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SEASONAL VARIATION IN HORNBILL DENSITIES IN COFFEE PLANTATIONS IN THE ANAMALAI HILLS, WESTERN GHATS, INDIA

Pooja Y. Pawar^{1,2*}, Rohit Naniwadekar², T.R. Shankar Raman² and Divya Mudappa²

¹Post-Graduate Programme in Wildlife Biology and Conservation, Wildlife Conservation Society-India, National Centre for Biological Sciences, GKVK Campus, Bangalore 560 065, Karnataka, India

²Nature Conservation Foundation, 1311 'Amritha' 12th A Main, Vijayanagar 1st Stage, Mysuru 570017, India

*Corresponding author. Email: pooja@ncf-india.org

ABSTRACT

Hornbill habitats are shrinking across their distribution ranges. Geographic spread and small sizes of most protected areas are not sufficient to conserve hornbill populations. Human-modified habitats adjoining protected areas could potentially hold hornbill populations depending upon the proximity to the forest, nature of land-use and structural complexity of the modified habitat. An assessment of the use and suitability of modified habitats can inform hornbill conservation beyond conventional protected areas. This study estimated and compared hornbill densities in pre- and post-nesting seasons using point-transect surveys in coffee plantations in the Anamalai Hills, Western Ghats, India. Overall Great Hornbill (GH) density was 31 ± 7.7 (mean \pm SE) individuals/km. Malabar Grey Hornbill (MGH) density was 56 ± 11.2 (mean \pm SE) individuals/km². These may, however, be overestimates because of the point count survey method used. Our study shows that coffee plantations adjacent to protected areas have a large potential to support hornbill populations and species conservation.

Keywords:



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Pooja Y. Pawar^{1, 2*}, Rohit Naniwadekar²,
T.R. Shankar Raman² and Divya Mudappa²

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Wildlife Conservation Society-India, National Centre for Biological Sciences,
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Abstract

Hornbill habitats are shrinking across their distribution ranges. Geographic spread and small sizes of most protected areas are not sufficient to conserve hornbill populations. Human-modified habitats adjoining protected areas could potentially hold hornbill populations depending upon the proximity to the forest, nature of land-use and structural complexity of the modified habitat. An assessment of the use and suitability of modified habitats can inform hornbill conservation beyond conventional protected areas. This study estimated and compared hornbill densities in pre- and post-nesting seasons using point-transect surveys in coffee plantations in the Anamalai Hills, Western Ghats, India. Overall Great Hornbill (GH) density was 31 ± 7.7 (mean \pm SE) individuals/km². Malabar Grey Hornbill (MGH) density was 56 ± 11.2 (mean \pm SE) individuals/km². These may, however, be overestimates because of the point count survey method used. Our study shows that coffee plantations adjacent to protected areas have a large potential to support hornbill populations and species conservation.

INTRODUCTION

Hornbills are flagship birds of Asian tropical rainforests. Their specialised nesting requirements and diet make them vulnerable to large scale habitat modification (Kemp 2001). Across hornbill distribution ranges, increasing landscape modification has led to shrinkage of habitats and their modification under human land uses (Kinnaird & O'Brien 2007). The modified habitats alter the nest and fruit availability thereby affecting the abundance of hornbills (Marsden & Pilgrim 2003; McConkey & Chivers 2004; Datta 1998). Anthropogenic threats like selective logging result in progressive degradation of

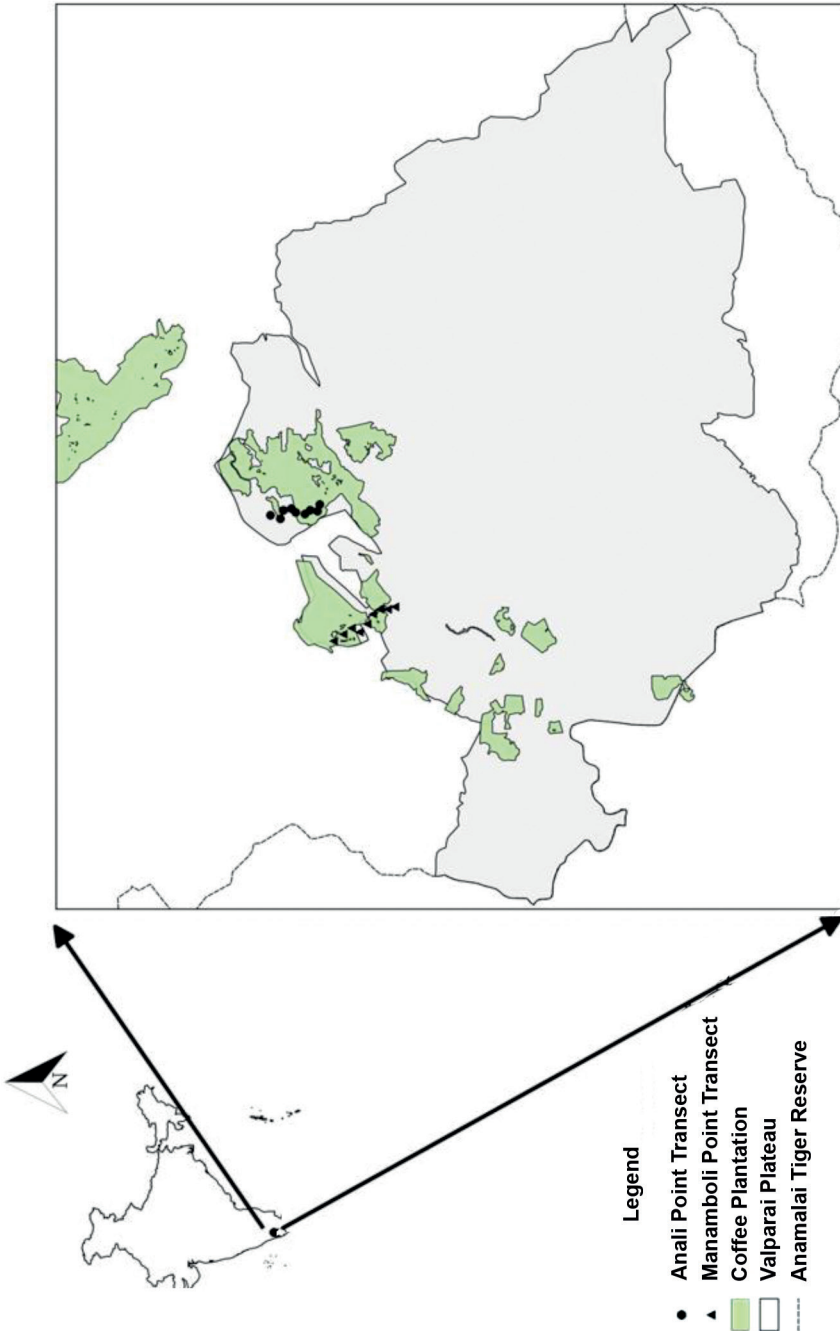


Fig. 1: Map of study area showing point transect locations in Anali (circles) and Manamboli (triangles) coffee plantation trails in the Valparai Plateau, Western Ghats, India.

hornbill habitats affecting fruit availability (Naniwadekar *et al.* 2015) and nest tree availability (Datta & Rawat 2004). Expansion of commercial plantations also alters structure and composition of hornbill habitats. However, hornbills are known to occupy relatively degraded habitats adjoining protected forest areas. To extend hornbill conservation beyond protected areas, it is crucial to assess the potential of such modified habitats and their use by hornbill populations.

In India, earlier studies have focused on mapping hornbill distribution and abundance inside protected areas, compared with non-protected areas such as degraded forests and rainforest fragments (Raman & Mudappa 2003; Naniwadekar & Datta 2013; Naniwadekar *et al.* 2015). However, hornbill abundances in commercial plantations remain poorly studied across their distribution range. The present study was carried out to estimate densities of the Great Hornbill (*Buceros bicornis*, GH) and Malabar Grey Hornbill (*Ocyrceros griseus*, MGH) in coffee plantations and compare hornbill abundances before and after the nesting season.

STUDY AREA

The study area, Valparai Plateau, is located in the Anamalai hills in South India. The Valparai plateau (10.26°–10.37° N and 76.87°–76.99° E) is a 220 km² mosaic of commercial plantations and rainforest fragments in the Anamalai Hills (Fig. 1). The plantations include tea (*Camellia sinensis*), coffee (*Coffea arabica* and *C. canephora*), cardamom (*Elettaria cardamomum*), and *Eucalyptus* spp. along with human settlements. Tea is the most dominant plantation, followed by coffee and eucalyptus. Over 40 tropical wet evergreen forest (rainforest) fragments of varying sizes (0.5 ha to 300 ha) are interspersed within this plantation landscape (Raman & Mudappa 2003). The study area is surrounded by protected areas that include the Anamalai Tiger Reserve in Tamil Nadu state, Parambikulam Tiger Reserve and Vazhachal and Sholayar Reserved Forests in Kerala state. The elevation of the Valparai Plateau ranges between 600 m and 1,500 m above mean sea level. The natural vegetation of the plateau is classified as the mid-elevation (700–1,400 m) tropical wet evergreen forest of the *Cullenia exarillata*–*Mesua ferrea*–*Palaquium ellipticum* type (Pascal 1988).

In this study, we estimated hornbill densities within two coffee plantations adjoining continuous rainforests and rainforest fragments – Anali (owned by Tata Coffee Limited and Senthil Estates; 76.89114 E, 10.35638 N) and Manamboli (owned by The Savamalai Estates Limited; 76.89743 E, 10.35007 N) – in