

Impacts of tropical selective logging on local-scale movements of understory birds

ABSTRACT

Widespread selective logging in tropical forest causes structural damage and associated shifts in species composition, but we lack understanding of how selective logging impacts mechanistic processes that drive these biodiversity changes. Movement is a vital mechanistic process underpinning demographic, ecological, and evolutionary processes that likely determine species responses to logging. We assessed how tropical selective logging impacts local movements of 71 understory avian species in Sabah, Malaysian Borneo, and determined whether movement patterns relate to species' conservation status, functional traits, sensitivity to logging and trophic position. We used a capture-mark-recapture methodology and a hierarchical Bayesian framework to model maximum observed local movement distances, accounting for spatial sampling heterogeneity. Across the avian community, we found a higher probability of moving shorter distances (up to 200 m) in logged forests, and higher movement probability at longer distances (above 200 m) in unlogged forests. Altered movement patterns after logging may reflect increased understory density, changed resource distribution and/or predation risks, and suggest smaller home-range sizes. Species' conservation status, body mass, foraging guild, logging sensitivity and trophic position were unrelated to the magnitude of movement change. The continued persistence of understory species in our sample after selective logging may depend on flexibility in movement behaviour, conferring resilience to habitat degradation and the retention of high conservation values. This lends further support for the protection of these logged forests for biodiversity conservation.