

VARIATIONS IN THE ASSEMBLAGE OF MALABAR PIED HORNBILL AT DIFFERENT ROOSTING SITES IN SHETTIIHALLI WILDLIFE SANCTUARY, WESTERN GHATS, KARNATAKA

¹ Shrinivas K.R., ² Vijaya Kumara

¹Research Scholar, ²Assistant Professor

¹Department of Wildlife and Management,

¹Kuvempu University, Shimoga, India

Abstract : There has been lot of variation in the population of Malabar Pied Hornbills (MPH) at the 4 roosting sites identified inside the Shettihalli Wildlife Sanctuary in the mid-western ghats region of Karnataka State, which covers an area of 396 Sq.kms with dry deciduous, moist deciduous and semi evergreen forests along with that there are 116 villages completely inside or partially attached with the sanctuary vicinity. The study was conducted from March 2014 to October 2017. Population during pre-breeding season and post-breeding season gives the population trends in that area. But with many anthropogenic threats, the population has shown tremendous fluctuations. At one of the roosting site, an average of 26 MPHs were found during the pre-breeding season of 2014 but by 2016 the population dwindled down to just 4. In another roosting site it was 46 in the year 2014 and by 2015 it increased to an average of 86 but in 2017 this population has again come down to an average 48. The same negative trend was followed in other two roosting sites. The number of juveniles also was not healthy in the year 2017 which clearly shows the breeding was unsuccessful to a large extent. This fluctuation in the hornbill's population at the roosting sites is mainly because of habitat degradation and predation. Degradation mainly due to lot of illegal activities like poaching, timber logging, soil excavation, partying and forest fires. The present study was conducted to know the breeding dynamics of MPHs, which will help us to ascertain the quantum of habitat degradation. If proper actions are not taken, the sanctuary may lose this flagship species in the near future.

I. INTRODUCTION:

Hornbills are charismatic avian species which are found only in Africa and Asia. Their peculiar breeding has always attracted many researchers and avid bird watchers. Hornbills occupy one of the extremes of habitat from moist evergreen forests to arid steppes where every millimeter of rain is precious (Kemp, 1995). Hornbills are not easily visible in their habitats, but each species has a loud and distinctive call that is among the most notable sounds of the region. Many hornbill species occupy the forest which are mostly under pressure from humankind and these hornbills require large areas of habitat to support viable population. Among such hornbills whose population are in a declining trend and has been threatened are Malabar Pied Hornbill (MPH). MPHs are distributed in three different regions of the subcontinent namely Western Ghats, East India and Srilanka (Grimmet etal, 1999). MPHs are considered as Near Threatened (NT) and the population trend is decreasing according to the IUCN Red list of threatened Species. MPHs are monogamous like any other hornbills. They need riverine conditions to roost and natural habitats to nest. Roost sites appear to be rather specific in form and regularly used by those species that form communal roosts (Kemp 1995).

The present study area, Shettihalli Wildlife Sanctuary (SWLS) lies in one of the eight hottest hot-spots of biological diversity in the world i.e., Western Ghats. This is well defined mountain range that extends all along the western coast of India from the Tapti valley in the north to Kanyakumari in the south in a more or less continuous strip very near to the coast (Negi, 2006) and covers an area of 160000 Sq.Km. No other biodiversity hotspot has human population density as the Western Ghats which is approximately around 245 million people. SWLS has an area of approximately 396 sq.km. and has around 116 villages in and around the sanctuary limits. SWLS has a core area of nearly 100 sq.kms., buffer zone of 237 sq.kms. and tourism zone of 57.6 sq.kms.(Manjrekar, 2000). Map showing the location of the SWLS is shown in Fig.1. and Fig.2. with Central coordinates: 13° 52' 0" North (13.87°) 75° 22' 59" East (75.38°)

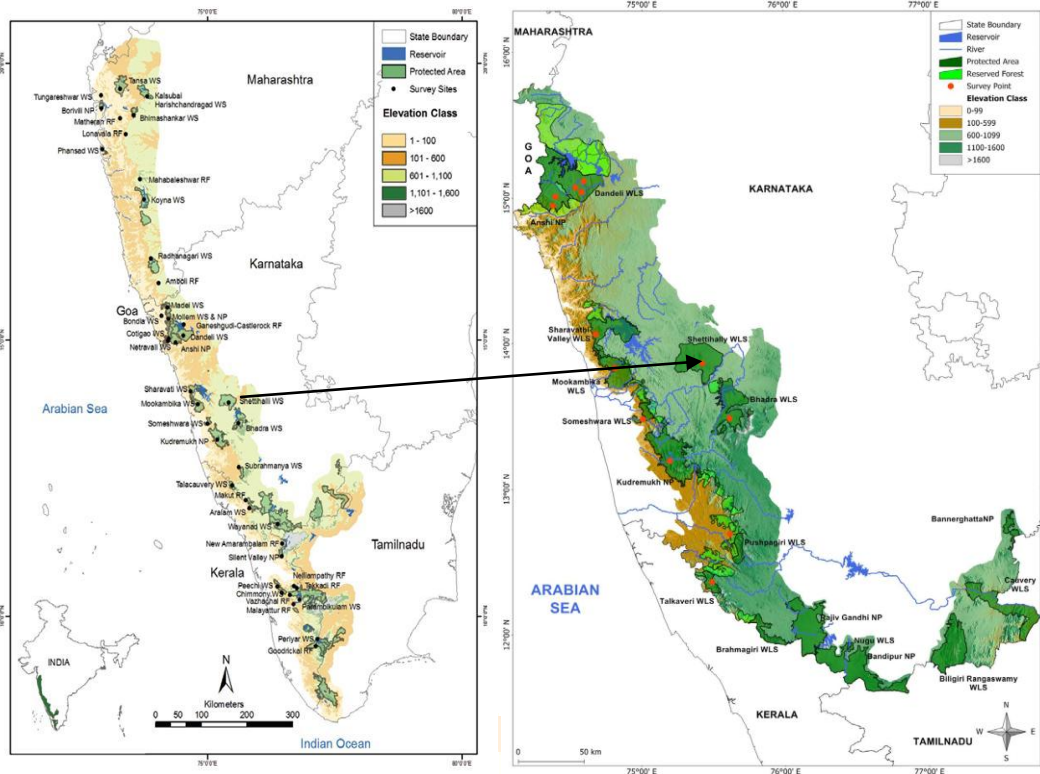


Fig 1: Map Showing the Study Area location from Western ghats



Fig 2: Shettihalli Wildlife Sanctuary (<http://datazone.birdlife.org/site/factsheet/shettihalli-wildlife-sanctuary-iba-india>)

The area is very much disturbed by the human activities and hence can be considered as high risk forest in the western ghats. SWLS is earmarked as one of the Important Bird Area (IBA) by the Birdlife International. The sanctuary consists of both plantation forest and natural forest and the forest types varies from dry deciduous to semi-evergreen (Manjrekar, 2000). The study area is always under stress due to one or the other illegal activities throughout the year like forest fires, timber poaching and hunting. Apart from this, fire wood collection, sand mining, cattle grazing and many more activities are prevalent. In our preliminary study during 2012 to estimate the population of the MPHs in one of the ranges of the sanctuary did not yield much information except two cases of fatalities and also could find out 2 roosting sites. The breeding success rate of MPHs in this area is critical and hence the study was carried out.

II. METHODOLOGY

4 roosting sites were identified in the study area (Fig 3), where hornbills regularly congregate during late evening. All the four roosting sites identified were near to a wetland. Three roosting sites had wetlands which were manmade, built for irrigation purpose and one had a waterhole which is a natural one. The population of the MPHs at each roosting sites were calculated using the look-see counting method (Bibby et al, 1992) to know the entire population of MPH in the sanctuary. Regular visits and counts were made to know the variations in each roosting site. The seasons with respect to hornbill's

breeding was recorded like pre-breeding season, breeding season and post-breeding season. The breeding season usually starts from March to June monsoon (Ali, 2002). The difference between the population in the post-breeding and the pre-breeding season gave the breeding success. The population of the breeding pairs can be determined by the difference in the numbers assessed during pre-breeding season and post-breeding season. Weekly one visit was made to each roosting site and monthly once all roosting site counts were made at a time with the help of forest personnel and fellow researchers. If repeated at regular intervals, the counts allow us to track changes in bird population (Sutherland et al., 2004). Safe distance was maintained to watch MPHs with high end binoculars (10x40) was used so that no birds are disturbed by our presence. Prior orientation was given to all the fellow researchers and forest personnel.

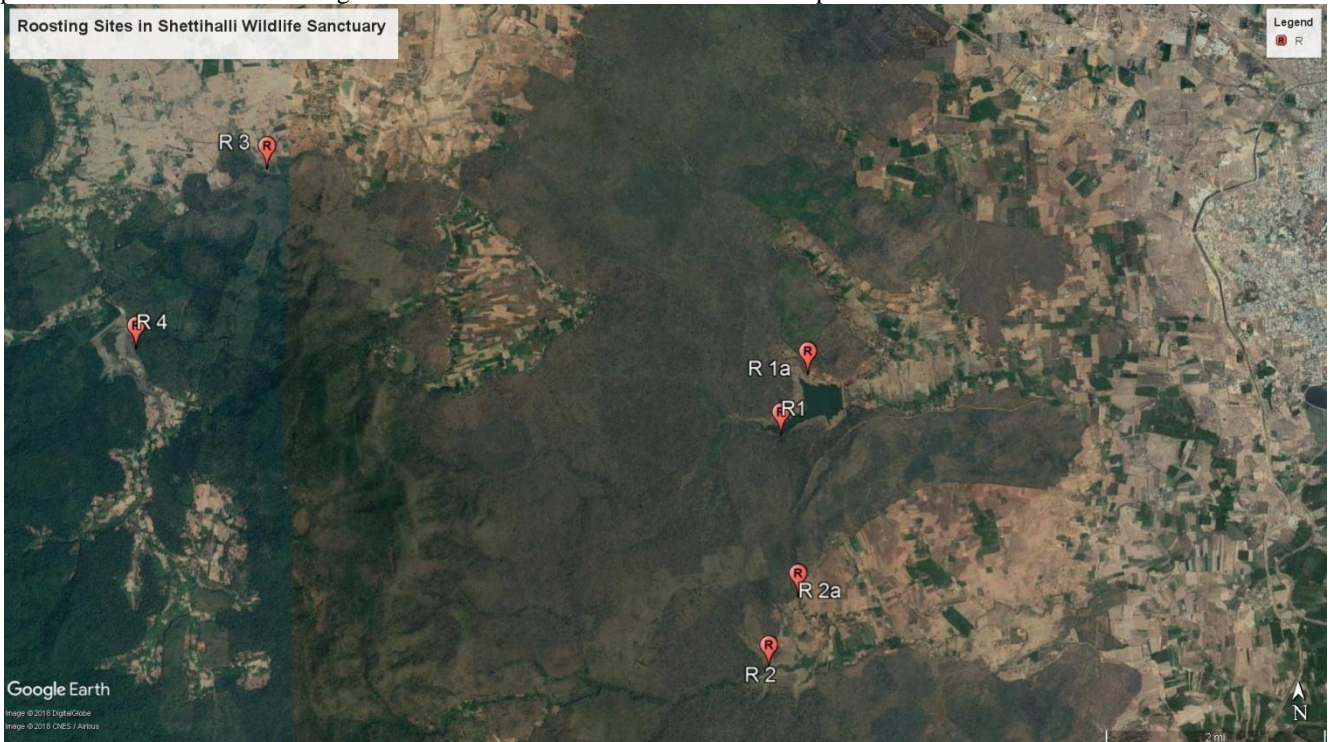


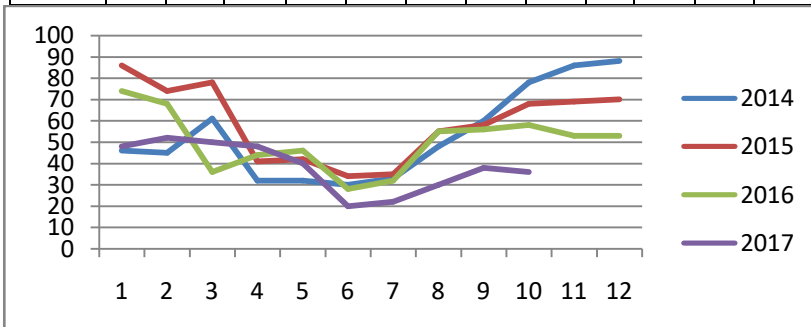
Fig 3: Roosting sites identified inside the Shettihalli Wildlife Sanctuary

III. RESULTS AND DISCUSSION

The study from January 2014 to October 2017 gave a clear picture of the declining trend in the population of the MPH. There was also shift in the roosting points around two waterholes to a safer places. The detailed counts of the MPHs at each site is given in a simple table and explained in the graph. R1 is the first roosting site which is located at the water hole (Purdal Dam). The MPHs used to roost in two places at this places, but with the decrease in the water level in the Purdal Dam, roosting of MPHs also decreased and concentrated only in one roost. Since 2015, due the expansion of agriculture the water level in the dam never raised which is the main reason for losing the roosting site and hence tagged as R1a.

Table 1: MPHs recorded in roosting site R1&R1a

Year/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	46	45	61	32	32	30	33	48	60	78	86	88
2015	86	74	78	41	42	34	35	55	58	68	69	70
2016	74	68	36	44	46	28	32	55	56	58	53	53
2017	48	52	50	48	40	20	22	30	38	36	-	-



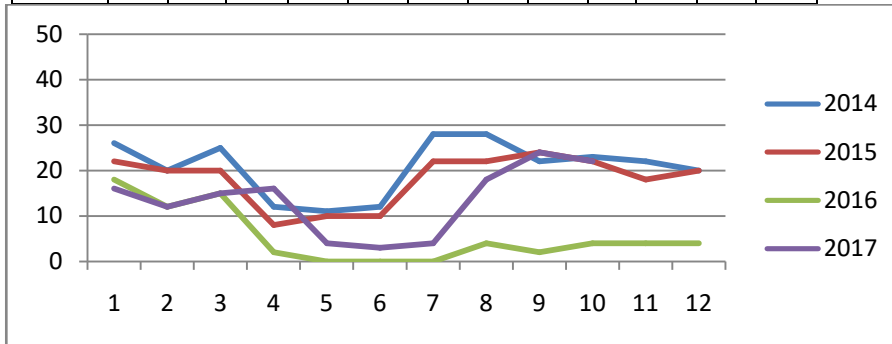
Graph 1: MPHs recorded in roosting site R1&R1a

R2 is the second roosting site which is located on the lake bed of Haihole Tank. During the initial study period the boundaries of R2 was covered with bamboo plants which later disappeared after the bamboo deflowering occurred and then burnt by villagers to make way for a green pasture to graze their cattle. The hornbills slowly moved to a new roosting

site which is next to a small pond almost 200 meters away from the Haihole tank. We called this new roosting site as R2a but the population was always in a reducing pattern. Another observation is we see horbills change the roosting sites quite frequently depending upon the foraging sites because we could identify the honrbills with some distinct markings or shapes in their casques, as a keen observer one can often recognize individuals (Kinnaird etal, 2007).

Table 2: MPHs recorded in roosting site R2&R2a

Year/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	26	20	25	12	11	12	28	28	22	23	22	20
2015	22	20	20	8	10	10	22	22	24	22	18	20
2016	18	12	15	2	0	0	0	4	2	4	4	4
2017	*16	*12	*15	*16	*4	*3	*4	*18	*24	*22	-	-

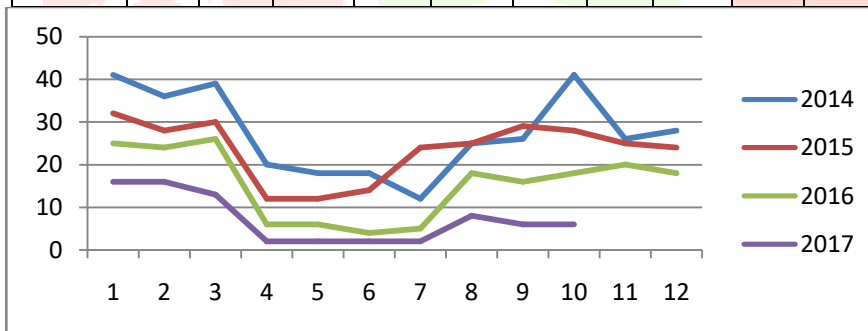


Graph 2: MPHs recorded in roosting site R2&R2a

The next roosting site is R3 at the Chowdikatte waterhole which is part of Sirigere range of the sanctuary and it is a natural pond and supports good flora and fauna around it. Due to the construction of new bund with wider and bigger, many shading trees were uprooted or lopped and since then the population of MPHs decreased rapidly.

Table 3: MPHs recorded in roosting site R3

Year/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	41	36	39	20	18	18	12	25	26	41	26	28
2015	32	28	30	12	12	14	24	25	29	28	25	24
2016	25	24	26	6	6	4	5	18	16	18	20	18
2017	16	16	13	2	2	2	2	8	6	6	-	-

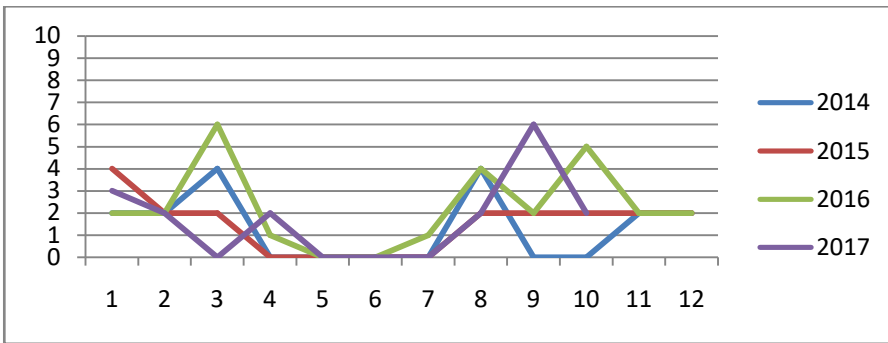


Graph 3: MPHs recorded in roosting site R3

The fourth roosting site is R4 at the Seegehalla Tank is unchanged with the perspective of MPHs population throughout the study period, as not many MPHs roost there (Table 4, Graph 4). This is huge tank which constructed for the irrigation purpose and the water level has depleted from the year 2016.

Table 4: MPHs recorded in roosting site R4

Year/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	2	2	4	0	0	0	0	4	0	0	2	2
2015	4	2	2	0	0	0	0	2	2	2	2	2
2016	2	2	6	1	0	0	1	4	2	5	2	2
2017	3	2	0	2	0	0	0	2	6	2	-	-

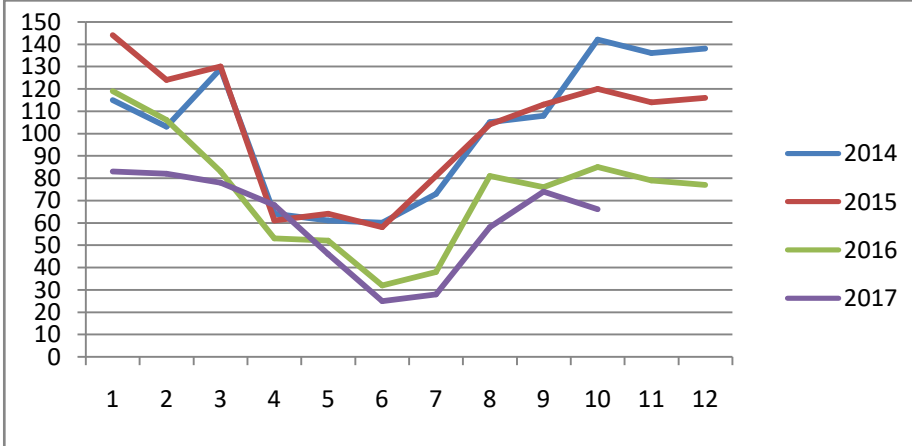


Graph 4: MPHs recorded in roosting site R4

Most important thing to notice in all the roosting sites is the demographic position. The roosting sites contain forest areas, human habitations and water source. The total average population in the four roosting site decreased over the period of the study from 144 numbers to 83 numbers (Table 5, Graph 5). Most drastic changed after early 2015 because of consistent forest fires and loss of habitat. We found many nesting trees been burnt out completely and loss of these flagship species are unavoidable. Hornbills except breeding pairs, roost communally throughout the year at the same roost (Reddy,1988). But we found adult hornbill pairs many times at roosting sites during the breeding season which gives a clear indication that they have lost their nest or predation at the nesting site. Sighting an adult male at the roosting site is common but the adult female sighting is not usual during the breeding season.

Table 5: MPHs recorded in overall roosting sites

Year/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	115	103	129	64	61	60	73	105	108	142	136	138
2015	144	124	130	61	64	58	81	104	113	120	114	116
2016	119	106	83	53	52	32	38	81	76	85	79	77
2017	83	82	78	68	46	25	28	58	74	66	0	0



Graph 5: MPHs recorded in overall roosting sites

IV. CONCLUSION AND RECOMMENDATION

Considering MPHs as flagship species due to its charismatic social behaviour (Mills, 2007). There has been lot of decrease in the population at all roosting sites which can be a great concern. If the same trend is continued and no action is taken then these species will become locally extinct.

There are many reasons which can be attributed to their decline. Forest fires is main reason for these hornbills to deprive from their breeding cycle. Keeping control on the forest fires will definitely reduce the damage. The forest fires in Indian sub-continent is always human induced, so taking confidence of the people around the sanctuary will reduce the forest in a big way.

There is also another option of identifying the nests of the hornbills and assigning the nest to the local community which takes the onus of protecting it at a nominal monetary support by the forest department. Then the department can utilize the nest for eco-tourism where people will flock to see the hornbill nests. This kind of program was initiated by Nature Conservation Foundation (NCF) in North-east India.

V. ACKNOWLEDGMENT

I kindly thank all the forest officials of the Shimoga Wildlife division for their support in organizing the field visits and also giving their valuable inputs. I also thank all the staff and research persons in the department of the Wildlife and Management, Kuvempu University. The support and guidance from Dr. Vijaya Kumara was overwhelming for the entire research work. Personal thanks to Dr. Praveen Dube and Mr. Thammaiah C.K..

VI. REFERENCES

- [1] Kemp, Alan (1995), The hornbills, Oxford University Press.
- [2] Kinnaird, Margaret F and O'Brien, Timothy G. (2007), The Ecology and Conservation of Asian Hornbills, University of Chicago Press.
- [3] Ali, Salim (2002), The Book of Indian Birds, 13th Edition, Oxford University Press.
- [4] Mills, Scott (2007), Conservation of Wildlife Populations, Wiley Blackwell.
- [5] Grimmett, Richard, Inskipp, Carol & Inskipp, Tim (1999), Pocket guide to the Birds of the Indian Subcontinent, Oxford University Press.
- [6] Bibby, Colin , Burgess, Niel D. & Hill, David A. (1992), Bird Census Techniques, Academic Press.
- [7] Reddy, Sanjeev (1988), Some aspects of ecology and behaviour of hornbills with special reference to *Anthracoceros coronatus* (Boddaert) from North Kanara District of Western ghats, Karnataka University, Dharwad.
- [8] Sutherland, William J., Newton, Ian and Green, Rhys E. (2004), Bird Ecology and Conservation, Oxford University Press.
- [9] Manjrekar, N. (ed.) (2000), A Walk on the Wild Side. Karnataka Forest Department, Wildlife Wing.
- [10] Negi, S.S., (2006), Indian Forests, Forestry and Wildlife, Indus Publishing Company.

