Annexure- 10

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Periodical Census to Monitor Blackbucks Population at Jayamangali Blackbuck Conservation Reserve, Mydanahalli, Tumkur Dt, Karnataka

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Abstract- **Blackbucks are endemic to the Indian Grasslands of Deccan Plateau. It is the only representative of genus antelope found in India and one of the most graceful and the fastest of all surviving species (70_km/hr). They were used to be seen in thousands at the beginning of this century all throughout the plains of India except the Western coast. In 1982, the estimated population in India was ranging from 22,500 to 24,500 [1]. According to India Environment Portal report at the time of Independence, the blackbuck population was estimated at about 80,000. Due to immense pressures of large scale poaching and destruction of their habitat including cultivation, cattle grazing, human habitation etc., today they survive only in a few isolated pockets, with their reduced population [3, 11]. One among these isolated patches of grasslands with Blackbuck is Maydanahalli area of Tumkur district. The major problems here are typical man-animal conflict and shrinkage of habitat both in quality and quantity. Inspite of measures taken by forest department many of the problems are still not addressed. These issues need to be addressed in a holistic manner by establishing the synergy between different stakeholders. Though few focus studies have been taken up but not much work has been done regarding the issues related to conservation and management of the reserve. This paper highlights the periodic census conducted in the project area, as a strategy to understand the populaton dynamics of blackbucks which in turn helps to evolve long term plannings to mitigating some of the problems and helps in evolving newer strategies to sustain the conservation efforts.**

Keywords- Habitat Conservation, Blackbuck census, Mydanahalli, Biodiversity

I. INTRODUCTION

Blackbuck (Indian Blackbuck (*Antelope cervicapra*)) is one of the antelopes endemic to the Indian subcontinent (*Antelope cervicapra centralis* in Central India, *Antelope cervicapra rajputani* in Westren India, *Antelope cervicapra rupicapra* in South India and *Antelope cervicapra cervicapra* in North India) and whose numbers are dwindling [4]. Blackbucks are designated as Vulnerable as per the Red Data Book (1994). Currently due to immense pressures of large scale poaching and destruction of their habitat including cultivation, cattle grazing, human habitation etc., blackbucks survive only in a few isolated pockets in Karnataka. The Blackbuck locally known as Krishnamruga, found in the grasslands of Jayamangali (formerly Maydanahalli) Blackbuck Conservation Reserve, in Tumkur district, Blackbucks have also been conserved in Ranebennur sanctuary which is located in Haveri district of Karnataka [6].

II. HABITAT QUALITY AND CONSERVATION ISSUES

Blackbuck require open grass lands with intermittent tall grass or bushes (for delivery, fawn nursing and to seek protection against predators as well as the rain and wind). Blackbuck are very territorial, marking it and defending it in the rutting season. Blackbucks live on fresh tender leaves, grass, crops, cereals, vegetables and leaves of shrubs and trees [9].

Blackbucks are not restricted to Mydanahalli (77°18' – 77°20' East and 13°44' – 13°16' North) area (798 acre) alone instead they roam around 26 surrounding villages for food and fodder. The natural vegetation of Mydanahalli represents Southern tropical thorn forests (6A) according to Champion and Seth's classification. The temperature varies from 8 to 43 degree Celsius in summer. The average of rainfall is approximately 30 to 35 cm. The Karnataka forest department has planted *Eucalyptus sp.* and *Acacia auriculiformis* as an effort towards afforestation [5]. The major problems of the reserve are two folded, one is typical man-animal conflict and other is the changing pattern of habitat w.r.t. quality and quantity.

The aim of the study is to evolve conservation strategies to conserve this blackbuck area by studying the biodiversity, habitat structure, change in land use pattern and anthropogenic pressures. Census as a main tool to understand the pattern of key species in the area provides relevant data to monitor the well-being of the habitat.

A. Surveys in the Suprrounding Villages

Data from the village panchayaths have been collected on village and agricultural profile and cattle population. Data are also being collected through interviews and discussions with the farmers. The data recorded showed that out of 26 villages surrounding this area about 14 of them are seriously affected. The small land holders of these villages are affected by the crop loss and undergone major loss in their annual income. The maximum number of about 400 farmers of Maydanahalli village were affected. The next affected village was Kodalapaura of about 370 farmers. Minimum affect of Blackbuck was observed in Yaragunta and Dodenahalli village (Fig. 1).

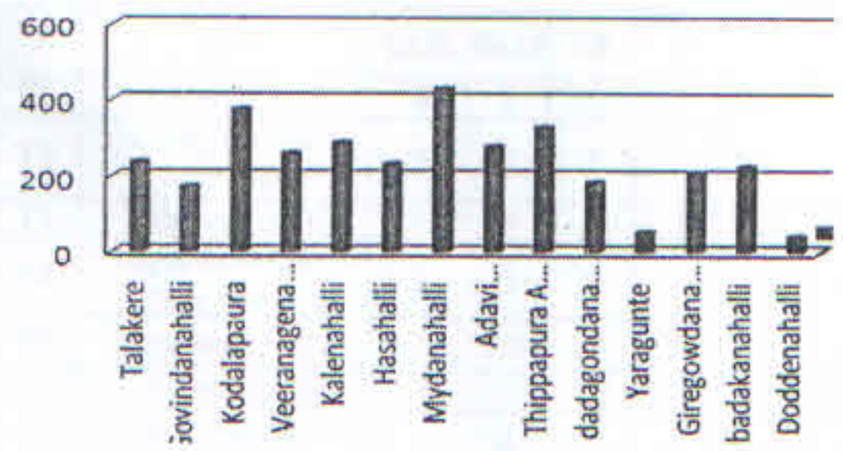


Fig. 1 Number of farmers affected due to the Blackbuck population present around the Jayamangali Blackbuck Conservation Reserve showed by the survey during 2005

The survey showed that the blackbucks caused damage to the agricultural crops of the surrounding villages and affected the local economy. Interference by human and their cattle had affected the ecological balance and sustainability of their habitat. Apart from this the cultivable areas supported the growth of a wide variety of pulses and cereals. The area is also a home for a large population of domestic animals comprising cattle, sheep, goats, dogs and wild ones [7].

B. Changes in Land Use

The land of the present Reserve Forest area which was earlier with revenue department was subjected to encroachment and many people had sought for regularization of it. Subsequently, after sustained efforts, 798.33 acres (323.28 hectares) of land has been transferred to forest department, which has now been declared as 'Jayamangali black buck conservation area'. This habitat is also been facing more pressures in terms of over grazing, accidental fires from the shephards, conversion of cart tracks in to non metal roads has resulted in increased vehicular movement. Changes in agricultural crops from traditional pulses and cereals to commercial crops and even establishment of Vine yards also resulted in fencing activities, establishment of brick kilns and also anthropogenic pressures which makes the animals to move out of the specified (declared) area.

III. MATERIALS AND METHODS

A. Previous Census of Biodiversity in the Study Area

A status survey confirms the presence of 19 species of mammals belonging to 11 families 125 species of Birds from 37 families (out of which 22 species are migratory), 26 species of reptiles from 02 orders including 14 different species of snakes and 67 species of butterflies belonging to 7 families. The documentation of amphibians, insects, herbs and shrubs is under progress. Some of the villagers claim to have sighted Great Indian Bustard in the distant past [5].

B. Census of Blackbucks

Since 1997, Wild life Aware Nature Club [1], has conducted blackbucks ensus three times in this study area. Line transect method was used in all the studies. The entire area was divided in to 12 divisions in first two wildlife census. In the recent wild life census, 21 transects were marked. These transects were marked on the *topographic maps* to ensure coverage of all the villages surrounding study area (Fig. 1). The trained volunteers along with trained forest department watchers participated in the census activity. They walk in each transect line and count the animals and their position, movement w.r.t. transect point and time. The data will be recorded and compiled at the base station at reggular intervals to avoid overlappings. After the census the villagers also being interviewed and evidenses of change in land use pattern, issues w.r.t. conservation will be documented. The equipments such as field compass, binoculars, wireless handsets and recorders were used [8].

IV. RESULTS AND DISCUSSIONS

A. Status of Blackbuck in the Study Area

The study area has been surveyed for the blackbucks over 21 transects – Line transect method (Fig. 2). The total number of 454 Blackbuck was counted during the census of 2009, which includes 120 are males 280 females and 49 fawns. The count details have been across the 21 transects (Fig. 3), and the transects have been plotted in a graph (Fig. 3.1) to understand the distribution and the skewed polpulations across some of the transects.

Fig. 2 Map depicting 21 transects in the conservaton area

[1] *An enthusiastic group of volunteers who works with issues related to conservation in Tumkur Dist.*

#	Area	Bl.M	Br.M	AF	F	UI	T
T1	Vine yard toIB	6	3	12	0	0	21
T2	Veernagenahalli to West Gate	3	2	7	4	0	16
T3	Talakere to IB	4	0	8	2	2	14
T4	Gregowdanahalli to plantation	2	3	5	7	0	17
T5	Yaragunte to IB	13	10	30	5	0	58
T6	I D halli to IB	14	15	128	10	0	167
T7	Yelkur main Road to IB	4	0	3	0	0	7
T8	Tipoapura to IB	10	5	21	13	0	49
T9	Tippapura to Forest Boundry	2	2	12	2	0	18
T10	A.Nnagenalli to IB	0	0	0	0	0	0
T11	Suddskunte to Mydenahalli	0	0	0	0	0	0
T12	I D Halli to Tippapura	1	1	2	0	0	4
T13	Kamatanahalli to Tippapura	0	0	0	0	0	0
T14	Tondoti to Siddakunte	0	0	0	0	2	0
T15	Doddadalvata to Oblapur plantation	1	1	4	1	0	7
T16	Vittalapura to Chikkadaivatta	0	0	0	0	0	0
T17	Polenahalli to Siddekonte	0	0	4	0	0	4
T18	Singenahalli to Mydenahalli	0	0	0	0	0	0
T19	Tadit to ID Halli	0	0	0	0	0	0
T20	Mydenahalli to IB	5	2	31	0	0	38
T21	Tippapura to Siddekunte	8	12	13	1	0	34
	Total	73	56	280	45	4	454

Bl M-Black Male, Br M- Brown Male, AF-Adult Female
F-female, UI-Unidentified, Fa-fawn, T- Total

TABLE. 3 BLACKBUCK COUNT IN ALL THE 21 TRANSECTS DURING 2009.

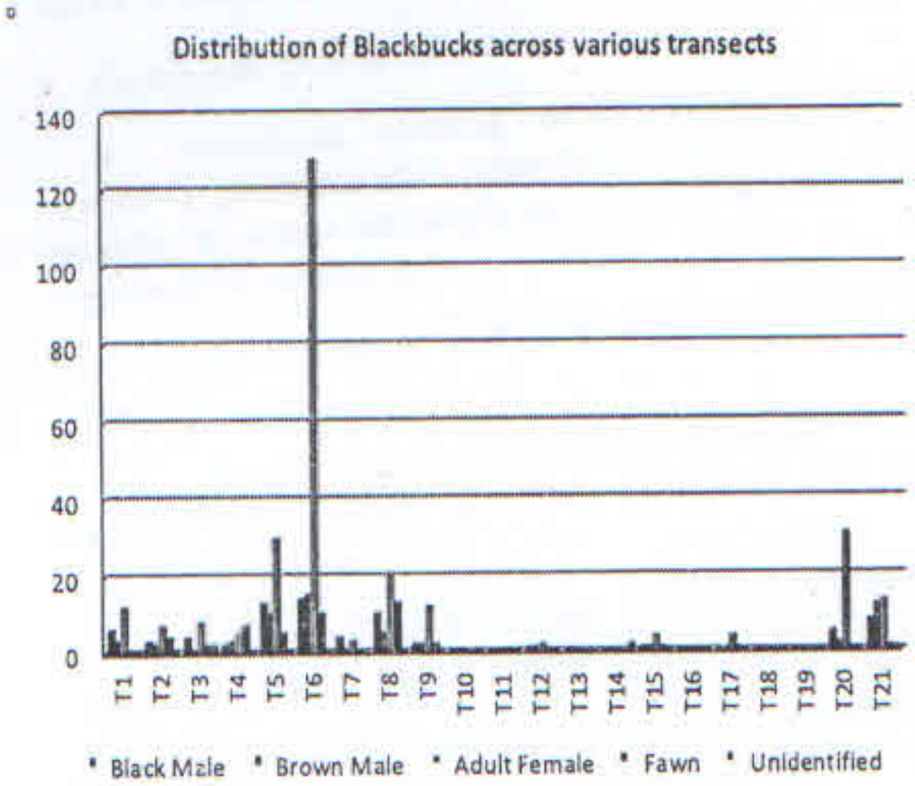


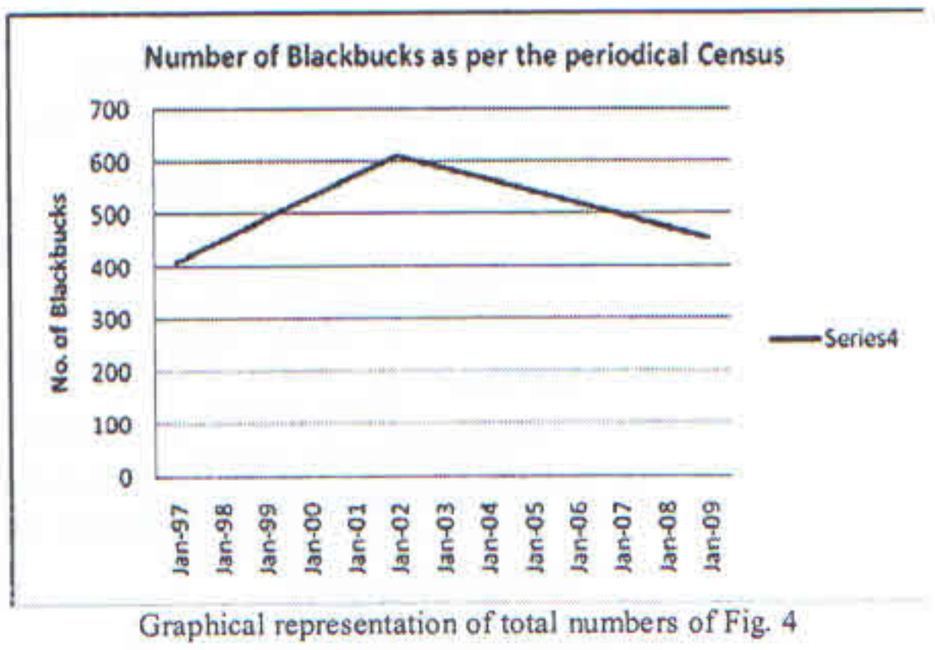
Fig. 3.1 The distribution of Blackbucks across transects

Comparisions of results with the previous census data show a decline trend in over all population as well as in the male –female ratio. The ratio has shown that there are less adult males. The ratio has decreased from 1:1.6 in 2002 to 1: 2.1 in 2009 (Fig. 4). The herd structures are not being studied in detail but in general the field experiences re-confirms that the number and size of herds has considerably come down with respect to the field sightings between 1997 and 2002.

Year	Male	Female	Fawn	Total
15-16th Nov1997	DNA	DNA	DNA*	408
1st -2nd Oct 2002	202	335	73	610
22-23rd Feb 2009	129	280	45 +4	454

*Data Not Available

TABLE. 4 CENSUS RESULTS FROM 1997 TO 2009 – (SHOWING THE DECLINE IN NUMBER OF MALES AND FAWNS.)



Graphical representation of total numbers of Fig. 4

B. Decline in the Numbers and Variation in Distribution of Population

The transect No. 10 to 19 which have high anthropogenic interference have shown very less movement of animals and the areas which had more animals in the previous census are now showing considerable decline in blackbuck numbers (Fig. 3.1). Most of the animals are restricted to 5-6 km radius from Mydanahalli inspection bungalow (transect No. 1 to 6). Even the distribution has been skewed in many areas around Mydanahalli. The population of Blackbucks has been decreased around villages which employed intensive agriculture.

The changed distribution pattern, skewed population in the areas which witnessed good numbers in the previous census and decrease in the overall number of blackbucks may be attributed to the increase of changed land use pattern and anthropogenic activities.

C. Decrease in the Number of Adult Males

The trend of decreased population of male needs to be seriously considered, as it may be the pivot reason for the decline in numbers. As male being targeted for its attractive skin and horn, it is more prone to poaching. The decline in the number of adult males disturbs the reproductive behaviors and in turn internal breeding has its own adverse effects on the diversity and viability of the population [3].

Blackbucks mate during all seasons of the year the most rutting takes place between March-April and August – October and gestation period of six months [2]. This naturally leads to more population growth in any protected area. From past few years the field notes confirm that there are very few fawns being sighted during the period when blackbucks give birth to young ones, where they otherwise to be more in number. This may be of several reasons. The

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ns need more busy places to hide when they are too ung to run and escape from the predators.

D. Probable Reasons for Decline in Numbers of Blackbucks

The increased anthropogenic activities such as promotion of horticulture, grazing of cattles and fencing of some areas in the habitat have resulted in the destruction of the habitat quality which also opens up challenges in the form of electrified fences and feral dogs. Few cases of poaching and smuggling of Blackbuck skin in the district have been recorded.

During my survey of the study area the following observations showed a matter of concern with relation to Blackbuck:

- Habitat destruction;
- Conversion of adjacent rain fed agricultural lands to irrigated and horticulture land;
- Electric fencing of agricultural fields preventing movement of the blackbuck from one grass land to the other;
- Development activity like illegal building of road leading to more traffic and disturbance to blackbuck;
- Increase in feral dogs and predators.

V. CONCLUSION

As the area needs protection both in terms of habitat and key species there should be continuous monitoring mechanisms in place. The study of habitat and key species is of prime importance and we listed our recommendations based on the probable time taken to implement them. They can be interchanged according to the need and priority.

A. Recommendations (short term)

- Grassland coming under revenue department should be protected and conservation should be focused to include the whole landscape instead of just the 798 acres of conservation reserve area
- Restriction of extensive grazing by the cattle and sheep
- Proper vaccination to the cattle in the surrounding villages which minimizes the occurrence and spread of infectious diseases
- Restriction of vehicle movement by shifting the road from conservation reserve
- Permanent wireless station (or watchman with a mobile) at the inspection bungalow who can be informed by locals about the poaching and animal movement
- Regular monitoring of electrical fences established adjacent to the reserve boundaries
- Providing more human resources and equipments to patrol the area adequately
- Removal of eucalyptus plantation to make way for grassland
- Controlling the feral dogs from hunting blackbucks
- Restricting the illegal activities of the visitors and restricting movement of tourists in the designated paths only
- Creation of community conservation and management committees

B. Recommendations (Long term)

- Development of green fencing
- Cultivation of feeding plots at regular intervals
- Encouraging the farmers to adopt organic farming practices by giving adequate facilities and subsidies
- Establish the models of 'community conservation reserves'
- Efforts to develop education and awareness among all the stakeholders of the habitat

Various attempts have been made at Nepal [4] and interventions where the community conservation reserves have been established to protect the natural habitats [10].

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