

THE ROLE OF FOREST FRAGMENTS IN SMALL MAMMAL CONSERVATION IN AN OIL PALM PLANTATION IN NORTHERN SARAWAK, BORNEO

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ABSTRACT

In recent decades vast areas of Bornean rainforest have been converted to monocultures, particularly to oil palm. This study describes and compares the diversity and persistence of small mammal species in fragmented forests within an oil palm plantation. Small mammals were trapped over 44 sampling days using mist-nets, harp traps, and cage traps. A total of 39 species of small mammals were trapped, represented by 22 volant (bats) and 17 non-volant species. These species were represented by 29, 15 and 26 species, and controlling for sampling effort by rarefaction, 19, 15 and 14 species of small mammals in high conservation value (HCV) forests, forest edge, and in oil palm plantation, respectively. Species diversity was greatest in the HCV forests ($H' = 2.22$), followed by oil palm plantation ($H' = 1.11$), and then edge ($H' = 1.07$). The smaller HCV forest (116 ha vs. 990 ha) contained more species than the larger forest (25 vs. 17 species). We attribute this to differences in species relaxation rates and the possibility that species density compensation has occurred in the smaller forest. This study demonstrates the conservation value of small forest fragments in oil palm plantations to maintaining native species diversity and the ecosystem services they provide.

Keywords: monocultures, HCV, diversity, persistence, bats, terrestrial small mammals.

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INTRODUCTION

Land-use intensification by agriculture is a major driver of the decline of biodiversity and critical ecosystem services and is an important environmental threat to biodiversity in Borneo (Foley *et al.*, 2011; Brodie, 2016). The most important economic crop in this region is oil palm (*Elaeis*

guineensis) and vast areas of primary and secondary rainforest have been converted to oil palm since the 1970s (Myers *et al.*, 2000; Gaveau *et al.*, 2014; MPOB, 2017). Malaysia accounts for more than 30% of the world's palm oil production (MPOB, 2017). Sarawak is considered the final frontier for oil palm expansion in Malaysia, as Sabah and Peninsular Malaysia have been saturated with oil palm plantations (Mohd-Azlan and Lawes, 2012). Consequently, the current rate of deforestation for oil palm production is greater in Sarawak than in Sabah and Peninsular Malaysia. Sarawak currently has 1.5 million hectares of oil palm, representing 27% of the total oil palm plantation area in Malaysia (5.8 million hectares) (MPOB, 2017). The present study was conducted

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