

Could it be culture? An inter-troop comparison of baboon behaviour in Gorongosa National Park, Mozambique



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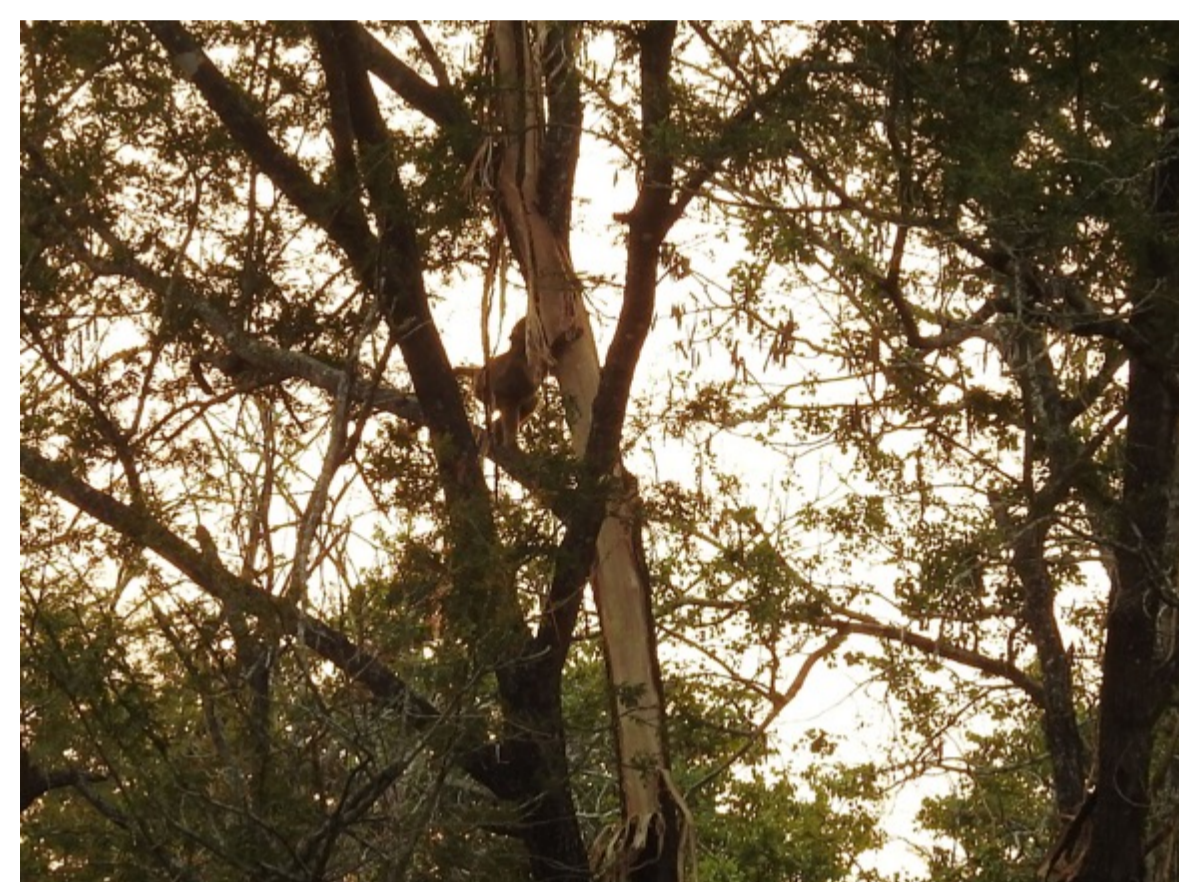


Background

Baboons in Gorongosa National Park have been observed to strip bark off *Acacia robusta* trees, chew the fibres underneath the bark, and spit out wadges. These actions leave identifiable marks on trees. Work conducted during 2018 indicates regional variation exists within the park¹. Some trees exhibit stripping on the trunk, likely by elephants, in addition to (or instead of) on upper branches. We resurveyed all sites for bark stripping in 2019 and tested several ecological hypotheses following the method of exclusion^{2,3}.



Below: Juvenile member of Woodland Troop stripping *Acacia robusta* bark, 2019.



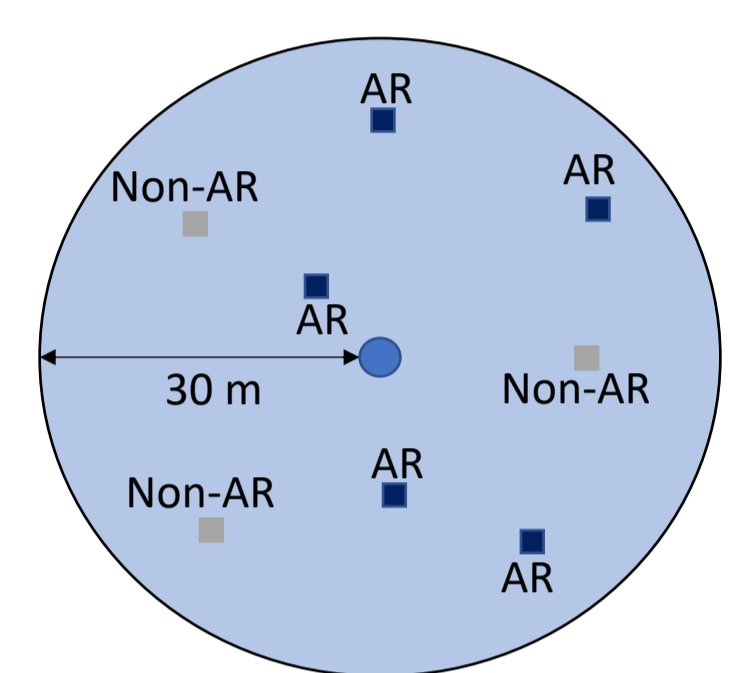
Research Questions & Methods

1. Is there **regional variation in the presence/absence** of *Acacia robusta* branch stripping?
2. Can variation be explained by **baboon absence** or **distance to a major water source**?
3. Are there **differences in diameter** between stripped versus unstripped trees at sites with stripping?

Methods

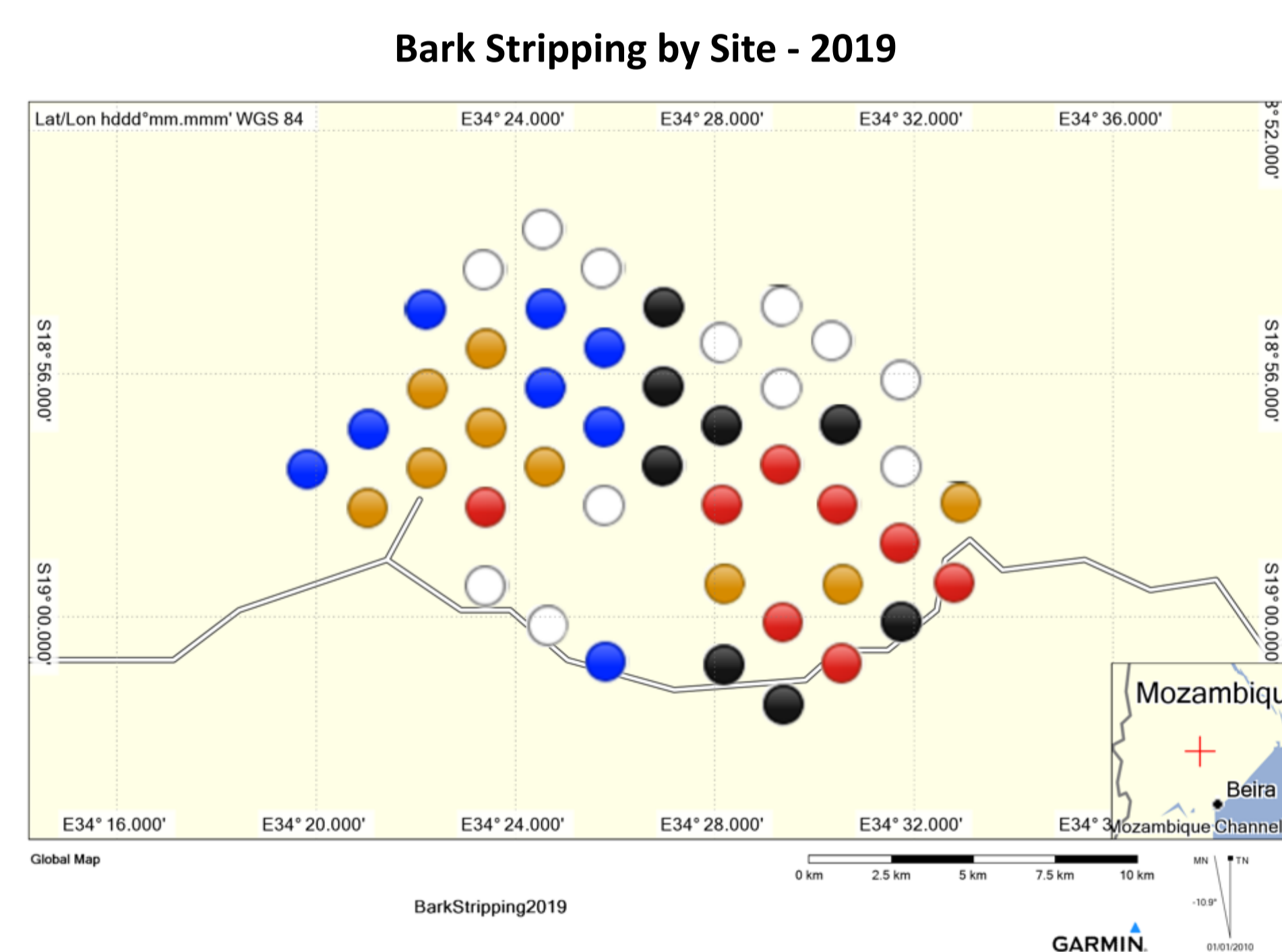
- 30 m radius **habitat plots** following a camera trap grid⁴ (n = 45, area = approx. 300 km², approx. 80+ troops¹)
- Recorded **total tree count**, *Acacia robusta* count, **AR** along transect walked to the site, and **DBH, canopy height, and stripping status** for each AR within the plot

30 m radius Habitat Plots



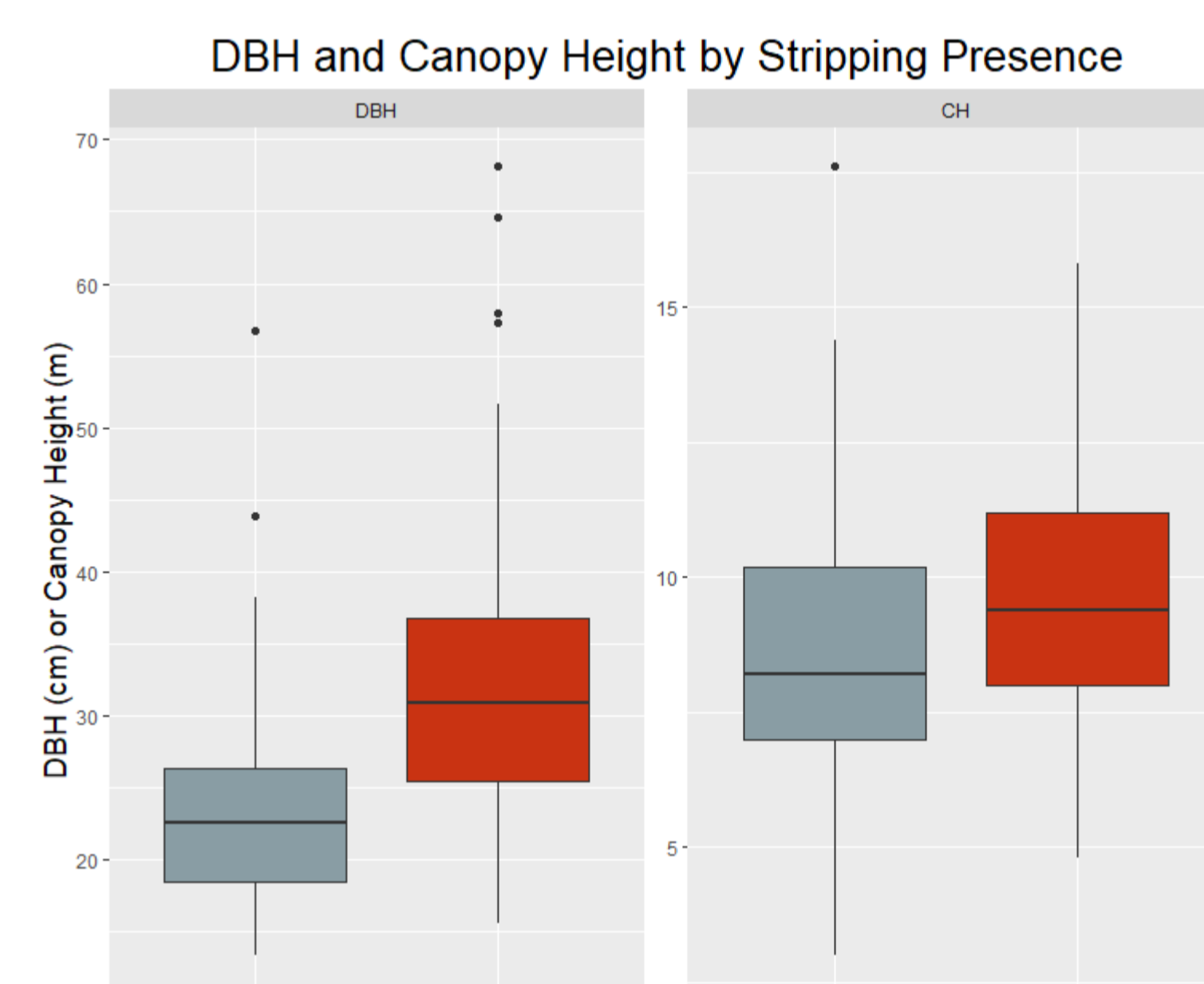
Results

Does regional variation exist in bark stripping?



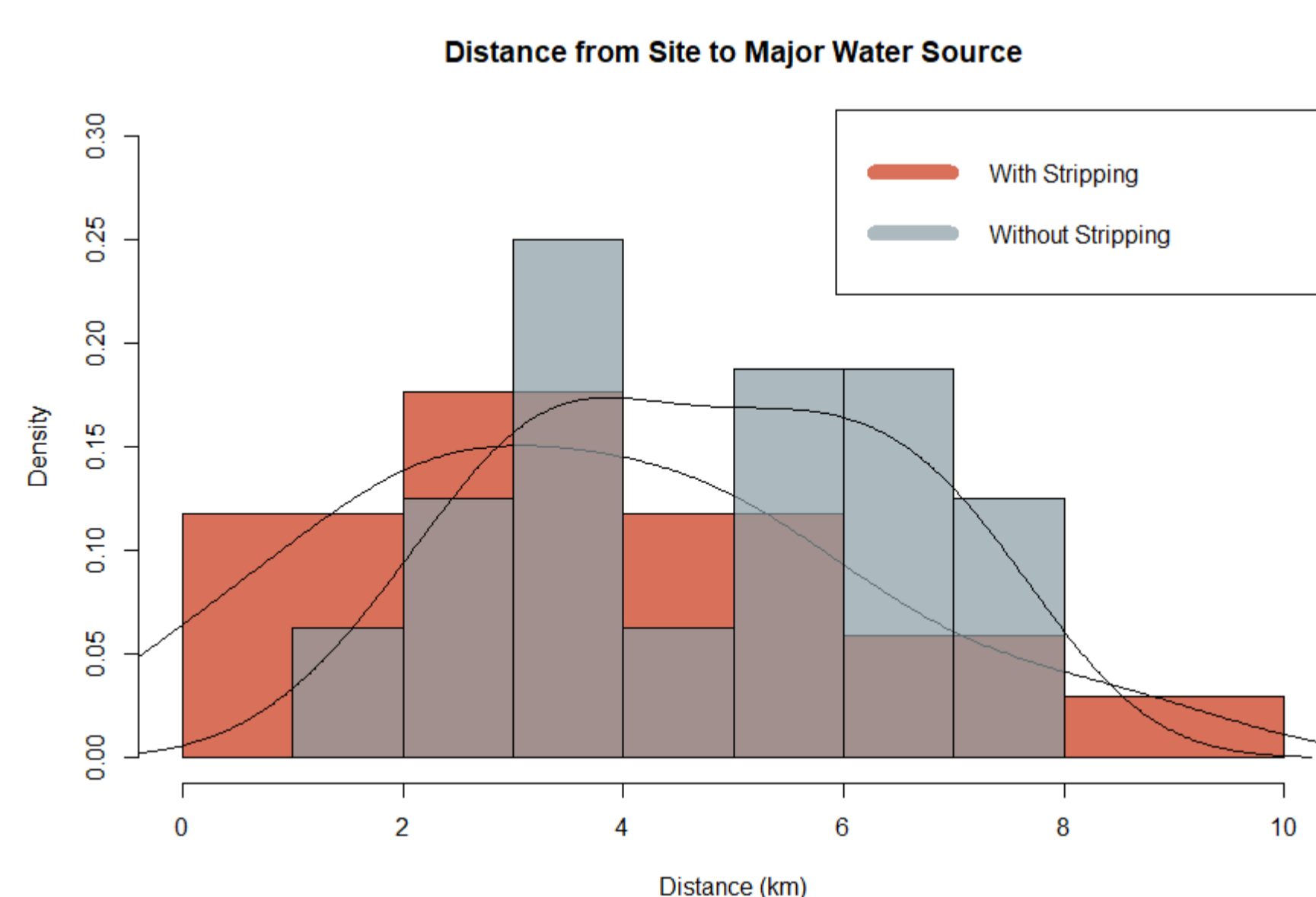
(Blue = baboon stripping only, Red = elephant stripping only, Tan = baboon and elephant stripping, Black = *A. robusta* present but no stripping, White = No *A. robusta*)

Which trees do baboons strip?



Binomial regression predicting stripping of individual trees with DBH as a fixed factor and site as a random factor. Only includes trees from sites at which stripping is present. Canopy height not included because of strong collinearity with DBH.
(DBH: $z = 3.961$, $p < 0.001$
Intercept: $z = -3.153$, $p < 0.01$)

Is regional variation explained by distance from a major water source?



Student's T-Test:
Sites With: Mean = 3.70 km, SD = 2.36
Sites Without: Mean = 4.73 km, SD = 1.76
 $t = 1.4174$, $df = 31$, $p > 0.05$

Discussion and Future Directions

- **Regional variation exists** – Visible East-West divide
- Variation is **not explained by**:
 - Presence/absence of *A. robusta*
 - Presence/absence of baboons (visible in 2016/17 at all camera trap locations)
 - Distance from a major water source
- Trees with **greater DBH more likely to be stripped**
 - Accumulation effect?
 - Would smaller trees not be easier to strip?

In 2020...

- Taphonomy of bark stripping – **can we age stripping?**
- **Seasonality** and season-specific water availability – **is stripping explained by seasonal pressures?**
- Soil salinity, vegetation types, and alternative food sources – **what are they missing?**
- Nutritional analyses & pharmacological hypothesis – **why strip bark?**
- Camera trapping – **who is stripping bark?**
- Direct observation – **how does bark stripping develop in young?**

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(1) Biro D, Bossino L, Hammond P, Lewis-Bevan L, Martinez FI, & Carvalho S. 2018. The unknown primates of the Urema Rift – Inter-troop behavioural variation in Gorongosa's baboons. In *Abstracts of the International Primatological Society Congress*, Event 711. Nairobi.
(2) Whiten A, Goodall J, McGrew WC, Nishida T, Reynolds V, Sugiyama Y, Tutin CEG, Wrangham RW, Boesch C. 1999. Cultures in chimpanzees. *Nature* [Internet] 399:682–685.
(3) Koops K, McGrew WC, Matsuzawa T. 2013. Ecology of culture: do environmental factors influence foraging tool use in wild chimpanzees, *Pan troglodytes verus*? *Anim Behav* [Internet] 85:175–185.
(4) Camera trap grid installed in 2016 by Kaitlyn Gaynor, NCEAS

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Permits: Gorongosa National Park (permit number: PNG/DSCI/C145/2019), University of Oxford Animal Welfare and Ethical Review Boards (reference number: APA/1/5/ACER/10Dec2018).
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