



The Sarawak Museum Journal

Vol. LXXIX No. 100

December 2018



ISSN: 0375-3050  
E-ISSN: 3036-0188

**Citation:** Gilang Fajar Ramadhan et. all (2018). Community Structure of Hornbills in and Oil Palm Landscape in East Kalimantan, Indonesia. The Sarawak Museum Journal, LXXIX (100) : 147-158

## COMMUNITY STRUCTURE OF HORNBILLS IN AN OIL PALM LANDSCAPE IN EAST KALIMANTAN, INDONESIA

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### ABSTRACT

Conserved land in human dominated landscapes such as oil palm plantations provide habitat for many animal taxa including hornbills. The aim of the study is to quantify species richness, distribution, population size and sex ratio of hornbill community in oil palm landscapes with retained native forest patches. Ecological sampling was conducted in an oil palm plantation in East Kalimantan, Indonesia. Birds were observed using fixed radius point count method. We found that there were six hornbill species belonging to four genera of Bucerotidae including Helmeted Hornbill, Rhinoceros Hornbill, Wreathed Hornbill, Wrinkled Hornbill, Black Hornbill and Oriental Pied Hornbill that occurred in the study site. Population density varied among species ranging from 0.17 to 4.72 individual per km<sup>2</sup> in 2012 and 0.34 to 3.35 individual per km<sup>2</sup> in 2013. Rhinoceros Hornbill was the most abundant species observed in one location with highest number of individual per group of about 21 individuals during flocking. Sex ratio (M:F) was ranged from 0.31 to 0.95. The dispersion of hornbill species was generally random. Our results show that retention of forest patches on oil palm plantations can help to maintain the diversity and abundance of hornbills in the region.

**Keywords:** Hornbill, population, conservation



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## Abstract

Conserved land in human dominated landscapes such as oil palm plantations provide habitat for many animal taxa including hornbills. The aim of the study is to quantify species richness, distribution, population size and sex ratio of hornbill community in oil palm landscapes with retained native forest patches. Ecological sampling was conducted in an oil palm plantation in East Kalimantan, Indonesia. Birds were observed using fixed radius point count method. We found that there were six hornbill species belonging to four genera of Bucerotidae including Helmeted Hornbill, Rhinoceros Hornbill, Wreathed Hornbill, Wrinkled Hornbill, Black Hornbill and Oriental Pied Hornbill that occurred in the study site. Population density varied among species ranging from 0.17 to 4.72 individual per km<sup>2</sup> in 2012 and 0.34 to 3.35 individual per km<sup>2</sup> in 2013. Rhinoceros Hornbill was the most abundant species observed in one location with highest number of individual per group of about 21 individuals during flocking. Sex ratio (M:F) was ranged from 0.31 to 0.95. The dispersion of hornbill species was generally random. Our results show that retention of forest patches on oil palm plantations can help to maintain the diversity and abundance of hornbills in the region.

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## INTRODUCTION

In Indonesia, hornbill species are scattered from the outer islands at the southern tip of Aceh to the smallest islands in the area of West Papua. Poonswad *et al.* (2013) recorded nine hornbill species present in Sumatra including Bushy-crested Hornbill (*Anorrhinus galeritus*), White-crowned Hornbill (*Berenicornis comatus*), Wrinkled Hornbill (*Aceros corrugatus*), Wreathed Hornbill (*Rhyticeros undulatus*), Black Hornbill (*Anthracoceros malayanus*), Oriental Pied Hornbill (*Anthracoceros albirostris*), Rhinoceros

Hornbill (*Buceros rhinoceros*), Helmeted Hornbill (*Rhinoplax vigil*) and Great Hornbill (*Buceros bicornis*). Four more are located in Sumba (Sumba Hornbill/*Rhyticeros everetti*), Sulawesi (Knobbed Hornbill/*Aceros cassidix* and Sulawesi Hornbill/*Penelopides exarhatus*), and Papua (Blyth's Hornbill/*Rhyticeros plicatus*).

Kalimantan is the most important home for many hornbill species, but fewer studies were conducted to look at their distribution and status. Information on population density was only reported in two locations of protected forests in Kalimantan (Leighton 1982; McConkey & Chivers 2004). Some species may interact with surrounding habitats which are dominated by human activities, such as oil palm plantations. Patches of natural ecosystem may also exist in the oil palm concessions and can be a home to many threatened species including hornbill (Hadiprakarsa *et al.* 2007). However, no study has ever been conducted to evaluate the value of forest patches for the conservation of hornbill species.

Development of oil palm plantations in Indonesia is frequently associated with declining biodiversity (Koh & Wilcove 2007; Koh 2008; Yaap *et al.* 2010; Koh *et al.* 2011; Foster *et al.* 2011). However, research mostly focused on comparing biodiversity in oil palm plantation and natural habitats, and convincing that oil palm plantation only support less biodiversity. Conservation of the remaining biodiversity at local level should consider the ecological dynamic at the landscape level and how species adapt, react, and using the existing mosaic. Unfortunately, oil palm plantations are frequently seen as a single habitat with uniform tree species and shape, which have much less complex structure (see Yaap *et al.* 2010), but not seen as a landscape that may contain a mosaic. It can be expected that conservation measures in oil palm plantation mostly focus on the improvement of the plantation for biodiversity (Yaap *et al.* 2010).

The aim of the study is to investigate the value of forest fragments distributed inside oil palm landscape for the conservation of hornbill species. This study is focused on determining the species diversity, population size, and dispersion pattern of hornbill community. The ultimate goal of the study is to recommend strategies for oil palm growers to assist in the protection of hornbill population through sustainable conservation efforts of the remaining forest patches in their concessions.