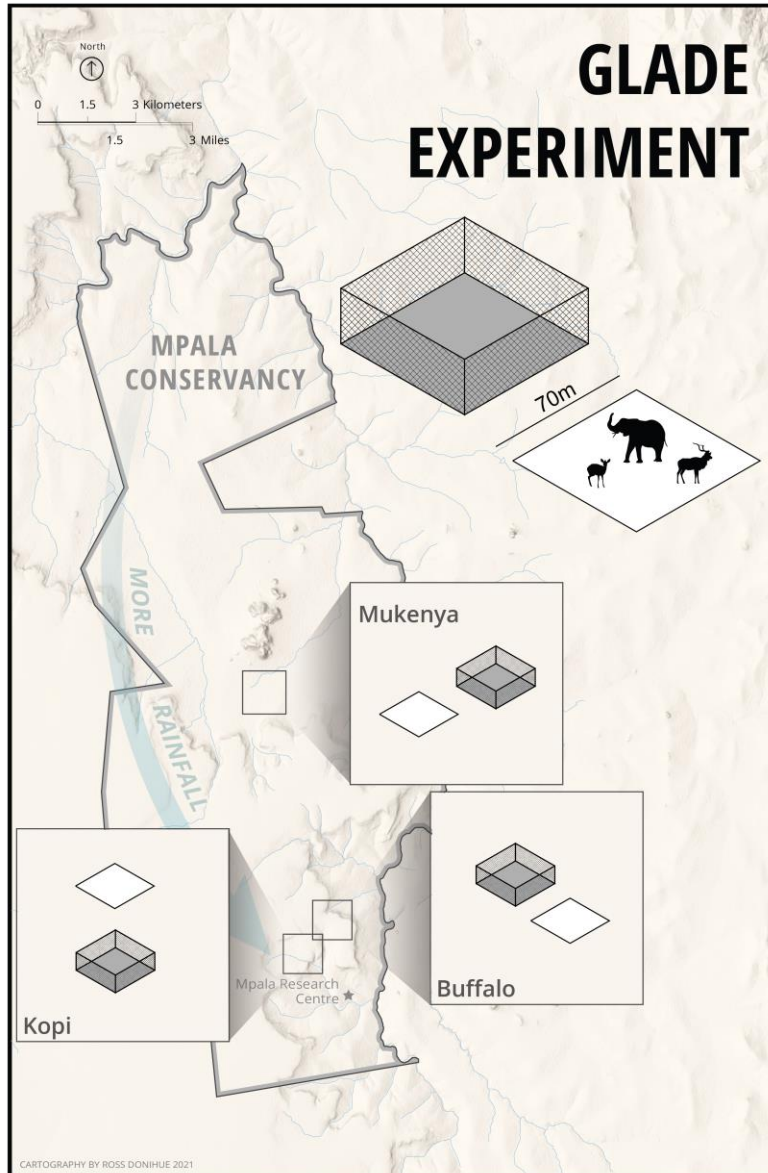




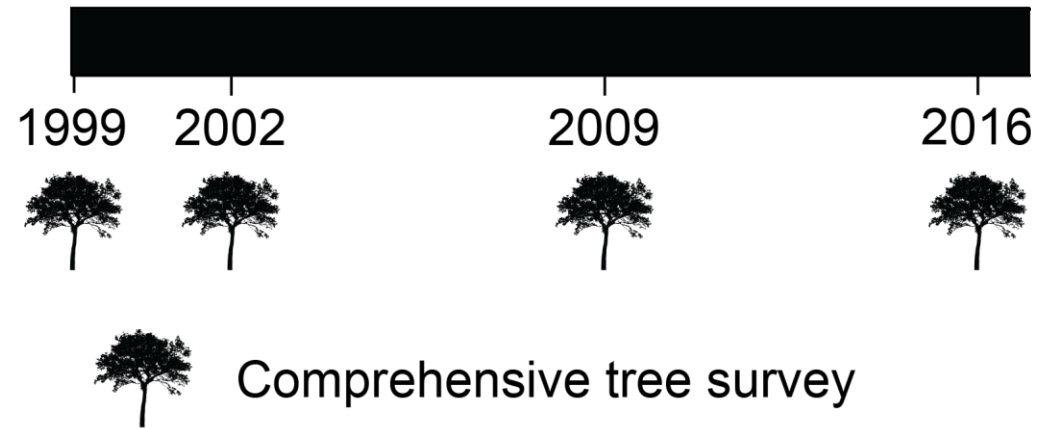
# Tree responses to megaherbivore reintroduction following two decades of experimental exclusion

Tyler Coverdale, Mahesh Sankaran,  
Andrew Davies, & David Augustine

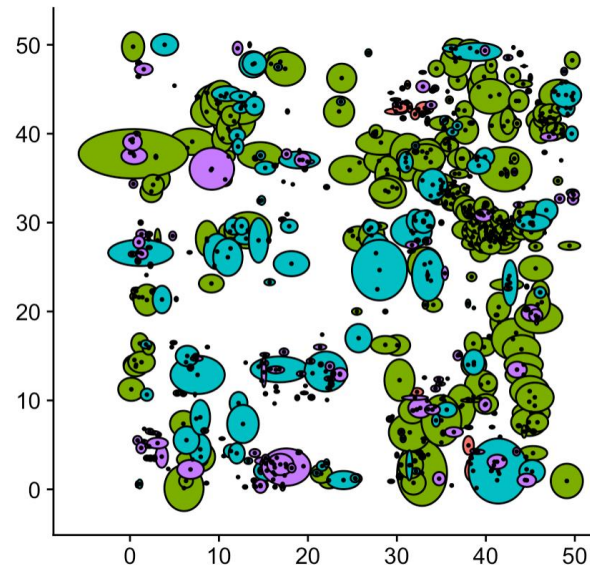
# Simulating defaunation with herbivore exclosure



Exclusion (17 years)

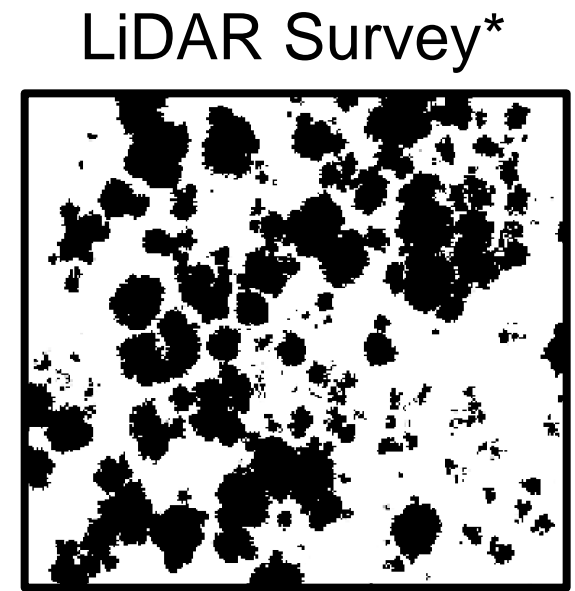
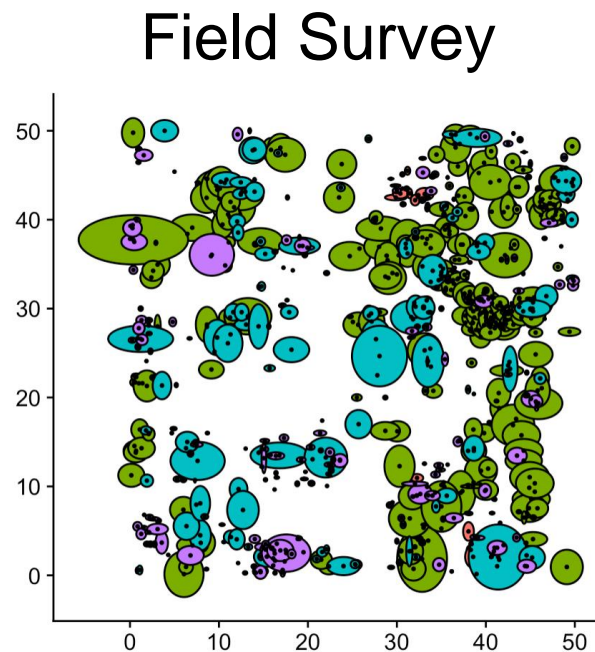
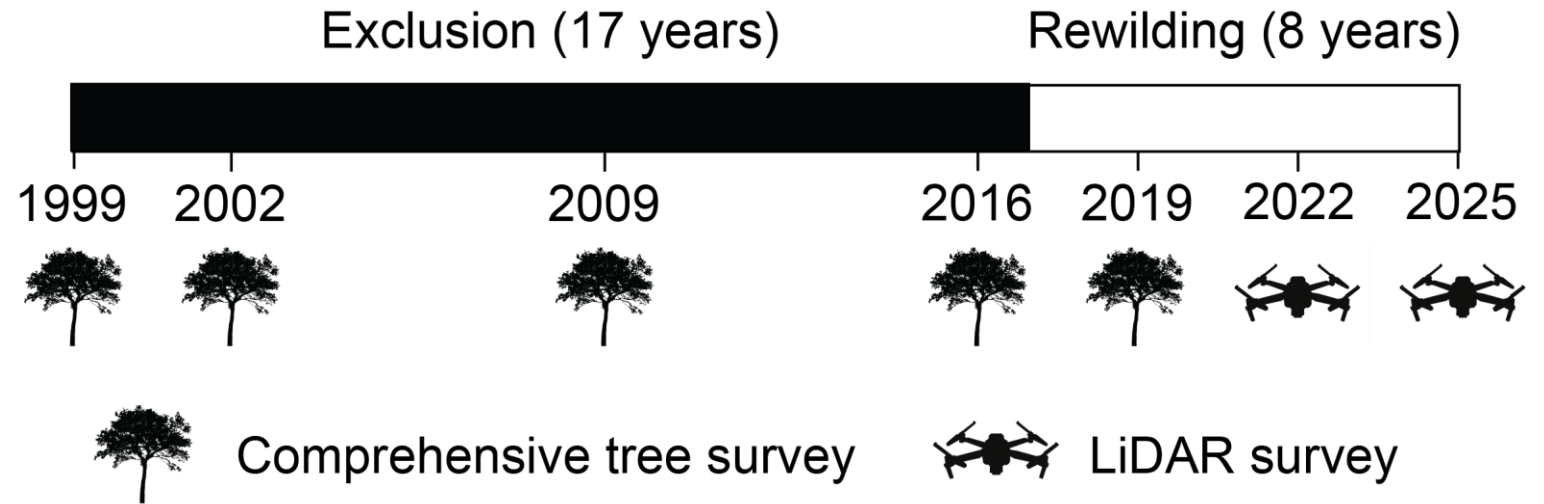
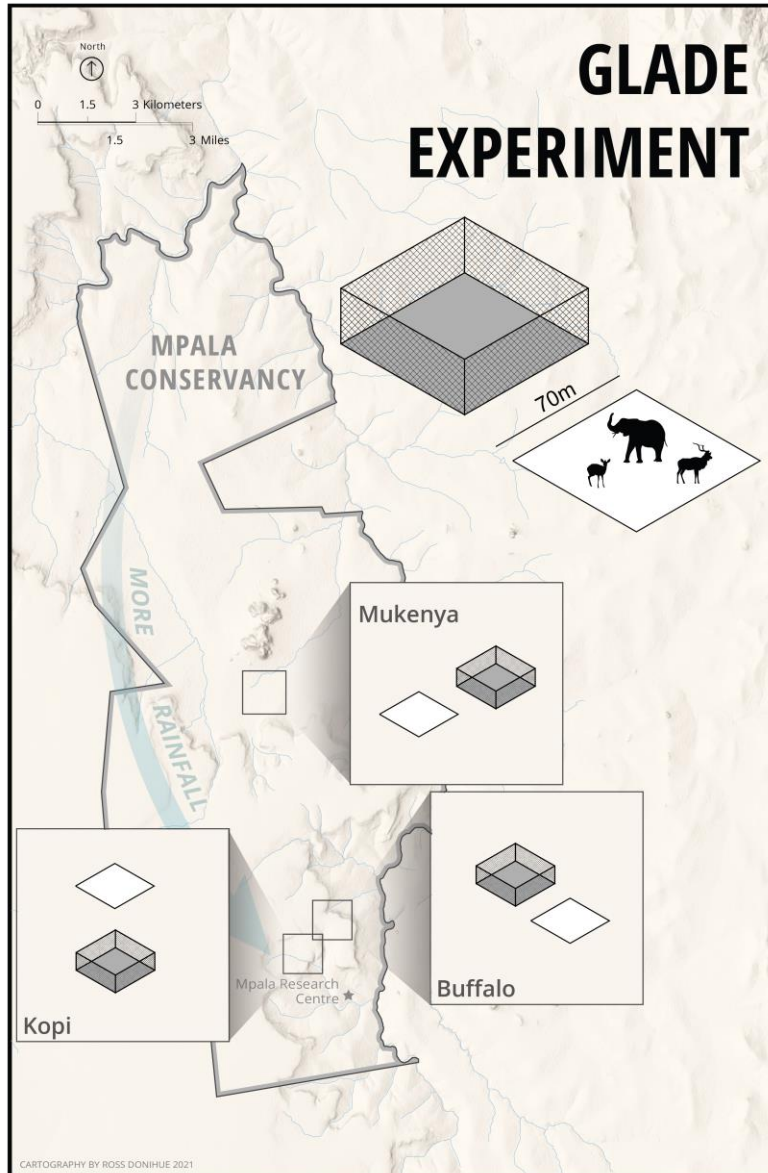


Field Survey

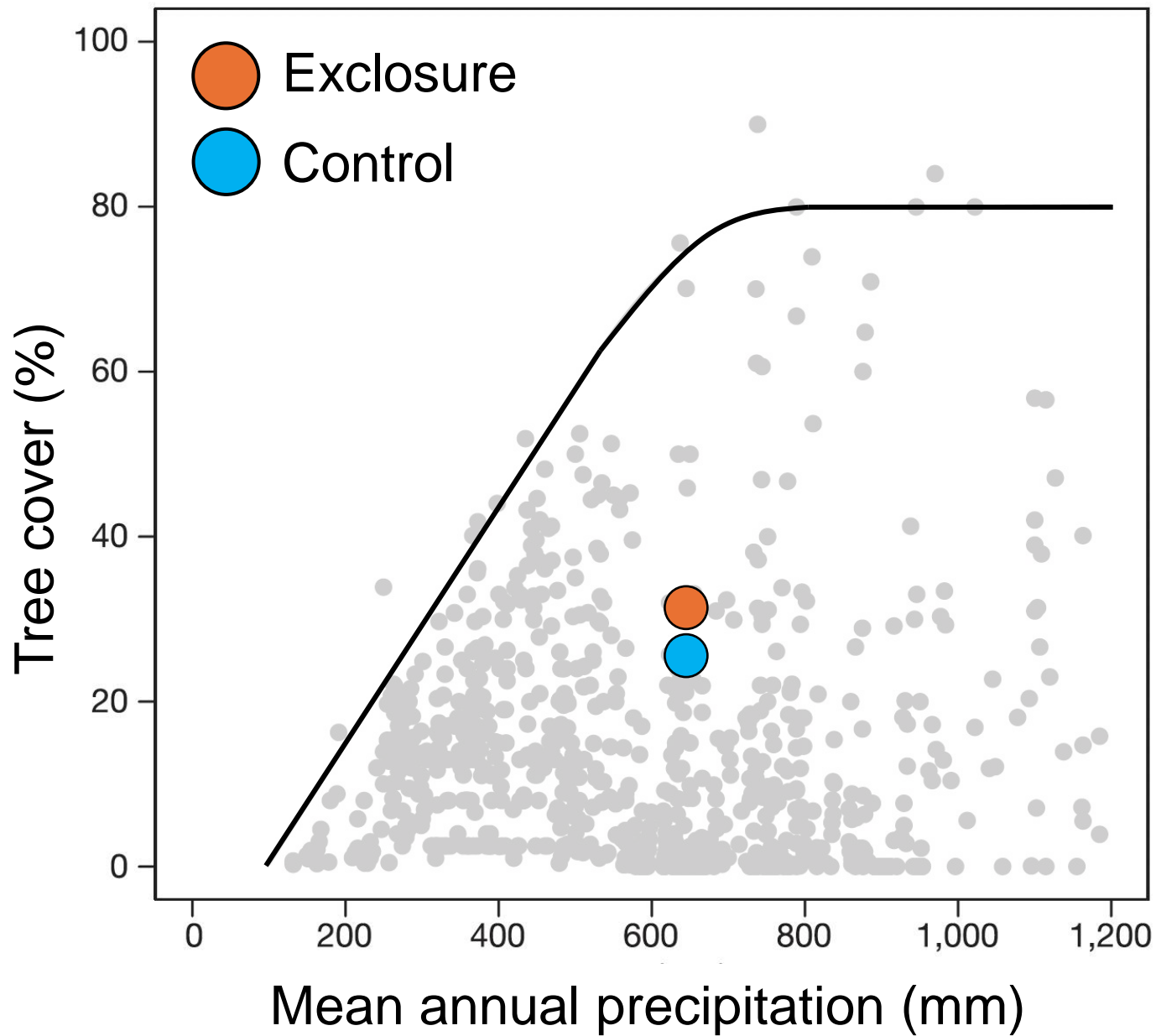


- Species
- Canopy area
- Height
- Basal diameter
- Location (x,y)

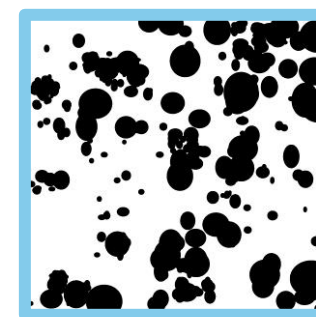
# Simulating rewilding with enclosure removal



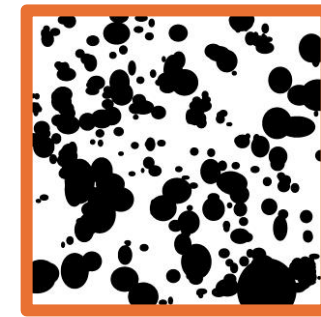
\*Tree cover only



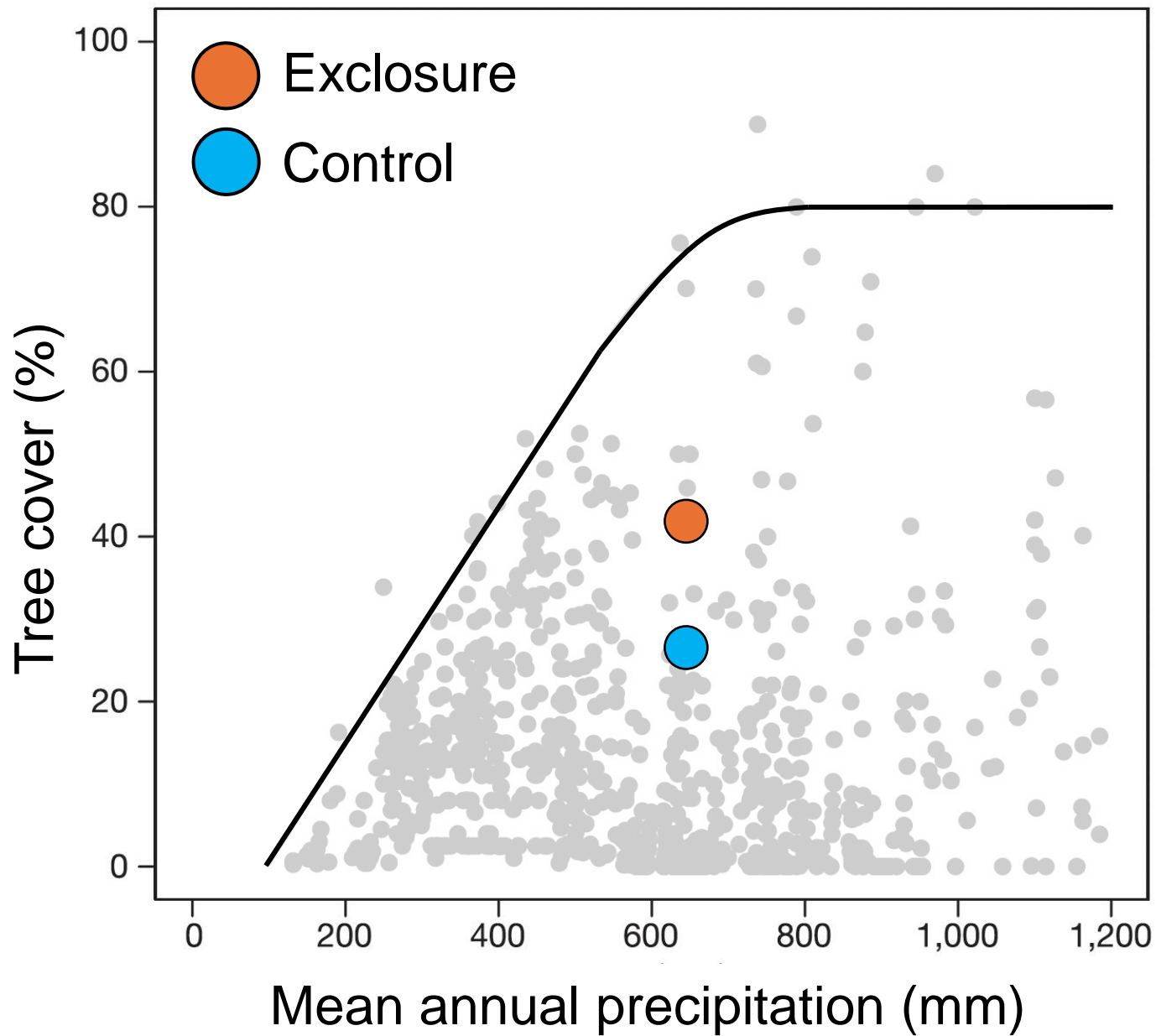
1999



Control



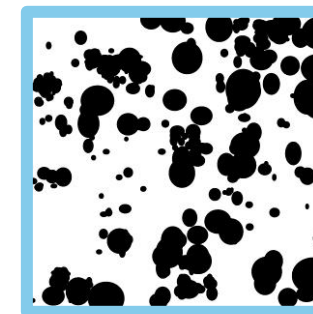
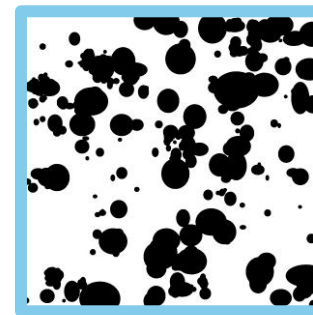
Exclosure



2002

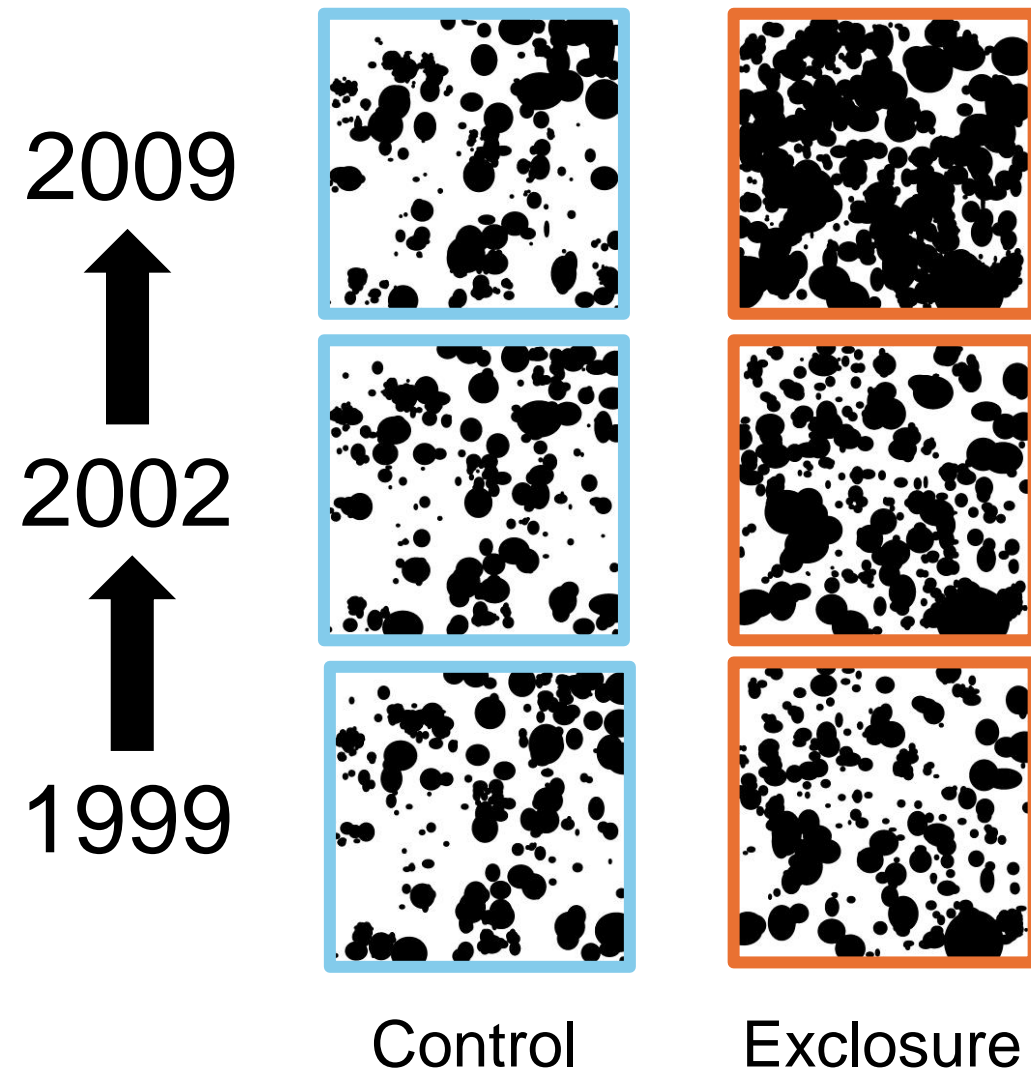
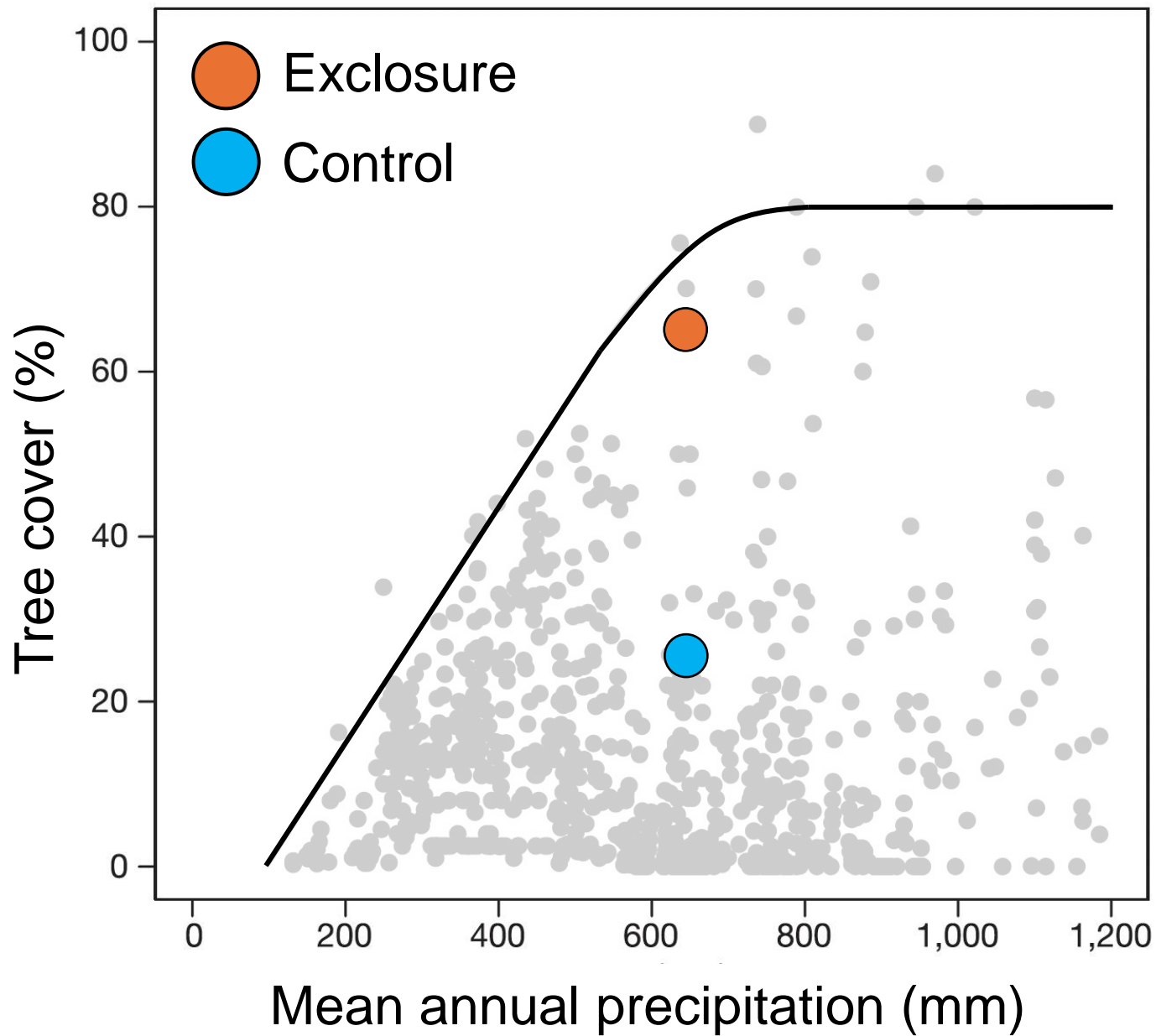


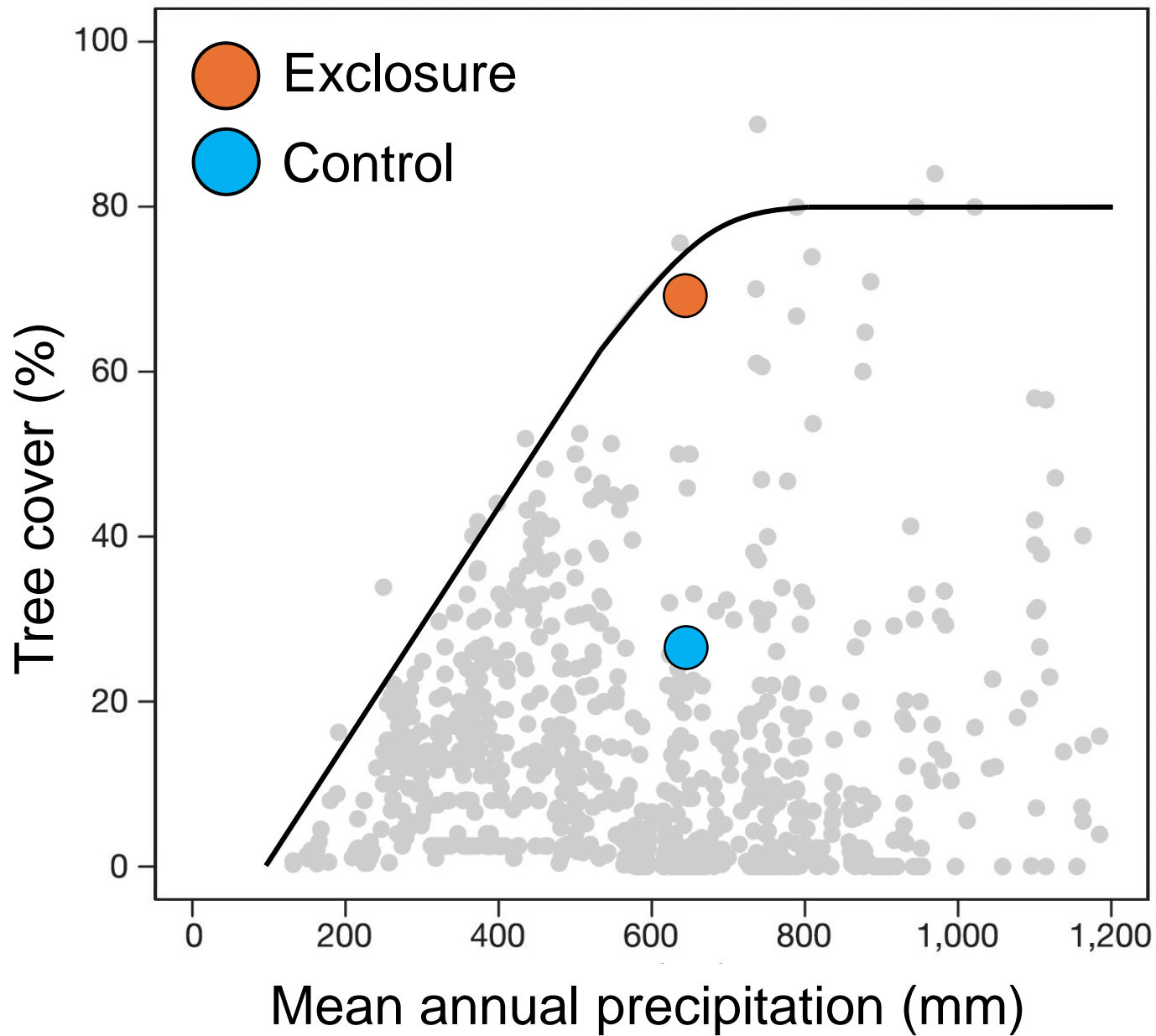
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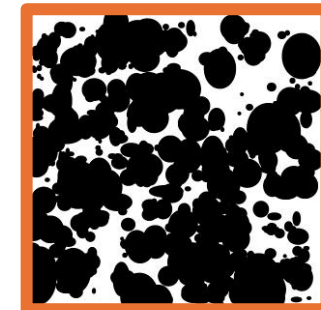
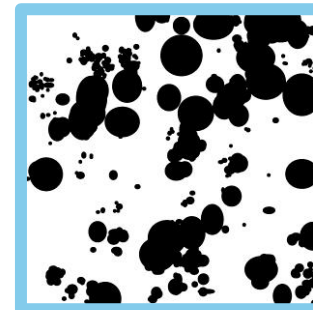
Control

Exclosure

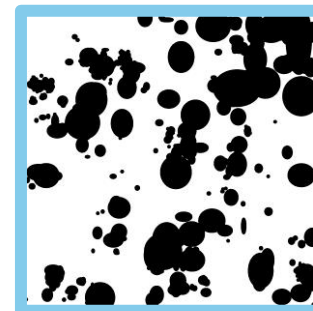




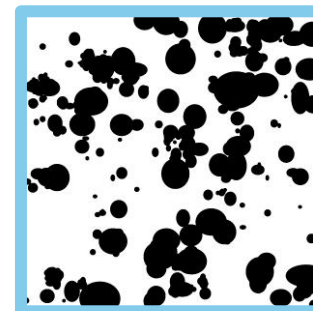
2016



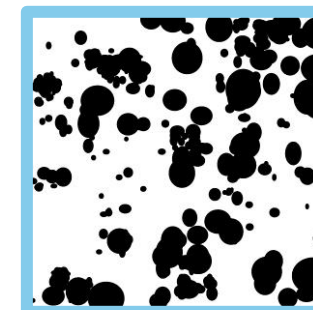
2009



2002

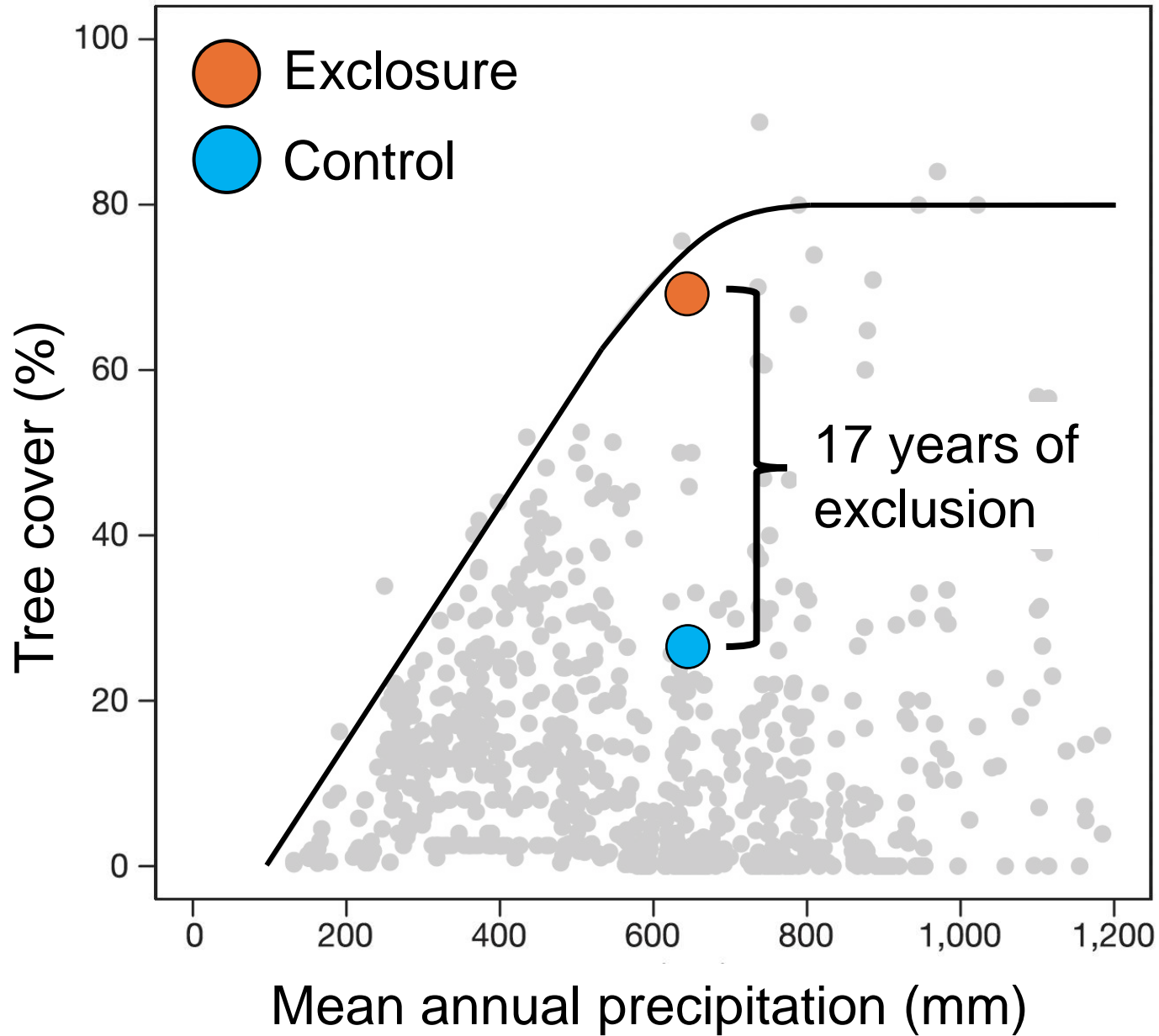


1999

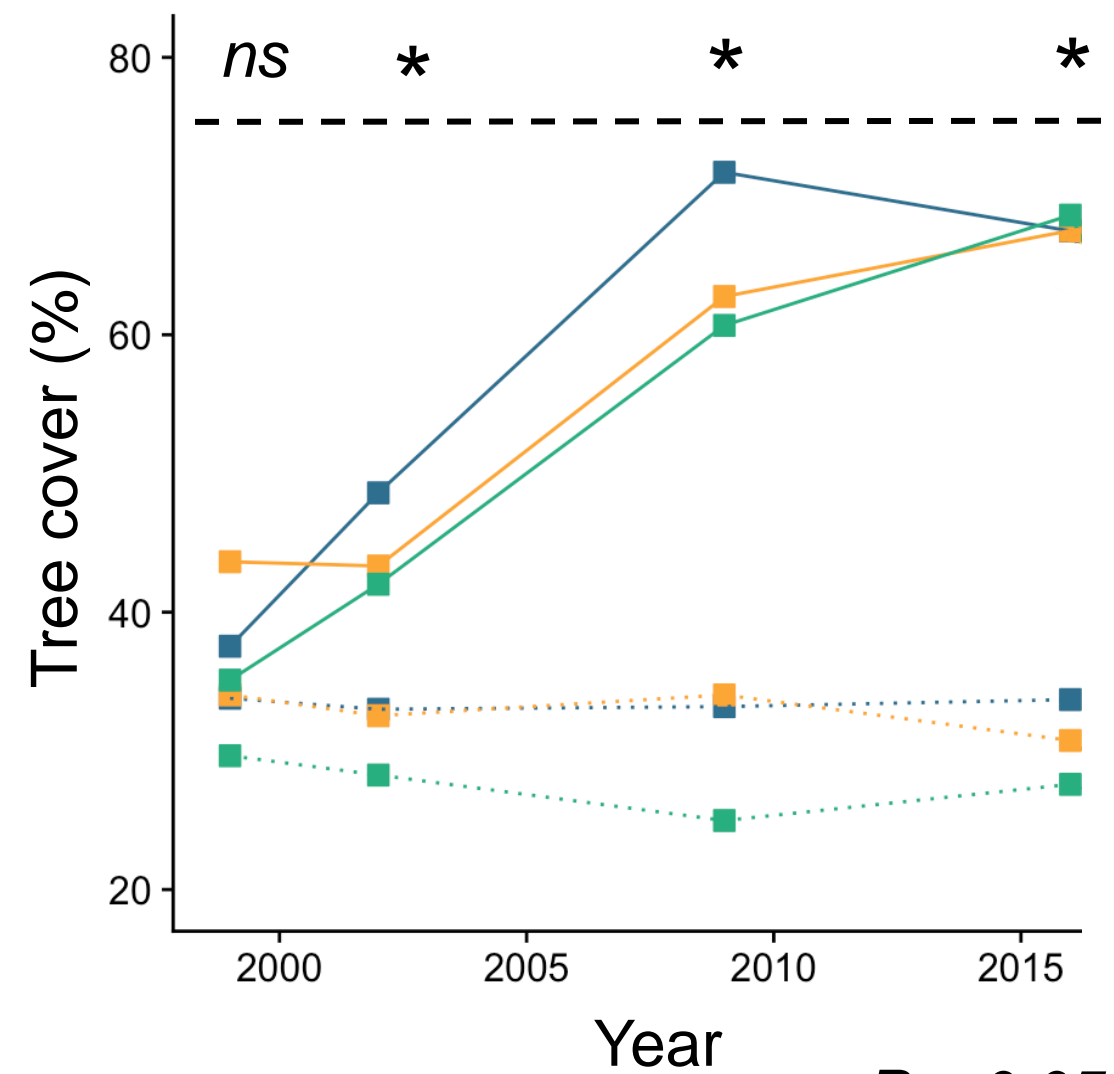


Control

Exclosure

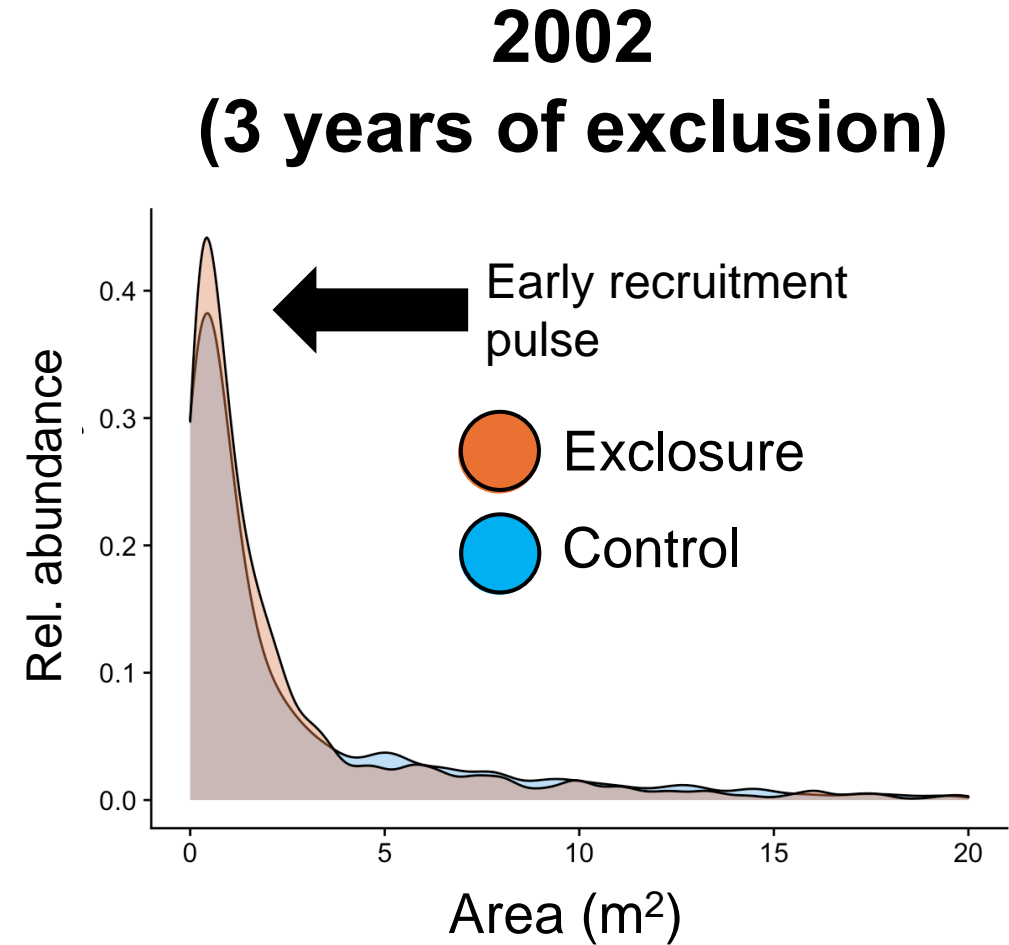
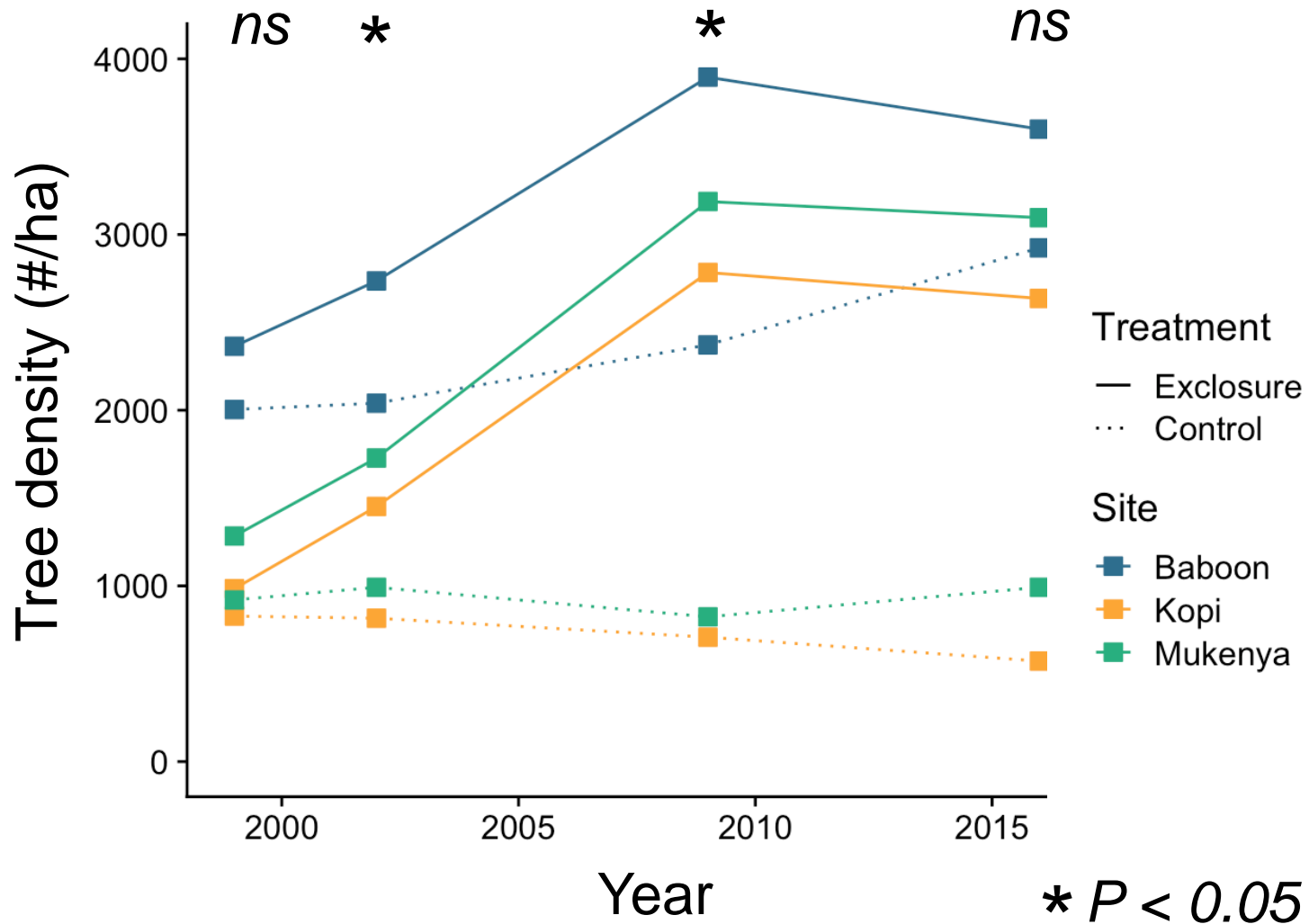


## What changes contribute to increased tree cover?

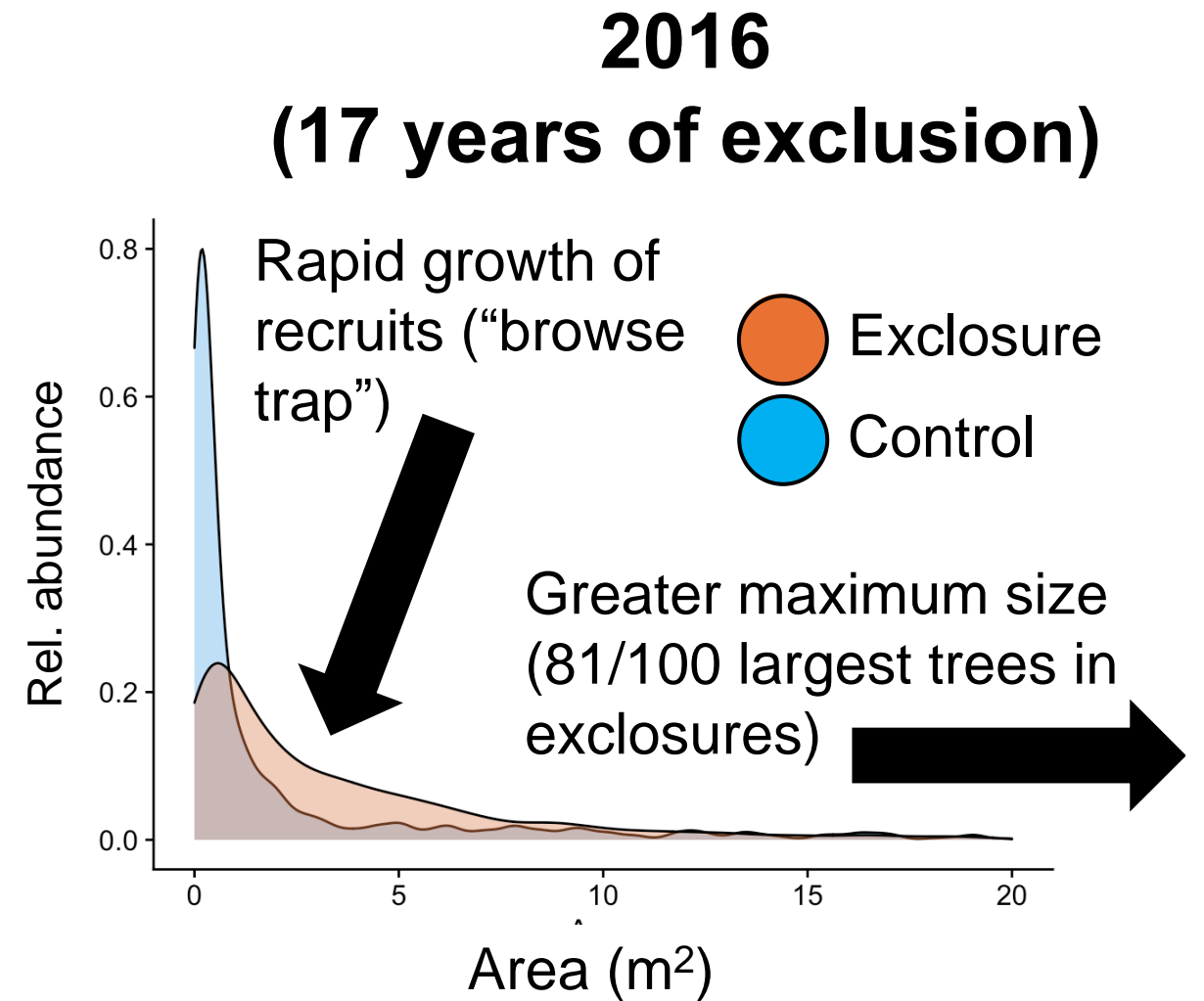
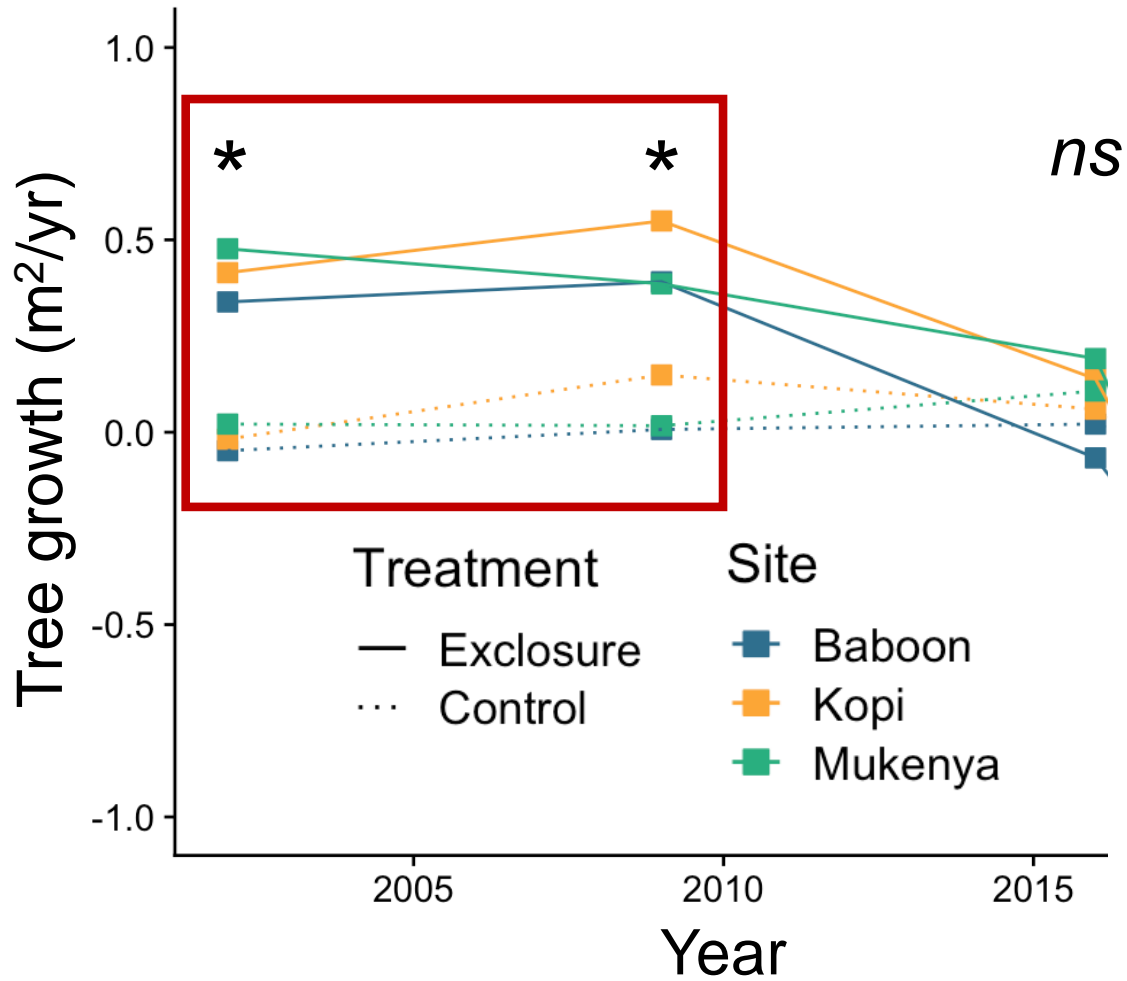


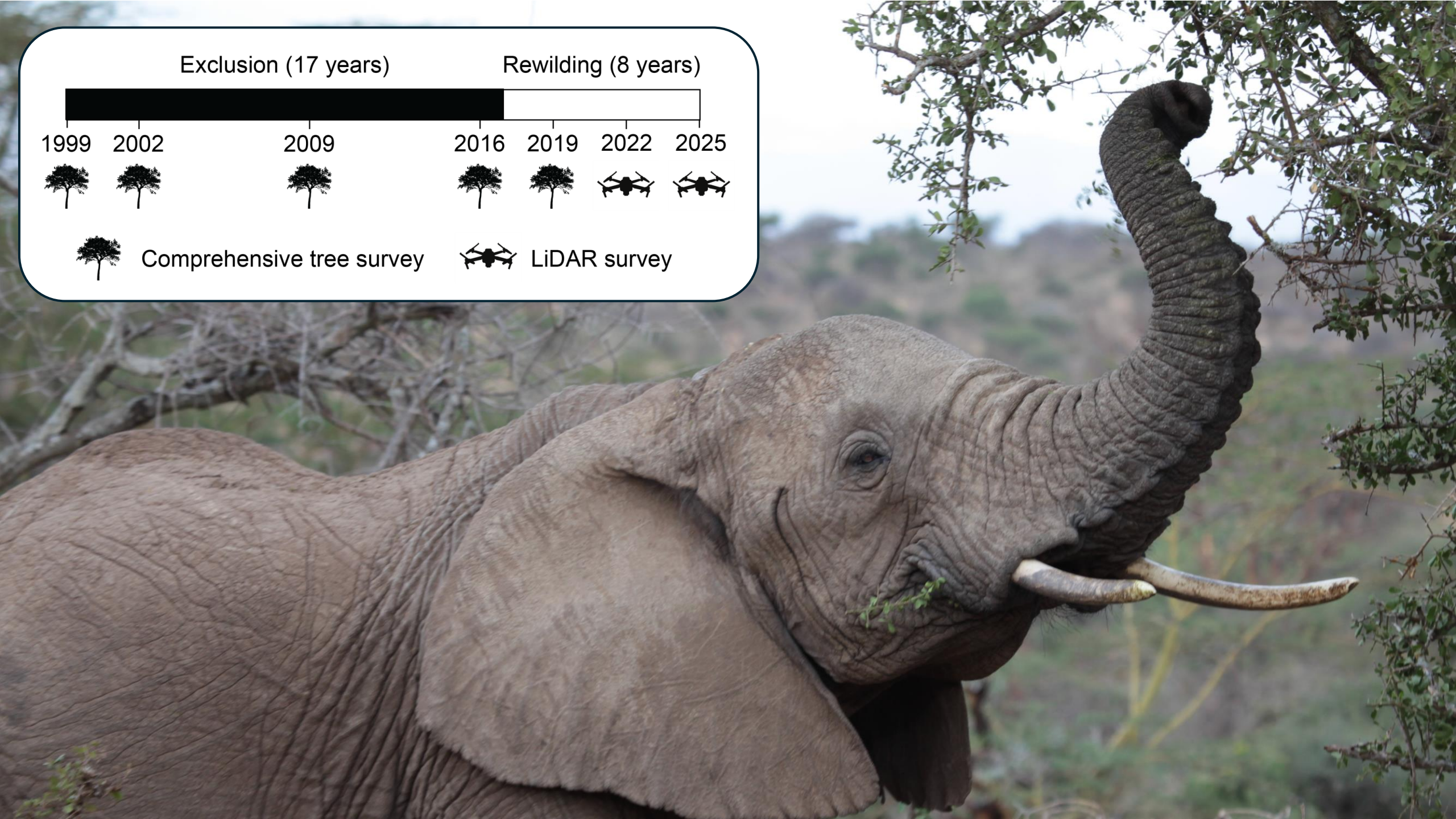
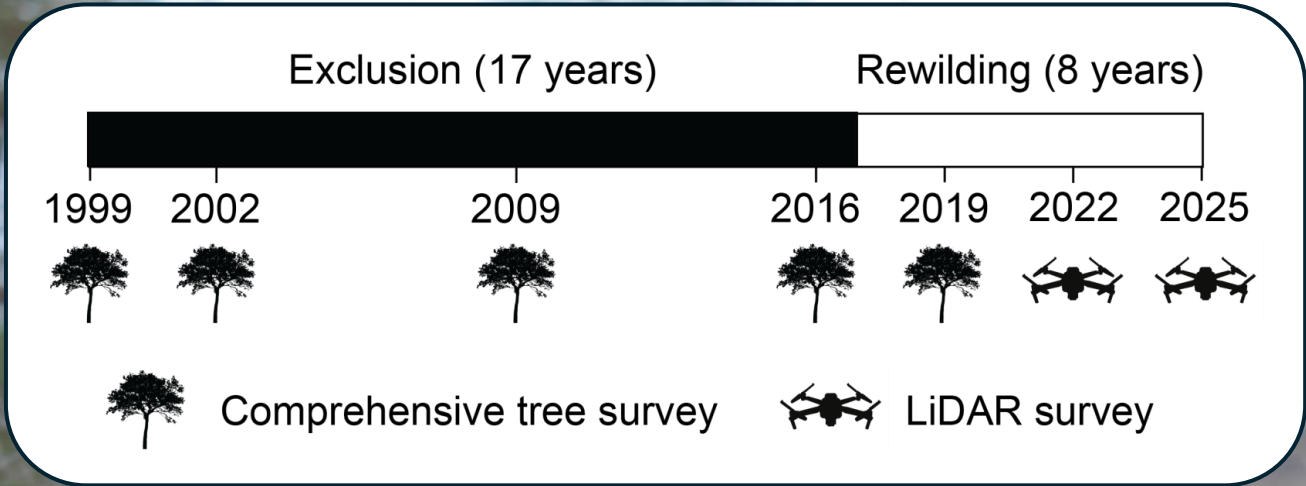
\*  $P < 0.05$

# Greater tree **density** contributes to increased tree cover in the absence of herbivores

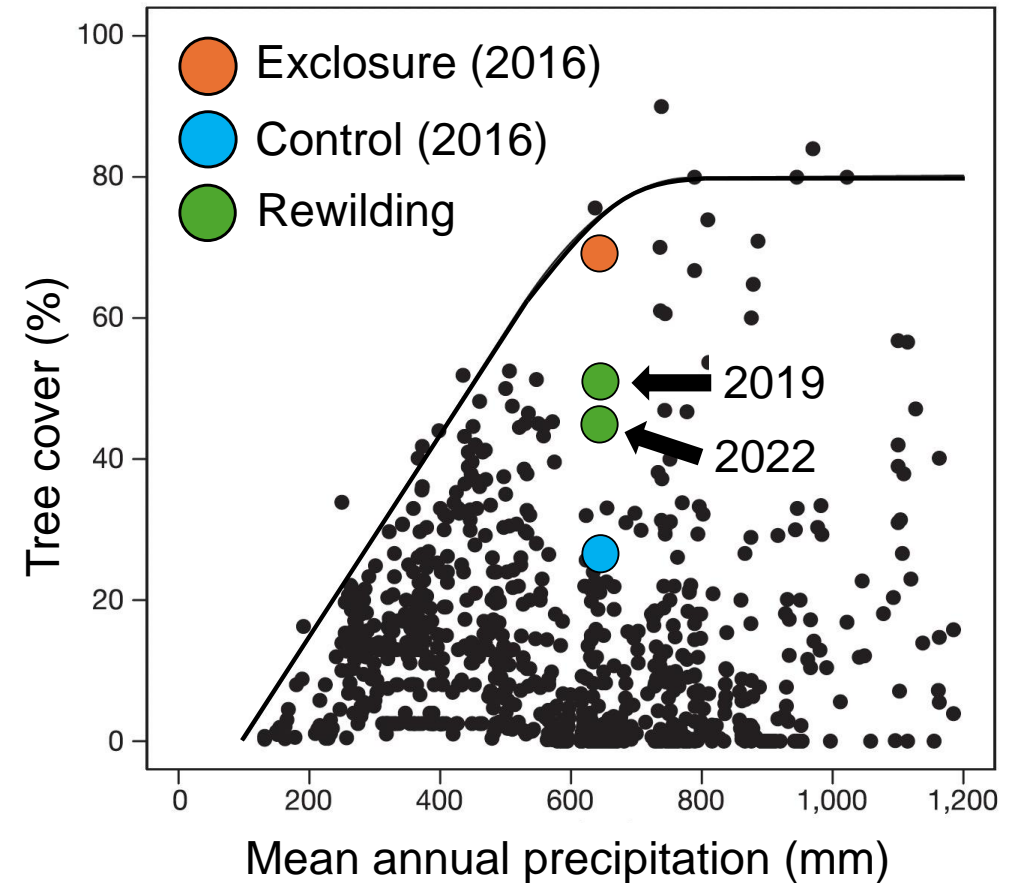
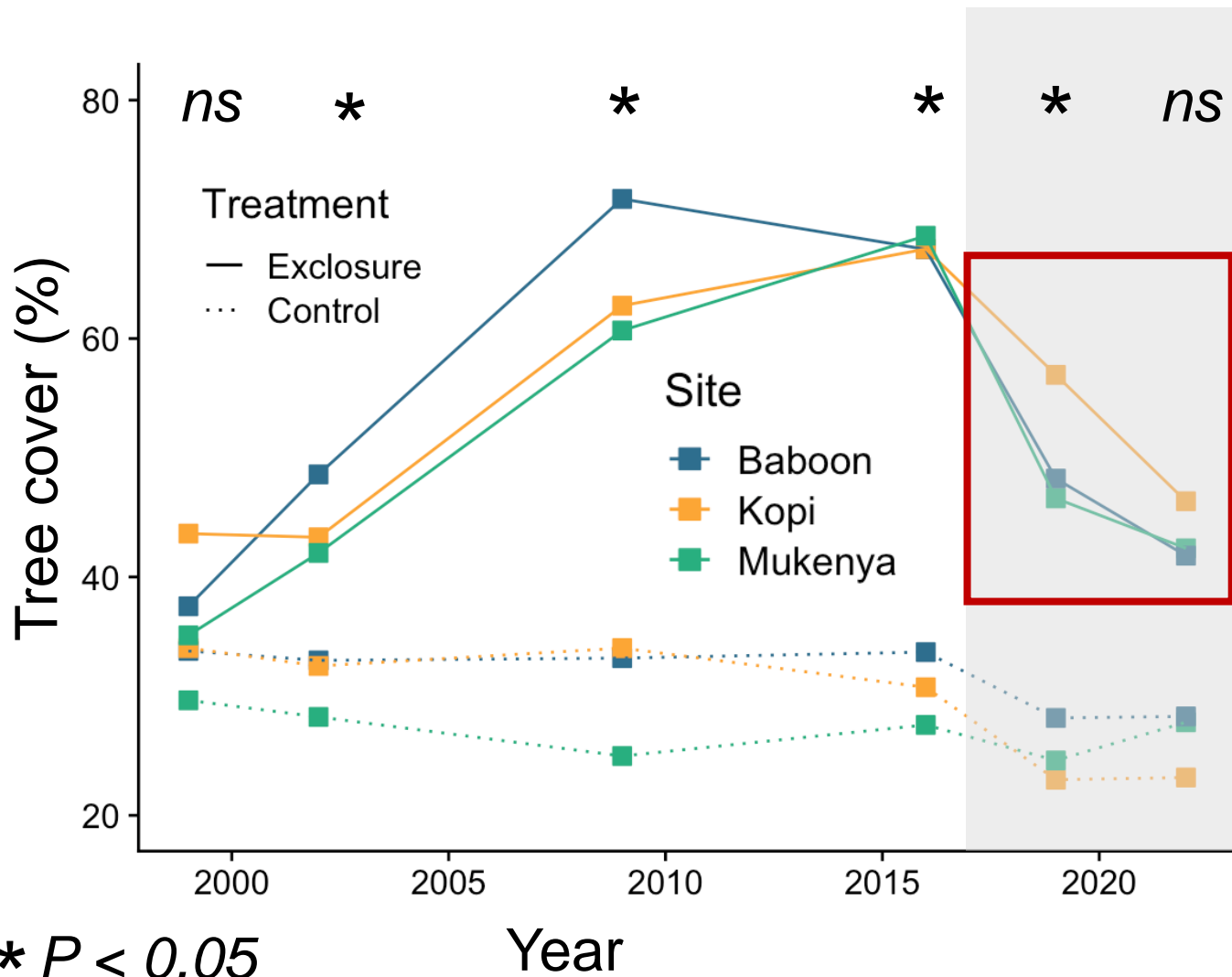


# Tree growth is greater without herbivores, leading to demographic shifts but not species turnover

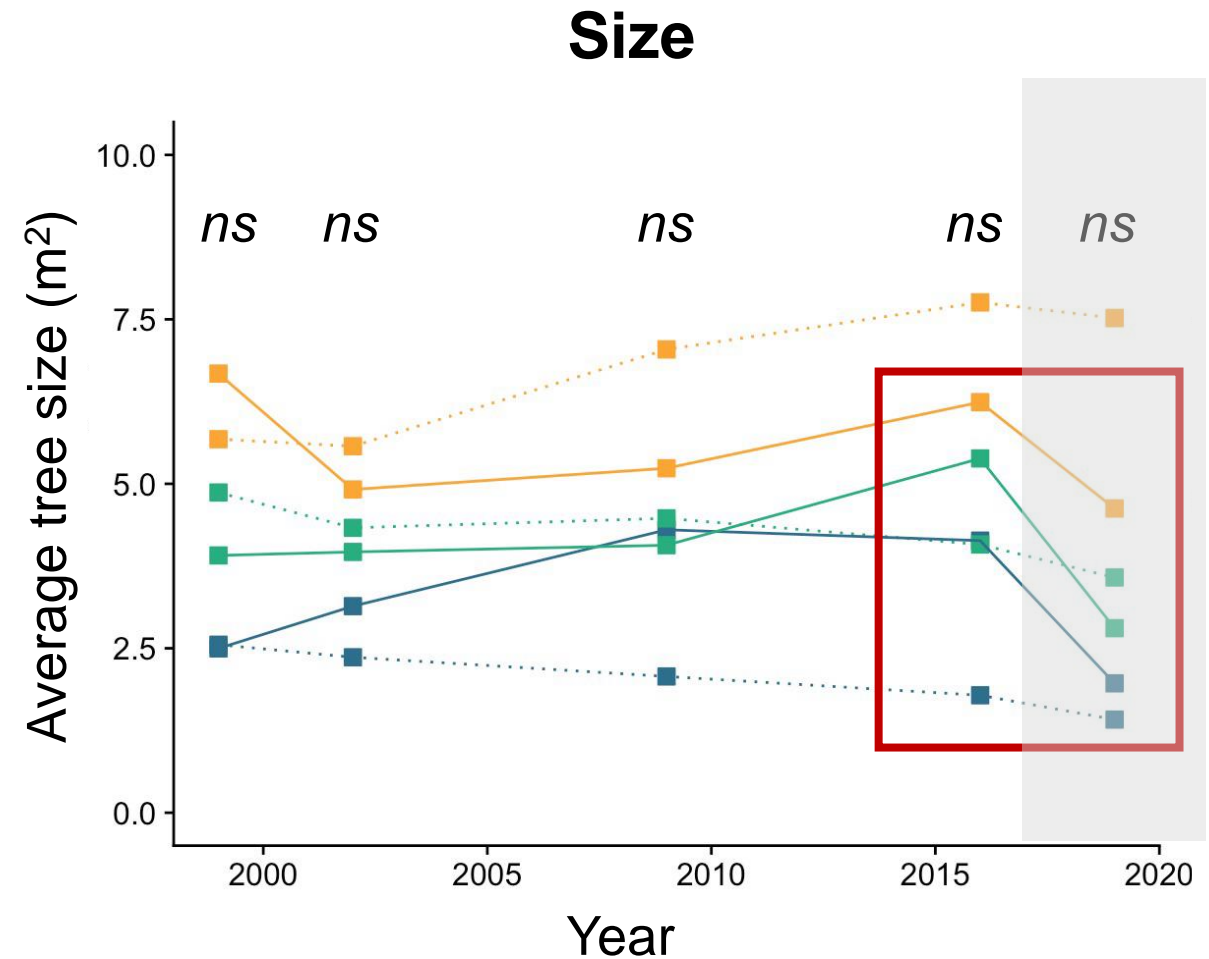
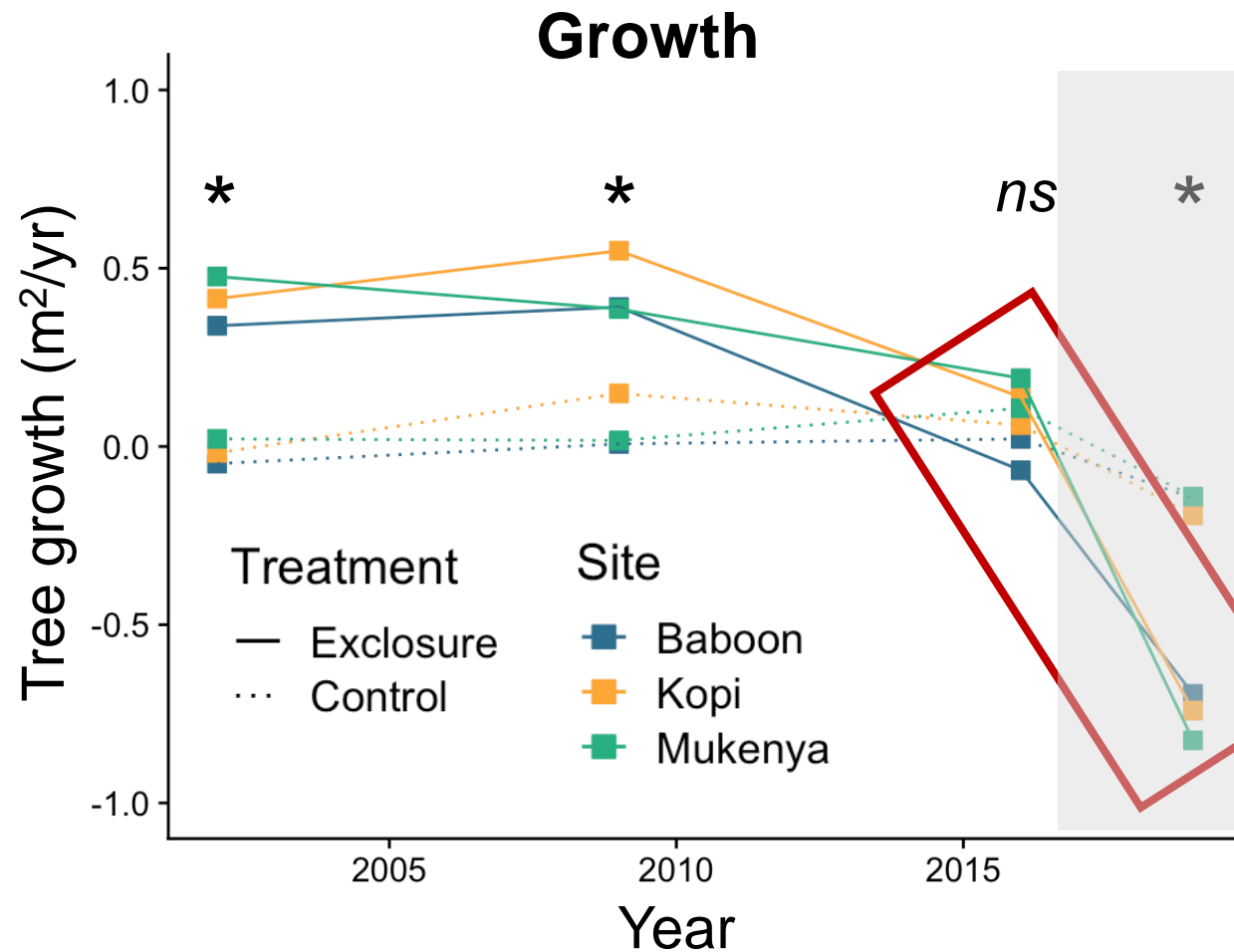




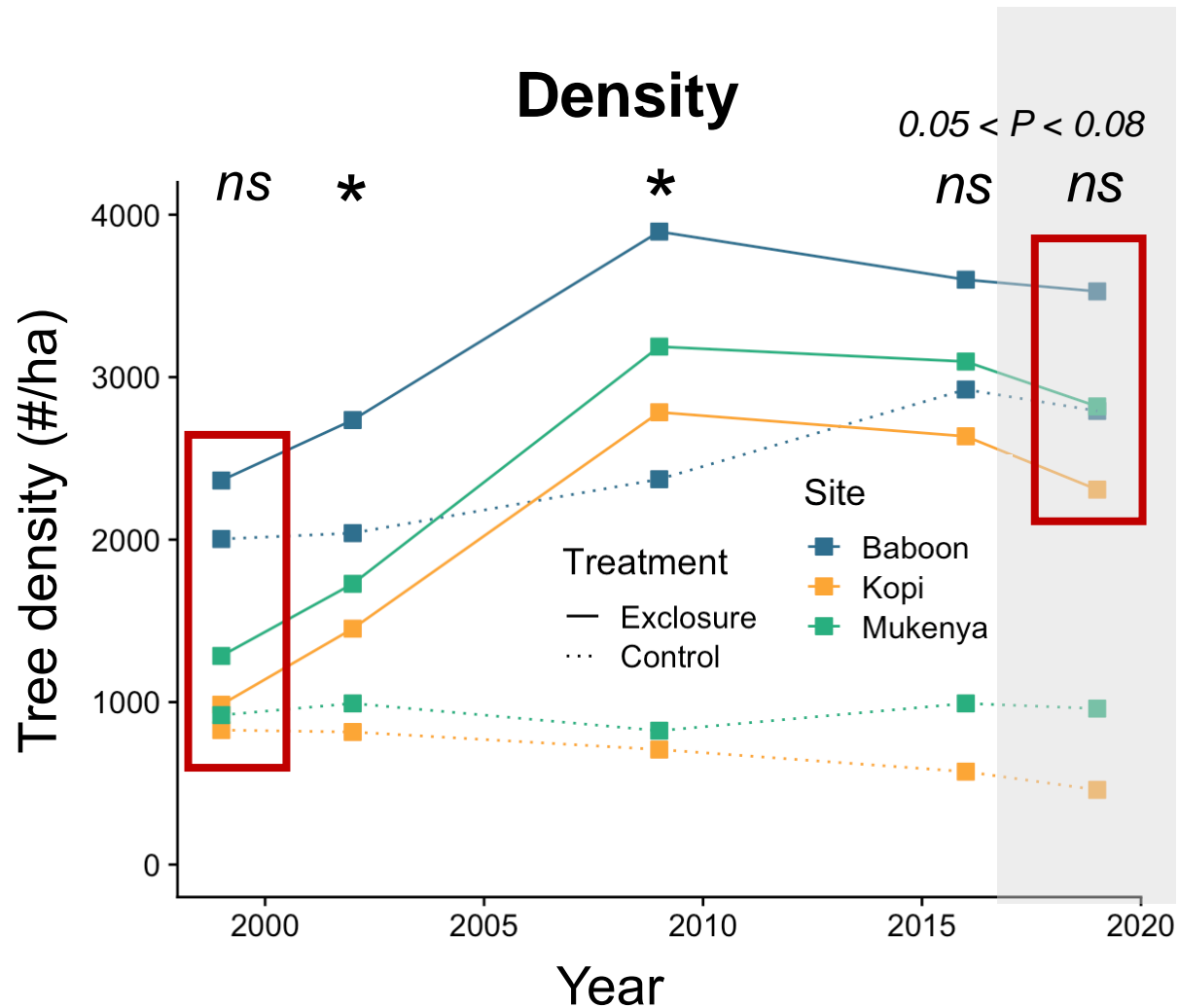
# Tree cover declined to *nearly* pre-exclosure levels after only five years of rewilding



# Average **growth** and **size** declined after (elephant) reintroduction, especially for the largest trees



# Tree density remains elevated and essentially unchanged from 2009-2019



# Conclusions

- Tree **cover** increased rapidly following defaunation and has declined following rewilding (with a diverse and abundant megafauna community)
- Individual tree traits (**size, growth**) respond quickly to both defaunation and rewilding
- Demographic changes (**density, size distribution**) are more resistant to rewilding and may have lasting effects
- Changes at ecosystem (**tree cover**), community (**composition**), population (**density**), and individual (**canopy area**) scales vary in their response to both defaunation and rewilding