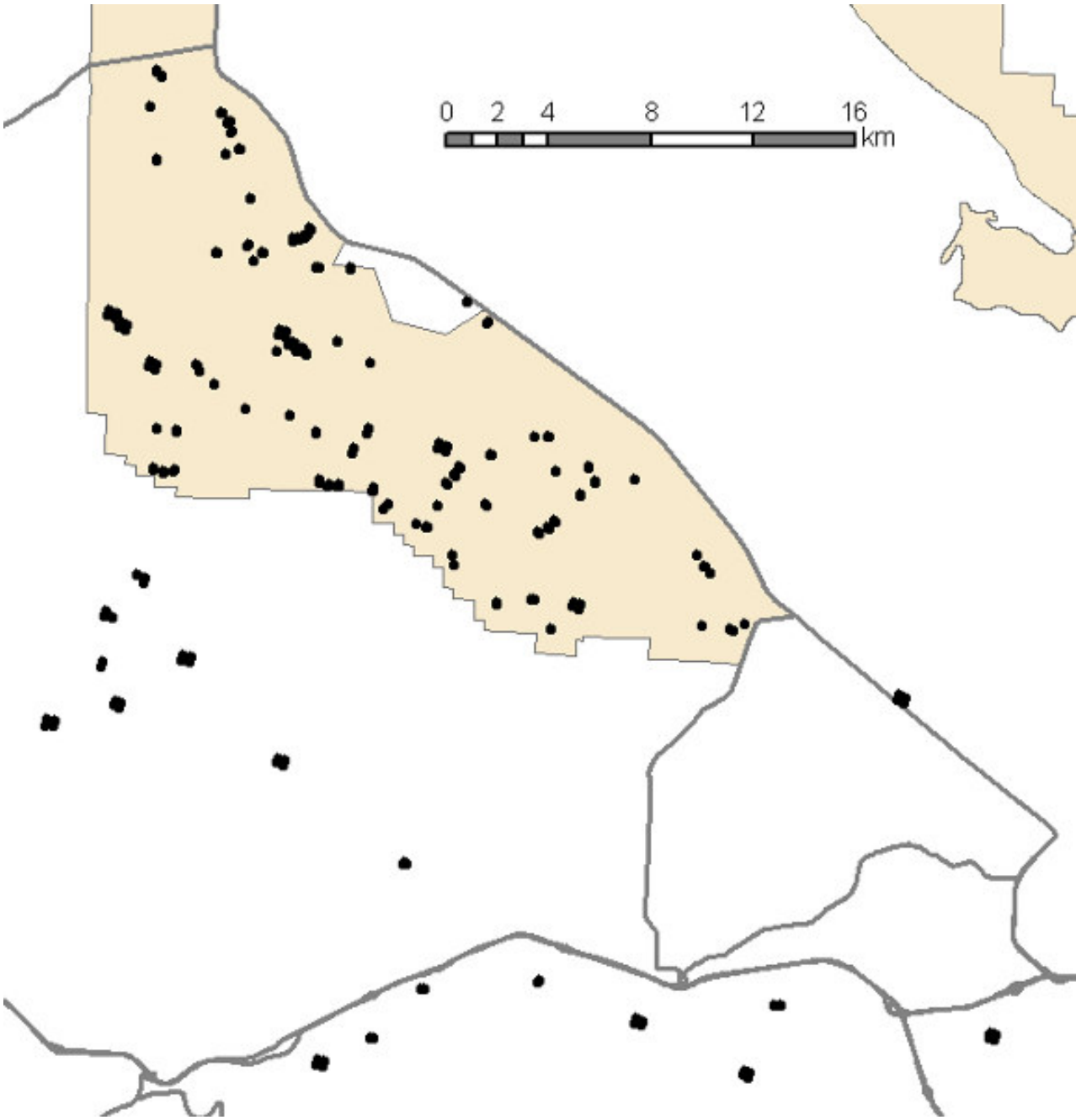
Permanent Plots



- Plots on and around ALE
- 1992-2010
- Major fires:
  - 24 Command (2000)
  - Wautoma and Milepost 17 (2007)



Projects

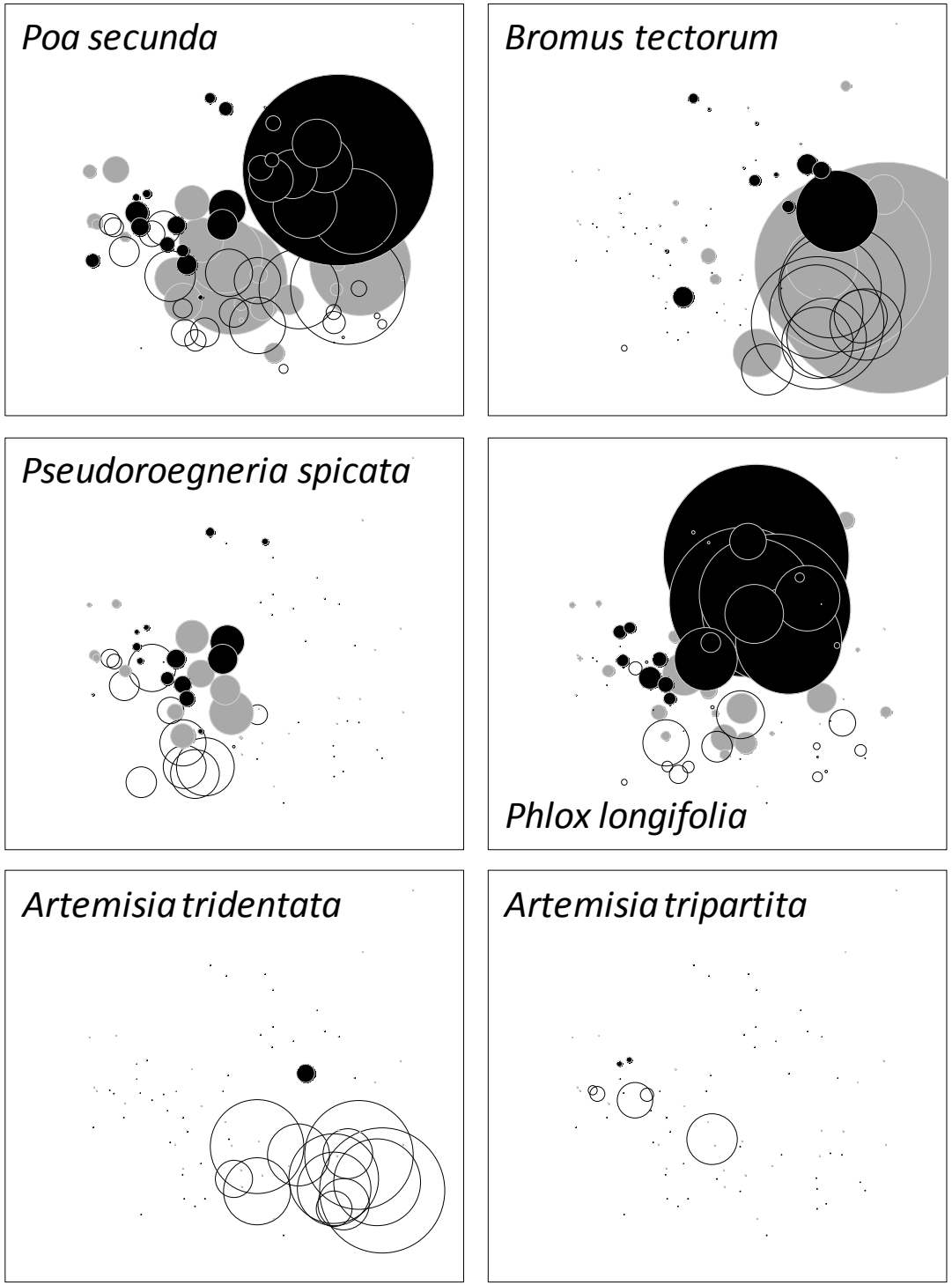
1. Vegetation dynamics
2. Species accumulation curves
3. Biotic soil crusts

1. Vegetation dynamics

- How have plant communities changed over the last 20 years?
- Trajectories of change
  - 1996, 2002, 2009
- Multivariate control charts
  - 1992-2010

- Compare:
  - 1996 (clear)
  - 2002 (grey)
  - 2009 (black)

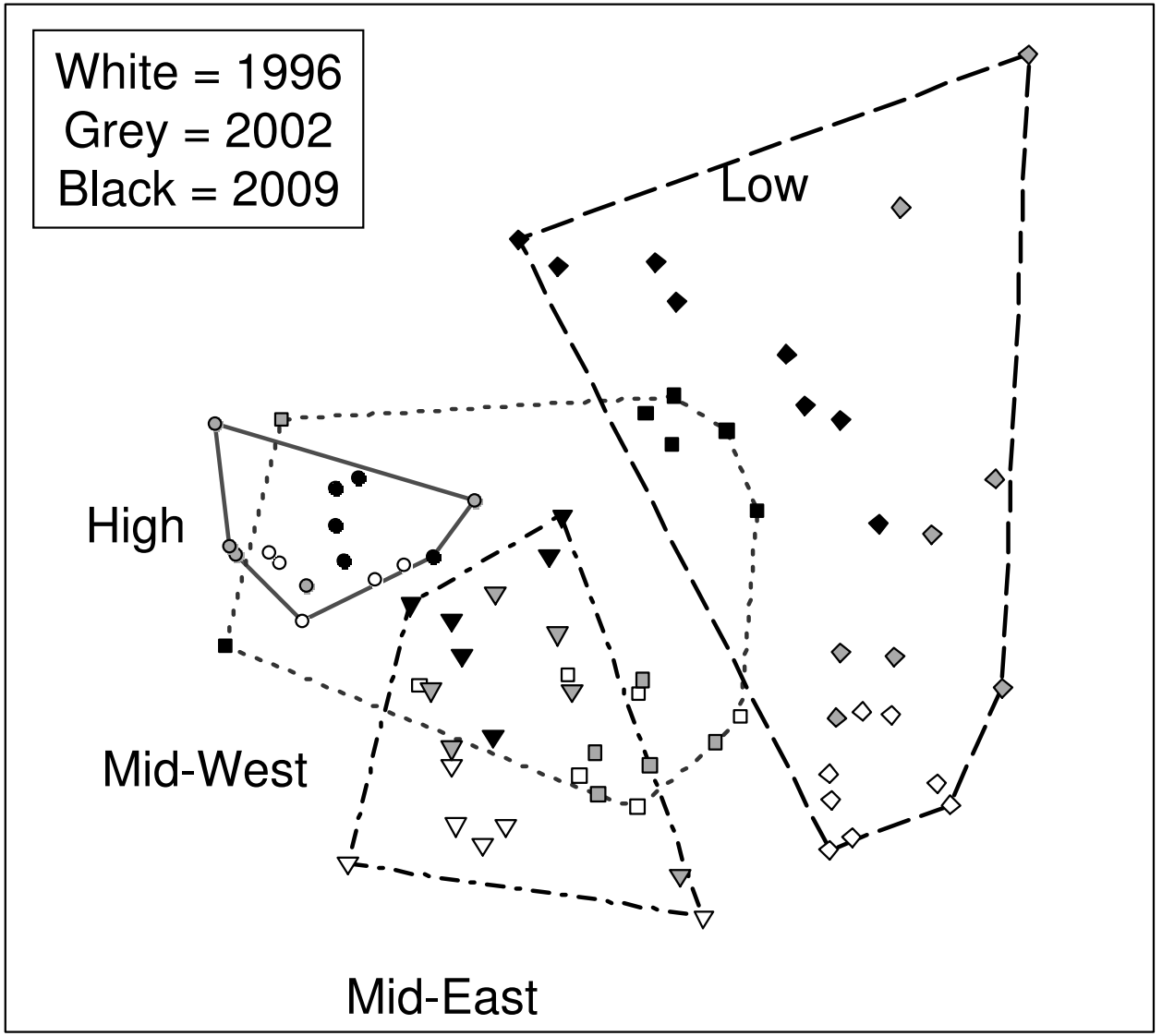
- Management of cheatgrass



Source: Davies et al, *in revision*

- 4 elevational groups on ALE:
  - Low
  - Mid-East
  - Mid-West
  - High

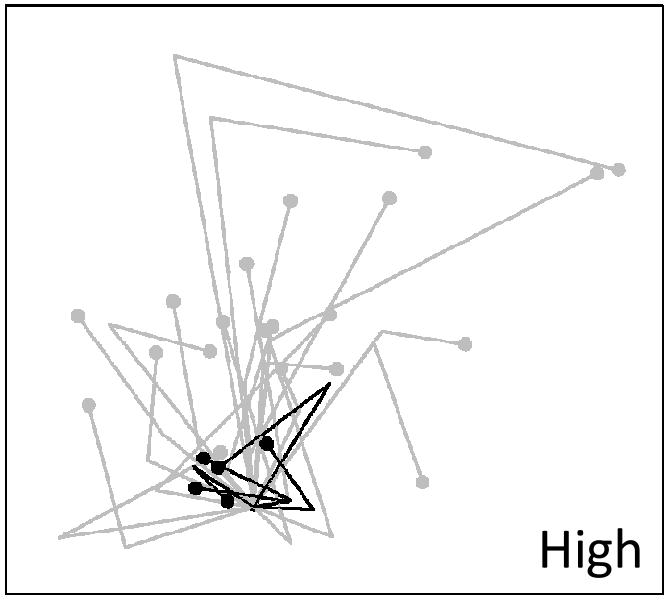
- Large change at low elevations
- Little change at high elevations

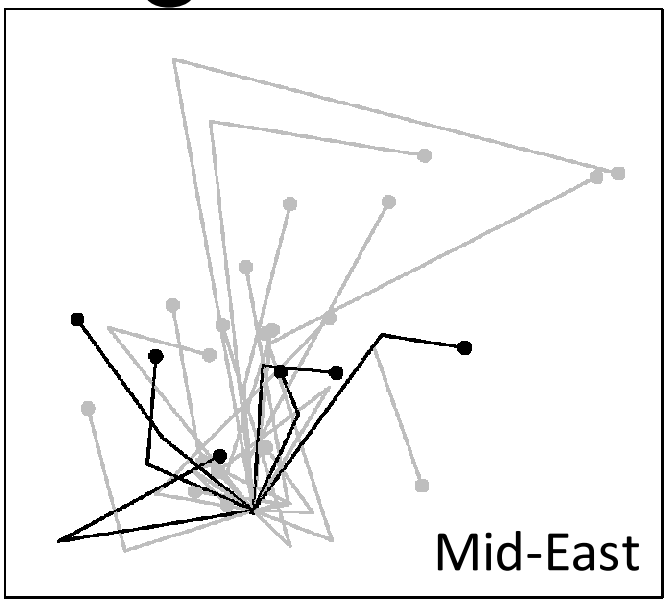


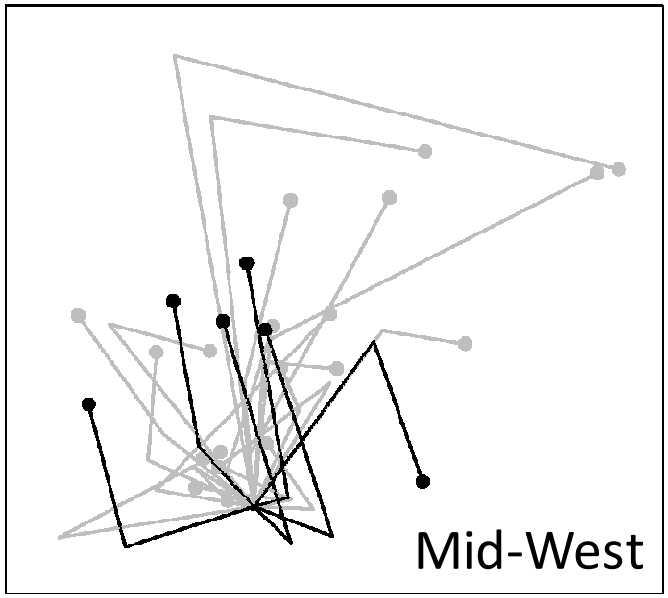
Source: Davies et al, *in revision*

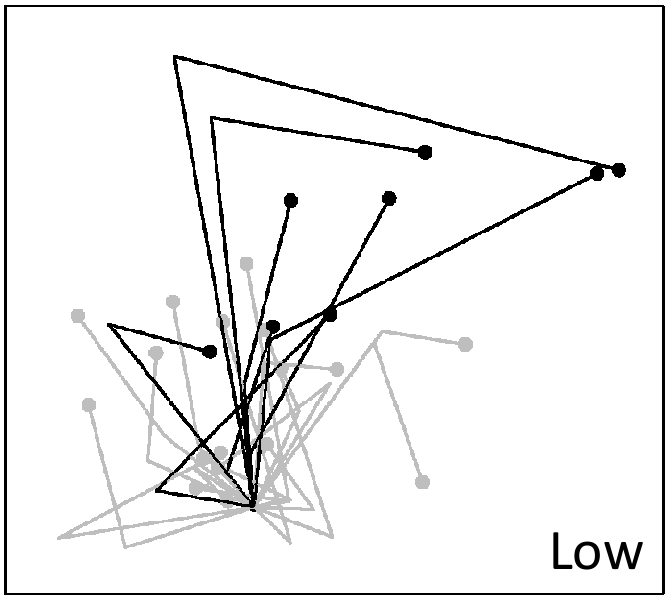
Trajectories of change

- Compare trajectories of ‘Low’ and ‘High’ communities

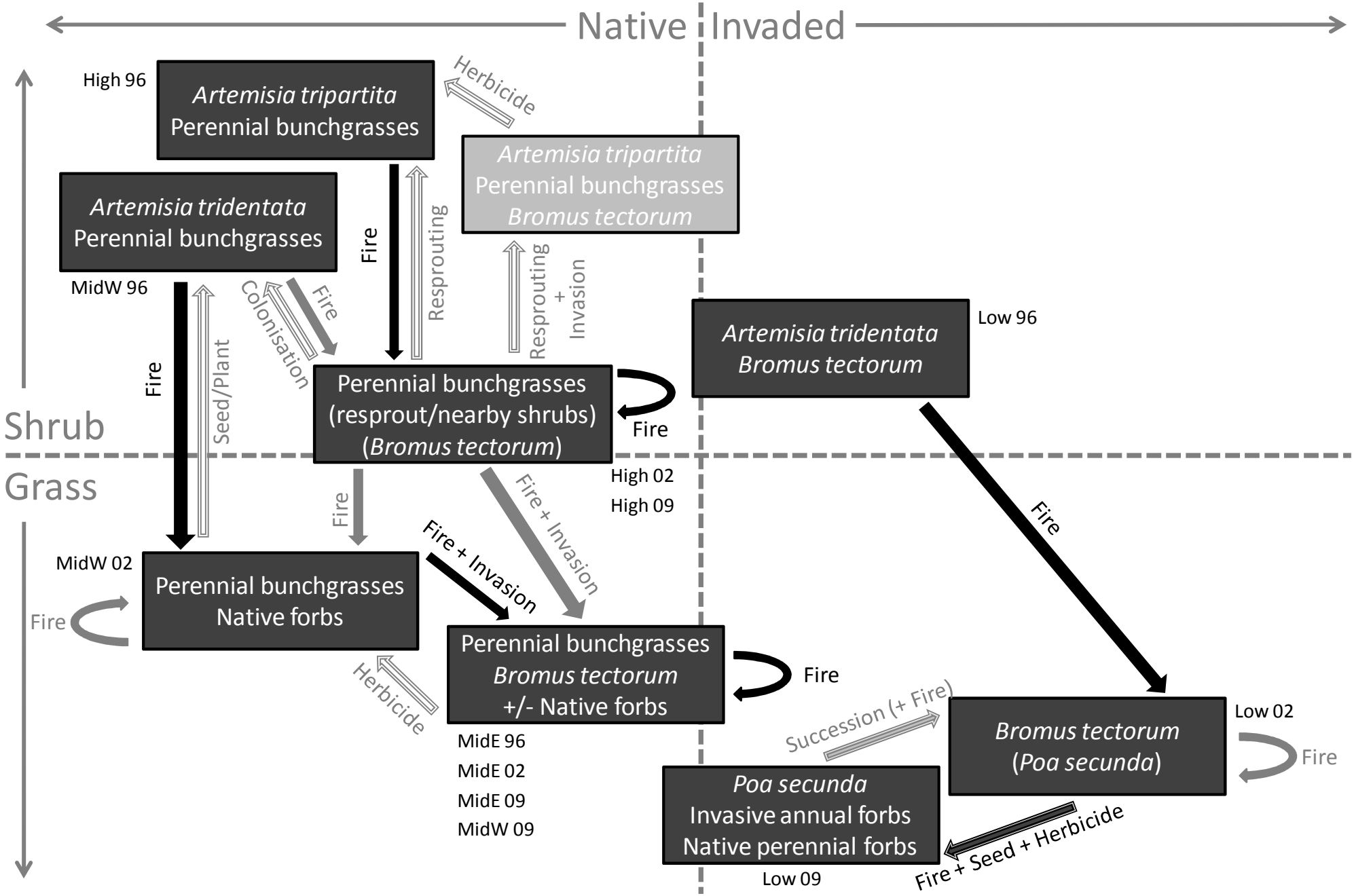








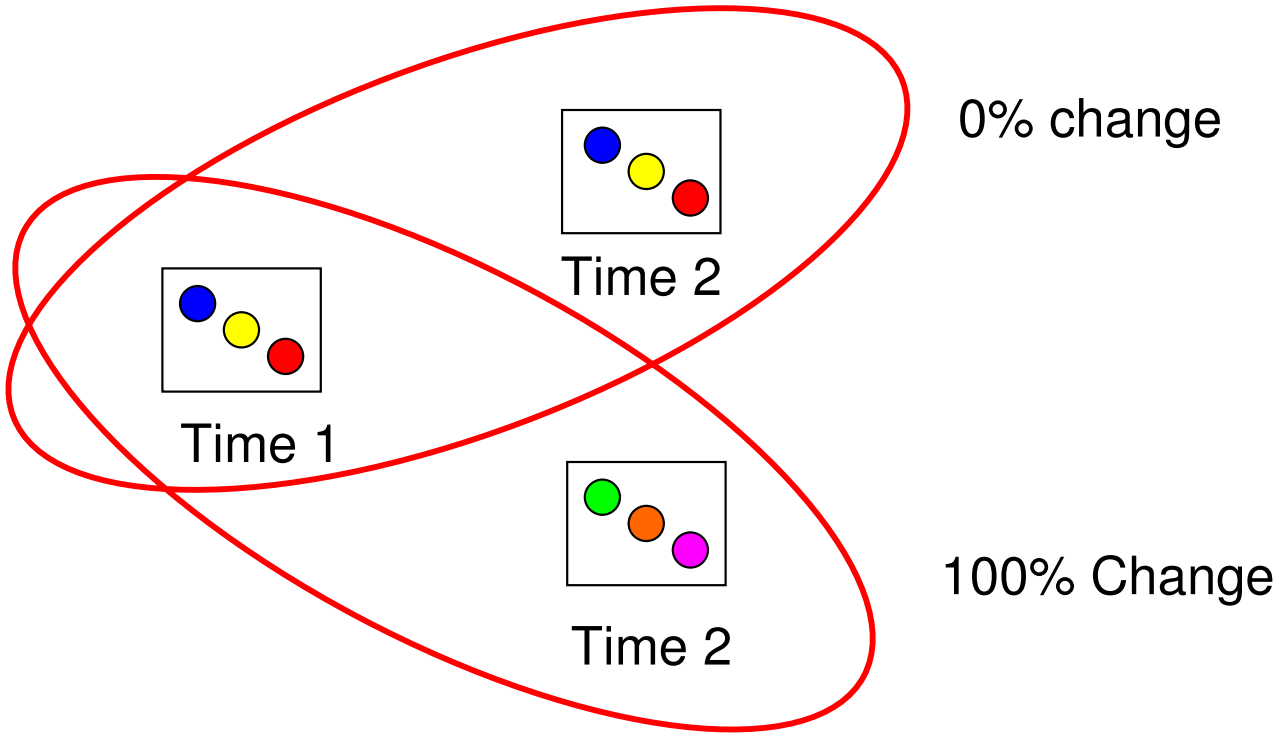
Source: Davies et al, *in revision*

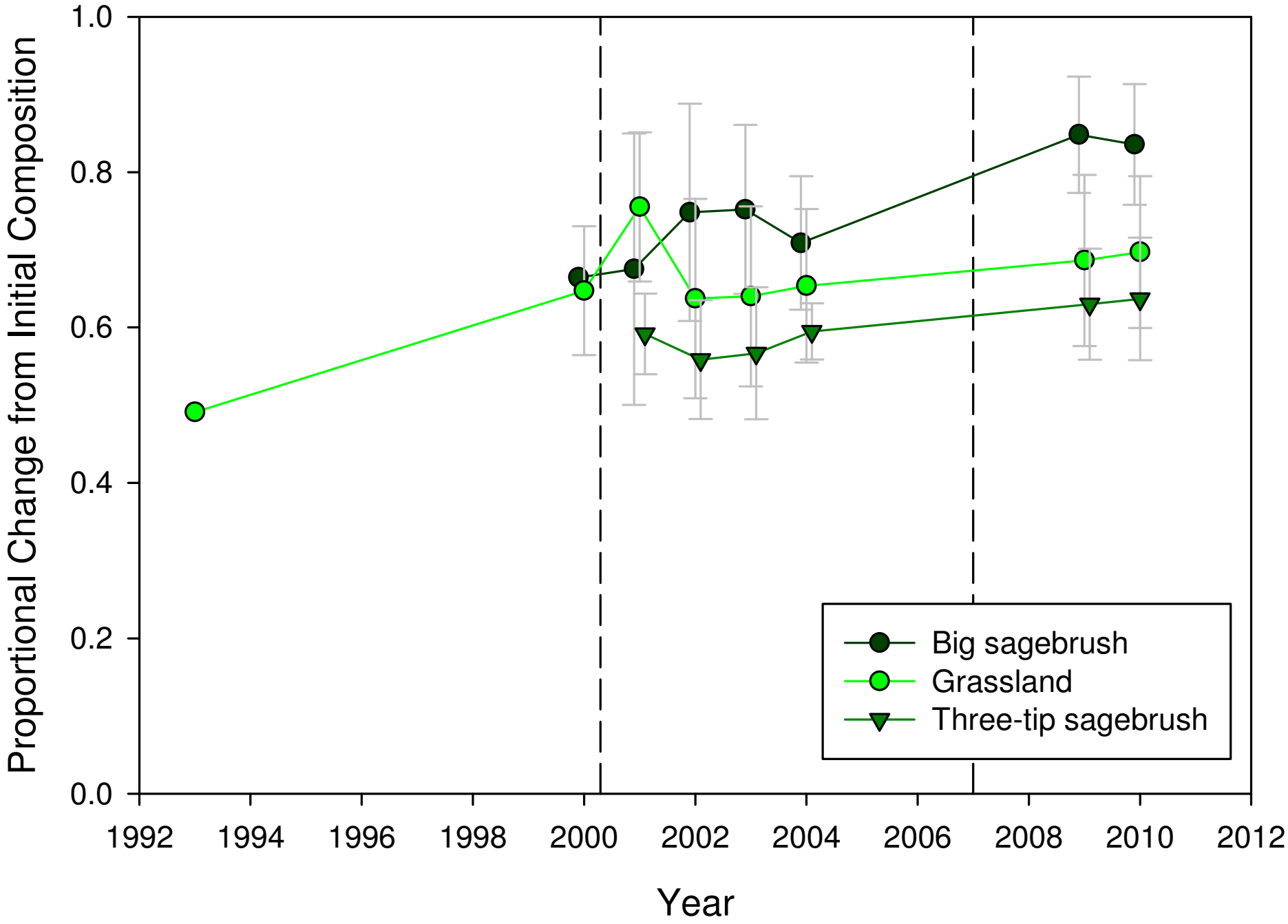


Source: Davies et al, *in revision*

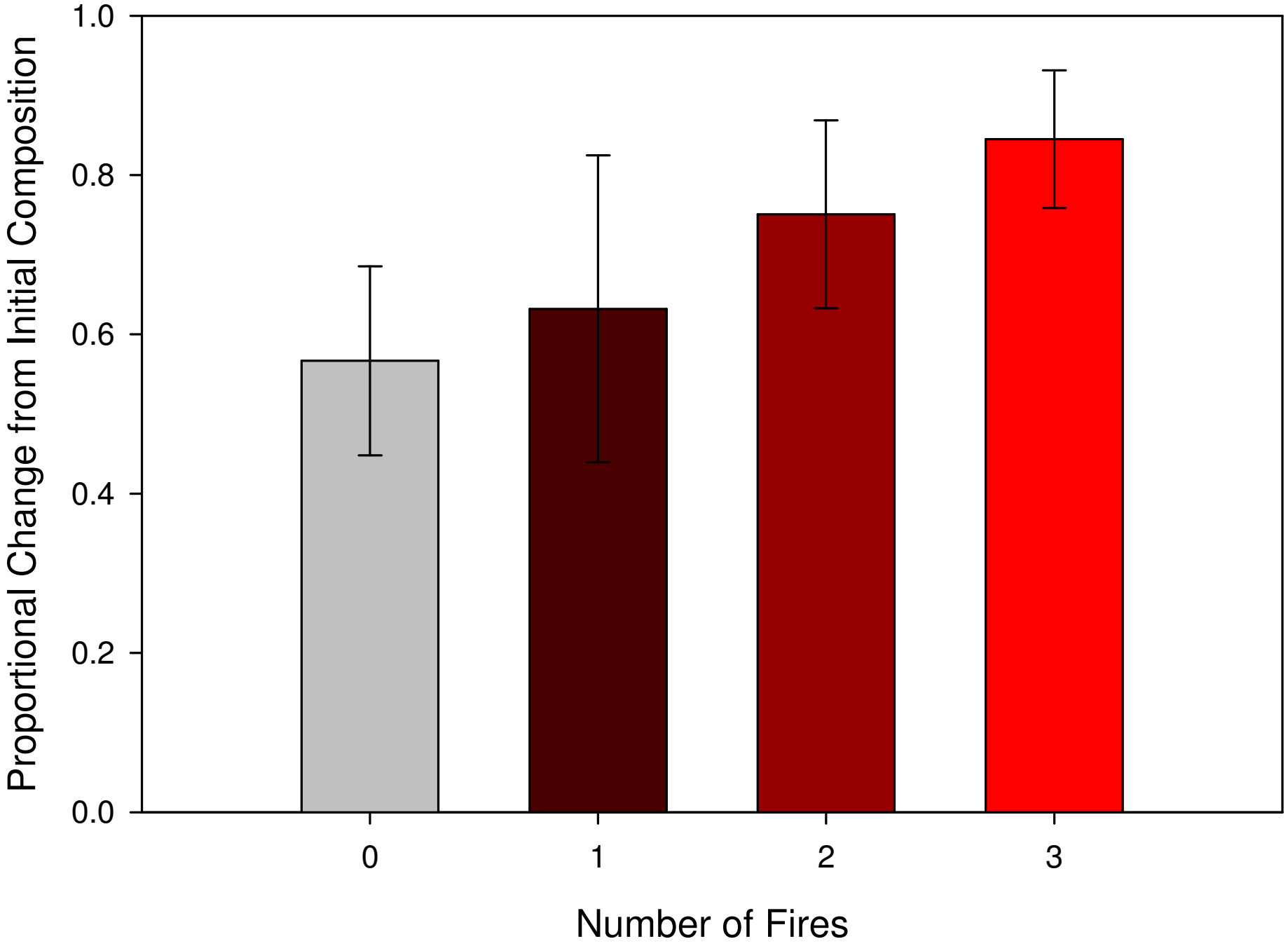
Multivariate control charts

- How does **composition** change over time?



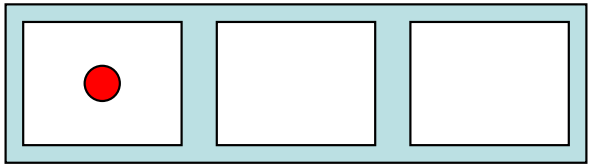
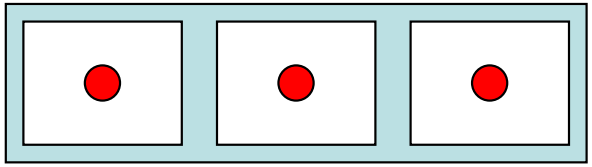
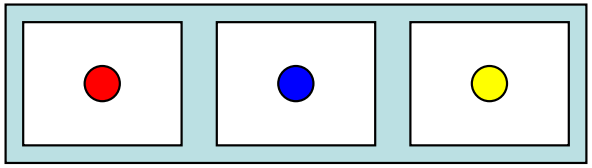
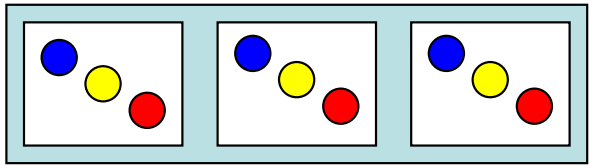


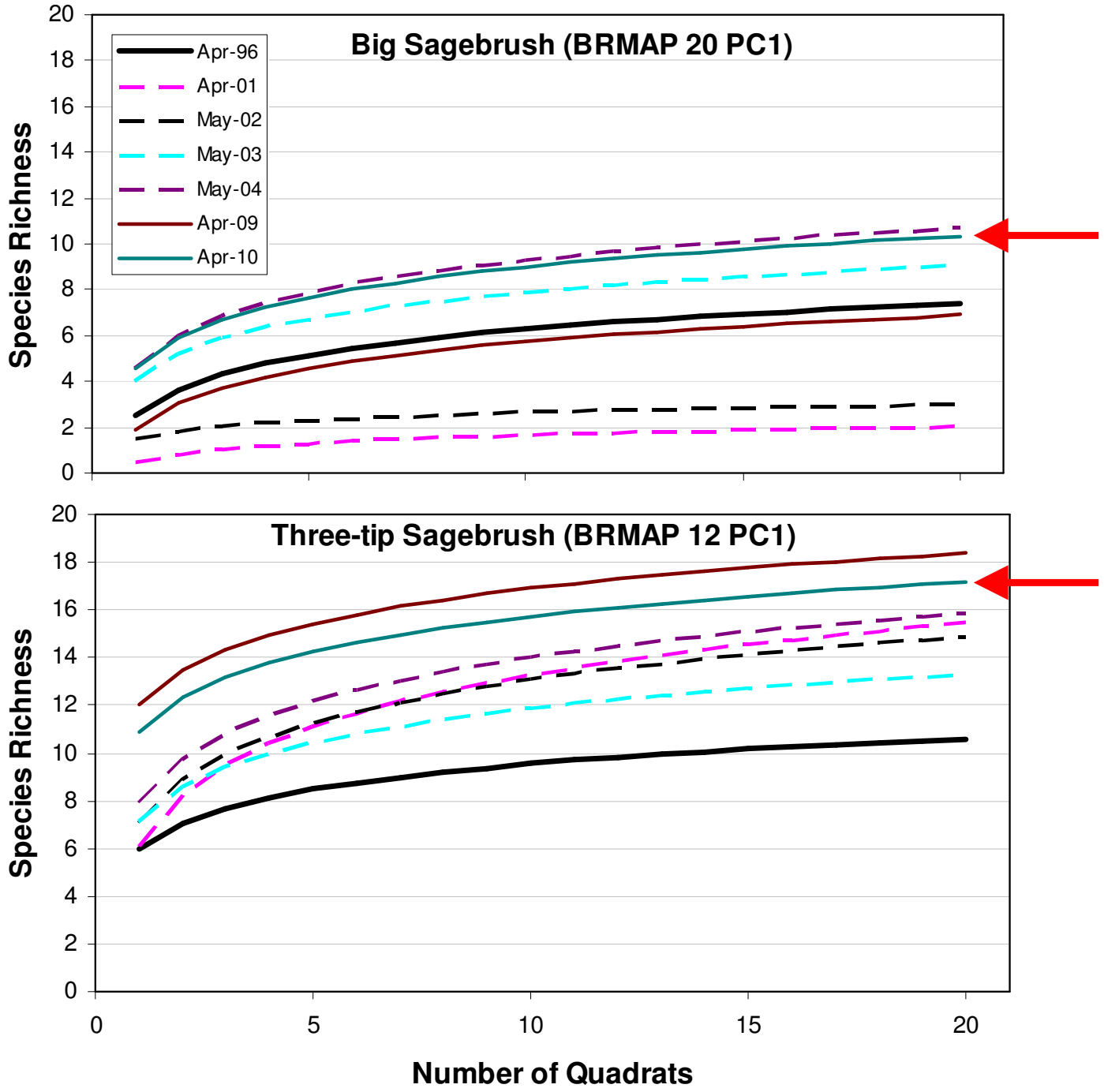
Source: Davies et al, *in prep.* – poster



Source: Davies et al, *in prep.* – poster

2. Species Accumulation Curves

	Quadrat	Transect
	0.3	1
	1	1
	1	3
	3	3



Source: Bakker et al, *in prep.*

3. Biotic Soil Crusts

- 98 transects, each 100 m long

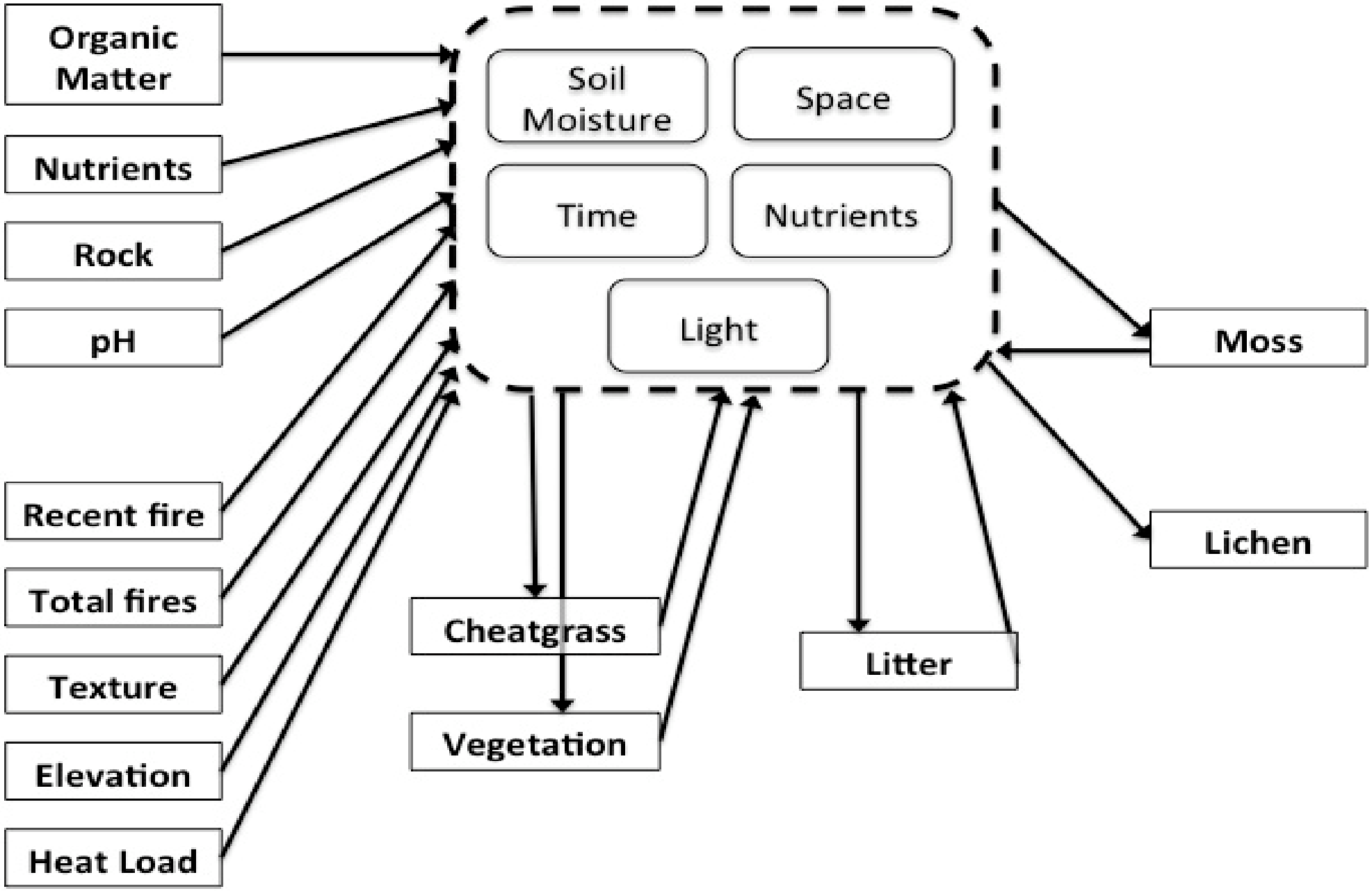
- 45 species or morphotypes

Caloplaca tomenii

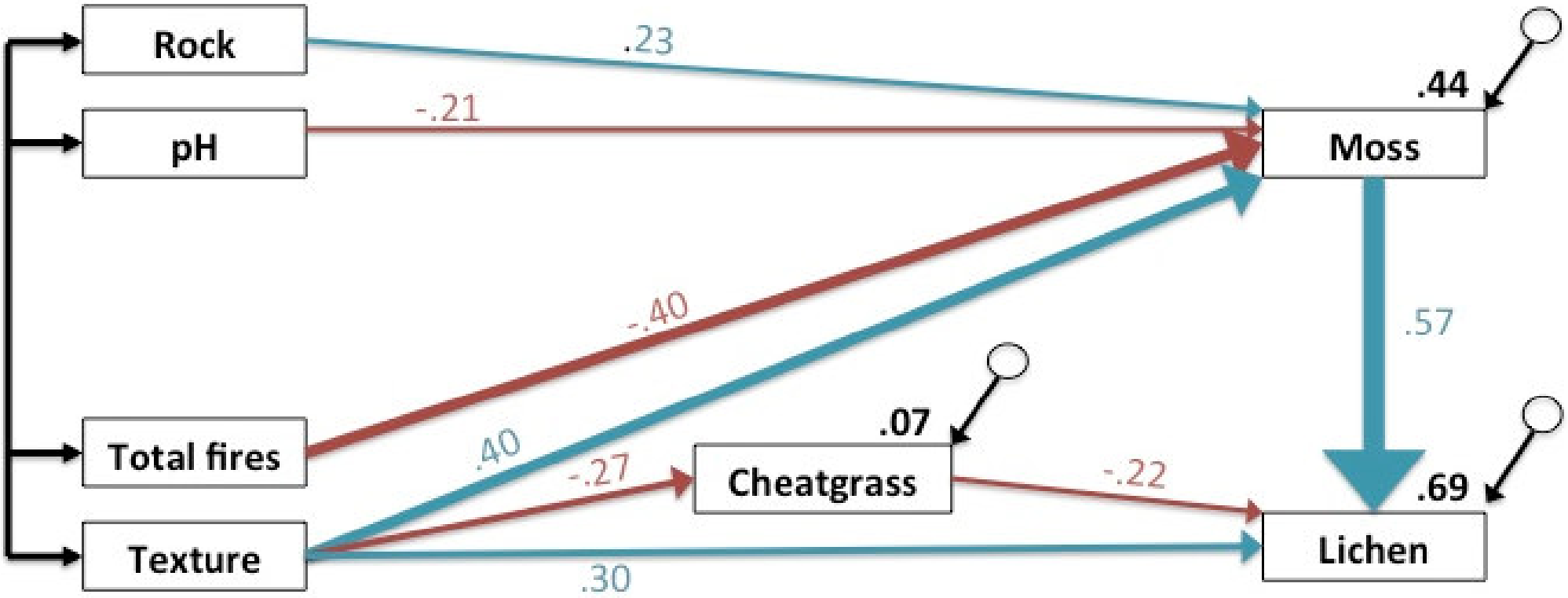
Acarospora schleisherii

Syntrichia ruralis

Source: Dettweiler-Robinson & Bakker – poster



Source: Dettweiler-Robinson & Bakker – poster



Source: Dettweiler-Robinson & Bakker – poster

Conclusions

- High-elevation areas more resilient to fire
  - Functional traits important (e.g., resprouting ability)
  - State-and-transition model based on nativity and life form
- Need to consider scale of analysis
- Biotic soil crusts affected by abiotic conditions and by fires

Conclusions

- Permanent plots provide invaluable information for managers
- New techniques provide insight into effects of wildfires and management

Acknowledgements

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