

## Camera trapping of terrestrial animals in Tanjung Datu National Park, Sarawak, Borneo

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**Abstract.** Information on distribution is useful for determining global conservation status of species and for prescribing sound management practices for taxa of conservation importance. Therefore, an attempt to understand the distribution of terrestrial animals using infra-red camera traps in Tanjung Datu National Park, Borneo, was carried out from July 2013 to October 2015 (28 months). A total of 23 camera locations set in various microhabitats and elevations accumulated 2,490 camera days, which resulted in 1,189 independent animal images comprised of 21 mammals, two birds, and one reptile species. The cameras revealed a total of 20 medium to large mammals (excluding treeshrews & small rodents), with the most common species photographed being the pig-tailed macaque (independent images  $n = 278$ ) and bearded pig (271), while the masked palm civet (1) and Sunda pangolin (1) were only represented by singletons. Most of the common species are listed as Protected (33.64%) in the Sarawak Wild Life Protection Ordinance 1998, while 2.02% species have Totally Protected status. Less than 1% of the species are considered Critically Endangered and Endangered, 3.57% are considered Near Threatened, and 74.3% are considered Vulnerable under the IUCN Red List of Threatened Species. In addition, this survey has provided detailed information on activity patterns of some cryptic species. The absence of larger carnivores suggests that species such as the Sunda clouded leopard and Bornean sun bear may have been extirpated from this small, isolated, and fragmented protected area. We emphasise that regular monitoring of wildlife in National Parks should not be neglected, especially when the surrounding area is experiencing accelerated and unprecedented rates of habitat conversion.

**Key words.** activity pattern, biodiversity conservation, independent images, protected area, regular monitoring, wildlife survey

### INTRODUCTION

Southeast Asia is one of the biodiversity hotspots of the world, representing the rich tropical rainforest. The state of Sarawak, in Malaysian Borneo, has one of the most extensive protected area networks in Malaysia where it now contains remnants of what were once some of the most diverse and continuous mature rainforest in the world (Mohd-Azlan & Lawes, 2012). Currently there are approximately 941,801.4 ha of protected land areas and water bodies in Sarawak, consisting of 37 national parks, 14 nature reserves, and five wildlife sanctuaries. These are the final frontiers in defense to protect Sarawak's biodiversity and prevent extinction. With

protected areas being fragmented and isolated, the ability of species to persist is of concern especially when surrounding areas are facing accelerated land conversion to agriculture, agro-forestry, and urban development (Froese et al., 2015; Sawada et al., 2015). In view of this, understanding species occurrence and distribution in protected areas is important for formulating sound management, addressing potential threats, and prescribing conservation strategies (Tempa et al., 2011; Bernard et al., 2013; Gandiwa et al., 2014). Continued monitoring is important and will provide critical information on where native species and threats occur, so that better management and conservation intervention may be implemented to avoid species extinction and changes to ecosystem structure and dynamics (Tempa et al., 2011). However, most cryptic and nocturnal mammals avoid open and disturbed sites and thus are not easily observed through conventional sampling methods. In addition to that, dense tropical rainforest with difficult terrain and remote survey areas may impede continuous monitoring of wildlife activities in Borneo (Mohd-Azlan, 2009; Mathai et al., 2013). Camera trapping is a good alternative to monitor wildlife in tropical rainforests and can be more effective than conventional surveys (e.g., line transects and visual sampling), which can be affected by the level of observer experience (Silveira et al., 2003; Mathai et al., 2013). Camera trapping is an effective and useful tool in monitoring and inventorying elusive, cryptic, and rare animals in the tropics (Mendoza et al.,

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