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Status and conservation of critically endangered White-rumped vulture *Gyps bengalensis* in Katarniaghat wildlife sanctuary, Uttar Pradesh, India

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Abstract

Population estimates of species are essential for their management and conservation in National Parks and Wildlife Sanctuaries in India. Most of the protected areas are lacking baseline data on population trend of species over the years except for charismatic species, such as the Tiger, Asian elephant and Indian rhinoceros. Vulture population has declined in India during past two decades due to various reasons, the main reason being introduction of anti-inflammatory drug diclofenac to reduce pain in cattle as suggested by scientists and researchers. They die due to renal failure triggered by diclofenac poisoning. Katarniaghat Wildlife Sanctuary still supports White-rumped Vulture *Gyps bengalensis* population that may serve as a source population for inhabiting adjacent suitable areas in due course of time. Data on population status of White-rumped Vulture is useful for comparing population trends over the years and identifying priority sites for its conservation within the Sanctuary.

Keywords: Population, white-rumped vulture, Katarniaghat wildlife sanctuary, conservation

Introduction

India has nine species of vultures in the wild, namely White-rumped Vulture (*Gyps bengalensis*), Slender-billed Vulture (*Gypstenuirostris*), Long-billed Vulture (*Gyps indicus*), Egyptian Vulture (*Neophron percnopterus*), Red-headed Vulture (*Sarcogyps calvus*), Eurasian Griffon (*Gyps fulvus*), Himalayan Griffon (*Gyps himalayensis*), Cinereous Vulture (*Aegypius monachus*) and Bearded Vulture or Lammergeier (*Gypaetus barbatus*). The population of three species, i.e., White-rumped Vulture, Slender-billed Vulture and Long-billed Vulture has declined drastically in the wild over the past decade (Prakash, 1999; Prakash *et al.* 2007; Jha, 2015) [11, 13, 6]. The population decline of *Gyps* genus in India has been put at 97% by 2005 (MoEF, 2006) [10]. The current population estimate for White-rumped Vulture in India based upon a regression model is that there were about 6,000 individuals in 2015 (Prakash *et al.*, 2017) [14].

Population estimates are important for species management and conservation in protected areas in India (Khan and Kumar, 2015; Khan, 2016, Khan and Kumar, 2017) [8, 9, 7]. Because of the evidence of widespread and rapid population decline, all three vulture species were listed by IUCN as 'Critically Endangered', which is the highest category of endangerment (Birdlife International, 2017) [1]. This assessment indicated a high risk of global extinction of these species in the wild in the near future. Unfortunately, the current captive populations in India are also not viable for any of the species and, therefore, complete extinction is likely to occur if no action is taken immediately (MoEF, 2006) [10].

Surveys on the population status of vultures have been carried out from time to time during the past two decades and reasons for their sudden decline studied by various avian experts in India (Satheesan, 1999; Prakash *et al.*, 2003, Prakash *et al.* 2007, Prakash *et al.* 2017; Satheesan and Khan, 2005; Sethi and Chauhan, 2010) [16, 12, 13, 14, 15, 17]. Diclofenac, a non-steroidal anti-inflammatory drug given to cattle to treat pain and inflammation, is a major killer of vultures (Green *et al.*, 2004; Green *et al.*, 2006; Green *et al.*, 2007) [2, 3, 4].

Katarniaghat Wildlife Sanctuary (KWS) faces immense anthropogenic threats from the resource dependent human populations residing both within and along the periphery of the Sanctuary. There are 10 villages within the boundary of KWS and another 64 villages located upto 5 km from the Sanctuary boundary (Jha, 2000) [5].

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Also, there is enormous livestock and human population living in these villages, which exert different anthropogenic pressures, such as grazing, poaching, wood cutting and encroachment on the forest land.

This study intended to generate baseline data for conservation of critically endangered White-rumped Vulture population in the Sanctuary. Population monitoring at feeding sites, their utilization, monitoring of nestswere carried out during this study. Information on different threats to the breeding birds was also collected.

Study Area

The Katerniaghat Wildlife Sanctuary is located in Nanpara Tehsil of district Bahraich. The Indo-Nepal border constitutes the northern boundary of the Sanctuary. The entire area, totaling 400.09 sq. km. is situated between 28°06' N and 28°24' N latitudes and 81°02' E and 81°19' E longitudes. The forest area was declared as a Wildlife Sanctuary with Govt. of U.P. notification no. 388/14-3-32/1976, dated May 31, 1976. The Sanctuary together with adjoining 150.02 sq. km. of Reserve Forest, which serves as buffer, constitutes one ecological unit. It is one of the few remnants of the rich and diverse 'Terai' ecosystems, having connectivity with Royal Bardia National Park, Nepal, which lies to the north and Dudhwa Natianal Park to the west of the Sanctuary (Jha, 2000) [5].

Methods

Data on status of White-rumped Vulture was collected by ground surveys and regular monitoring of nesting and feeding sites in Katerniaghat Wildlife Sanctuary. Field visits (N=24) were made to above sites during 2013-2015. Data was

collected while field study for doctoral thesis of the senior author was underway at same study sites within the Sanctuary. Individual vulture numbers were recorded from vantage points using Aerolite 8×40 binoculars (Model no. 738H). Geo-coordinates (Latitude, Longitude and Elevation) were recorded with help of handheld Magellan eXplorist 100 Global Positioning System (GPS) having ± 10 m positional accuracy. Awareness programme on vultures and their ecological role and importance was also conducted in and around the Sanctuary villages, which is essential for conservation and recovery of species where populations have alarmingly declined.

Results and Discussion

Population estimates

The total population of White-rumped Vulture in Katerniaghat Wildlife Sanctuary was 75-100 individuals during 2013-2015 and all of them were seen only in Girijapuri and Sadar Beats of Katerniaghat Forest Range. Mean population size of White-rumped Vulture was highest in 2014 with 76±17.27 (Mean±SD) individuals in Girijapuri and Sadar forest beats (Table 1). The lowest population estimates with 63±22.97 (Mean±SD) individuals were recorded in 2015 in the same area (Table 1). Fifteen nest sites were identified during the study period. However, we could not collect information on recruitment and survival of hatchlings and fledglings. Katerniaghat Wildlife Sanctuary lacks reliable population data on White-rumped Vulture as is the fact with many other protected areas in India. It is thus suggested to maintain data on vulture population over the years to know trends of their population and take appropriate conservation measure(s) based on available data.

Table 1: Population Status of Critically Endangered (CR) White-rumped Vulture *Gyps bengalensis* in Katerniaghat Wildlife Sanctuary

S No.	Year	Site	Population Size (Mean±SD)
1	2013	Girijapuri and Sadar Forest Beat	67±18.22
2	2014	Girijapuri and Sadar Forest Beat	76±17.27
3	2015	Girijapuri and Sadar Forest Beat	63±22.97

Awareness campaign in schools and villages

Awareness programmes under taken included lectures on vulture conservation, film shows on vultures, painting and general knowledge competition, vulture watch and field visits for school children. These programmes were arranged for school going students, villagers and forest managers. All 10 villages inside the Sanctuary were selected for this purpose. There is a pressing need to educate and aware tribal people living in and around Katerniaghat Wildlife Sanctuary about use of diclofenac drug to treat cattle and its long-term impact on vulture conservation.

Nest Monitoring

White-rumped Vultures start nest building activity during August-September after the rainy season. They build nests on tall Semal (*Bombax ceiba*) and Haldu (*Adina cordifolia*) trees. The field staff of the Forest Department and villagers were contacted to get additional information about presence of vultures in the area. Micro habitat variables, such as availability of large canopy old trees, availability of water, availability of abandoned and/or left over kills of large carnivores and cattle carcasses are crucial for survival of White-rumped Vulture population in the Sanctuary and more specifically during its breeding season. The livestock population entering the Sanctuary for grazing need to be

strictly controlled so as to minimize disturbance to breeding vultures and other biodiversity values. Optimum grazing with limited livestock should be permitted only in prescribed areas of the Sanctuary. Fuelwood and non-timber forest products (NTFPs) collection also need to be regulated in the area as extensive removal of these produces may affect survival of White-rumped Vulture.

Monitoring at feeding site

Feeding sites of vultures were located within Sanctuary area. The vultures were often observed soaring high and moving in the area to locate domestic or wild ungulates that are killed by Tiger (*Panthera tigris*) and Common Leopard (*Panthera pardus*) and also searching dead cattle in villages. We also counted White-rumped Vultures at feeding sites and a maximum of 73±16.44 individuals were counted at feeding sites. Katerniaghat Wildlife Sanctuary shares international border with Nepal and there is frequent movement of people across border after committing wildlife crimes and is a major problem for the forest officials to take action as they cross international border. There is an urgent need for good coordination and joint patrolling along the international border by forest staff of both the countries.

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