



International Journal of Fauna and Biological Studies

Available online at www.faujournal.com

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International
Journal of
Fauna And
Biological
Studies

ISSN 2347-2677

IJFBS 2017; 4(5): 63-66

Received: 01-07-2017

Accepted: 02-08-2017

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An Assessment of animal diversity present with in 2km radius of Bannerghatta national park, Karnataka, India

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Abstract

The study was carried out by following the transect method. A total of seven transects each one measuring two km in length were laid evenly within two km area surrounding the park except the northern part which is almost fully urbanized. At 250m point interval of each transect. The survey results suggest that the region is having high faunal diversity with 34 species identified around the villages during the study period (Table 1). The region is also an habitat for a minimum of 7 IUCN listed threatened species viz. Sloth bear (*Melursus ursinus*), Wild dog (*Cuban alpinus*), Pangolin (*Manis crassicaudata*), Sambar deer (*Cervus unicornis*), Slender loris (*Loris tardigradus*) and Hyaena (*Hyaena hyaena*) including the endangered Asian Elephant (*Elephant maximus*).

Keywords: elephant-human conflict, forest

Introduction

Bannerghatta National Park (BNP) is one of the small National parks of Karnataka state which was started in the year 1971 and confirmed as a National park in the year 1974 by declaring its intentions to represent such area as a national park by Government of Karnataka vide Notification No.AFD.61 fwl 74, 74 published in the Karnataka Gazette dated 9-1-1975 in exercise of the powers conferred by sub-section(1) of section 35 of the wild life (protection) Act, 1972 (Central Act 53 of 1972). It encompasses an area of 102.74 Sq. Km. comprising of 10 reserve forests extend over the districts of Bangalore urban and Ramnagara district situated nearest to Bangalore the first growing scientific city and the capital of Karnataka. This park was started with the primary objectives of bioconservation and also to provide bio-recreation to the visiting tourists with nature-education facilities to students and researchers. Geographically the park is adjacent in the south with the last largest remaining scrub forest of the country and has been a variety of wild life (Mr. Gopalakrishna S.P., *et al*, 2011) [2]. The topography of the park is highly undulating in nature with pronounced mountains and valleys and it is roughly linear and highly irregular in shape. The parks landscape is enclosed by a high compactness of human settlements including five settlements and agricultural lands situated within the park (Singh 2008) [3].

Agriculture is the major activity carried out by the neighborhood in this land which is changing gradually as a result of urbanization, especially in the northern and eastern parts of the park. Further, many developmental projects are coming up around the park such as manufacture, road widening, renovate and safeguarding of roads passing through the park (Singh 2008) [3]. All these factors are likely to have an influence on the type and extent of diverse landscape elements in the area.

The study of jungle cover, type, its spread and other aspects associated within, play a critical role in long term management of a large mammal such as the Asian elephant. Territory use also depends on the composition of food species and shade species in a forest like BNP. Therefore, variety of the species composition, diversity, richness, abundance, size distributions, canopy cover and ground cover are crucial in developing a management policy related to conservation of species like elephants.

Incursion of exotic species is among the most important global scale problems experienced by natural ecosystems and Bannerghatta National Park is not an exception to it. In the present day, invasion of alien species is second only to habitat loss as a cause of species endangerment and

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extinction (Schei 1996) [4]. Forest and shrub lands are often invaded by the short invasive species (Wiser. S.K., *et al.* 1998) [5].

Emergent human population and improved trans-continental transport have increased the degree of movement of non-indigenous organisms and the current improved rate of invasion constitutes one of the mainly important effects that humans have had on the earth (Sharma *et al.* 2005) [6]. In the present study an attempt has been made to identify with the status of the faunal diversity within 2km radius of the BNP.

II. Materials and methods

Study Area

The BNP is one of the smallest National Parks in the country measuring about 103 km² (Singh 2008) [3] in area. The park is highly irregular in shape and measures a maximum of 26 km in length from North to South and varies between 0.3 and 5 km in width from East to West. The park lies between 12° 34' and 12° 50' N latitudes and between 77° 31' and 77° 38' E longitudes (Rajeev 2002) [7]. Though a small National Park, geographically the park is contiguous in the south with the last largest remaining scrub forest of the country – the Hosur forest division of the Tamil Nadu state to the South- East and

the Kanakapura forest division of the Karnataka state to the South-West. These two further connects to larger forest tracks of the Cauvery Wildlife Sanctuary (Figure. 1a) eventually joining the Nilgiri Biosphere Reserve of Western Ghats forest at Nilgiris stretching through Malaimahadeshwara hills, Biligiri Rangana Temple Sanctuary, Kollegal Forest Division and Sathyamangala Forests (Singh 2008) [3]. The park is further divided into three forest ranges namely the Bannerghatta Range, Harohalli Range and Anekal Range for administrative purpose. The terrain of the park is highly undulating with a mean altitude of 865m and ranges between 700 and 1035m above mean sea level. The park receives an average annual rainfall of 937mm ranging between 728mm and 1352mm (Figure 1a). The park experiences rainfall spread across 8 months (April-November). The maximum rainfall (50%) is received between August and October. January, February and March are the peak dry months and the rainfall ranges from 0.3 to 46mm in these months.

A 2 km buffer area from the park periphery was demarked on a topographic map and a total of 77 revenue villages located within this area were listed. Of this 21 villages distributed evenly around the park representing the three forest ranges were selected for sampling (Figure.1b).

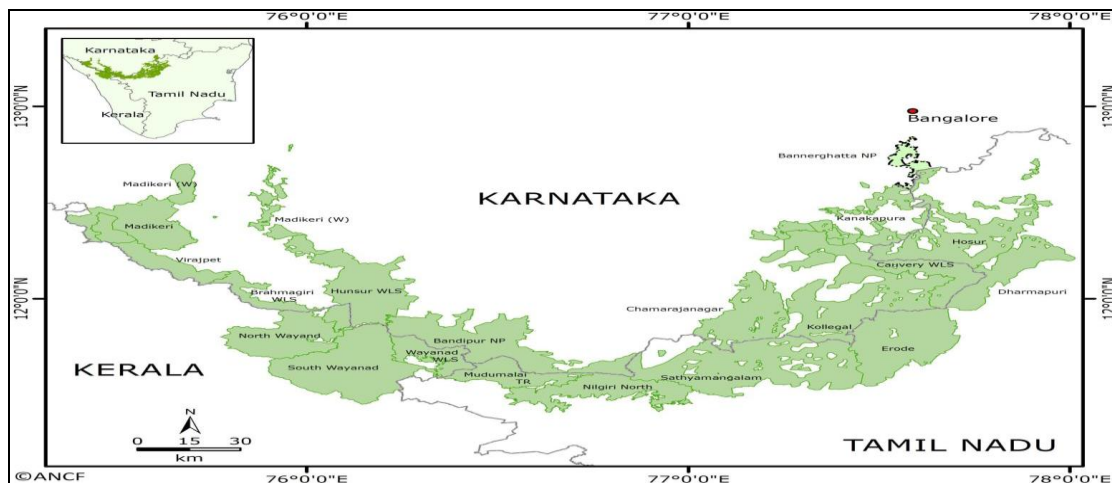


Fig 1a: Showing Bannerghatta National Park (BNP) along with other adjacent forest divisions.



Fig 1b: Villages in around Bannerghatta National park

a). Description of Boundaries

All around boundaries of Bannerghatta national park to the radius of 2 km as marked on toposheet and also extends to the enclosures situated with in BNP. The borders adjoining Ragihalli south block and gullahatti Kaval on their eastern would be as shown on toposheet extended consistently to the

radius of 2km as shown in toposheet.

b). Field survey

The field surveys were conducted during the month of June 2015 visiting all the 21 villages by vehicle. An individual data collection felid sheet was designed to collect information on

these villages such as livestock, soil type, crops cultivated, including the faunal diversity.

III. Results and Discussion

The results show that about 43% of the villages are located on undulating terrain followed by about 33% on slopes and 5% in villages. Only 19% of the villages in the region were situated on plateau lands. This clearly suggests that the lands of these are highly undulating and less suitable for human habitations. The major soil type in the region is found to be red soil (50%) followed by clay soil (31%), sandy soil (24%), loamy soil (19%), gravelly soil (19%), Alluvial soil (14%) and black soil (10%). The region also falls under the catchment area of Arkavathi River (A tributary of river Cauvery) and has given birth to two major streams viz. Antharagange hole and Rayatmale hole both in the Western part of the BNP. The survey results showed that agricultural farming is the major land use in the study area (86%) followed by urban development (19%), industrial development (5%) and stone quarry (5%) and sand mining (5%) (Fig. 4). The crop Ragi (*Eleusinecoracana*) is found to be the major crop (90%) cultivated followed by mango (*Mangifera indica*) (71%), paddy (*Oryza sativa*) (67%), Jack fruit (*Artocarpusheterophylla*) (62%), Banana (*Musa paradisiaca*)

(57%), Sapota grooves (*Achrassapota*) (38%) and Maize (*Zea mays*) (19%) among the villages in the study area (Fig.2). The agriculture in the region is both rain and ground water dependent (76%). About 47% of the villages also utilizes surface water stored in open tanks followed by open wells in 14% of the villages. The results show that majority of villages in the study area have cow (*Bosindicus*) and chicken (*Gallus gallus*) (95%) followed by Goat (*Capraaegagrushircus*) (86%), Sheep (*Ovisaries*) (81%), Buffalo (*Bubalus Arnee*) (76%) Bullock (*Bosindicus*) (62%) pig (24%) and Horse (*Equuscaballus*) (5%) depicting a good diversity of livestock in the region (Fig. 3).

Faunal diversity

The survey results suggest that the region is having high faunal diversity with 34 species identified around the villages during the study period (Table.1). The region is also an abode for a minimum of 7 IUCN listed threatened species viz. Sloth bear (*Melursusursinus*), Wild dog (*Cuban alpinus*), Pangolin (*Maniscrassicaudata*), Sambar deer (*Cervus unicolor*), Slendorloris (*Loristardigradus*) and Hyaena (*Hyaenahyaena*) including the endangered Asian Elephant (*Elephant maximus*).

Table 1: Major faunal diversity of the villages in the region

Sl. No.	Common Name	Scientific Name	Proportion of villages present	Conservation status
1	Elephant	<i>Elephas maximus</i>	100.0	Endangered
2	Spectacled Cobra	<i>Naja naja</i>	85.71	
3	Mungusi	<i>Herpestes edwardsi</i>	80.95	
4	Bandicoot	<i>Bandicota bengalensis</i>	80.95	
5	Rat Snake	<i>Ptyas mucosus</i>	80.95	
6	Common Garden Lizard	<i>Calotes versicolor</i>	80.95	
7	Chameleon	<i>Chamaeleo zeylanicus</i>	76.19	
8	Green whip snake	<i>Ahaetulla nasutus</i>	76.19	
9	Bonnet macaque	<i>Macaca radiata</i>	71.43	
10	Rat	<i>Rattus rattus</i>	71.43	
11	Skink	<i>Sphenomorphus indicus</i>	71.43	
12	Kaadubekku	<i>Felis chaus</i>	66.67	
13	Jackel	<i>Canis aureus</i>	66.67	
14	wild boar	<i>Sus scrofa</i>	66.67	
15	Chekeredkeelback	<i>Xenochrophis piscator</i>	66.67	
16	Sloth deer	<i>Melursus ursinus</i>	61.90	Vulnerable
17	Wolf Snake	<i>Lycodon aulicus</i>	61.90	
18	Indian rock python	<i>Python molurus</i>	52.38	
19	Stripenecked Mongoose	<i>Herpestes vitticollis</i>	47.62	
20	Mandaladahaavu	<i>Viperarusselli</i>	47.62	
21	Rock Agama	<i>Psammophilus dorsalis</i>	47.62	
22	Leopard	<i>Leopard spp</i>	47.61	
23	Indian Porcupine	<i>Hystrix indica</i>	42.86	
24	Small Indian civet	<i>Viverricula indica</i>	38.10	
25	Wild dog	<i>Cuon alpinus</i>	33.33	Endangered
26	Pangolin	<i>Maniscrassicaudata</i>	23.81	Nearly threatened
27	Sambar	<i>Cervus unicolor</i>	19.05	Vulnerable
28	Chital	<i>Axis axis</i>	19.05	
29	Barking deer	<i>Mantiacus muntjac</i>	14.29	
30	Bronze Back Snake	<i>Dendrelaphis pictus</i>	9.52	
31	Kaadupaapa/Slendorloris	<i>Loris tardigradus</i>	4.76	Endangered
32	Kathekiruba	<i>Hyaenahyaena</i>	4.76	Nearly threatened
33	Mouse deer	<i>Moschiola indica</i>	4.76	
34	Banded Kukri snake	<i>Oligodon signatus</i>	4.76	

(Endangered, Vulnerable, Nearly threatened (Source: IUCN, 2009) [8])

Conclusion

The proposed 2km radius of the BNP has more undulating

terrain which is a characteristic of forest land. The region also falls under the catchment area of the Arkavathi River which is

the tributary of Cauvery. The region is moderately developed in terms of connectivity. Agricultural farming is mostly seasonal but intensive. The economy of the region is agriculture based with a recent addition of stone quarrying and illegal sand mining. The study area appears to be a region

of high faunal diversity has a high conservation value. The faunal diversity is more stable and growing forest type with more number of juveniles present in it. However, there is an inadequacy in the findings in terms of density values for the region due to the inadequacy of time.

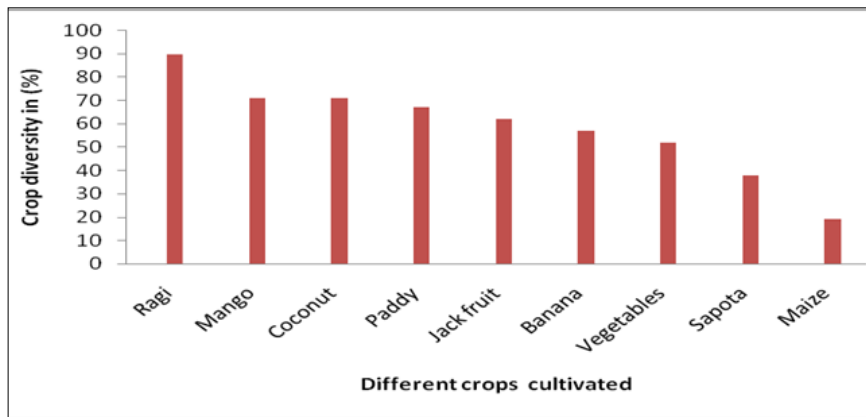


Fig 2: Crops cultivated in the study area

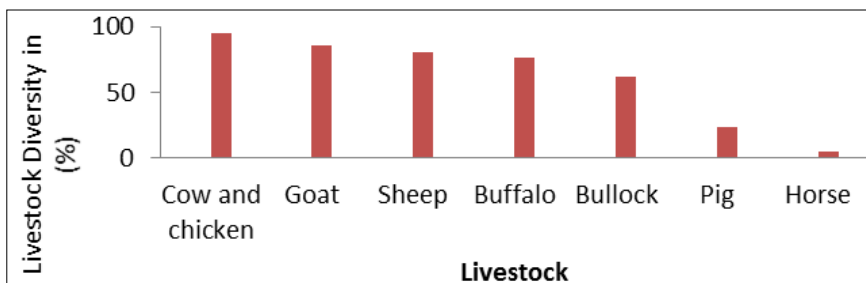


Fig 3: Diversity of Livestock in the study area

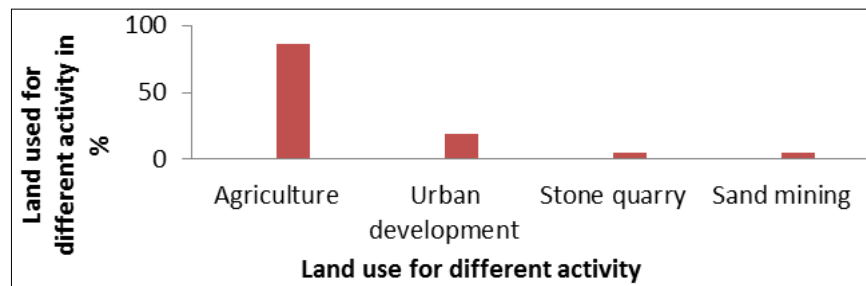


Fig 4: Land Use for different activity

Acknowledgement

Authors are thanking full to DST project for providing financial assistance for man and elephant project. We are also thank full to Deputy conservator of forest, Assistant conservator of forest, Range forest, officers of Bannerghatta National Park Bangalore and field staff of Rocha India (NGO) for providing necessary information.

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