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Arboreal primate ranging from a new perspective: UAS technology at the landscape scale

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Unmanned Aerial System (or drone) technology allows the 3-dimensional mapping of forest landscapes, allowing a new perspective of arboreal primate habitat use. Utilizing UASs in primatological studies enables the assessment of canopy use by arboreal primates as well as the identification of discreet forms of anthropogenic disturbance, such as historical selective logging. Combining 3D canopy structure with microclimate measurements, we explore how canopy structure buffers solar radiation and how arboreal species behaviourally thermoregulate within the canopy. Applying future climate change predictions to microclimate models, we can estimate how increased temperatures may affect their behavior, ranging and time-budgets, addressing the conditions that may have led to the adoption of terrestrial locomotion in ape species. We present data on a study of the arboreal primate community in a lowland section of the Gunung Leuser Ecosystem in Northern Sumatra. We present results on how the synergistic effects of 3D canopy structure and microclimates alter the ranging of siamang (*Symphalangus syndactylus*) in low cloud cover ($X^2 = 145.3$, $p =<0.001$) as they try to remain with their thermoneutral zone. We also explore how future climate change may alter habitat suitability for orang-utan (*Pongo abelii)* and siamang, decreasing the availability of prime habitat unequally for each species (O: -15.2%, S: -18%) due to their behavioral and eco-morphological adaptions. We also discuss how UAS technology can be utilized in other future studies.

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