

## Full Length Research Article

### AVIFAUNAL DIVERSITY OF MANDI DISTRICT, HIMACHAL PRADESH, INDIA

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#### ABSTRACT

The avifaunal diversity at six study sites (Sundernagar, Rewalsar, Maloh-Bandli WLS, Jogindernagar, Barot and Tattapani) of Mandi district in Himachal Pradesh was explored during 2008 (monsoon summer), 2009 (monsoon summer) and 2011 (spring). In total, 94 species of birds belonging to 12 orders and 30 families were recorded (38: Sundernagar, 28: Rewalsar, 22: Maloh-Bandli WLS, 28: Barot, 35: Jogindernagar, 58: Tattapani). The highest number of species were found in order Passeriformes (58) 61.7% followed by Piciformes (6) 6.3% and Columbiformes (6) 6.3% and least number (1) 1.0% in other 3 orders. The highest number of species were found in family Muscicapidae (12) 12.7% followed by Corvidae (10) 10.6% and Silviidae (8) 8.5% and least number (1) 1.0% in other 11 families. The relative abundance of species was Very Common (10), Common (31), Uncommon (44) and Rare (9). The total number of species observed in two seasons were Spring (56) and Monsoon Summer (65). Twelve species were found further additions to birdlist of Mandi district. The rare species Brown-capped Pygmy Woodpecker *Dendrocopos nanus* was also reported. One globally threatened (IUCN status) species Egyptian Vulture *Neophron percnopterus* was found to have relative abundance as Uncommon.

**Key words:** Avifaunal, Diversity, Birds, Mandi, District, Himachal Pradesh.

#### INTRODUCTION

There are about 10,000 living species of birds in the world. Birds are diverse in nature and vary in their habitats, diversity, abundance and distribution throughout the world. They have usually more diversity in tropics than temperate, alpine or polar regions. Their habitat preferences are more or less specialized. They occupy variable trophic levels in food webs from consumers to top predators. They vary in their abundance, as some species occur in huge numbers while others are represented by few individuals only. Some birds have small breeding ranges in particular region or biome only whereas others undertake long distance annual migrations throughout the world. Their distribution reflects many other wildlife groups. They are economically important for pest control. Birds serve as valuable indicators of changes in biodiversity and environment of the world (Bird Life International, 2015). India has more than 1250 species of birds (Grimmett *et al.*, 1999; Kazmierczak and Perlo, 2000). Himachal Pradesh has more than 500 to 600 species of birds (Ali and Ripley 1968-1999; Singh *et al.*, 1990; Grimmett and Inskipp, 2003; Besten 2004; Mahabal 2005; Thakur and Mattu 2012; Singh, 2015). Some of the checklists of birds of Himachal Pradesh are as follows: Ali and Ripley (1968-1999) mentioned about birds recorded in Himachal Pradesh in their book "Handbook of Birds of India and Pakistan, together with

those of Bangladesh, Nepal, Bhutan and Srilanka-10 Vols". Singh *et al.* (1990) enlisted about 358 species of birds from 2 National Parks and 29 Wildlife Sanctuaries in Himachal Pradesh. Grimmett and Inskipp (2003) enlisted about 572 species in Himachal Pradesh in their book "Birds of Northern India". Besten (2004) reported 555 species of birds in Kangra in his book "Birds of Kangra" including previous lists of Hingston (1921), Whister (1926), Panday (1987) and other sources. Mahabal (2005) made a systematic list of 447 species of birds recorded in Himachal Pradesh in publication of Zoological Survey of India as "Fauna of Western Himalaya, Part -2". Thakur and Mattu (2012) reported 322 species in their book "Birds of Himachal Pradesh". The author (Singh, 2015) recorded 308 species (study carried out during 2007 to 2012) in his book "Birds Recorded during a Study in Himachal Pradesh".

The avifauna of Mandi district has been studied in past by some workers (Mahabal and Mukherjee, 1991; Mehta *et al.*, 2003; Thakur *et al.*, 2003; Mahabal, 2005; Thakur *et al.*, 2010). Mahabal and Mukherjee (1991) reported 70 species of birds in Mandi district. Mehta *et al.* (2003) recorded 121 species in Balh Valley of Mandi district. Thakur *et al.* (2003) reported 123 species in Balh Valley of Mandi district. Mahabal (2005) made a systematic list of 134 species in Mandi district (studies during March 1990 and October 1994). Thakur *et al.* (2010) reported 102 species in Sarkaghat valley of Mandi district.

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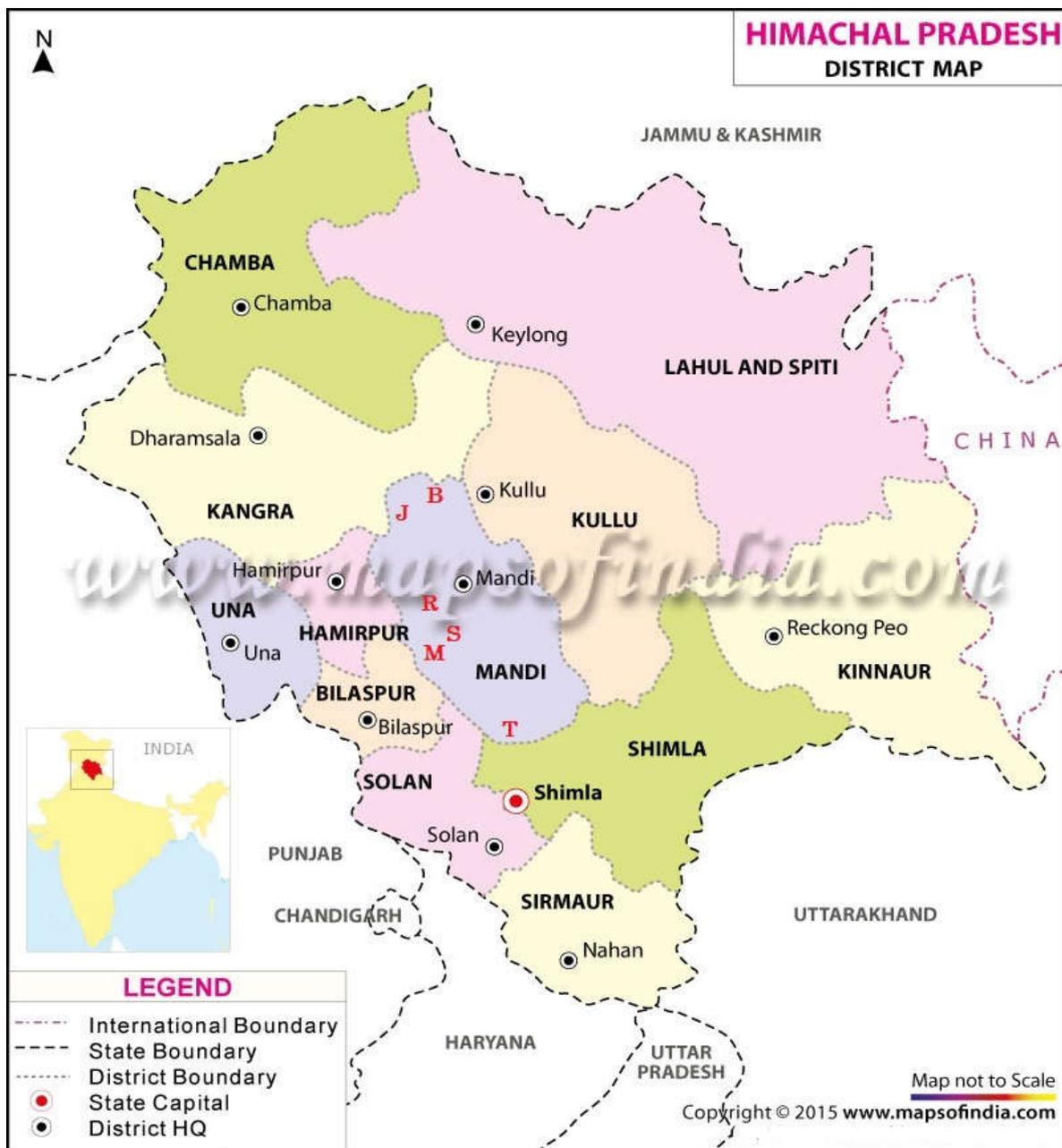
Despite these works, some areas of Mandi district remained unexplored, therefore present study was undertaken. A preliminary checklist of this area has already been reported by author (Singh, 2011, 2015) and present study aims to give further information about relative abundance, season of observation and habitat of birds.

## MATERIALS AND METHODS

### Study Area

Mandi district ( 31°13' 50" to 32°4' 30" N, 76°37'20" to 77°23'15" E) lies in Humid sub-tropical zone ( lower elevations) and Wet sub-temperate or Humid sub-temperate zone (higher elevations) of Himalayas in Himachal Pradesh. It has almost central position and is bounded by Kangra, Kullu, Shimla, Solan, Hamirpur and Bilaspur districts of Himachal Pradesh (Figure 1).

Mandi district receives higher rainfall in the state with an average annual precipitation of 2000 mm. Sundenagar is known for BBMB (Bhakhra Beas Management Board) project of Government of India. Rewalsar is famous for Rewalsar Lake (735 m shoreline) with floating islands and as sacred place of three religions (Hindu, Sikh and Buddhist). Barot is a tourist place in small valley on bank of river Uhl and reservoir. It has surroundings of deodar, oak forests and is way to Nargu Wildlife Sanctuary. Maloh is a small village in proximity of Bandli Wildlife Sanctuary. Bandli Wildlife Sanctuary (760 m-2160 m) has temperature range of 1<sup>0</sup> C (winter) to 35<sup>0</sup> C (summer) with an average annual rainfall of 1520 mm. Jogindernagar is famous for 3 hydroelectric power stations and adventurous sports. Tattapani is a tourist place situated on the bank of river Satluj. It is famous for natural hot water springs and as one of the hottest places of Mandi district. (Balokhra, 2010; Wikipedia, 2015).



(Map Source: www.mapsofindia.com)

Figure 1. Map showing location of study sites (S: Sundernagar, R: Rewalsar, M: Maloh-BandliWLS, J: Jogindernagar, B: Barot, T: Tattapani) in Mandi district of Himachal Pradesh

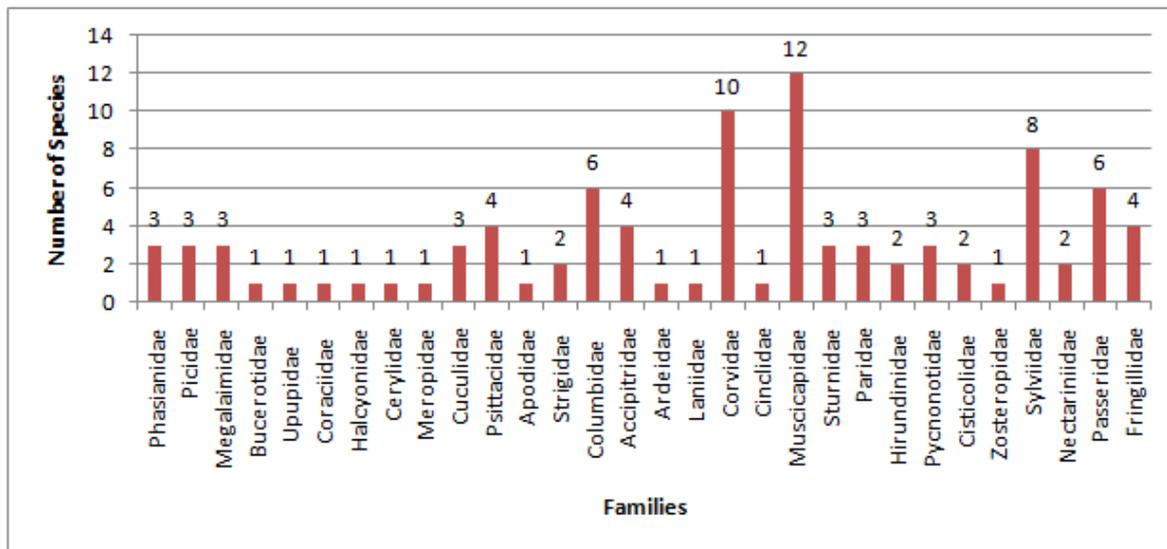


Figure 2. Family-wise distribution of bird species in Mandi district

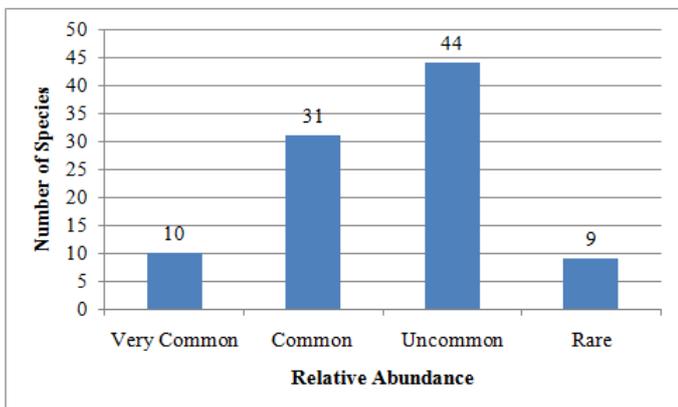


Figure 3. Relative Abundance of bird species in Mandi district

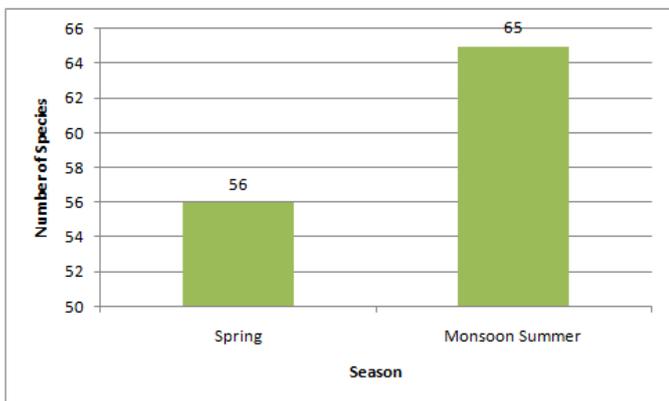


Figure 4. Season of observation of bird species in Mandi District

Rewalsar lake and surroundings; 1200 m- Maloh village including a part of Bandli Wildlife Sanctuary area; 1850 m- Barot village surroundings ; 1050 m- Jogindernagar town surroundings; and 670 m-Tattapani including Randole, Baldi, Thali and Jyori). From central point of Sundernagar, distances of these sites are: 28 km (Rewalsar), 8 km (Maloh-Bandli Wildlife Sanctuary), 96 km (Jogindernagar), 136 km (Barot) and 118 km (Tattapani).



Figure 5. Brown-capped Pygmy Woodpecker *Dendrocopos nanus* (Tattapani)

**Methods**

Because of large area of study sites, stratified sampling technique was adopted to include all different kinds of habitats of study area by selecting a representative sample of each habitat. Each site was searched along routes of roads, paths and other accessible ways in the periphery of about 3-5 km. Six study sites of Mandi district were covered during 2008 monsoon summer (Sundernagar, Rewalsar and Maloh-Bandli Wildlife Sanctuary), 2009 monsoon summer (Jogindernagar and Barot) and 2011 spring (Tattapani). Minimum 2-3 days were given to each site during any visit.

The vegetation and habitats of study area mainly consists of subtropical broadleaved forests, coniferous (pine) forests (lower elevations), temperate mixed (deodar, ban, oak etc.) forests (higher elevations), scrubs, streams, rivers, bushes, gardens, grassy slopes and agricultural lands. The sites located within an altitudinal range of about 670 meters to 1850 meters above mean sea level were selected for observation of birds: (1150 m- Sundernagar including BBMB colony , Trambli, Kanody forest and Keran area ; 1350 m- Rewalsar including

Table . Systematic List of bird of Mandi District

SN	Common and Scientific Names (with orders and families)	Study Sites	Habitats	Season	Rel. Abu.
GALLIFORMES					
Phasianidae					
1	Black Francolin <i>Francolinus francolinus</i>	J, T	GS, SI	PS	UC
2	Red Jungle Fowl <i>Gallus gallus</i>	S, T	MF, Bu	P	C
3	Kalij Pheasant <i>Lophura leucomelanos</i>	S		S	C
PICIFORMES					
Picidae					
4	Brown-capped Pygmy Woodpecker <i>Dendrocopos nanus</i>	T	Gr	P	SC
5	Brown-fronted Woodpecker <i>Dendrocopos auriceps</i>	S, R	CF	S	C
6	Fulvous-breasted Woodpecker <i>Dendrocopos macei</i>	S, M	BF, Gr	S	UC
Megalaimidae					
7	Great Barbet <i>Megalaima virens</i>	M, B, T	MF, Gr	PS	C
8	Brown-headed Barbet <i>Megalaima zeylanica</i>	T	Gr, Ga, Al	P	UC
9	Blue-throated Barbet <i>Megalaima asiatica</i>	S, J	Gr, Ga	S	UC
BUCEROTIFORMES					
Bucerotidae					
10	Indian Grey Hornbill <i>Ocyroceros birostris</i>	T	Gr, Al	P	UC
UPUIFORMES					
Upupidae					
11	Common Hoopoe <i>Upupa epops</i>	S,T	La, Ga, Al	PS	UC
CORACIIFORMES					
Coraciidae					
12	Indian Roller <i>Coracias benghalensis</i>	T	OA	P	SC
Halcyonidae					
13	White-throated Kingfisher <i>Halcyon smyrnensis</i>	S, R, J, T	St, Lk, Ri	PS	C
Cerylidae					
14	Crested Kingfisher <i>Megaceryle lugubris</i>	B, J	St	S	UC
Meropidae					
15	Green Bee-eater <i>Merops orientalis</i>	T	St, Gr, He	P	C
CUCULIFORMES					
Cuculidae					
16	Pied Cuckoo <i>Clamator jacobinus</i>	S	Al	S	SC
17	Eurasian Cuckoo <i>Cuculus canorus</i>	J	Ga	P	SC
18	Asian Koel <i>Eudynamis scolopacea</i>	J, T	Ga, Gr	PS	UC
PSITTACIFORMES					
Psittacidae					
19	Alexandrine Parakeet <i>Psittacula eupatria</i>	T	Al, Ga	P	UC
20	Rose-ringed Parakeet <i>Psittacula krameri</i>	J	Ga, Al	S	C
21	Slaty-headed Parakeet <i>Psittacula himalayana</i>	B	MF, Ga	S	UC
22	Plum-headed Parakeet <i>Psittacula cyanocephala</i>	T	Ga, Al	P	C
APODIFORMES					
Apodidae					
23	House Swift <i>Apus affinis</i>	J	HH	S	UC
STRIGIFORMES					
Strigidae					
24	Asian Barred Owllet <i>Glaucidium cuculoides</i>	R, J,T	CF, Gr	PS	UC
25	Spotted Owllet <i>Athene brama</i>	T	Gr	P	SC
COLUMBIFORMES					
Columbidae					
26	Rock Pigeon <i>Columba livia</i>	S, R, M, B, J, T	HH, Al, Ga	PS	VC
27	Oriental Turtle Dove <i>Streptopelia orientalis</i>	B	Ga, MF	S	UC
28	Laughing Dove <i>Streptopelia senegalensis</i>	T	Sl, La, Al	P	UC
29	Spotted Dove <i>Streptopelia chinensis</i>	S, R, M, J, T	Al, HH, Ga, Gr	PS	C
30	Eurasian Collared Dove <i>Streptopelia decaocto</i>	R,T	La,	PS	C
31	Yellow-footed Green Pigeon <i>Treron phoenicoptera</i>	T	Al	P	UC
CICONIIFORMES					
Accipitridae					
32	Black Kite <i>Milvus migrans</i>	S, R, M, J, T	Ga, Gr, DS, St, OA, HH	PS	C
33	Egyptian Vulture <i>Neophron percnopterus</i>	T	Ri	P	SC
34	Himalayan Griffon <i>Gyps himalayensis</i>	T	Ri	P	UC
35	Shikra <i>Accipiter badius</i>	T	Gr	P	UC
Ardeidae					
36	Indian Pond Heron <i>Ardeola grayii</i>	R	Lk	S	UC
PASSERIFORMES					
Laniidae					
37	Long-tailed Shrike <i>Lanius schach</i>	S, M, J, T	Sl, Al	PS	UC
Corvidae					
38	Black-headed Jay <i>Garrulus lanceolatus</i>	M	MF, Gr	S	UC
39	Red-billed Blue Magpie <i>Urocissa erythrorhyncha</i>	S,T	Gr, MF	PS	C
40	Rufous Treepie <i>Dendrocitta vagabunda</i>	S	Gr, BF, Al	S	C
41	Grey Treepie <i>Dendrocitta formosae</i>	R, M, B, J	MF, Gr, Al	S	C
42	Large-billed Crow <i>Corvus macrorhynchos</i>	S, R, M, B, J, T	HH, Al, Gr, MF	PS	VC

Continue.....

43	Long-tailed Minivet <i>Pericrocotus ethologus</i>	B	MF	S	UC
44	White-throated Fantail <i>Rhipidura albicollis</i>	S	Bu, BF	S	UC
45	Black Drongo <i>Dicrurus macrocercus</i>	S, T	Sl, Al	S	C
46	Ashy Drongo <i>Dicrurus leucophaeus</i>	J	Gr, Ga	S	C
47	Asian Paradise-flycatcher <i>Terpsiphone paradise</i> Cinclidae	T	Gr, Ga	P	UC
48	Brown Dipper <i>Cinclus pallasii</i> Muscicapidae	B	St	S	UC
49	Blue Whistling Thrush <i>Myophonus caeruleus</i>	S, R, B, J, T	St, Ri, MF	PS	VC
50	Dark-throated Thrush <i>Turdus ruficollis</i>	T	Gr	P	UC
51	Dark-sided Flycatcher <i>Muscicapa sibirica</i>	M	MF	S	SC
52	Verditer Flycatcher <i>Eumyias thalassina</i>	S, R, M	MF, Gr	S	UC
53	Rufous-bellied Niltava <i>Niltava sundara</i>	B	Bu	S	SC
54	Oriental Magpie Robin <i>Copsychus saularis</i>	S, R, J, T	Ga, La	PS	C
55	Indian Robin <i>Saxicoloides fulicata</i>	S, R, J, T	Bu, Sl	PS	C
56	White-capped Water Redstart <i>Chaimarrornis leucocephalus</i>	J, T	St, Ri	PS	UC
57	Plumbeous Water Redstart <i>Rhyacornis fuliginosus</i>	B, T	St, Ri	PS	C
58	Common Stonechat <i>Saxicola torquata</i>	T	Sl, He	P	UC
59	Pied Bushchat <i>Saxicola caprata</i>	T	Sl, He	P	C
60	Grey Bushchat <i>Saxicola ferrea</i> Sturnidae	R, B	Sl, He	S	C
61	Brahminy Starling <i>Sturnus pagodarum</i>	S	La, Ga	S	UC
62	Common Myna <i>Acridotheres tristis</i>	S, R, M, B, J, T	HH, Ga, Al, La, Sl	PS	VC
63	Jungle Myna <i>Acridotheres fuscus</i> Paridae	J	La, Al	S	C
64	Great Tit <i>Parus major</i>	S, R, M, B, J, T	Ga, Gr, CF, MF, Sl, Al	PS	VC
65	Green-backed Tit <i>Parus monticolus</i>	S, B, M	MF, Bu	S	UC
66	Black-lored Tit <i>Parus xanthogenys</i> Hirundinidae	S, B	MF, Bu	S	UC
67	Plain Martin <i>Riparia paludicola</i>	T	Ri	P	C
68	Barn Swallow <i>Hirundo rustica</i> Pycnonotidae	R	HH, OA	S	UC
69	Himalayan Bulbul <i>Pycnonotus leucogenys</i>	S, R, M, B, J, T	Sl, MF, CF, BF, Bu, Al	PS	VC
70	Red-vented Bulbul <i>Pycnonotus cafer</i>	S, R, M, J, T	Sl, Bu, BF	PS	C
71	Black Bulbul <i>Hypsipetes leucocephalus</i> Cisticolidae	B, T	MF, Gr	P	UC
72	Striated Prinia <i>Prinia criniger</i>	R, J, T	Bu, He, GS	PS	C
73	Grey-breasted Prinia <i>Prinia hodgsonii</i> Zosteropidae	S, R, M, J, T	He, Bu	PS	C
74	Oriental White Eye <i>Zosterops palpebrosus</i> Sylviidae	S, R, M, B, J, T	MF, BF, Gr	PS	VC
75	Common Tailorbird <i>Orthotomus sutorius</i>	S, R, J, T	Ga, Bu	PS	UC
76	Grey-hooded Warbler <i>Seicercus xanthoschistos</i>	S, R, M, B, J, T	BF, MF, Bu, Ga, Gr, Sl	PS	VC
77	Streaked Laughingthrush <i>Garrulax lineatus</i>	S, R, B, J	MF, Ga	S	C
78	Black-chinned Babbler <i>Stachyris pyrrhops</i>	S	Bu	S	UC
79	Yellow-eyed Babbler <i>Chrysomma sinense</i>	T	He, Bu	P	UC
80	Common Babbler <i>Turdoides caudatus</i>	T	He,	P	UC
81	Jungle Babbler <i>Turdoides striatus</i>	S, M, J, T		PS	VC
82	Whiskered Yuhina <i>Yuhina flavicollis</i> Nectariniidae	B	Bu, MF	S	UC
83	Purple Sunbird <i>Nectarinia asiatica</i>	T	Sl	P	C
84	Crimson Sunbird <i>Aethopyga siparaja</i> Passeridae	M, J	Ga	S	UC
85	House Sparrow <i>Passer domesticus</i>	S, R, M, B, J, T	HH, La, Bu	PS	VC
86	White Wagtail <i>Motacilla alba</i>	B	St	S	C
87	Grey Wagtail <i>Motacilla cinerea</i>	R, B, J, T	St, Ri	S	C
88	Paddyfield Pipit <i>Anthus rufulus</i>	T	La	P	UC
89	Long-billed Pipit <i>Anthus similis</i>	S	Sl	S	SC
90	Scaly-breasted Munia <i>Lonchura punctulata</i> Fringillidae	S, B	He, La	S	C
91	Fire-fronted Serin <i>Serinus pusillus</i>	T	La, Ga	P	UC
92	Yellow-breasted Greenfinch <i>Carduelis spinoides</i>	B	Ga, Al, Sl	S	UC
93	European Goldfinch <i>Carduelis carduelis</i>	T	Ga, La	P	UC
94	White-capped Bunting <i>Emberiza stewarti</i>	T	La, Ga	P	UC

The observations were done during morning (7.00-11.00 hrs) and evening times (15.00-17.00 hrs) in sufficient sunlight at local time. The relative abundance of bird species was estimated on the basis of frequency of sightings and number of birds seen. The birds were observed visually by binocular (7x35mm) and sometimes photographed for aid in identification by digital camera (12x optical zoom). The birds were identified with the help of field guides: *Pocket Guide to the Birds of the Indian Subcontinent* (Grimmett et al., 1999); and *A Field Guide to the Birds of India, Srilanka, Pakistan, Nepal, Bhutan, Bangladesh and the Maldives*

(Kazmierczak and Perlo, 2000) Nomenclature and classification follows *An Annotated Checklist of the Birds of the Oriental Region* (Inskipp et al., 1996).

## RESULTS AND DISCUSSION

In total, 94 species of birds belonging to 12 orders and 30 families were observed (Table). The total number of species found in 30 families were (Table, Figure 2): Phasianidae (3) 3.1%, Picidae (3) 3.1%, Megalaimidae (3) 3.1%, Bucerotidae (1) 1.0%, Upupidae (1) 1.0%, Coraciidae (1) 1.0%,



Figure 6. Dark-sided Flycatcher *Muscipapa sibirica* (Maloh-Bandli Wildlife Sanctuary)



Figure 7. Long-billed Pipit *Anthus similis* (Sundernagar)



Figure 8. Pied Cuckoo *Clamator jacobinus* -Juvenile (Sundernagar)

Halcyonidae (1) 1.0%, Cerylidae (1) 1.0%, Meropidae (1) 1.0%, Cuculidae (3) 3.1%, Psittacidae (4) 4.2%, Apodidae (1) 1.0%, Strigidae (2) 2.1%, Columbidae (6) 6.3%, Accipitridae (4) 4.2%, Ardeidae (1) 1.0%, Laniidae (1) 1.0%, Corvidae (10)

10.6%, Cinc000000lidae (1) 1.0%, Muscipapidae (12) 12.7%, Sturnidae (3) 3.1%, Paridae (3) 3.1%, Hirundinidae (2) 2.1%, Pycnonotidae (3) 3.1%, Cisticolidae (2) 2.1%, Zosteropidae (1) 1.0%, Silviidae (8) 8.5%, Nectariniidae (2) 2.1%, Passeridae (6) 6.3% and Fringillidae (4) 4.2%.

The highest number of species were found in order Passeriformes (58) 61.7% followed by Piciformes (6) 6.3% and Columbiformes (6) 6.3% and least number (1) 1.0% in other 3 orders. The highest number of species were found in family Muscipapidae (12) 12.7% followed by Corvidae (10) 10.6% and Silviidae (8) 8.5% and least number (1) 1.0% in other 11 families (Table).

The relative abundance (Table, Figure 3) of species was Very Common (10), Common (31), Uncommon (44) and Rare (9). The highest number of species were found in uncommon followed by common, very common and rare.

The total number of species found in two seasons (Table, Figure 4) were Spring (56) and Monsoon Summer (65). Thus, monsoon summer was dominant for bird diversity than spring. The total number of species found in six study sites were (Table): 38 (Sundernagar), 28 (Rewalsar), 22 (Maloh-Bandli WLS), 28 (Barot), 35 (Jogindernagar) and 58 (Tattapani). Of 94 species, 10 species (Rock Pigeon, Spotted Dove, Black Kite, Large-billed Crow, Common Myna, Great Tit, Himalayan Bulbul, Oriental White Eye, Grey-hooded Warbler and House Sparrow) were found common in all study sites (Sundernagar, Rewalsar, Malo-BandliWLS, Barot, Jogindernagar and Tattapani). This shows that these species have common occurrence in Mandi district.

Of 94 species, 82 species were found common with previous records of Mandi district (Mahabal and Mukherjee, 1991; Mehta *et al.*, 2003; Thakur *et al.*, 2003; Mahabal, 2005; Thakur *et al.*, 2010) and remaining 12 species [Brown-capped Pygmy Woodpecker, Indian Grey Hornbill, Indian Roller, Crested Kingfisher, Ashy Drongo, Brown Dipper, Dark-sided Flycatcher (Figure 6), Grey-breasted Prinia, Paddy field Pipit, Long-billed Pipit (Figure 7), Fire-fronted Serin and European Goldfinch] were found further additions to bird list of Mandi district. The occurrence of an interesting species Pied Cuckoo *Clamator jacobinus* in juvenile form (Figure 8) indicates its breeding status in that area (Sundernagar, 26 August 2008). One of the rare species Brown-capped Pygmy Woodpecker *Dendrocopos nanus* (Figure 5) was also reported (Tattapani). One globally threatened (IUCN status) species Egyptian Vulture *Neophron percnopterus* was found to have relative abundance as Uncommon and thus, have scope of conservation in this area.

#### Abbreviations

#### Table

SN: Serial Number, Rel. Abu.: Relative Abundance

#### Season

P: Spring (March to April), S: Monsoon Summer (July to August)

### Study Sites

S: Sundernagar, R: Rewalsar, M: Maloh (Bandli Wildlife Sanctuary), J: Jogindernagar, B: Barot, T: Tattapani

### Relative Abundance

VC: Very Common (Abundant number of sightings/ Sightings in 80-100 % of field visits)/Abundant number of birds seen

C: Common (Regular sightings but less than VC/ Sightings in 50-79 % of field visits)/Moderate number of birds seen

UC: Uncommon (Occasional sightings/ Sightings in 6-49 % of field visits)/Less number of birds seen

SC: Scarce/ Rare (Hardly visible/ Sightings in 1-5 % of field visits)/ Few birds seen

### Habitats

Al: Agricultural Land, Sl: Scrub Land, MF: Mixed Forest (temperate broadleaved and coniferous- ban, oak, deodar etc), BF: Broadleaved Forest (subtropical), CF: Coniferous Forest (pine), HH: Human Habitations, Ga: Garden, Gr: Grove, GS: Grassy slope, DS: Dumping Site, OA: Open Area, He: Herb, Bu: Bush, Ri/St: River/Stream, Lk: Lake, La: Lawn, Ro/So: Rock/Stone.

### REFERENCES

- Ali, S. and Ripley, S.D. 1968-1999. Handbook of Birds of India and Pakistan, together with those of Bangladesh, Nepal, Bhutan and Srilanka, 10 Vols. New Delhi: Oxford University Press.
- Balokhra, J.M. 2010. The Wonderland Himachal Pradesh. New Delhi: H.G. Publications.
- Besten, den J.W. 2004. Birds of Kangra. Dharamsala, Himachal Pradesh: Moonpeak Publishers.
- BirdLife International, 2015. Birds help us understand the natural world. Birds are very useful indicators for other kinds of biodiversity. Available: <http://www.birdlife.org/datazone/sowb/introduction/INTR02/> <http://www.birdlife.org/datazone/sowb/casestudy/79>, (Checked September 2015)
- Grimmett, R., Inskipp, C. and Inskipp, T. 1999. Pocket guide to the Birds of the Indian Subcontinent. New Delhi: Oxford University Press.
- Grimmett, R. and Inskipp, T. 2003. Birds of Northern India. New Delhi: Oxford University Press.
- Inskipp, T., Lindsey, N. and Duckworth, W. 1996. An Annotated Checklist of the Birds of the Oriental Region. Sandy, U.K.: Oriental Bird Club.
- Kazmierczak, K. and van Perlo, B. 2000. A Field Guide to the Birds of the India, Srilanka, Pakistan, Nepal, Bhutan, Bangladesh and the Maldives. New Delhi: OM Book Service.
- Mahabal, A. and Mukherjee, R. 1991. Birds of Mandi district (Himachal Pradesh). Newsletter for Birdwatchers, 31(1 and 2), 8-9.
- Mahabal, A. 2005. Aves. In: The Director (Ed.), Fauna of Western Himalaya (Part-2) (pp.275-339). Kolkata: Zoological Survey of India.
- Mehta, H.S., Paliwal, R. and Thakur, M.L. 2003. Birds of Balh Valley. Newsletter for Birdwatchers, 43(4), 56-57.
- Singh, D. 2011. Investigation on the Avian Biodiversity of Himachal Pradesh. Ph.D. Thesis, Kukulshetra, India: Kurukshetra University.
- Singh, D. 2015. Birds Recorded during a Study in Himachal Pradesh. New Delhi: Renu Publishers.
- Singh, S., Kothari, A., and Pande, P. (Eds.) 1990. Directory of National Parks and Sanctuaries in Himachal Pradesh: Management Status and Profiles. New Delhi: Indian Institute of Public Administration, (Environmental Studies Division).
- Thakur, M.L., Mattu, V.K., Mattu, N., Sharma, V.N., Bhardwaj, R. and Thakur, V. 2010. Bird Diversity in Sarkaghat Valley, Mandi (Himachal Pradesh), India. Asian J. Exp. Biol. Sci. 1 (4), 940-950.
- Thakur, M.L., Paliwal, R., Tak, P.C. and Mattu, V.K. 2003. Birds of Balh Valley, District Mandi, Himachal Pradesh, India. Annals of Forestry 11 (1), 113-126.
- Wikipedia, 2015. Sundernagar, Rewalsar Lake, Barot, Jogindernagar Available: [https://en.wikipedia.org/wiki/Sunder\\_Nagar/Rewalsar\\_Lake/Barot/Jogindernagar](https://en.wikipedia.org/wiki/Sunder_Nagar/Rewalsar_Lake/Barot/Jogindernagar) (Checked September 2015).

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