



## **Blackbuck (*Antilope cervicapra*) Population Status Around Jodhpur, Rajasthan**

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### **ABSTRACT**

*Antelopes found in India and have a wide distribution in Rajasthan. The Jodhpur District of Rajasthan has the maximum numbers of Blackbuck. A study was conducted to assess the Blackbuck population in the Jodhpur District Rajasthan. Populace status of the ultimate wild population of endangered and guarded species of Blackbuck (*Antilope cervicapra*) was studied at Jodhpur, Rajasthan by the direct observation method from August 2019 to Feb 2020 for detail. The total population of Blackbuck during that period was 303 with the crude population density of 14 individuals/ Km<sup>2</sup> and the ecological density of 32 individuals/ Km<sup>2</sup> at the core habitat. The average herd size was computed to be of 8 individuals per herd. The male to female sex ratio was 1:3 showing a sex ratio of 78.26 bucks to 100 does. The annual natality rate was computed to be 12 per matured female per year and the mortality rate was 26 per individual per year. However, thereafter till 2019, annual lump sum population data only are given for general overview.*

**Keywords:** Blackbuck (*Antilope cervicapra*), Population, individual, Natality, Annual, Jodhpur, Rajasthan.

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### **INTRODUCTION**

An elegant Blackbuck *Antilope cervicapra* Linnaeus (1758) is a species of Bovidae family. Blackbuck groups are largely found in many regions of India, Pakistan, Nepal, Srilanka, except for the north-eastern region. It is also known by a number of other names like Kala Hiran, Krishna America. The conservation status of Blackbuck is listed in Red Data Book of IUCN (International Union for Conservation of Nature and Natural Resources) as near-threatened since 2003, in CITES

(Convention of International Trade for Endangered Species of Wild Flora and Fauna) is categorized in Appendix III. It is classified in schedule I of Wildlife Protection Act, 1972. Essentially a species of open plain, it is found in a wide range of habitats from arid grassland, scrubland to marshy coastal plains, and open woodlands [1]. It is primarily a grazer and browser, in the absence of grass; it can be considered a mixed feeder [2, 3 and 4].

The Blackbuck can utilize a range of habitats including tropical and subtropical weed land, dry deciduous forest, open plain (grassland), riverbanks, and semi-desert habitats, and can forage in cropland and pasture land. They are generally sedentary, but they may move for long distances in search of water and forage in summer [1]. The average life-span of Blackbuck determined in captivity is 12 years and the upper limit is 16 years [5].

Population dynamics of the Blackbuck and the land use of the Blackbuck area at Jodhpur are not documented scientifically. Considering limited resources and multiplying needs with a growing human population, management supported a holistic research approach that is important and appropriate.

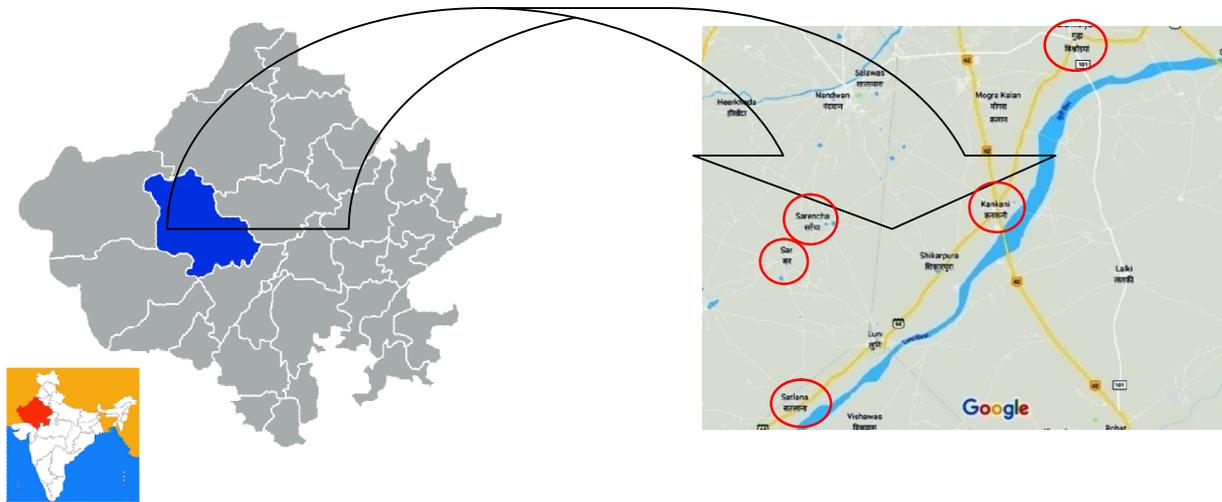
Biological data, which incorporates the present population status and understanding of behavior, are vital for in-situ conservation of any species. This study extrapolates the population characteristics of the endangered species of Blackbuck in Jodhpur [6].

### **MATERIAL AND METHODS**

**Study Area:** The study of population of Blackbuck is carried out in the entire district of Jodhpur from August 2019 to Feb 2020. The observations were made for 5 days in every month visiting Jodhpur

district has five study areas namely Guda Bishnoiya, Kakani, Sar, Srecha, and Satlana. Each area is covered in a single day by using a motorcycle. In this study, we followed the method used by Khanal [7].

Figure: -1 The Study of Blackbuck population in Jodhpur District in Study area



The study area has a tropical monsoon climate. Three distinct seasons were identified in this area as the hot season (mid-February to mid-June), monsoon (mid-June to late September), and cool, dry season (early October to mid-February). The average annual mean rainfall recorded was 362 mm, almost 80% of the rainfall occurs from June to September. The Maximum and minimum temperature recorded is 45° C and 8° C respectively.

**Method:-**The Proposed Blackbuck study Area was visited on a motorcycle in August, September, October, November, and December (2019), January, and February (2020). The secondary data about the past population of Blackbuck were collected from the available sources in Forrest Choki and other works of literature. The detailed analysis in this paper is based on the 2019-20 study, while annual population data and other references are covered until 2019 for a general overview.

Initially, the information about the presence of Blackbuck in the study area was collected through interviews and discussions with villagers, farmers, and school teachers at the Panchayat level.

On the basis of the information gathered, the actual sightings of Blackbuck were made by repeatedly visiting the same location in different months and seasons of the year. The highest number counted during the study period is considered for a population estimate. The presence of Blackbuck is confirmed by reaching the Blackbuck location. The complete count was done in the early morning when most of the Blackbuck comes out in the grassland area for grazing.

**Population Census:-** Direct count of the Blackbuck with the help of binoculars was carried out and total population, age, and sex composition were recorded and determined after replication. Four expert persons were connected for thorough counting in each session to avoid the double count of animals. The maximum concurrent count was taken as the total population of the Blackbuck in Jodhpur [8]. The crude population density was calculated as the total number of animals occupying per unit area of Proposed Blackbuck living Area and ecological density was calculated as the total number of individuals present in the actual area of habitat available.

**Age and Sex Composition:-** Binoculars were used to observe animals and their activities from a distance. Blackbucks were observed regularly and in each startup age and sex composition noted according to [9]. Mature males and females were differentiated from their body color and horn and immature were differentiated with the keen observation on the belly to look at the position of urethra. The strikingly different posture of males and females during urination and the place of licking of the doe after suckling of the neonate was the main aid to identify the sex of fawns and neonate [10].

Age classes were limited to four groups viz. fawn (below six months), adolescent (six months to one year), sub-adult (one to two years) and adult (two years and more); discernible in the field by mere observation.

**Herd Size and Number:-** Average herd size was estimated by dividing the total number of Blackbucks counted during the observation period by the total number of herds observed. The population of Blackbuck recorded during the year of 2019/2020 has been used for the demographic analysis.

## RESULTS

### Population Status of Blackbuck in Jodhpur

Land of Jodhpur district is covered mainly by Agricultural fields, with a few patches of scrubby forest and grassland. It is considered as the most ideal habitat for Blackbuck [1]. The Blackbuck is known to prefer open habitat [11]. The distribution of Blackbuck in Jodhpur district is uneven.

They are widely distributed in Jodhpur district. The total population recorded in the Jodhpur district is 919 (census 2019 forest department). The highest numbers of 150 individuals in 10 herds are in Kakani and the Kakani area alone has 150 Blackbuck. Guda Bishnoiya has the second-highest population 70. Sar, and Sreacha, and Satlana have a meager population that is 18, 27, and 38 respectively (Table 1 and Figure 2).

Table 1: Blackbuck population in study area Jodhpur district during the year August 2019 to February 2020.

Sr. No.	Area	Location (a)	No. of Herd (b)	Population (c)
1	Guda Bishnoiya	5	6	70
2	Kakani	6	10	150
3	Sar	1	2	18
4	Sreacha	3	3	27
5	Satlana	5	5	38
<b>Total</b>		<b>20</b>	<b>26</b>	<b>303</b>

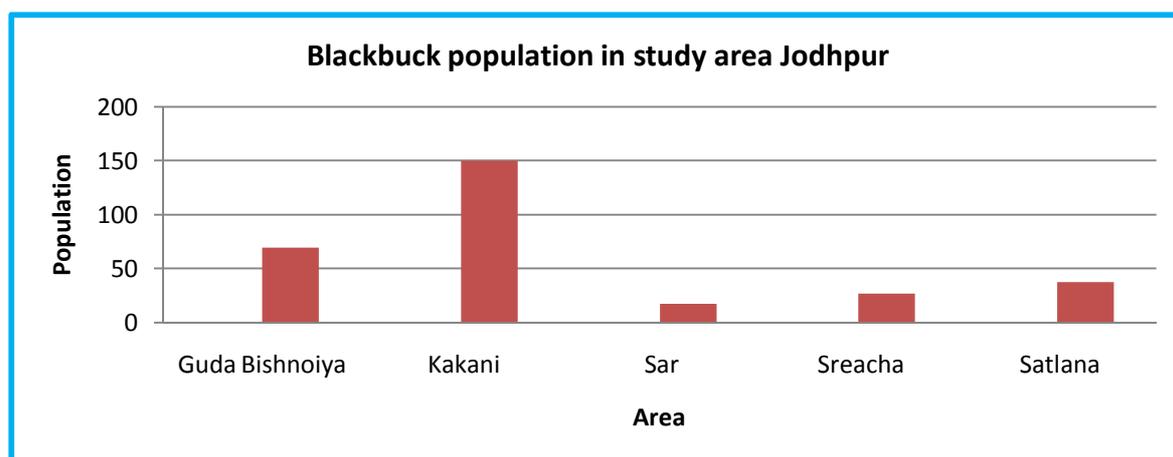


Figure 2. Blackbuck population in study area Jodhpur district during the year August 2019 to February 2020.

The Guda Bishnoiya area in Jodhpur has the highest congregation in small grassland areas measuring less than 180 hectares. They freely roam near the village and in grassland. This small grassland is a private land surrounded by the Air Force boundary from two sides and the remaining two sides by the village. The Air Force guards never allow any person to come near the fencing wall and they also keep a vigil on the Blackbuck. The attack of predators like stray dogs and jackals is prevented by the villagers and the Air Force guards. This is the reason for the highest number of Blackbuck in such a small area of grassland. It is completely private land [12].

Their movement is within forest and village area of Kakani, Sar, Sreacha, and Satlana forest patch has hectare land with 5 counted. Kakani village has 120 hectares of open grassland and the Blackbuck population is counted 150 in number.

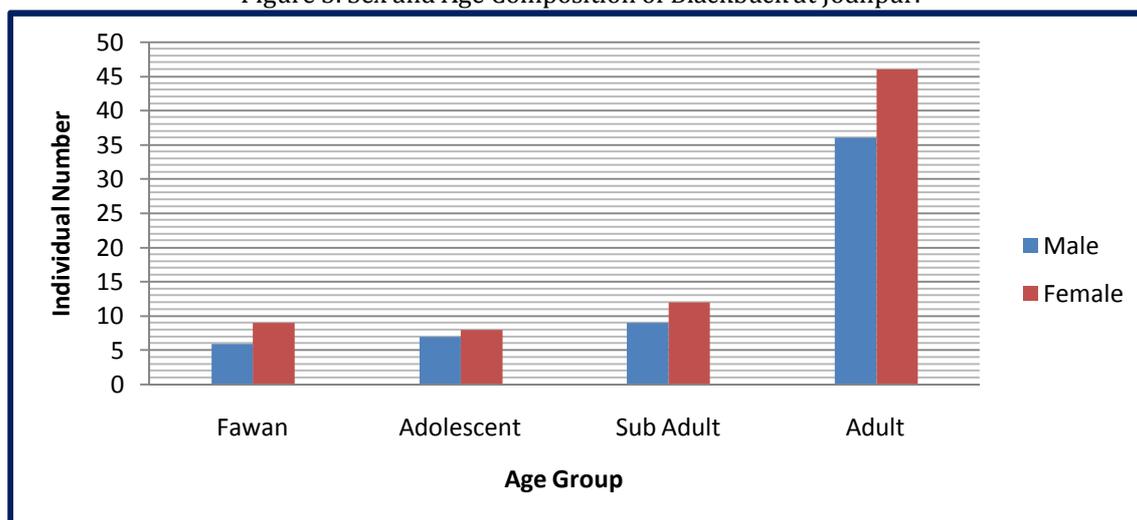
Blackbuck is always found in this area, there are many herds of Blackbuck, and each herd contains 8-10 Blackbucks. As they get enough cropland here, they never go into the forest [13]. They prefer cropland for food. Blackbuck is surviving in huge numbers because it's undisturbed, safe, and has huge grassland with abundance availability of food and water.

Population Density:-The total population in the Jodhpur counted was 919 in census 2019 and a total of five study areas in the Jodhpur. Therefore the crude density in the study area was calculated to be 14 individuals / km<sup>2</sup> [14]. The crude density for 2019 would be 32 animals /km<sup>2</sup>. However, the area of the realized habitat of Blackbuck in Sar is only 1 km<sup>2</sup> excluding the encroached residential and cultivated area and the eastern forest with no access to Blackbuck; therefore the ecological density of Blackbuck

population in the study area was calculated to be 35 individuals / km<sup>2</sup>. The same area applies for 2019 reveals the ecological density of 50 blackbucks per square kilometer.

Age and Sex structure:- Out of the total population of Blackbuck in the Study Area, males were counted 58 (43.6%) and females were 75 (56.4%), thus male to female ratio was computed to be 1:3. Among adults, out of 82 individuals, male to female ratio was the count at 1:1.28 indicating 78.26 adult males to 100 adult females. The sex ratio was 1:1.33 among sub-adults, 1:1.14 among adolescents, and 1:1.5 among fawns. In all the age groups of the wild population of Blackbuck in Study area, there were more females than males, but in no age group did this depart significantly from a 1:1 sex ratio.

Figure 3. Sex and Age Composition of Blackbuck at Jodhpur.



**Natality and Mortality Rate:-** Total number of live births from August 2019 to February 2020 was recorded to be 26 and the average number of females of age of reproduction was 33 for that time period. Hence, the natality rate of Blackbuck population in my Study area is computed to be 12 per matured female per year.

The average population of Blackbuck in study area from August 2019 to February 2020 was 303. The total number of death within that one year period including one pre-natal death was recorded 8 (Table 2).

Table 2. A Glimpse of Frequency Distribution of Yearly Deaths of Blackbuck in Study Area Jodhpur 2019-2020

Year	2019					2020	
	Aug.	Sept.	Oct.	Nov.	Dec.	January	February
<b>No. of Deaths</b>	2	0	1	0	2	1	2

(Source: Record from Study area Post and Field Visit, 2019-2020.)

**Herd Size and Number:-** The average herd size of 6 individuals was computed from 303 individuals counted during the study period on 20 groups or herds during the study period. Almost one-third (32.34 percent) were observed as single individuals of which 74% of the individuals were single isolated males. The largest herd size of 80-90 individuals including both sexes and of all the age groups was observed in the early morning of 10<sup>th</sup> August 2019. 34 percent of the herds were observed in the groups of six to ten.

## CONCLUSION

The study on the Blackbuck distribution population was successfully conducted in the Jodhpur district of western Rajasthan. The district is famous for Historical fort, Traditional Festivals, Cultures, Medicinal plants, and Crops.

The climate of the district is good for surviving wild plants and animals. Hence, the population of Blackbuck is good in a number. Based on our research work the status, population condition has resulted in this manner. Blackbuck (*Antelope cervicapra*) is a species of order Artiodactyla which is present in Jodhpur in good numbers.

The distribution of Blackbuck is in a few selected areas of the district. But the land of the district is suitable for the survival of this species. Hence, certain crops of the farmers are grazed often by the

Blackbuck which has become an unsolvable problem for them. This region has less forest and more grassland contained habitat so the Blackbuck population is nicely adapted. There is no National Park, Wildlife Sanctuary, and Bio reservoir.

Therefore, this Blackbuck population is randomly distributed and migrated. Besides the crops are affected and farmers are in great loss. To control this problem an urgent Blackbuck Bio-reservoir is needed. By the reservoir the population of Blackbuck will enhance, the threats on Blackbuck can also be controlled and the farmers' crops can also be saved.

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