

The Return of the Nature's Guard: Endangered Vulture's Population on Rise in Rajaji National Park, North India

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Abstract- Out of the total nine species of vultures reported from the Indian sub-continent, six (*Neophron percnopterus*, *Aegypius monachus*, *Sarcogyps calvus*, *Gyps bengalensis*, *Gyps indicus* and *Gyps himalayensis*) were observed from Rajaji National Park, north India. The population of all the vultures was found to be stable except for Himalayan griffon, which was frequently observed in different altitudinal locations of the park. All the species were observed in small flocks (c 2–17) whereas only Himalayan griffon was observed in big flocks (c 3–38). Remarkably red-headed vulture, white-rumped vulture and long-billed vulture were continuously sighted, which were considered to be critically endangered species. A rise in vulture's population was observed since 2007 and all the reported six species were seen on seasonal basis. Among six, three species are altitudinal migrant and three are resident however their ecological studies are still required, which would be helpful in knowing their population status, feeding requirements and range utilization. A ground-based strategy cum action plan is also needed to be documented and implemented so that we can ensure the endangered vulture's survival in Rajaji National Park.

Keywords- Vulture; Rajaji National Park; Status; Conservation; North India

I. INTRODUCTION

Indian sub-continent has nine species of vultures of which six species are being seen in the Rajaji National Park, north India. Once vultures have mythical status across the country, they have become a threatened species primarily due to their vulnerability to drugs found in the carrion they eat; rapid expansion of agriculture land, urbanization and industrialization. A detailed study on the use of diclofenac drug and action in India carried out by a team of workers [1], revealed that contamination of vulture's carrion food supply with the non-steroidal anti-inflammatory drug diclofenac has caused rapid population declines across the Indian sub-continent of three species of *Gyps* vultures endemic to south Asia.

Three species of vultures endemic to south Asia, oriental white-backed vulture (*Gyps bengalensis*), long-billed vulture (*Gyps indicus*) and slender-billed vulture (*Gyps tenuirostris*) are listed as being threatened with extinction after rapid population declines in Indian sub-continent, which began in the 1990s [2], [3]. The population of three species (*Gyps bengalensis*, *Gyps indicus* and *Gyps tenuirostris*) in the wild has declined drastically over the past decade and the decline of *Gyps* genus in India has been put at 97% by 2005 [4].

II. STUDY AREA

The Rajaji National Park (RNP; Fig. 1) in northwest India (29° 15'-30° 31' N, 77° 52'-78° 22' E, elevation 250–1100 m

above MSL) was created in 1983 to protect Asian elephants and their habitat, which falls under Shivalik Elephant Reserve No. 11. RNP is spread over an area of 820 km² in and around the Shivalik foothills has been designated as a reserved area for 'Project Elephant' by the Ministry of Environment and Forests, Government of India with the sole aim of maintaining a viable elephant population.



Fig. 1 Location map of the Rajaji National Park

III. METHODS

To evaluate vultures' presence and status, study was conducted in the Chilla forest of the RNP and adjoining protected habitats year round from 2007–2011 (06:00 h–09:00 h and 16:00 h–18:30 h). Different forest blocks / compartments were surveyed using line transect method. Riparian corridors of Ganges were also incorporated in this study as these sites are always considered good habitats for these birds. Besides, whenever any large flock was found soaring over to forest, it was identified cautiously using field binocular (Nikon Action series, 10X50 CF). Several times, when any carcass was sighted, vulture's presence (species specific) was noted carefully along with other geographical details. In addition, their sighting time/season and number of individuals sighted was also documented duly. To strengthen study photographs were also taken with Nikon Coolpix 8700 Camera. I propose that this is first ever published study, which signifies evidence based record regarding vulture's existence in RNP. This study was a part of my long term study on elephant's ecology and behaviour in RNP.

IV. RESULTS

During 2007-2011, six species of vultures were observed in different regions of the RNP, however most of the flocks have been documented from riparian corridors.

A. White-Rumped Vulture (*Gyps bengalensis*)

It is a common wide-spread resident species but currently their population is falling rapidly. Only two individuals were sighted sitting on a dried forest patch of *Acacia catechu* and *Dalbergia sissoo* in Mundhal forest during November 2006. Later to it, three individuals were observed soaring over to Luni forest during March 2007 (Fig. 2).

IUCN Status: Critically Endangered



Fig. 2 A large flock of White-rumped vultures at Mundhal forest

B. Long-Billed Vulture (*Gyps indicus*)

This species is a lower altitudinal migrant. A flock of seven vultures was observed near to the boundary of Chilla and Khara forest (adjoining to Shyampur forest of Haridwar forest division) during May 2008. Later to it another flock consisting of 13 individuals was observed sitting in a big naked tree in Jhabargarh forest spread across river Ganges, which only one individual was found basking on the western edge of Ganges in Dudhia forest during June 2009 (Fig. 3).

IUCN Status: Critically Endangered



Fig. 3 An individual of Long-billed vulture at Jhabargarh forest

C. Himalayan Griffon (*Gyps himalayensis*)

This vulture is a common winter migrant in the park (Fig. 4); every year it arrives at the onset of winter (November–December) and stayed upto the end of cold i.e. March–April. It can be easily seen near to carcasses in different forest ranges of the park. A large flock of more than 40 individuals were sighted while feeding on a carcass of adult buffalo in Chilla forest during March 2009. Later to it several flocks (c 7–18) were also sighted at different locations of the Chilla forest (resting on trees, while soaring and feeding).

IUCN Status: Least Concern



Fig. 4 Himalayan griffon in Rajaji

D. Egyptian Vulture (*Neophron percnopterus*)

This is a wide-spread resident of the park and was sighted round the year. Four individuals were observed feeding on a carcass of *Axis axis* (spotted deer) at Jhabargarh forest adjoining to river Ganges during May 2010 (Fig. 5).

IUCN Status: Endangered



Fig. 5 Egyptian vulture is taking off in Jhabargarh forest

E. Cinereous Vulture (*Aegypius monachus*)

This vulture is an uncommon winter migrant, which was observed only once in Chilla forest, sitting on a naked tree of *Dalbergia sissoo* along with Himalayan griffon. Only three individuals were observed during March 2009, however they were sighted along with their infants (Fig. 6).

IUCN Status: Near Threatened



Fig. 6 Towards conservation: Three adult cinereous vultures along with their juveniles (red circled) in Chilla forest

F. Red-Headed Vulture (*Sarcogyps calvus*)

It is a wide-spread resident to the park area. Large flocks were seen (c 10-18) at Khara forest during 2007 and 2008 but later on four individuals were sighted feeding on a carcass of *Cervous unicolor* (sambhar) at Khara forest during April 2010 (Fig. 7).

IUCN Status: Critically Endangered

There has been a crash in population of *Gyps* vultures in Keoladeo National Park over a decade. The white-backed vulture has suffered large-scale adult mortality and total breeding failure. The long-billed vulture has also suffered a population decline of over 97%. The Indian griffon and Himalayan griffon have also experienced drastic fall in numbers. The non-*Gyps* species of vultures have maintained

fairly stable population over the years [5]. A total of 38 individuals of white-rumped vultures and 28 long-billed vultures were sighted in Motichur and Dholkhand ranges of the RNP in 2001–2002, whereas during 2002–2003 their populations were reduced to six and zero respectively and during 2005–2006 the population of white-rumped vultures was found same and long-billed vultures was not sighted at all [6].



Fig. 7 King or red-headed vulture at Khara forest

Among *Gyps* vultures, Himalayan griffon was only the species, which was observed frequently in large flocks during winters (December–April). As far as abundance of other two species is concerned, long-billed vulture was more commonly observed in smaller flocks as compared to white-rumped vultures. Egyptian vulture was mostly sighted at the outskirts of villages adjoined to forest area however several individuals (c 1–4) were also observed while sitting or feeding in core zone of the park. Large-billed crows (*Corvus macrorhynchos*) were also observed feeding along with this vulture species. Cinereous vulture although considered as winter migrant, but its population was observed very rare especially in the hilly tracks having higher elevation (>400 m above MSL). Red-headed vulture's or king vulture's population was observed to be stable in the study area. These vultures always sighted alone while feeding on carcasses. Slowly their sighting became uncommon even though it is considered to be wide-spread resident.

Noticeably, large flocks (>20) of vultures were not sighted except of Himalayan griffon. Maximum sightings of vultures were made near to perennial and annual rivers (Mundal, Gara, Ghasiram, Khara, Mitthawali, Luni, Rawasan and Binj), however sometimes few individuals were observed from core forest especially shrubby areas while feeding and perching over to tall tree's branches.

Several times some flocks were also observed soaring over to forest > 500 meter, but it was not possible to identify precisely as during high level soaring most of the vultures are looking alike and there are the chances of error in identifying them especially when we are documenting such an important record in respect to critically endangered species. Commonly vultures could fly up to the height of 1000 to 5000 meter but during unfavourable conditions, they were also reported to ascending up to the height of 10,000 to 15,000 meter [7].

V. DISCUSSION

A total of seven vulture species were documented from RNP during 1994 including Eurasian Griffon (*Gyps fulvus*) and white-rumped vulture was considered to be common species (wide-spread resident; [8]) but their population was found to be declining during 2000-2006 [6], when India, Nepal and Bangladesh were facing population crash in *Gyps* especially in white-rumped vultures. A study carried out in Chitwan area (Nepal), explored that there was decline of vultures population especially *Gyps* vultures, besides their nesting sites was also observed to be declining [9].

A detailed study carried out in lower Garhwal Himalayas during 1982–2000 revealed that eight species of vultures were using the Dehradun and adjoining valley, which included Lammergeier (*Gypaetus barbatus*) and Eurasian griffon (*Gyps fulvus*) [10]. A total of six species of vultures were reported from RNP, however their sighting is uncommon and their population also fluctuated throughout the year. Most of the vultures were observed during February–July (summer) whereas Himalayan griffon was only species, which was observed maximum during December – April (winter).

Although among nine species of vultures found in Indian sub-continent, six species have been observed from RNP and their adjoining habitats, despite their population trend was observed to be stable except for Himalayan griffon. Remarkably, their sighting sometimes is not very common especially of white-rumped vulture and of cinereous vulture. Their sighting further depends upon the presence of natural food. On the other hand leopard's population in Rajaji appears to be increasing and presence of a number of herbivores (*Axis axis* spotted deer, *Cervus unicolor* sambhar, *Muntiacus muntjak* barking deer etc.), which further ensures their long-term survival.

Use of diclofenac, ketoprofen and pesticides like DDT and cyclodienes was also considered as lethal to vulture's survival [11]. I never observed any died individual in the study area however it was difficult to visit always in some higher elevation parts like Pulani, Rawasan and Luni, which are spread across to Lansdowne forest division. Besides, vultures were sometimes found to feed on remains of carcasses of cattle of the villagers and Gujjars (nomadic community) while killed by the tiger or leopards. It is usually difficult to locate dead vultures, as they often die on large trees and quite often in secluded areas. Their carcasses are frequently seen entangled in the branches of trees or in thickets below the trees. Jackals also feed on the vulture carcasses. So, though vultures are big birds, their carcasses largely go unnoticed [5].

The population trend of vultures was found to stable in RNP besides, some resident species were sighted very occasionally on seasonal basis and their population was also found fluctuating, however they are utilizing the park-range round the year. During field visits, once I documented the juveniles of cinereous vulture (Figure 6), which revealed that their breeding is ongoing in RNP. The highest population was observed during summer (March–June), when maximum water sources spread within the core zone became dried and all animals used the plains of Ganges.

The exact cause of the population crash is not clear in RNP. Although there is little literature available on raptors in RNP, however population status of vultures in study area is still unknown. RNP is having one of the richest ecosystem as this area falls under lesser Himalayan zone and upper Gangetic plains; consequently, several migratory avian

species always used to arrive here every year. Infact, the Indian Himalayan region is also very rich in diversity and healthy and high-altitude resident bird species used to arrive in Rajaji and Corbett National Parks (Ganges and Ram-Ganga plains) especially during winters (November–March).

However, some conservation threats appears are large-scale developmental activities, which include expansion of road network, agriculture lands in the outskirts of park, anthropogenic activities inside the forest, which includes collection of fuelwood and fodder from the forest and huge activities ongoing across the Ganges (fishing, mining etc.). Besides, a serious threat was also found influencing the vulture's population was shrinking of natural perennial water sources inside the park, which encourage the animals to move in buffer areas and thereby causing man–animal conflict. Intensive efforts and studies are required to address vulture's presence and the cause of population stability in RNP so that we can ensure their long-term arrival and existence.

VI. CONCLUSION

Even though most of the vulture's species found across Indian sub-continent are categorised under threatened category, Rajaji National Park in north India holds six vulture species populations. Among all, only Himalayan griffon is frequently seen within the park area in large flocks. The population of long-billed vulture, Egyptian vulture, cinereous vulture and red-headed vulture seems stable and of white-backed vulture was not common. This species was not sighted since 2008 in this area, however there are evidences of its presence in and around the RNP. Other eight forest ranges of the RNP and few other protected habitats (Haridwar, Dehradun and Lansdowne forest division), which are adjoining to RNP area were not incorporated in this study and it may be possible that their populations exist there. The maximum sighting of vultures was observed in between March to June. Notably, some evidences of breeding among cinereous vultures were also found, which further indicates towards favourable ecosystem and environmental conditions. To till date, no systematic field work on vultures' status has been done in RNP, therefore further studies are highly needed to understand the ecological impacts of various anthropogenic activities on vultures' population and their behavioural responses to illustrate conservation actions.

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