



RESEARCH ARTICLE

Avifaunal Diversity of Hamirpur District, Himachal Pradesh, India

Diljeet Singh

Department of Zoology, Government College Shahpur (Kangra), Himachal Pradesh, India- 176206.

Manuscript Info

Manuscript History:

Received: 15 October 2015

Final Accepted: 26 November 2015

Published Online: December 2015

Key words:

Avifaunal, Diversity, Birds,
Hamirpur, District, Himachal
Pradesh

*Corresponding Author

Diljeet Singh

Abstract

The avifaunal diversity at four study sites (Nadaun, Jihan Forest, Sujanpur and Hamirpur) of Hamirpur district in Himachal Pradesh was explored during 2007-2009 (monsoon summer) and 2015 (autumn). In total, 100 species of birds belonging to 11 orders and 31 families were recorded (Nadaun: 63, Jihan Forest: 63, Sujanpur: 53 and Hamirpur: 53). The highest number of species were found in order Passeriformes (58) 59.1% followed by Ciconiiformes (12) 12.2% and Piciformes (8) 8.1% and least number (1) 1.0% in other 3 orders. The highest number of species were found in family Corvidae (14) 13.2% followed by Muscicapidae (12) 12.2% and Passeridae (9) 9.1% and least number (1) 1.0% in other 13 families. The relative abundance of species was Very Common (23), Common (24), Uncommon (40) and Rare (13). The seasonal status of species was Monsoon Summer (76) and Autumn (64). One globally threatened (IUCN status) species Egyptian Vulture *Neophron percnopterus* was also reported.

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Introduction

There are about 10,000 living species of birds in the world. Birds vary in their habitats, diversity, abundance and distribution throughout the world. Birds are more or less specialized in their habitats. More diversity is often found in tropics than temperate, alpine or polar regions. Abundance is also variable as some bird species occur in small numbers whereas others are represented by huge numbers. Some species have small breeding ranges restricted to particular region only while others undertake long distance annual migrations throughout the world. They occupy variable trophic levels in food webs from consumers to top predators. During the last few decades, bird species have faced increased rate of threat or extinction due to various kinds of human activities. More than 150 bird species have become extinct in the last 500 years. Due to human interferences like infrastructural developments, pollution, unsustainable agricultural practices, overexploitation of some species, climate changes, introduction of invasive alien species, forest loss, degradation, fragmentation and loss of habitats of birds have caused significant decline in biodiversity. Therefore, studies on bird diversity can provide valuable information about monitoring of biodiversity and environment of the world at local, national and global level (BirdLife International, 2015).

India has more than 1250 species of birds (Grimmett et al. 1999; Kazmierczak and Perlo, 2000). Himachal Pradesh has in its credit 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) compiled a list of about 358 species from 2 National Parks and 29 Wildlife Sanctuaries of 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 in Kangra in his book "Birds of

Kangra”. Mahabal (2005) made a systematic list of 447 species found 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”. 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 Hamirpur district has been studied in past by few workers (Mahabal, 1996, 2005) and that of adjoining Kangra district also (Besten, 2004). Mahabal (1996) studied the birds of Siwalik Himalaya and recorded 136 species from Bilaspur, Hamirpur and Una districts. Mahabal (2005) made a systematic list of 148 species found in Hamirpur district. Despite these works, some areas of Hamirpur district were unattended; therefore present study was undertaken. A preliminary checklist of this area has already been reported by author (Singh, 2011, 2015) and present study comes with further additions, information about relative abundance, habitat and seasonal status of birds.

Material and Methods

Study Area

Hamirpur district (31°52 to 31°58 N, 76°18 to 76° 44 E) lies in Humid-subtropical zone of Shiwalik Himalaya in Himachal Pradesh. It is bounded by Kangra, Bilaspur, Mandi and Una districts of Himachal Pradesh (Fig.1). The elevation of district varies from 400 meters to 1100 meters above mean sea level and has flat to hilly terrain. Hamirpur is the smallest district of Himachal Pradesh and has an area of 1118 km². The temperature of district varies from 0⁰ C (winter) to 40⁰ C (summer). Hamirpur district has three principal ranges (Jakh Dhar, Kali Dhar and Sola Singhi Dhar) of which ‘Sola Singhi Dhar’ is the longest range of tract. Hamirpur town is district headquarter and has become educational hub during the last few years due to establishment of various institutions. Sujanpur is situated on bank of river Beas and is known for old temples and forts at Tira and Sujanpur. A large fair (Holi) is held at Chaugan of Sujanpur every year. Nadaun is also situated on bank of river Beas and is known for Mahadev temple founded by Pandavas. Jihan village is known for Jihan Demarcated Protected Forest (subtropical broadleaved forest mainly consists of Acacia and Dalbergia sp. with other species also). (Balokhra, 2010; Wikipedia, 2015).

The vegetation and habitats of study area mainly consist of subtropical broadleaved forests, coniferous (pine) forests, streams, rivers, scrubs, grasses, bushes and agricultural lands. The sites located within an altitudinal range of about 500 meters to 800 meters above mean sea level were selected for observation of birds: 800 m- Hamirpur town including Hira Nagar, Loharda, Dagredi, Lahladi, Baru and nearby areas; 500 m- Nadaun including Beas river, Bharoli, Katoi, Kopra and nearby areas; 600 m- Jihan Demarcated Protected Forest including Jihan, Badetar, Bhou, Bagdu and nearby areas; 560-700 m- Sujanpur town including Bear river, Tira and nearby areas. From central point of Hamirpur, distances of other sites are: 26 km (Nadaun), 23km (Sujanpur), 45 km (Jihan Forest). (Google Maps, 2015).

Methods

Because of large area, 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. These study sites were covered earlier in 3 visits during 2007, 2008, 2009 (monsoon summer) and recently in 2015 (autumn). Minimum 2-3 days were given to each site during any visit. The observations were done during morning (7.00-11.00 hrs) and evening times (15.00-17.30 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 seasonal status of bird species was evaluated on the basis of presence or absence of birds during two different seasons of year. The birds were observed visually by binocular (10x25 mm) and sometimes photographed for aid in identification by digital cameras (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, 100 species of birds belonging to 11 orders and 31 families were observed. The total number of species found in 31 families were (Table, Fig. 2): Phasianidae (5) 5.0%, Picidae (4) 4.0%, Magalaimidae (4) 4.0%, Bucerotidae (1) 1.0%, Upupidae (1) 1.0%, Coraciidae (1) 1.0%, Halcyonidae (1) 1.0%, Meropidae (1) 1.0%, Cuculidae (4) 4.0%, Psittacidae (2) 2.0%, Strigidae (1) 1.0%, Columbidae (4) 4.0%, Scolopacidae (1) 1.0%,

Burhinidae(1) 1.0%, Charadriidae (3) 3.0%, Accipitridae (3) 3.0%, Phalacrocoracidae (1) 1.0%, Ardeidae (3) 3.0%, Laniidae (1) 1.0%, Corvidae (14)14.0 %, Muscicapidae (12) 12.0%, Sturnidae (3)3.0%, Paridae (1) 1.0%, Hirundinidae (3) 3.0%, Pycnonotidae (3) 3.0%, Cisticolidae (2) 2.0%, Zosteropidae (1) 1.0%, Sylviidae (6) 6.0%, Alaudidae (1) 1.0%, Nectariniidae (3) 3.0% and Passeridae (9)9.0%.

The highest number of species were found in order Passeriformes (58) 58.0% followed by Ciconiiformes (12)12.0% and Piciformes (8) 8.0% and least number (1) 1.0% in other 3 orders. The highest number of species were found in family Corvidae (14) 14.0% followed by Muscicapidae (12) 12.0% and Passeridae (9) 9.0% and least number (1) 1.0% in other 13 families (Table).

The relative abundance of species (Fig. 3) was Very Common (23), Common (24), Uncommon (40) and Rare (13). Thus, the highest number of species were found in uncommon followed by common, very common and rare.

The seasonal status of species (Fig. 4) was Monsoon Summer (76) and Autumn (64). The summer season was found dominant for bird diversity than autumn.

The total number of species recorded at four study sites were: 63 (Nadaun), 63 (Jihan Forest), 53 (Sujanpur) and 53 (Hamirpur).

Of 100 species, 31 species (Grey-capped Pygmy Woodpecker, Brown-headed Barbet, Indian Grey Hornbill, White-throated Kingfisher, Asian Koel, Rose-ringed Parakeet, Plum-headed Parakeet, Rock Pigeon, Spotted Dove, Black Kite, Red-billed Blue Magpie, Rufous Treepie, Large-billed Crow, White-throated Fantail, Asian Paradise-flycatcher, Blue Whistling Thrush, Oriental Magpie Robin, Indian Robin, Pied Bushchat, Grey Bushchat, Common Myna, Great Tit, Himalayan Bulbul, Red-vented Bulbul, Grey-breasted Prinia, Oriental White Eye, Common Tailorbird, Grey-hooded warbler, Black-chinned Babbler, Jungle Babbler and House Sparrow) were found common in all study sites (Nadaun, Jihan Forest, Sujanpur and Hamirpur). This indicates that these species have common occurrence in Hamirpur district.

Of 100 species, 73 species were found common with previous records of 148 species in Hamirpur district (Mahabal, 2005). Thus, remaining 27 species (Indian Peafowl, Grey-capped Pygmy Woodpecker, Fulvous-breasted Woodpecker, Grey-headed Woodpecker, Great Barbet, Asian Barred Owllet, Green Sandpiper, Great Thick-knee, Little Ringed Plover, River Lapwing, Egyptian Vulture, Little Cormorant, Large Cuckooshrike, Ashy Drongo, Spangled Drongo, Large Woodshrike, Slaty-blue Flycatcher, Rufous-bellied Niltava, Blue-throated Flycatcher, Streak-throated Swallow, Black Bulbul, Striated Prinia, Puff-throated Babbler, Black-chinned Babbler, Sand Lark, Crimson Sunbird and Russet Sparrow) were found further additions to birdlist of Hamirpur district.

The interesting species found in study area were Large woodshrike *Tephrodornis gularis* (Fig. 5), Coppersmith Barbet *Megalaima haemacephala* (Fig. 6) and Dark-sided Flycatcher *Muscicapa sibirica* (Fig. 7).

The globally threatened (IUCN Status) species Egyptian Vulture *Neophron percnopterus* was also reported and found to have relative abundance as rare.

Table. Systematic List of birds of Hamirpur district

SN	Common and Scientific Names (with orders and families)	Study Sites	Habitats	Seasonal Status	Rel. Abu.
	GALLIFORMES Phasianidae				
1	Black Francolin <i>Francolinus francolinus</i>	J, S	Sl	S	UC
2	Grey Francolin <i>Francolinus pondicerianus</i>	N	Sl	S	UC
3	Jungle Bush Quail <i>Perdica asiatica</i>	J	Bu	A	UC
4	Red Junglefowl <i>Gallus gallus</i>	J, S	BF	SA	C
5	Indian Peafowl <i>Pavo cristatus</i>	J, S	BF	SA	UC
	PICIFORMES Picidae				
6	Grey-capped Pygmy Woodpecker <i>Dendrocopos canicapillus</i>	N, J, S, H	BF	SA	C
7	Fulvous-breasted Woodpecker <i>Dendrocopos macei</i>	J	BF	A	C
8	Grey-headed Woodpecker <i>Picus canus</i>	J	BF	SA	UC
9	Black-rumped Flameback <i>Dinopium benghalense</i>	N, J, H	BF, Gr, CF	S	UC

	Megalaimidae				
10	Great Barbet <i>Megalaima virens</i>	J, H	CF	S	UC
11	Brown-headed Barbet <i>Megalaima zeylanica</i>	N, J, S, H	BF, Gr, Al	SA	C
12	Blue-throated Barbet <i>Megalaima asiatica</i>	J, S	Gr, Al	S	UC
13	Coppersmith Barbet <i>Megalaima haemacephala</i>	H	Sl	A	SC
	BUCEROTIFORMES Bucerotidae				
14	Indian Grey Hornbill <i>Ocyroceros birostris</i>	N, J, S, H	Gr, Ga, Al	SA	C
	UPUPIFORMES Upupidae				
15	Common Hoopoe <i>Upupa epops</i>	N	La, Al, Sl	SA	UC
	CORACIIFORMES Coraciidae				
16	Indian Roller <i>Coracias benghalensis</i>	N	OA	S	SC
	Halcyonidae				
17	White-throated Kingfisher <i>Halcyon smyrnensis</i>	N, J, S, H	Ri, St	SA	C
	Meropidae				
18	Green Bee-eater <i>Merops orientalis</i>	J	BF	S	UC
	CUCULIFORMES Cuculidae				
19	Pied Cuckoo <i>Clamator jacobinus</i>	N	Sl	S	UC
20	Common Hawk Cuckoo <i>Hierococcyx varius</i>	J	BF	S	SC
21	Eurasian Cuckoo <i>Cuculus canorus</i>	J, H	BF, Gr, Al	S	UC
22	Asian Koel <i>Eudynamis scolopacea</i>	N, J, S, H	Gr, Ga	S	C
	PSITTACIFORMES Psittacidae				
23	Rose-ringed Parakeet <i>Psittacula krameri</i>	N, J, S, H	HH, Gr, Ga, Al	SA	VC
24	Plum-headed Parakeet <i>Psittacula cyanocephala</i>	N, J, S, H	Gr, Ga, Al	S	C
	STRIGIFORMES Strigidae				
25	Asian Barred Owlet <i>Glaucidium cuculoides</i>	J, H	Gr, BF	A	SC
	COLUMBIFORMES Columbidae				
26	Rock Pigeon <i>Columba livia</i>	N, J, S, H	HH, Al	SA	VC
27	Spotted Dove <i>Streptopelia chinensis</i>	N, J, S, H	HH, Al, Ga, Gr	SA	VC
28	Red Collared Dove <i>Streptopelia tranquebarica</i>	N, H	Sl, Al	S	SC
29	Eurasian Collared Dove <i>Streptopelia decaocto</i>	N, S	La, Al, Gr	S	UC
	CICONIIFORMES Scolopacidae				
30	Green Sandpiper <i>Tringa ochropus</i>	S	Ri	A	UC
	Burhinidae				
31	Great Thick-knee <i>Esacus recurvirostris</i>	N	Ri	A	UC
	Charadriidae				

32	Little Ringed Plover <i>Charadrius dubius</i>	N	Ri	A	UC
33	River Lapwing <i>Vanellus duvaucelii</i>	N, S	Ri	A	VC
34	Red-wattled Lapwing <i>Vanellus indicus</i>	N, H	Ri, St, Al	SA	C
	Accipitridae				
35	Black-shouldered Kite <i>Elanus caeruleus</i>	J	OA	S	SC
36	Black Kite <i>Milvus migrans</i>	N, J, S, H	Ri, HH, OA, CF	SA	VC
37	Egyptian Vulture <i>Neophron percnopterus</i>	N, S	Ri, OA	SA	SC
	Phalacrocoracidae				
38	Little Cormorant <i>Phalacrocorax niger</i>	N, S	Ri	A	VC
	Ardeidae				
39	Little Egret <i>Egretta garzetta</i>	N, S, H	Ri, St	A	VC
40	Cattle Egret <i>Bubulcus ibis</i>	N, S	Ri, La, Al	S	C
41	Indian Pond Heron <i>Ardeola grayii</i>	N	Po	A	UC
	PASSERIFORMES				
	Laniidae				
42	Long-tailed Shrike <i>Lanius schach</i>	N, H	Sl, Bu	SA	UC
	Corvidae				
43	Red-billed Blue Magpie <i>Urocissa erythrorhyncha</i>	N, J, S, H	BF, Gr	SA	C
44	Rufous Treepie <i>Dendrocitta vagabunda</i>	N, J, S, H	BF, CF, Gr, Ga, HH	SA	VC
45	Large-billed Crow <i>Corvus macrorhynchos</i>	N, J, S, H	HH, Al, DS, La, BF, CF	SA	VC
46	Eurasian Golden Oriole <i>Oriolus oriolus</i>	J	BF, Gr	S	UC
47	Large Cuckooshrike <i>Coracina macei</i>	H	CF	S	SC
48	Small Minivet <i>Pericrocotus cinnamomeus</i>	J, S	Gr	S	UC
49	White-throated Fantail <i>Rhipidura albicollis</i>	N, J, S, H	BF, Bu	SA	UC
50	Black Drongo <i>Dicrurus macrocercus</i>	N, J, H	Sl, Bu, He, Al	S	C
51	Ashy Drongo <i>Dicrurus leucophaeus</i>	S	BF, Gr	S	UC
52	Spangled Drongo <i>Dicrurus hottentottus</i>	N, J	BF, Gr, Al	SA	C
53	Asian Paradise-flycatcher <i>Terpsiphone paradise</i>	N, J, S, H	Bu, Ga	S	C
54	Common Iora <i>Aegithina tiphia</i>	J	Ga, Gr	S	SC
55	Common Woodshrike <i>Tephrodornis pondicerianus</i>	J	BF	S	UC
56	Large Woodshrike <i>Tephrodornis gularis</i>	S	BF	S	SC
	Muscicapidae				
57	Blue Whistling Thrush <i>Myophonus caeruleus</i>	N, J, S, H	St	SA	VC
58	Dark-sided Flycatcher <i>Muscicapa sibirica</i>	J	Gr	A	SC
59	Slaty-blue Flycatcher <i>Ficedula tricolor</i>	J, S, H	Bu	A	UC
60	Rufous-bellied Niltava <i>Niltava sundara</i>	H	Bu	A	SC
61	Blue-throated Flycatcher <i>Cyornis poliogenys</i>	J	BF, Bu	S	SC
62	Oriental Magpie Robin <i>Copsychus saularis</i>	N, J, S, H	Ga, La	SA	C
63	Indian Robin <i>Saxicoloides fulicata</i>	N, J, S, H	Bu, Sl, BF	SA	VC
64	White-capped Water Redstart <i>Chaimarrornis leucocephalus</i>	S, H	St	A	UC
65	Plumbeous Water Redstart <i>Rhyacornis fuliginosus</i>	H	St	A	UC
66	Common Stonechat <i>Saxicola torquata</i>	N	Bu, He, Sl	A	C
67	Pied Bushchat <i>Saxicola caprata</i>	N, J, S, H	Bu, He, Sl	S	C

68	Grey Bushchat <i>Saxicola ferrea</i>	N, J, S, H	He, Bu, Sl	A	VC
	Sturnidae				
69	Brahminy Starling <i>Sturnus pagodarum</i>	N, J	Sl, Al	SA	UC
70	Common Myna <i>Acridotheres tristis</i>	N, J, S, H	HH, Al, La, Sl	SA	VC
71	Jungle Myna <i>Acridotheres fuscus</i>	N, S, H	La, Al	SA	C
	Paridae				
72	Great Tit <i>Parus major</i>	N, J, S, H	HH, Ga, Gr, BF, CF, Al, Sl	SA	VC
	Hirundinidae				
73	Wire-tailed Swallow <i>Hirundo smithii</i>	N	HH, He, La	S	UC
74	Red-rumped Swallow <i>Hirundo daurica</i>	S	HH, La	S	C
75	Streak-throated Swallow <i>Hirundo fluvicola</i>	N, H	Ri, St	A	VC
	Pycnonotidae				
76	Himalayan Bulbul <i>Pycnonotus leucogenys</i>	N, J, S, H	Sl, Bu, BF, CF, Ga, Gr	SA	VC
77	Red-vented Bulbul <i>Pycnonotus cafer</i>	N, J, S, H	Bu, Sl, BF, Ga	SA	C
78	Black Bulbul <i>Hypsipetes leucocephalus</i>	J	BF	A	UC
	Cisticolidae				
79	Striated Prinia <i>Prinia criniger</i>	N, J, H	Gl, He, Bu	S	UC
80	Grey-breasted Prinia <i>Prinia hodgsonii</i>	N, J, S, H	He, Bu	SA	VC
	Zosteropidae				
81	Oriental White Eye <i>Zosterops palpebrosus</i>	N, J, S, H	BF, Ga, Gr, Bu	SA	VC
	Sylviidae				
82	Common Tailorbird <i>Orthotomus cuculatus</i>	N, J, S, H	Ga, Bu	SA	UC
83	Common Chiffchaff <i>Phylloscopus collybita</i>	J	BF	S	UC
84	Grey-hooded Warbler <i>Seicercus xanthoschistos</i>	N, J, S, H	Ga, Gr, CF, BF, Sl	SA	VC
85	Puff-throated Babbler <i>Pellorneum ruficeps</i>	J	Bu, BF	S	UC
86	Black-chinned Babbler <i>Stachyris pyrrhops</i>	N, J, S, H	Bu, BF	SA	C
87	Jungle Babbler <i>Turdoides striatus</i>	N, J, S, H	Ga, Gr, BF, Al, Bu, Sl	SA	VC
	Alaudidae				
88	Sand Lark <i>Calandrella raytal</i>	N	Ri	A	VC
	Nectariniidae				
89	Pale-billed Flowerpecker <i>Dicaeum erythrorhynchus</i>	J	BF	A	UC
90	Purple Sunbird <i>Nectarinia asiatica</i>	J, S	Sl, BF, Ga, Bu	S	UC
91	Crimson Sunbird <i>Aethopyga siparaja</i>	J	Ga	S	UC
	Passeridae				
92	House Sparrow <i>Passer domesticus</i>	N, J, S, H	HH, La, Al, Bu	SA	C
93	Russet Sparrow <i>Passer rutilans</i>	J	BF, Bu	A	UC
94	White Wagtail <i>Motacilla alba</i>	N, S, H	Ri, La	SA	VC
95	White-browed Wagtail <i>Motacilla maderaspatensis</i>	N, S, H	Ri, La	SA	C
96	Grey Wagtail <i>Motacilla cinerea</i>	S, H	Ri, St, La	A	UC
97	Paddyfield Pipit <i>Anthus rufulus</i>	N	Ri, La	SA	VC
98	Baya Weaver <i>Ploceus philippinus</i>	N	Sl, He	S	UC
99	Indian Silverbill <i>Lonchura malabarica</i>	N	Gl, He	S	UC
100	Scaly-breasted Munia <i>Lonchura punctulata</i>	N, S, H	Gl, He, La, Al	SA	C

**Abbreviations:
Table**

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

Study Sites

N: Nadaun, J: Jihan Forest, S: Sujanpur, H: Hamirpur

Seasonal Status

Monsoon Summer (Mid June to August), Autumn (September to October)

Relative Abundance

VC: Very Common (Abundant number of sightings/ 81-100% Sightings) /Abundant number of birds seen

C: Common (Regular number of sightings but less than VC/ 51-80% Sightings)/Moderate number of birds seen

UC: Uncommon (Occasional sightings/21-50% Sightings)/ Less number of birds seen

SC: Scarce/Rare (Hardly visible/1-20% Sightings)/Few birds seen

Habitats

Al: Agricultural Land, Sl: Scrub Land, Gl: Grassland, HH: Human Habitations, BF: Broadleaved Forest (subtropical), CF: Coniferous Forest (pine), Ga: Garden, Gr: Grove, OA: Open Area, DS: Dumping Site, He: Herb, Bu: Bush, Ri/St: River/Stream, Po: Pond/Pool, La: Lawn



Figure 1. Map showing location of Study Sites (N: Nadaun, J: Jihan Forest, S: Sujanpur, H: Hamirpur) in Hamirpur district of Himachal Pradesh. (Map Source: www.mapsofindia.com)

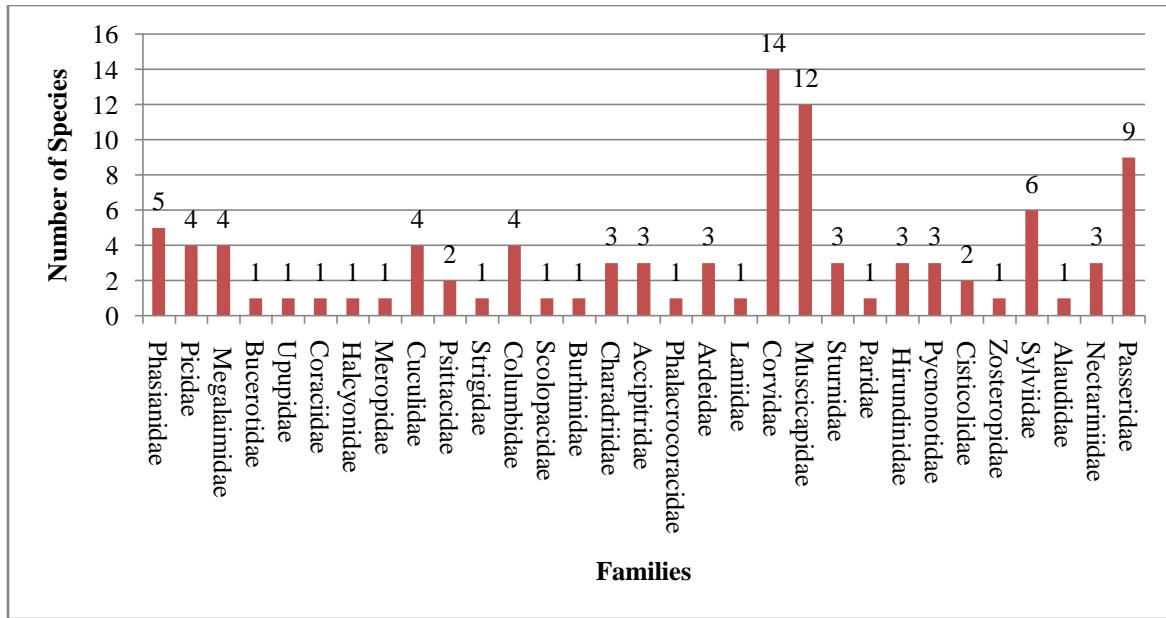


Figure 2. Family-wise distribution of bird species in Hamirpur district

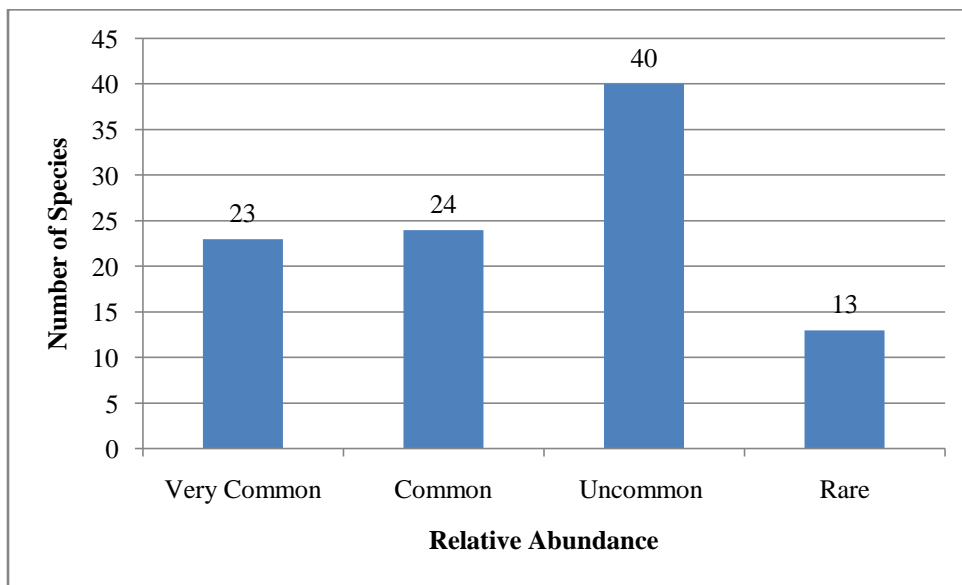


Figure 3. Relative Abundance of bird species in Hamirpur district

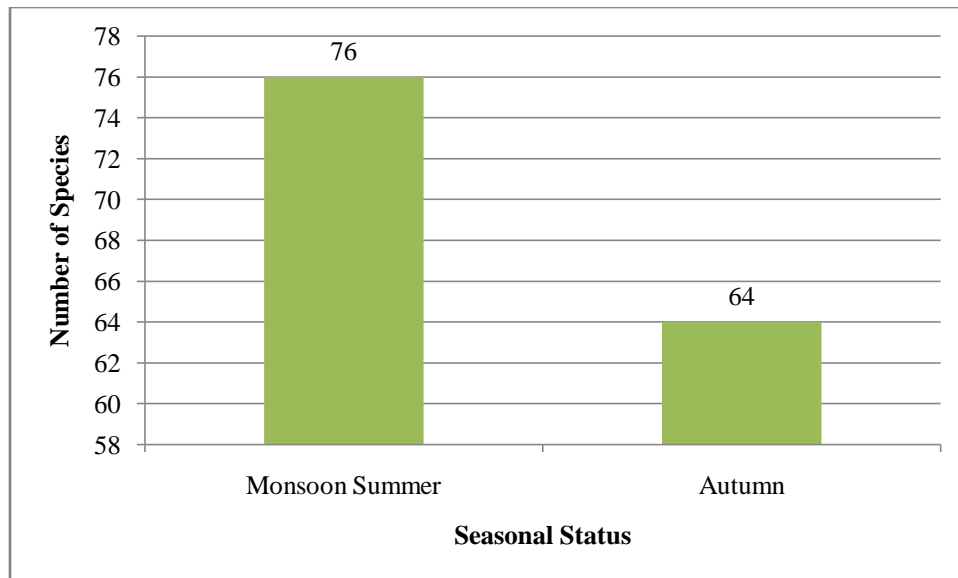


Figure 4. Seasonal Status of bird species in Hamirpur district



Figure 5. Large Woodshrike *Tephrodornis gularis* (Sujanpur-Tira)



Figure 6. Coppersmith Barbet *Megalaima haemacephala* (Hamirpur)



Figure 7. Dark-sided Flycatcher *Muscicapa sibirica* (Jihan Forest)

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