

Spatial Distribution of Small Carnivores within Oil Palm Plantations

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ABSTRACT

Small carnivores are known to contribute to rat control in oil palm plantations. A better knowledge of their distribution and habitat preferences would provide guidance for promoting their presence within oil palm landscapes. We conducted a 3-year study in well-established oil palm plantations in Riau and Bangka provinces, in Indonesia, and investigated several issues: what species of small carnivores occur within oil palm plantations; are they found deep within the oil palm or are they preferentially found near oil palm edge, i.e. closer to other habitats; are small carnivores attracted by forest fragments around oil palm plantations, and/or are they attracted by extensive areas of lowland forest in the surrounding landscape?

Within two plantations in Riau and two plantations in Bangka, we assessed the spatial distribution of small carnivores at the community and species level. Using spotlighting and faeces counts, we used a one-tailed hypothesis test to determine the attractive effect of two focal habitats: oil palm edge and forest fragments. Within the two plantations in Riau, we estimated occupancy using camera trapping; we tested whether two covariates (distance to the edge of the oil palm habitat and distance from extensive area of lowland forest) affected the model parameters for each small carnivore species.

We found no attractive effect of forest habitat or oil palm edge for the leopard cat (*Prionailurus bengalensis*) and the common palm civet (*Paradoxurus hermaphroditus*), which can be encountered deep within the oil palm habitat, at least during night time. During the day time, 87% of leopard cat detections with camera traps were recorded ≤ 0.2 km from the edge of the oil palm. These results suggests that the oil palm plantation is important for food foraging at night for these two species, and we suspect that non-oil palm habitat is of greater importance during the day. The Malay civet (*Viverra zibetha*) was rarely detected and only near the edge of the oil palm habitat; this suggests the great importance of forest habitat for this species. We did not detect any characteristic distribution pattern for the small-toothed palm civet (*Artogalidia trivirgata*), but the number of observations was very low for this species (n=4). At the community level, our analysis of faeces spatial distribution showed an attractive effect of forest and oil palm edge habitats.

These results support the hypothesis that although the oil palm habitat might be suitable for some small carnivore species, such as the leopard cat and the common palm civet (where they supposedly forage at night), most species of small carnivores need forested habitat for their survival in oil palm landscapes. Small carnivores may be encouraged to utilise oil palm by creating suitable rest sites and by increasing habitat heterogeneity (including forest fragments and corridors) throughout the plantation.