Bureaucrats, burning and biodiversity:

Keeping monitoring and evaluation at the forefront of savanna burning



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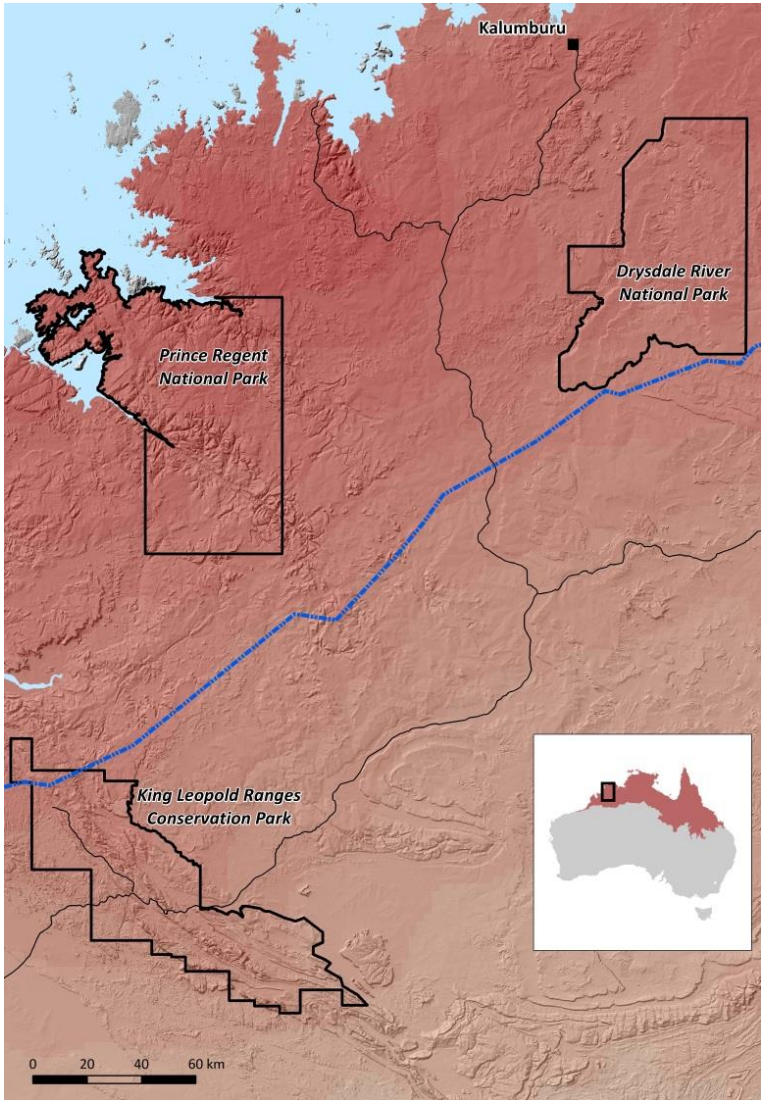
PARKS AND WILDLIFE SERVICE

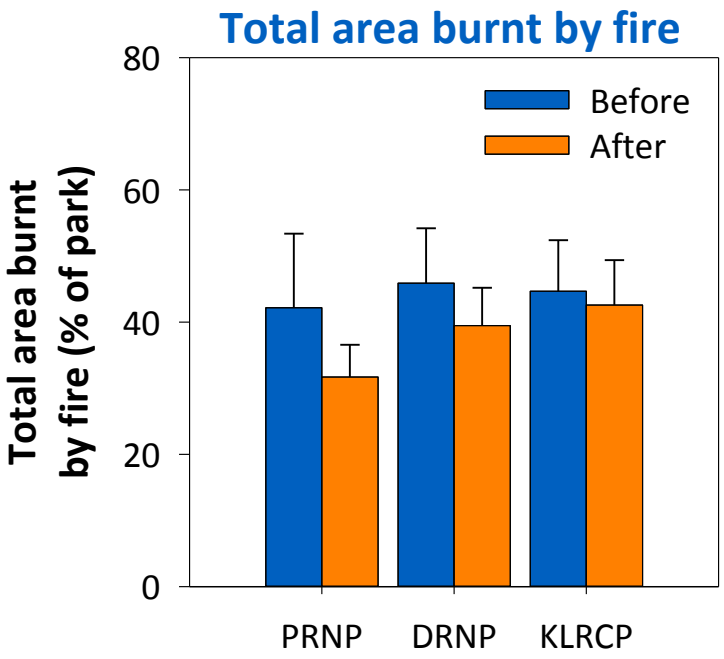
Overview

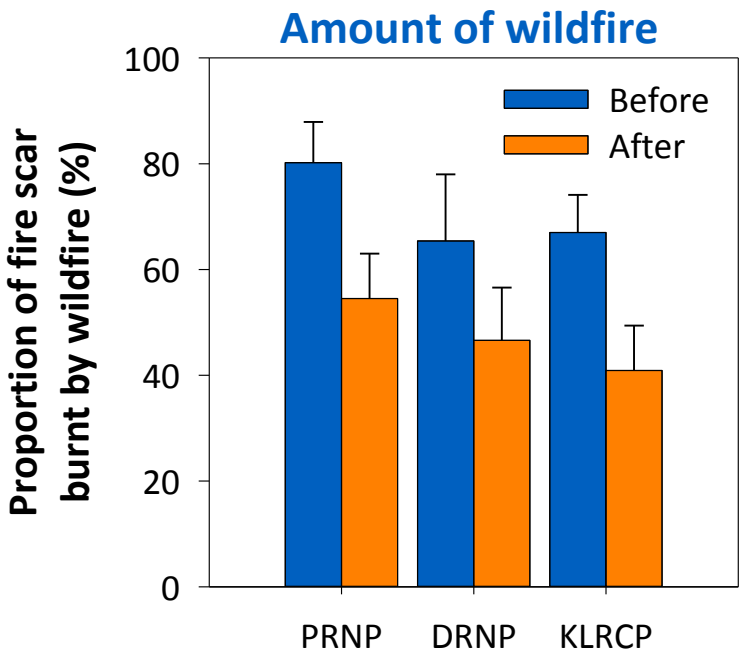
- Fire scar patterns: north west Kimberley national parks

  (2 x carbon projects)
- What is on-ground biodiversity monitoring showing?
- Putting fire scar, mammal and environmental data together
- Lessons learnt (in the context of savanna burning)



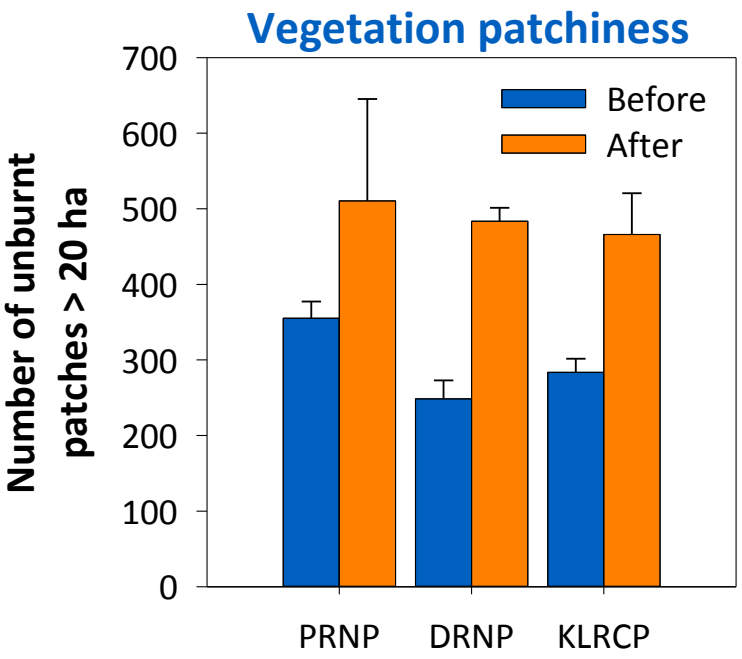
Total and late-dry season fire

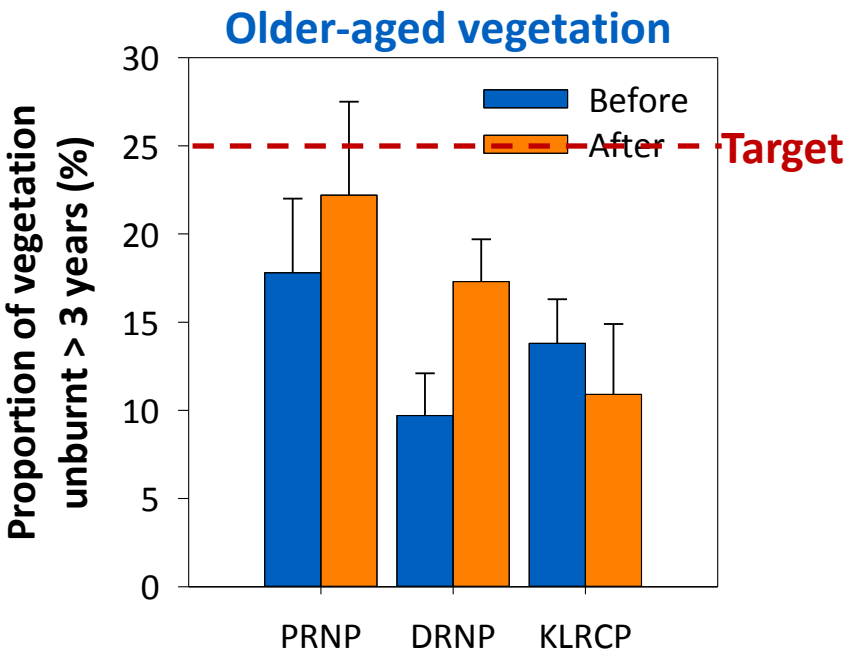




- No significant reductions in total area burnt
- Reduction in LDS fire in PRNP and KLRCP (but not DRNP)
- Rainfall had a significant influence on total fire extent and extent of LDS fire

Patchiness and extent of unburnt vegetation

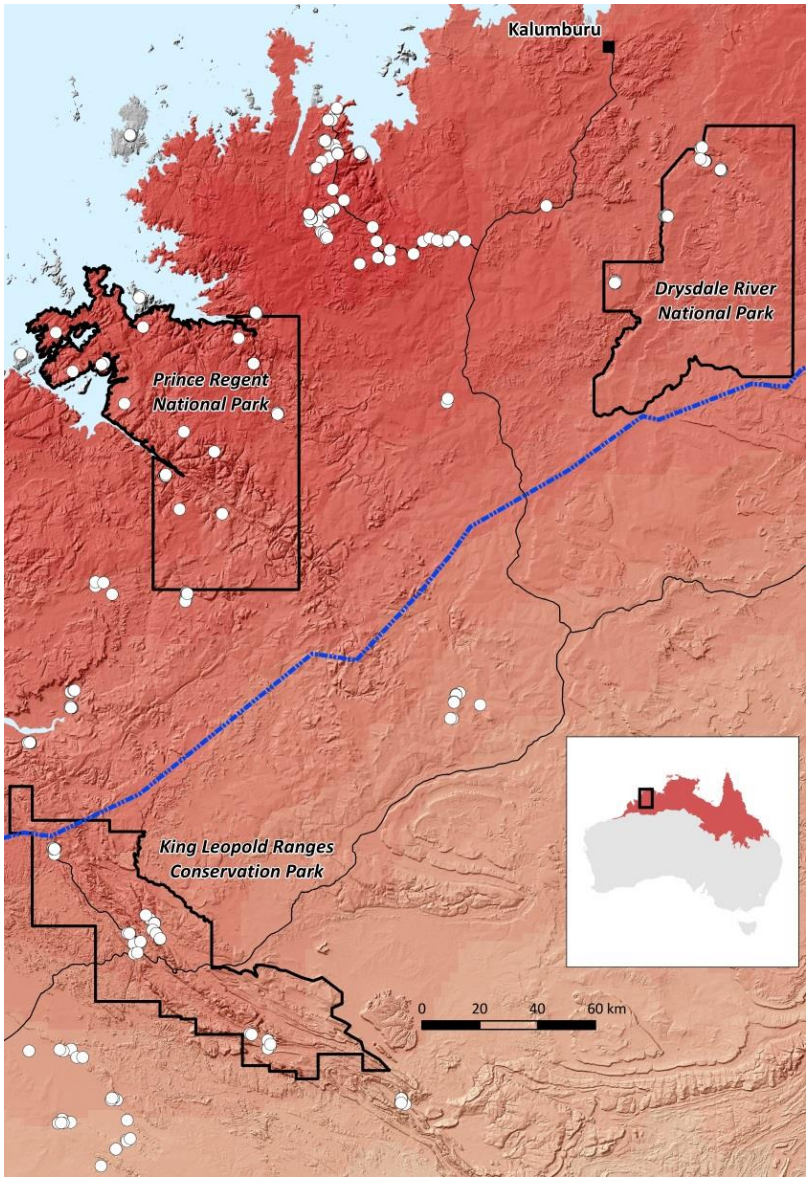




- Big increases in the number of unburnt patches (> 20 ha)
- Patchiness increased with more EDS burning
- Increase in older-aged vegetation in DRNP (decrease in KLRCP); still not enough

On-ground monitoring

- Standard cage and Elliot trap array (24 traps on 0.25 ha plot)
- Remote cameras
- Vegetation and habitat attributes
- Some sites visited annually, others biennially



LDS Fire Frequency

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

Monitoring Site

0 2.5 5 km

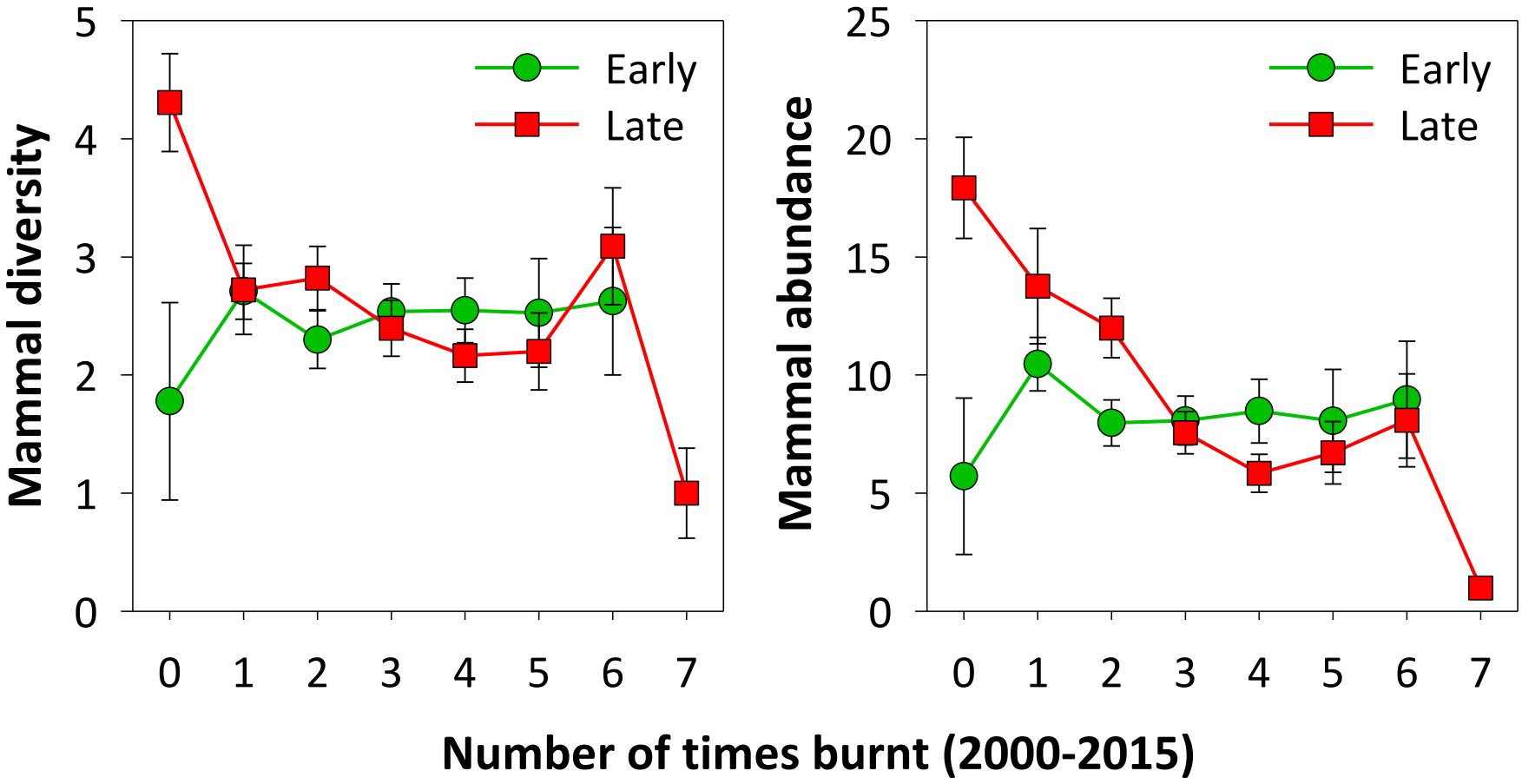
Vegetation age

0
1
2
3
4 +

Monitoring Site

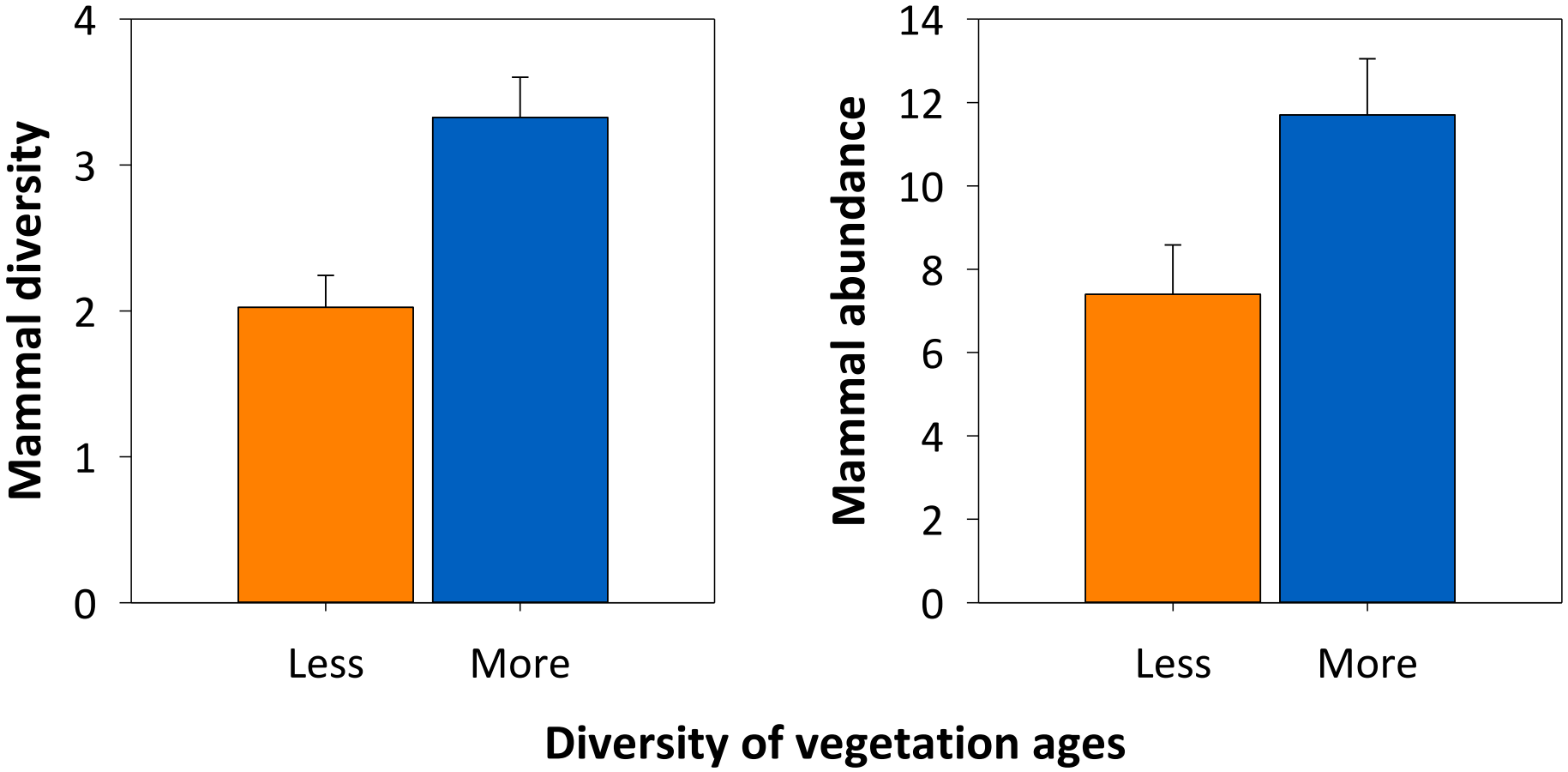
0 2.5 5 km

Small mammals don't like frequent late fires



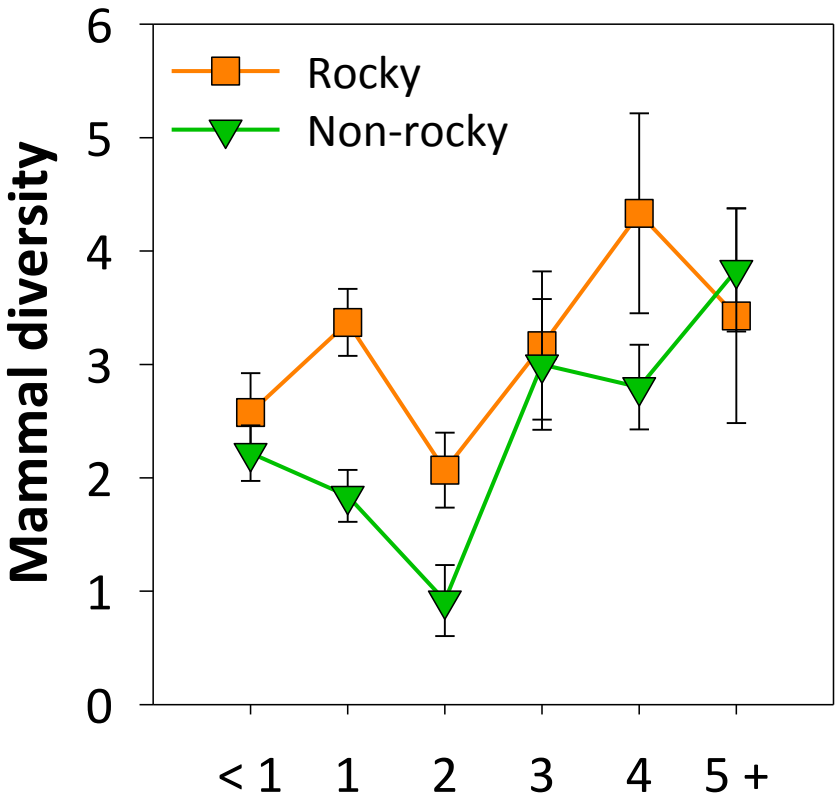
- Sites that frequently burn late have the lowest diversity and abundance
- Sites that never burn late have the highest diversity and abundance

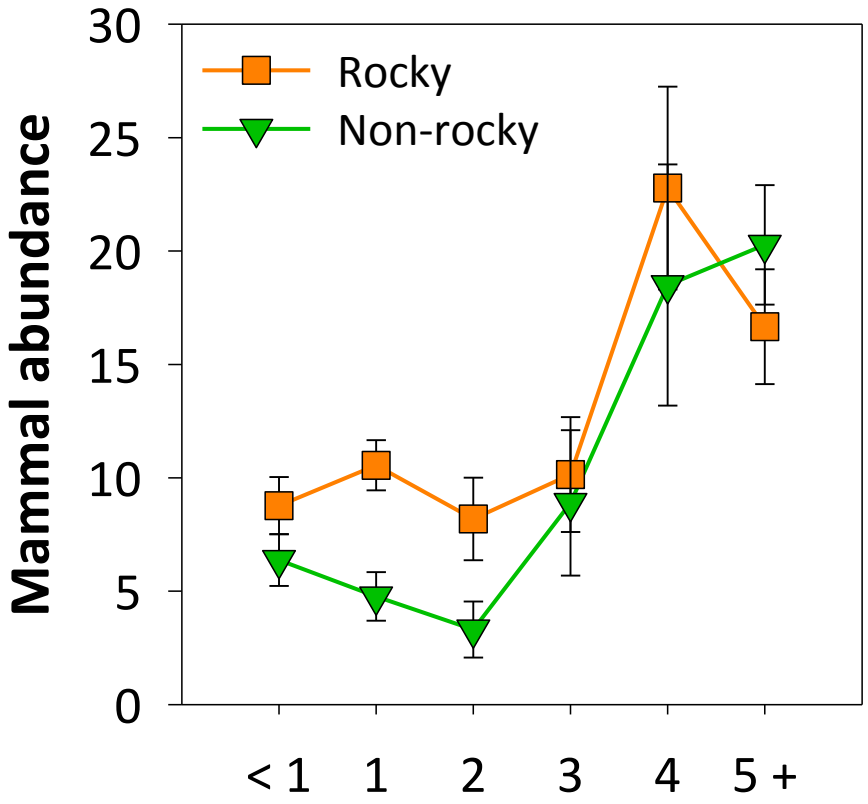
Small mammals like patchy landscapes



- Mammal diversity and abundance is higher at sites that have a higher than average number of vegetation ages (within a 3 km radius)

Small mammals and vegetation age





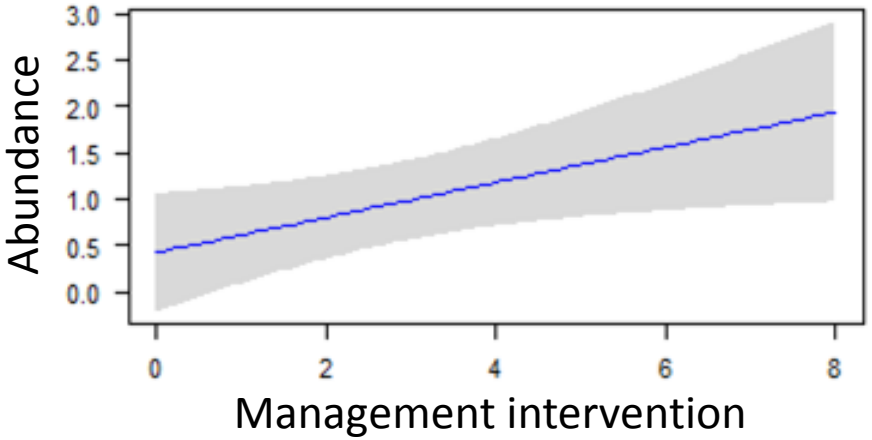
Vegetation age (years since last burnt)

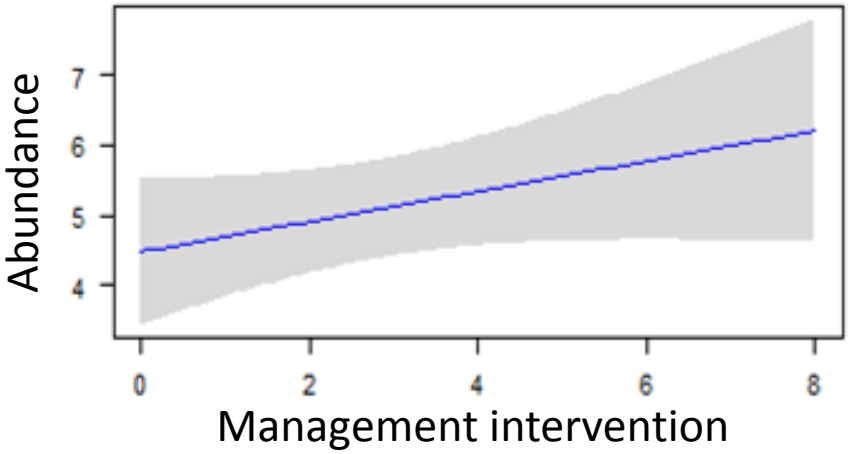
- Mammal diversity and abundance is highest at sites that are unburnt for 3–5 years

So what…

- Reiterating what is already suspected
- Knowing what things do and don't like is one thing
- Making the link between better fire management and on-ground biodiversity improvements has been much harder… (often little 'before' data)
- Intervention models incorporating vegetation, environmental, fire history and mammal data at Mitchell Plateau

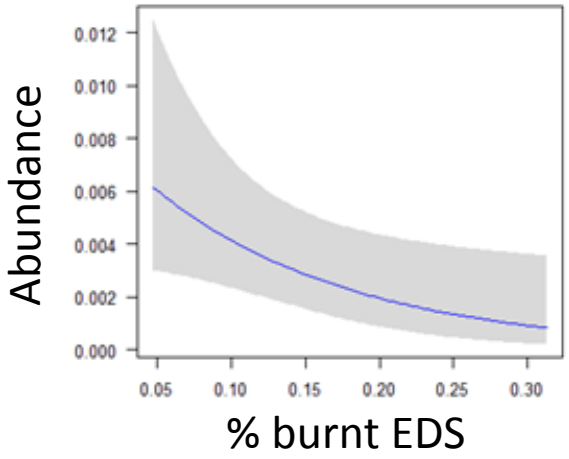
Is early burning good for mammals?

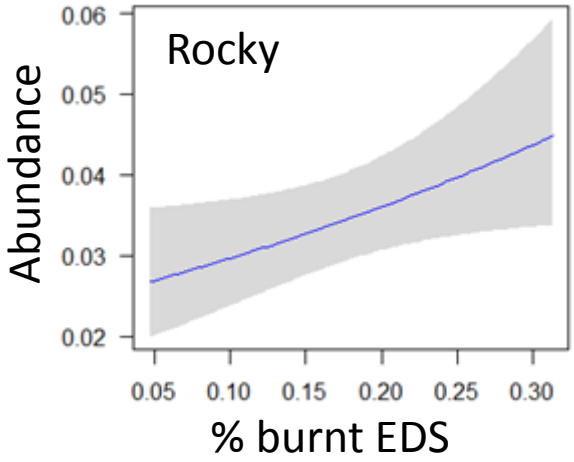


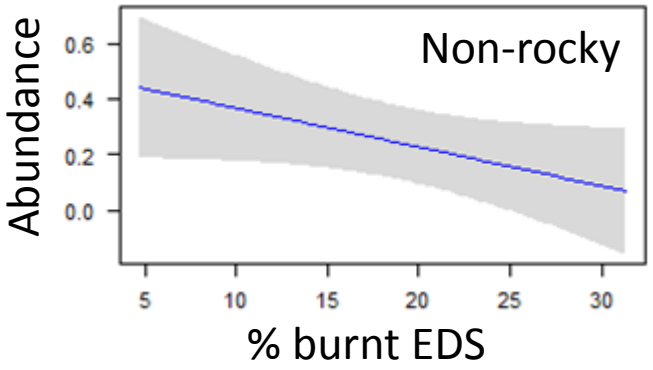


Yes… but…

Not everything responds the same







So… keep fires small, and low intensity to retain different habitat values (shrub cover, hollow logs, tree hollows, perennial grasses)

Lessons

- Older-aged vegetation and small fire sizes important – even EDS fires bad if too big
- Don’t rely solely on fire scars and EDS vs. LDS burning as an indication of good management
- Monitoring *critical* to understanding biodiversity responses to burning, and showing improvements (or otherwise)