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# STATUS AND DISTRIBUTION OF FOUR SPECIES OF HORNBILLS FROM NORTH AND CENTRAL WESTERN GHAT—A REPORT

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## INTRODUCTION

The Western Ghats is one of the globally recognized "Hot Spots" for biodiversity in India (Mayers, 1990). It lies between 20° 12´ N in the north of Navpur or somewhat north of river Tapati and Kanyakumari (8° 06´ N, 77° 35´ E) in the south and spread over six states. The Western Ghats complex encompasses southern Gujarat, western Maharashtra, Goa, western Karnataka, Kerala and part of Tamil Nadu (Fig. 1). It is located between the Tropical African (Ethiopian) and the Indo-Malayan biogeographic regions. Physiographically the area is somewhat flattened or flat-topped range of hills rise from the Arabian Sea and runs more or less parallel with it. The major hill ranges are the Nilgiri, Annamalai, Palanis and Cardamom hills.

The Western Ghats, being an important part of the monsoon land, is typically characterized by the development of the luxuriant tropical rainforests. The vegetation is influenced more by the abundance of seasonal rainfall than atmospheric temperature. This important biogeographic zone offers most suitable niche to the avifauna and it contains about 59% of Indian forms. Out of which 3 genera and 4 species of hornbills inhabit in Western Ghats. Hornbill is a large bird with considerably huge curved bills surmounted by casque in most of the species. It harbours in the semi-evergreen forests. The avifauna of Western Ghats and South India was studied by Davison (1883), Dewar (1904), Ali (1942-43), Ali (1969), Ali and Ripley (1970), Nicholas (1937). In recent years the birds are studied by Mahabal and Vasanth (2001), Pande *et al* (2003). This report deals with the distribution and abundance of our species of hornbills namely Malabar Grey Hornbill, Indian Grey Hornbill, Malabar Pied Hornbill and Great Pied Hornbill (Family Bucerodidae) in some areas of Western Ghats.

## STUDY AREAS

Chatterjee (1940) classified the Western Ghats in four broad phytogeographic regions. The regions are (i) River Tapti to Goa; (ii) River Kalinadi to Coorg; (iii) the Nilgiris; (iv) The Anamalai, Palanis and Cardomum hills. The present studies on hornbills were carried out in two regions—(i) River Tapti to Goa, covering southern Gujarat, parts of Maharashtra and Goa and (ii) River Kalinadi to Coorg, which included part of Karnataka. The states and districts that are included in these two complexes of Western Ghats fall in north Western Ghats and central Western Ghats (Fig. 2). The physiography of the northern Western Ghats consisted of ravines and canyons, flattopped spurs interesected by valleys on the easter side and the central Western Ghats regions having valleys surrounded by deep gorges 3-5 km across and 30 m deep. At Maharashtra state many hills have terrace sides and flat tops and great Marathas have built forts in some hilltops. the average elevation of the hills is about 500 m and some peaks arise up to 1000 m. The rainfall is heavy, may go up to 5000 mm in a year. The average maximum and minimum temperature are 30° c and 9.5° c respectively and at higher elevation the temperature goes down up to 5° c.

The major rivers in the study areas are Tapti, Krishna, Savitri, Koyna, Bhima, Kalinadi etc. High atmosphere humidity, warm temperature and high

**Table-1 :** Selected characters to identify the hornbills in field.

| Species | Status | Characters |
|---|---|---|
| Malabar Grey Hornbill (*Ocyceros griseus*) | Endemic | Bill with no casque, bill colour yellow with brownish re-tinge at the tip. Plumage slaty grey. |
| Indian Grey Hornbill (*Ocyceros birostris*) | - | Bill with small feel-shaped casque, bill almost wholly yellow. Plumage brownish grey. |
| Malabar Pied Hornbill (*Anthracoceros coronatus*) | NT (IUCN) | Casque compressed, ridge-like and ending in a simple point, bill is black. White underparts, black neck. |
| Great Pied Hornbill (*Buceros bicornis*) | NT (IUCN) | Bill large high casque, ending anteriorly in two points. Underparts and wings black, tail with a broad black subterminal band. White neck. |

**Table-2 :** Description and distribution of hornbills in Western Ghats.

| Species | Characters | Distribution |
|---|---|---|
| Malabar Grey Hornbill (*Ocyceros griseus*) | Slaty grey hornbill. Head, throat and breast streaked with whitish, wings and tail black with white tipped. **No casque on bill, Sexes alike.** | Mumbai, Khandala south through southern Maharashtra, Goa, western Karnataka, western Tamil Nadu and Kerala. (Ali & Ripley, 1970). |
| Indian Grey Hornbill (*Ocyceros birostris*) | Brownish grey with black and whilte tipped graduated tail. **Heavy curved bill surmounted by a pointed casque. Sexes alike.** | Maharashtra, Karnataka, Kerala, Gujarat. Absent in the arid parts of Gujarat and also in the heavy rainfall areas of Kerala. (Ali & Ripley, 1970). |
| Malabar Pied Hornbill (*Anthracoceros coronatus*) | Large pied hornbill with black nect and white under parts. **A huge yellow and black bill surmounted by a ridgelike casque ending in front in a single point. Female smaller.** | Ratnagiri of Maharashtra through Goa, western Karnataka, western Tamil Nadu and Kerala. (Ali & Ripley, 1970). |
| Great Pied Hornbill (*Buceros bicornis*) | A large black and white bird with neck, abdomen and tail white in colour. Face, wings and under parts black. **A large yellow bill surmounted by a concave topped casque. Female smaller.** | Khandala (18°N, 74°E) of Maharashtra south through Goa, western Karnataka, western Tamil Nadu and Kerala. (Ali & Ripley, 1970). |

precipitation of southeast monsoon favours deep forests with dense undergrowth. The flora recorded are *Tectona grandis*, *Terminalis tomemtosa*, *T. arjuna*, *T., peniculata*, *Ixora parviflora*, *Adina cordifolia*, *Butea frondosa*, *Ziziphus rugosa*, *Anogeissus laifolia*, *Ficus bengalensis*, *Eugenia janbolana*. Bamboo (*Bambusa arundinacea*, *Dendrocalamus strictus*) and medicinal plants are much common in these areas.

## METHODOLOGY

Initially available literatures were consulted and before the field survey was initiated, information was gathered from forest personnel associated in the field, local people and tribal communities of the forests. The hornbills are frugivorous birds and used the upper canopy of the trees, thus the forest types and areas were selected depending upon roosting sites and feeding trees. A slow moving vehicle surveyed the entire areas with three observers. The forests tracts and trials were surveyed on foot. The study was conducted by adopting random sampling technique. Nearly 50 km stretch was covered in each day survey and presence of hornbills either sighted or reported was being recorded. As the habitable areas of the hornbills spill over to a number of states/districts, a multiple field trips were conducted. A total of 90 days was spent in the field for locating these birds and at about 500 hours were spent. During 2001-2003,

altogether six surveys were conducted covering Narmada district of Gujarat south through Jog Falls of Karnataka. The mechanical aid used in the field was binoculars (7 × 50). During field survey minute and careful observation could only distringuish the four different species of hornbills. There were some characters, so close in the four species of hornbills; therefore some major criteria were chosen to identify the species in the field shown in Table-1.

A total of 228 hornbills were sighted comprising of all four species in the surveyed areas of Western Ghats (Table-3). About 132 reported information of hornbills other than the observed data was collected except Malabar Grey Hornbill (Table-4). During the entire period of survey in Western Ghats we could fail to gather any information on the presence of this species of bird in other areas.

***Malabar Grey Hornbill*** Ocyceros griseus

There were 21 birds sighted during the course of survey in Western Ghats (north and central), out of which 8 birds were from Karnataka and 13 birds from Maharashtra (Table-3). Malabar Grey Hornbills were located from localities in Western Ghats 13 birds were sighted in Amboli Ghats in Sindhudurg district of Maharashtra of which 7 birds were seen in a mixed flock of Malabar Pied Hornbills. 3 birds were sighted from Karnataka and 5 from near Molem, Goa. In the National Zoological Collection, Kolkata, it was recorded that majority of Malabar grey hornbills were collected from Goa part of Western Ghats. The 14 examples that were collected, of which 12 birds were represented from Goa during 1968-1981 periods. It was also surprising that no report was available for the presence of this species in other areas of Western Ghats except only very few places in Goa. Ali and Ripley (1970) recorded distribution range of Malabar Grey Hornbill in Western Ghats from Mumbai and Khandala south through southern Maharashtra, Goa, western Karnataka, western Tamil Nadu and Kerala. The present study revealed that this species no longer exists in Mumbai, Khandala up to Kolhapur and Ratnagiri district of Maharashtra. The Malabar Grey Hornbill not even found in the Dharwar and Shimoga district of Karnataka and it is replaced by another species of hornbill, the Indian Grey Hornbill. The Malabar Grey Hornbill is now restricted in its distribution in some parts of Maharashtra and Goa in Western Ghats (Fig. 3).

**Table-3 :** The distribution of hornbills in north and central Western Ghats.

| Sl. No. | Species | State/District | Locality | Habitat | Total No. bird |
|---|---|---|---|---|---|
| 1 | Malabar Grey Hornbill (*Ocyceros griseus*) | Sindhudurg Maharashtra | Amboli Ghat | F | 6 |
| 2 | | Sindhudurg Maharashtra | Amboli Ghat | F | 7 |
| 3 | | Molem, Goa | Molem | F | 5 |
| 4 | | Belgaum, Karnataka | Narden | V | 5 |
| 5 | | Karnataka | Jog Falls | F | 3 |
| | | | | **Total** | 26 |
| 6 | Indian Grey Hornbill (*Ocyceros birostris*) | Narmada/ Gujarat | Sorsi, Mandvi range | F | 6 |
| 7 | | Narmada/ Gujarat | Kevdi, Vansda N.P. | F | 7 |
| 8 | | Sholapur, Maharashtra | Villages near Nannaj Sancuary | V | 8 |
| 9 | | Pune, Maharashtra | Dhebewadi | T | 5 |

| Sl. No. | Species | State/District | Locality | Habitat | Total No. bird |
|---|---|---|---|---|---|
| 10 | | Purne, Maharashtra | Dhebewadi | T | 3 |
| 11 | | Satara, Maharashtra | Pune-Kholapur | V | 1 |
| 12 | | Raigad, Maharashtra | Karnala Bird Sanctuary | F | 8 |
| 13 | | Dharward/ Karnataka | Dandeli | T | 5 |
| 14 | | Shimoga/ Karnataka | Yarmukh village | V | 6 |
| 15 | | Shimoga, Karnataka | Shimoga | T | 30 |
| | | | | **Total** | 79 |
| 16 | Malabar Pied Hornbill (*Anthracoceros coronatus*) | Satara, Maharashtra | Pratapgarh | V | 3 |
| 17<br>18 | | Kolhapur, Maharashtra | Fanasgaon | V | 4 |
| 19 | | Kolhapur, Maharashtra | Velgive | V | 2 |
| 20 | | Ratnagiri, Maharashtra | Jaitapur | F | 6 |
| 21 | | Ratnagiri, Maharashtra | Devrukh | V | 3 |
| 22 | | Ratnagiri, Maharashtra | Kundi | V | 2 |
| 23 | | Ratnagiri, Maharashtra | Sakharpa | V | 4 |
| 24 | | Ratnagiri, Maharashtra | Hatkhamba | V | 4 |
| 25 | | Ratnagiri Maharashtra | Ujgaon | V | 3 |
| 26 | | Ratnagiri, Maharashtra | Talekanta | V | 3 |
| 27 | | Ratnagiri, Maharashtra | Pangri | V | 4 |
| 28 | | Sindhudurg, Maharashtra | Majgaon | F | 2 |
| 29 | | Sindhudurg, Maharashtra | Amboli Ghat | F | 6 |
| 30 | | Daraward, Karnataka | Dandeli | F | 53 |

| Sl. No. | Species | State/District | Locality | Habitat | Total No. bird |
|---|---|---|---|---|---|
| 31 | | Shimoga, Karnataka | Bhadra WLS | F | 1 |
| 32 | | Shimoga, Karnataka | Sharavati WLS | F | 7 |
| | | | | **Total** | 111 |
| 33 | Great Pied Hornbill (*Buceros bicornis*) | Satara, Maharashtra | Pratapgarh | V | 2 |
| 34 | | Satara, Maharashtra | Pratapgarh | T | 2 |
| 35 | | Satara, Maharashtra | Dhudosi | V | 2 |
| 36 | | Darward Karnataka | Gund range, Dandeli div. | F | 4 |
| 37 | | Shimoga Karnataka | Sharavati | F | 2 |
| | | | | **Total** | 12 |
| | | | | **Grand Total** | 228 |

Abbreviation : **V**-Village; **F**-Forest; **T**-Town

***Indian Grey Hornbill*** Ocyceros birostris

79 Indian grey hornbills were recorded from north and central Western Ghats during the surveys; of which 13 from Gujarat, 25 birds were slighted in Maharashtra, and 41 from Karnataka parts. The Gujarat population was recorded from the forests. Maharashtra and Karnataka population were observed in forests, villages and towns (Table-3). the highest concentration of Indian Grey Hornbills in a single spot was recorded from Shimoga town, Karnataka and it was 30 in number. The Indian Grey Hornbills' collection in the Zoological Survey of India from Western Ghats was only from Pune district, Maharashtra. During the course of survey in Western Ghats, this species was reported from 10 localities comprising forest, village and town areas. Altogether 12 birds were reported on enquiry at various levels in the large areas that were surveyed. The population of Indian Grey Hornbill recorded from Western Ghats was very low and distributed in some pockets. It was observed that this species harbour from Narmada district of Gujarat to Satara district of Maharashtra and in the Shimoga district of Karnataka. The left out stretch from Kolhapur district, Maharashtra through Goa and Belgaum district, Karnataka now occupied by the Malabar Grey Hornbill (Fig. 3).

**Table-4 :** The distribution of hornbills in north and central Western Ghats (Reported).

| Sl. No. | Species | State/District | Locality | Habitat | Total No. bird |
|---|---|---|---|---|---|
| 1 | Malabar Grey Hornbill (*Ocyceros griseus*) | | None | | |
| 2 | Indian Grey Hornbill (*Ocyceros birostris*) | Gujarat/ Narmada | Nenai Falls Sagai range Shoolpaneswar WLS | F | 3 |
| 3 | | ” | Saribar beat, Pipalod Range | F | 3 |

| Sl. No. | Species | State/District | Locality | Habitat | Total No. bird |
|---|---|---|---|---|---|
| 4 | | Gujarat/ Narmada | Vaghmar beat Dumakhal, | F | 2 |
| 5 | | ” | Namgir, Dediapada | F | 2 |
| 6 | | Maharashtra, Dhule | Valpai Range, Dev River | F | 2 |
| | | | | **Total** | 12 |
| 7 | Malabar Pied Hornbill (*Anthracoceros coronatus*) | Goa | Codra village (Ponda) | V | 10+ |
| 8 | | Maharashtra Sindhudurg | Madkol & Danoli village | V | 8+ |
| 9 | | ” | Parula (Vengurla) | V | 2+ |
| 10 | | ” | Otawana (Sawanwadi) | V | 2+ |
| 11 | | ” | Talera & Vidaydurg | V | 10+ |
| | | ” | Darum (Kankavali) | V | 2+ |
| 12 | | Maharashtra, Ratnagiri | Dongar (Rajapur) | F | 6+ |
| 13 | | ” | Kundi (Devrukh) | V | 15+ |
| 14 | | ” | Tulsani (Sangameswar) | V | 10+ |
| 15 | | ” | Hansgaon (Dajipur) | V | 2+ |
| 16 | | Maharashtra, Raigarh | Khandas | V | 2+ |
| 17 | | Karnataka, Dandeli | Kulig, Nature Camp | F | 2+ |
| 18 | | ” | Konappa (Dandeli) | V | 3+ |
| 19 | | ” | Gunda Range | F | 4+ |
| 20 | | ” | Kadagani (Anshi) | V | 2+ |
| 21 | | ” | Kudagadi (Anshi) | V | 3+ |
| 22 | | Karnataka, Shimoga | Haihole (Saithyali) | F | 2 |
| | | | | **Total** | **85** |
| 23 | Great Pied Hornbill (*Buceros bicornis*) | Dandeli WLS, Karnataka | Yarmuchh-Karemnae, Gond Range | F | 35 |
| | | | | **Grand Total** | **132** |

Abbreviation : **V**-Village; **F**-Forest; **T**-Town

***Malabar Pied Hornbill*** Anthracoceros coronatus*

A total of 111 Malabar Pied Hornbills were recorded from Western Ghats, of which 50 birds were sighted in Maharashtra part and remaining 61 from Karnataka part (Table-3). No birds were recorded from Goa. Enquiry from the local people revealed that this bird paid regular visit in the Codra village, near Molem, Goa during fruiting season and the number was between 8 and 10. The largest flock of 53 Malabar Pied Hornbills was recorded from Dandeli, Karnataka. These birds were roosting in the trees in the afternoon after feeding. the entire population of Malabar Pied Hornbill of Karnataka harbour in the forests, whereas only 18 birds were found in the forests of Maharashtra. The remaining 32 birds recorded from Maharashtra were inhabited in the villages, of which 23 birds were observed in the villages of Ratnagiri district. During the surveys 111 birds were reported from the Western Ghats and it spread over from Satara and Kolhapur through Sindhudurg districts of Maharashtra south to Jog Falls of Karnataka (Fig. 3). The survey also revealed that Malabar Pied Hornbills were found more in the villages, of Maharashtra with a good population. Local enquiry in the villages also confirmed that the many a times villagers noticed this large bird flying across.

***Great Pied Hornbill*** Buceros bicornis**

The population of this bird is very low in these parts of Western Ghats. Altogether only 12 birds were recorded from the entire surveyed areas of which 6 birds were seen from Satara district of Maharashtra and equal number from Karnataka (Table-3) All Great Pied Hornbills were observed in the forests of the two states. Local people of Velgire village, Kankavali taluka, Sindhudurg district, Maharashtra reported to see this bird during fruiting season (April-May) of every year. Villagers of Kundi village, c. 20 km. from Devrukh, Sangameswar taluka, Ratnagiri district, reported 6-7 birds during April-May 2002. Reported Information revealed that the villagers and forest personnel at Yarmuckh-Karemane areas near Gund Range of Dandeli Wildlife Sanctuary of Karnataka sighted nearly 30-35 birds. This bird visits this place during September-October every year when Ciddar fruits are available. So, the Great Pied Hornbill found in Satara districts of Maharashtra is a disjunctive isolated population (Fig. 3).

**Negative Areas :**

**Table-5 :** Negative areas of the North and Central Western Ghats (surveys were undertaken but hornbills were not found).

| Sl. No. | Surveyed Area | Period of Survey |
|---|---|---|
| 1 | Samot, Dediapada Taluka, Narmada district, Gujarat (Fig. 4) | 19.07.2003-22.07.2003 |
| 2 | Bardipada, Purna WLS, North Dang Division, Ahwa district, Gujarat | 23.07.2003-25.07.2003 |
| 3 | Pimpri, South Dang Division, Vansda NP, Navsari district, Gujarat | 26.07.2003-29.07.2003 |
| 4 | Mahabaleswar & Pratabgarh, Satara district, Maharashtra (Fig. 5 & 6) | 07.08.2002-09.08.2002 |
| 5 | Khadala, Raigad district, Maharashtra (Fig. 7) | 10.08.2002-11.08.2002 |
| 6 | Pen and Alibag Maharashtra (Fig. 8) | 12.08.2002 |
| 7 | Panvel, Karmala Bird Sanctuary, Raigad, Maharashtra (Fig. 9) | 13.08.2002 |
| 8 | Poi, Karjat, Raigad, Maharashtra | 14.08.2002-16.08.2002 |
| 9 | Koyna WLS, Karad, Satara district, Maharashtra | 10.11.2001 |
| 10 | Chinchini, Pune district, Maharashtra | 6.11.2001 |
| 11 | Sagareswar WLS, Islampur, Sangli district, Maharashtra | 17.11.2001 |
| 12 | Panhala, Kolhapur district, Maharashtra | 10.11.2001 |
| 13 | Waranabad Dam, Chandoli WLS, Kolhapur district | 15.11.2001 |
| 14 | Radhanagri WLS, Kolhapur district, Maharashtra | 15.11.2001 |

*2♂ 1♀ were observed from Hyderabad, Andhra Pradesh (Pittie, A 2003); 4 examples on 30.07.2003 and a flock on 09.03.2003 were observed from Sanjay Gandhi National Park, Mumbai, Maharashtra (Andheria *et al* 2003).

**2 examples on 30.07.200 and 1♀ on 09.03.2003 were observed from Sanjay Gandhi National Park, Maharashtra (Andheria *et al* 2003).

## DISCUSSION

Surveys of north and central parts of Western Ghats revealed an approximate estimation harbouring localities but not the population desnity of the hornbills. The four species of hornbills that were found in Western Ghats at present, observed patchy distribution at certain pockets fallen under Maharashtra, Goa and part of Karnataka (Fig. 3). The distribution is not continuous one as referred by Ali and Ripley (1970) nearly 30 years back. Out of four species of hornbills that are inhabited in Western Ghats, the Indian Grey Hornbills and Malabar Pied Hornbills were more in numbers. the Indian Grey Hornbills now found in good concentration in Karnala Bird Sanctuary, Raigad district, Dhebewadi, Pune district, Maharashtra and Shimoga district of Karnataka. The birds were recorded in forests, villages and towns of the surveyed areas. The Malabar Pied Hornbills were recorded in the forests and a good number were located all along the forests tracts of Konkan Railway running from north to south. The highest concentration of this bird was observed in Dandeli forest of Karnataka consisting of 53+ birds. The Malabar Pied Hornbill prefers high trees with thick foliage to hide them. They also prefer villages near the forested areas. The populationof Malabar Grey Hornbills and Great Pied Hornbills were very poor as compared to Indian Grey Hornbill and Malabar Pied Hornbill in Western Ghats as observed during the study. Only 21 birds of Malabar Grey Hornbills and 12 birds of Great Pied Hornbills were recorded in large areas of Western Ghats. It is evident from earlier records that Malabar Grey Hornbills were plenty in numbers about thirty years back in Goa (Ali & Ripley 1970 and National Zoological Collections, Kolkata). Now a days due to rapid urbanization, forest cutting, habitat loss, the population of Malabar Grey Hornbill had declined in 2001-2002 in these areas. It was observed that now a days Malabar Grey Hornbills are not found in Dharwar and Shimoga districts of Karnataka, once they were found in good numbers. Itr seems that they are being replaced by the Indian Grey Hornbills.

## RECOMMENDATIONS FOR CONSERVATION

Hornbill, a small family of frugivorous birds, consists of five genera and nine species in the Indian forms, of which the Western Ghat Complex shares three genera and four species. The hornbills whatsoever found in Maharashtra and Goa is well protected due to religious belief. According to Hindu mythology, it is called “Guard Pakshi”, means the carrier of Lord Vishnu. The population of hornbills is more in the plains rather than in the hills where tribal people kill them for flesh and feathers. They also used the head with casque of the hornbills for decorative purposes. Morevoer, hornbills are mostly dweller of evergreen forest which is decreasing day by day. So the hornbills are concurrently decreasing mainly due to loss of habitats. It is well presumed that coming days are not rosy for hornbills.

It was observed from this study that population of Malabar Grey Hornbill and Great Pied Hornbill is very less. Moreover Malabar Grey Hornbill *Ocyceros griseus* is n endemic bird species and restricted to Western Ghats only (Jathar and Rahmani, 2006). So, it requires full protection. Further, both Malabar Pied Hornbill *Anthracoceros coronatus* and Great Pied Hornbill *Buceros bicornis* are included in Schedule-I, part-III (Birds) of Indian Wildlife (Protection) Act, 1972 (as amended up to 2002) and are also categorized as Near Threatened species as per Red List species of Birds from India as per Bird Life International 2004. Hence they also need a protection. So in this context, before all these hornbill species silently disappear, a positive cution should be taken to protect the remaining population of hornbills from north and centgral Western Ghats.

1. Steps should be taken to preserve forest patches of Maharashtra and Karnataka, particularly where Great Pied Hornbill and Malabar Grey Hornbill are found.
2. Forest patch of Molem, Goa, is steady decreasing. This patch should also keep aloof from speedy urbanization.
3. Human association is preferred by hornbills, as it was seen in whole of Maharashtra; Dandeli and Shimoga towns of Karnataka where both Indian Grey Hornbill and Malabar Pied Hornbill keeps human association for their safety. So it is need of the day to be friend with hornbills and not to disturb them at their roosting and nesting places. Hence, there is a need to educate the local people and School children; make them aware through newspaper, radio, television programmes and

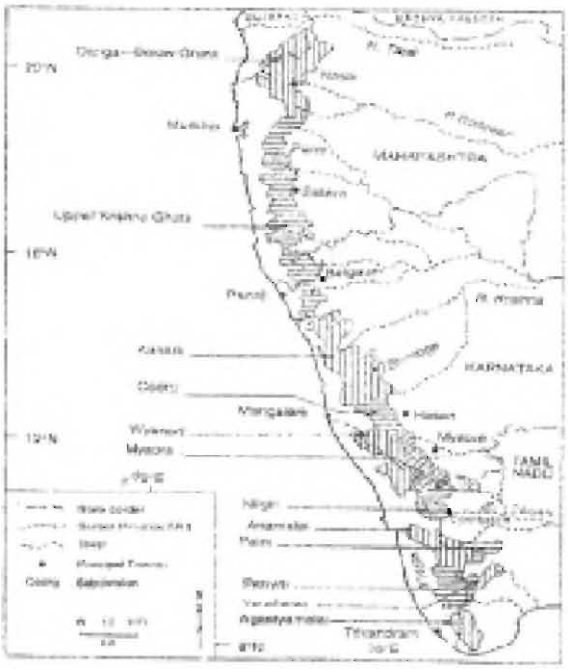
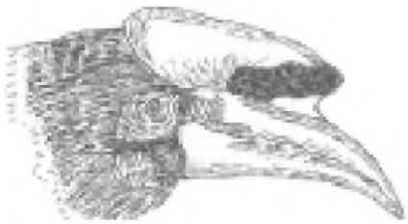
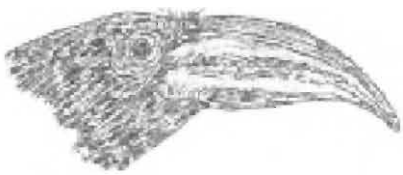



**Fig. 1 :** Map of Western Ghats (above)

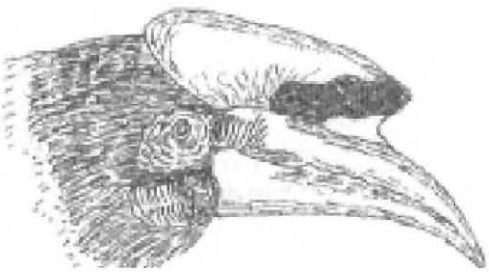

**Fig. 2 :** Map of surveyed and non surveyed parts of Western Ghats during the study period



1. Indian Grey Hornbill



2. Malabat Grey Hornbill



3. Malabar Pied Hornbill

4. Great Pied Hornbill

Pict. 1. Indian Grey Hornbill

Pict. 2. Malabar Grey Hornbill

Pict. 3. Flock of Malabar Pied Hornbill

Pict. 4. Malabar Pied Hornbill

Pict. 5. Great Pied Hornbill

**Four species of Hornbills in North and Central Western Ghats**

Great Pied Hornbill
Past Distribution

Great Pied Hornbill
Present Distribution

Indian Grey Hornbill
Past Distribution

Indian Grey Hornbill
Present Distribution

Malabar Grey Hornbill
Past Distribution

Malabar Grey Hornbill
Present Distribution
(Sporadic)

Malabar Pied Hornbill
Past Distribution

Malabar Pied Hornbill
Present Distribution

**Fig. 3 :** Present and past (Ali & Ripley 1970) distribution of Hornbills in north and central Western Ghats

**N.B. :** Red line across the sketches is the demarcation line in between northern (surveyed) and southern (nost surveyed portionof the Western ghats.

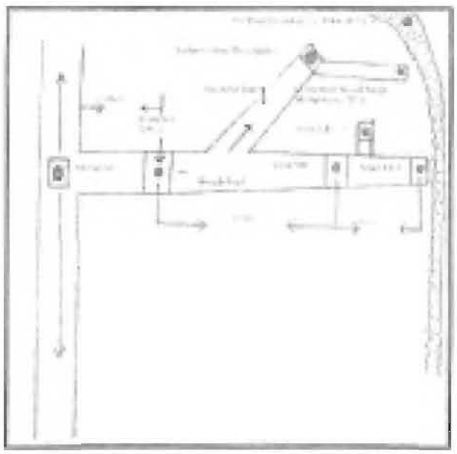


Fig. 4. Camp : Samot, Taluka : Dediapada, Dist. : Narmada, Gujarat

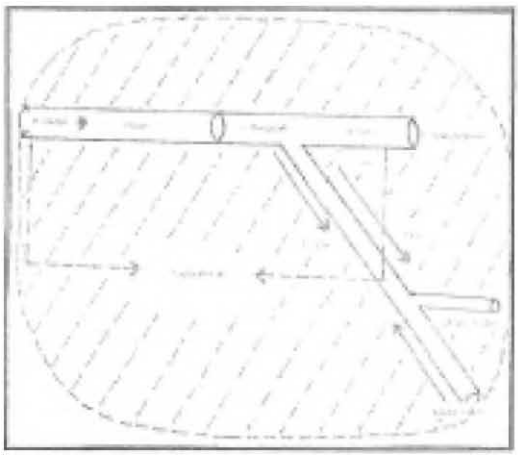


Fig. 5. Camp : Pratapgarh, Dist. Satara, Maharashtra

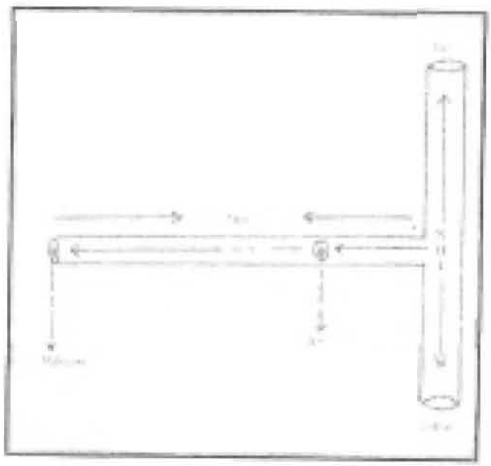


Fig. 6. Camp : Mahabaleswar, Dist. : Satara, Maharashtra

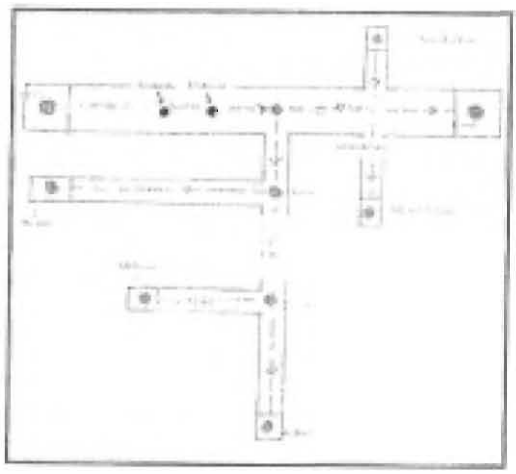


Fig. 7. Camp : Khandala, Dist. : Raigad, Maharashtra

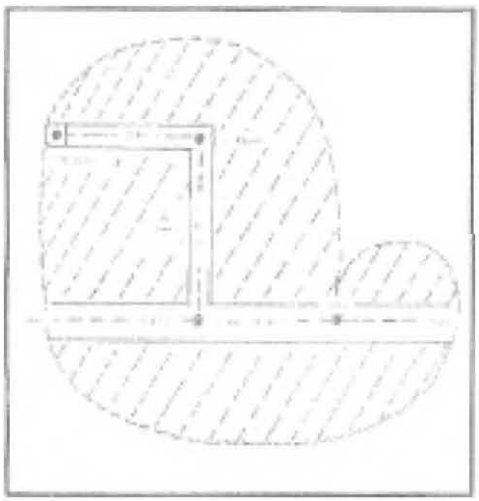


Fig. 8. Camp : Khandala, Dist. : Raigad, Maharashtra

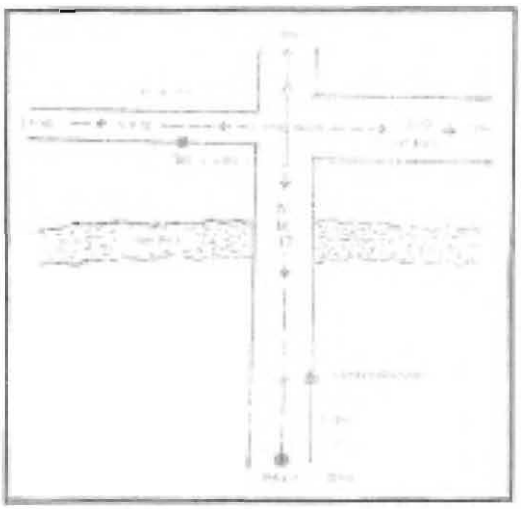
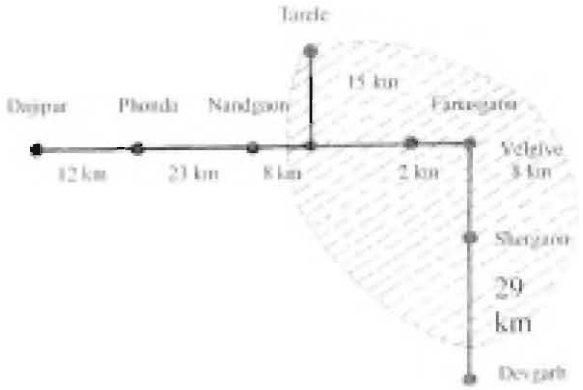
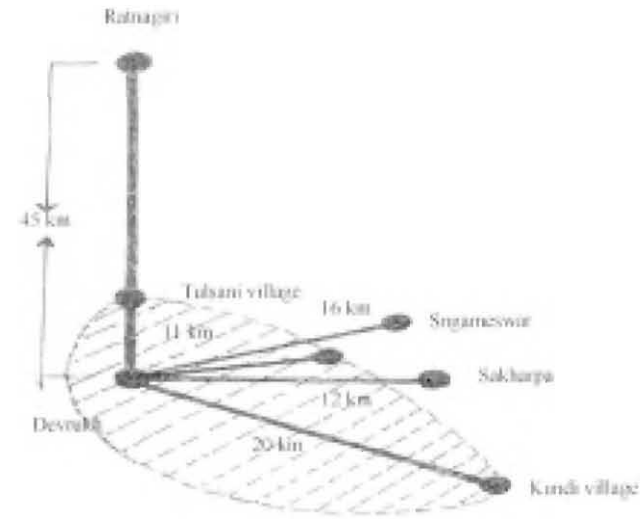


Fig. 9. Camp : Panvel, Dist. : raigad, Maharashtra

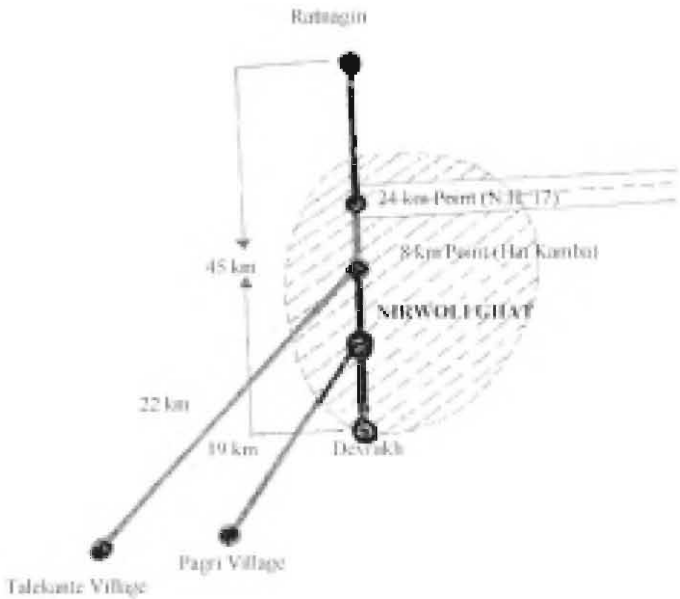
**Fig. 4-9 :** Imaginary sketches of surveyed areas of North and Central Western Ghats where hornbills were not found.




The whole stretch of hills starting from Tarele to Shergaon under Devgarh Taluka, sindhudurg district is the homeland of Malabar Pied Hornbill along with Great Indian Pied Hornbill.




Whole stretch has a very good population of Malabar Pied Hornbill




This stretch has a concentration of Malabar Pied Hornbill

**Fig. 10 :** Distribution sketch of Malabar Pied Hornbill in Maharashtra.

involve them along with NGOs, Forest Department in conservation activities.

4. Enforcement Authorities like Forest and Police departments of these states should take legal action against the poaching activities, illegal shooting of hornbills for flesh, feathers and bill with casque.

## SUMMARY

Altogether 6 surveys were conducted during, 2001-2003 in north and central Western Ghats for four species of hornbills that are distributed in the Western Ghats complex. A total of 223 hornbills were sighted and about 132 ± reported information other than observed data were collected except Malabar Grey Hornbill. The population of all four species appeared to be declining and the worst affected is Great Pied Hornbill of which two isolated thin population were observed in the study area. Indian Grey Hornbill and Malabar Pied Hornbill have steady population in comparison with other two species. Malabar Grey Hornbill at present limits its distribution in some pocket of Goa State. To provide thin lifeline on the four species of hornbills in north and central Western Ghats, habitat so for remains till date, should be kept intact in order to check elimination of hornbills in future.

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