

Avifauna in Mahavir Swami Wildlife Sanctuary of Deogarh in Lalitpur District, Uttar Pradesh, India

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Abstract

The avifauna of Mahavir Swami Wildlife Sanctuary has never been studied before. So the study was undertaken to get a reliable checklist of the bird species in the sanctuary. The reasons to carry out this study was to know how many particular species of bird are present and to have baseline information for the protected area and its bird species, that is poorly known. A total of 176 species of birds representing 48 families were recorded. Of these, 143 species are resident and 33 migrant. Out of the total bird species reported 3 were critically endangered, 1 endangered, 1 vulnerable, 6 near threatened, for 4 species data has not been assessed and 161 least concerned. Although Deogarh is splendidly steeped in religious history, it has many treasures for the discerning nature lover to discover. In the future, this study will help to track changes in bird populations. Information on avian species can also be used to set priorities, allowing conservation effort to be focused on those species most in need of attention.

Keywords: Avifauna, bird, Mahavir Swami Wildlife Sanctuary, species

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INTRODUCTION

Mahavir Swami Wildlife Sanctuary holds a noteworthy population of bird species. It is located at 24°30'36.64" N and 78°15'19.06" E in Deogarh, a small village that lies on the right bank of river Betwa at a distance of 33 km from Lalitpur. The Sanctuary was set up 41 years back, in 1977. Deogarh is known for Gupta monuments and for many ancient monuments of Hindu and Jain origins [1, 2]. The Sanctuary is located at a height of 300 feet above Betwa, in the Vindhya Range (Figure 1). The cliffs are formed of Red sandstone. In its midst of this Sanctuary is a group of 41 Jain Temples covering an area of approximately 8 acres. Since the Jain temples are situated in the centre of the sanctuary, the place is regularly visited by the tourists (Figure 2). The area of the Deogarh Wildlife Sanctuary has traditionally come down from the Gupta Period of ancient history; later occupied by the Pratiharas and Chandelas; the Jain temples and the sculptures are a reflection of the art and architecture of the period. Primarily the forest comprised of Teak Trees and is also the "last Teak wood forest" in the south-west region of Uttar Pradesh. Besides this, Arjun, Tendu, Goonj trees are also found. Scantly, Bamboo plants are also found on the hilly slopes. The Average rainfall per year is

800-900 mm and dry months in a year may range between 3 mm to 7 mm. The summer temperature may exceed 48 °C. Mahavir Swami Wildlife Sanctuary is lesser known for its wild animals, but it is an important locate for the critically endangered vulture species. The Sanctuary has been an important breeding site for the Long-billed vultures (*Gyps indicus*) and is being monitored regularly since 2007 [3]. Although there has been vulture census in Deogarh, the avifauna of Mahavir Swami Wildlife Sanctuary has never been studied before. So this study was undertaken to get a reliable checklist of the bird species in the sanctuary. The reasons to carry out this study was to know how many particular species of bird are present and to have baseline information for the protected area and its bird species, that is poorly known.

MATERIAL AND METHOD

In the present study, observations were made throughout the study area for the last 2 years (June 2016- June 2018). No capturing of birds done to identify the birds at sub-specific level. The Observational recordings were using data sheets and 10x50 mm binoculars while photographic recordings and video recordings were done with the help of 7D and 70D DSLR

Canon Cameras. The surveys were carried out at a suitable time for 3 hours in morning and evening (i.e. morning: 05:30 to 9:00 hr and from evening: 16:30 to 19:00 hr in summers while from 7:00 to 11:00 am in morning and 15:00-17:30 pm in evening during the winters) of the day. This was done to observe maximum bird species that may be active at a different time to the day. Data was collected on habitat

utilization by the bird species in the sanctuary such as the green spaces, the cliffs, river, and the ancient temples. Birds sighted during the study period were categorized according to their presence (month-wise) status as residents (R) or migrants (M). Identification of birds was done with the help of key reference books [4-6].



Fig. 1: Location of Mahavir Swami Wildlife Sanctuary, Deogarh.



Fig. 2: Jain Temples situated in the Centre of the Sanctuary.

RESULTS AND DISCUSSION

The observations and data were compiled to get the checklist of 176 birds of 48 families in the Mahavir Swami Wildlife Sanctuary. Of the 48 bird families reported (Table 1), a majority of 20 families were represented by a single bird species, while 6 families had 2 bird species and 5 families had 3 bird species each. The family Accipitridae had a maximum number of bird

species (16) that included the critically endangered vulture species, followed by Corvidae (15) and Passeridae family (14). The Musciapidae family was also represented by 12 bird species in the Sanctuary. About 13 families were symbolized by 4-9 avian species each (Figure 3).

Table 1: Checklist of birds of Mahavir Swami Wildlife Sanctuary.

Common Name	Zoological Name	R/M	AC	IUCN Status
Phasianidae (4)				
Grey Francolin	<i>Francolinus pondicerianus</i>	R	C	LC
Jungle bush quail	<i>Perdica asiatica</i>	R	UC	LC
Peacock	<i>Pavo cristatus</i>	R	C	LC
Painted Spurfowl	<i>Galloperdix lunulata</i>	R	UC	LC
Dendrocygnidae (1)				
Lesser Whistling duck	<i>Dendrocygna javanica</i>	R	C	LC
Picidae (3)				
Black-rumped Flameback	<i>Dinopium benghalense</i>	R	C	LC
Yellow-crowned woodpecker	<i>Dendrocopus maharattensis</i>	R	C	NA
Brown-capped Pygmy woodpecker	<i>Dendrocopus nanus</i>	R	FC	LC
Megalaimidae (2)				
Brown-headed barbet	<i>Megalaima zeylanica</i>	R	FC	NA
Coppersmith Barbet	<i>Megalaima haemacephala</i>	R	C	LC
Bucerotidae (1)				
Indian Grey Hornbill	<i>Ocyrceros birostris</i>	R	FC	LC
Upupidae(1)				
Common Hoopoe	<i>Upupa epops</i>	R	C	LC
Coraciidae(1)				
Indian Roller	<i>Coracias benghalensis</i>	R	C	LC
Alcedinidae(1)				
Common Kingfisher	<i>Alcedo atthis</i>	R	FC	LC
Halcyonidae (1)				
White-throated kingfisher	<i>Halcyon smyrnensis</i>	R	C	LC
Cerylidae(1)				
Pied Kingfisher	<i>Ceryle rudis</i>	R	C	LC
Meropidae(2)				
Green bee-eater	<i>Merops orientalis</i>	R	C	LC
Blue -tailed bee-eater	<i>Merops philippinus</i>	R	C	NA
Cuculidae (4)				
Pied cuckoo	<i>Clamator jacobinus</i>	R	FC	LC
Brain-fever bird	<i>Hierococeyx varius</i>	R	FC	LC
Asian koel	<i>Eudynamys scolopacea</i>	R	C	LC
Grey bellied cuckoo	<i>Cacomantis passerinus</i>	R	UC	LC
Centropodidae (1)				
Greater Coucal	<i>Centropus sinensis</i>	R	C	LC
Psittacidae (2)				
Rose-ringed Parakeet	<i>Psittacula krameri</i>	R	C	LC
Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	R	FC	LC
Apodidae (1)				
House Swift	<i>Apus affinis</i>	R	C	LC

Strigidae (7)				
Collared Scops Owl	<i>Otus bakkamoena</i>	R	FC	LC
Barn Owl	<i>Tyto alba</i>	R	UC	LC
Brown Fish Owl	<i>Ketupa zeylonensis</i>	R	UC	LC
Indian Eagle owl	<i>Bubo bengalensis</i>	R	FC	LC
Brown Hawk Owl	<i>Ninox scutulata</i>	R	UC	LC
Spotted Owlet	<i>Athene brama</i>	R	C	LC
Jungle Owlet	<i>Glaucidium radiatum</i>	R	FC	LC
Caprimulgidae (2)				
Grey Nightjar	<i>Caprimulgus indicus</i>	R	FC	LC
Common Indian Nightjar	<i>Caprimulgus asiaticus</i>	R	FC	LC
Columbidae (6)				
Rock Pigeon	<i>Columba livia</i>	R	C	LC
Yellow-footed green pigeon	<i>Treron phoenicoptera</i>	R	C	LC
Laughing dove	<i>Streptopelia senegalensis</i>	R	C	LC
Red collared dove	<i>Streptopelia tranquebarica</i>	R	FC	LC
Spotted dove	<i>Streptopelia chinensis</i>	R	C	LC
Eurasian collared dove	<i>Streptopelia decaocto</i>	R	C	LC
Rallidae (4)				
White-breasted waterhen	<i>Amauornis phoenicurus</i>	R	C	LC
Purple Swamphen	<i>Porphyrio porphyrio</i>	R	C	LC
Common Moorhen	<i>Gallinula chloropus</i>	R	C	LC
Common coot	<i>Fulica atra</i>	M	C	LC
Scolopacidae (5)				
Wood sandpiper	<i>Tringa glareola</i>	M	C	LC
Common sandpiper	<i>Actitis hypoleucos</i>	M	C	LC
Common Redshank	<i>Tringa totanus</i>	M	C	LC
Common Greenshank	<i>Tringa nebularia</i>	M	C	LC
Ruff	<i>Philomachus pugnax</i>	M	C	LC
Jacaniidae (1)				
Bronze-winged jacana	<i>Metopidius indicus</i>	R	C	LC
Burhinidae (1)				
Eurasian thick knee	<i>Burhinus oedicephalus</i>	R	C	LC
Charadriidae (5)				
Black-winged stilt	<i>Himantopus himantopus</i>	R	C	LC
Little Ringed Plover	<i>Charadrius dubius</i>	R	C	LC
Kentish Plover	<i>Charadrius alexandrinus</i>	M	FC	LC
Red-wattled lapwing	<i>Vanellus indicus</i>	R	C	LC
River Lapwing	<i>Vanellus duvaucelii</i>	R	FC	NT
Glareolidae (1)				
Small Pratincole	<i>Glareola lactea</i>	R	FC	LC
Sternidae (1)				
River tern	<i>Sterna aurantia</i>	R	FC	NT
Laridae (3)				
Pallas's Gull	<i>Larus ichthyaetus</i>	M	UC	LC
Black-headed gull	<i>Larus ridibundus</i>	M	C	LC
Brown-headed gull	<i>Larus brunnicephalus</i>	M	C	LC
Accipitridae (16)				
Osprey	<i>Pandion haliaetus</i>	R	FC	LC
Black-shouldered kite	<i>Elanus caeruleus</i>	R	FC	LC

Black Kite	<i>Milvus migrans</i>	R	C	LC
Oriental Honey Buzzard	<i>Pernis ptilorhynchus</i>	R	FC	LC
Common Buzzard	<i>Buteo buteo</i>	M	UC	LC
Crested Serpent Eagle	<i>Spilornis cheela</i>	R	FC	LC
Bonelli's eagle	<i>Hieraetus fasciatus</i>	R	UC	LC
Eurasian Marsh Harrier	<i>Circus aeruginosus</i>	M	C	LC
Short-toed snake eagle	<i>Circaetus gallicus</i>	R	UC	LC
Long-billed Vulture	<i>Gyps indicus</i>	R	UC	CR
White-backed vulture	<i>Gyps bengalensis</i>	R	UC	CR
King vulture	<i>Sarcogyps calvus</i>	R	UC	CR
Egyptian vulture	<i>Neophron percnopterus</i>	R	UC	E
Eurasian Griffon	<i>Gyps fulvus</i>	M	UC	LC
White-eyed buzzard	<i>Butastur teesa</i>	R	FC	LC
Shikra	<i>Accipiter badius</i>	R	C	LC
Falconidae (1)				
Common Kestrel	<i>Falco tinnunculus</i>	M	FC	LC
Podicipedidae (1)				
Little Grebe	<i>Tachybaptus ruficollis</i>	R	C	LC
Anhingidae (1)				
Darter	<i>Anhinga melanogaster</i>	R	FC	NT
Phalacrocoracidae (3)				
Little Cormorant	<i>Phalacrocorax niger</i>	R	C	LC
Indian Cormorant	<i>Phalacrocorax fuscicollis</i>	R	C	LC
Great Cormorant	<i>Phalacrocorax carbo</i>	R	FC	LC
Ardeidae (9)				
Cattle egret	<i>Bubulcus ibis</i>	R	C	LC
Little egret	<i>Egretta garzetta</i>	R	C	LC
Intermediate egret	<i>Mesophoyx intermedia</i>	R	C	LC
Greater egret	<i>Casmerodius albus</i>	R	C	LC
Indian pond heron	<i>Ardeola grayii</i>	R	C	LC
Grey heron	<i>Ardea cinerea</i>	M	C	LC
Night heron	<i>Nycticorax nycticorax</i>	R	FC	LC
Purple heron	<i>Ardea purpurea</i>	R	C	LC
Black bittern	<i>Dupetor flavicollis</i>	R	UC	LC
Threskiornithidae (3)				
Black Ibis	<i>Pseudibis papillosa</i>	R	FC	LC
Black-headed ibis	<i>Threskiornis melanocephalus</i>	R	FC	NT
Eurasian Spoonbill	<i>Platalea leucorodia</i>	R	C	LC
Ciconiidae (5)				
Black necked Stork	<i>Ephippiorhynchus asiaticus</i>	R	C	NT
Painted stork	<i>Mycteria leucocephala</i>	R	C	NT
Asian Openbill	<i>Anastomus oscitans</i>	R	FC	LC
Woolly-necked stork	<i>Ciconia episcopus</i>	R	FC	V
Lesser adjutant	<i>Leptoptilos javanicus</i>	R	UC	NT
Laniidae(2)				
Long-tailed Shrike	<i>Lanius schach</i>	R	C	LC
Bay-backed shrike	<i>Lanius vittatus</i>	R	FC	LC
Corvidae (15)				
Rufous Treepie	<i>Dendrocitta vagabunda</i>	R	C	LC
House crow	<i>Corvus splendens</i>	R	C	LC

Jungle crow	<i>Corvus macrorhynchos</i>	R	C	LC
Ashy Wood swallow	<i>Artamus fuscus</i>	R	FC	LC
Eurasian Golden Oriole	<i>Oriolus oriolus</i>	R	C	LC
Black-hooded Oriole	<i>Oriolus xanthornus</i>	R	FC	LC
Black drongo	<i>Dicrurus macrocerus</i>	R	C	LC
Ashy Drongo	<i>Dicrurus leucophaeus</i>	M	FC	LC
White-bellied drongo	(<i>Dicrurus caerulescens</i>	R	UC	LC
Common Iora	<i>Aegithina tiphia</i>	R	FC	LC
Large Cuckooshrike	<i>Coracina macei</i>	R	UC	LC
Small minivet	<i>Pericrocotus cinnamomeus</i>	R	FC	LC
White- browed fantail	<i>Rhipidura aureola</i>	R	FC	LC
Common Woodshrike	<i>Tephrodornis pondicerianus</i>	R	FC	LC
Asian Paradise flycatcher	<i>Terpsiphone paradisi</i>	R	FC	LC
Musciapidae (12)				
Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i>	M	FC	LC
Verditer Flycatcher	<i>Eumyias thalassina</i>	M	FC	LC
Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i>	R	FC	LC
Red-throated flycatcher	<i>Ficedula parva</i>	M	FC	LC
Oriental Magpie Robin	<i>Copsychus saularis</i>	R	C	LC
Indian Robin	<i>Saxicoloides fulicata</i>	R	C	LC
Blue throat	<i>Luscinia svecica</i>	M	FC	LC
Common Stonechat	<i>Saxicola torquata</i>	M	C	LC
Pied Bushchat	<i>Saxicola caprata</i>	R	C	LC
Blue Rock Thrush	<i>Monticola solitarius</i>	M	UC	LC
Black Redstart	<i>Phoenicurus ochruros</i>	M	FC	LC
Brown Rock-chat	<i>Cercomela fusca</i>	R	FC	LC
Sturnidae (5)				
Brahminy Starling	<i>Sturnus pagodarum</i>	R	C	LC
Asian pied starling	<i>Sturnus contra</i>	R	C	LC
Common Mynah	<i>Acridotheres tristis</i>	R	C	LC
Bank Mynah	<i>Acridotheres ginginianus</i>	R	C	LC
Chestnut tailed starling	<i>Sturnus malabaricus</i>	R	FC	LC
Paridae (1)				
Great Tit	<i>Parus major</i>	R	FC	LC
Hirundinidae (5)				
Plain Martin	<i>Riparia paludicola</i>	R	C	LC
Wire -tailed Swallow	<i>Hirundo smithii</i>	R	FC	LC
Barn/common Swallow	<i>Hirundo rustica</i>	M	C	LC
Streak-throated Swallow	<i>Hirundo fluvicola</i>	R	FC	LC
Eurasian crag martin	<i>Hirundo rupestris</i>	R	FC	LC
Pycnonotidae (1)				
Red-vented Bulbul	<i>Pycnonotus cafer</i>	R	C	LC
Cisticolidae (5)				
Zitting Cisticola	<i>Cisticola juncidis</i>	R	FC	LC
Jungle Prinia	<i>Prinia sylvatica</i>	R	FC	LC
Ashy Prinia	<i>Prinia socialis</i>	R	C	LC
Plain Prinia	<i>Prinia inornata</i>	R	C	LC
Grey-breasted Prinia	<i>Prinia hodgsonii</i>	R	FC	LC
Zosteropidae (1)				
Oriental White-eye	<i>Zosterops palpebrosus</i>	R	C	LC

Sylviidae (8)				
Common Tailorbird	<i>Orthotomus sutorius</i>	R	C	LC
Common Babbler	<i>Turdoides caudatus</i>	R	FC	LC
Yellow eyed babbler	<i>Chrysomma sinense</i>	R	C	LC
Large Grey Babbler	<i>Turdoides malcolmi</i>	R	C	LC
Jungle Babbler	<i>Turdoides striatus</i>	R	C	LC
Tawny bellied babbler	<i>Dumetia hyperythra</i>	R	UC	LC
Common Chiffchaff	<i>Phylloscopus collybita</i>	M	C	LC
Lesser Whitethroat	<i>Sylvia curruca</i>	M	C	LC
Alaudidae (3)				
Ashy-crowned Sparrow Lark	<i>Eremopterix grisea</i>	R	FC	LC
Oriental Skylark	<i>Alauda gulgula</i>	R	C	LC
Indian bush lark	<i>Mirafra erythroptera</i>	R	FC	LC
Nectariniidae (2)				
Thick-billed Flowerpecker	<i>Dicaeum agile</i>	R	FC	LC
Purple Sunbird	<i>Nectarinia asiatica</i>	R	C	LC
Passeridae (14)				
House Sparrow	<i>Passer domesticus</i>	R	C	LC
Chestnut-shouldered Petronia	<i>Petronia xanthocollis</i>	R	FC	LC
White Wagtail	<i>Motacilla dukhunensis</i>	M	C	LC
Grey Wagtail	<i>Motacilla cinerea</i>	M	FC	LC
White-browed Wagtail	<i>Motacilla maderaspatensis</i>	M	FC	LC
Yellow wagtail	<i>Motacilla thunbergi</i>	M	C	LC
Paddyfield Pipit	<i>Anthus rufulus</i>	R	C	LC
Tawny Pipit	<i>Anthus Pipit</i>	M	FC	NA
Olive –backed pipit	<i>Anthus hodgsoni</i>	M	FC	LC
Indian Silverbill	<i>Lonchura Malabarica</i>	R	C	LC
Scaly-breasted Munia	<i>Lonchura punctulata</i>	R	FC	LC
Black headed munia	<i>Lonchura malacca</i>	R	FC	LC
Red Avadavat	<i>Amandava amandava</i>	R	FC	LC
Baya Weaver	<i>Ploceus philippinus</i>	R	C	LC
Fringillidae (1)				
Crested bunting	<i>Emberiza lathami</i>	M	FC	LC

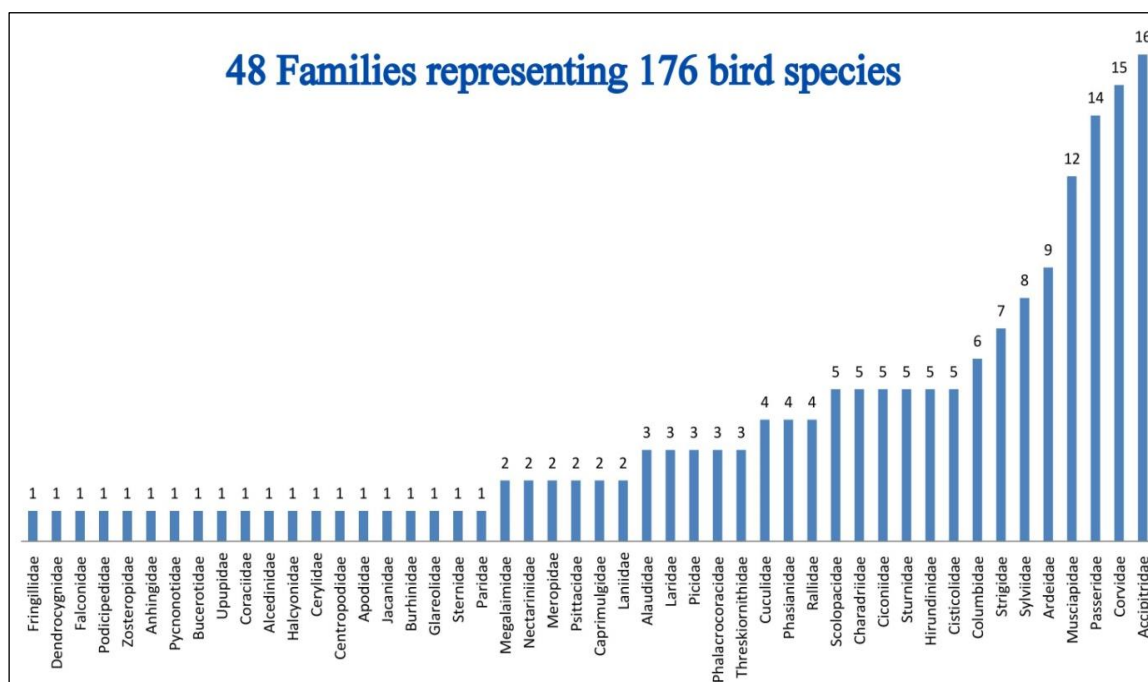


Fig. 3: Family-wise Distribution of Bird species in the Sanctuary.

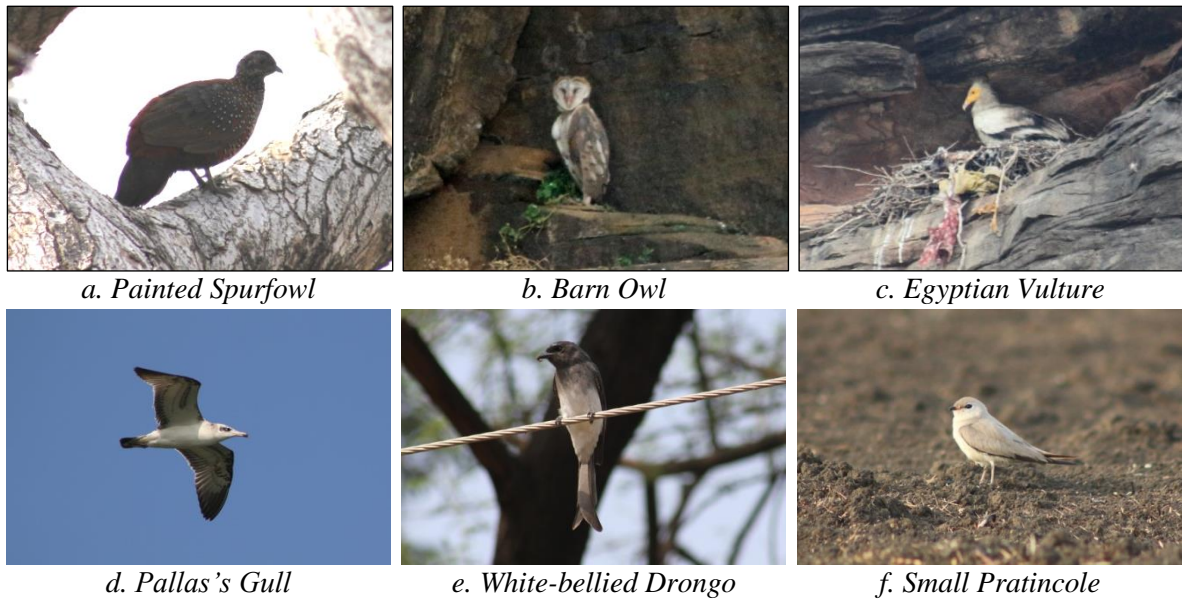


Fig. 4(a-f): Some Uncommon and Fairly common birds in Mahavir Swami Wildlife Sanctuary.

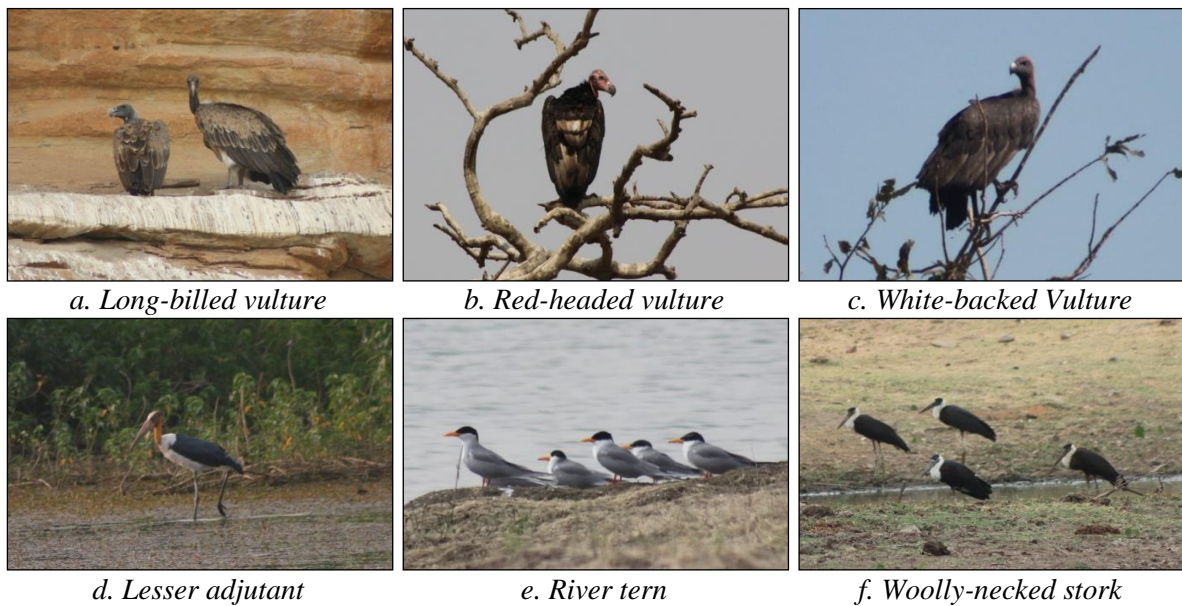


Fig. 5a-f): Some Critically Endangered (a-c), Near Threatened (d, e), and Vulnerable species (f).

The Abundance code of bird species shows that 89 species are common (C), 66 are fairly common (FC), and 21 are uncommon (Figure 4a-f). The IUCN status shows that 3 birds are critically endangered, 1 endangered, 6 near threatened, 1 vulnerable, for 4 species data has not been assessed and 161 bird species are Least Concerned (Figure 5a-f).

The Sanctuary supports the highest numbers of accipitrid species due to the forests that are imperative productive habitats. Raptor species depend on trees for nesting, perching, roosting and hunting. For that reason, habitats with trees

can generally sustain several raptor species than those without trees [7, 8]. Moreover, the 300 feet high red sandstone cliffs are an ideal habitat for the vultures, owls, eagles, martins and other bird species. The cliffs are straight and high as such it is not possible to reach up to their nests and cause disturbance [9].

The food availability also forms the base of selection of the habitation by the Accipitrids. A high-quality accipitrid habitat is one with large quantities of high-quality food that is accessible and predictable over time [7, 8]. Other distinctive factors that are important in habitat

selection are the incidences and amount of human disturbance, the risk of predation and availability of suitable nesting, roosting sites, and foraging. The previous studies done in Deogarh were focused on the vulture populations and their conservation [3]. Recently studies have also been undertaken on the Gull and Tern population in the study area [10-12]. However, there had been no previous study on the complete avifaunal diversity of the Sanctuary. The study undertaken provides the detail and illustrative study on the bird biodiversity that will unbolt innovative research opportunities.

Although Deogarh is splendidly steeped in religious history, it has many treasures for the discerning nature lover to discover. In the future, this study will help to track changes in bird populations. Information on avian species can also be used to set priorities, allowing conservation effort to be focused on those species most in need of attention.

ACKNOWLEDGMENT

Thanks are due to the Chief Wildlife Warden of Forest Department Uttar Pradesh for providing the permission to carry out the study. We highly appreciate the co-operation of Forest Officials of Deogarh during the survey work. Special thanks to all the volunteers without whom the field exercise would not have been easy.

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Cite this Article

Sonika Kushwaha, Akhilesh Kumar, Abhishek Namdev. Avifauna in Mahavir Swami Wildlife Sanctuary of Deogarh in Lalitpur District, Uttar Pradesh, India. *Research & Reviews: A Journal of Life Sciences*. 2018; 8(3): 140–148p.