

# Observation of a population of Egyptian Vultures *Neophron percnopterus* in Ramanagaram Hills, Karnataka, southern India

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## Abstract

The results of counts at two different regular Egyptian Vulture *Neophron percnopterus* feeding sites are presented for the Ramanagaram Hills Reserve Forest between 2013 and 2014 in Karnataka, southern India. The number of Egyptian Vultures recorded at feeding sites ranged from 2 to 19 individuals (mean  $12.3 \pm 1.76$  s.e.). The attitude of local people towards vulture conservation was assessed and more than 90% (90.82%) of respondents had a favourable opinion of vultures. We highlight that educating livestock owners, farmers and veterinary personnel is essential to secure healthy food for vultures.

## Introduction

Vultures perform a vital role in nature's sanitation process by eating meat from carcasses (Houston 1974). While feeding, vultures reduce the potential spread of diseases that could affect other animals and humans (Ogada *et al.* 2012a). Nine species of vultures are recorded in India (Ali & Ripley 1987) and of

these, six are found in southern India namely Egyptian Vulture *Neophron percnopterus*, Red-headed Vulture *Sarcogyps calvus*, White-rumped Vulture *Gyps bengalensis*, Long-billed Vulture *Gyps indicus*, Cinereous Vulture *Aegyptius monachus* and Himalayan Vulture *Gyps himalayensis* (Srinivasulu & Srinivasulu 1999, Sashikumar 2001,

Subramanya 2001, Davidar & Davidar 2002, Thejaswi 2004, Subramanya & Naveen 2006, Davidar 2007, Umapathy *et al.* 2009, Ramakrishnan *et al.* 2010, 2012, Praveen *et al.* 2014, Ramakrishnan *et al.* 2014, Samson *et al.* 2014a,b, Samson *et al.* 2015, Samson *et al.* 2016 a.b).

Presently, 14 of the world's 23 (61%) vulture species are threatened with extinction and the most rapid declines have occurred in the vulture-rich regions of Asia and Africa (Ogada *et al.* 2012b). The reasons for these population declines vary, but poisoning (both deliberate and accidental) or human persecution or both feature in the list of nearly every declining species. The most drastic decline of all in vulture populations occurred over the Indian subcontinent since the 1990s (Prakash 1999, Prakash & Rahmani 1999, Virani *et al.* 2001, Prakash *et al.* 2003, Gilbert *et al.* 2004, Chhangani 2005). These declines and the critical conservation status of most vultures in India are largely due to the veterinary drug diclofenac, used on cattle, which has proved to be highly toxic to any vultures feeding on the carcass of a recently treated animal (Oaks *et al.* 2004, Green *et al.* 2004). Both Egyptian and Red-headed Vultures have

declined in parallel to *Gyps* vultures in the Indian subcontinent, including Nepal (Cuthbert *et al.* 2006). These species are therefore also considered to be susceptible to diclofenac poisoning (Green *et al.* 2004, Cuthbert *et al.* 2006).

The Egyptian Vulture is a resident species of Ramanagaram Hills in Karnataka, southern India. It plays an important ecological role by removing municipal waste and animal carcasses. The breeding range of this species is very large and spreads over southern Europe, northwest Africa and some areas of near Asia and India (Cramp & Simmons 1980). Egyptian Vultures normally feed on carrion and generally prefer forested habitats to human-dominated areas. Ali & Ripley (1987) however, highlight that the Egyptian Vulture can persist near human habitation and that it forages in refuse dumps. It is therefore an opportunistic scavenger that uses a variety of food sources in its diet. The aim of the present study was to examine the population status and feeding behaviour of Egyptian Vultures and also to assess people's perception of Egyptian Vultures in the Ramanagaram Hills Reserve Forest, Karnataka, an area unrepresented for studies on this species.

**Study area**

The Ramanagaram Hills are sparsely vegetated granite hills located to the southwest of Bangalore (12°07–12°58’N 77°08’–77°25’E) in Karnataka, India (Map 1). They extend for approximately 75 km and are approximately 25 km wide. The average elevation is 747 m (2450 feet) above sea level. The hills are home to a wide variety of flora and fauna and the forest-covered slopes are of significant ornithological importance,

supporting over 150 species of birds including the endemic Yellow-throated Bulbul *Pycnonotus xantholaemus* and the critically endangered Long-billed Vulture; one of the few locations in south India where Long-billed Vultures nest (Subramanya & Naveen 2006). Although the Hills of Ramanagaram form part of the Important Bird Area (IBA) network in India (Islam & Rahmani 2004), they are threatened by quarrying and also plans to carve statues into the hills.



**Map 1:** Map showing the location of Ramangara and the study sites where Egyptian Vultures were counted.

## Materials and methods

The study was carried out from December 2013 to May 2014 in the Ramanagaram Hills Reserve Forest as well as surrounding areas of human habitation, which we considered to be favourable for sighting Egyptian Vultures. Counts of Egyptian Vultures, Black Kites *Milvus migrans*, Brahminy Kites *Haliastur indus*, House Crows *Corvus splendens*, Pond Herons *Areola grayii* and Cattle Egrets *Bubulcus ibis* were done at twice-monthly intervals survey was completed at 8 am to 12 am in a day all feeding stations located at silk processing sites and slaughter houses (Map 1) in the Ramanagaram Hills (Purohit & Saran 2013). Feeding behaviours were recorded using scan sampling and *ad libitum* methods (Altman 1974) and behaviour sampling rules (Martin and Bateson 1986), both of which are adequate for opportunistic records and were used throughout the observations whenever vultures were sighted during field visits. Birds were spotted with the naked eye and behaviours were observed through 10 × 48 binoculars from a distance of 80 to 100 m.

A questionnaire was used to assess attitudes towards Egyptian

Vulture conservation among local people living within the forest fringes (n=60): local people (n=16); livestock owners (n=30); silk processing site owners (n=4); slaughterhouse owners (n=4); local veterinarians (n=2) and drug pharmacies (n=4). The questionnaire recorded the age of the respondent, their religion, views of vulture conservation and the importance of vultures, carcass disposal methods, amount of livestock holdings, veterinary practices and diclofenac usage (Baral *et al.* 2005, Subadi 2007).

## Results

Two counts per month were completed at the silk processing sites and the slaughterhouse waste dumps over the five months of the study. A total of 123 individual vultures were recorded across the 10 visits. Of the 123 birds, most birds (79) were adults (Table 1). The number of adult vultures sighted at a count ranged from 1 to 14 ( $7.9 \pm 1.26$  s.e.), the number of sub-adults ranged from 1 to 4 ( $2.4 \pm 0.37$  s.e.) and juveniles from 1 to 5 ( $2.75 \pm 0.45$  s.e.). Overall counts of all age classes combined ranged from 2 to 19 ( $12.3 \pm 1.76$  s.e.).

**Table 1:** Counts of Egyptian vultures at silk processing sites and slaughterhouses in the Ramanagaram Hills December 2013 to May 2014

Months	Count No.	Adult	Sub-adult	Juveniles	Total
December	1	6	2	4	12
	2	10	1	5	16
January	1	1	1	0	2
	2	5	2	2	9
March	1	10	4	3	17
	2	6	2	0	8
April	1	13	4	2	19
	2	9	3	1	13
May	1	5	0	3	8
	2	14	3	2	19
<b>Total (Mean ± s.e.)</b>		79 (7.9 ±1.26)	22 (2.4 ±0.37)	22 (2.75 ±0.45)	123 (12.3 ±1.76)

### Feeding associations

Two types of feeding were observed at silk separation sites: waste areas and feeding on worms and invertebrates. In total, six species of larger bird were recorded at silk separation sites. The most numerous birds at the silk separation sites were Brahminy Kites and Black Kites; Egyptian Vulture were the least numerous (Table 2).

At the silk separation sites, wastes are dumped into drainage areas and these wastes contain silk worms and larvae. These areas attract crows, herons, and egrets. More open and drying areas attract Black Kites, Brahminy Kites and Egyptian Vultures. In these areas the crows, herons and egrets are displaced by the kites and vultures, so they generally feed in the drainage wastage areas.

**Table 2:** Counts of six species of larger bird at silk separation sites in the Ramanagaram Hills December 2013 to May 2014.

Variables	Black Kite	Brahminy Kite	House Crow	Pond Heron	Cattle Egret	Egyptian Vulture
Visits	10	10	10	10	10	10
Total	442	448	93	90	227	51
Min	31	33	10	3	16	2
Max	57	63	17	15	29	9
Mean (s.e.)	44(2.41)	49 (3.19)	13 (1.02)	9(1.35)	23 (1.48)	5 (0.67)

### Conservation perspectives on Egyptian Vulture conservation

Survey results showed that most people (90.82%) have a favourable opinion of vultures and consider conservation of vultures good for nature because they keep the ecosystem clean. Most people (63%, n=38) considered that vultures are Nature's scavenger, although a significant proportion (37%, n=22) considered them also to be hunters. Thirty cattle owners were interviewed and although most (79%, n = 23) were illiterate, they answered that they did not know about diclofenac. The main disposal method for carcasses was not favourable for vultures. Most people (89%, n=25) buried dead cattle and the remainder leave carcasses in an open area of the forest. The

veterinarians interviewed were using the vulture-safe drug meloxicam for livestock. Although diclofenac is not available for veterinary use it is sold at pharmacies (n=4) for human use. Several respondents indicated that in the Ramanagaram Hills, although most people are Hindu and therefore do not consume beef, there are a few Muslim communities and in these areas there are a few slaughterhouses and shops that sell beef.

### Discussion

Vulture populations, especially *Gyps* species, across the Indian subcontinent have declined drastically from the 1990s (Prakash *et al.* 2003, Gilbert *et al.* 2004, Green *et al.* 2004). The Egyptian Vulture is a long-lived species, which is classified as endangered

because of recent and rapid population declines in India and Nepal (Cuthbert *et al.* 2006). Hence, this study was conducted in the Ramanagaram Hills in order to make a first assessment of India's southern-most Egyptian Vulture population.

Diet and food intake is a central component of animal ecology, therefore knowledge of diet and food is key to understanding occurrence patterns, habitat selection and breeding productivity of species (Donázar & Ceballos 1988, Litvaitis, 2000, Sonerud *et al.* 2001, Sonerud *et al.* 2002, Margalida & Boudet 2003, Navarro *et al.* 2003, Sará & Divittorio 2003, Zabala & Zuberogoitia 2003, Zduniak & Kuczynski 2003, Zduniak & Antczak 2003). All vulture species feed on carcasses of small and large mammals, especially on the domestic animals in the vicinity of the Ramanagaram Hills. However, two additional congregations of feeding birds were studied here: dumps at slaughterhouses and worm feeding at silk processing sites. The silk cocoons contain pupae inside and these are separated manually at silk processing sites in the Ramanagaram hills; cocoons come from various places to be processed (10 times per month this work is carried out in

Ramanagaram Hills). The discarded pupae attract foraging birds and fresh pupae are especially attractive to Egyptian Vultures. Egyptian Vultures are most usually carrion feeders, in forest areas, but they are capable of thriving in areas of human habitation and at refuse dumps (Ali & Ripley 1987).

Most people interviewed during the study were in favour of Egyptian Vulture conservation, but many respondents were illiterate and did not know about the impact of diclofenac on vulture populations. Despite this, the veterinary practices interviewed were favourable for vulture conservation in the study area. In Africa, Brandl *et al.* (1985) reported a negative correlation between human impact on the landscape and raptor diversity and density and it is clear that a positive conservation attitude is key to garnering local support for species conservation. Education campaigns, such as street theatres and distributing posters in local languages highlighting the importance of vultures and the threats they face should be conducted to inform the general public. Such programmes enhance the awareness of people to the wide range of values provided by vultures. Another important strategy is to

educate livestock owners, farmers and veterinary personnel on the negative effects of diclofenac and on the proper disposal of contaminated carcasses. Green *et al.* (2004) found that, based on demographic modelling, less than 1% of

contaminated carcasses can cause a rapid population decline of vultures. Therefore, educating livestock holders, farmers and veterinary personnel will help to secure healthy food for vultures.

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