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Acoustic Signatures of Habitat Types in the Miombo Woodlands of Western Tanzania

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ABSTRACT

The Miombo Woodlands of Tanzania comprise several habitat types that are home to a great number of flora and fauna. Understanding their responses to increasing human disturbance is important for conservation, especially in places where people depend so directly on their local ecosystem services to survive. Soundscapes are a powerful approach to study complex biomes undergoing change. The sounds emitted by soniferous fauna characterize the acoustic profile of the landscapes they inhabit such that habitats with the highest acoustic abundance are considered as the most diverse and possibly more ecologically resilient. However, acoustic variability within similar habitat types may pose a challenge not only in determining their pristine condition but also in acoustically detecting their ecological change. The study presented here attempts to assess the soundscapes across habitat types in the Miombo Woodlands of the Issa Valley, Tanzania. A set of 24-hour audio recordings was collected using passive acoustic recorders over an area of 18000 km2. Sites were clustered based on acoustic indices that quantified sound diversity, and this cluster was compared to a similar cluster based on habitat physical attributes calculated using MODIS imagery and geographic information systems. The culminating analysis is a statistical correlation between habitats as defined by their soundscapes and by their landscape attributes. Results indicate acoustic variability was greater in dense canopy habitats and that wetland soundscapes are strongly correlated to the landscape attributes. More analysis need to be done to detect further ecological factors affecting the soundscape in places where the variability was high.

KEYWORDS

soundscape, acoustic indices, Miombo Woodlands, habitat, landscape