Екологія	Беркут	19	Вип. 1-2	2010	101 - 107

OCCURRENCE OF TWO CRITICALLY ENDANGERED SPECIES OF *GYPS* VULTURES IN D'ERING MEMORIAL WILDLIFE SANCTUARY AND ADJACENT AREAS, ARUNACHAL PRADESH, INDIA

Anil Kumar

Abstract. Arunachal Pradesh is a recognized global biodiversity hotspot in India. It is the home of over 700 species of birds including many endemic and/or most rare/endangered species such as vultures. The sudden catastrophic decline in population of three species of vultures throughout the Indian subcontinent became a conservation concern at international level. Present situation prompted me to undertake extensive surveys between 3.10.2006 to 18.02.2009 in a potential area (i.e. D'Ering Memorial Wildlife Sanctuary) of Arunachal Pradesh to understand the present status of these species in the area. Results indicate that the area support a fairly large population (33 individuals) of vultures. Occurrence of large congregation of three species of vultures (most of them were 1 to 3 years old sub-adults/juveniles) reveals the successful natural breeding is being taken place some where in area. It is likely to be important for further investigations and monitoring of possible natural breeding activities of White-backed and Slender-billed vultures. Occurrence of 13 individuals of Slender-billed is especially interesting because recently it is being considered most rare species of vultures.

Key words: White-backed Vulture, Slender-billed Vulture, *Gyps bengalensis, Gyps tenuirostris,* conservation.

✉ A. Kumar, Arunachal Pradesh Regional Centre, Zoological Survey of India, Itanagar-791 113, Arunachal Pradesh, India; e-mail: anil_rathi@yahoo.com.

Встречаемость двух критически угрожаемых видов грифов в резервате Д'Еринг, Аруначал Прадеш, Индия. - А. Кумар. - Беркут. 19 (1-2). 2010. - Штат Аруначал Прадеш является одной из наиболее важных территорий для охраны биоразнообразия в Индии. Здесь обитает более 700 эндемичных и редких видов птиц. Внезапное катастрофическое сокращение численности популяций трех видов грифов на Индийском субконтиненте привлекло серьезное внимание на международном уровне. Исследование грифов в резервате проводилось 3–23.10.2006 г. и 11–18.02.2009 г. Всего были обнаружены 33 птицы 3 видов, в основном молодые. Это говорит об успешном размножении грифов в резервате. Наиболее интересна находка 13 особей тонкоклювого грифа, который сейчас считается наиболее редким.

Introduction

Arunachal Pradesh (26°28′ – 29°30′ N and 91°30′ – 97°30′ E) is recognized as global biodiversity hotspot and situated in the transition zone between the Himalayan and Indo-Burmese region. The total geographical area of the Arunachal Pradesh is 83,743 km^2 (largest state in North-East India and greenest part of the country). It is predominantly hilly and mountainous, and largely covered with highly varied and dense vegetation/forests: about 82% of the total geographical area (Forest Survey of India, 2000). The state harbors the world's northernmost tropical rain forests (Kaul, Haridasan, 1987; Kalita, Haridasan, 2001), which carry fairly large populations of faunal elements belong to various groups of invertebrates and vertebrates (Fauna of Arunachal Pradesh, 2006a, 2006b; Kumar, 2008). For wildlife management and conservation, ten wildlife sanctuaries (7114 km^2) and two national parks (2468 km^2) covering an area of 9582 km^2 have been established in the state.

Arunachal Pradesh is the home of over 700 species of birds including many endemic and / or most rare / endangered species such as vultures (Singh, 1994; Choudhury, 2006). Out of nine species of vultures reported from Indian subcontinent, seven species including two critically endangered species* of genus *Gyps* namely Oriental White-backed Vulture (*G. bengalensis*) and Slender-billed Vulture (*G. tenuirostris*) occur in Arunachal Pradesh (Choudhury, 2006). Himalayan Vulture (*G. himalayensis*) is a more common species. The

* See: http://www.iucnredlist.org

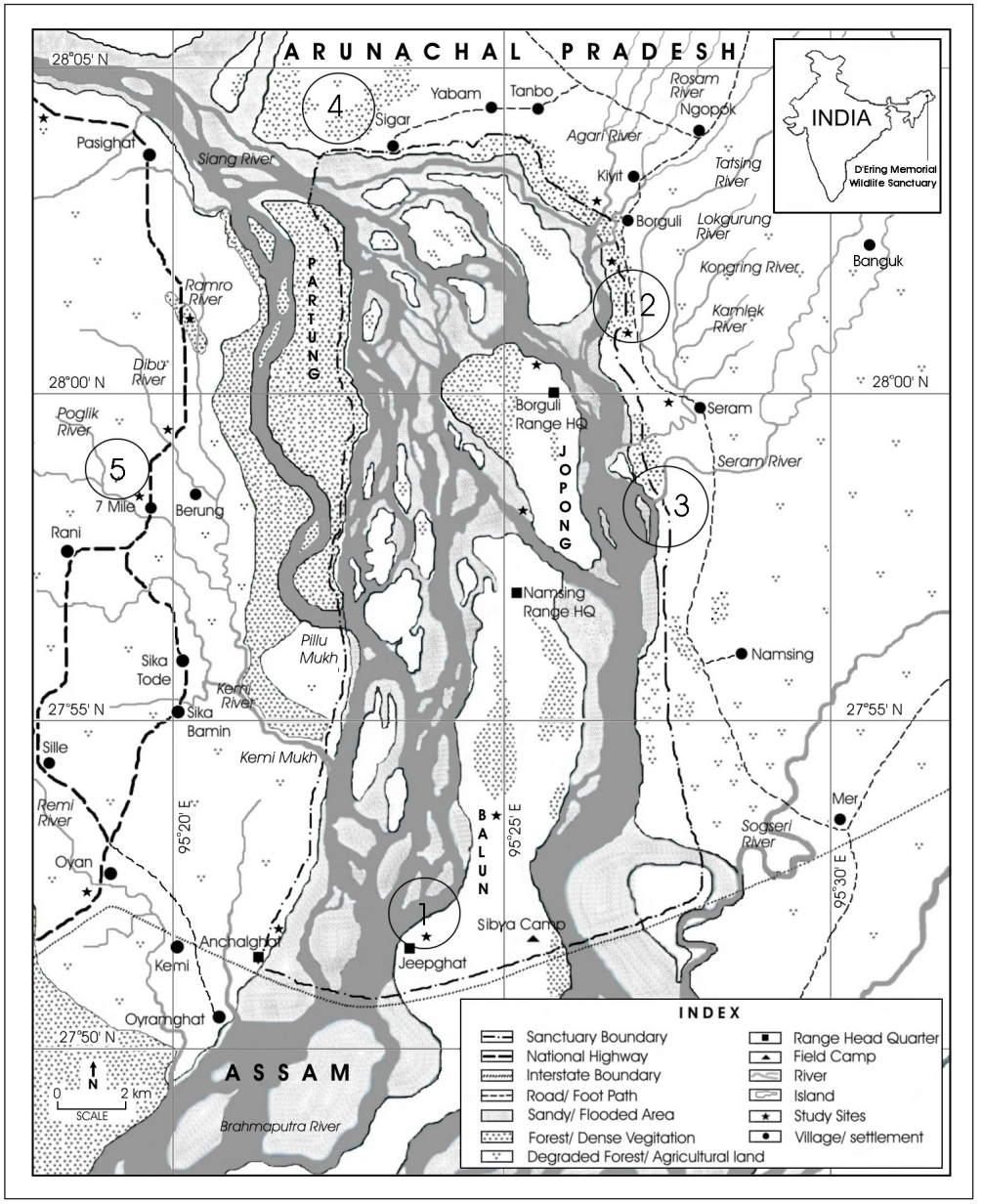

Fig. 1. Study area

Рис. 1. Район исследований

sudden catastrophic decline (> 95%) in population of three species of vultures throughout the Indian subcontinent (as distributed) became a conservation concern at international level and triggered investigations, monitoring, captive breeding programme and other conservation efforts (Prakash et al., 2007; Poharkar et al., 2009; Srinivasulu et al., 2009). In past both Slender-billed and White-backed vultures were common in north-east except some areas such as Khasi and adjoining hills (Hooker, 1854; Baker, 1928). Studies carried out during

Results of vulture counts in 2009 Результаты учетов грифов в 2009 г.

Date	Site and geographical position	Total number of individuals	*G. bengalensis*		*G. tenuirostris*		Unidentified / *G. himalayensis*
			Ad	Imm	Ad	Imm	
13.02	Site 1 (Jeepghat area) 27°51′59.90′′ N 95°22′59.79′′ E	12	2	?	?	?	10
16.02	Site 2 & 3 (Borguli area) 28°02′15.50′′ N 95°28′08.25′′ E	27	3	2	4	9	9*
17.02	Site 4 (Sigar area) 28°04′29.76′′ N 95°22′46.72′′ E	33	4	7	4	11	7
18.02	Site 5 (Rani-Berung area) 27°59′00.09′′ N 95°19′26.99′′ E	2	?	?	?	?	2

* *Gyps himalayensis*.

last two decades indicate that now both species of *Gyps* vultures are almost disappeared from most areas of Arunachal (Naoroji, 2006; Sangha, Naoroji, 2007). Present situation prompted me to undertake extensive survey in a potential area (i.e. D'Ering Memorial Wildlife Sanctuary) of Arunachal Pradesh to understand the present status of these species.

Study area

D'Ering Memorial Wildlife Sanctuary (hereafter DWS) located in the eastern Arunachal Pradesh and one of the biodiversity rich areas of the state. It was notified as Lali Wildlife Sanctuary in 1978 (vide notification no. FOR/284/78/2 dated 23.08.1978). Later on it was named as Daying Ering Memorial Wildlife Sanctuary (vide notification no. CWL/37/83/D/T/4524-54 dated 27.10.1986). The total area of sanctuary is about 190 km^2 including aquatic area of Siang river. The sanctuary located between 95°22′ E – 95°29′E and 27°51′ N – 28°05′ N, and divided into three ranges namely Anchalghat, Namsing and Borguli (Fig. 1). The sanctuary supports a large number of endangered and rare species of animals such as White-winged Duck (*Cairina scutulata*), Bengal Florican (*Houbaropsis bengalensis*), Gangetic Dolphin (*Platanista gangetica*), Tiger (*Panthera tigris*), Hispid Hare (*Caprolagus hispidus*) and some rare species of invertebrates. According to a rough estimation more than 200 species of birds and about 29 species of mammals inhabit the sanctuary (Kumar, 2009). The sanctuary area mainly composed of two types of habitats. Most of the area (about 75%) is alluvial grassland and rest is covered by semi evergreen forest patches. Most of the sanctuary area composed of islands formed between Siang River and its tributary Sibia River. Both the rivers divided into streams which intersect the sanctuary and form several islands. The topography of these islands change time to time depends upon the season, rainfall and flooded water. The surrounding area of the sanctuary mainly composed of agriculture fields and thick forests. The main agriculture crop is paddy, while thick forest composed

Fig. 2. Roosting site of three species of vultures:
a) mixed roosting flock of Slender-billed and Himalayan Vultures; b) three individuals of White-backed Vulture (left to right: mature, juvenile and mature individuals); c) Slender-billed Vulture (1 to 2 years old); d) juvenile of Himalayan Vulture.
Рис. 2. Место отдыха трех видов грифов.

of mixed vegetation such as *Bombax ceiba, Albizzia procera, Dipteria wallichii, Talauma hodgsonii, Daubanga grandiflora, Solanum torvum* and *Ficus dumosa* etc.

Material and Methods

Field surveys were conducted from 3.10 to 23.10.2006 and 11.02 to 18.02.2009. During the survey different localities of DWS (namely Borguli Range, Jeepghat, Anchalghat and Namsing area) and surrounding areas (namely Mebo and surrounding area, Along road, Pasighat and surrounding area, Ruksin and surrounding area, Ranging village, Oyan village and Selluk village) were visited (see map: Fig. 1) for the documentation of avifauna in general and vultures in particular. Mebo town located about 12 km from Borguli towards north and Selluk village located about 11 km from Mebo towards east (places are not shown in the map). Observations on birds were made every day starting from morning to evening (6^{00} am to 5^{00} pm; with few exceptions), with the help of prismatic field binocular (10 x 50) and species identification was carried out with the help of field guide of Birds of India (Kazmierczak, Perlo, 2000) and Birds of Prey of the Indian Subcontinent (Naoroji, 2006). Photographs were taken with the help of Nikon D70 digital camera and 600 mm telephoto lens for further identification and documentation.

Results and Discussion

During the first survey in October 2006 different localities of sanctuary and adjacent areas were visited, but none of the vulture

Fig. 3. Mixed species flock of vultures soaring in Sigar area:
a) large flock of all three species of vultures; b) White-backed Vulture (adult); c) Himalayan Vulture (sub-adult); d) Himalayan Vulture (juvenile).
Рис. 3. Смешанная стая грифов, парящих в районе Сигар.

species was seen. During second survey in February 2009, the same area visited and three species of vultures observed as summarized in Table. On 13.02.2009, twelve individuals were seen, while soaring in the sky over Jeepghat area (circle 1 in map). Only two individuals of White-backed Vulture (both adults) could be identified. Due to distance other individuals were unidentified. However, most of them were immature / juveniles. Flock could not be approached closely due to river as an obstacle. After soaring about 12 min, all individuals moved towards north. On 16.02 morning (10^{15} am) while surveying eastern bank of the sanctuary, 8 individuals were seen in the sky of Borguli area (circle 2 in map). They were moving towards south. At about 11^{30} am again 9 individuals were seen in Seram area. They were soaring in a wide circle. During evening (4^{45} pm), while returning from Namsing area, 27 individuals of three species were seen roosting on *Bombax ceiba* trees (Fig. 2) in Seram area (circle 3 in map). At this location, I approached quite closely for identification and photographed most individuals. Details of the individuals (species and numbers) are given in Table.

On 17.02.2009 (about 9^{00} am) in Sigar area (circle 4 in map) a big flock (24 individuals) of vultures was seen in the sky. They were

soaring (Fig. 3) and slowly moving from north to east. At the same time another flock of 9 individuals was moving from Pasighat side. Individuals of both flocks joined together and formed large congregation (total 33 individuals). There were three species and most individuals were juveniles / sub-adults. After soaring about 10 min the flock split into two subflocks. One group of 12 individuals moved towards Portung forest towards south and rest of individuals moved towards Borguli area. On 18.02.2009 when returning from Pasighat, 2 individuals were seen in Rani-Berung area (circle 5 in map). Unfortunately due to distance individuals could not be identified.

Results of the present study indicate that the area support a fairly large population of vultures (high in comparison with other recent studies: Prakash et al., 2007; Sanga, Naoroji, 2007). It is likely to be important for vulture conservationists/scientists to consider DWS as a potential area for *in-situ* conservation or further monitoring programme. Occurrence of at least 13 individuals of Slender-billed Vultures is especially interesting because recently it is being considered most rare species of vulture. During my earlier survey in October 2006, none of the vulture species was seen in the area, while in second survey in February 2009, occurrence of large congregation of three species of vultures (most of them were 1 to 3 years old sub-adults / juveniles: Table) reveals the successful natural breeding is being taken place some where in area. It is likely to be important for further investigations and monitoring of possible natural breeding activities of White-backed and Slender-billed Vultures.

It is worth mentioning that DWS is located between the mighty Siang River and its tributary Sibya River. The wide course and fast flow of these rivers make DWS difficult to access in general for local poachers/ hunters. The use of any non-steroidal anti-inflammatory veterinary drugs (such as Diclofenac: considered main cause of population decline in vultures) is also almost negligible in the area. The patches of trees of *Bombax ceiba* are common in the area, which may serve as potential roosting/ nesting sites for vultures. In Pakistan also it has been seen that facilitated plantation of *Dalbergia sissoo* and *Bombax ceiba* are new nesting sites for vultures in newly irrigated areas (Naoroji, 2006). It seems that DWS and adjacent areas have potential for successful survival of vultures. However, habitat degradation was also seen in some areas most probably due to increasing anthropogenic pressure in terms of harvesting of fuel wood, timber, foliage and medicinal plants. Indirect evidences indicate that some local people also involved in wildlife hunting.

Acknowledgements

I am grateful to Director, ZSI, Kolkata, to grant the permission for field surveys and Officer-in-Charge, APRC, ZSI, Itanagar, for extending departmental facilities. My sincere thanks are due to Dr. Ambrish Kumar, Scientist-C, BSI, Itanagar, for the identification of plants. Kind support and active cooperation at various levels from Forest Department of Arunachal Pradesh is also gratefully acknowledged. Special thanks are due to DFO and staff of D'Ering WL Sanctuary and my colleague Dr. D. Suresh Chand, ZSI, and field staff (Mr. Dhan Bhadur Tamang and Mr. D. Bhowmick) for support and active cooperation in field.

REFERENCES

Baker E.C.S. (1928): The fauna of British India including Ceylon and Burma. 2nd ed. Vol. 5. Taylor and Francis, London.

Choudhury A. (2006): A Pocket Guide to the Birds of Arunachal Pradesh. Gibbon Books, and The Rhino Foundation for Nature in NE India, Guwahati, Assam, India.

Fauna of Arunachal Pradesh. - State Fauna Series. Zool Surv. India, Kolkata, 2006a. 13 (1): 1-396.

Fauna of Arunachal Pradesh. - State Fauna Series. Zool Surv. India, Kolkata, 2006b. 13 (2): 1-518.

Forest Survey of India. The State Forest Report, 1999. FSI, Govt. of India Press, Dehradun, 2000. 1-133.

Hooker J.D. (1854): Notes of a Naturalist. Himalayan Journals. Vol. II. Reprinted 1999. Natraj Publishers, Dehradun.

Kalita S.N., Haridasan K. (2001): Forest and wildlife management in Arunachal Pradesh. - Arunachal Forest News. 19 (1-2): 26-31.

Kaul R.N., Haridasan K. (1987): Forest types of Arunachal

Pradesh – A preliminary study. - J. Econ. Tax. Bot. 9 (2): 397-389.

Kazmierczak K., van Perlo B. (2000): A field guide to the birds of India. Om Book Service, Darya Ganj, New Delhi.

Kumar A. (2008): Observations on the avifauna of Tawang Chu Valley, Arunachal Pradesh along with a new record *Muscicapa ruficauda* (Rusty-tailed Flycatcher) for Arunachal Pradesh. - Bull. Arunachal Forest Research. 24 (1-2): 54-62.

Kumar A. (2009): Occurrence of mammals in D'Ering Memorial Wildlife Sanctuary and adjacent areas, Arunachal Pradesh, India. - J. Env. Bio-sci. 23 (1): 107-111.

Naoroji R. (2006): Birds of prey of the Indian subcontinent. Om books International, New Delhi, India.

Poharkar A., Reddy P.A., Gadge V.A., Kolte S., Kurkure N., Shivaji S. (2009): Is malaria the cause for decline in the wild population of the Indian White-backed vulture (*Gyps bengalensis*)? - Curr. Sci. 96 (4): 553-558.

Prakash V., Green R.E., Pain D.J., Ranade S.P., Saravanan S., Prakash N., Venkitachalam R., Cuthbert R., Rahmani A.R., Cunningham A.A. (2007): Recent changes in populations of resident *Gyps* vultures in India. - J. Bombay Nat. Hist. Soc. 104 (2): 129-135.

Sanga H.S., Naoroji R. (2007): New and significant records of birds in Arunachal Pradesh, north-east India. - Forktail. 23: 179-181.

Singh P. (1994): Recent bird records from Arunachal Pradesh. - Forktail. 10: 65-104.

Srinivasulu C., Srinivasulu B., Venkateshwarlu P., Seetharamaraju M., Kaur H., Sreekar R. (2009): Present status of critically endangered species of Gyps in Andhra Pradesh, India. - Curr. Sci. 96 (4): 449-450.

Короткі повідомлення	Беркут	19	Вип. 1-2	2010	63, 107

Московського державного університету (НДЗМ МДУ), спеціалістами якого вона віднесена до підвиду *T. a. alba.*

На суміжних з Миколаївщиною територіях в останні десятиріччя відомі наступні реєстрації виду. У Березівському районі Одеської області (с. Ставкове) В.В. Кіндою 5.07.1980 р. було спіймано сипуху у складі з зерном (Кошелев и др., 1991). У м. Кривий Ріг (Дніпропетровська область) 3.03.2002 р. знайдено труп самця підвиду *T. a. guttata* (Коцюруба, Стригунов, 2003). У с. Ліски (передмістя Одеси) 13.12.2002 р. було підібрано свіжий труп сипухи (І.П. Гержик, особ. повід.). У м. Херсон 23.02.2005 р. на горищі жилого будинку знайдено мертвого птаха (Роман та ін., 2008). Територіальну пару спостерігали 26.05–13.06.2007 р. на фермі в околицях с. Кучурган Роздільнянського району Одеської області (Архипов, 2008; особ. повід.). У м. Одеса біля залізничної станції Одеса-Пересип на пустищі 11.03.2008 р. був знайдений мертвий птах, який загинув наприкінці лютого – початку березня (П.С. Панченко, особ. повід.). За фотографією цю особину співробітником НДЗМ МДУ Є.О. Кобліком було віднесено до підвиду *T. a. alba.*

(*Закінчення, початок на с. 63*).

ЛІТЕРАТУРА

Архипов О.М. (2008): Спостереження рідкісних видів птахів у деяких районах Одеської області у 2004–2007 рр. - Знахідки тварин Червоної книги України. Київ. 5-8.

Дементьев Г.П. (1951): Отряд Совы. - Птицы Советского Союза. М.: Сов. наука. 1: 342-429.

Коцюруба В.В, Стригунов В.И. (2003): О находке сипухи (*T. a. guttata*) в г. Кривой Рог. - Бранта. 6: 201-202.

Кошелев А.И., Корзюков А.И., Лобков В.А., Пересадько Л.В. (1991): Анализ численности редких видов птиц в Одесской области. - Редкие птицы Причерноморья. К.-Одесса. 9-35.

Підоплічко І.Г. (1932): Аналізи погадок за 1924–1929 рр. - Матеріяли до порайонового вивчення дрібних звірів та птахів, що ними живляться. Київ. 1: 5-76.

Портенко Л.А. (1928): Очерк фауны птиц Подольской губернии. - Бюл. МОИП. Отд. биол. 37 (1-2): 92-204.

Роман Є.Г., Маркауцан О.Є., Підгайний М.М. (2008): Знахідки рідкісних видів фауни на півдні України. - Знахідки тварин Червоної книги України. Київ. 281-293.

Expedition report (2002): Monitoring wolf, jerboa, viper and bird populations and studying bird migration on the Kinburn peninsula, Black Sea, Ukraine. 1-64.

З.О. Петрович,
РЛП «Кінбурнська коса»,
вул. Шкрептієнка, 16,
м. Очаків, Миколаївська обл., 57500,
Україна (Ukraine).