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FUTURE OUTLOOK OF BUILDING INDONESIA NATIONAL HORNBILL MONITORING PROTOCOL

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ABSTRACT

Hornbills (Bucerotidae) are endangered bird species and current trade issues become major threats which surpass the information available on hornbill population. Differences in survey protocol from various regions in Indonesia may lead to acquisition of low quality data. Using Distance Sampling data from Sumatra and Sulawesi gathered from various projects, we examined different protocols for hornbill population estimation. The results demonstrated that most of hornbill species are distributed in the undisturbed forests of protected areas. The higher the efforts of the survey, the more observations are obtained. Density estimations were similar for Sumatran species except for the Rhinoceros Hornbill. Density estimation for Sulawesi hornbills was inconsistent, probably due to difference in site (mainland versus island). Line transect seemed more effective to achieve detections compared to point count suggest that detection at initial location may be violated in point count. These results suggested that understanding distance sampling is important in standardising protocols. Additionally, improvement on detections and hornbill identification is needed. Thus, training is crucial to ensure that a national hornbill monitoring protocol can be established and applied throughout Indonesia.

Keywords: Hornbills, Sumatra, Sulawesi, line-transect methods, point count method, monitoring protocol

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Hornbills (Bucerotidae) are endangered bird species and current trade issues become major threats which surpass the information available on hornbill population. Differences in survey protocol from various regions in Indonesia may lead to acquisition of low quality data. Using Distance Sampling data from Sumatra and Sulawesi gathered from various projects, we examined different protocols for hornbill population estimation. The results demonstrated that most of hornbill species are distributed in the undisturbed forests of protected areas. The higher the efforts of the survey, the more observations are obtained. Density estimations were similar for Sumatran species except for the Rhinoceros Hornbill. Density estimation for Sulawesi hornbills was inconsistent, probably due to difference in site (mainland versus island). Line transect seemed more effective to achieve detections compared to point count suggest that detection at initial location may be violated in point count. These results suggested that understanding distance sampling is important in standardising protocols. Additionally, improvement on detections and hornbill identification is needed. Thus, training is crucial to ensure that a national hornbill monitoring protocol can be established and applied throughout Indonesia.

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INTRODUCTION

Hornbills are large birds with black base colour, and the flutter of wings for some species produce loud sounds that can be detected far away. Hornbills usually have loud calls which are different for each species.

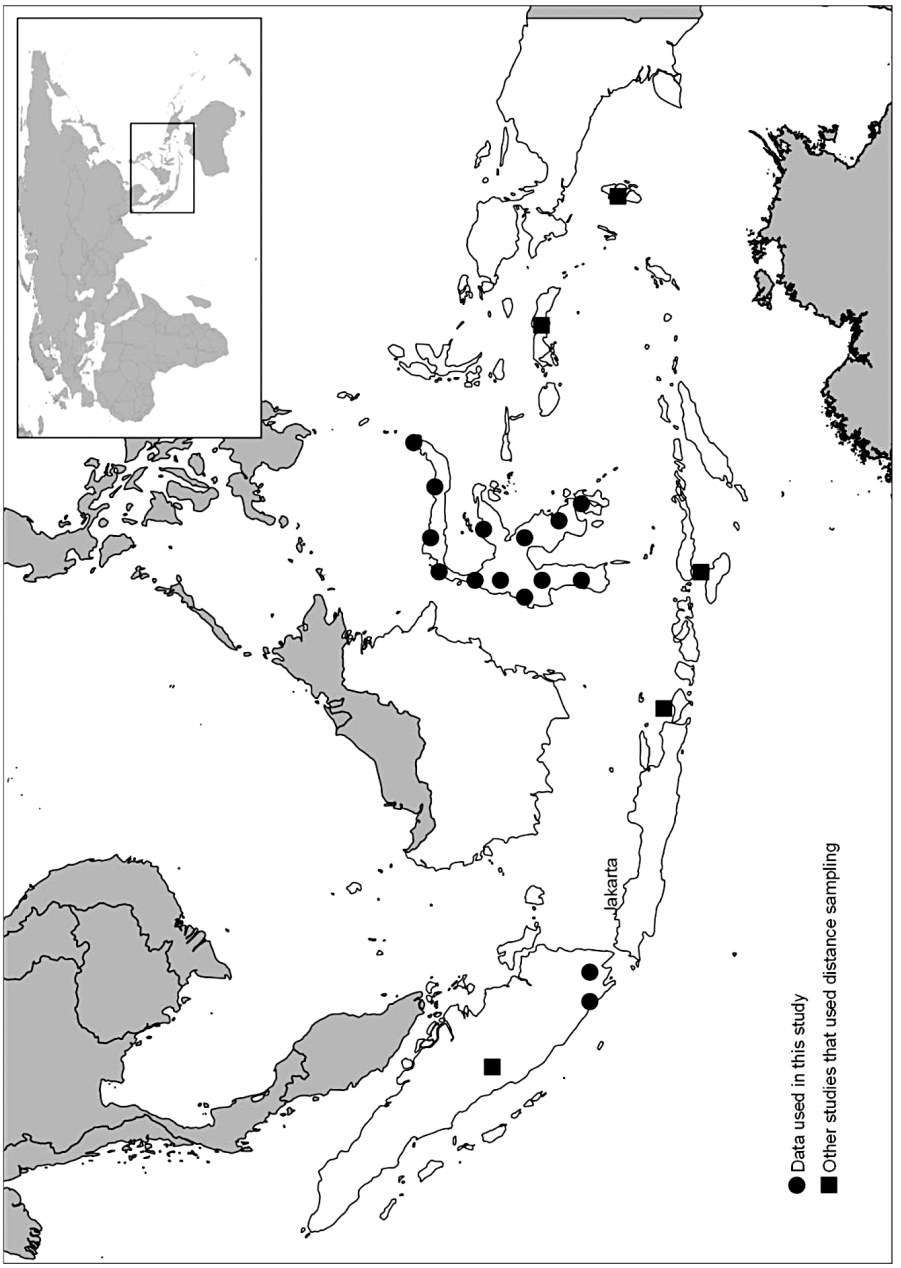

Fig. 1: Distance sampling studies that have been carried out in Indonesia and data used in this study.

Hornbills are adorned with casques on their heads with shapes and colours that are quite different for each species. Conducting wildlife monitoring programme is sometimes not easy because many species are present at low densities, unevenly distributed, or have a high mobility (Marsden 1999). There are 13 hornbill species in Indonesia, each with different morphologies making them relatively easy to identify in the field.

The majestic characteristics of hornbill, however also created the high demand in hunting and trade. In Borneo, trophies of at least two hornbill species, the Helmeted hornbill (*Rhinoplax vigil*) and the Rhinoceros Hornbill (*Buceros rhinoceros*) are frequently used in traditional ceremonies, costumes, and dancing (Kemp 1995; see also Bennett *et al.* 1997). For the last five years, hornbills' ivory trade of the Helmeted Hornbill becomes headline news. Surveys in West Kalimantan in 2013 suggested that hunters tracked the fruiting figs and that there were 10–30 hornbills hunted per trip/group resulting in 500 hornbillls hunted per month (Hadiprakarsa 2016). Although there are downward trends in population, there are no updates on population estimates due to the limited long-term monitoring of hornbills available in Indonesia.

Distance sampling with point count and line transect methods have been carried out in Indonesia (Fig. 1). Anggraini *et al.* (2000) analysed population fluctuation of hornbill using line transect. However, the protocol was initiated for large mammals (O'Brien *et al.* 2003) and have been used for other species such as Great Argus pheasant (*Argusianus argus*) (Winarni *et al.* 2009). Line transect was also used for Sulawesi birds (Riley & Mole 2001) and for Sulawesi hornbills (Kinnaird *et al.* 1996). Point count method was usually designed for birds in general (Marsden 1998; Trainor 2007) although analysis on Sulawesi hornbills was also conducted (Winarni & Jones 2012). Marsden (1999) reviewed point count methods for hornbill from his research in Sumba, Buru, and Seram particularly for Sumba Hornbill (*Rhyticeros everetti*) and Papuan Hornbill (*Rhyticeros plicatus*).

Due to the differences in protocol, an appropriate monitoring protocol for hornbill is needed. In this study, we compared and reviewed both distance sampling techniques, the line transect and point count methods for hornbill monitoring and investigated the best practices to establish a national hornbill monitoring protocol. A sound monitoring program is needed to verify the distribution and health condition of bird populations, including its habitat.