
Insights into the structure of ecological communities from acoustic sensor networks

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Abstract

Little is known about the role of acoustic communication in structuring ecological communities. Using acoustic sensors we can record and localise acoustically communicating animals and determine spatial and temporal activity and interactions between individuals. Such communication networks can inform us about patterns of competition among species and how acoustic communication may regulate spatial movements. We tested the ability of a wireless sensor network to localise birds in a Mexican rainforest environment. We found that bird songs projected within the area could be localised at high accuracies, with error levels on the order of 20cm, with similar results for localisation of *Formicarius antthrushes* vocalising in response to playback experiments. We also tested the extent to which individuals can be identified from their songs and used vocal signatures to map the territories of pairs in the study area. We discuss how using these methods will allow us to examine spatial and temporal interactions in a community of vocally active, ground-dwelling rainforest birds. Such studies can provide an insight into the role of the sound environment in the temporal structure of acoustic behaviour of animals but also in spatial partitioning of an ecological community.

Keywords: acoustic sensors, spatial partitioning, vocal signatures

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