ISSN 2710-1142(online)
SIS Conservation, 2022, 4, 55-59
SHORT COMMUNICATION

Natural history and behavioural observations of Red-naped ibis *Pseudibis papillosa* in Dhariawad and Sikar cities, Rajasthan

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Abstract The Red-naped Ibis *Pseudibis papillosa* is among the least studied waterbirds of the Indian subcontinent. With the intention to increase knowledge on the birds' habits, we assembled observations in and around two differently sized cities – the smaller Dhariawad (Pratapgarh district) and larger Sikar (Sikar district) – of Rajasthan between 2021-2022. In both cities, ibises used busy marketplaces to forage and roost. Feeding observations included some known habits such as feeding on earthworms and feeding on carcasses. Novel feeding habits included catching fish, predation of birds' eggs and adult Rock Pigeons *Columba livia*, scavenging on roadkill especially feeding on the bone marrow of recently killed cattle, and feeding on waste (dead rats and left-over foods) that house owners disposed on roadsides. Red-naped Ibis in both cities nested and roosted almost entirely on artificial structures (mobile phone towers, high-tension pillion towers, light poles) despite the presence of abundant trees at both locations. Our observations add a number of novel habits of the Red-naped Ibis. Though entirely anecdotal, the observations point to Red-naped Ibis showing considerable plasticity in habits in urban areas when persecution by people is absent. Observing poorly understood resident species such as the Red-naped Ibis, especially in small cities, offers opportunities to add knowledge to the habits of such species and how they interact with varying levels of urbanisation.

Keywords Artificial roost and nest site, catching fish, predating on birds, scavenging, urban birds.

Introduction

The Red-naped Ibis *Pseudibis papillosa* is a species endemic to the Indian subcontinent that has been very poorly studied (Ali and Ripley 2007; Hancock *et al*. 1992). The entirety of understanding of the species' habits is based on anecdotal observations despite the commonness of the species across the subcontinent. Such natural history observations are useful to develop early ideas of species requirements, traits, habits, and other associated ecological aspects, especially for poorly studied species.

In this note, we compile observations on Red-naped Ibis made between 2021 and 2022 in and around two differently sized cities: the smaller Dhariawad city (Pratapgarh district) and the larger Sikar city (Sikar district) of Rajasthan in north-western India. These two cities have greatly disparate conditions with Dhariawad located in the wettest part of the state and Sikar in one of the driest parts of the state (pers. obs.). Red-naped Ibis have colonised both cities and are among the most

Article history
Received: 24 November 2022,
Received in revised form: 01 February 2023,
Accepted: 23 February 2023,
Published online: 28 February 2023.

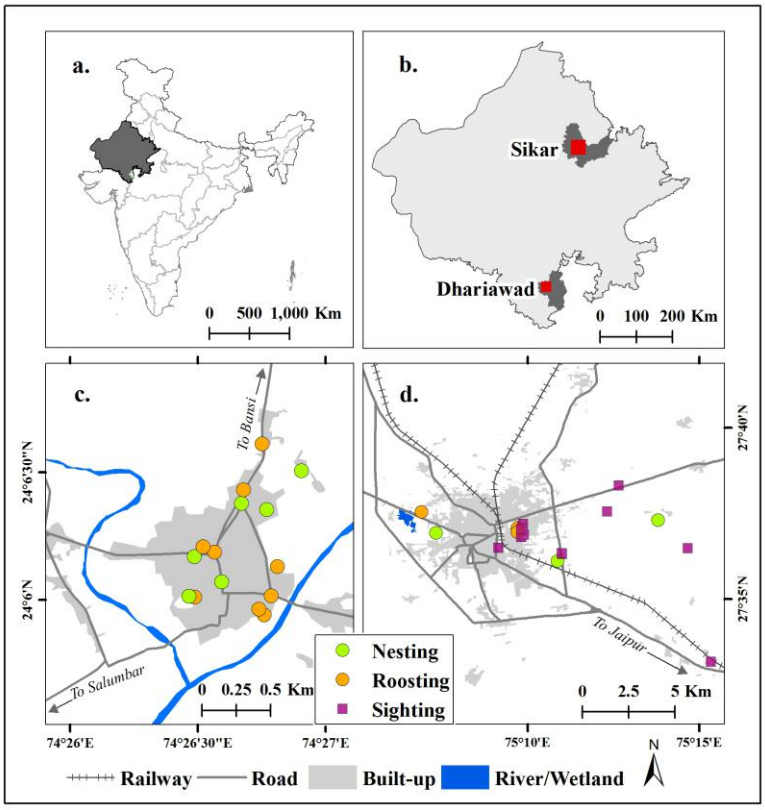

Figure 1. Map showing the location of Rajasthan (a) and the two focal cities, Dhariawad and Sikar, in Rajasthan (b). Detailed maps show nest and roost locations in each city (c: Dhariawad; d: Sikar), and include the locations of the various observations made in and around Sikar city. City maps are simplified to show only major features.

common bird species observed in both cities (pers. obs.). We provide observations on feeding and breeding, with few notes on other ecological aspects. Finally, we discuss our observations in relation to information available in existing literature, including papers published in this issue of *SIS Conservation*.

Study Area

There have not been any studies previously in the two focal cities (see Figure 1 for locations), and we therefore base the majority of the descriptions on personal observations, and sources such as Wikipedia which are not directly citable. Dhariawad city, located in Pratapgarh district (known as the greenest district of Rajasthan state), is a small town surrounded by large arid scrublands and extensive rainfed farmlands amid the Aravalli Mountains. The major crops are Maize *Zea mays*, Wheat *Triticum aestivum*, Soya Bean *Glycine max* and Opium *Papaver somniferum*. The city is called the "river city" of Pratapgarh district as it is situated between five rivers leading to its name in the local Rajasthani language ("dariya" meaning rivers, "wad" meaning between; information from local villagers). The largest dam in the state, Jakham, is located 32 km from the city which also has one seasonal and two perennial rivers. The town has a population of just over 11,300 people (Census of India 2011). Climatic variables were available from the nearest large city, Udaipur, and their averages are recorded between 1981-2010. Temperatures varied between 32º C (high) and 17.6º C (low), with an annual mean rainfall of 674 mm. Sikar city, in stark contrast, is located within the area broadly described as the Thar desert, the most lowland arid area of the Indian subcontinent. The region has a single large water body situated in the adjoining Jhunjhunu district known as Kot dam situated around 30 km from Sikar city. The dam is surrounded by the Aravali hills without any irrigation utility. The surrounding area of the dam consists of sparse tree growth spread over a large area, in an otherwise arid landscape, especially of Sheesham *Dalbergia sissoo*, Neem *Azadirachta indica*, Bargad *Ficus bengalensis* and Peepal *Ficus religiosa*. Sikar city had a population of over 2,37,500 people (Census of India 2011). Temperatures varied between 44.9º C and 1º C, with an annual mean rainfall of 358 mm. Both cities experienced very strong seasonality due to temperature and precipitation patterns. The severity of conditions including heat (much hotter and longer summers in Sikar) and rainfall (much more in Dhariawad) provide contrasting environments for Red-naped Ibises.

Methods

Observations on Red-naped Ibis were initiated in September 2021 continuing until end of October 2022. Opportunistic observations were made throughout. We also interviewed farmers, other villagers and business owners who were observed to be noticing behaviour of the ibises. Most observations in Dhariawad city were made inside the town, while observations were made in and around Sikar city (see Figure 1).

Results

Habitat use and nesting

In Dhariawad city, Red-naped Ibis were observed

as single birds (rarely), pairs (mostly) or small groups of 3-5 that were likely family groups. No large flocks were sighted in the city during the entire observation period. Ibises were observed foraging in rivers, fallow agricultural fields, beside wetlands, and rarely, in the marketplace. Several roosting sites were located, and all of these were on poles erected to provide light in markets (see Figure 2). Roosts had only pairs except for one roost that had six ibises. Ibises were observed on 15 artificial structures of three types (mobile towers, light poles, temple flagpoles) out of which five were used for nesting, all within a radius of approximately 1 km from the town centre (Figure 1). The ibises used four mobile towers and two light poles (see Figure 2) for nesting over two consecutive nesting seasons. Two juveniles fledged from each nest every season and all nests were reused for two consecutive seasons. Two additional nesting sites were initiated but no eggs seemed to have been laid, and both were abandoned. Despite considerable tree cover in and around the city

Figure 2. Red-naped Ibis nesting atop public light poles in Dhariawad city. The photographs show proximity to busy marketplaces (above, and below-right) and rooftops from where residents watch the ibises frequently (below-left). (Photographs by Pradeep Sharma and Mahendra Singh.)

(pers. obs.), no nest was observed on trees.

In Sikar city, a total of 54 Red-naped Ibis were observed with 11 juveniles in ten visits. A flock of 27 ibises was seen feeding on a cattle carcass near the city. A single flock of at least 200 ibises was additionally counted in the periphery of the city during winter 2021 spread out over a mobile phone tower nearby the carcass dump. Red-naped Ibises were also seen in pairs and small flocks of < 5 birds foraging in wheat and vegetable fields, nurseries where plants and trees were grown for sale, garbage dumps, and along highways. Three active nests, all of them on artificial structures (two on powerline towers, one on a mobile phone tower) were located, and at least one juvenile fledged from each nest.

Feeding

In Dhariawad town, Red-naped Ibis were observed feeding on unidentified insects (including Coleoptera grubs), frogs and unidentified worms (very likely earthworms) in freshly tilled agricultural fields just prior to the monsoon season. Red-naped Ibis were frequently observed feeding on livestock carcasses and at a garbage dump situated beside a river. An adult Red-naped Ibis was observed predating nests of Rock Pigeons *Columba livia* located on air conditioners outside windows in a busy part of the city. Pigeon juveniles were killed using both the beak and the feet and taken to a nest atop a light pole to be fed to ibis nestlings. Residents whose rooftop allowed close observations of the nest described such hunting of pigeons as common. One Red-naped Ibis was seen flying to the nest on a light pole with an unidentified snake measuring < 0.5 m, which was fed to its nestlings.

In Sikar city, Red-naped Ibises were observed eating several animal carcasses dumped by city municipal workers at a main garbage dump site. These included a snake, several unidentified birds, and rodents. One flock of 22 Red-naped Ibis feeding at a carcass dump included five juveniles. The carcasses were of mostly cattle with few dog carcasses. Ibises fed on small meat pieces and skin parts. Two ibises were observed inserting their beaks into the bones of cattle that had died after a collision with vehicles on the highway. The ibises were apparently feeding on bone marrow. In a plant nursery, a Red-naped Ibis adult was observed catching and swallowing 28 earthworms in one

minute. Several ibises were seen catching fish from the shallow waters of a reservoir. At a dam, one of a flock of three Red-naped Ibises caught a fish in shallow waters and tried to fly off with it. The fish slipped out onto the shore and the ibis swallowed the fish only after it stopped moving. Inside the city, Red-naped Ibis were observed feeding on a dead mouse that was thrown out of a house, and on leftover food thrown after a social event. Four juvenile Red-naped Ibis were observed to feed on carcasses of Grey-headed Swamphens *Porphyrio poliocephalus*, Lesser whistling Duck *Dendrocygna javanica*, Red-wattled Lapwing *Vanellus indicu*s, and Black-winged Stilt *Himantopus himantopus* around a municipal sewage outflow. Ibises were observed flying towards living birds of these species apparently for hunting, but none of these attacks resulted in a kill during observations. One ibis was observed feeding on a roadkill snake of an unidentified species. Around mobile phone towers in the city, where the ibis roosted, three separate observations were made of adult ibises attacking Rock Pigeons that were either feeding on grains, on the ground or flying. Two of these attacks resulted in kills, and ibises flew away with the dead pigeons. Farmers reported that Red-naped Ibises feed extensively on white grubs, a prominent pest of local crops.

Discussion

Our observations collectively support some existing observations of Red-naped Ibis feeding behaviour but add considerably to the known feeding and breeding habits of the species. While insects, frogs and reptiles are known to occur in the species' diet, its habit of catching fish appears to be novel (Hancock *et al*. 1992; Ali and Ripley 2007). Additional novel feeding habits included predating Rock Pigeon nests, hunting adult pigeons, eating bird carcasses and roadkill, and some novel food items of a uniquely urban origin (dead rodents being thrown out of a house, and leftover foods) from people inside the cities. Reaching into bone cavities, presumably for bone marrow, is also a previously undescribed feeding behaviour suggestive of ibises getting habituated to feeding on road kills of large domestic animals. A more careful systematic study of the dietary habits of Red-naped Ibis will likely yield newer dietary items. Designing such a study to include ibis populations inside cities can assist to understand their reliance on foods found in urban areas and the extent to which they appear habituated to humans.

A previous study of the breeding biology of Red-naped Ibis in another city of Rajasthan, Churu, showed the ibises to nest only on trees (Soni 2008). Our observations of nests in both cities were entirely on artificial structures, including previously unknown ones such as temple flagpoles. There was no scarcity of potential nest trees in either focal city (pers. obs.) and it is not clear why Red-naped Ibises appear to have shifted nesting to entirely artificial structures. In other parts of the country, Red-naped Ibis have been observed building nests on artificial structures, both in areas where trees were rare or absent (Parasharya and Naik 1990; Juvvadi 2022) and at other times, when trees did not appear to be limiting (Ali *et al*. 2013; Sangha 2013; Rajesh and Kumar 2019). A careful study of nesting ecology of Red-naped Ibis in varied settings, and over multiple years, will be required to understand whether the species is shifting nesting habits and becoming more reliant on artificial structures.

Roosting Red-naped Ibis have previously been observed using artificial structures (Dodia and Parasharya 1986), but large roosts such as the one we report appear to be rare. It is likely that the large ibis roost near Sikar city is formed by birds attracted to the carcass dump site nearby. Such carcass dump sites are found near all cities in Rajasthan suggesting that more careful observations in and around cities may help discover many more roosting sites with high numbers of Red-naped Ibis.

Collectively, our observations suggest that Red-naped Ibis are acclimatized to cities of varied sizes in Rajasthan. People in Rajasthan do not persecute ibises, and many appear to be closely watching the habits of these birds on a regular basis. While farmers were previously known to be aware of ibises' feeding habits (Ali and Ripley 2007; Hancock *et al*. 1992), our interactions with residents of the two focal cities suggested that the ibises are being observed closely by many people. These people were aware of habits, such as ibises predating pigeon nests, feeding on white grubs and snake kills, that does not find any mention in available literature. There appears to be great value in employing common resident waterbirds such as Red-naped Ibis as long-term study subjects to understand how waterbirds interact with urban

areas and people.

Acknowledgments

We thank the many farmers, workers at carcass and garbage dumps, and residents of Dhariawad and Sikar who readily shared their observations on Red-naped Ibis. We thank also two anonymous reviewers and the Editor for an excellent review of a previous draft and pointing out several issues that required revision.

References

Ali, S. and S. D. Ripley. 2007. *Handbook of the Birds of India and Pakistan. Volume I. Divers to Hawks*. Oxford University Press, New Delhi, India.

Ali, M. S., A. H. S. Rameshkumar and P. R. Arun. 2013. Black Ibis *Pseudibis papillosa* nesting on power transmission line pylons, Gujarat, India. *BirdingASIA* 19: 104-106.

Census of India. 2011. Population census 2011-2022. https://www.census2011.co.in/. Accessed 12 November 2022.

Dodia, J. F. and B. M. Parasharya. 1986. Black Ibis roosting on electric poles. *Newsletter for Birdwatchers* 26 (5 & 6): 16-17.

Hancock, J. A., J. A., Kushlan and M. P. Kahl. 1992. *Storks, Ibises and Spoonbills of the world*. 1st Edition. Academic Press, London, United Kingdom.

Juvvadi, P. S. 2022. Nesting substrates of Red-naped Ibis *Pseudibis papillosa* in human dominated landscapes of Telangana, India. *SIS Conservation* 4: 48-54.

Parasharya, B. M. and R. M. Naik. 1990. Ciconiiform birds breeding in Bhavnagar City, Gujarat: a study of their nesting and plea for conservation. Pp. 429-445. In: Daniel J. C. and J. S. Serraro (eds.) *Conservation in developing countries: Problems and prospects:1990*. Proceedings of Centenary Seminar, Bombay Natural History Society and Oxford University Press, India.

Rajesh and M. Kumar. 2019. Breeding ecology of Black Ibis *Pseudibis papillosa* in agro ecosystem of Punjab, India. *Journal of Experimental Zoology, India* 22(2): 1151-1155.

Sangha, H. S. 2013. Nesting of Black Ibis *Pseudibis papillosa* on electricity pylons near Bikaner, Rajasthan. *Indian BIRDS* 8(1): 10-11.

Soni, K. C. 2008. *Study on the population, foraging, roosting and breeding activities of the Black Ibis/ Rednaped Ibis* Pseudibis papillosa *inhabiting the arid zone of Rajasthan*. Ph. D. Thesis, Maharshi Dayanand Saraswati University, Ajmer, India.