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Avian Diversity of Hadoti Region of Rajasthan

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ABSTRACT
Birds are typically the most numerous and beautiful species of wildlife found in any given area. They are the best possible indication of habitat condition due to their highly particular habitat and behavior. The town of Hadoti in Rajasthan is home to a wide variety of local and seasonal bird species. During the course of the survey, 62 different species were observed. Of these, 54 were permanent residents, and 8 were seasonal visitors. Locations with plenty of water, trees, and vegetation had the highest rates of bird observations. Neither the Great Indian Bustard (the state bird of Rajasthan) nor the Vulture were seen during this count. These birds need serious conservation measures.
KEYWORDS: *Diverse, indicator, habitat, resident, migrant*

I. INTRODUCTION

Birds have played a significant role in human history and culture from antiquity right up to the present day. Scavenging is one of a vulture's many skills. The family Accipitridae is home to every kind of vulture there is. Although vultures' appearance is often maligned, they actually play an important role in maintaining a balanced environment and halting the spread of illness by cleaning up after dead animals.

India is home to nine different vulture species, but a recent, dramatic decline in their numbers has put them all in jeopardy of extinction. There used to be up to 80 million White-rumped vultures (Gyps bengalensis) in India in the 1980s, but currently there are only a few thousand left (IUCN, 2015). Out of these nine species, seven species of vulture found in Rajasthan, Long billed vulture (Gyps indicus), White-backed vulture (Gyps bengalensis), Red-headed vulture (Sarcogyps calvus) and Egyptian vulture (Neophron percnopterus) as breeding residents, Himalayan griffon (Gyps hymalayensis), Eurdasian griffon (Gyps fulvus) and Cinereous vulture (Aegypius monachus) are winter migratory species. Vultures are essential to ecosystems because of the important role they play in decomposing dead animals and so maintaining a healthy environment for various forms of life on Earth. Their presence is crucial to maintaining a balanced ecosystem. Vulture numbers have been on the decline, and this drop has been connected to the veterinary usage of the NSAID diclofenac (DF), according to several studies.

The Hadoti region of Rajasthan spans the coordinates 23°45′N to 25°53′N and 75°09′E to 77°26′E, rising to an average elevation of 300 meters above sea level. Hadoti is home to a historically significant and agriculturally focused populace. Kota, Bundi, Baran, and Jhalawar are the districts that make up this region. Important geographical boundaries include the Mewar region of Rajasthan to the west and the Malwa region of Madhya Pradesh to the south. While other parts of Rajasthan are dry and barren, this region is well-supplied with water thanks to rivers like the Chambal and its tributaries (the Kali Sindh, the Parvan, etc.). Trees of many species make up the forests. Hadoti's dense forests, tanks, ponds, reservoirs, rivers, wetlands, and grasslands have made it a new preferred wintering place for migrating birds, while local birds are also abundant there.

II. METHODOLOGY

From January of 2012 through March of 2013, the survey was conducted annually. Binoculars were used for a direct visual sighting method. The birds were identified with the help of Salim Ali's (2002) The Book of Indian Birds. Nomenclature of birds of the Indian subcontinent, written by Pittie & Robertson (1993), was examined for the zoological names of the birds.

The city of Hadhoti was the site of the aforementioned research. Hadhoti is a district in the western section of the Indian state of Rajasthan. Gapernath Temple, Deeppura Village, Harigarh (Chalte woodland), Thamlav Village, Borabas Village, Sentab Colony, Near Bhainsroadgarh, and Submersible Bridge are just few of the eight study sites chosen from the former Bundi Kingdom in western Rajasthan. From July 2019 to March 2020, researchers used the Line Transect method (Prakash et al., 2012) to perform a thorough and consistent field survey at predetermined study sites. Each week, a different location was surveyed between sunrise and sunset. The vultures were observed from 7:00 a.m. to 10:30 a.m., when they emerge from their nests to sun themselves and fly in the sky over their nests before venturing out to find food, and again from 4:00 p.m. to 6:30

p.m., when they return to their roosts and circle overhead before settling in for the night. Each survey involved the preparation and filling out of a data sheet (Figure 1). Using field shots and reference material images (Ali and Ripley, 1987; Kazmierczak, 2000), vultures were successfully recognized. Head count methodology was used to examine population size and composition (Kumar et al., 2014; Chhanjani, 2007; Purohit & Saran, 2013). Using photographs and video records in addition to the head count approach, researchers assessed the health of various vulture populations. Nesting, roosting, and feeding areas were tracked using GPS, vulture species were photographed for positive identification, and a head count was taken using binoculars to determine population size. Binoculars were used to make the observations from a safe distance of 300 to 600 meters away from the cliffs (Purohit and Saran, 2013).

III. RESULTS

During the course of the survey, 62 different species were observed. Of these, 54 were permanent residents, and 8 were seasonal visitors. House sparrows, warblers, lapwings, peafowl, parakeet, pigeon, dove, quail, francolin, egret, coucal, bulbul, myna, and owl were among the most commonly seen native bird species. Pelicans, bar-headed geese, and painted storks were among the numerous migratory birds.

Table 1. Resident birds

S. no.	Common Name	Zoological Name
1	House sparrow	Passer domesticus
2	Tailor bird	Orthotomus sutorius
3	Weaver bird	Piloceus philippinus
4	Blue rock pigeon	Streptopelia decaoto
5	Little brown dove	Streptopelia senegalensis
6	Cattle egret	Bubulcus ibis
7	Indian peafowl	Pavo cristatus
8	Rose ringed parakeet	Psittacula krameri
9	Coucal	Centropus sinensis
10	Koel	Eudynamus scolopacea
11	Hoopoe	Upupa epops
12	Quail	Coturinix coturinix
13	Francolin	Francolinus pondicerianus
14	Red wattled lapwing	Vanellus indicus
15	Kingfisher	Alcedo althis
16	Bee eater	Merops orientalis
17	Blue tailed bee eater	Merops philippinus
18	Barn owl	Tyto alba
19	Spotted owlet	Athene brama
20	Pond heron	Ardea cinerea
21	Barblet	Megalaima haemacepala
22	Red vented bulbul	Pycnonotus cafer
23	Woodpecker	Dinopium bengalensis
24	Purple moorhen	Porphyrio porphyrio
25	Common moorhen	Gallinula chloropus

26	White breasted water hen	Arpaurornis phonicurus
27	House crow	Corvus splendens
28	White ibis	Threskiornis aethiopica
29	Black ibis	Psendibis papillosa
30	Little grebe	Podiceps rficollos
31	Pied bush chat	Saxicola caprata
32	Black drongo	Dicrurus adsimilis
33	Starling	Sturnus vulgaris
34	Rosy pastor	Sturnus roseus
35	Pied myna	Acridotheres contra
36	Common myana	Acridotheres tristis
37	Bank myana	Acridotheres ginginiamus
38	Wagtail	Motacilla alba
39	Crested lark	Galerida cristata
40	Common babbler	Turdoides caudatus
41	Little ringed plover	Charadrius dubius
42	Munia	Lonchura malabarica
43	Cotton pygmy goose	Nettapus coromandelians
44	Spot billed duck	Anas poecilorhyncha
45	Common teal	Anas crecca
46	Comb duck	Sarkidiornis melanotos
47	Treepie	Dendrocitta vagabunda
48	Sunbird	Nectarinia asciatica
49	Flycatcher	Rhipidura aureola
50	Kite	Elanus caeruleus
51	Eagle	Circaetus gallicus
52	Coot	Fulica atra
53	Great egret	Alba alba
54	Little egret	Egretta garzetta

Table 2. Migratory birds

S. no.	Common Name	Zoological Name
1	Painted stork	Mycteria leucocephalia
2	Openbill stork	Anastomus oscitans
3	Wooly neck stork	Ciconia episcopus
4	Bar headed goose	Anser indicus
5	Ruddy shelduck	Tadorna ferruginea
6	Grey lag goose	Anser anser
7	Pelican	Pelicanus crispus
8	Spoonbill	Platalea leucorodia

Sightings of birds were more common in locations with plenty of water, trees, and vegetation. In this survey, we didn't see any vultures, any Sarus cranes, or the Great Indian Bustard (the state bird of Rajasthan). These birds need serious conservation measures. The resident birds have a large enough range and population that the International Union for the Conservation of Nature (IUCN) does not consider them to be in danger of extinction.

Mycteria leucocephalia, a species of migratory bird, is considered to be Near Threatened because its population is declining at a moderate rate, mostly as a result of hunting, wetland drainage, and pollution. As a result of a dramatic population fall that is predicted to persist, the Pelicannus crispus has been designated as a vulnerable species.

Three of Rajasthan's seven vulture species—the White-rumped, Egyptian, and Long-billed Vultures—were spotted over the course of the research. There were 164 total vultures spotted (Fig. 2-5), including three

different species: White-rumped Vultures, Long-Billed Vultures, and Egyptian Vultures. The Long-billed Vulture (n = 83) and the White-rumped Vulture (n = 69) had the largest populations, while the Egyptian Vulture (n = 12) had the smallest. Study site VII saw the highest concentration of vultures (n= 45), whereas site II saw the lowest (n= 11). In Table 1, we can see that the mean vulture flock size was 20.5, with a standard deviation of 3.86. NPCIL (2010) reported an average of 34.83 vultures per flock with a standard deviation of 20.45, and an average of 19.16 White-rumped vultures per flock with a standard deviation of 16.92 in the area of Rawatbhatta, Rajasthan. The study indicated that the number of vultures varied among sites, with the highest count occurring at site VII (Submersible Bridge) and the lowest count occurring at site II (Deeppura Village) (Fig. 1). Long-billed vultures were found to have a mean flock size of 10.37, with a standard deviation of 3.90. Study site VII had the highest concentration of Long-billed vultures, whereas sites II and III had the lowest. According to the NPCIL (2010), the typical number of birds in a flock of Long-billed vultures is 11.5, with a standard deviation of 7.13. Egyptian vulture flocks had a mean of 1.5 birds and a standard deviation of 1.58 birds. Study site VI had the highest population of Egyptian vultures, while sites I, V, VII, and VIII had none. Egyptian vulture flocks had an average of 4.16 birds with a standard deviation of 2.26 (NPCIL, 2010). All of the species that were recorded at the study sites during the study period are highly protected under Schedule -I of the Wildlife Protection Act of 1972 (Table 2), and their local status has been assigned based on surveys conducted at the sites.

Table.1 Showing flock size of vulture at all study sites

Study Site	Name of site	No. of vultures observed	Species of vulture			Average flock size	Standard Deviation (S.D.)
			WRV	LBV	EV		
I	Gapernath Temple	16	3	13	0		
II	Deeppura Village	11	3	6	2		
III	Thamlav Village	12	3	6	3		
IV	Borabas Village	14	4	7	3		
V	Sentab Colony	25	15	10	0		
VI	Near Bhainsroadgarh	28	14	10	4		
VII	Submersible Bridge	45	27	18	0	**20.5**	**3.86**
VIII	Harigarh (Chalte forest)	13	0	13	0		
	Total	164	69	83	12		

Table.2 List of Vulture species along with their status according to WPA- 1972

S. No.	Vulture species	WPA-1972 Status
1	White-rumped vulture	**Schedule I**
2	Long-billed vulture	**Schedule I**
3	**Egyptian vulture**	**Schedule I**

IV. RECOMMENDATIONS:

The measures listed below are essential for the protection of endangered species. Educating the public Wildlife Protection Act of 1972 Habitat Management Ongoing Evaluation and Enforcement Hostels for birds of prey: Vultures should always have access to diclofenac-free carcasses, hence it's important to keep garbage dumps far from populated areas. Based on the data collected from all 8 study locations, it was determined that a total of 164 individuals across 3 species were present during the study time. There were a total of 153 vultures in the area, with 12 Egyptian vultures (Neophron percnopterus), 69 Indian vultures (Gyps indicus), and 83 white-rumped vultures (Gyps bengalensis). Vulture flocks were found to have an average of 20.5, with a standard deviation of 3.86. According to ethograms, they spend the bulk of their time foraging and then relaxing. Fifty-seven percent of those polled had a favorable opinion about vultures, 22.5 percent had a negative one, and 20 percent were agnostic. Only 29 people responded that they had seen vultures, and of those, 55.17 percent had noticed a drop in the number of vultures in the vicinity. Out of 40 responders, 86% consult a veterinarian before treating their animals, while 11% use traditional veterinary medication and the remaining others do not. The significance of those who have no strong feelings one way or another toward vultures is highlighted in this study. The study provided conclusive evidence that this species serves a crucial role in maintaining a disease-free habitat. As we saw in the study, vultures are under serious threat, so it was recommended that we educate the public about the significance of conserving these species in order to ensure their survival. The rapid decline

of India's vulture population is deeply troubling and calls for the government's quick attention to protect these important scavenger birds, which help keep the environment clean and prevent the spread of rabies.

V. CONCLUSION

The local bird population has adapted to human presence and now makes its home in urban areas, residential colonies, and the like. Nesting quails, frncolin, and lapwings have been spotted in newly established but still undeveloped neighborhoods. Many vacant lots in these locations become flooded from wastewater or rainfall, and the presence of shrubs like Prosopsis juliflora and Calotropis provides good cover from scavengers like stray dogs and cats. However, human hunters pose a real danger. From October until late March, migratory birds rest and feed in Hadoti's waterways before flying back home. Due to their need on the natural environment for both nesting and food, these birds are especially vulnerable to human disturbance.

They are extremely sensitive to environmental and habitat changes of any kind. Since Hadoti wasn't on their route until very recently, this shift could explain why so many of these birds have been stopping here.

Keoladev, in the Bharatpur district of Rajasthan, used to be a frequent stop for these birds (Rahamani and Islam, 2005). However, they were pushed to look for new breeding and feeding sites as a result of water scarcity brought on by human activity (the diversion of water for irrigation). Migratory birds find this area to be a haven thanks to the abundance of forest cover, wetland areas, and black soil, as well as the conservation efforts of locals and government agencies. Awareness of the value of wildlife, the environment, and peaceful cooperation is a pressing necessity. As Chaurasia and Aggarwal (2011) point out, ecotourism offers a viable solution to the issue at hand. It will help protect biodiversity while also creating new jobs.

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