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Research article

PRELIMINARY STUDY REPORT ON DISTRIBUTION OF BLACKBUCK (*ANTILOPE CERVICAPRA L.*) IN MELKOTE TEMPLE WILDLIFE SANCTUARY, SOUTH INDIA.

Rajkumar Devaraj Urs[1], Sumanas Koulagi[1,2], Mohan K[1,2]* and Parthasarathi AS[2].

[1]Wildlife Conservation Foundation, 398/1, Shivayan mutt road, Devaraja Mohalla, Mysore – 570 024.
[2]Janapada Seva Trust, Kalyani Street, Melkote – 571 431, Mandya.

ABSTRACT: *Antilope cervicapra* (Blackbuck) is considered to be one of the key species of the grassland biome. It is habitat specialist of grassland and partial shrub areas. Melkote Temple Wildlife Sanctuary is one such area considered to be dry deciduous forest which also house for Blackbuck. This study basically focuses on the distribution of Blackbuck species in the sanctuary. It also gives clear knowledge about the consequences faced by the Black buck, owing to the decrease in their population. The possible mitigation and adaption strategies in terms of species conservation which can protect the species from the consequences of species decline in this region are discussed.
Key words: Blackbuck, Melkote Temple Wildlife Sanctuary, Grassland, Habitat destruction.

*Corresponding author: Mohan.K, Wildlife Conservation Foundation, 398/1, Shivayan mutt road, Devaraja Mohalla, Mysore, India E-mail: kmohan1992@yahoo.in Phone number: +91 9663121203

INTRODUCTION

Black buck (*Antilope cervicapra L.*) are well known ungulate species in the arid and semi-arid regions of India [1, 2, 3]. They prefer open grass lands and waste land, avoid thick covers [4, 5, 6] and occasionally need drinking water [7]. Melkote Temple Wildlife Sanctuary (MWS) harbors a diversity of wildlife and plant life. It is a geographical link between the Western Ghats and the Eastern Ghats, and perhaps acts as the migration and mixing of Western Ghats element with the of Eastern Ghats [8]. Hence we can see unique vegetation in the region. A population of native Blackbuck (*Antilope cervicapra L.*) inhibits MWS. Since, *A. cervicapra* is one of the key species of the grassland biome [9], its presence in the local vegetation and limited grazing area were considered to be important limiting factors for blackbuck conservation to restore the regional biodiversity is discussed. It is now given as threatened status and placed in schedule 1 of wildlife (Protection) Act of 1972 [10]. There is no much information available about the distribution of the species in the wildlife sanctuary. Hence it was planned to conduct a systematic study on the distribution of Blackbuck in the sanctuary. The study will be of value in formulating scientific management strategies for its protection.

MATERIALS AND METHODS

Study area:

Melkote Temple Wildlife Sanctuary (49.82 sq. km) is situated in Mandya district of Karnataka and was declared as a sanctuary in 1974 especially to protect the habitat of the Grey Wolf (*Canis lupus pallipes*). The sanctuary is named after the famous Melkote temple situated on its periphery. The sanctuary is divided into two blocks. The Narayanadurga block that lies from 12°37' to 12°44' N latitude and 76°34' to 76°39'E longitude and the Mudibetta block lies from 12°41' to 12°43' N latitude and 76°39' to 76°41'E longitude. Not less than two dozen water bodies can be counted in and around the Sanctuary. Altitude varies from 880 m to 1127 m; Temperature ranges from 17°C to 38°C and mean annual rainfall is 700 mm. This locality is a part of the Mysore plateau or south Karnataka plateau.

Vegetation: The landscape is rocky, with tropical dry deciduous and scrub vegetation. It is home for rare *Cycas swamyi* [8, 11]. Important species that have been recorded here are *Shorea roxbhurgii, Terminalia chebula, Chloroxylon swietenia, Anogeissus latifolia, Santalum album.*

Fauna: Beside the Blackbuck other mammals such as Leopard (*Panthera pardus*), Sloth bear (*Melurus ursinus*), Bonnet Macaque (*Macaca radiata*), Jackal (*Canis aureus indicus*), Common mongoose (*Herpestes edwardsii*), Common palm Civet (*Paradoxurus hermaphroditus*), Black napped hair (*Lepus nigricollis*), Porcupine (*Hystrix indica*), Pangolin (*Manis crassicaudata*), Wild pig (*Sus scrofa*), several species of rodents and bats are present. Reptiles such as Bamboo Pit Viper (*Trimeresurus gramineeus*), Saw scaled viper (*Echis carinatus*), Python (*Python molurus*) are typical. Many rare species of butterfly like Southern Rustic (*Cupha erymanthis*) and many birds species like Yellow throated Bulbul (*Pycnonotus xantholaemus*), Brown Rock Pipit (*Anthus similis*), and Ultramarine Flycatcher (*Ficedula superciliaris*), can be seen.

Methodology

Systematic data was collected using area search method. The study was conducted during the month of July 2012 – Aug 2012. The Blackbuck distribution map was prepared to understand the present status of this species in the area. The distribution study was done by dividing the sanctuary into 9 blocks based on the beats made by the Karnataka Forest Department. Each block was visited three times randomly and was covered by walking in slow pace at 10 km per day. In every block, the search was made for direct and indirect evidence i.e. visual sighting, Hoof marks and Pellet lumps respectively by using a standard data sheet. Simultaneously the threats found for the species were documented. For each visual sighting, Group size, Age, Sex were noted & location marked using GPS (Global Positioning System). All indirect evidence was recorded, photographed and location marked using GPS. Population of Blackbuck in each block was estimated by visual sightings and interrogating with the respective forest officials and local people about the population seen.

RESULTS AND DISCUSSION

The study showed that, the Blackbucks were present only in the northern part of the sanctuary, which includes block 5, 6, 7 & 8. Sixty-one direct and indirect evidences of Blackbuck were recorded during the study. Out of that, 8 were direct sightings, 14 were hoof marks and 39 were pellet lumps. The Blackbucks were sighted only in the peripheral regions of the sanctuary. Most of the peripheral region is under the hold of social forestry division of forest department. There were 8 herds of Blackbucks in the sanctuary in which the highest number of individuals recorded was in the block 6 i.e. north-west part of the sanctuary. The evidence of Blackbuck habitation was found inside the range of 0.5±0.2 km from the sanctuary boundary.

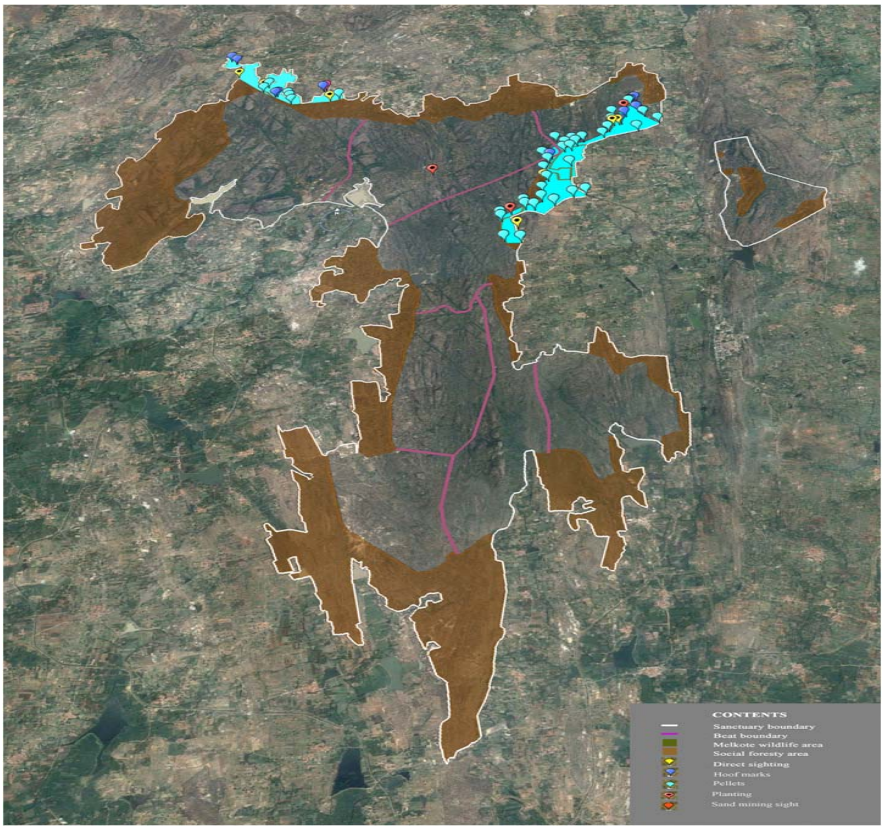

Figure 1: Map showing the direct sighting spots, indirect sighting, planting area, sand mining area spots in the MWS.

Table 1: Blackbucks observed based on visual sightings during the study.

Block No	No of herds	No of individuals in each herd	Sex in No
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	2	2	1F, 1M
		11	10F, 1M
6	1	17	15 F, 2M
7	-	-	-
8	1	6	6 F
9	-	-	-
TOTAL	**4**	**36**	**32F & 4M**

M =Male; F=Female.

Table 2: The observation of field staff of Forest department and local people.

Block No	No of herds	No of individuals in each herd	Sex in No
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	2	2	1F, 1M
		11	10F, 1M
6	3	7	6F, 1M
		15	13F, 2M
		6	6F
7	1	17	15 F, 2M
8	2	4	4 F
		12	11 F, 1M
9	-	-	-
TOTAL	**8**	**74**	**66F & 8M**

M = Male; F = Female

*Recorded during the informal discussion with field staff of Karnataka Forest Department and local people living around the Melkote Temple Wildlife Sanctuary

Photo 2: Photo showing a group of Blackbucks i.e. a male with black body coat and twined horns at the right most corner with two females in the block 5.

Photo 3: A group of female Blackbucks in the open areas of block 5.

Photo 4: Photo showing a group of Blackbucks i.e. a male at the centre with black body coat and twined horns with other females of the group near the social forestry in block 6.

Photo 5: Photo showing a group of female Blackbucks found in the block 8 near the eucalyptus plantation.

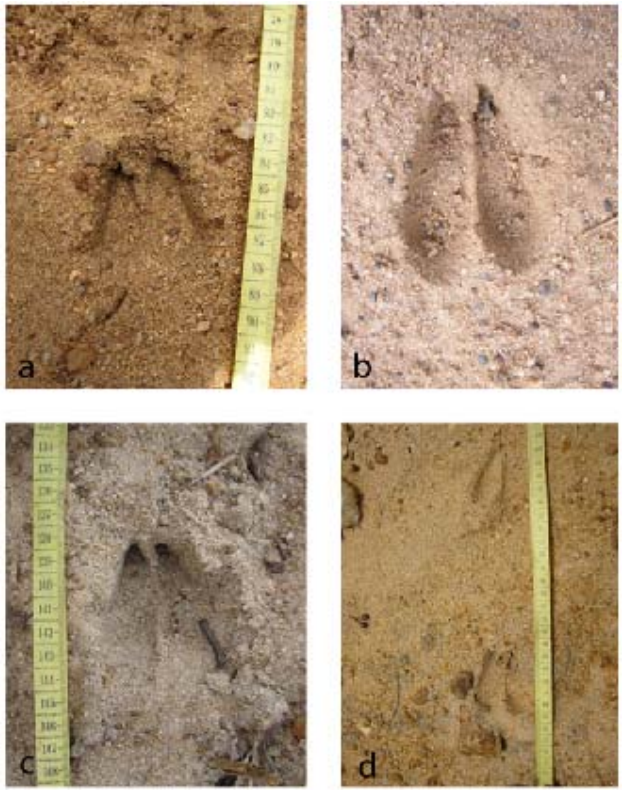

Photo 6: a, b, c & d. Hoof mark of Blackbuck found in Block 5, 6, 7 & 8

Photo 7: a, b, c, & d. Pellets of Blackbuck which were recorded in Block 5, 6, 7 & 8

Photo 8: a & b. Lekking spots of Blackbuck

Photo 9: Planting inside the Blackbuck habitat by forest department: a. *Pongamia pinnata*; b. *Pterocarpus marsupium*; c. *Phyllanthus emblica*; d. *Simarouba Glauca*

Photo 10: a & b. Planting area inside the Blackbuck habitat

Photo 11: a. Mining area; b & C. Accumulation of sandy slush as waste from the mining machine deposited inside the sanctuary

Photo 12: a. Livestock inside the Blackbuck habitat; this water hole is the source of water for Black buck. b. Forest fire in the habitat i.e. block 8, 2011

Major threats observed in the area were,

- *Grazing of livestock:* There are around 20 villages in the Blackbuck habitat. Approximately 70% of the livestock of the villagers depend on the forest for grazing. The livestock have become major competitors for fodder, which has led to fodder scarcity, resulting in frequent crop raiding by the Blackbucks to the nearby agricultural fields.
- *Planting:* In and around N-12°43'13.43 E-76°38'30.80 and N-12°42'50.00 E- 76°39'.87, the Karnataka Forest Department in Melkote Temple Wildlife Sanctuary has planted more than 8000 saplings since last 4 years inside the Blackbuck habitat i.e. in blocks 5, 7 & 8. It includes both social forestry and as well as wildlife area. This is resulting in habitat change and increasing tree density in the area. Plants placed with a distance of 15.28±2.519 ft between two saplings, Major plants planted are *Pongamia pinnata*, *Pterocarpus marsupium*, *Phyllanthus emblica* & *Simarouba glauca* saplings and average height of these plants measured during our study was *Pongamia pinnata* 2.74±1.625 ft, *Pterocarpus marsupium* 2.886±2.619 ft, *Phyllanthus emblica* 5.16±2.881 ft & *Simarouba glauca* 2.921±1.243 ft respectively. Survival percentage of the planted saplings was measured at around 75%.
- *Forest fire:* It is a major threat noticed during the study, which is primarily posed by the villagers. This has again added to fodder scarcity & resulting in crop raiding by the Blackbucks to the nearby agricultural fields.
- *Sand mining:* The sand mining was observed in Kotagalli Lake (12°44'525 N 76°35'769 E) which is near block 6 and less than 50m away from the Blackbuck habitat and as well as sanctuary boundary. The mining activity is draining the slush into the sanctuary. This has led to good water scarcity in the sanctuary.
- *Road:* Melkote – Shravanabelagola and Melkote – Krishnaraja Pete roads are bisecting the sanctuary (Block no. 2, 4, 7 & 8) and creating hindrance for movement of wildlife, especially continuous night traffic with dazzling headlights disturb wildlife movement.

CONCLUSION

As per the studies, The Blackbucks prefer grassland and lightly wooded landscapes [9, 2, 12]. However, most part of the core zone of the sanctuary has high undulations & more tree density. Because of this, the blackbucks have their habitation only in the periphery of the sanctuary where land is flat and open and variation in the lekking spot selection were also observed [13]. In some of the Blackbuck habitats, unfortunately, the forest department has planted saplings inside the wildlife sanctuary which is the violation of section 29 of the wildlife protection act, 1972. Human activities such as grazing, sand mining, forest fire have further disturbed the habitat of blackbucks in the area. Serious measures to be taken by the authorities to provide better and safe habitat for this threatened species in Melkote Temple Wildlife Sanctuary.

Recommendation

- **Action to be taken by the forest department**

- Social forestry department have to stop planting new trees in the blackbuck habitat especially North part of the sanctuary i.e. Blocks 5, 6, 7 & 8.
- Urgent need for preventing the slush generated by mining from Kotagalli lake mining site, which is near the block 6.
- Awareness programs about the Blackbucks for Village forest committee (VFC) members, local farmers, schools and children should be conducted regularly.
- Constant documentation of visual sightings and deaths of Blackbuck is required.
- Making fences live by connecting electric line should be controlled by the forest department
- Fire lines should be done before the summer to protect the habitat from fire.

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