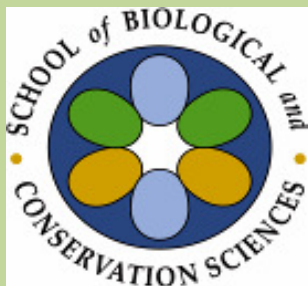


Effects of fire frequency on herbivore distribution and behavior in KNP

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Introduction

- Fire and herbivores strongly shape the savanna grassland ecosystem

Hobbs *et al.* 1991

Liedloff *et al.* 2001

van Langevelde *et al.* 2003

- The effects of fire and herbivory on vegetation are well documented

Johnson & Matchett 2001

Uys *et al.* 2004

- But how fire affects herbivore behavior is less well known

Burns *et al.* 2009

Aims and objectives

- Determine the effect of fire frequency on seasonal herbivore distribution and behavior on selected Experimental-Burn Plots (EBPs) in KNP.
- Investigate the underlying mechanisms driving herbivore distribution and behavior.

Aims and objectives

Potential driving mechanisms:

- Forage quality
- Forage quantity
- Plant species composition
- Plant primary productivity (ANPP)
- Predation risk
- Soil nutrients

Research questions

- What is the distribution of herbivores in various burning treatments during the dry and wet season?
- How do herbivores use the various burning treatments during the different seasons?

Experimental set-up

- EBPs: 7ha each at Satara, Marheya and Nwanetsi.
- Burning treatments – Unburnt (Control), 3yr, 1yr.
- In addition, one new plot (NP) per site was burnt adjacent to existing long term plots.

Methods & materials

- Dung counts
Once a month



- Herbivore day and night vehicle surveys



Methods & materials

- Behavioral observations

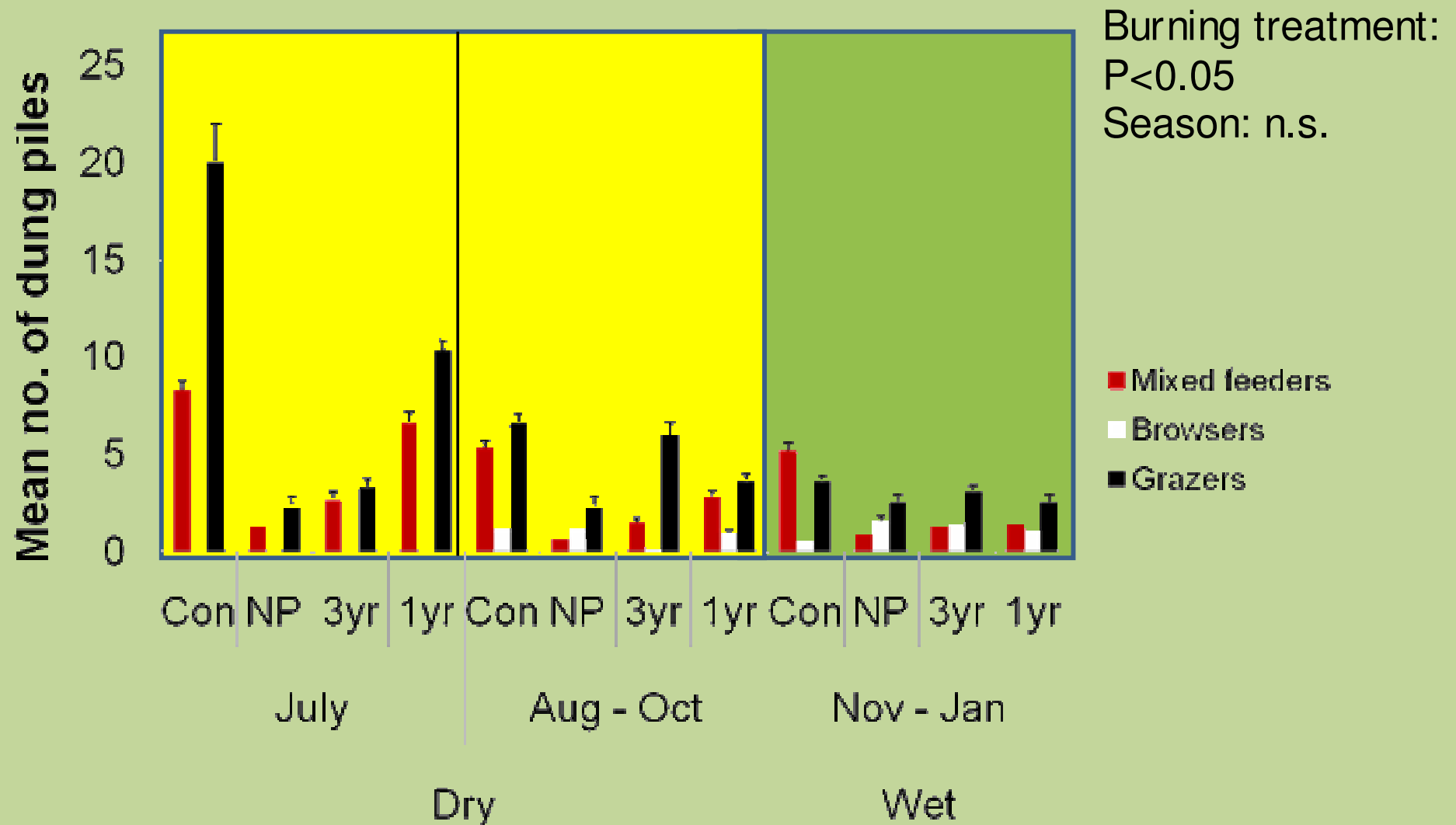
For 15 min, every 15 sec one individual's behavior was recorded.



- Plant biomass

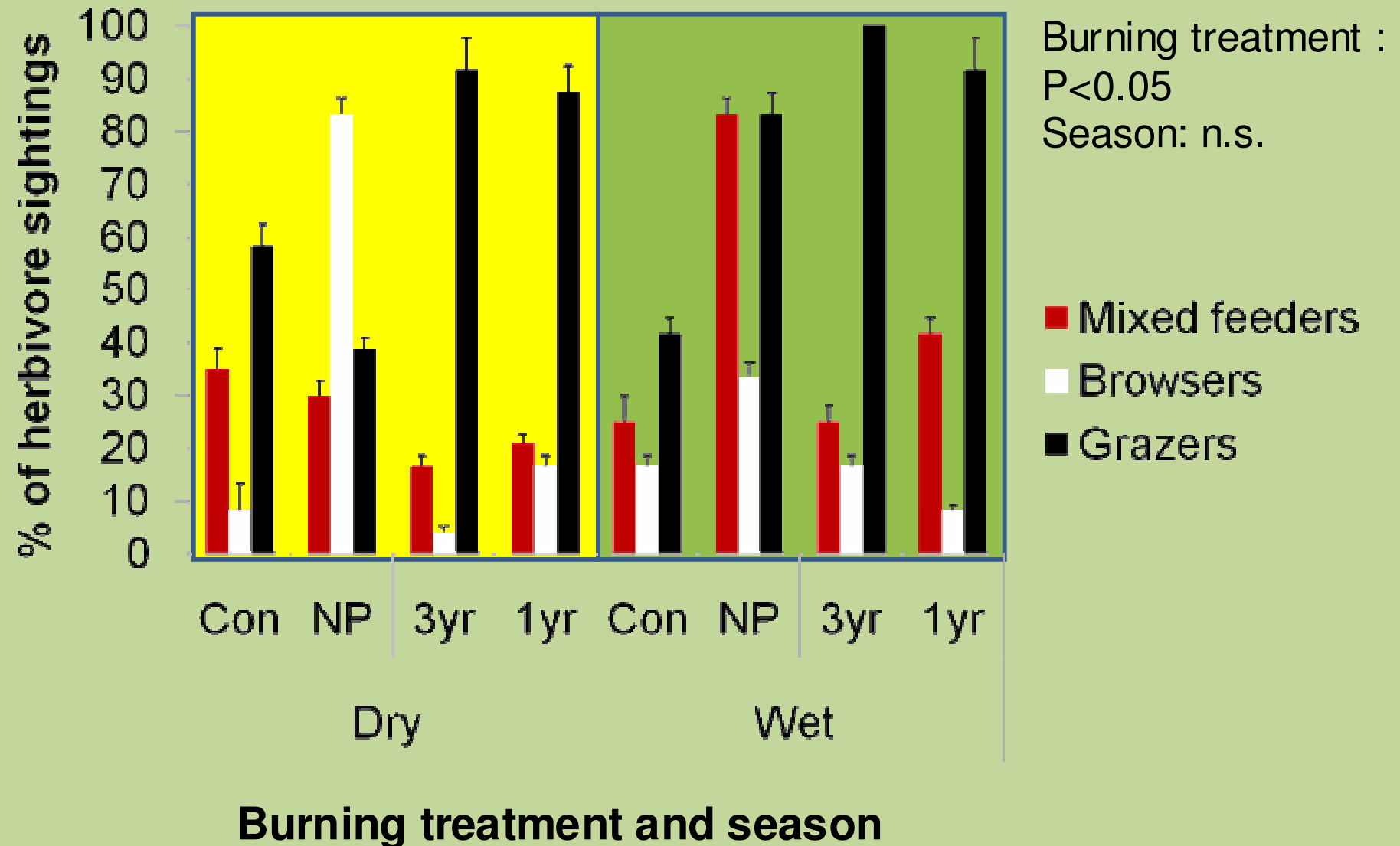
Disc pasture meter – 200 readings per plot.

Herbivore dung counts

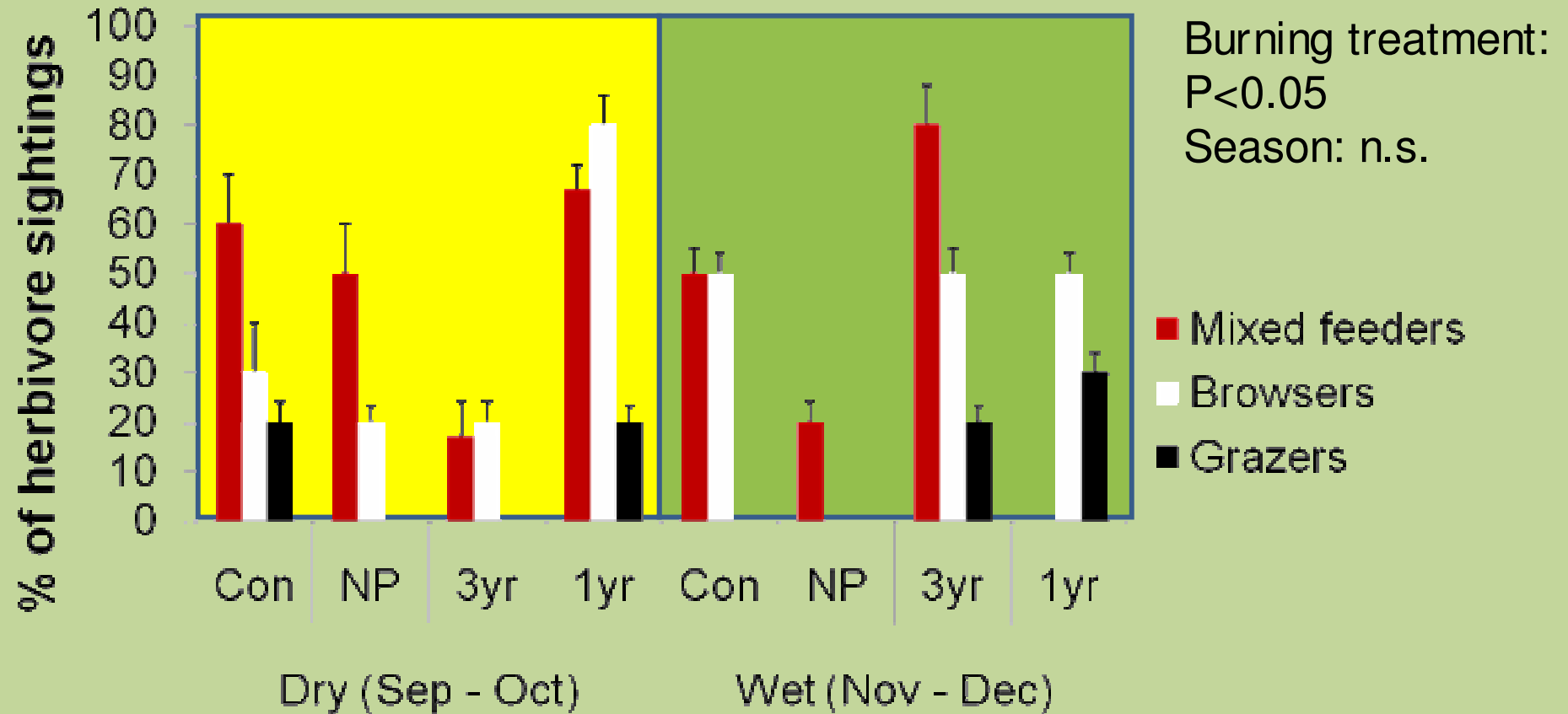


Burning treatment & season

Herbivore day surveys



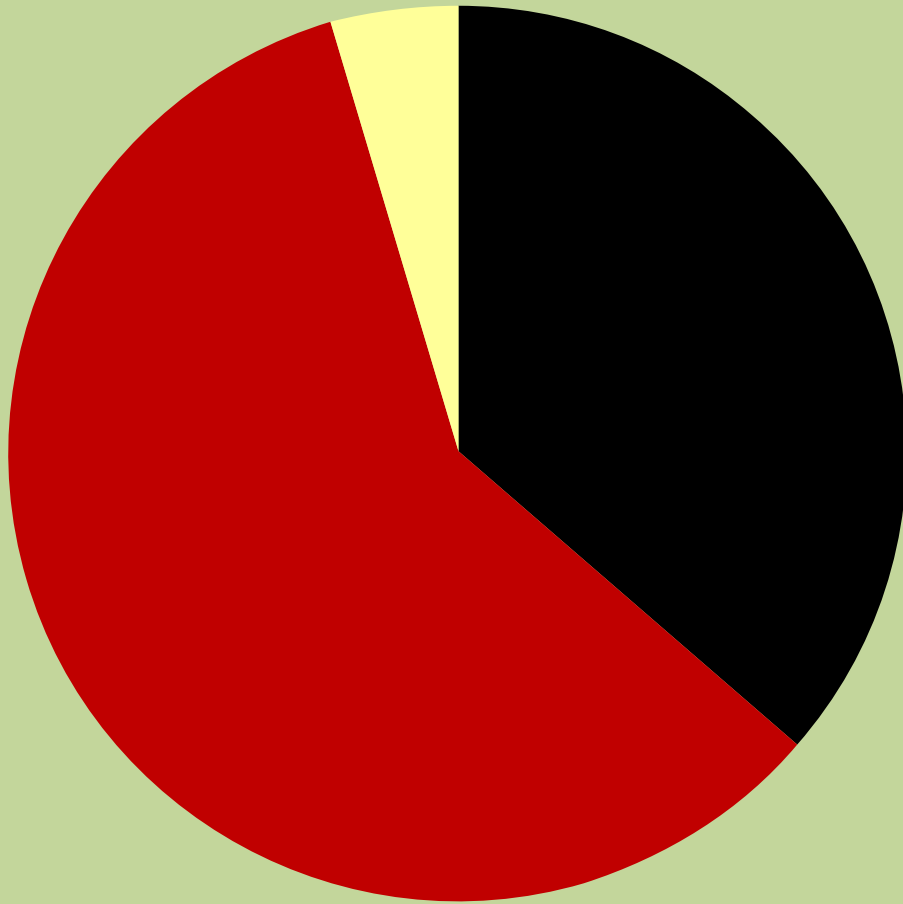
Herbivore night surveys



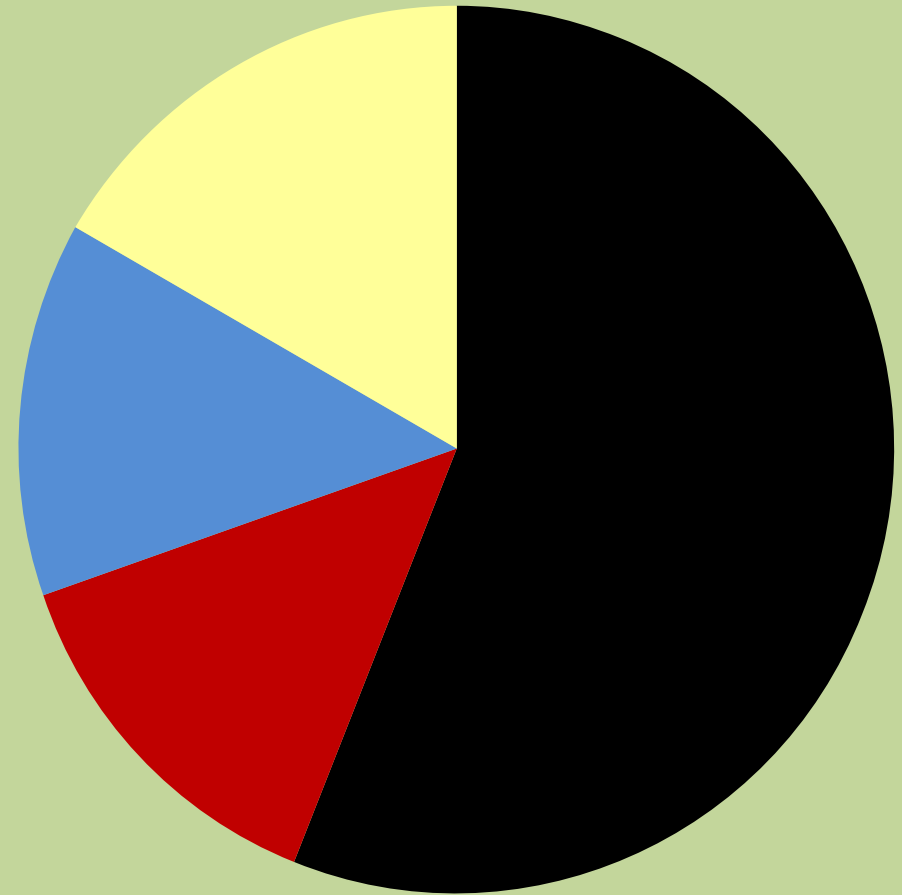
Burning treatment and season

Impala behavior in 3-year burning treatment

Dry season

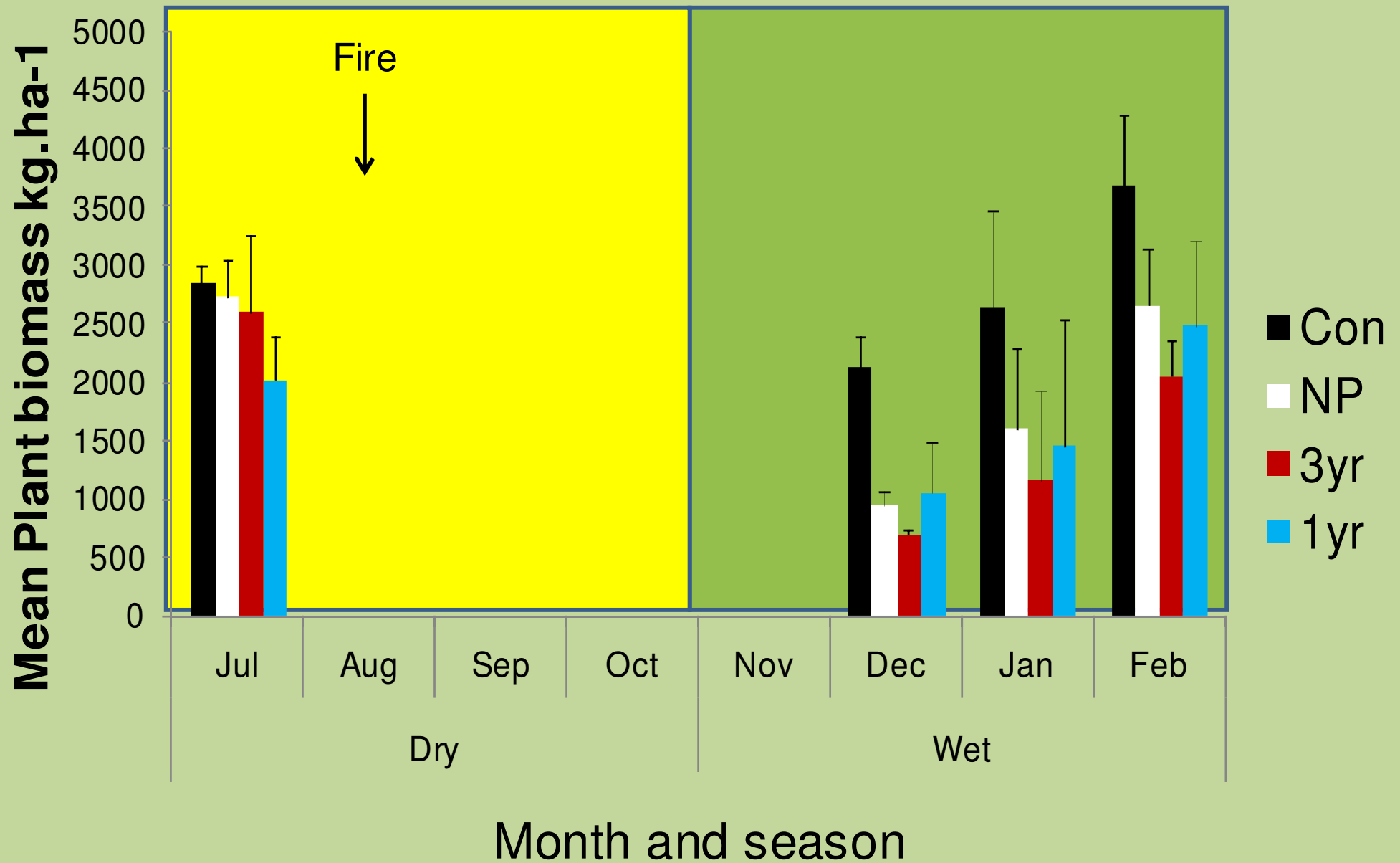


Wet season



■ Moving ■ Feeding ■ Vigilance ■ Standing

Plant biomass



Conclusions

- Distribution of herbivores mostly affected by burning treatment.
- Grazers generally observed during the day, while browsers and mixed-feeders typically observed at night.
- Herbivore behavior is affected primarily by season.

Management implications

- Fire regimes can differentially affect herbivore distribution and behavior, even at relatively small scales (e.g. 7ha).
- This suggests that experiments at the scale of the EBPs can provide useful management information.

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