

## CURRENT STATUS OF VULTURE POPULATION AT JORBEER, BIKANER

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### AUTHORS' CONTRIBUTIONS

This is an original piece of research work carried out at the Department of Zoology, Government Dungar College, Bikaner among authors BS, DSS and SC. Author BS designed the study, performed the field work, performed the statistical analysis of data and drafted the manuscript. Author SC managed the analyses of the study and the literature searches, while author DSS read and approved the final manuscript.

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### ABSTRACT

Vultures are important for their ecological, social and cultural significance. They scavenge on animal carcasses and keep the environment clean. Vultures have appeared to be one of the fastest declining bird species in the world since early nineties. Nine species of vultures have been recorded in the India; seven species out of them have been observed in the study area including resident and migratory species. Population estimation and monitoring is essential for conservation of any species. Since the population of vulture is declining. Population size along with life history parameters indicates whether the species is declining, stable or increasing. Hence, the status of vulture population at Jorbeer has been carried out in the present investigation. This study will establish the investigated area as a paradise for vultures that havens various vulture species of conservational importance.

**Keywords:** Caracass; Jorbeer; population; scavenger; species; vultures.

### 1. INTRODUCTION

Vultures are important group of birds having onus of clinching the environment from decaying carcasses. They are also nature's disposal squads or "incinerators". Vultures play an important role in nature to prevent the outbreak and spread of infectious diseases by decomposed carcasses [1]. Vultures depend mainly on large animal for food. They devour large chunks of food. They get food from carnivore kills in forest and flayed carcasses and meat primitive slaughterhouses, carcass dumps, carcass processing centers and bone mills. They come to the rescue of man to dispose of carcasses when animals die during natural calamities such as floods, storms droughts, storms and wars. They also feed on small mammals

such as cat, dog or larger rodents at times. The speed and efficiency with which they remove carcasses is staggering. An army of 200 vultures can reduce a large buffalo carcass to bare skeleton within 20 minutes [2]. Vultures are friends of farmers as their excreta (containing guanine) are a good fertilizer. They are magnificent birds and boon to mankind. Their status and distribution has widely been studied in India [3,4,5,6,7,8].

All over the world there is 23 species of vulture, out of which nine species of vultures are found in India [9,10]. Seven species of vultures had been reported from Jorbeer Conservation Reserve located in Bikaner district about 12 km SE from city and it is a paradise for vultures. The species reported from here are:

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**Fig. 1. Location map of study area**

Indian Griffon vulture (*Gyps fulvus*), Cinereous vulture (*Aegypius monachus*), Indian Long billed vulture (*Gyps indicus*), Red headed vulture (*Sarcogyps calvus*), Himalayan vulture (*Gyps himalayensis*), White rumped vulture (*Gyps bengalensis*) and Egyptian vulture (*Neophron percnopterus*). The present status of vulture population at Jorbeer, Bikaner (Rajasthan) has been carried out in this study.

**Study Area:** Jorbeer conservation reserve (JCR) lies in Bikaner district in the North-west part of India. This conservation reserve is situated about 12 km SE of Bikaner City (Fig. 1). The dump site of the conservation reserve lies at 27°58'2.0"N latitude and 73°22'37"E longitude having 56.26 sq.km areas. Jorbeer and its nearby desert villages are well known for avian fauna especially the Gyps and other species of vultures during winters. Egyptian vulture is resident species and can be observed throughout the year and other six species are migratory. Jorbeer is the winter home of many migratory vulture species and they start arriving here during September-October and return back to their original home by February-March.

Considering the steep decline in vulture population in Indian subcontinent, the vulture population at Jorbeer area, is being monitored from last four years [11]. The Jorbeer area is dominated by the desert sand dunes and the typical desert plantation. Study area does not witness much human interference but the railway tracks diagonally traverse through the area,

distributing scavenging birds regularly. The vultures live in this natural habitat and feed on carcasses of animals brought by Bikaner Municipality. They feed upon dumped carcasses along with dogs, black ibises, steppe eagles and cattle egrets. These large congregations of scavenging birds attract scientists and researchers from all around the world.

## 2. MATERIALS AND METHODS

**Observation Survey:** An extensive and regular survey for population status of vultures was carried out in and around Jorbeer, Bikaner. As all feathered creatures are protected under Wildlife (Protection) Act, 1972, maximum efforts were made for their direct sighting records, calls, nesting, roosting and behavioural patterns. All precaution was taken not to disturb them in any way.

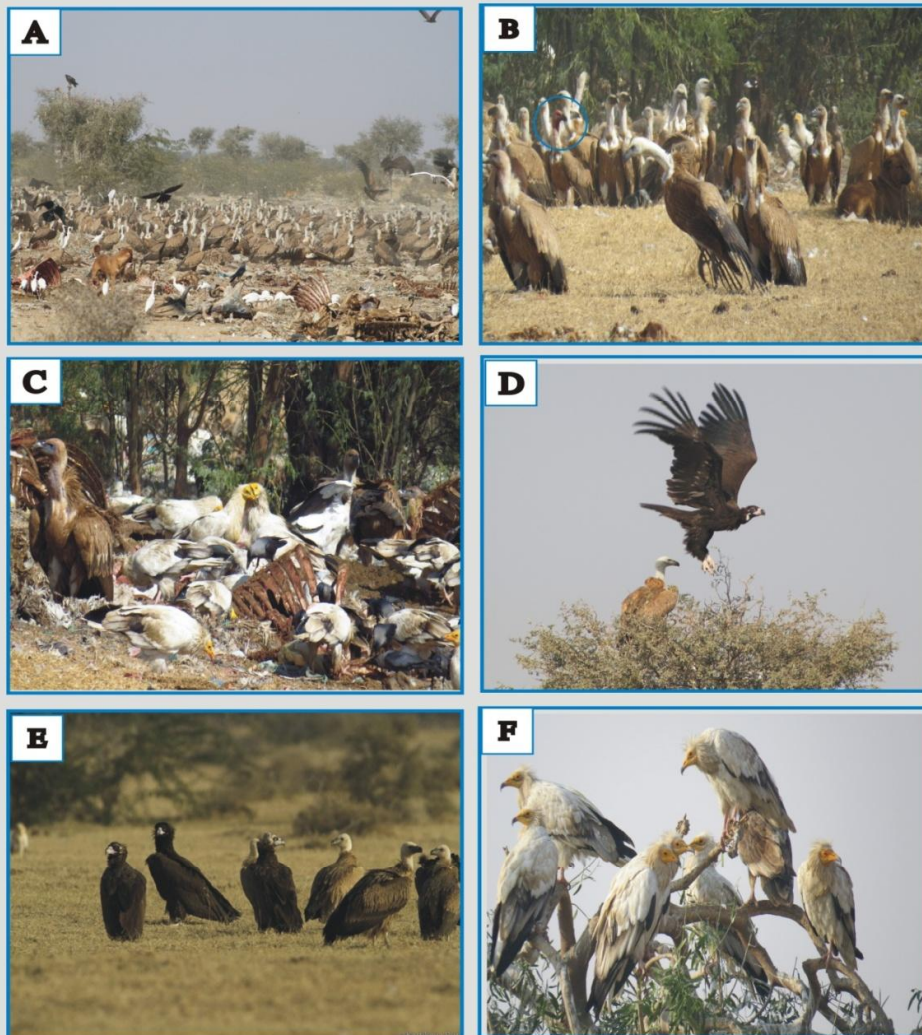
The population status of Egyptian vulture (*Neophron percnopterus*), Himalayan vulture (*Gyps himalayensis*), Cinereous vulture (*Aegypius monachus*) and Indian Griffon vulture (*Gyps fulvus*) was investigated by means of head count methods [12], supported by photography and videography. Binoculars and GPS-Garmin72 like instruments were used.

Field surveys and observations for vultures were carried out at Municipal Corporation's dumping site (vultures feeding site), to explore roosting, nesting, feeding and water point for population status of

vulture species in the study area with the help of forest department personnel's, members of local communities and surrounding villages (Plate 1).

The weekly survey of the study area was carried out during winter i.e. October to march for the season of 2015-16 to 2018-19 for population studies of vultures.

The vultures and other birds sighted during present investigations were Identified and classified with the help of field guides [13,14,15]. The roosting patterns of the species of vultures were observed during day and on full moonlit night. In addition to extensive fieldwork was carried out and data were collected.



**Plate1 Fig. A- Mixed group of Himalayan Vulture and Indian Vulture.  
 Fig. B- Griffon Vulture showing red head because of the blood smear on head which occurs due to eating of fresh caracass.  
 Fig. C- Griffon Vulture and Egyptian Vulture at feeding site.  
 Fig. D- Cinereous Vulture taking off from tree.  
 Fig. E- Cinereous and Griffon Vultures sunning at ground.  
 Fig. F- Group of Egyptian Vulture resting on tree.**



### 3. RESULTS AND DISCUSSION

Population estimation and monitoring is essential for conservation of any species as it gives idea about status of the species. Population size along with life history parameters indicates whether the species is declining, stable or increasing.

Demography of any species can answer several questions: Why does the population fluctuate from year to year? What determines level of abundance? How strong is density dependence and at what life stage does it operate? And what are the consequences of competitors, herbivores or predators on the population?

Vultures, due to their steep decline in population (up to 95%) during last 10-15 years, have received attention of gypsophils and conservationists. The Thar Desert is important abode for migratory vulture species. Bikaner and Jodhpur are two centers, which attract vultures in winters in thousands. Considering the decline in population, Wildlife Laboratory of Dungar College is monitoring their population from last four years and present study is outcome of that research. Population estimation helps us to monitor the changes any species is facing. It also helps to

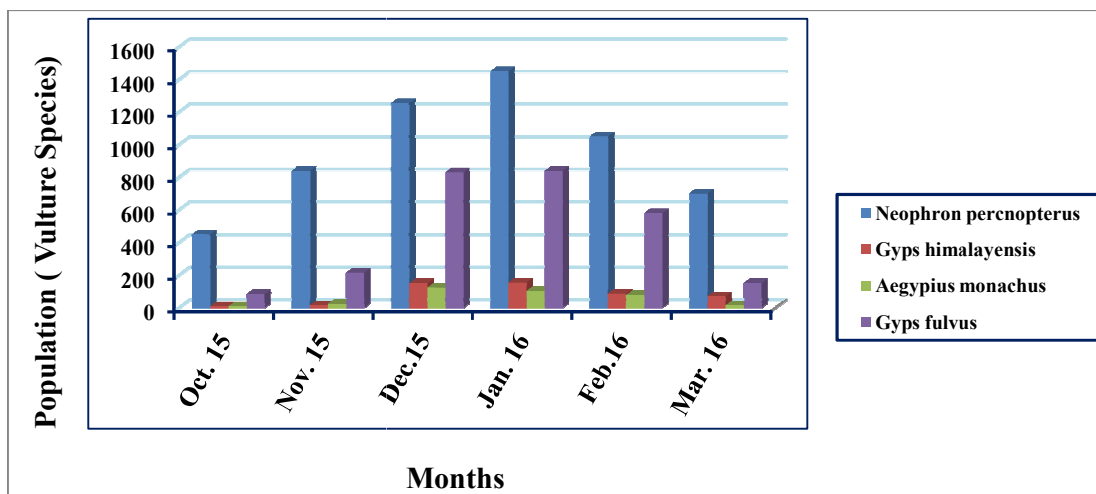
determine habitat requirement of the species and the factors behind decline of the population.

Four species of vultures King Vulture or Red-headed Vultures, Long-billed Vulture, White-backed Vulture and the Scavenger Vulture are resident of Thar Desert. Eurasian Griffon, Himalayan Griffon and Cinereous Vultures are the winter visitors to the Thar Desert. These migratory species start arriving at Bikaner from September - October and stay here till February - March. Jorbeer is the municipal dumping ground of cadavers, and is situated on the outskirts of Bikaner city, about 12 km from main city. This is the main feeding and roosting site of migratory and resident species. None of the migratory species has been observed to breed in the area. There is dearth of large trees with good canopy cover and rock cliffs around Bikaner, so the species which breed here had to build nest on electricity pylons.

Our observations of last four years (Tables 1-4) indicate that the population of vultures is increasing in number from month of October to January. Since January is the peak month of the season for vultures at study area and thereafter population number declines from February to March as the migratory vultures starts their journey back to their resident place.

**Table 1. Population status of vultures during 2015-16**

Month	<i>Neophron percnopterus</i>	<i>Gyps himalayensis</i>	<i>Aegypius monachus</i>	<i>Gyps fulvus</i>
Oct. 15	450	10	10	84
Nov. 15	840	15	25	216
Dec.15	1254	150	124	830
Jan. 16	1450	155	103	840
Feb.16	1050	87	78	580
Mar. 16	700	70	15	150



**Fig. 2. Graphical representation of population status of vultures during 2015-16**

Table 2. Population status of vultures during 2016-17

Month	<i>Neophron percnopterus</i>	<i>Gyps himalayensis</i>	<i>Aegypius monachus</i>	<i>Gyps fulvus</i>
Oct. 16	578	21	12	78
Nov. 16	897	35	35	312
Dec.16	1358	109	115	986
Jan. 17	1854	154	118	1004
Feb.17	795	87	76	574
Mar. 17	359	35	35	105

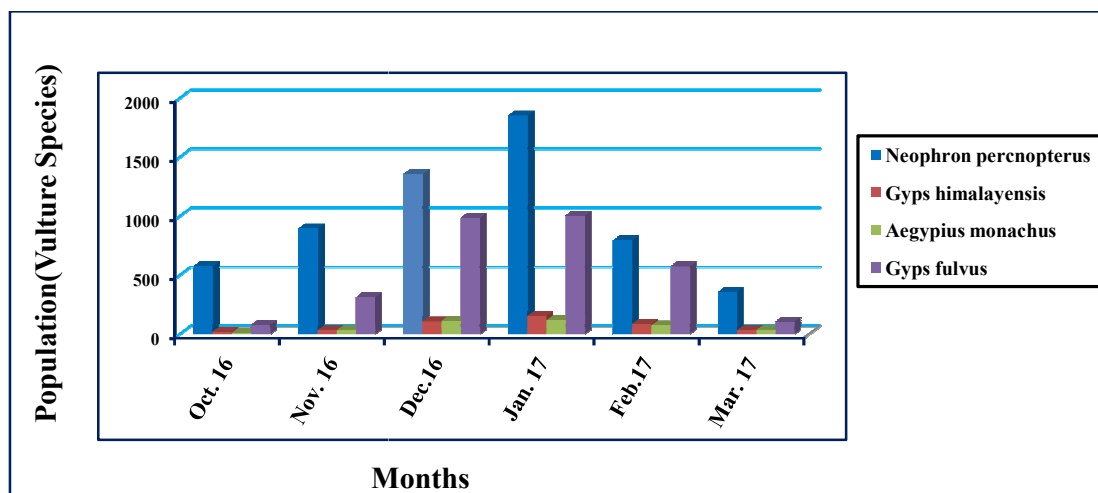


Fig. 3. Graphical representation of population status of vultures during 2016-17

Table 3. Population status of vultures during 2017-18

Month	<i>Neophron percnopterus</i>	<i>Gyps himalayensis</i>	<i>Aegypius monachus</i>	<i>Gyps fulvus</i>
Oct. 17	615	5	12	126
Nov. 17	912	46	34	255
Dec.17	1305	100	89	919
Jan. 18	1420	110	98	882
Feb.18	1105	87	84	478
Mar. 18	398	13	32	201

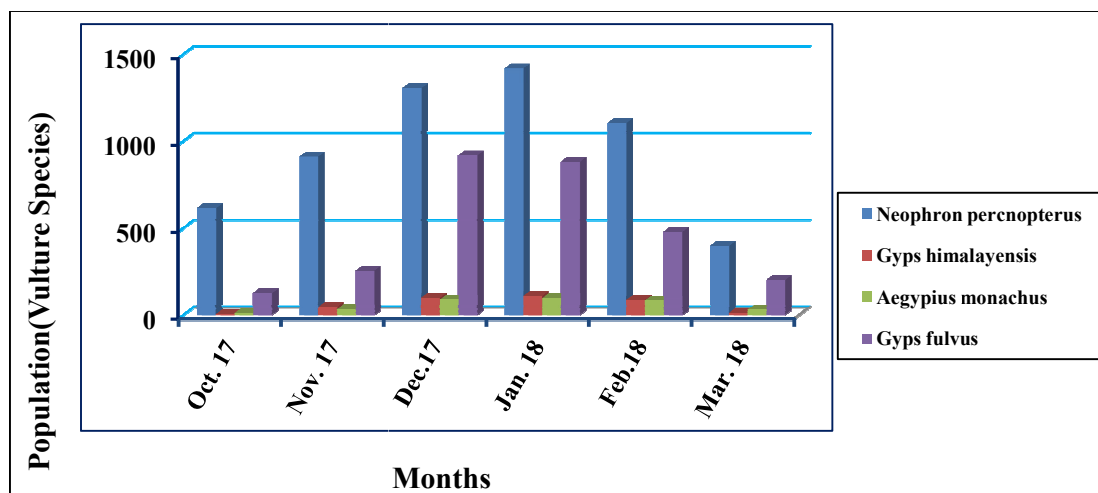


Fig. 4. Graphical representation of population status of vultures during 2017-18

Table 4. Population status of Vultures during 2018-19

Month	<i>Neophron percnopterus</i>	<i>Gyps himalayensis</i>	<i>Aegypius monachus</i>	<i>Gyps fulvus</i>
Oct. 18	743	5	24	214
Nov. 18	1100	20	101	415
Dec.18	2136	157	137	870
Jan. 19	2010	168	105	910
Feb.19	1204	56	45	610
Mar. 19	423	12	25	214

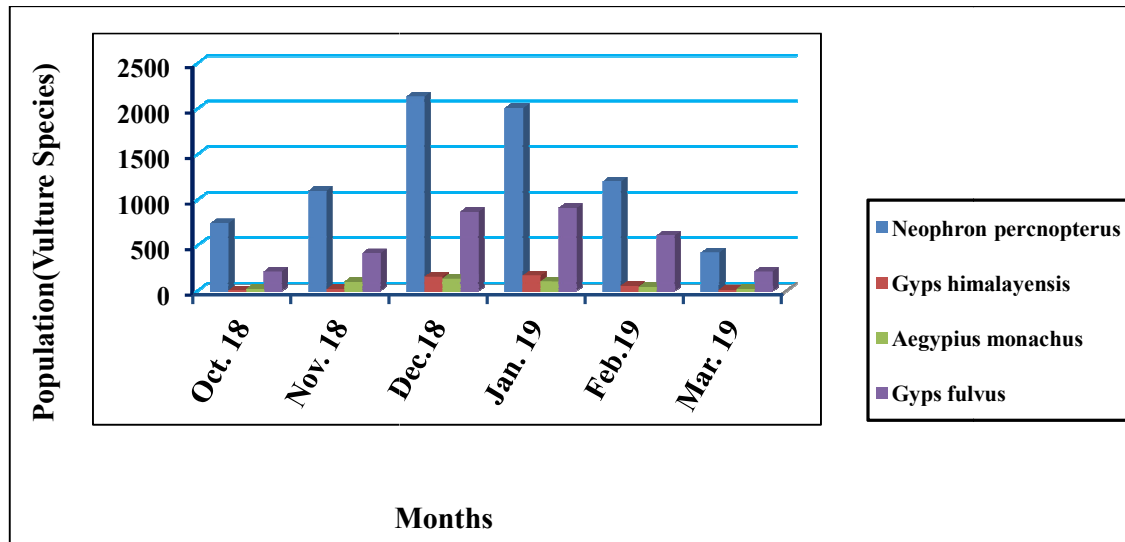


Fig. 5. Graphical representation of population status of vultures during 2018-19

#### 4. CONCLUSION

The migratory species Eurasian Griffon and Cinereous vulture keep on coming during November - December and their population keeps on increasing continuously. Their maximum number can be observed here during December – January, when winter is at peak. From February the species starts returning back to its native place and as a consequence their number starts declining. The month of their return again depends on the temperature. This year the resident species and population stayed here till end of March because of prolonged winter. Maximum population of vulture species observed in the study area in December and January. During December Egyptian vulture start moving towards its nesting site for breeding and from February onwards, the migratory species start returning to their native places.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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