

The status of the large mammals in the Keoladeo Ghana Sanctuary, Rajasthan

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Keoladeo Ghana is known as one of the finest waterbird sanctuaries in India. However, it is not generally appreciated that this reserve also harbors such typically Indian mammals as the blackbuck, nilgai and chital, in addition to sambar, hog deer, leopard, and others. These could become a major attraction to the numerous tourists that visit Agra only 36 miles away.

It appears likely that some of India's wildlife species such as the blackbuck may be able to survive only in rigidly protected sanctuaries. Therefore, a knowledge of the status of the wildlife in each reserve is urgently needed. Adequate conservation practices can be based only on a body of precise facts which have been collected and analyzed continuously over a period of years. In order to obtain some data on the condition of the large mammals, particularly the ungulates, in the Keoladeo Ghana Sanctuary, a series of counts was undertaken between February 12th 1965 and January 30th 1966.

The sanctuary is composed of 7,000 acres of marsh and open woodland completely surrounded by cultivation near the town of Bharatpur. It was once the private shooting preserve of the Maharaja of Bharatpur, but after independence the Forest Department assumed management of the area. A shallow, marshy lake broken by numerous reed beds, patches of higher ground, and earthen dams or dikes covers about 2,000 acres in the center of the sanctuary. A forest of *Acacia arabica*, *Prosopis spicigera*, *Zyzyphus* sp. and other thorny shrubs and trees, characteristic of this semi-desert region, extends on three sides from the marsh to the reserve boundaries. The eastern side consists in part of grassland.

Census method. The entire land area of the sanctuary was transected on foot. We walked in parallel lines from 150 to 300 feet apart, depending on the density of the undergrowth, and counted the ungulates that flushed along the route of travel. We walked only between 0900 and approximately 1600 hours, a time of day when the wildlife was resting and not inclined to move far when disturbed. Although our transect method was relatively crude, it provided sufficient accuracy under the prevailing conditions. For example, during the 1965 census nearly all the blackbuck in the sanctuary were in one large herd and most of the chital had congregated in several large herds, which confined themselves to two specific areas. This enabled us to count all or most of these two species on the same day without duplication. However, in 1966 both the blackbuck and chital were scattered in small groups in different parts of the sanctuary, and they were also much more wary than in 1965, making accurate counts difficult. Nilgai were readily tallied because they are large, generally confine themselves to open or park-like areas, and are not greatly disturbed by the presence of man. Any duplication in our counts of nilgai was probably offset by the few animals we may have overlooked. Our transect data were generally confirmed by other visits on foot, by bicycle or by car to various parts of the sanctuary.

Results. The chital is the most abundant wild species in the sanctuary. In 1965, we counted about 360, but, since it is likely that a few were overlooked, we estimated a total population of 375-400. In 1966, we counted only 200, but, due to the extreme shyness of the deer, a total population of 300-325 was estimated, a decrease of at least 20 percent from the previous year.

About 110 nilgai were counted in 1965 and we believed this figure to be quite accurate. A total of 152 were counted in 1966, an increase of approximately 25 percent.

In 1965 most of the blackbuck were congregated into a single large herd. They were counted several times and 70 was the highest total, although one or two small fawns hiding in the grass may have been overlooked. The blackbuck were scattered in small groups in several parts of the sanctuary in 1966, making it difficult to get a count as accurate as that of the previous census. Our highest total was 54 and we feel certain that there are presently less than 60 in the sanctuary. This is a decline of approximately 25 percent in the blackbuck population during the year.

Nine, or possibly eleven, different sambar were seen in 1965. Thirteen sambar (two males, six females, four young and one adult not sexed) were observed in 1966. However, the shy and solitary nature of these deer and the small sample size make it difficult to state whether or not their numbers increased during the year.

Hog deer were so rare that prior to the 1965 census the sanctuary staff appeared unaware of their presence. Single males were seen on two occasions in 1965 and a solitary male was observed in 1966.

According to the files of the Forest Department, numerous wild pigs died of disease in May 1964. They were few in number during the 1965 census. A total of six pigs were counted on four occasions, but the tendency of these animals to remain hidden until closely approached makes an accurate census difficult by our method. A total of 35 pigs were tallied in 1966. These included a group of 18 (apparently two females with young), a female with eight young, two groups of two adults and one of three, and a solitary adult male. This is clearly an increase in numbers and we guess that the total population may contain as many as 80 head.

We saw the fresh track of an adult leopard in 1965. At that time others had recently seen a large cub. The previous summer a member of the Forest Department staff also picked up two young cubs along the road, which were sent to a zoo. However, in 1966 we saw no evidence of leopard and heard no recent reports of their presence in the area. It is doubtful that more than one or two, if any, survive in the area. The sanctuary also contains an undetermined number of hyaena, jackal, fox, jungle cat, mongoose porcupine, hare, and other smaller mammals.

Conservation problems. The abundance and variety of birds and mammals, the easy visibility of the wildlife, the accessibility of the sanctuary throughout the year and its proximity to major tourist centers, all combine to make Keoladeo Ghana unique among India's reserves. It is, therefore, distressing to read of a number of serious problems which affect the sanctuary so adversely as to cause grave concern for its future. These include high domestic livestock density and the resultant overgrazing and trampling which has severely damaged the vegetation. In some areas, particularly the eastern and northern parts, the grass cover has been almost completely removed, leaving only bare sandy soil, or at best, a few unpalatable weeds. In most other areas, the grass has either been cropped to ground level or consists of coarse bunch grasses not favoured by livestock or wildlife. The carrying capacity of the area is obviously far exceeded by livestock alone, leaving little margin for the wild ungulates.

Chital, blackbuck, and other game species are by preference grazers like the domestic animals. Therefore, severe competition exists between the two for forage. The sanctuary at present contains only about one wild ungulate per 8 acres (excluding the marsh) or one wild ungulate per 11 head of domestic livestock. It is unlikely, therefore, that wildlife can be appreciably increased until competition by livestock has been substantially reduced. If cattle and buffalo are permitted to remain at their present numbers, the range will ultimately, and perhaps within only a few years, deteriorate so much that it can support only a small fraction of the animals, both domestic and wild, now grazing there.

Other adverse factors are predation, not only by feral dogs, jackals, and perhaps leopards and hyaenas which kill a certain amount of wildlife each year, but especially by man both through legal but unregulated hunting and poaching. In addition to tending livestock and poaching, villagers gather berries, dig and remove grass from the sanctuary, collect and dry water plants as livestock fodder, collect firewood, make charcoal, and so forth. Many of these people were also observed to clap their hands and shout to frighten the wild animals which they saw. As a result the wildlife is almost constantly disturbed and its normal activity is continuously disrupted.

Some of this human activity also adversely affected the vegetation. For example, although the Forest Department has licensed only 36 wood collectors to remove *dead* wood from the reserve, as many as 15 illegal loads of wood were seen leaving the sanctuary in one evening. Wood collectors were also observed in 1965 to break down growing trees for firewood; in 1966 many of them used axes to fell living trees.

The problems of Keoladeo Ghana confront most other sanctuaries of India to a greater or lesser degree. The task of preserving a remnant of the unique fauna of the country lies with the present generation. It cannot be too often reiterated that the sanctuaries of India with the wealth of wild animals and plants which they contain are irreplaceable and as much a part of the nation's heritage as the Ta Mahal and the ruins of Khajuraho.