

# Long-term demographic study reveals role of **elephants**, and limited impact of **drought**, in regulating **tree** abundances in semi-arid **savannas** in South Africa

SAVANNA SCIENCE NETWORKING MEETING  
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Dr Tony Swemmer

Patrick Ndhlovu, Mightyman Mashele, Peace Nkuna, Oupa Mbokoda, Rion Lerm

# ↓ Tall trees



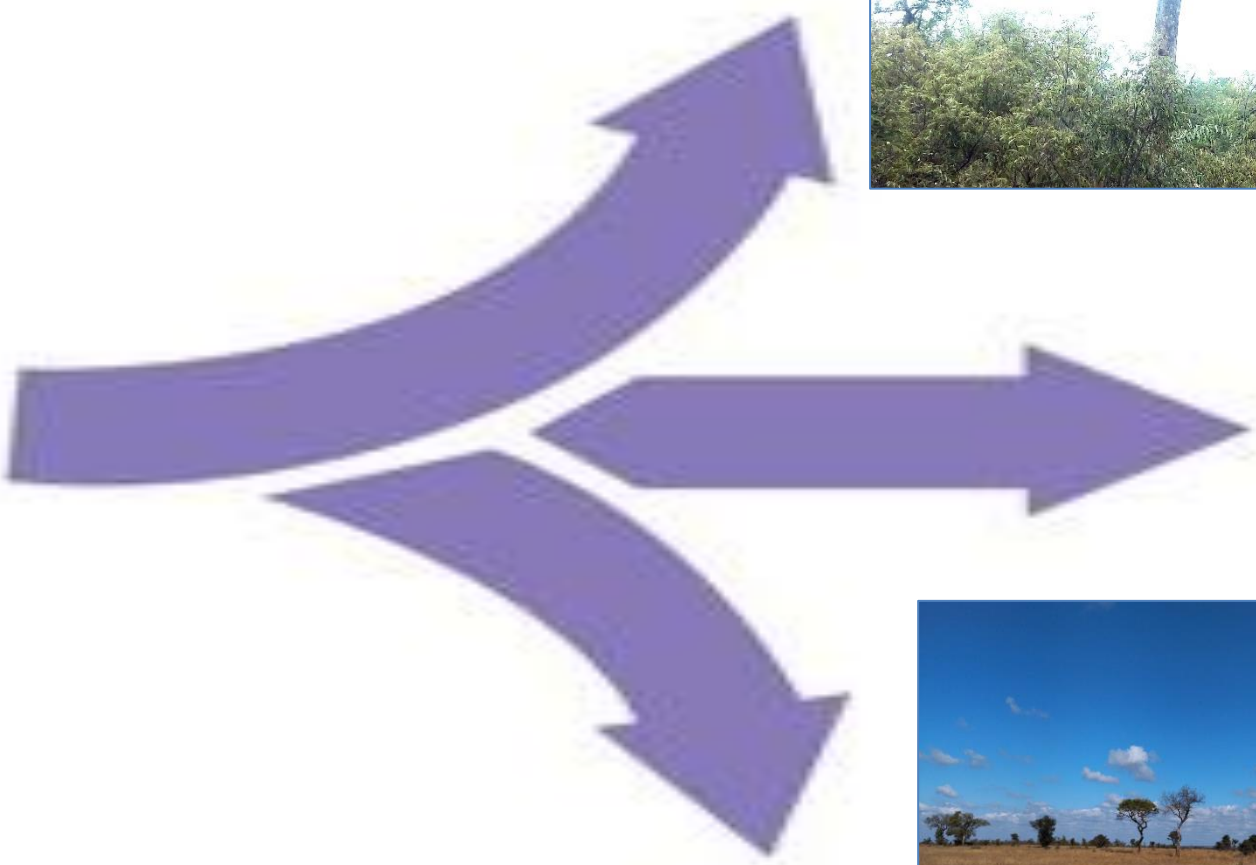
# Bush encroachment

↓ Tall trees



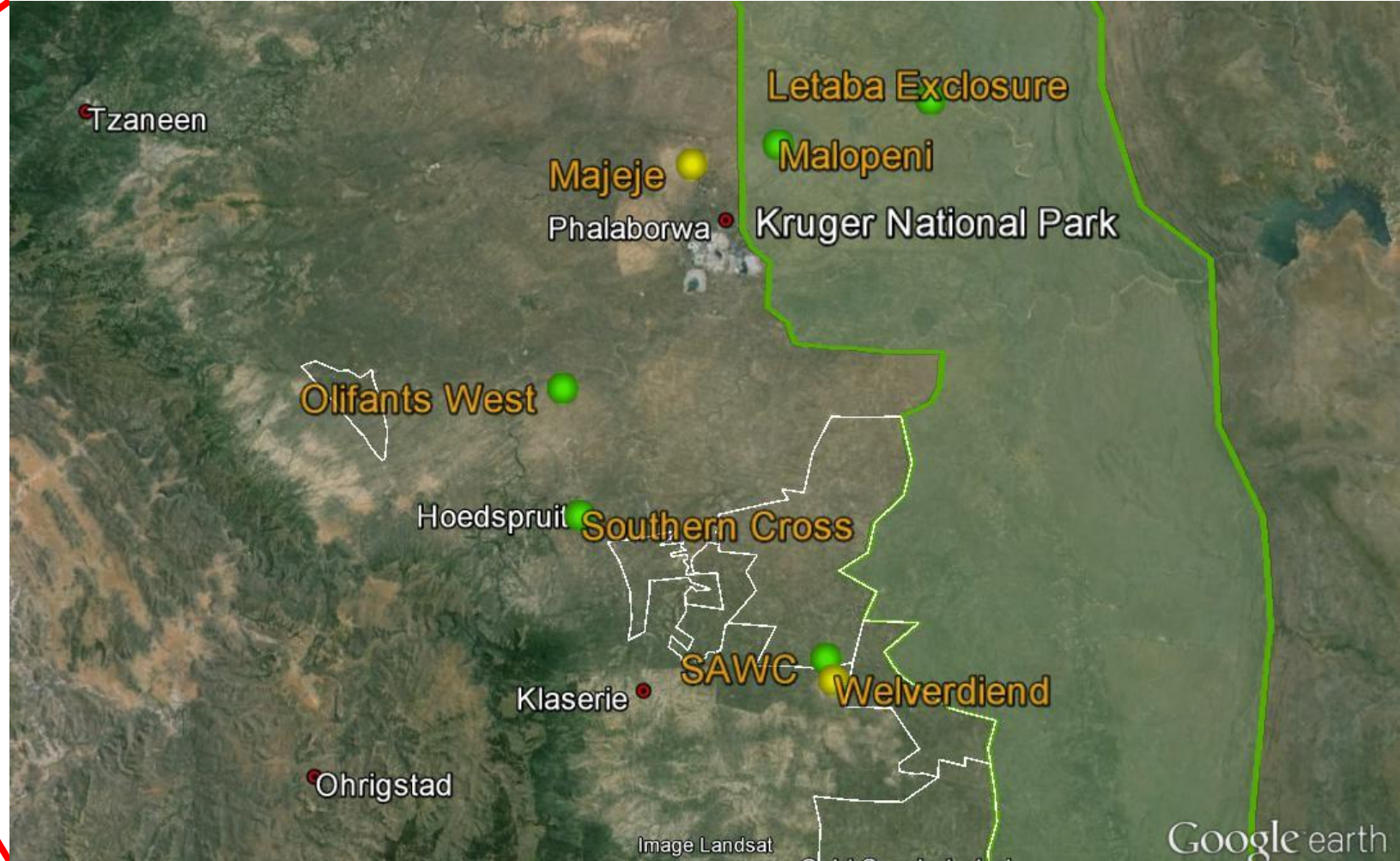
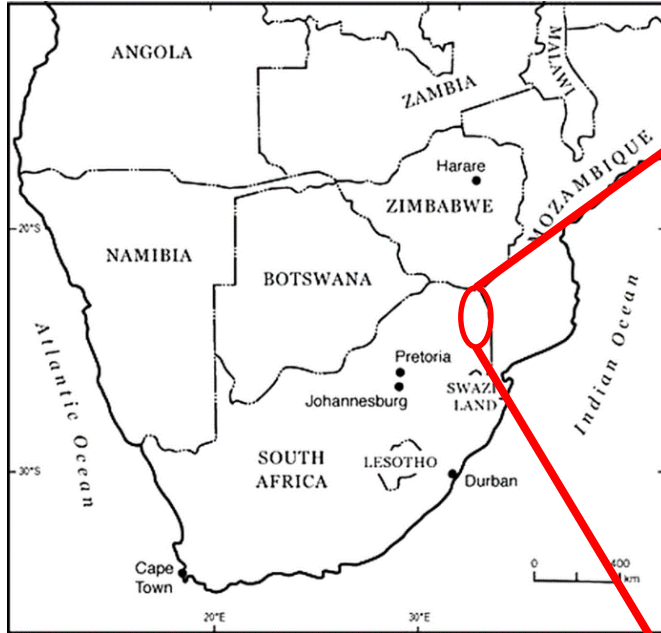






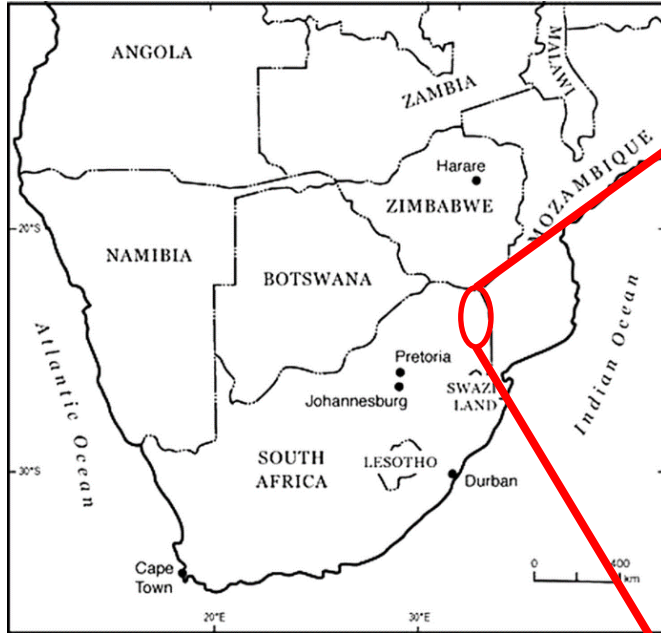


# Sites





# Sites



# Methods

## Permanent plots

- 5m radius, or 20m x 20m
- **Tagged trees** > 30cm tall
- Additional large trees (5-10m)

## Measurements

- Annual
- Damage & mortality
- Subset measured annually
  - HEIGHT
  - STEM DIAMETER
- Count individuals < 30cm tall & seedlings
- Grass layer (biomass)



# Methods

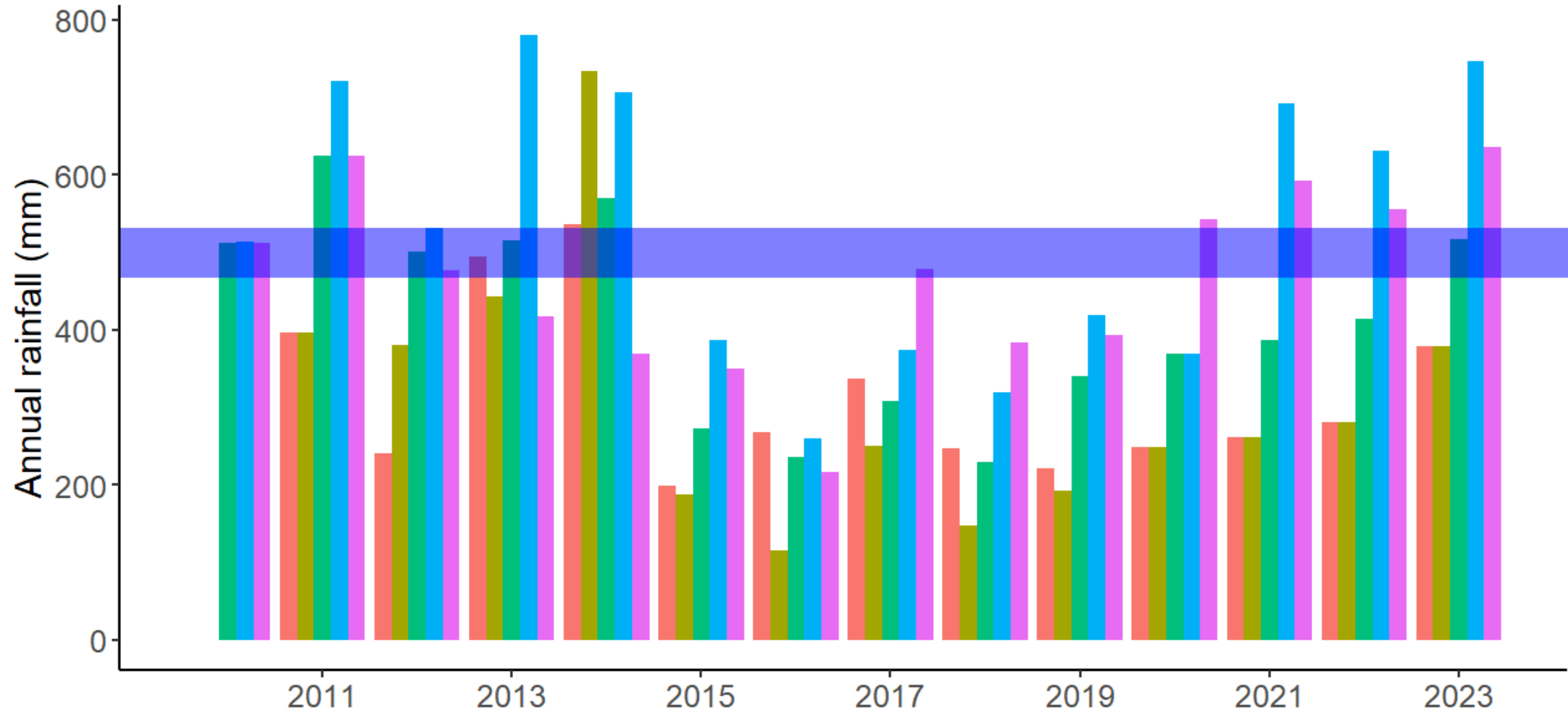


# Aims

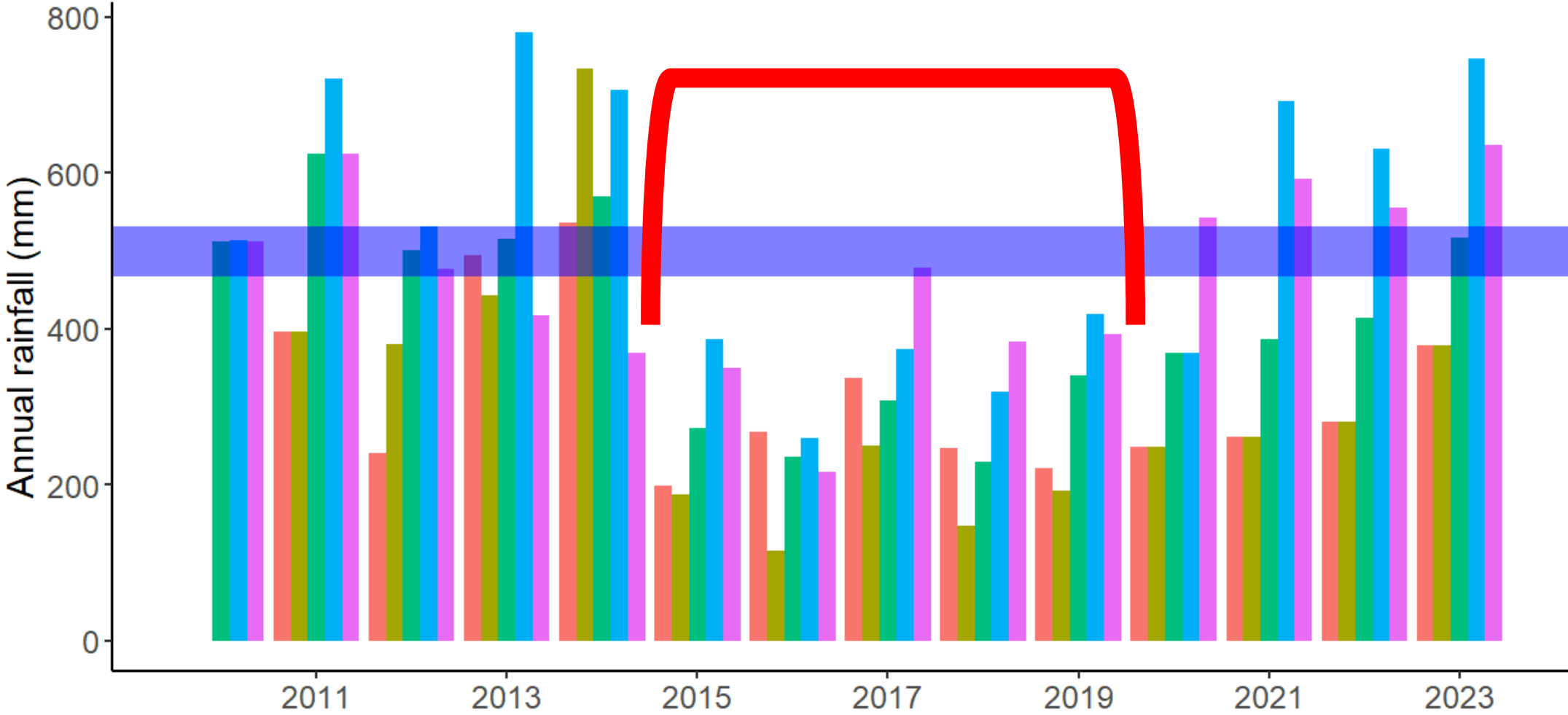
In savanna ecosystems with **infrequent or no fire**,

- Can tall tree species recruit?
- What is the impact of elephants on short trees & shrubs?
- Is there an interactive elephant x drought effect?

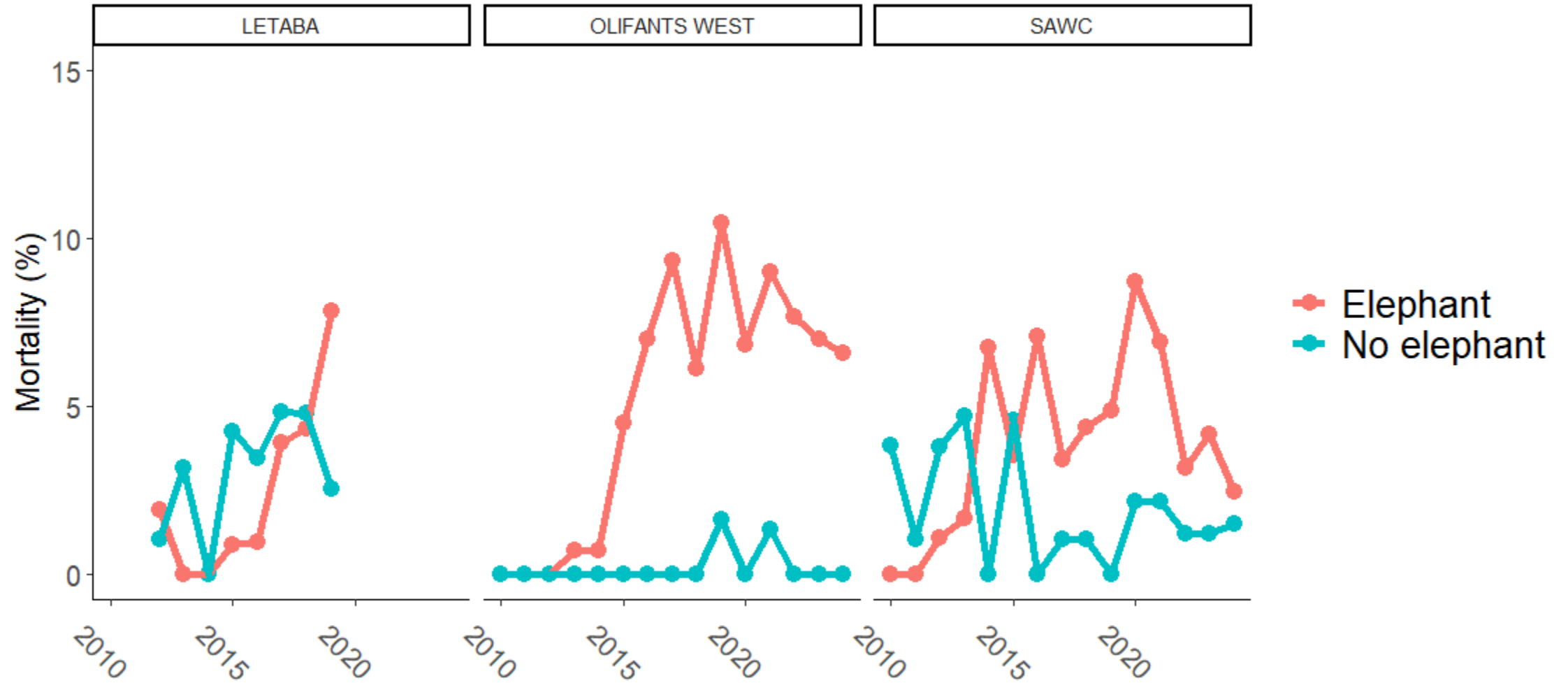
# Precipitation



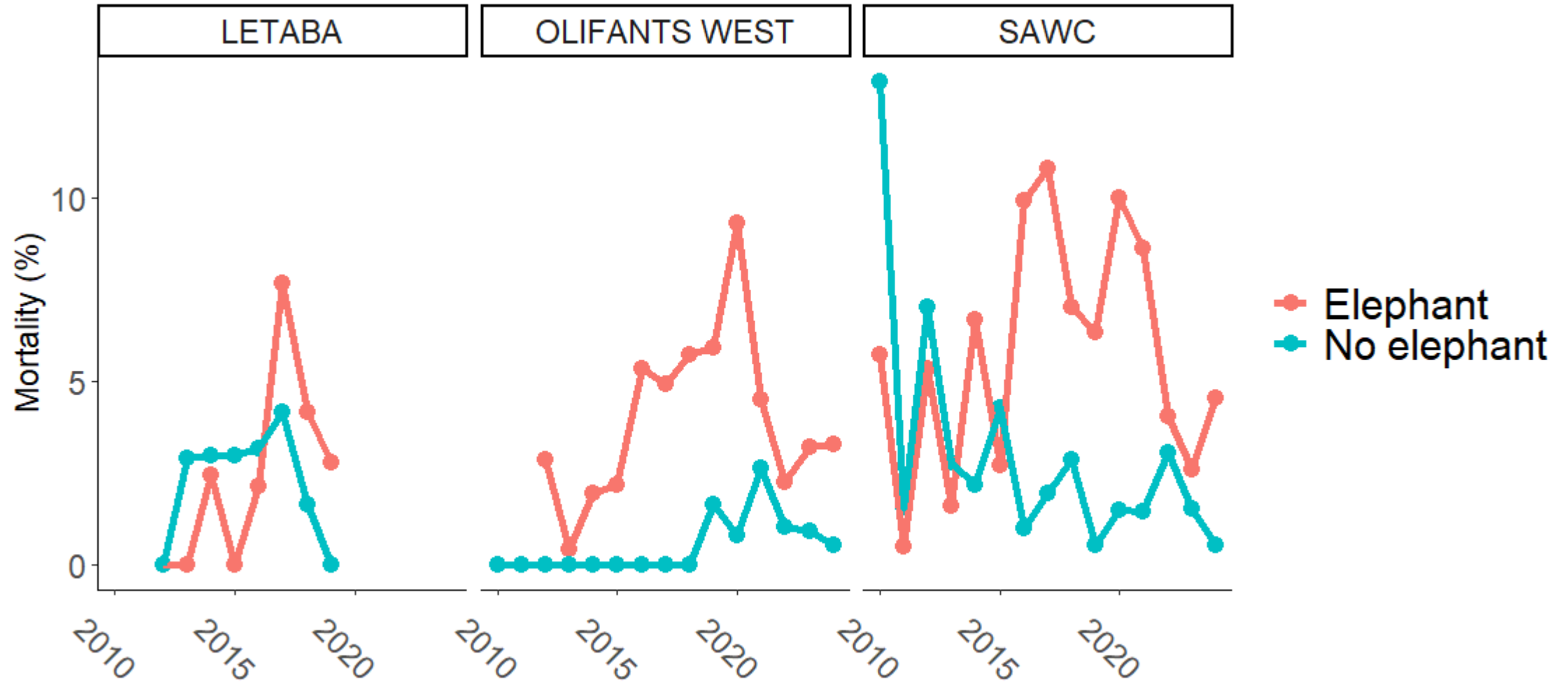
# Precipitation



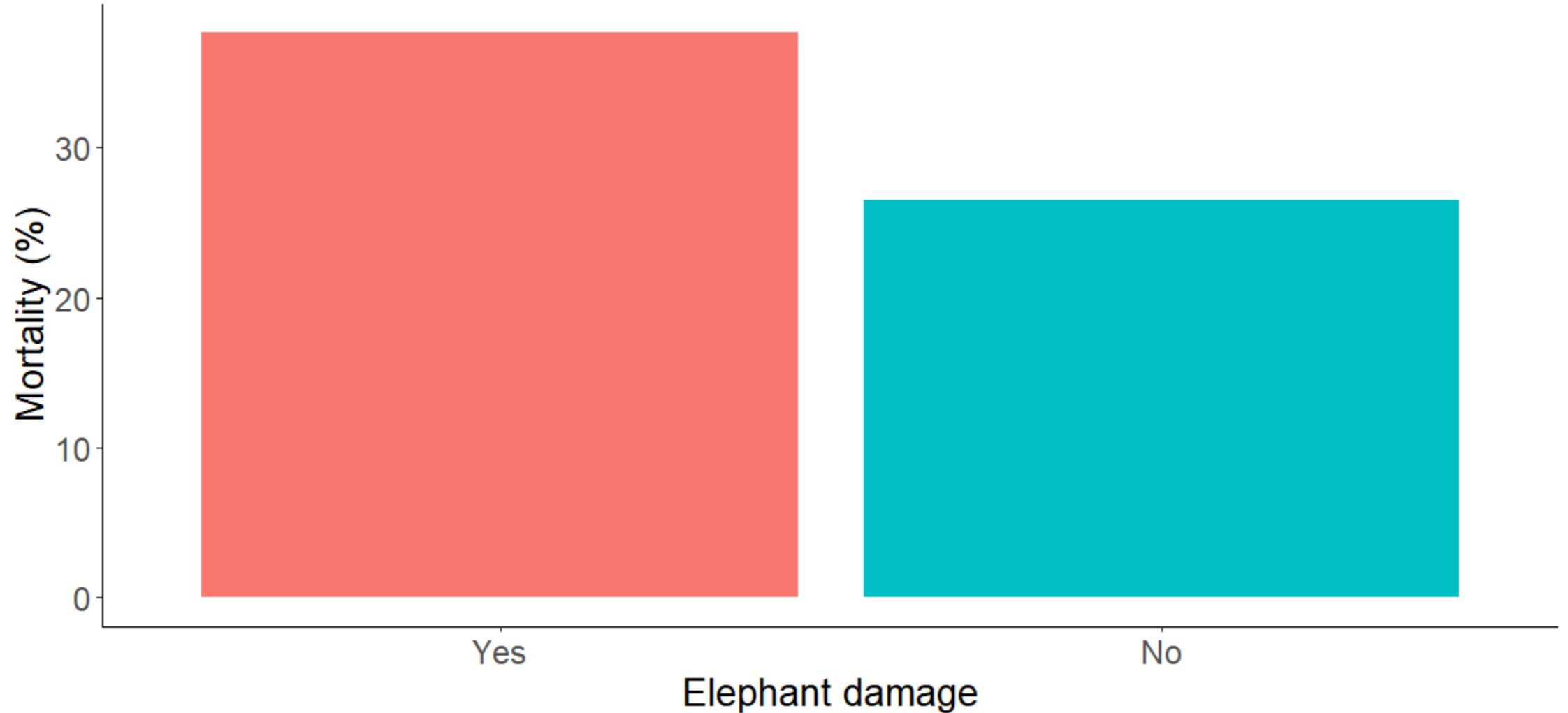
# Mortality (tree species)



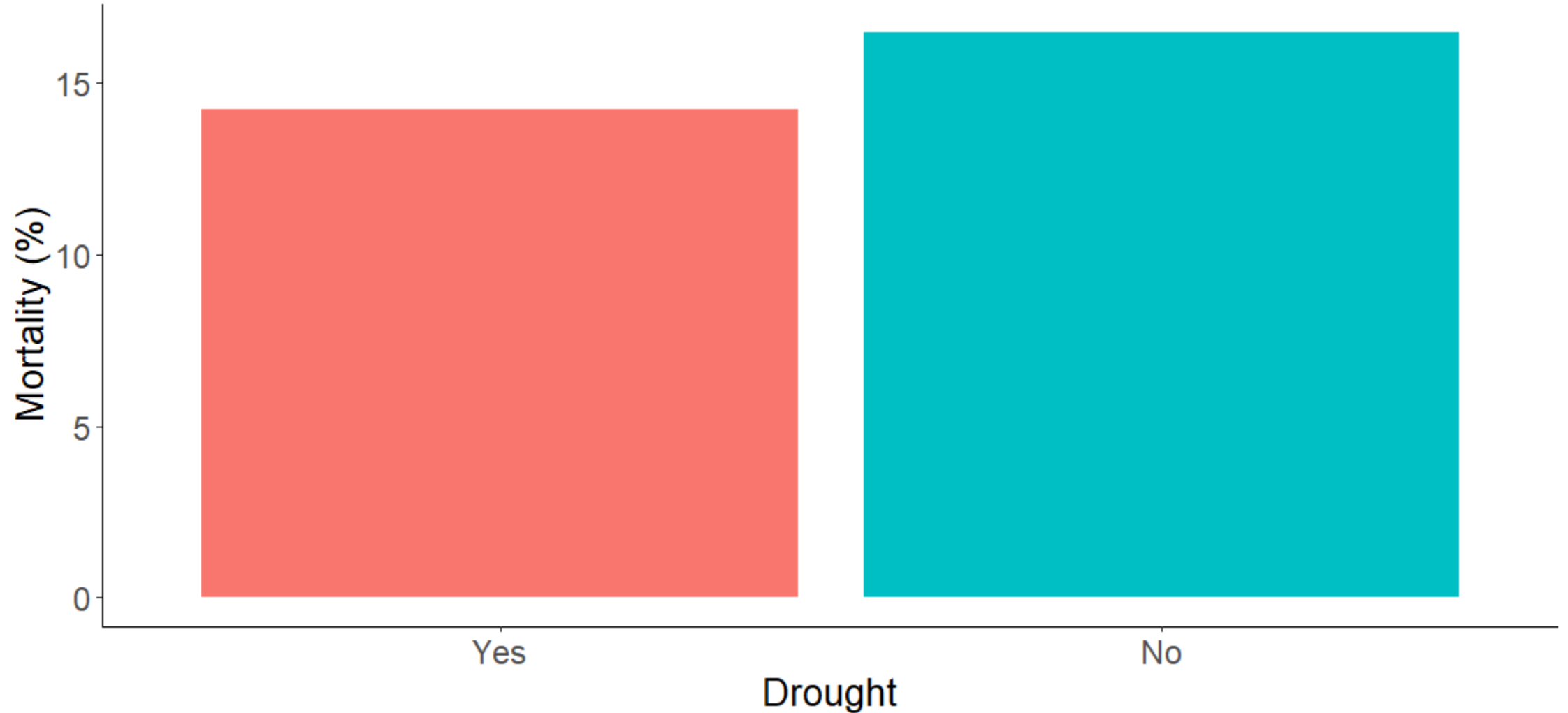
# Mortality (shrub species)



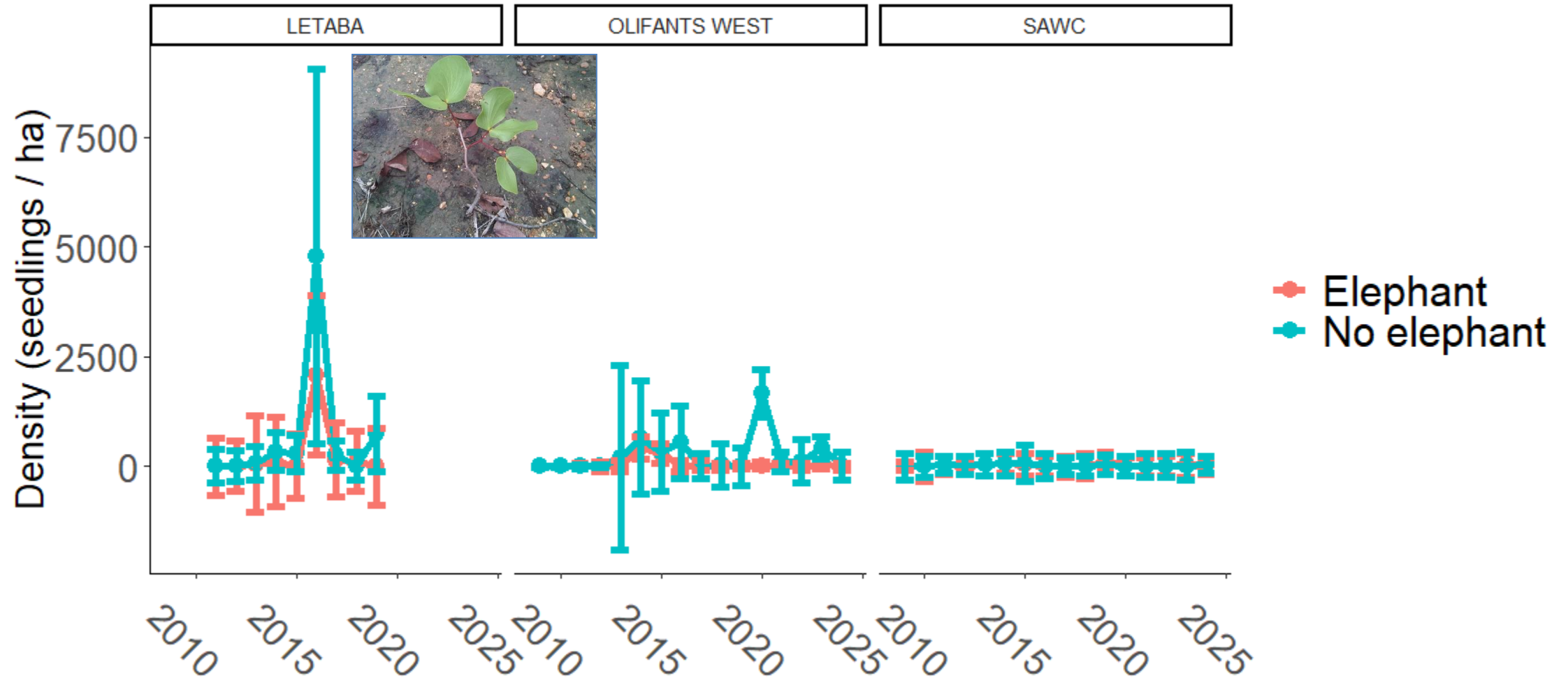
# Mortality (all species)



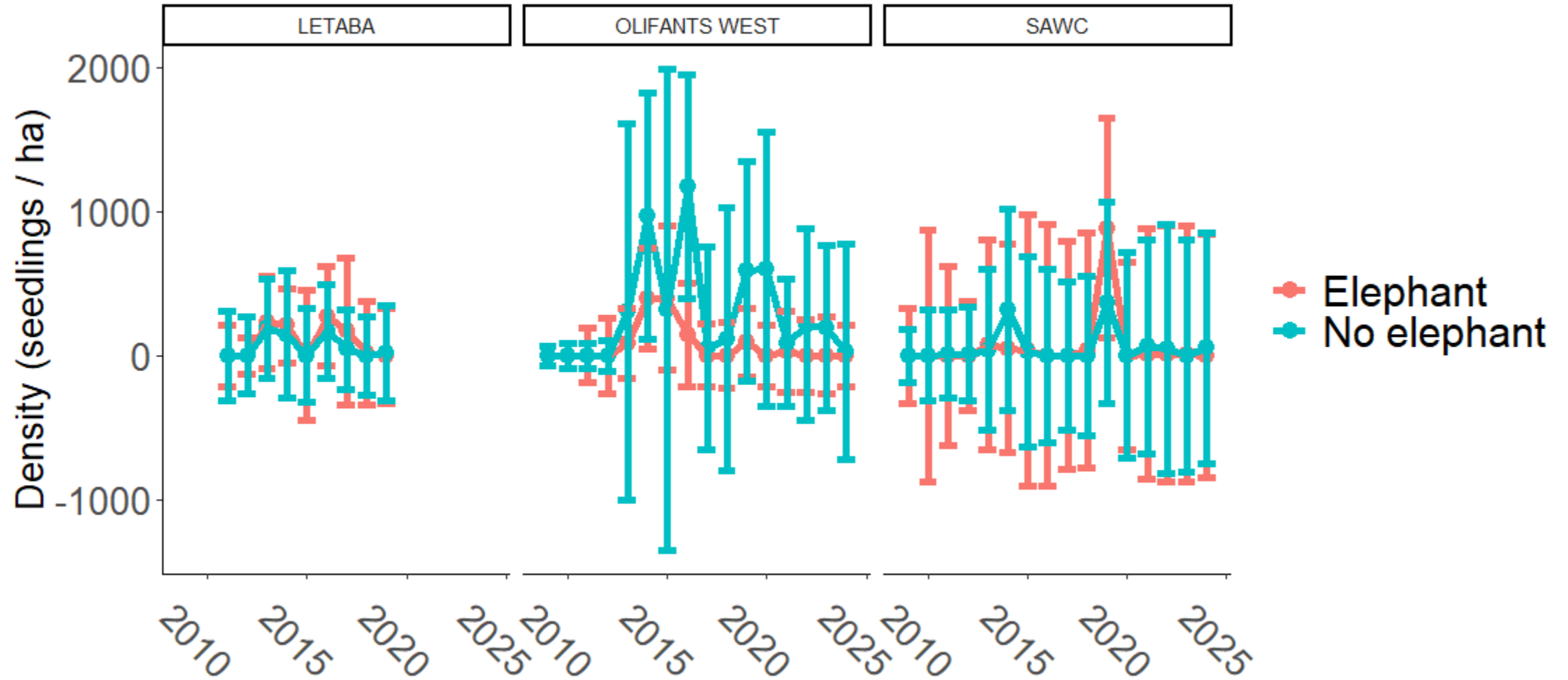
# Mortality (all species)



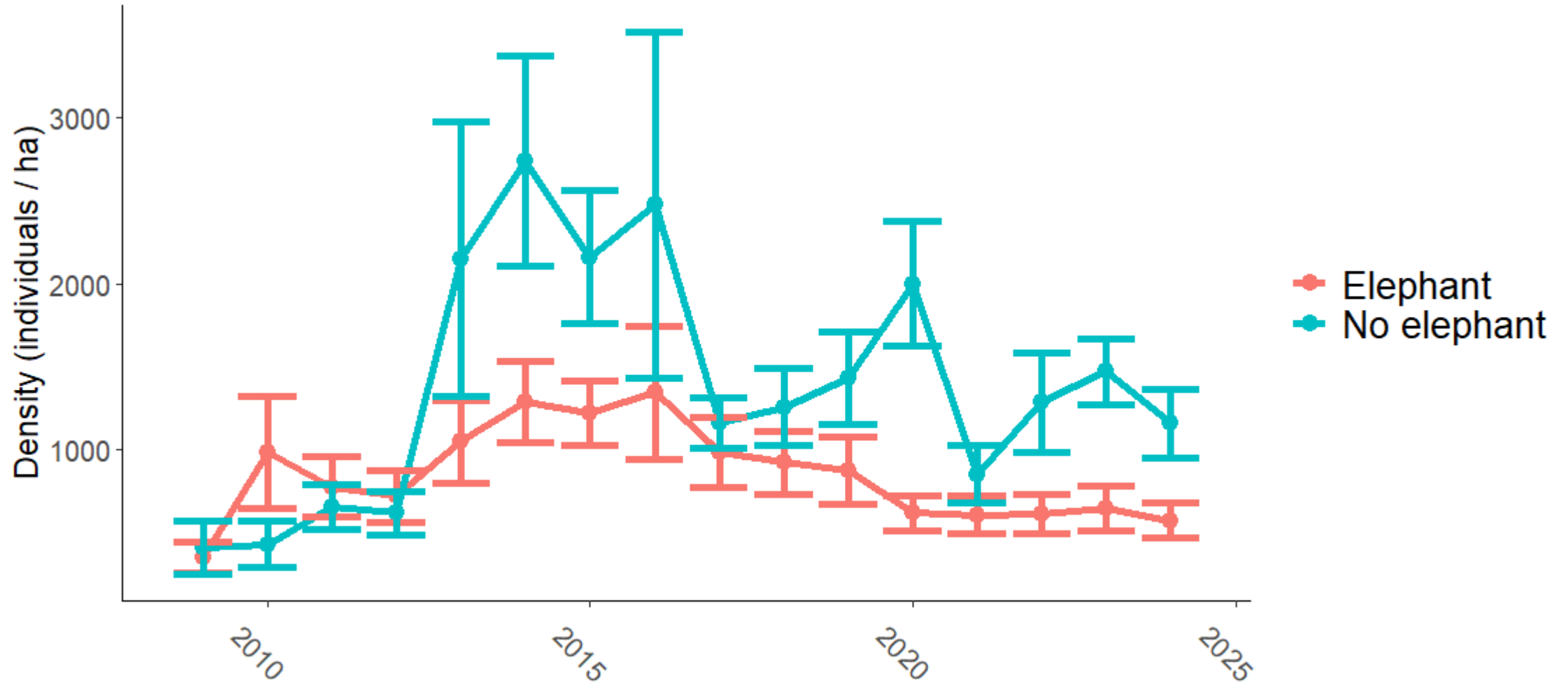
# Recruitment (tree species)



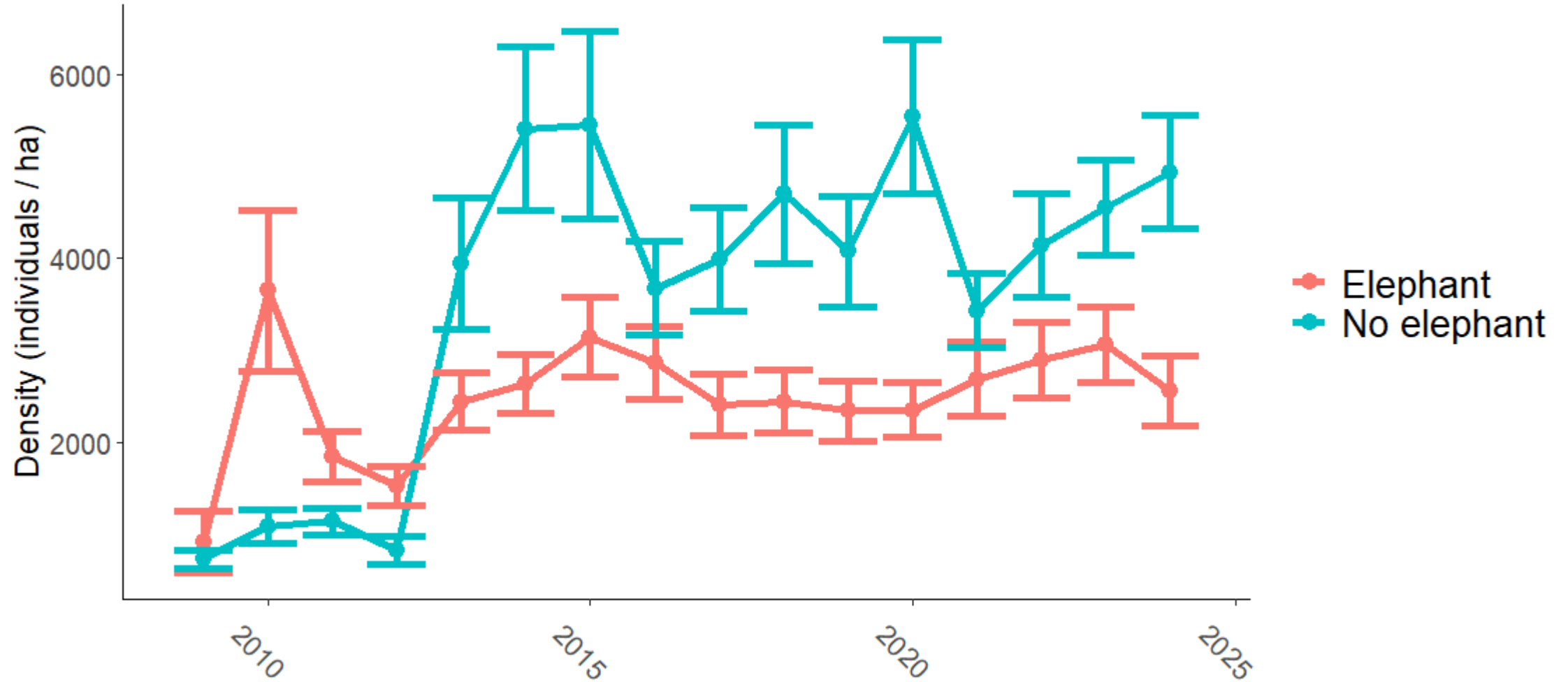
# Recruitment (shrub species)



# Density (tree species)



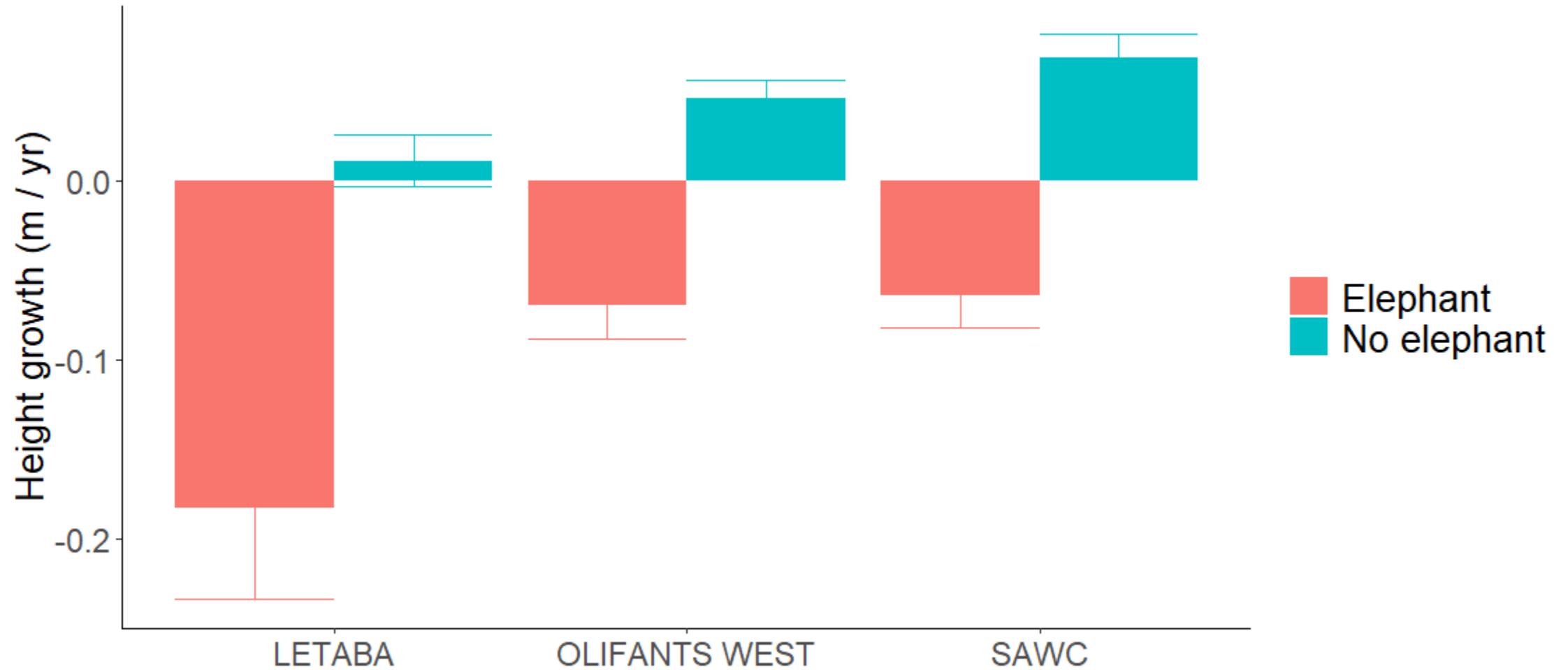
# Density (shrub species)



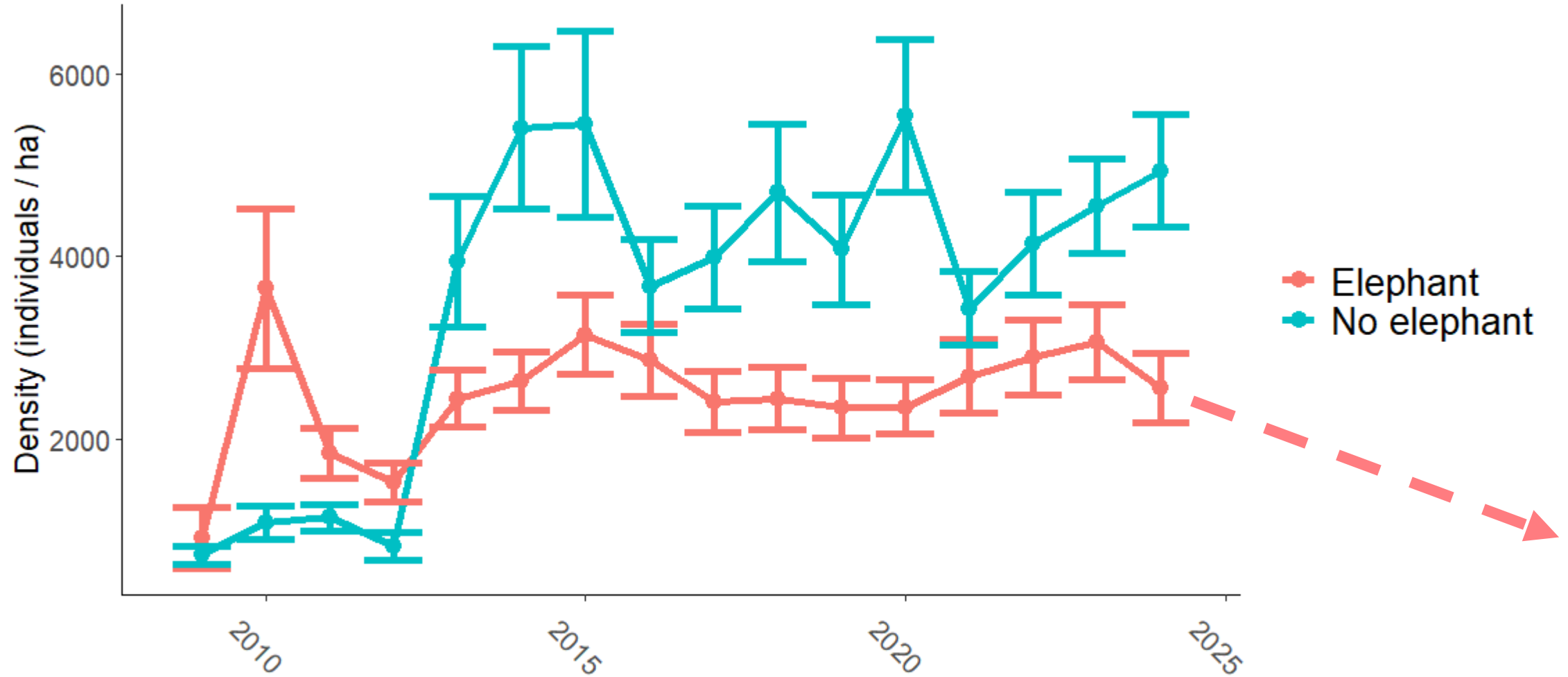
# Growth (tree species)



# Growth (shrub species)



# Density (shrub species)



# Conclusions

Elephants reducing tall trees, regulating shrubs

- very open system for KNP in a few decades
- no elephants = bush encroachment)

Drought impacts < elephants

# Acknowledgements

SANParks

Transfrontier Africa  
(Olifants West Private Nature Reserve)

Southern Cross Schools

South African Wildlife College

