Bird-o-soar

Is formation of new heronries a result of degradation of old heronries? An insight of Keoladeo-Complex heronries

A heronry is an aggregation of colonial birds. It usually includes tree nesting waders and divers, such as storks, egrets, spoonbills, cormorants, and herons. Nesting is primarily driven by water availability, and other factors such as nesting substrate, climate, predation, and human disturbance, may also affect it (Vijayan 1987, 1991). However, there is little explanation on what causes the formation of new heronries and abandoning of old heronries. In this article, the authors discuss the Keoladeo-Complex (KNP-Complex) heronries to suggest a possible mechanism in the formation of new heronries.

Authors identify KNP-Complex as the set of heronries located in the district of Bharatpur and Mathura, India (Figure 1, Table 1). It includes six heterospecific breeding aggregations of colonial birds. These include 15



Figure 1. Map showing location of Keoladeo (KNP)-Complex heronries.

breeding species of wader and divers (Vijayan 1991; Dwevedi et al. 2014; Tiwary et al. 2015). Among these, KNP is a large wetland heronry and others are small village tank heronries. All heronries of the complex are located within ~35kms of radius. These heronries are composed of colonial birds, numbers ranging from a few nests to hundreds. These heronries include nests of Painted Stork Mycteria leucocephala, Eurasian Spoonbill Platalea leucordia. Black-headed Ibis Threskiornis melanocephalus, Oriental Darter Anhinga melanogaster, Little Cormorant Phalacrocorax niger, Indian Cormorant Phalacrocorax fuscicollis. Little Egret Egretta garzetta, Intermediate Egret Mesophoyx intermedia, Cattle Egret Bubulcus ibis, Indian Pond Heron Ardeola grayii, Black-crowned Night Heron Nycticorax nycticorax, **Openbill Stork** Anastomus oscitans, and Grey Heron Ardea cinerea. Nesting of these species usually starts after summers and with the

Bird-o-soar



Figure 2. Images showing nesting of birds at Akbarpur heronry in Mathura: a) Painted Stork, b) Spoonbill, c) Painted Stork and Little Cormorant, and d) Black-headed Ibis. © Rajneesh Dwivedi.



Figure 3. Plot showing water released to the KNP since 1980 (WR – Water released from Ajan Dam in million cubic feet), *Water release data was obtained from the KNP authorities. Data points in red colour shows the year of breeding failure at KNP (Note the low volume of water released in these years).

beginning of the monsoon. The above species are mostly dependent on aquatic food and hence are affected by water conditions.

Recently, our research team, in the year 2019, encountered another unreported heronry in Mathura. It is located at 27.64° N & 77.56° E in the Akbarpur Village, close to already existing Chhata Heronry (Dwevedi & Urfi 2012). It is a heterospecific heronry composed of nests of Black-headed Ibis, Painted Stork, Little Cormorant, and Spoonbill (Figure 2). Though three individuals of Oriental Darter were spotted, no nest was recorded. It is to be noted that Black-headed Ibis and Painted Stork are Near Threatened birds (BirdLife International 2021). Hence, this heronry is of conservation significance.

In the KNP-complex, the largest and oldest heronry is Keoladeo Ghana National Park (KNP) located in Bharatpur, Rajasthan. The rest of the five heronries are located in the district of Mathura (Table 1). These four heronries have come into existence in the past

Heronry	District	Present Age [*] (In Years)	First Reported	Nearest existing heronry	Breeding failures at KNP
Keoladeo National Park (KNP)	Bharatpur	>250	NA	MOR (27.5 km)	1979, 1987, 1991, 1997, 1999, 2000, 2002, 2004, 2006, 2007, 2009, 2014
Mathura Oil Refinery (MOR)	Mathura	~20	2001	KNP (27.5 km)	
Chhata	Mathura	~50 to 40	2010	Khanpur (4.0 km)	
Khanpur	Mathura	~15	2013	Chhata (4.0 km)	
Akbarpur	Mathura	~12	2019	Khanpur (10.5 km)	
[*] as confirmed with the local people or published records.					

Table 1. Heronries located in the KNP-Complex.

two decades. One heronry also existed in Govardhan, and no one has recorded any nesting here in the past several decades (Dwevedi et al. 2014).

KNP is the oldest and largest colony in the KNP-complex and therefore, possibly function as the source of bird population to other heronries. It is possible that birds flew out of KNP to search for new breeding habitats during the years of drought. These heronries are geographically close to each other (Figure 1, Table 1) therefore, the movement of individual birds between these heronries is very much possible.

Though not a strong evidence, small heronries of KNP-complex have formed either in the year of drought or immediately after drought years (Table 1). Infrequent droughts could have proven good for the formation of large heronry such as KNP (Frederick & Ogden 2001) but in the past two decades droughts have become more frequent and the water supply from Ajan Dam has been disrupted multiple times at KNP (Figure 3). This has contributed to the continuous deterioration of habitat at KNP and caused a reduction in the breeding population of birds at KNP (Dwevedi et al. 2021). Prima facie observations suggest a link between heronries of KNP-complex and each being dependent on one another for long-term survival. Smaller heronries, probably function as a refuge to the breeding birds in times of water scarcity or any other disturbance at KNP, however, this needs to be verified through population genetics and satellite/geotagging of birds.

KNP-complex supports a large number of heronry birds including many species of conservation importance. Encroachment, waste dumping, water pollution, eutrophication etc. are threatening the existence of small heronries (Dwevedi et al. 2014), hence, these small heronries require the attention of local authorities/ forest department/panchayat and local people participation. Public participation is particularly key to the conservation of these heronries. Many of these heronries have religious/spiritual/traditional and cultural values (Dwevedi et al. 2014; Tiwary et al. 2014), therefore, the participation of local people can achieve greater success in their conservation.

Bird-o-soar

References

BirdLife International (2021). IUCN Red List for birds. Downloaded from http://www.birdlife.org on 24.viii.2021.

Dwevedi, R. & A.J. Urfi (2012). Discovery of a large heronry at Chhata, near Mathura, in western Uttar Pradesh. *Journal of the Bombay Natural History Society* 108(3): 231–232.

Dwevedi, R., S.K. Singh & V. Krishna (2014). Heronries of Mathura District, western Uttar Pradesh, India. *Indian BIRDS* 9(4): 93–95.

Dwevedi, R., V. Deo, J. Sethy, R. Gupta & M. Mylswamy (2021). Performance of imputation-based models in predicting breeding population trend of a near-threatened bird in changing water regime: A 36-year long-term case study of Painted Stork, *Mycteria leucocephala. Journal of Applied and Natural Science* 13(3): 1072–1082. https:// doi.org/10.31018/jans.v13i3.2876

Frederick, P.C. & J.C. Ogden (2001). Pulsed breeding of long-legged wading birds and the importance of infrequent severe drought conditions in the Florida Everglades. *Wetlands* 21(4): 484–491.

Tiwary, N.K., B.B. Sharma & A.J. Urfi (2014). Two new nesting colonies of Painted Stork *Mycteria leucocephala* from northern India. *Indian BIRDS* 9(4): 85–88.

Vijayan, V. (1987). Keoladeo National Park Ecology Study. Bombay Natural History Society, Bombay.

Vijayan, V. (1991). Keoladeo National Park Ecology Study: Final Report, 1980–1990. Bombay Natural History Society, Bombay.

Rajneesh Dwevedi¹, Renuka Gupta² & Janmejay Sethy³

^{1,3} Amity Institute of Forestry and Wildlife, Amity University, Noida, Uttar Pradesh 201313, India.
² Department of Biology, Lady Irwin College, University of Delhi, Delhi 110001, India.
Email: ¹dwevedi.rajneesh@gmail.com (corresponding author)

Acknowledgements: Authors are thankful to the Director, Keoladeo National Park and Forest Department, Government of Rajasthan, India for sharing the information on nest counts and water released in the KNP. RD is thankful to Mukesh, a farmer in Chhata (Mathura), for his continuous support in providing accommodation and assistance during field visits.

Citation: Dwevedi, R., R. Gupta & J. Sethy (2021). Is formation of new heronries a result of degradation of old heronries? An insight of Keoladeo-Complex heronries. Bird-o-soar #102, In: *Zoo's Print* 36(10): 73–76.