

Direct comparisons of logging and agroforestry influence on tropical mammals in Sarawak, Borneo

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Abstract

Tropical regions are undergoing rapid land use change, with major implications for global biodiversity. Selective logging and agroforestry are particularly widespread across tropical forests, often occurring in close proximity. But while a number of studies have addressed their impacts separately, few have directly compared how they influence forest vertebrates. Here, we assessed the occurrence of medium- to large-bodied mammals in logged forest, unlogged forest, and agroforestry areas in three study areas in interior Sarawak, Malaysian Borneo. We detected 34 species across 99 camera trap locations and used multi-species occupancy models to estimate species-specific occurrence while accounting for imperfect detectability, spatial autocorrelation, natural habitat heterogeneity, and metrics of site accessibility (distance to human infrastructure) as proxies for potential hunting pressure. We found that species occurrences were unaffected by the distance to the nearest road or village and only responded to elevation and the distance to the nearest river in a single species each. Detection rates tended to vary with micro-habitat characteristics such as the size of tree stumps and the prevalence of trees and rattan palms, which are often not considered in camera-based occupancy studies. Occurrence rates of five species varied across habitat types but were not detectably lower in agroforestry sites than in unlogged forest for any species. Our results indicate that without unsustainable hunting, agroforestry and logged forest provide usable habitat for some, though not all, rainforest mammals. We also suggest that camera trap studies may benefit from the incorporation of fine-scale habitat information into detectability estimation.

Abstract in Malaysian is available with online material.

KEYWORDS

bearded pig, Borneo, camera trapping, civet, habitat disturbance, logging, mammals, occupancy, species richness, sun bear