Effects of selective logging on the microhabitat-use patterns of non-volant small mammals in a Bornean tropical lowland mixed-dipterocarp forest

Abstract

To assess the effects of habitat disturbance caused by selective logging, the microhabitat-use patterns of six understorey species of small (<1 kg), non-volant mammals in unlogged forests were compared with those in adjacent forests that had been selectively logged 13 and 25 years previously. The study was conducted in a lowland mixed-dipterocarp forest at Tabin Wildlife Reserve, located in eastern Sabah, Malaysian Borneo. Twenty-three microhabitat variables mainly related to vegetation structure, but also including other habitat features, were used to characterise trap-stations set along twenty 200-m long trap-lines equally distributed among four trapping-sites (i.e., five traplines per site). The trapping-sites represented two primary and two logged forests. These were arranged as pairs of logged-unlogged forest treatments located at two independent sampling locations. Canonical discriminant function analysis revealed significant separation between trap-stations both occupied and non-occupied by small mammals in the primary and logged forest pair sites at both locations. However, there was no consistent trend observed in the small mammals microhabitat-use patterns in primary compared to logged forests. In general, the small mammals appeared to be able to utilise different sets of microhabitats in different habitat types. Captures in both primary and logged forests were generally positively associated with higher density of fallen logs, twigs and rock piles, number of tree stumps and vegetation cover at the understorey and canopy levels. Wet sites tend to be avoided. These variables seemed to suggest that habitat utilisation by small mammals is closely linked to food or foraging areas and shelter or refuge sites, with probably a strong influence for predator avoidance. Tabin small mammals are able to persist following the first cut in logged forest indicating that although in general, logged forest cannot replace primary forest, selectively logged forests may still constitute an important component for the preservation of small mammal species diversity.