Abundance estimates of the Rufous-necked Hornbill *Aceros nipalensis*, and characterisation of a montane subtropical forest in the Indian Eastern Himalaya

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Abstract

The Rufous-necked Hornbill *Aceros nipalensis* is a globally threatened species with limited information available on its natural history and ecology across its range in South- and South-east Asia. Within India, it is among the most endangered and one of the least studied hornbill species. We report densities of the Rufous-necked Hornbill at a subtropical montane forest site in western Arunachal Pradesh. The estimated densities were found to be fairly high (6.12 birds/km^2) and similar to estimates from other sites in India. We characterised the vegetation composition, overall tree density, and food plant density in the subtropical forest habitat.

Introduction

Most hornbill species found in the tropical forests of Asia are known to be highly frugivorous and play an important functional role as seed dispersers, especially of large-seeded fruiting plants (Kannan & James 1999; Datta 2001; Kitamura *et al.* 2004; Kinnaird & O'Brien 2007; Kitamura *et al.* 2011; Naniwadekar 2014). Among the 32 Asian hornbill species (Poonswad *et al.* 2013), 12 are listed as Vulnerable, Endangered, and/or Critically Endangered. One of the species listed as Vulnerable by the IUCN (BirdLife International 2012) is the Rufous-necked Hornbill *Aceros nipalensis*. Its population is fast disappearing across much of its global range (Poonswad *et al.* 1998; BirdLife International 2016; Trisurat *et al.* 2013). The Rufous-necked Hornbill (hereinafter, RNH) **[120]** is restricted to hill evergreen forests in Bhutan, parts of north-eastern India in South Asia, northern Myanmar, southern China, western- and northern Thailand, northern Laos, and north-western Vietnam in mainland South-east Asia. It is reportedly extinct from Nepal and close to extinction in Vietnam (Poonswad *et al.* 2013). The global population for this species is estimated to be more than 2500 but less than 10,000 birds (Poonswad *et al.* 2013).

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120. Male Rufous-necked Hornbill.

Much of what we know of the ecology of the RNH is from long-term studies in Thailand (Chimchome *et al.* 1998; Ouithavon *et al.* 2005; Tifong *et al.* 2007; Jornburom *et al.* 2010; Jinamoy *et al.* 2013; Thongsikem *et al.* 2014), and a few studies in eastern Arunachal Pradesh (Datta 2009; Naniwadekar & Datta 2013; Naniwadekar 2014; Naniwadekar *et al.* 2015a, b, c).

It is a species that is found in a limited elevational range (500–2000 m asl) in hill evergreen forests, although it is sympatric with several other hornbill species like the Wreathed Hornbill *Rhyticeros undulatus*, Great Hornbill *Buceros bicornis*, Austen's Brown Hornbill *Anorrhinus austeni*, and Plain-pouched Hornbill *R. subruficollis* in some parts of its range (Jornburom *et al.* 2010). Past studies on the feeding ecology of the RNH have found that fruits comprise more than 95% of its diet (Ouithavon *et al.* 2005; Naniwadekar *et al.* 2015c), most of which is made up of non-fig fruits.

Within India, it is restricted to the Eastern Himalaya, mainly in northern West Bengal, and Arunachal Pradesh. It also occurs, to a lesser extent, in isolated hilly areas in Assam, Nagaland, and Mizoram (Naniwadekar *et al.* 2016). From recent surveys, it appears that reasonably good populations of the RNH are mainly in Arunachal Pradesh (Naniwadekar *et al.* 2015a,c). More detailed information on RNH populations in India is available only from the Namdapha Tiger Reserve and surrounding forests in eastern Arunachal Pradesh (Datta 2009; Naniwadekar & Datta 2013; Naniwadekar 2014; Naniwadekar *et al.* 2015b). In Namdapha, the Wreathed Hornbill, Great Hornbill, and Brown Hornbill co-occur with the Rufous-necked Hornbill in mid-elevation forests

(500–800 m), however, the Wreathed Hornbill moves out of these mid-elevation forests in the breeding season (Naniwadekar & Datta 2013).

Hunting is a major threat to wildlife in Arunachal Pradesh (Aiyadurai *et al.* 2010), particularly that of hornbills (Datta 2009; Naniwadekar *et al.* 2015a). Since the other preferred target of hunters, the Great Hornbill, does not occur at elevations above 1000 m in Arunachal, the Rufous-necked is the main target of hunters at these elevations (Datta 2009). In addition, although human population densities are relatively low, Arunachal now has the highest decadal population growth rate (Census of India 2011), and forests in the state are likely to be negatively affected by numerous proposed developmental activities like dams, road-building (Vagholikar & Das 2010), and the expansion of cash crop plantations.

56% of the forest area of the state is community-owned, which has higher levels of human use and activity (FSI 2015). An earlier study in eastern Arunachal Pradesh has shown that densities of RNH are lower outside protected areas than inside them (Naniwadekar *et al.* 2015a). Only 18% of the forested areas in the state are protected areas, with a handful of sites harbouring the RNH (Naniwadekar *et al.* 2015a).

The RNH is classified as 'Vulnerable' by the IUCN (BirdLife International 2016), and is listed under Appendix I and II of CITES, while in India, it is listed as a Schedule I species (highest level of legal protection) under The Indian Wildlife (Protection) Act, 1972 (Anonymous 1972). IUCN's Red List classification is based on observed/estimate/inferred reduction in population and on projected reductions over the next ten years. Published information on its abundance is available only from three sites, one in India (Naniwadekar & Datta 2013), and two in Thailand (Jornburom *et al.* 2010; Jinamoy *et al.* 2013). The need for reliable estimates of abundance of threatened species from at least some of the important sites in a species' geographic range has most recently been highlighted due to the escalating threat to the global population of the Helmeted Hornbill *Rhinoplax vigil* (Hii 2015; Sadler 2015), which is being killed in large numbers for trade in its body parts. Such studies on abundance act as important baseline data for monitoring future trends in population.

In this study, we aimed to determine the status of the RNH in a subtropical montane forest in western Arunachal Pradesh by estimating its density across seasons. We characterised the vegetation composition, tree density, and forest structure of the montane habitat of the RNH. We also obtained a preliminary understanding of the patterns in fruit availability through phenology monitoring, and obtained some information on food plant species of the RNH.

Methods

Study area

The study was carried out in the Eaglenest Wildlife Sanctuary (hereinafter, EWS; 218 sq. km; 27.00°N–27.11°N, 92.02°E–92.58°E), which is located in West Kameng District in western Arunachal Pradesh state. EWS spans an elevation gradient from 500 to 3300 m (Choudhury 2003) and includes a diversity of habitat types from tropical semi-evergreen, sub-tropical, temperate broad-leaved, and conifer forests (Champion & Seth 1968) **[121]**. This area is within the Eastern Himalaya global biodiversity hotspot (Mittermeier *et al.* 2004). EWS is located close to Sessa Wildlife Sanctuary and Pakke Tiger Reserve (hereinafter, PTR), and together they form a large contiguous

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121. A view of the subtropical forest at Sessni.

patch of around 1200 sq. km., of protected forest. EWS is also surrounded by the Reserved Forests of Doimara, and Amartala. EWS is well-known for its bird species richness (454 species) as it spans a wide altitudinal gradient (Choudhury 2003; Athreya 2006a). It is also famous for the discovery of a new bird species (Athreya 2006b). Apart from the Rufous-necked Hornbill, Great Hornbill, Wreathed Hornbill, and Oriental Pied Hornbill *Anthracoceros albirostris* also occur in the area, mainly in the lower elevations below 1000 m, although occasionally flocks of Wreathed Hornbill are seen in the higher areas in winter (non-breeding season).

We selected our intensive study site in such a way that it encompassed the main elevational gradient where the RNH is known to occur in EWS. Although it does occur in areas from 500 to 1000 m, those areas were out of bounds due to logistic problems and security concerns.

Our study was carried out from November 2013 till May 2014, within an elevational gradient of 1100–1800 m, in the forests around the Sessni camp (1230 m). The terrain in the Sessni area is quite steep, with narrow valleys surrounding the forest streams, making access difficult. Sessni is 50 km from Lama camp (the main entry point to the sanctuary, though the sanctuary boundary starts near Eaglenest Pass), and is accessed through a fair-weather unpaved road that is motorable mainly in the dry season. This road connects the entire sanctuary to Khellong in the lower elevations (Fig. 1). Access to the Sessni area becomes difficult during the monsoon.

November to February are the winter months, while the rains

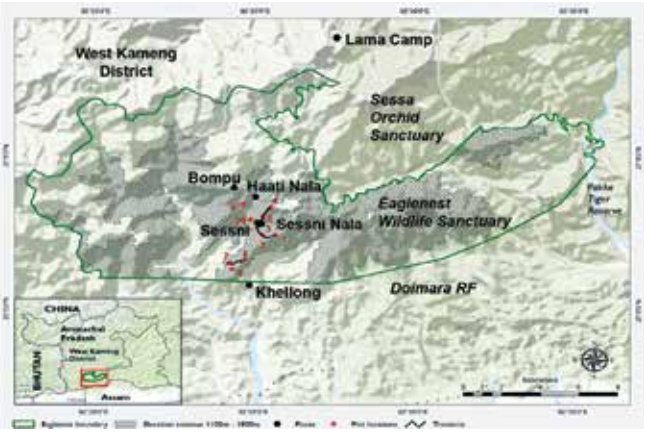

Fig. 1. Map of Eaglenest Wildlife Sanctuary, western Arunachal Pradesh showing intensive study site at Sessni, important forest camps and location of transects and vegetation plots.

start as early as late April and continue till September in this area. The average annual rainfall ranges from 1500 to 3000 mm. The early rains from end April to early May are also accompanied by heavy fog enveloping the hill slopes, making the lack of visibility a problem.

According to Choudhury (2003), the broadleaved subtropical forests between 800–1800 m in EWS are dominated by several oak, and three pine species. However no detailed published information on vegetation composition and structure is available for EWS.

Estimation of Rufous-necked Hornbill densities

To estimate RNH densities, we walked three transects (two trails of 1.5 km, and one trail of 1.2 km) in its non-breeding season, which is in the winter (November 2013–February 2014) and the summer or early part of the breeding season (March–May 2014). These three trails were walked 106 times from November to May: 71 times in winter, and 35 times in summer. The breeding season of the RNH is known to be from last week of April (female entry into nest cavity) to August (Datta 2009). The steep terrain, and narrow valleys, in the intensive study site made it difficult to create additional transects in the same elevation range. The three trails spanned an elevation range of 1100–1800 m.

We chose the variable-width line transect method (Buckland *et al.* 2001), since the point count method has been found to be unsuitable for rare species (Marsden 1999). Two or three observers walked each trail early in the morning. A single transect was walked in a day. We recorded the number of RNH seen, activity (whether it was feeding/perching/flying), and the perpendicular distance of the bird from the trail. If a flock was encountered on the transect, the perpendicular distance to the centre of the flock was noted. Although we noted calls, we excluded calls while estimating densities, for which we only used direct sightings.

The total effort spanned 99 km in winter, and 49.2 km in summer.

Vegetation

We established ten vegetation sampling plots of 0.25 ha (250 m x 10 m) each, totalling to 2.5 ha of sampling effort. We enumerated all trees with girth at breast height (hereinafter, GBH) ≥ 30 cm. We measured the GBH and height of all trees, and collected samples of unidentified individuals/tree species in the plots, and prepared a herbarium collection for identification.

We marked, and monitored, phenology for a total of 1139 individual trees in ten plots, between November 2013 and May 2014. The number of monitored trees changed across each month as more plots were marked and trees included from the new plots. We monitored the trees every fortnight and recorded the phenophases (flowering, fruiting, leafing) of all trees ≥ 30 cm GBH (Kannan & James 2007). Although information was recorded for all phenophases, we present only the fruiting phase data, as it is the most important aspect linked to hornbill abundance in the area. We calculated the proportion of trees in fruit based on the total number of marked trees that were monitored for that phenological monitoring period, which varied across the different monitoring periods. The plots were monitored between the 10th and 13th of the month, and on the 25th and 28th of the month. We could not monitor the trees in the second half of December (25–28), and February (25–28), and the first half of March 2014 (10–13).

Fig trees were not common in plots inside the forest, but were common along the Bompu–Sessni road, and along the main forest streams. To obtain a better estimate of fig abundance in the area, we counted individual fig trees in a 20 m strip width, 10 m on each side of a 5 km trail on the main road from Haathi nala to beyond Sessni camp with a total area of 10 ha sampled.

Foraging records

We obtained a few direct foraging observations during our transect walks and from *ad libitum* observations in the study area. We also used information from published studies to determine known food plant species that also occur in the study area, and potential food plant species that have fruit characteristics that are known to be consumed by RNH, and other frugivorous hornbill species at other forest sites (Ouithavon *et al.* 2005; Datta 2009; Naniwadekar *et al.* 2015c).

Data analysis

The density estimates were calculated using DISTANCE v6.2 (Thomas *et al.* 2010). We used only perching or feeding records (direct sightings) for calculating densities and excluded the records where we noted birds flying over the transects. However the flying records were included while estimating encounter rates. For density estimation, we followed the same method as Naniwadekar & Datta (2013) to enable comparisons between the two sites. We used standard, well-established, statistical procedures (Thomas *et al.* 2010) for estimating densities using distance sampling (Buckland *et al.* 2001). Since we had less than 40 detections in each of the two strata (summer and winter), we pooled the data to estimate detection probability and cluster size.

Results

Estimation of Rufous-necked Hornbill densities and encounter rates

We had a total of 59 independent sightings of 95 RNH individuals in 148.2 km of effort. These sightings of individuals on repeated transect walks are used to estimate density based on sampling and are not to be considered as total counts of birds as there is no way of recognising individual birds. Of these, 28 sightings were in summer, March–May (effort=49.2 km), and 31 sightings were in winter, November–February (effort=99 km). The average flock size was 1.6 (95% CI=1.4–1.8).

The mean encounter rate in summer was 0.52 (95% CI=0.3–0.9), which was higher than in winter (0.3; 95%

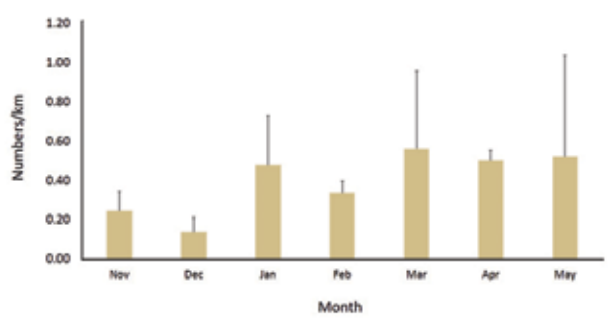

Fig. 2. Monthly encounter rates (± SE) of Rufous-necked Hornbill in Sessni area of Eaglenest WS, Arunachal Pradesh from November 2013 to May 2014.

CI=0.18–0.49) season. The number of hornbill sightings was very low from December to mid-January (Fig. 2). The numbers increased around the end of March, just before the onset of the breeding season. While there were fluctuations in encounter rates between the months, the 95% CIs on the mean encounter rates overlapped indicating the absence of significant differences in the encounter rates between the two seasons (Fig. 2).

The overall flock density of the RNH, across the trails and over the study duration, was 3.8 flocks/km^2 (95% CI=2.5–5.8) (Table 1). The overall individual density of the RNH was 6.12 birds/km^2 (95% CI=4–9.4). The mean individual density of the RNH was 1.7 times higher in the breeding season (mean: 8.6; 95% CI=4.8–15.2) as compared to the non-breeding season (estimate: 4.9; 95% CI=2.9–8.5) (Table 1).

Table 1. Density estimates of Rufous-necked Hornbill (flocks and/or birds per km^2) in the winter and summer season in the Sessni area of Eaglenest WS, Arunachal Pradesh. The study was conducted between November 2013 and May 2014.

	Estimate	% CV	df	95% Confidence Interval
Pooled Estimates				
Estimated flock density[1]	3.80	20.77	55.00	2.52 - 5.75
Overall individual RNH density	6.12	21.70	100.55	4.00 - 9.37
Winter season (November 2013–February 2014)				
Estimated flock density	3.05	27.22	55.00	1.79 - 5.22
Overall individual RNH density	4.91	27.93	100.55	2.85 - 8.45
Summer season (March–May 2014)				
Estimated flock density	5.33	29.04	55.00	3.01 - 9.42
Overall individual RNH density	8.56	29.71	100.55	4.81 - 15.24

Vegetation composition and fruiting phenology

We enumerated 1139 individual trees from the plots. Of these, we were able to identify 23 species comprising 427 individuals. 24 species could be identified only up to generic level, while three other species were identified only up to the family level. 93 individuals belonged to 31 unique species, though they were not identified, and 125 individuals remained unidentified.

Lauraceae was the most dominant plant family in the area with 29 species recorded in the plots. Other important plant families were Meliaceae (8 species), Fagaceae (4), and Myrtaceae (3). *Cryptocarya, Litsea, Castanopsis, Beilschmiedia, Syzygium*, and *Aglaia* were some of the most common genera found in the area.

The availability of ripe fruits appeared to increase towards the beginning of the breeding season (Fig. 3). Unripe fruits were recorded almost throughout the study period (Fig. 3). However, there was a drastic decline in the proportion of trees with unripe fruits after late March. This coincided with the heavy rainstorms that hit the area from late March to mid-April, which damaged a large proportion of the fruits on trees.

Tree densities and forest structure

The number of trees in each plot of 0.25 ha varied from 81 to 146. The overall tree density was 453 trees/ha (SE ± 24.79),

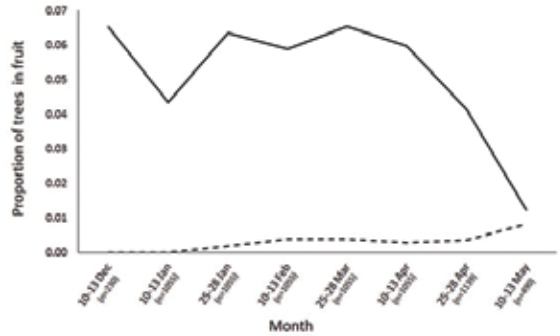

Fig. 3. Proportion of trees with unripe (solid line) and ripe (dashed line) fruits across months (November 2013-May 2014) in Sessni area of Eaglenest WS, Arunachal Pradesh.

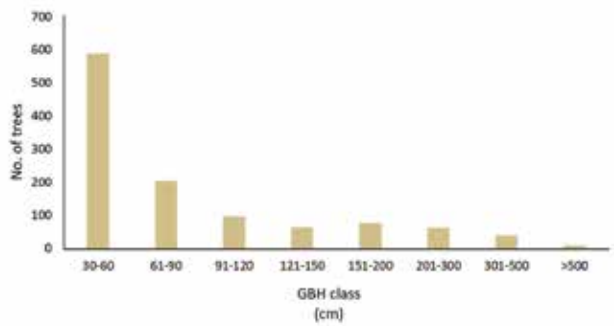

Fig. 4. Girth class distribution (GBH ≥ 30 cm) of individual trees measured across 10 vegetation plots in Sessni area (n=1139 trees).

which is lower than the tree density in the unlogged, low-elevation tropical forest in nearby PTR where tree density was 507 trees/ha (SE ± 19.3) (Datta & Goyal 2008).

The girth class distribution of trees in our plots was skewed towards younger individuals, with 73% in the smaller GBH classes below 100 cm (Fig. 4). The average GBH was 93.72 (SE ± 2.68 cm), ranging from 30 to over 700 cm. The basal area of the trees in the plots was 61.23 sq. m/ha, while the average tree height was 14.9 m (SE ± 0.22 m).

We identified a total of 27 species that are potential food plant species of RNH in our study area (Appendix 1). Of these, 17 species belonged to Lauraceae, three to *Ficus* (Moraceae), three to Meliaceae, three *Syzygium* species (Myrtaceae), and one *Canarium* species (Burseraceae). The overall food tree density varied between 0.4 and 24.4 trees/ha, except for a *Syzygium* species that had a density of 67.6 trees/ha.

We counted 98 individuals of *Ficus roxburghii*, and 11 individuals of *F. hirta* in 10 ha, which gives an estimated density of 10.9 fig trees/ha. However, inside the plots, fig densities were markedly lower (1.2 trees/ha).

Foraging observations and fruiting patterns of hornbill food plant species

On transects we recorded the RNH feeding on *Litsea salicifolia* **[122]** on 11 occasions between January and April 2014. Additionally, we also saw RNH feeding on/inspecting fruits of *Trichilia* sp., and *F. roxburghii* on three occasions, *Aglaia* sp., on two occasions, and *Beilschmiedia assamica* once. Ripe fruits of *Alseodaphne* sp., *Aglaia* sp., and *F. roxburghii* were also brought by a male RNH on a feeding visit to a nest that was observed between April and May 2014.

At the start of the nesting season in the third week of April, fruits

1 The 95% confidence interval (CI) expresses the degree of uncertainty associated with a sample statistic. If hornbill densities were estimated 100 times independently, 95 times the estimated mean (3.8 RNH flocks per km2) will lie between between 2.52 and 5.75 flocks per km2 The Coefficient of variation (CV) is a measure of variability around the mean. It is a useful measure to compare if the variability around the different estimated means is similar or different. In this case, the variability around the mean is similar between the two seasons (27% in winter and 29% in summer).

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122. Fruits of *Litsea salicifolia*.

of *F. roxburghii* were ripening on trees along the main road and along the main streams (Haathi and Sessni *nala*, see Fig. 1).

Discussion

Our density estimates for EWS are similar to those obtained at Namdapha, which was 6.9 birds/sq. km (Naniwadekar & Datta 2013). With a potential habitat of 100 sq. km. (see Fig. 1, shaded region) in EWS, between 1100–1800 m and additional habitat in the elevational range between 500 and 1100 m, which we did not sample, EWS appears to have a fairly good population of RNH. Based on the few current available estimates of its population from two sites in Thailand (Jornburom *et al.* 2010; Jinamoy *et al.* 2013), and another site in eastern Arunachal Pradesh as cited above, this is possibly one of the few places globally to have a high density of RNH. Following the suggestion of Naniwadekar & Datta (2013), we consider that the global estimates of RNH populations and its IUCN status may need revision.

Of the total of about 9,500 sq. km of forests classified as Protected Areas (PAs) in Arunachal Pradesh, only a handful of them have potential RNH habitat. The potential area adds up to less than 2500 sq. km. It would be useful if future studies can estimate densities of this species in some of the other important Protected Area sites within its range in India, such as the Neora Valley Wildlife Sanctuary, Mahananda Wildlife Sanctuary, and Buxa Tiger Reserve in northern West Bengal; higher areas of PTR, Mouling National Park, Kamlang Wildlife Sanctuary, Mehao Wildlife Sanctuary, and Tale Wildlife Sanctuary in Arunachal Pradesh; Murlen- and Lengteng Wildlife Sanctuary in Mizoram, and Fakim Wildlife Sanctuary, and the Saramati landscape in Nagaland; besides sites in Bhutan, and Myanmar, to determine its current population status.

The encounter rates varied dramatically between the non-breeding and breeding season, with a decline in numbers seen from end-November to early January. This is in contrast to the findings of RNH numbers in the mid-elevation forests (500–800 m) of Namdapha, which did not fluctuate much between months (Naniwadekar & Datta 2013). These differences in RNH numbers may be either related to elevational, or site differences in local fruit availability patterns and is an interesting question to explore further in future studies.

Our observations on foraging by RNH suggest that the availability of ripe fruits might be a contributing factor to the abundance of these birds in the study area. We had very few sightings of the RNH from end of November, when the fruiting of *Trichilia* was over, till mid-January when only semi-ripe *Litsea salicifolia* drupes were available. The general trend from our phenology monitoring suggests an upward trend in ripe fruit availability from late April to early May that coincided with the onset of the breeding season of the RNH. However, we could not monitor the patterns in ripe fruit availability for the whole year.

The overall tree density was fairly high, and only slightly lower than that of the adjoining lower-elevation forest of PTR. Fruits of Lauraceae and Meliaceae are known to be important food resources for hornbills and other avian frugivores (Datta 1998; Datta & Rawat 2008), and these were found to be in fairly high numbers in our plots. In fact, most of the genera or species recorded in our plots are animal-dispersed, which is similar to other tropical forests in South-east Asia where about 80–90% of trees are known to be animal-dispersed. Based on the observed fruit colour and fruit type of the tree species in our study site, there appear to be more bird-dispersed tree species than mammal-dispersed tree species.

The RNH occurs mainly in the higher elevations (500–2000 m); and it occurs sympatrically with up to three to four other hornbill species in some areas like Namdapha. However, in areas higher than 1000 m, it is usually the only resident hornbill species apart from the semi-nomadic Wreathed Hornbill, which seasonally visits mid- to high-elevation forests in Arunachal Pradesh (Naniwadekar & Datta 2013). Therefore in the higher areas, hunting pressures on this species remains high (Datta 2009). The Great- and Brown Hornbills, which are found more in low-elevation forests, have lost substantial areas of their forest habitat due to expansion of human settlements, agriculture, and cash crop plantations in the lowland and foothill forests.

Habitat loss due to agricultural expansion, cash crop plantations, logging and urbanisation, till now, has been lower in the higher elevation forest habitat of the RNH. It is more likely that hunting is the primary threat to the species, at least in Arunachal Pradesh. However, with the proposed construction of over 160 mega-dams and road-building across the state (Dutta 2010; Vagholikar 2011; Pandit & Grumbine 2012) and the planned expansion of cash crop plantations, this is likely to change as these developments are likely to affect the montane habitat of the RNH, especially in western Arunachal Pradesh. Given the increasing pressures of human activities on hornbills and their habitats globally, it is crucial to have some quantitative information on their populations from at least a few key sites. Unfortunately for most hornbill species and sites there is little ecological data, barring the few sites where long-term studies have been carried out. Considering this scenario, even preliminary information on abundance, habitat characteristics, and natural history of this species, from baseline studies such as this one can contribute to filling the gap in our understanding of the ecology of this species.

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Appendix 1. Potential food plants of Rufous-necked hornbill identified in Sessni area of EWS and their tree densities.

No.	Family	Tree species	Density (trees/ha)
1	Myrtaceae	*Syzygium* sp.1	67.6
2	Myrtaceae	*Syzygium* sp. 2	4.8
3	Myrtaceae	*Syzygium formosum*	2
4	Lauraceae	*Phoebe* sp. 1	1.2
5	Lauraceae	*Phoebe* sp. 2	3.2
6	Lauraceae	*Phoebe paniculata/cooperiana*	16
7	Lauraceae	*Persea* sp.	12.8
8	Lauraceae	*Machilus* sp.	3.2
9	Lauraceae	*Cryptocarya amygdalina*	24.4
10	Lauraceae	*Cryptocarya andersonii*	16
11	Lauraceae	*Litsea messnei*	6.4
12	Meliaceae	*Aglaia spectabilis*	14
13	Meliaceae	*Dysoxylum binectariferum*	3.2
14	Lauraceae	*Cinnamomum* sp.	2
15	Burseraceae	*Canarium* sp.	0.4
16	Lauraceae	*Beilschmiedia assamica*	2.4
17	Lauraceae	*Litsea salicifolia*	6.4
18	Lauraceae	*Beilschmiedia* sp. 2	1.2
19	Lauraceae	*Beilschmiedia* sp. 3	1.6
20	Lauraceae	*Litsea cubeba*	1.6
21	Lauraceae	*Litsea assamica*	0.4
22	Lauraceae	*Litsea khasyana*	1.2
23	Lauraceae	*Litsea lancifolia*	0.4
24	Moraceae	*Ficus roxburghii***	9.8
25	Moraceae	*Ficus hirta***	1.1
26	Meliaceae	*Trichilia* sp. **	NA
27	Meliaceae	*Aglaia* sp.**	NA

**species not found in vegetation plots.

Recent sighting of Grey-bellied Cuckoo *Cacomantis passerinus* in Hailakandi District, Assam

Amir Sohail Choudhury

Choudhury, A. S., 2016. Recent sighting of Grey-bellied Cuckoo *Cacomantis passerinus* in Hailakandi District, Assam. *Indian BIRDS* 12 (4&5): 134–135.
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The Grey-bellied Cuckoo *Cacomantis passerinus* is a rare species for Assam, and for north-eastern India. Ali & Ripley (1987) did not mention its occurrence in that state. Grimmett *et al.* (1999), and Kazmierczak (2000) show a few records from north-western Assam, but not from the other north-eastern states of India. Choudhury (2000, 2003a, 2006, 2007), and Barua & Sharma (1999) record its occurrence in Assam. Records from other regions of north-eastern India, and its neighbouring countries are: Meghalaya (Choudhury, 2014); Nagaland (Choudhury, 2001, 2003b); Sikkim, Bangladesh, Bhutan, and Nepal (Ali & Ripley, 1987; Grimmett *et al*, 1999; Kazmeirczak, 2000). But all these records of Assam were from the Brahmaputra Valley, i.e., the northern part of Assam, or from other north-eastern states. Here I report a sighting of the Grey-bellied Cuckoo, for the first time, from Hailakandi District of Barak Valley in the southern part of Assam.

The bird was seen on two occasions: on 14-, and 25 January 2016 in a semi-rural area of Hailakandi District (24.68ºN, 92.56ºS; 21m asl). The species was differentiated from the commoner Plaintive Cuckoo *C. merulinus* by its un barred greyish breast, which fades to a pale grey on its belly, and its white vent (ventral view). When it turned, and its dorsal side was visible, dark grey, and brown were clearly seen, as was the blackish tail with white tips. In the second sighting, apart from a grey chin, throat, breast, and whitish vent, its rectrices were clearly visible, with a slant white patch, and conspicuous white patches were seen at the base of primaries, in flight However, a picture was taken only at the time of first sighting, which unfortunately does not show most of these features; but the lack of contrast between head and back, as expected on Grey-bellied (*versus* Plaintive), is visible **[123]**.

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123. The Grey-bellied Cuckoo.