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# A Preliminary Survey of Birds in Pench Tiger Reserve, Madhya Pradesh, India

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### Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

### Article Information

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## ABSTRACT

A preliminary survey of bird species and habitat in the Karmajhiri Range, Pench Tiger Reserve was conducted during March 2014 - May 2014. The aim of this study was assessment of avian population by addressing some ecological status such as faunal type, phenological traits, trophic status, occurrence and protection status of birds species. 221 species of birds were recorded from study area. Out of 26 order in India 16 order of birds were presented in and around Pench Tiger Reserve (PTR) which comprises 61 families. PTR provides habitat for three critically endangered species, namely White-rumped Vulture (*Gyps bengalensis* Gmelin, 1788), Red-headed Vulture (*Sarcogyps calvus* Scopoli, 1786) and Indian Vulture (*Gyps indicus* Scopoli, 1786). Regarding species protected by Berne convention 34 species are listed in Appendix 2 (strictly protected fauna) and only one are represented in Appendix 3 (Protected fauna) House Sparrow (*Passer domesticus* Linnaeus, 1758). Based on the AEWA (African-European Migratory Waterbird Agreement) bird list, 18 bird species are noted in the study area. The dominance of Oriental faunal type provide information on the relationship of the surveyed avifauna to the biogeographical zones. We were recorded 28 biome restricted bird species. This assessment also supports and justifies its classification as an Important Bird Area "IBA" because of the importance and abundance of avian species. Its provide shelter and hosts to birds. To conserve birds species in tropical

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deciduous forest in PTR, it will be necessary to preserve large areas of contiguous forest and monitor the effect of Habitat fragmentation and other development activities in and around forest area will have impact on their foraging, breeding and subsequently their population. These scientific findings will help to evaluate the effectiveness of legislation and policies for bird protection and will under in future conservation action for birds and their habitats.

*Keywords: Habitat diversity; habitat type; IBA; threatened species; biogeographical zone.*

## 1. INTRODUCTION

India lies within the oriental region and it is one of the 17 mega-biodiverse countries in the world [1,2]. With its varied climate and terrain and characterized by at least 10 distinct biogeographical region [3], India support a huge variety of forest types and harbour three global terrestrial biodiversity hotspots [4]. The forest cover was estimated to be 29.36% of total geographical area of India [5]. Champion and Seth [6] have classified Indian forest based on physiognomy and climate. The predominant forest types of India are tropical dry deciduous and tropical moist deciduous. Of the total forest cover, tropical dry deciduous forests occupy an area of 2,17,713 sq km (34.80%) followed by 2,07,649 sq km (33.19%) under tropical moist deciduous forests, 48,295 sq km (7.72%) under tropical semi evergreen forests and 47,192 sq km (7.54%) under tropical wet evergreen forests [5].

The 11,121 species of birds occur all over the world included 742 “new species”, with 46 parrots, 36 hummingbirds and 26 owls. (Birdlife International 2018) [7], while the bird species from the Indian Subcontinent is 1383, that from within the geographical boundaries of India is 1306 [8]. Of these, 72 species of birds are endemic to India, constituting about 5.5% of the country’s bird diversity. Taxonomically, the Indian avifauna covers 26 orders, 111 families, and 492 genera [8]. However, two families, Asiatic Barbets Megalaimidae and Leafbirds Irenidae, occur in the Oriental region, the rest of the bird families are found in other biogeographical regions of the world too. The Oriental region is also the centre of radiation for many bird groups such as the Pheasants, Laughing thrushes, Drongos, Leafbirds, Pittas, Parrotbills, and Flowerpeckers [9].

Being a physical part of Asia, India is least limited by geographical barriers, thus it has acted as a centre of dispersal of species, and has also received species from the Palaearctic, Ethiopian, Indo-Chinese and Indo-Malayan subregions. But

the dominant groups of birds in India belong to what is sometimes called the ‘Indo-Chinese’ fauna, the birds adapted to life in the warm, moist tropical Southeast Asia, birds primarily of jungle or heavy forests [10]. The geographical ramifications of south-east Asia, the tangled patterns of mountain chains, river drainage systems, and a long period of stable climate seem to have been ideal for the evolution of a wide array of avian species [10].

In India there are 467 Important Bird and Biodiversity Area [11]. The IBA serve as conservation areas for protection of birds at the global, regional or subregional level (Birdlife International 2018) [7]. The presence of tropical forest and habitat diversity maintain the biodiversity of Pench Tiger Reserve (PTR) and should be regarded as Important Bird and Biodiversity Area. This is probably because PTR contain a range of habitat such as tropical dry and moist deciduous forest, wetland, reservoirs, grassland and scrubland making it excellent indicator of biodiversity richness. Its lies in Biome 11(Indo-Malayan tropical dry zone) thus represent distribution for many biome-restricted birds [9]. Birdlife International (undated) [12] identified 59 species in Biome-11. In PTR 30 biome- restricted bird species have been seen [13]. Besides the biome- restricted species it’s also hold significant numbers of more globally threatened bird species. It provide ecologically and biologically significant area which has huge potential for breeding and migratory birds, arrives in the reserve every year especially at the onset of winter and stay in different location of the reserve until the onset of summer compared to other surrounding areas.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

According to the biogeographic classification of [3] the study area falls under 6E biogeographic province of the Deccan peninsula. Pench Tiger Reserve (PTR) (21°50’42”N latitude, 79°27’47”E longitude), lies in southwest Madhya Pradesh

(Fig. 1). The reserve is located in the southern slopes of satpura hills in Seoni and Chhindwara district of Madhya Pradesh. The total area of the reserve is 768.302 sq km in Seoni and Chhindwara district. The 292.857 sq km area of the tiger reserve managed as core area. Pench Tiger Reserve derived its name from the river Pench that flow through the reserve in a north south direction covering length of 24 km [14].

The terrain is gently undulating and is dissected by a number of seasonal stream and nullahs. The altitude of the reserve ranges from 350 to 650 m [14]. Climatically the area has four seasons summer (March- June), Monsoon (July-August), Post-Monsoon (September- October) and Winter (November – February). The annual range of temperature varied from as low as -2°C in peak winter to as high as 49°C in peak summer [14]. The vegetation of the area comprises two broad categories such as Tropical Dry Deciduous and Tropical Moist Deciduous forest type [6]. These forest types, for the present study were further sub divided as follows:

- Teak dominant forest
- Miscellaneous forest
- Bamboo forest
- Grassland
- Scrubland

## 2.2 Data Collection

Data were collected by Fixed-Radius Circular Point Count method and Mackinnon's methods [15]. During the field work all birds species seen were recorded in six different habitats types and identified using Grimmett et al. [16]. The points were randomly established with a minimum interval of 200 - 300 m. We recorded the number of individuals of each species detected in a Fixed- Radius circular plot of 30 meters for 20 minutes observation period at each 180 points. Observation were done in the morning (06:00-11:00) and in the afternoon (15:00- 17:00).

Another method that is Mackinnon's method was also used to get a quick idea of the species richness and composition in an area. The study area was monitored at a regular speed and the species of birds encounter was recorded. Once a list of 10 species is completed, another list was prepared. No same species was recorded again in the same list. The study was conducted from March 2014 to May 2014.

## 3. RESULTS AND DISCUSSION

Despite the limited area of this study, the surveyed avifauna is diverse. Order Passeriformes (51.58%) had highest numbers of species followed by Falconiformes (9.50%) (Table 5). It represents over a quarter of Madhya Pradesh birds [17]. There are 26 orders of the birds in India [8] out of these 16 sorders of birds present in and around PTR which comprises 61 families in which 221 species of birds were recorded in and around PTR and covers more than half of the orders (61.54%) and families (54.96%) described in the country. We also recorded 28 biome- restricted species in study area (Appendix 2).

### 3.1 Protection Status of Birds

Following the IUCN Red List, 94.11% of all birds are of least concern (LC) while only one species namely Green Warbler (*Phylloscopus nitidus* Sundevall, 1837) has the "Data Deficient" status and another two have "Vulnerable" such as Greater spotted Eagle (*Aquila clanga* Palas, 1811) and Eastern imperial Eagle (*Aquila heliacal* Savigny, 1809) respectively (Table 1). Only three of 221 species (1.36% of all birds) are currently critically endangered. These are White-rumped Vulture (*Gyps benghalensis* Gmelin, 1788), Red-headed Vulture (*Sarcogyps calvus* Scopoli, 1786) and Indian Vulture (*Gyps indicus* Scopoli, 1786). Moreover White-rumped Vulture (*Gyps benghalensis* Gmelin, 1788), Indian Vulture (*Gyps indicus* Scopoli, 1786) and Indian Peafowl (*Pavo cristatus* Linnaeus, 1758) are listed in Schedule 1 of Wildlife Protection Act 1972. Indian subcontinent birds are also protected under the CITES, Bonn Convention, Berne Convention, AEWA Agreement. It is the focus of close monitoring and targeted conservation action across most of its range. For, India is not a party to the Berne Convention and AEWA (African-European Migratory Waterbird agreement) but receives bird species which are listed in Appendix 2 and 3. We recorded 35 species which are listed in Berne convention, out of these 33 are listed isn Appendix 2 (strictly protected fauna) and only one are represented in Appendix 3 (Protected fauna) *Passer domesticus* Linnaeus, 1758. Unlike the IUCN Red List criteria, these species are listed as Least concern (Table 2). 26 species are listed in Appendix 2 of the Convention of Washington (CITES), out of these 21 species belonging to the order of Falconiformes (Table 1).

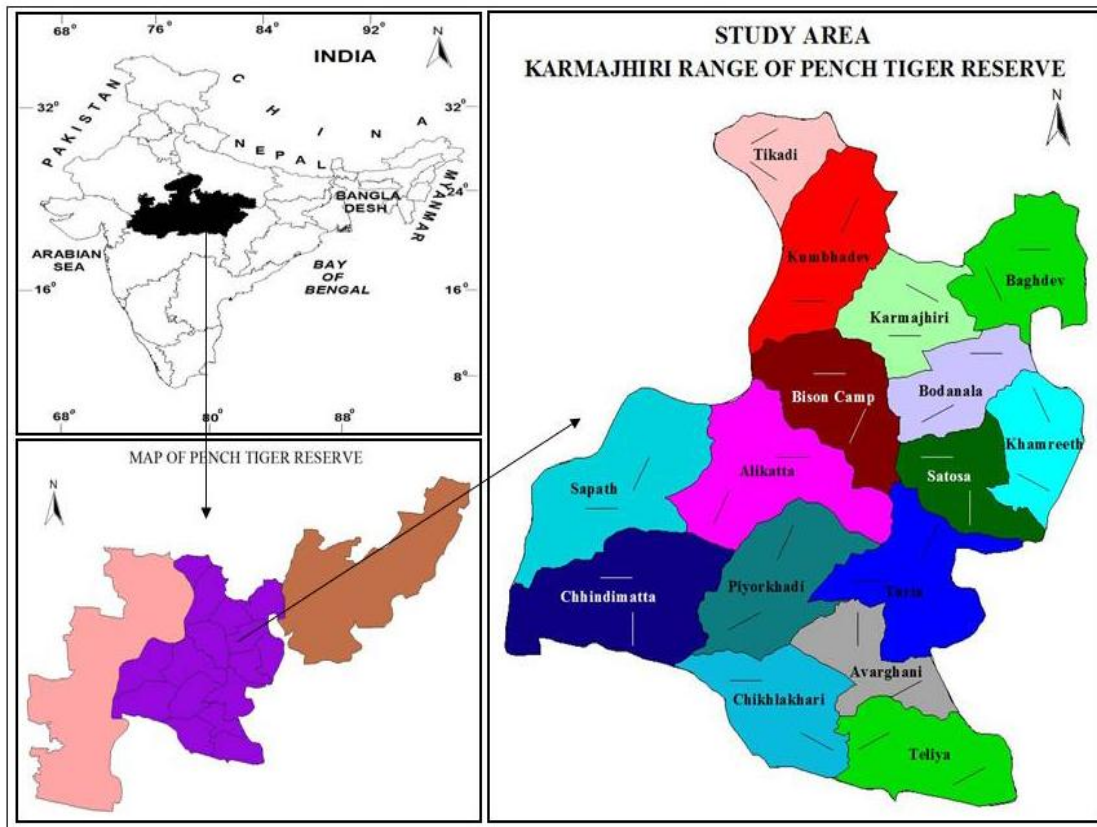


Fig. 1. Map of PTR (Karmajhiri range)

Table 1. Summary of numbers of bird species within each category of threat

Treaty & convention on bird protection	Code	Passerines	Non-passerines	Total	%
<b>Red list of IUCN</b>					
Critically Endangered	CR	0	3	3	1.36
Vulnerable	VU	0	2	2	0.91
Near Threatened	NT	1	6	7	3.17
Least Concern	LC	114	94	208	94.11
Data Deficient	DD	1	0	1	0.46
<b>Convention of Washington (CITES)</b>					
Appendix 2	T2	0	26	26	11.77
<b>Convention of Bonn</b>					
Appendix 1	N1	0	2	2	0.91
Appendix 2	N2	22	20	42	18.56
<b>Convention of Berne</b>					
Appendix 2	E2	19	15	34	15.39
Appendix 3	E3	1	0	1	0.46
<b>AEWA Agreement</b>					
	A	0	18	18	8.15

**Table 2. Comparison of IUCN status of birds to Berne and AEWA status**

S. no.	Species	IUCN red list	Berne convention Appendices	AEWA
1	<i>Anas strepera</i> (Linnaeus, 1758)	Lc	-	A
2	<i>Anas platyrhynchos</i> (Linnaeus, 1758)	Lc	-	A
3	<i>Aythya ferina</i> (Linnaeus, 1758)	Lc	-	A
4	<i>Tadorna ferruginea</i> (Pallas, 1764)	Lc	E2	A
5	<i>Ciconia episcopus</i> (Boddaert, 1783)	Lc	-	A
6	<i>Ardea cinerea</i> (Linnaeus, 1758)	Lc	-	A
7	<i>Ardea purpurea</i> (Linnaeus, 1766)	Lc	E2	A
8	<i>Mesophoyx intermedia</i> (Wagler, 1827)	Lc	-	A
9	<i>Egretta garzetta</i> (Linnaeus, 1766)	Lc	E2	A
10	<i>Bubulcus ibis</i> (Linnaeus, 1758)	Lc	E2	A
11	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Lc	E2	A
12	<i>Falco tinnunculus</i> (Linnaeus, 1758)	Lc	E2	-
13	<i>Gallinule chloropus</i> (Linnaeus, 1758)	-	-	A
14	<i>Fulica atra</i> (Linnaeus, 1758)	-	-	A
15	<i>Glareola maldivarum</i> (Forster, 1795)	-	E2	
16	<i>Gallinago gallinago</i> (Linnaeus, 1758)	-	-	A
17	<i>Tringa ochropus</i> (Linnaeus, 1758)	Lc	E2	A
18	<i>Actitis hypoleucos</i> (Linnaeus, 1758)	Lc	E2	
19	<i>Calidris minuta</i> (Leisler, 1812)	Lc	E2	A
20	<i>Calidris ferruginea</i> (Pontoppidan, 1763)	Lc	E2	A
21	<i>Sterna albifrons</i> (J.E.Gray, 1831)	Lc	E2	A
22	<i>Alcedo atthis</i> (Linnaeus, 1758)	Lc	E2	-
23	<i>Upupa epops</i> (Linnaeus, 1758)	Lc	E2	-
24	<i>Lanius cristatus</i> (Linnaeus, 1758)	Lc	E2	-
25	<i>Lanius meridionalis</i> (Temminck, 1820)	Lc	E2	-
26	<i>Calandrella brachydactyla</i> (Leisler, 1814)	Lc	E2	-
27	<i>Hirundo rustica</i> (Linnaeus, 1758)	Lc	E2	-
28	<i>Cercopis daurica</i> (Laxmann, 1769)	Lc	E2	-
29	<i>Delichan urbicum</i> (Linnaeus, 1758)	Lc	E2	-
30	<i>Pastor roseus</i> (Linnaeus, 1758)	Lc	E2	-
31	<i>Monticola solitaries</i> (Linnaeus, 1758)	Lc	E2	-
32	<i>Phoenicurus ochruros</i> (S.G.Gmelin, 1774)	Lc	E2	-
33	<i>Luscinia svecica</i> (Linnaeus, 1758)	Lc	E2	-
34	<i>Saxicola torquatus</i> (Linnaeus, 1766)	Lc	E2	-
35	<i>Passer domesticus</i> (Linnaeus, 1758)	Lc	E3	-
36	<i>Motacilla citreola</i> (Tunstall, 1771)	Lc	E2	-
37	<i>Motacilla falva</i> (Linnaeus, 1758)	Lc	E2	-
38	<i>Motacilla cinerea</i> (Tunstall, 1771)	Lc	E2	-
39	<i>Anthus campestris</i> (Linnaeus, 1758)	Lc	E2	-
40	<i>Anthus godlewskii</i> (Taczanowski, 1876)	Lc	E2	-
41	<i>Anthus richardi</i> (Vieillot, 1818)	Lc	E2	-
42	<i>Anthus hodgsoni</i> (Richmond, 1907)	Lc	E2	-
43	<i>Carpodacus erythrinus</i> (Pallas, 1770)	Lc	E2	-
Total	43		35	18

### 3.2 Phenology and Biogeographical Range of Species

Current study was recorded less number of birds than other studies that was conducted in PTR

because it is just a preliminary survey for the short period of time. We missed species that move regionally as well as intertropical migrants that sometimes occur in great abundance in forest habitat around. Secondly, the survey was

done during the breeding season for many species, when habitat requirements typically become more restricted, and third we did not cover whole PTR, some forested patches known to be relatively rich in bird species, were excluded. Birds have biogeographical affinity to the oriental region according to the dominant faunal type with more than a quarter of all counted species (49.33%). It was followed by Oriental- Palearctic region (19.01%) then the Palearctic region (14.03%) then came to the Oriental- Holarctic region (0.46%) (Table 3). Resident birds were found to be maximum and distributed throughout the Oriental region with 86 birds species followed by Oriental- Palearctic region (exist in both biogeographical region) with 26 species of forest birds (Table 3). Passage migrant was best characterized by Common House Martin (*Delichon urbicum* Linnaeus, 1758) and belongs to Oriental-Palearctic region. Altogether Resident migrants (that is, birds that breed in one part of the area in one season and move to other parts within the state or country in a different season) such as Mallard (*Anas platyrhynchos* Linnaeus, 1758), Ruddy Shelduck (*Tadorna ferruginea* Pallas, 1764), Asian Openbill (*Anastromus oscitans* Boddaert, 1783), Grey Heron (*Ardea cinerea* Linnaeus, 1758), Painted Stork (*Mycteria leucocephala* Pennant, 1769) were winter migrants in this region constituting 54 (24.43%) of all birds species which conduct local seasonal movement and track available food resources. Of these, 17 bird species show their affinity to the Oriental region. It was followed by Palearctic with 12 birds species and Oriental- Palearctic region with 12 birds species respectively (Table 3). Whereas some species for example Indian Cuckoo (*Cuculus micropterus* Gould, 1837), Grey-bellied Cuckoo (*Cacomantis passerines* Vahl, 1797) and Indian Pitta (*Pitta brachyuran* Linnaeus, 1766) were resident summer migrants with 3.61% of all birds species and fall under Oriental and Oriental- Palearctic biogeographical region. However a number of winter visitor received from Palearctic region with 19 birds species to the study area for example Eastern imperial Eagle (*Aquila heliaca* Savigny, 1809), Steppe Eagle (*Aquila nipalensis* Hodgson, 1833), Green Sandpiper (*Tringa ochropus* Linnaeus, 1758), Red-headed Bunting (*Emberiza burniceps* Brandt, 1841) and only one species Gadwall (*Anas strepera* Linnaeus, 1758) belongs to Oriental- Holarctic region. Only one species that is Common swift (*Apus apus* Linnaeus, 1758) was recorded as Summer visitor which fall under Palearctic–Ethiopian biogeographical

range. Similarly Common house Martin (*Delichon urbicum* Linnaeus, 1758) was recorded as passage migrants and has Oriental-Palearctic biogeographical range. Resulting in the predominance of resident and resident migratory birds in the region indicates the ecological importance of this site (Table 4). It provides abundant food resources in both quality and quantity for a large variety of birds, particularly waterfowl that find it an ideal refuge to fatten during the winter [18].

### 3.3 Trophic Status of Species

Among foraging group, the majority of species were polyphagous followed by invertebrates-feeder, dominated by order passeriformes (Table 5). The invertebrate feeders also provides information on the health of habitats which offer an abundant biomass of insect species which represent the food of choice for many passerines and of aquatic invertebrates that feed waterfowl [19,20]. In addition the increase in leaf cover may have provided an additional food resource to invertebrates and therefore a food source for foraging invertebrates-feeders. Beside the invertebrates feeder polyphagous such as chestnut shouldered Petronia (*Gymnoris xanthocollis* Brunton, 1838), Grey breasted Prinia (*Prinia hodgsonii* Blyth, 1844) Red-vented Bulbul (*Pycnonotus cafer* Linnaeus, 1766), Oriental white Eye (*Zosterops palpebrosus* Temminck, 1824) etc. probably increased due to an increase in both invertebrates and fruit abundance in the forest. These fruits are produced by canopy trees such as *Ficus benghalensis*, *Butea monosperma*, *Syzygium cumini*, *Diospyros melanoxylon*, *Grewia tilifolia* etc and also attracting gregarious frugivores such as Plum headed Parakeet (*Psittacula cyanocephala* Linnaeus, 1766) and Brown-headed Barbet (*Megalaima zeylanica* Gmelin, 1788). Many of these species are also able to diet-switch in response to seasonal abundance in either fruit, flowers or invertebrates has been recorded in forest elsewhere For example many frugivores also incorporate invertebrates in their diet, because fruits are low in protein and lipids [21], and the properties of insects in the diet varies between season such as Yellow-footed green pigeon (*Treron phoenicopterus* Latham, 1790) has a mixed diet of fruit and invertebrates during breeding season. Meanwhile if ground foraging granivores like Common Rosefinch (*Carpodacus erythrinus* Pallas, 1770), Crested Bunting (*Melophus lathamii* Gray, 1831) and other birds, such as Red Avadavat (*Amandava amandava*

Linnaeus, 1758) and do not have access to litter and forbs cover acts as barrier to ground them, individuals will most likely leave the forest foraging birds, which reducing visibility of food to where these resources are more accessible resources such as fallen petals of flowers from [22]. because of dense herbaceous layer, leaf trees like *Madhuca indica*, *Erythrina* spp. Etc.

**Table 3. Distribution of bird species by biogeographical range in and around PTR**

Faunal type (symbol)	R	RMW	RMS	WV	SV	P	E	Total	%
Cosmopolitan(C)	8	2	-	-	-	-	-	10	4.53
Holarctic(H)	-	4	-	-	-	-	-	4	1.81
Oriental(O)	86	17	4	-	-	-	2	109	49.33
Palaearctic(P)	-	12	-	19	-	-	-	31	14.03
Old World(OW)	7	5	-	-	-	-	-	12	5.43
Oriental Palaearctic(OP)	26	12	4	-	-	1	-	42	19.01
Oriental Ethiopian(OE)	6	1	-	-	-	-	-	7	3.17
Oriental Holarctic(OH)	-	-	-	1	-	-	-	1	0.46
Oriental Australasian Palaearctic(OAP)	1	1	-	-	-	-	-	2	0.91
Oriental Australasian Ethiopian(OAE)	1	1	-	-	-	-	-	2	0.91
Palaearctic Ethiopian(PE)	-	-	-	-	1	-	-	1	0.46
Total	135	54	8	20	1	1	2	221	100

Abbreviation: R = Resident, RMW= Resident Migratory In Winter, RMS = Resident Migratory In Summer, WV = Winter Visitor, SV = Summer Visitor, P = Passage Migrants, E = Endemic

**Table 4. Phenology of birds in and around PTR**

Phenology	Passerine	Non-passerine	Total	%
Resident	62	73	135	61.08
Endemic	0	2	2	0.90
Resident Migratory In Winter	35	19	54	24.43
Resident Migratory In Summer	5	3	8	3.61
Summer Visitor	0	1	1	0.45
Winter Visitor	13	7	20	9.04
Passage Migrant	1	0	1	0.45
Total	116	105	221	100

**Table 5. Summary of trophic status of bird species in different orders**

Orders	Trophic status							Total	%
	Pp	Cv	Cr	G	Pisci/Inv	Inv	F		
Galliformes	6	-	-	-	-	-	-	6	2.72
Anseriformes	5	-	-	-	-	-	-	5	2.27
Ciconiformes	3	-	6	-	5	-	-	14	6.34
Pelecaniformes	-	-	-	-	3	-	-	3	1.36
Falconiformes	-	3	18	-	-	-	-	21	9.50
Gruiformes	4	-	-	-	-	-	-	4	1.80
Charadriiformes	6	-	-	-	5	3	-	14	6.34
Columbiformes	4	-	-	-	-	-	1	5	2.27
Psiittaciformes	-	-	-	-	-	-	3	3	1.36
Cuculiformes	2	-	-	-	-	4	-	6	2.72
Strigiformes	-	-	3	-	-	-	-	3	1.36
Caprimulgiformes	-	-	-	-	-	1	-	1	0.46
Apodiformes	-	-	-	-	-	5	-	5	2.27
Coraciiformes	4	-	-	-	4	2	-	10	4.53
Piciformes	7	-	-	-	-	-	-	7	3.17
Passeriformes	42	-	4	6	-	62	-	114	51.58
Total	83	3	31	6	17	77	4	221	100

Abbreviation: Pp= Polyphagous, Cv= Carrion feeder, Cr= Carnivores, G= Granivores, Pisci/Inv= Piscivores/invertebrates, Inv= Invertebrates, F= Frugivores

#### 4. CONCLUSION

It is concluded that vegetation cover has both direct and indirect effects on the distribution of foraging birds. The present study was a short term study in a small area karmajhiri region. To monitor the factors influencing the geographical ranges of birds and relationship between breeding and wintering areas and between abundance and distribution is needed long term study to collect the seasonal data in different years in all the three ranges.

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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## Appendix 1. List of birds recorded from Pench Tiger Reserve, MP India

Order	Family	Scientific Name	Trophic Status	Phenology of Species	Faunal Type	Protection Status	Habitat
Galliformes	Phasianidae	<i>Francolinus pondicerianus</i> (Gmelin, 1789)	Pp	R	OP	Lc	1
		<i>Perdicula asiatica</i> (Latham, 1790)	Pp	R	O	Lc	1
		<i>Galloperdix spadicea</i> (Gmelin, 1789)	Pp	E	O	Lc	1
		<i>Galloperdix lunulata</i> (Valenciennes, 1825)	Pp	E	O	Lc	1
		<i>Gallus gallus</i> (Linnaeus, 1758)	Pp	R	O	Lc	1
		<i>Pavo cristatus</i> (Linnaeus, 1758)	Pp	R	O	Lc	1, 2
Anseriformes	Anatidae	<i>Nettapus coromandelianus</i> (Gmelin, 1789)	Pp	R	OP	Lc	1,3
		<i>Anas strepera</i> (Linnaeus, 1758)	Pp	WV	OH	Lc, N2, A	1,3
		<i>Anas platyrhynchos</i> (Linnaeus, 1758))	Pp	RMW	H	Lc, N2, A	1,3
		<i>Aythya ferina</i> (Linnaeus, 1758)	Pp	WV	P	Lc, N2, A	1,3
		<i>Tadorna ferruginea</i> (Pallas, 1764)	Pp	RMW	P	Lc, N2, A, E2	1,3
		<i>Mycteria leucocephala</i> (Pennant, 1769)	Cr	RMW	O	NT	1,3
Ciconiiformes	Ciconiidae	<i>Anastromus oscitans</i> (Boddaert, 1783)	Cr	RMW	O	Lc	1,2,3
		<i>Ciconia episcopus</i> (Boddaert, 1783)	Cr	R	OE	Lc, A	1,3
		<i>Threskiornis melanocephalus</i> (Latham, 1790)	Pp	R	O	NT	1,3
	Threskiornithidae	<i>Pseudibis papillosa</i> (Temminck, 1824)	Pp	R	O	Lc	2,3
		<i>Ardea cinerea</i> (Linnaeus, 1758)	Cr	RMW	OW	Lc, A	1,3
		<i>Ardea purpurea</i> (Linnaeus, 1766)	Cr	RMW	OW	Lc, A, E2	1,3
	Ardeidae	<i>Mesophoyx intermedia</i> (Wagler, 1827)	Pisci/Inv	RMW	OE	Lc,A	1, 2,3
		<i>Egretta garzetta</i> (Linnaeus, 1766)	Cr	R	C	Lc, A, E2	1, 2,3
		<i>Bubulcus ibis</i> (Linnaeus, 1758)	Pisci/Inv	RMW	C	Lc, A, E2	1, 2,3
		<i>Ardeola grayii</i> (Sykes, 1832)	Pisci/Inv	R	OP	Lc	1, 2,3
		<i>Butorides striata</i> (Linnaeus, 1758)	Pisci/Inv	R	C	Lc	1,3
		<i>Nycticorax nycticorax</i> Linnaeus, 1758)	Pp	R	C	Lc, A, E2	2,3
Ciconiiformes	Ardeidae	<i>Ixobrychus cinnamomeus</i> (Gmelin, 1789)	Pisci/Inv	RMW	OP	Lc	2,3
Pelecaniformes	Phalacrocoracidae	<i>Phalacrocorax fuscicollis</i> (Stephens, 1826)	Pisci/Inv	RMW	O	Lc	1,3
		<i>Microcarbo niger</i> (Vieillot, 1817)	Pisci/Inv	RMW	O	Lc	1,2,3
		<i>Anhinga melanogaster</i> (Pennant, 1769)	Pisci/Inv	RMW	OEA	Lc	1,3
Falconiformes	Accipitridae	<i>Pernis ptilorhynchus</i> (Temminck, 1821)	Cr	R	OP	Lc,T2, N2	1, 2
		<i>Milvus migrans</i> (Boddaert, 1783)	Cr	R	C	Lc, T2, N2	2
		<i>Elanus caeruleus</i> (Desfontaines, 1789)	Cr	R	C	Lc, T2,	2

Order	Family	Scientific Name	Trophic Status	Phenology of Species	Faunal Type	Protection Status	Habitat		
Falconiformes	Accipitridae Falconidae	<i>Ichthyophaga ichthyophaga</i> (Horsfield, 1821)	Cr	R	O	NT, T2	1,2		
		<i>Gyps benghalensis</i> (Gmelin, 1788)	Cv	R	O	CR, T2	1		
		<i>Sarcogyps calvus</i> (Scopoli, 1786)	Cv	R	O	CR, T2	1		
		<i>Circaetus gallicus</i> (Gmelin, 1788)	Cr	R	OP	Lc, T2, N2	1, 2		
		<i>Gyps indicus</i> (Scopoli, 1786)	Cv	R	O	CR, T2	1		
		<i>Spilornis cheela</i> (Latham, 1790)	Cr	R	O	Lc,T2	1, 2		
		<i>Accipiter badius</i> (Gmelin, 1788)	Cr	R	OW	Lc, T2,N2	1, 2		
		<i>Accipiter virgatus</i> (Temminck, 1822)	Cr	R	OP	Lc, T2, N2	2		
		<i>Butastur teesa</i> (Franklin, 1831)	Cr	R	O	Lc,T2	1,2		
		<i>Aquila clanga</i> (Pallas, 1811)	Cr	RMW	P	VU,T2, N1,N2	1		
		<i>Aquila rapax</i> (Temminck, 1828)	Cr	R	OE	Lc, T2, N2	1		
		<i>Aquila nipalensis</i> (Hodgson, 1833)	Cr	WV	P	Lc, T2, N2	1		
		<i>Aquila heliaca</i> (Savigny, 1809)	Cr	WV	P	VU, T2,N1,N2	1		
		<i>Aquila fasciatus</i> (Vieillot, 1822)	Cr	R	OP	Lc, T2,	1		
		<i>Aquila pennata</i> (Gmelin, 1788)	Cr	RMW	OP	Lc, T2	1		
		<i>Nisaetus cirrhatus</i> (Gmelin, 1788)	Cr	R	OP	Lc, T2	1		
		<i>Nisaetus nipalensis</i> (Hodgson, 1836)	Cr	R	OP	Lc, T2	1		
		<i>Falco tinnunculus</i> (Linnaeus, 1758)	Cr	RMW	OW	Lc, T2,N2,E2	1		
		Gruiformes	Rallia	<i>Amaurornis akool</i> (Sykes, 1832)	Pp	R	O	Lc,	2,3
				<i>Amaurornis phoenicurus</i> (Pennant, 1769)	Pp	R	O	Lc	2,3
Charadriiformes	Charadriidae	<i>Gallinule chloropus</i> Linneus, 1758)	Pp	RMW	C	Lc, A	2,3		
		<i>Fulica atra</i> (Linneus, 1758)	Pp	RMW	OPA	Lc, A	2,3		
		<i>Vanellus duvaucelli</i> (Lesson, 1826)	Inv	R	O	NT	1,3		
		<i>Vanellus malabaricus</i> (Boddaert, 1783)	Inv	R	O	Lc	2,3		
		<i>Vanellus indicus</i> (Boddaert, 1783)	Inv	R	OP	Lc, N2	1, 2,3		
		<i>Glareola maldivarum</i> (Forster, 1795)	Inv	R	OP	Lc, E2	1,3		
		<i>Rostratula benghalensis</i> (Linnaeus, 1758)	Pp	R	C	Lc	2,3		
		<i>Gallinago gallinago</i> (Linnaeus, 1758)	Pp	RMW	H	Lc, N2, A	2,3		
<i>Tringa ochropus</i> (Linnaeus, 1758)	Pp	WV	P	Lc,N2, A, E2	2,3				

		<i>Actitis hypoleuc</i> (Linnaeus, 1758)	Pp	RMW	P	Lc, E2	2,3
		<i>Calidris minuta</i> (Leisler, 1812)	Pp	WV	P	Lc,N2, A, E2	2,3
		<i>Calidris ferruginea</i> (Pontoppidon, 1763)	Pp	WV	P	Lc,N2, A, E2	2,3
	Sternidae	<i>Sterna aurantia</i> (J. E. Gray, 1831)	Pisci/Inv	R	O	NT	1,2,3
		<i>Sterna albifrons</i> (Pallas, 1764)					
Columbiformes	Columbidae		Pisci/Inv	R	OW	Lc, N2, A, E2	1,3
		<i>Streptopelia decocta</i> (Friveldszky, 1838)	Pp	R	OP	Lc	1,2
		<i>Streptopelia tranquebarica</i> (Hermann, 1804)	Pp	R	OP	Lc	1
		<i>Strigmatopelia senegalensis</i> (Linnaeus, 1766)	Pp	R	O	Lc	2
		<i>Strigmatopelia chinensis</i> (Scopoli, 1768)	Pp	R	OE	Lc	1,2
Columbiformes	Columbidae	<i>Treron phoenicopterus</i> (Latham, 1790)	F	R	O	Lc	1,2
Psittaciformes	Psittacidae	<i>Psittacula eupatria</i> (Linnaeus, 1766)	F	R	OE	Lc, T2	1
		<i>Psittacula krameri</i> (Scopoli, 1769)	F	R	O	Lc	1,2
		<i>Psittacula cynocephali</i> (Linnaeus, 1766)	F	R	O	Lc, T2	1,2
Cuculiformes	Cuculidae	<i>Hieroccyx varius</i> (Vahl, 1797)	Inv	R	O	Lc	1, 2
		<i>Cuculus micropterus</i> (Gould, 1837)	Inv	RMS	OP	Lc	1, 2
		<i>Cacomantis passerines</i> (Vahl, 1797)	Inv	RMS	O	Lc	1
		<i>Surniculus lugubris</i> (Horsfield, 1821)	Inv	R	O	Lc	1
		<i>Eudynamys scolopaceus</i> (Linnaeus, 1758)	Pp	R	OPA	Lc	1,2
		<i>Centropus parroti</i> (Stephens, 1815)	Pp	R	O	Lc	1,2
Strigiformes	Tytonidae	<i>Tyto alba</i> (Scopoli, 1769)	Cr	R	C	Lc	1
	Strigidae	<i>Otus bakkamoena</i> (Pennant, 1769)	Cr	R	O	Lc, T2	1
		<i>Glaucidium radiatum</i> (Tickell, 1833)	Cr	R	O	Lc, T2	1,2

Caprimulgiformes	Caprimulgidae	<i>Caprimulgus asiaticus</i> (Latham, 1790)	Inv	R	O	Lc	1
Apodiformes	Hemiprocnidae	<i>Hemiproctne coronate</i> (Tickell, 1833)	Inv	R	O	Lc	1
		<i>Zoonavena sylvatica</i> (Tickell, 1846)	Inv	R	O	Lc	1
	Apodidae	<i>Cypsiurus balasiensis</i> (J.E. Gray, 1829)	Inv	R	O	Lc	1
		<i>Apus affinis</i> (J.E. Gray, 1830)	Inv	R	OW	Lc	1
Coraciiformes	Coraciidae	<i>Apus apus</i> (Linnaeus, 1758)	Inv	SV	PE	Lc	1
		<i>Coracias benghalensis</i> (Linnaeus, 1758)	Pp	R	OP	Lc	1,2
		<i>Alcedinidae</i>	<i>Ceryle rudis</i> (Linnaeus, 1758)	Pisci/Inv	R	OW	Lc
	Meropidae	<i>Alcedo atthis</i> (Linnaeus, 1758)	Pisci/Inv	R	OP	Lc, E2	1
		<i>Pelargopsis capensis</i> (Linnaeus, 1766)	Pisci/Inv	R	O	Lc	2
		<i>Halcyon smymensis</i> (Linnaeus, 1758)	Pisci/Inv	R	OP	Lc	1,2
		<i>Merops orientalis</i> (Latham, 1801)	Inv	R	OE	Lc	1,2
		<i>Merops philippinus</i> (Linnaeus, 1766)	Inv	RMS	O	Lc	2
Coraciiformes	Upupidae	<i>Upupa epops</i> (Linnaeus, 1758)	Pp	R	OW	Lc, E2	2
	Bucerotidae	<i>Ocyrceros birostris</i> (Scopoli, 1786)	Pp	R	O	Lc	1,2
Piciformes	Megalamidae	<i>Anthracoceros coronatus</i> (Boddaert, 1783)	Pp	R	O	NT, T2	1,2
		<i>Megalaima zeylanica</i> (Gmelin, 1788)	Pp	R	O	Lc	1,2
		<i>Megalaima haemacephala</i> (Statius Muller, 1776)	Pp	R	O	Lc	1,2
	Picidae	<i>Dendrocopos nanus</i> (Vigors, 1832)	Pp	R	O	Lc	1
		<i>Dendrocopos mahrattensis</i> (Latham, 1801)	Pp	R	O	Lc	1
		<i>Dinopium benghalensis</i> (Linnaeus, 1758)	Pp	R	O	Lc	1,2
		<i>Chrysocolaptes festivus</i>	Pp	R	O	Lc	1,2

		(Boddaert, 1883)						
		<i>Picus xanthopygaeus</i> (Gray & Gray, 1847)	Pp	R	O	Lc		1
Passeriformes	Pittidae	<i>Pitta brachyuran</i> (Lanneus, 1866)	Inv	RMS	OP	Lc		1
	Tephrodornithidae	<i>Tephrodornis pondicerianus</i> (Gmelin, 1789)	Inv	R	O	Lc		1,2
	Aegithinidae	<i>Aegithina tiphia</i> (Linnaeus, 1758)	Inv	R	O	Lc		1,2
		<i>Aegithina nigrolutea</i> (Marshall, 1876)	Inv	R	O	Lc		2
	Campephagidae	<i>Coracina macei</i> (Lesson, 1830)	Pp	R	O	Lc		1,2
		<i>Coracina melanoptera</i> (Ruppell, 1839)	Pp	RMS	O	Lc		1
		<i>Pericrocotus roseus</i> (Vieillot, 1818)	Inv	R	O	Lc		1
		<i>Pericrocotus cinnamomeus</i> (Linnaeus, 1766)	Inv	R	O	Lc		1,2
		<i>Pericrocotus erythropygius</i> (Jerdon, 1840)	Inv	R	O	Lc		1
		<i>Pericrocotus ethologus</i> (Bangs & Phillips, 1914)	Inv	R	O	Lc		1
	Laniidae	<i>Lanius cristatus</i> (Linnaeus, 1758)	Cr	WV	P	Lc, E2		2
		<i>Lanius vittatus</i> (Valenciennes, 1826)	Cr	R	OP	Lc		2
		<i>Lanius schac</i> (Linnaeus, 1758)	Cr	R	OP	Lc		1,2
Passeriformes	Lanidae	<i>Lanius meridionalis</i> (Temminck, 1820)	Cr	RMW	OW	Lc, E2		2
	Oriolidae	<i>Oriolus kundoo</i> (Sykes, 1832)	Pp	RMS	OP	Lc		1,2
		<i>Oriolus xanthornus</i> (Linnaeus, 1758)	Pp	R	O	Lc		1,2
	Dicruridae	<i>Dicrurus macrocercus</i> (Vieillot, 1817)	Pp	R	OP	Lc		1,2
		<i>Dicrurus leucophaeus</i> (Vieillot, 1817)	Inv	RMW	OP	Lc		2
		<i>Dicrurus caerulescens</i> (Linnaeus, 1758)	Inv	R	O	Lc		1,2
		<i>Dicrurus paradiseus</i> (Linnaeus, 1766)	Pp	R	O	Lc		1,2

	Rhipiduridae	<i>Rhipidura aureola</i> (Lesson, 1830)	Inv	R	O	Lc	1
	Monarchidae	<i>Hypothymis azurea</i> (Boddaert, 1783)	Inv	R	O	Lc	1,2
		<i>Terpsiphone paradise</i> (Linnaeus, 1758)	Inv	RMS	OP	Lc	1,2
	Corvidae	<i>Corvus splendens</i> (Vieillot, 1817)	Pp	R	O	Lc	2
		<i>Corvus culminates</i> (Skyes, 1832)	Pp	R	OP	Lc	1,2
		<i>Dendrocitta vagabunda</i> (Latham, 1790)	Pp	R	O	Lc	1,2
	Paridae	<i>Parus major</i> (Linnaeus, 1758)	Pp	R	OP	Lc	1,2
	Remizidae	<i>Cephalopyrus flammiceps</i> (Burton, 1836)	Pp	RMW	O	Lc	1
	Alaudidae	<i>Mirafra cantillans</i> (Blyth, 1845)	Pp	R	OE	Lc	2
		<i>Eremopterix griseus</i> (Scopoli, 1786)	Pp	R	O	Lc	2
		<i>Ammomanes phoenicura</i> (Franklin, 1831)	Pp	R	O	Lc	2
		<i>Calandrella brachydactyla</i> (Leisler, 1814)	Pp	WV	P	Lc, E2	2
	Pycnonotidae	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Pp	R	O	Lc	1,2
	Hirundinidae	<i>Riparia paludicola</i> (Vieillot, 1817)	Inv	R	OP	Lc	2
		<i>Ptyonoprogne concolor</i> (Sykes, 1832)	Inv	R	O	Lc	2
		<i>Hirundo rustica</i> (Linnaeus, 1858)	Inv	RMW	H	Lc, E2	2
		<i>Hirundo smithii</i> (Leach, 1818)	Inv	R	OW	Lc	2
		<i>Cercopis daurica</i> (Laxmann, 1769)	Inv	R	OW	Lc, E2	2
		<i>Hirundo fluvicola</i> (Blyth, 1855)	Inv	R	O	Lc	2
	Hirundinidae	<i>Delichan urbicum</i> (Linnaeus, 1858)	Inv	P	OP	Lc, E2	2
Passeriformes	Sylviidae	<i>Acrocephalus agricola</i> (Jerdon, 1845)	Inv	RMW	P	Lc, N2	1,2
		<i>Acrocephalus dumetorum</i> (Blyth, 1849)	Inv	RMW	P	Lc, N2	1,2
		<i>Acrocephalous stentoreus</i> (Hemprich & Ehrenberg, 1833)	Inv	RMW	OP	Lc, N2	2

		<i>Iduna caligata</i> (Lichtenstein, 1823)	Inv	RMW	P	Lc	1
		<i>Iduna rama</i> (Sykes, 1832)	Inv	RMW	P	Lc	1
		<i>Phylloscopus collybita</i> (Vieillot, 1717)	Inv	WV	P	Lc, N2	1
		<i>Phylloscopus fuscatus</i> (Blyth, 1842)	Inv	WV	P	Lc, N2	1,2
Passeriformes	Sylviidae	<i>Phylloscopus fuligiventer</i> (Hodgson, 1845)	Inv	RMW	O	Lc	2
		<i>Phylloscopus affinis</i> (Tickell, 1837)	Inv	RMW	O	Lc	1,2
		<i>Phylloscopus griseolus</i> (Blyth, 1847)	Inv	RMW	OP	Lc, N2	1,2
		<i>Phylloscopus humei</i> (Brooks, 1878)	Inv	RMW	OP	Lc	1
		<i>Phylloscopus trochiloides</i> (Sundevall, 1837)	Inv	RMW	OP	Lc	1,2
		<i>Phylloscopus nitidus</i> (Blyth, 1843)	Inv	RMW	P	DD, N2	1
		<i>Phylloscopus magnirostris</i> (Blyth, 1843)	Inv	RMW	O	Lc, N2	1,2
		<i>Phylloscopus reguloides</i> (Blyth, 1842)	Inv	RMW	O	Lc, N2	1
		<i>Phylloscopus tytleri</i> (Brooks, 1872)	Inv	RMW	O	NT, N2	2
		<i>Sylvia curruca</i> (Linnaeus, 1758)	Inv	WV	P	Lc, N2	1
		<i>Sylvia althaea</i> (Hume, 1878)	Inv	RMW	OP	Lc, N2	1
	Cisticolidae	<i>Orthotomus sutorius</i> (Pennant, 1769)	Pp	R	O	Lc	1,2
		<i>Cisticola juncidis</i> (Rafinesque, 1810)	Inv	R	OAE	Lc	2
		<i>Prinia buchanania</i> (Blyth, 1844)	Inv	R	O	Lc	2
		<i>Prinia hodgsonii</i> (Blyth, 1844)	Inv	R	O	Lc	1
		<i>Prinia sylvatica</i> (Jerdon, 1840)	Inv	R	O	Lc	1,2
Passeriformes		<i>Prinia socialis</i> (Skyes, 1832)	Inv	R	O	Lc	1,2
		<i>Prinia inornata</i> (Skyes, 1832)	Inv	R	O	Lc	1,2
	Timaliidae	<i>Turdoides malcolmi</i> (Skyes, 1832)	Pp	R	O	Lc	1
		<i>Turdoides striata</i> (Dumont, 1823)	Pp	R	O	Lc	1,2
		<i>Chrysomma sinense</i> (Gmelin, 1789)	Pp	R	O	Lc	1
	Zosteropidae	<i>Zosterops palpebrosus</i> (Temminck, 1824)	Pp	R	OP	Lc	1,2
	Sittidae	<i>Sitta castanea</i> (Lesson, 1830)	Pp	R	O	Lc	1
	Sturnidae	<i>Acridotherus tristis</i> (Linnaeus, 1766)	Pp	R	OP	Lc	1,2
		<i>Gracupica contra</i> (Linnaeus, 1758)	Pp	R	O	Lc	2



		<i>Sturnia malabarica</i> (Gmelin, 1789)	Pp	R	O	Lc	1,2
		<i>Sturnia pagodarum</i> (Gmelin, 1789)	Pp	R	O	Lc	1,2
		<i>Pastor roseus</i> (Linnaeus, 1758)	Pp	WV	P	Lc, E2	2
	Turdidae	<i>Monticola solitaries</i> (Linnaeus, 1758)	Pp	RMW	P	Lc, N2, E2	1
		<i>Zoothera citrine</i> (Latham, 1790)	Pp	R	O	Lc	1,2
		<i>Zoothera mollissima</i> (Blyth, 1842)	Pp	RMW	O	Lc, N2	1
		<i>Turdus unicolor</i> (Tickell, 1833)	Pp	RMW	O	Lc, N2	1,2
		<i>Turdus simillimus</i> (Jerdon, 1839)	Pp	RMS	O	Lc	1
	Muscicapidae	<i>Phoenicurus ochruros</i> (S.G.Gmelin, 1774)	Inv	RMW	OP	Lc, N2, E2	2
		<i>Muscicapa dauurica</i> (Pallas, 1811)	Inv	RMW	OP	Lc, N2	1,2
		<i>Muscicapa muttui</i> (Layard, 1854)	Inv	RMW	O	Lc, N2	1
		<i>Ficedula parva</i> (Bechstein, 1792)	Inv	WV	P	Lc, N2	1,2
		<i>Ficedula superciliaris</i> (Jerdon, 1840)	Inv	RMW	O	Lc, N2	1
		<i>Cyornis tickelliae</i> (Blyth, 1843)	Inv	RMW	O	Lc	1,2
		<i>Luscinia svecica</i> (Linnaeus, 1758)	Inv	RMW	H	Lc, E2	1,2
		<i>Copsychus saularis</i> (Linnaeus, 1758)	Inv	R	O	Lc	1,2
		<i>Saxicoloides fulicata</i> (Linnaeus, 1766)	Pp	R	O	Lc	2
		<i>Oenanthes fusca</i> (Blyth, 1851)	Inv	R	O	Lc	2
		<i>Saxicola torquatus</i> (Linnaeus, 1766)	Inv	RMW	OW	Lc, N2, E2	2
	Chloropseidae	<i>Chloropsis jerdoni</i> (Blyth, 1844)	F	R	O	Lc	1,2
		<i>Chloropsis aurifrons</i> (Temminck, 1829)	F	R	O	Lc	1,2
	Dicaeidea	<i>Dicaeum agile</i> (Tickell, 1833)	Pp	R	O	Lc	1,2
	Pale-billed Flowerpecker	<i>Dicaeum erythrorhychos</i> (Latham, 1790)	Pp	R	O	Lc	1,2
	Nectariniidae	<i>Cinnyris asiaticus</i> (Latham, 1790)	N	R	O	Lc	1,2
	Passeridae	<i>Passer domesticus</i> (Linnaeus, 1758)	Pp	R	C	Lc, E3	2
		<i>Gymnoris xanthocollis</i> (Burton, 1838)	Pp	R	OP	Lc	1,2
	Estrildidae	<i>Amandava amandava</i> (Linnaeus, 1758)	G	R	O	Lc	1
		<i>Lonchura punctulata</i> (Linnaeus, 1758)	G	R	O	Lc	2
		<i>Lonchura malabarica</i> (Linnaeus, 1758)	G	R	O	Lc	2
	Motacillidae	<i>Dendronanthus indicus</i> (Gmelin, 1789)	Inv	WV	P	Lc	1
		<i>Motacilla alba</i> (Linnaeus, 1758)	Inv	RMW	OP	Lc	2
		<i>Motacilla maderaspatensis</i> (Gmelin, 1789)	Inv	R	O	Lc	1,2
		<i>Motacilla citreola</i> (Pallas 1776)	Inv	RMW	P	Lc, E2	2
		<i>Motacilla falva</i> (Linnaeus, 1758)	Inv	RMW	P	Lc, E2	1,2
		<i>Motacilla cinerea</i> (Tunstall, 1771)	Inv	RMW	P	Lc, E2	2

		<i>Motacilla tschutschensis</i> (JF Gmelin, 1789)	Inv	WV	P	Lc	2
		<i>Anthus campestris</i> (Linnaeus, 1758)	Pp	WV	P	Lc, E2	2
		<i>Anthus godlewskii</i> (Taczanowski, 1876)	Pp	WV	P	Lc, E2	2
		<i>Anthus richardi</i> (Vieillot 1818)	Pp	WV	P	Lc, E2	1,2
		<i>Anthus hodgsoni</i> (Richmond 1907)	Pp	RMW	OP	Lc, E2	1
		<i>Anthus rufulus</i> (Vieillot 1818)	Pp	R	O	Lc	2
Passeriformes	Emberizidae	<i>Emberiza burniceps</i> (Brandt, 1841)	G	WV	P	Lc	2
	Emberizidae	<i>Melophus lathamii</i> (Gray, 1831)	G	R	O	Lc	2
	Fringillidae	<i>Carpodacus erythrinus</i> (Pallas, 1770)	G	RMW	OP	Lc, E2	2

## ABBREVIATION

<b>Protection Status Codes;</b>	
• <b>IUCN Convention</b>	<b>Berne</b>
Critically Endangered-CR	Appendix 2- E2
Vulnerable- VU	Appendix 3- E3
Near Threatened- NT	<b>AEWA- A</b>
Least Concern- Lc	
Data Deficient- DD	
• <b>CITIES</b>	
Appendix 2- T2	
• <b>Bonn Convention</b>	
Appendix 1- N1	
Appendix 2-N2	

<b>Faunal Type Codes;</b>
Oriental- O
Palaearctic-P
Holarctic-H
Old World-OW
Oriental-Palaearctic-OP
Oriental-Holarctic-OH
Oriental-Australasian-Ethiopian-OAE
Oriental-Australasian-Palaearctic-OAP
Palaearctic-Ethiopian-PE
Cosmopolitan- C

<b>Trophic Status Codes;</b>
Carnivores- Cr
Carrion feeder- Cv
Frugivores- F
Invertebrates feeder- Inv
Piscivores/ Invertebrates feeder- Pesci/ Inv
Polyphagous-Pp
Granivores -G

<b>Phenology Codes;</b>
Resident- R
Winter Visitor-WV
Summer Visitor-SV
Resident Migratory In Summer-RMS
Resident Migratory In Winter-RMW
Passage Migrant- P
Habitat
1. Forest
2. Countryside
3. Wetland

**Appendix 2. List of Biome-restricted birds recorded from Pench Tiger Reserve, MP India**

S. no.	Species name	Scientific name
1	Red-napped Ibis	<i>Pseudibis papillosa</i> (Temminck, 1824)
2	White-rumped Vulture	<i>Gyps bengalensis</i> (Gmelin, 1788)
3	Indian Vulture	<i>Gyps indicus</i> (Scopoli, 1786)
4	Red-headed Vulture	<i>Sarcogyps calvus</i> (Scopoli, 1786)
5	White-eyed Buzzard	<i>Butastur teesa</i> (Franklin, 1831)
6	Jungle Bush-quail	<i>Perdica asiatica</i> (Latham, 1790)
7	Painted Spurrowl	<i>Galloperdix lunulata</i> (Valenciennes, 1825)
8	Indian Peafowl	<i>Pavo cristatus</i> (Linnaeus, 1758)
9	Yellow-wattled Lapwing	<i>Vanellus malabaricus</i> (Boddaert, 1783)
10	Yellow-footed Green-pigeon	<i>Treron phoenicoptera</i> (Latham, 1790)
11	Plum-headed Parakeet	<i>Psittacula cyanocephala</i> (Linnaeus, 1766)
12	Indian Nightjar	<i>Caprimulgus asiaticus</i> (Latham, 1790)
13	Indian Grey Hornbill	<i>Ocyrceros birostris</i> (Scopoli, 1786)
14	Brown-headed Barbet	<i>Megalaima zeylanica</i> (Gmelin, 1788)
15	Lesser Goldenback	<i>Dinopium benghalense</i> (Linnaeus, 1758)
16	Ashy-crowned Sparrow-lark	<i>Eremopterix griseus</i> (Scopoli, 1786)
17	Common Woodshrike	<i>Tephrodornis pondicerianus</i> (Gmelin, 1789)
18	Black-headed Cuckooshrike	<i>Coracina melanoptera</i> , (Ruppell, 1839)
19	Small Minivet	<i>Pericrocotus cinnamomeus</i> (Linnaeus, 1766)
20	Indian Robin	<i>Saxicoloides fulicata</i> (Linnaeus, 1766)
21	Large Grey Babbler	<i>Turdoides malcolmi</i> (Sykes, 1832)
22	Jungle Babbler	<i>Turdoides striatus</i> (Dumont, 1823)
23	Ashy Prinia	<i>Prinia socialis</i> (Sykes, 1832)
24	Jungle Prinia	<i>Prinia sylvatica</i> (Jerdon, 1840)
25	White-browed Fantail	<i>Rhipidura aureola</i> (Lesson, 1830)
26	Chestnut-tailed Starling	<i>Sturnus malabaricus</i> (Gmelin, 1789)
27	Brahminy Starling	<i>Sturnus pagodarum</i> (Gmelin, 1789)
28	White-bellied Drongo	<i>Dicrurus caerulescens</i> (Linnaeus, 1758)

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