



Congregations of two subspecies of Egyptian Vulture *Neophron percnopterus* in Unnao district of Uttar Pradesh, India

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ABSTRACT

The Globally Endangered Egyptian Vulture *Neophron percnopterus* congregates in the areas which are away from human disturbances, where food availability is high and roosting substrates are present. There are three subspecies of Egyptian Vultures in the world. Out of three subspecies two subspecies are present in India. Present study discusses the population status of both the subspecies at their congregation sites in district Unnao, Uttar Pradesh, India. Adults of both subspecies of the Egyptian vulture were studied and compared for their population from January 2014 to December 2017. Direct observations were made to get an idea of the number. Vultures were counted using the Total count method. Maximum number of individuals was counted in 2017 and the site with the highest congregation was identified. Population of *Neophron p. percnopterus* (338.5±86.2) was around double than the population of *Neophron p. ginginianus* (168.2 ± 45.8). Adult individuals were considered. They were either Sunbathing, dustbathing or simply roosting on the trees and ground. To avoid negative effects on the population of the Egyptian Vultures, we strongly recommend that the site sheltering the highest number of individuals should be considered as the Important Roost site and there should be safe food availability for them in the form of 'Vulture Restaurants' to conserve them from further decline.

Keywords: *Neophron percnopterus percnopterus* ; *Neophron percnopterus ginginianus*; Population; Conservation..

INTRODUCTION

Egyptian Vulture *Neophron percnopterus* is a medium sized raptor and globally endangered species distributed throughout southern Europe, northern and central Africa, the Middle East, Transcaucasia, Central Asia and the Indian subcontinent (Ferguson- Lees and Christie 2001). There are

three subspecies of the Egyptian Vulture *Neophron percnopterus* (*percnopterus* in Linnaeus 1758, and corrected in Linnaeus 1766) which are currently recognized, viz. nominate *percnopterus* (Linnaeus 1758), *ginginianus* (Latham 1790) in the Indian subcontinent, and *majorensis* (Donazar et al. 2002) in the Canary Islands, off the north-west coast of Africa.

Neophron p. percnopterus and *Neophron p. ginginianus* differ by only two characteristics: one is size (by "5%", Ferguson-Lees & Christie 2001: 116) and the other is bill (strictly rhamphotheca, Proctor & Lynch 1993) colour. The *ginginianus* individual has a yellow bill and appears smaller/shorter in size to its *percnopterus* neighbours (*op. cit.* plate 24). Both the subspecies are considered to be "locally migratory" (Naoroji 2006: 230). At large congregation sites even a single threat might lead to serious and disproportionate population declines. Thus, more research on the congregation sites is needed for timely detection of threats and therefore implementation of effectively directed conservation measures. Therefore, profound and consistent research is needed for the congregation sites of both the subspecies in order to detect potential threats and therefore effectively direct conservation measures. The present study would present the data on the recent numbers of different subspecies of Egyptian Vultures to serve as a baseline for future monitoring, research as well as it would give emphasis on the potential threats and conservation priorities for the species.

MATERIAL AND METHODS

Study Area

Unnao (Fig.1) is an industrial district and is famous for various food and agro-based industries. It is a part of Central Ganges plain and covering an area of 4558 km square, located between the coordinates 26.55°N, 80.49°E. It has also been enlisted as a municipality of Kanpur Metropolitan Area. There are around 1900 agro-based industries running there as Amin International Limited, Rustam foods, Indagro Foods Limited, Allana foods, Bharat Bone Crushing Company etc. The Sai River (Sai setu) is a tributary of the Gomti River and it separates the region of Lucknow and Unnao. The main site where maximum number of Egyptian Vultures were observed is surrounded by factories and slaughterhouses from where a lot of organic waste (carcass remains) is dumped at the ground behind the factories. There is a wheat crop field also where the Egyptian Vultures have been observed roosting and sunning during winters. These factors along with a waterbody nearby are probably the main reason for the regular and permanent occurrence of a large number of both the subspecies of Egyptian vultures and other species like Black Kites, Cattle egrets etc. at the rubbish dump.

Data Collection

The surveys were conducted from January 2014 to December 2017 using the total count and road-count technique (Thiollay 2006).

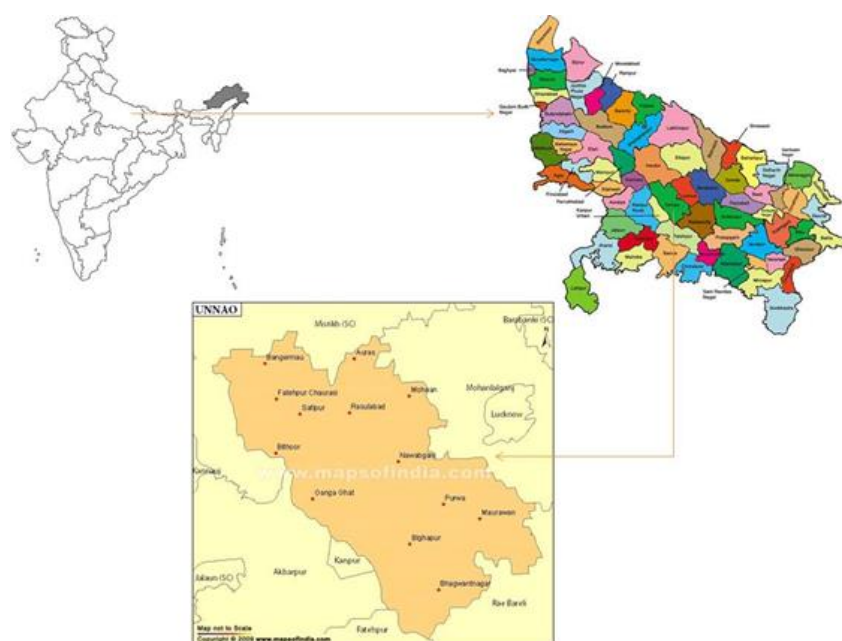


Fig.1 Map of Study Area- Unnao

Counting has been done every year in all the seasons (summer, monsoon, winter). The subspecies were differentiated according to Naoroji 2006: 230. The counting of all the roosting, sunning, dust bathing individuals was done. Data were collected under suitable weather conditions for adequate visibility – no fog, heavy rain, etc. in morning 11:00 -14:00 and evening 15:00 to 17:00 local time until darkness, by experienced observers. All roosting, sunning and dustbathing points were observed.

RESULT AND DISCUSSION

Vulture numbers, subspecies ratio and roosting sites

The biggest congregations of both the subspecies were found in December 2017 (Fig.2). Population of *Neophron p. percnopterus* (338.5 ± 86.2) was around double than the population of *Neophron p. ginginianus* ($168.2 \pm$

45.8). Most of the individuals recorded was adults. Adults were either Sunbathing, dustbathing or simply roosting on the trees and ground. The maximum number of individuals of both the subspecies were observed in 2016-2017 and minimum in 2013-2014. Study reveals that the population of nominate subspecies, *Neophron percnopterus percnopterus* is more than *Neophron percnopterus ginginianus* at every year of the study period.

Both the subspecies share the same niche because there is ample amount of food availability and therefore least competition for food has been observed. Three types of roosting substrates used were ground, tree and boundary of dump ground. The maximum number of individuals were observed doing ground roosting. The few other species like Cattle egrets, House crows, Black Kites, Dogs etc. were observed in association with Egyptian Vultures.

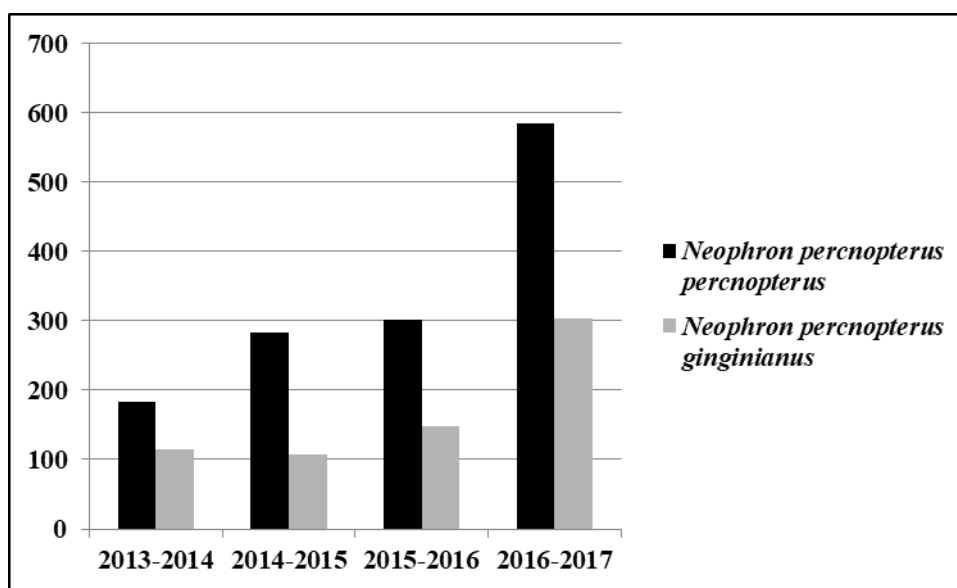


Fig. 2 : Yearly variations in the number of Individuals of *Neophron p. percnopterus* and *Neophron p. ginginianus* at Unnao

Implications for Conservation

Maximum number of Individuals of both the sub species have been observed in 2017. The rubbish dump of the food and agro based industries and organic remains from the slaughter houses are the source of consistently available food and are very beneficial for the vultures surviving there. It could be affected if poisoned or contaminated material is available. Because vultures feed in aggregations and congregation, single contamination incident can have serious effects on their

population on any particular site or even the wider population (Tewes 2002).

As in the absence of trees most of the raptors have been very often seen roosting on different roosting substrates like electric pylons and mobile towers (Stahlecker 1979; Olenndorf *et al.* 1981). A lot of work has been done in many parts of the world to design the acceptable ways of constructing power lines and pylons that are not dangerous to birds (eg. Jenkins *et al* 2010).



a



b



c



d



e



f



g



h



i



j

Fig.3(a-j) Different roosting substrates at the Congregation site in Unnao District



a. Food availability



b. Ingenious Feeding Site

Fig.4 (a-b): The study area with Maximum Congregation near the Dump ground of Slaughterhouse (showing ample food for Egyptian Vultures)

However, it is known that at congregation sites the species uses other substrates for roosting as well. Levy and Mendelsohn (1989) reported another large congregation of the species seen in 1958 roosting on telegraph pylons in Afar. These records show that, in the absence of suitable trees or cliffs, in areas with high food abundance Egyptian Vultures may roost even on the ground or use different artificial structures (Fig.3). At the study area, the site with maximum congregation has an ample availability of food (Fig.4). The spatial distribution of roosting Egyptian vultures depends on the availability of roosting substrates and food (Donázar *et al.* 1996).

Considering the significant numbers of both the subspecies of Egyptian vultures in Unnao every single threat may have a very disastrous effect on the global population and therefore should be considered as a major concern. As there is a promising number of both

the subspecies of Egyptian vultures therefore the special attention must be given to such factors there. So far the effect of these power lines on Egyptian vultures in Unnao is unknown and should be studied. Other threats include, closure and modification of slaughterhouses which could result in the changes in food availability. The potential modernization of waste disposal could negatively affect the Egyptian vulture population in the study area.

The management of waste is one of the important aspects to consider for the conservation of these precious species and there is a strain between the desire to dispose of the waste in a way that supports human health conditions and a way that makes food available for vultures. In European countries strict animal carcass disposal laws were made applicable due to concern about the possibility of harmful and dreadful diseases(eg.BSE) spreading to humans and as a result

the food availability to scavengers dropped and special attention need to be given to the concept of 'Vulture Restaurants' that would provide safe and plentiful food for avian scavengers.

It is important that strategies for the waste disposal should be made but not undermining the conservation. Therefore the 'Vulture friendly' zones at such crucial sites should be established where food for vultures could be made available under professional supervision and thus ensuring the safe food availability to them.

The dump sites around the factories and slaughterhouses are attractive to vultures and other raptor species like Black Kites and therefore it makes these sites attractive to birdwatchers from different parts of the country or even the world.

CONCLUSION

While providing potential benefits for these vital species of nature, there would be other benefits too. It would promote the ecotourism that would ultimately increase economic benefits. Although no plans have been made till yet but the discussions are being made with the Government and the Forest Department about the possibility of building a 'Vulture Restaurant' at Unnao. The situation in Unnao offers possibilities to better understand about the Egyptian vulture ecology and biology and provide information on Egyptian vultures at the regional level, highlighting their importance and conservation.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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