? Journal of Research (Science), Bahauddin Zakariya University, Multan, Pakistan.
Vol.12, No.1, June 2001, pp. 97-104 ISSN 1021-1012

A SURVEY OF THE ORIENTAL WHITE-BACKED VULTURE *GYPS BENGALENSIS* IN THE PUNJAB PROVINCE, PAKISTAN

Aleem A. Khan[1], Munir Z. Virani[2], J. Lindsay Oaks[3], Patrick C. Benson[4], Martin Gilbert[2], Rick T. Watson[2] and Robert W. Risebrough[5]
[1]Zoology Division, Institute of Pure & Applied Biology, Bahauddin Zakariya University, Multan, Pakistan. [2]The Peregrine Fund, 566 West Flying Hawk Lane, Boise, ID 83709, USA. [3]Department of Veterinary Microbiology and Pathology, Washington State University, Pullman, WA 99164-7040, USA. [4]Department of Zoology, University of Witwatersrand, 1 Jan Smut Ave., Johannesburg, 2001, South Africa. [5]The Bodega Bay Institute, 2711 Piedmont Avenue, Berkeley CA, 94705 USA.

Abstract: During bird survey in Pakistan, a distance of 1809 kilometers was covered in the Punjab province between August 16-29, 2000. A total of 1366 Oriental White-backed Vultures WBV (0.76 WBV/Km) was estimated from the study area. Out of a total of 175 WBV observed at close quarters for head drooping behaviour (from 7 different sites), the overall proportion of droopers to non-droopers was 16.6%, (which is similar to what observed in Nepal and West Bengal, India). The proportion of drooping birds to non-drooping birds was significantly higher at sites in Pakistan close to the Indian border near Rajasthan than those further away from the Rajasthan border. Similarly, more deaths were reported at sites closer to the Rajasthan border than those further inland towards the Indus River.

Keywords: Oriental White-backed Vulture, *Gyps bengalensis,* Punjab, Pakistan drooping behaviour,

INTRODUCTION

The Oriental White-backed Vulture *Gyps bengalenesis* is resident species in Pakistan and is widely distributed throughout the provinces of Punjab, Sindh and the broader valleys of the North West Frontier Province [Roberts 1991] (Fig. 1). The species prefers cultivated tracts with scattered trees and relatively high human population, that is attracted to larger towns and cities where slaughter houses and refuse tips offer more opportunity for obtaining food [Roberts 1991].

Gyps vultures have declined to an alarming extent throughout south Asia over the last 5 years [Prakash 1999, Risebrough 2000]. Certain areas in northern India have shown declines by upto 95% [Prakash 1999] while in the countries east of India, *Gyps* vultures have become virtually extinct (Prakash *et al*. 2000). Heavy mortalities of white-backed and cliff vultures *Gyps indicus* have been recorded in the states of Rajasthan and west Bengal in India [BNHS 2000, Prakash pers. comm., Virani pers. obs]. The obvious causes of decline and consequent deaths include lack of food, use of pesticides/poisons, human persecution, infectious disease, loss of habitat and environmental changes. *Gyps* vultures in India and along the lowlands of Nepal have been observed to exhibit an abnormal increase in the rate and frequency of “head drooping”, a behaviour pattern not so

commonly observed in the species [Prakash 1999, Risebrough and Virani pers. obs.]. It is suggested that this pattern could be linked to one of the clinical signs of "infected birds" in colonies [Prakash 1999, Risebrough and Virani, in lit.].

We conducted two surveys of *Gyps* vultures in the Punjab, Pakistan. The first between August 15th and 29th, 2000; and the second between November 15th and December 10th, 2000. The aims of the survey were to:

a) Census *Gyps* vultures in their main habitats and determine their nesting densities;
b) Assess the magnitude of "head drooping" behaviour in various colonies; and
c) Evaluate the spreading potential of the infectious disease factor from Indian *Gyps* populations to those in Pakistan.

STUDY AREA AND METHODS

The study was conducted in the province of Punjab along tributaries and canals of the Indus River (Fig. 1). Avenues and groves of Sheesham trees (*Dalbergia sissoo*) along canal banks were found to be used as roosting and nesting sites by vultures.

Land-use pattern at all sites was moderate to intensive agriculture having cotton, wheat and rice as main crops along with sizable herds of grazing livestock in these fields. Some sites such as Changa Manga, Katora and Kundian forest were exclusively set-aside as forest plantations grown mainly for the harvest of Sheesham trees to cope up timber wood demand for the country.

In selecting study area and methods

Main study sites

Supplementary sites;

Vegetation and topography survey

Land-use patterns;

Methods for counting/censusing vultures Bibby *et al.* [1998] was followed.

RESULTS

We covered a total distance of 1809 km during the survey and estimated a total of 1366 white-backed vultures (0.76 white-backed vulture per km). Forest officers, forest guards and villagers were interviewed at all sites to attest chances of having come across dead or dying vultures (except at Layyah). Ninety percent of the interviewees (n = 35 from 5 different sites) were consistent in their reports on dead/dying birds. The general consensus was that the Oriental White-backed Vultures were seen dead or dying in numbers ranging from 5 to more than 20 birds as reported per person per site. This phenomenon has been observed mainly during the summer months (April to July) and only over the last "2 to 3" years. All interviewees claimed that the vultures were dying "because of sickness caused by intense heat during summer months". A further 20% added

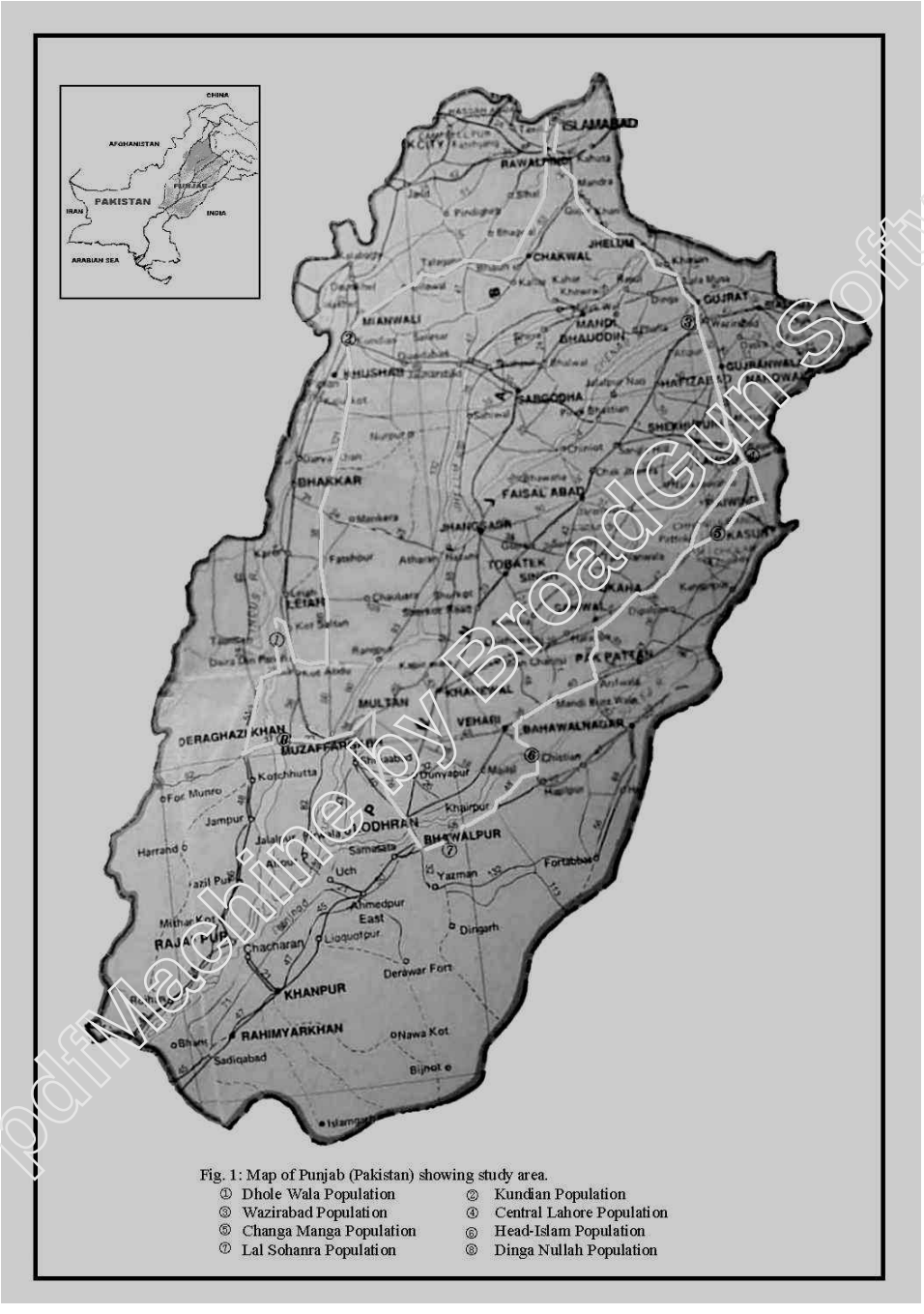

Fig. 1: Map of Punjab (Pakistan) showing study area.

① Dhole Wala Population
② Kundian Population
③ Wazirabad Population
④ Central Lahore Population
⑤ Changa Manga Population
⑥ Head-Islam Population
⑦ Lal Sohanra Population
⑧ Dinga Nullah Population

that lack of water or access to “clean” drinking water during the summer months may have contributed to deaths of vultures.

SITE ACCOUNTS

Dholewala

White-backed vultures were observed sparsely scattered along 15-km embankment of Sheesham trees. No dead vultures were found in the area. At least 48 white-backed vultures were seen on the ground, close to a partially consumed donkey carcass. Of these, we observed 6.3% (3 vultures) with “drooping heads”. All the different age classes in the group were well represented, particularly the juvenile birds. We estimated the total white-back vulture colony to be about 200 birds. In general, the colony appeared to be healthy. No deaths or evidence of dead vultures was observed. Fifteen local villagers (including some children) were interviewed to confirm the results.

Kundian Forest

White-backed vultures and their nests were abundantly seen on Sheesham trees along the Kundian forest canals. We counted 9 vulture nests along a 3 km by 50 m transect (60 nests per km^2). Pairing of vultures had begun (we observed a copulating pair) and at least 4 pairs were observed lining their nests. We estimated the total vulture population of 300 birds in Kundian forest. At a fresh donkey carcass, we observed 63 white-backed vultures. Of these, sub-adults made up 52.4% whilst juveniles and adults comprised 23.8% in each case. All birds at the carcass looked healthy. No drooping vultures were seen at Kundian forest although we found evidence of one dead vulture.

Changa Manga Forest

Forty-five white-backed vultures were observed between 07.00hrs and 08.30 hrs perching on Sheesham trees in compound of the forest headquarters. Of these, 15.6% (7) showed drooping heads. At 09.00hrs, we observed scores of white-backed vultures soaring in air thermals. We counted at least 500+ vultures soaring above our heads. At a slaughter-house about 4 km from the forest headquarters, we observed approximately 80 white-backed vultures soaring and perched near a donkey carcass. No dead or dying vultures were observed.

Lahore City

In the Lawrence Gardens recreational park and the nearby Pakistan Administrative Staff headquarters in the city of Lahore, we observed a total of 31 white-backed vultures perching on large Kapok trees. Of these, 22.6% (7) showed drooping heads. At the same time, we also observed a further 25 soaring vultures.

Wazirabad

On the Chenab River bridge, near Wazirabad we counted approximately 105 soaring Oriental white-backed vultures. These vultures were only

seen while passing by and no effort was made to search for "head droopers" or dead birds.

Head Islam

We observed white-backed vultures perching on Sheesham trees along the banks of the abandoned Melsi canal. Near one village, we counted a total of 21 perching white-backed vultures of which 33.3% (7) showed drooping heads. We estimated the total vulture population of 150 birds at Head Islam.

Lal Suhanra National Park

We observed and counted a total of 35 white-backed vultures perched on Sheesham trees near the TDCP motel in the park and estimated the proportion of "head droopers" to be 20%.

Dinganullah

We observed 20 white-backed vultures perching on Sheesham trees along a canal. Of these, 15% (3) were "head droopers".

During the survey, a total of 1366 Oriental White-backed Vultures WBV (0.76 WBV/Km) was estimated from the study area. Out of total 175 WBV observed at close quarters for head drooping behaviour (from 7 different sites), the overall proportion of droopers to non-droopers was 16.6% (Table 1), (which is similar to what observed in Nepal and West Bengal, India). The proportion of drooping birds to non-drooping birds was significantly higher at sites in Pakistan close to the Indian border near Rajasthan than those further away from Rajasthan border (Fig. 2). Similarly, more deaths were reported at sites closer to the Rajasthan border than those further inland towards the Indus River.

Table 1: Total number of white-backed vultures, "head droopers" and approximate estimates of dead/dying birds reported at various sites in Punjab province, Pakistan

Site	Total no. of white-backed vultures	Percentage of "head droopers" (n)	Approx no. of dead/dying vultures reported	Distance from Indian border (km)
Layyah	200	6.3 (48)	0	265
Kundian	300	0 (63)	> 20	325
Changa Manga	500	15.6 (45)	> 20	13
Lahore	56	22.6 (31)	3	35
Wazirabad	105	N/A	N/A	85
Head Islam	150	33.3 (21)	> 10	70
Lal Suhanra	35	20 (10)	> 5	90
Dinga Nullah	20	15 (20)	N/A	200
TOTAL	1366	16.6 (175)		

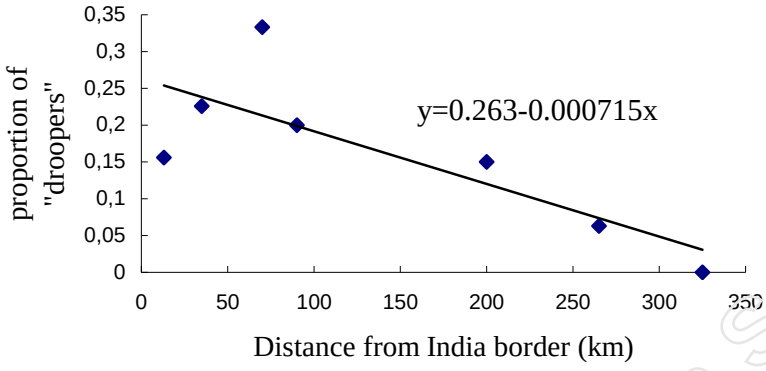

Fig. 2: A strong correlation showing proportion of head-droopers with distance from Rajasthan border.

DISCUSSION

Duckworth *et al.* [2001] concluded that a combination of persecution, food shortage, and habitat loss could account for the population collapses of Oriental White-backed, Slender-billed and Red-headed Vultures in the countries like Indochina and Malaysia. Whether the disease factor was ever present in these areas, or contributed to the disappearance of vultures from Burma and Thailand cannot be determined from the available information.

The decline of the Red-headed Vultures in Southeast Asia at a rate parallel with those of the two *Gyps* species and the stability of its populations in peninsular India has suggested that a different factor or factors have been operating in the two regions. The Red-headed Vultures typically are solitary feeders in Keoladeo National Park or feed in pairs; occasionally taking live prey, and did not feed with the crowded assemblages of *Gyps* vultures [Prakash, 1999]. Wells [2000] noted that in the mid-twentieth century all three species fed at slaughterhouses in Malaysia under conditions that would have exposed Red-headed Vultures to a mortality factor that was transmitted from bird to bird during feeding. Yet the apparent extinction of Red-headed Vultures in Bangladesh, and a major population decline if not collapse of Oriental White-backed Vultures during the 1970s over much of Bangladesh indicate that a combination of persecution, food shortage and habitat loss probably were the contributing causes rather than the disease factor that appeared about 20 years later in India.

Duckworth [2000] pointed out that the age structure of the Indochinese vultures is strongly biased towards adults, even in the area of greatest abundance in eastern Mondulkiri province of northeast Cambodia where all three species have high adult : immature ratios, in the order of 9:1. Wells [2000] also noted that only adults were present in the relict

population of Oriental White-backed Vultures in Pattani province of southern Thailand in the 1980s. Since a failure to breed is most frequently associated with a low food supply [Newton 1979], these ratios are consistent with a hypothesis that food shortage was a principal factor in the decline of the Southeast Asia populations. Yet a comparable ratio was observed by [Prakash *et al*. 2000] among the remnant Oriental White-backed Vultures in India during a countrywide survey that documented an abundance of food. Also many juvenile vultures have been dying on their nests in India, in part at least from the mortality factor; some are likely to have starved after the death of one or more of the parents. In this case, therefore, age ratios are not an indicator of reproductive success independent of mortality factors.

The information is not therefore sufficient to support a hypothesis that the disease factor ever was or continues to be present in South-east Asia. Determination of the status of the remnant populations in northeastern Cambodia and adjacent regions of Laos and Vietnam is an evident of immediate priority.

Intensive monitoring of the surviving populations of all three species on the Subcontinent, particularly of their reproductive success, is another evident priority. Whether these are birds never exposed to the disease factor, are resistant to it, or may yet succumb, are the research topics that cannot be postponed. Although as yet there is no indication that the disease will spread westwards through the populations of Griffon Vultures, the plausibility that this will occur alone justifies an intensive international multidisciplinary research effort of the broadest possible scale, both to prevent the decimation of vulture populations in countries to the west of the Subcontinent and to restore if at all possible those populations that have been affected [Risebrough *et al.* 2001].

However, our present results reflect on westward trend of the factors responsible for the decline of Oriental white-backed vultures in Pakistan. There is need to study in detail the imminent factors responsible for decline of Oriental white-backed vultures along with other *Gyps* species, with particular reference to Griffon vultures in Pakistan.

References

Bibby, C., Jones, M. and Marsden, S. (**1998**) “Expedition Field Techniques Bird Surveys”, Royal Geographical Society, London, p. l34.

BNHS, (**2000**) “A brief report on the International Seminar on Vulture situation in India”, *Bombay Nat. Hist. Soc.*, 26.

Duckworth, J.W., Poole, C.M., Round, P.D., Timmins, R.J. and Davidson, P. (**2001**) “Vulture Populations in South-east Asia during the twentieth century” unpublished manuscript.

Duckworth, W. (**2000**) E-mail to Dave Ferguson *et al*. of 14 April and E-mail to Oriental Birding Groups of November 21.

Newton, I. (**1979**) "Population Ecology of Raptors", Buteo Books, Vermillion, S.D., p. 399.

Prakash, V. (**1999**) *J. Bombay Nat. Hist. Soc.*, 96(3), 365-378

Prakash, V., Gargi, Verma, A., Sivakumar, S. and Prakash, N.V. (**2000**) "A Progress report on status and distribution of *Gyps* species of vultures in India", *Bombay Nat. Hist. Soc.*, 46

Risebrough R.W., Virani, M.A., Khan, A.A., Baral, H.S., Sarkar, S.U. and Chaudhury, A. (**2001**) "The collapse of populations of *Gyps* Vultures in Indian subcontinent", unpublished manuscript.

Risebrough, R.W. (**1999**) "Population crash of the *Gyps* Vultures in India: evidence for a disease factor and recommendations for emergency efforts", Report to the office of International conservation, US Fish and Wildlife service, Berkley, The Bodega Bay Institute.

Roberts, T.J. (**1991**) "The birds of Pakistan", Vol. 1, Non-passeriformes, Karachi, Oxford University Press, p. 598.

Wells, D. (**2000**) E-mail of 17 April 2000 to David Ferguson *et al.,* http://www.allindia.com/article.htm