



AN ASSESSMENT OF DIVERSITY OF AVIAN SPECIES IN KAIS WILDLIFE SANCTUARY, KULLU (HIMACHAL PRADESH)

A. Sharief, S. Paliwal, A.K. Sidhu, T. Kubendran

High altitude Regional Centre, Zoological Survey of India, Solan-173211, India

*Corresponding author email: amirasharief.25@gmail.com

ABSTRACT

In the present studies the Bird diversity of Kais Wildlife Sanctuary, Kullu has been documented and assessed for the first time. A total of 78 bird species belonging to 29 families and 10 orders has been recorded from the study area. Most dominant family is Muscicapidae represented by 12 species, followed by Accipitridae & Phylloscopidae (7 species each). Of the 78 bird species, two species are residents/partial migrants, one species shows winter migration, four are either residents/summer migrants, 15 summer visitors and the rest are residents to this area. According to IUCN status, out of 78 species of birds, Himalayan griffon (*Gyps himalayensis*) is listed under category Near Threatened, Egyptian vulture (*Nephron percnopterus*) under the category Endangered and rest of the bird species were listed under the category of Least Concern.

KEY WORDS: Birds, Diversity, Himalaya, Wildlife Sanctuary, abundance.

INTRODUCTION

Himalaya is very rich and diversified in its faunal diversity due to varied climatic conditions and topography. It ranges from tropical environment in the foothills to arctic environment in the Trans-Himalayan region. The state of Himachal Pradesh covers an area of 56,019 square kilometers and lies in the north-western hill tracts of Himalaya. The state is located between 32° 22' 40" N lat to 30° 12' 4" N lat. and 75° 47' 55" E long to 79° 4' 20" E long. The great variations in altitudes of Himachal Pradesh has offered varied topography and vegetation exhibiting a wide variety of habitats each supporting its distinctive type of fauna particularly bird diversity. Birds vary in their habitats, diversity, abundance and distribution throughout the world. Diversity of birds is often more in tropical regions than temperate regions. Occurrence of some bird species is in small numbers whereas others are represented by huge numbers which gives variability in their abundance. Some species have small restricted ranges to particular area only while others undertake long route migrations throughout the world. Out of 10,000 bird species of the world, the Indian subcontinent harbours about 1342 bird species belonging to 21 orders, 88 families and 432 genera (Ali and Ripley, 1983a & b). Of which 618 bird species belonging to 20 orders are represented in the state of Himachal Pradesh (Kumar, 2015). It is now well-established fact that human interferences like pollution, unsustainable agricultural practices, overexploitation of natural resources, climate changes, fragmentation and loss of habitats have caused significant decline in biodiversity. Therefore the studies on bird diversity and abundance provide valuable information about monitoring of biodiversity and environment of the world at local, national and global level (BirdLife International, 2015). The present studies on avifauna have carried out in Kais Wildlife Sanctuary situated between

32° 03' 10" N & 77° 12' 32" E, north; 32° 02' 42" N & 77° 12' 32" E, east; 31° 59' 38" N & 77° 10' 17" E, south; 32° 00' 23" N & 77° 09' 19" E west in Kullu district of Himachal Pradesh which is divided into two beats Tandla and Matikochar. The total geographical area of the Sanctuary is 12.61 Km² with an altitude of about 2800 to 3680 masl.

The study of relevant literature reveals that the initial work on population estimation of avifauna received attention from eminent scientists. Studies on diversity and status of avifauna present in different parts of the state have been conducted by various workers like Whistler (1926 a & b), Ali (1949), Gaston *et al.* (1981). Whistler (1926 a & b) studied the birds of Kangra and Kullu districts respectively. Ali & Ripley (1983a & b) presented a summarized account on avifauna of Himachal Pradesh. Pandey (1989) studied birds of Pong Dam and adjacent localities and documented over 415 avian species. Number of studies has been carried out on different aspects of avifauna of Himachal Pradesh like geographical and altitudinal distribution patterns by some workers like (Mahabal and Sharma, 1990; Singh *et al.*, 1992; Mahabal, 1996, 2000, 2005; Thakur *et al.*, 2002, 2010, and Singh, 2006, 2011). Sharma *et al.* (2009) recorded the occurrence of 210 species of birds in Simbalbara wildlife sanctuary. Miller (2010), Thakur and Mattu (2011), Thakur and Narang (2012), Kumar and Paliwal (2015), Thakur and Mehta (2015) also documented avifauna of Himachal Pradesh from different localities of the state. Kumar *et al.* (2014) recorded 93 species from Kalatop Khajjiar wildlife Sanctuar. Kumar (2015) documented 618 species of birds belonging to 20 orders and 91 families from Himachal Pradesh. The birds present in Kais Wildlife sanctuary have been insufficiently explored. Very less literature is available on avifauna of Kais Wildlife Sanctuary. The present work is first time compilation of bird diversity of this sanctuary.

MATERIALS & METHODS

During present study an area of some 12.61 sq km of Kais Wildlife Sanctuary has been explored. Surveys are conducted in Kais Wildlife Sanctuary from January to April 2018. The birds are observed in the field from 6:00am in the morning and from 4.00pm in the evening. Average 5 hrs are spent in the field daily. Random Sampling Technique is followed for counting the birds in the study area. Birds are observed with an aid of prismatic (10*50 DPS) Olympus field binoculars. Field identifications are carried out with the help of various field guides (Ali and Ripley, 1983; Grimmett *et. al.*, 2003; Kazmierczak, 2000). The data recorded in each survey is analyzed for population estimation and status of bird species.

RESULTS & DISCUSSION

During present study on avifauna of Kais WLS of Kullu district of Himachal Pradesh, 78 species of birds belonging to 29 families and 10 orders have been recorded. Birds sighted during the surveys are categorized based on their migratory nature as follows: R =Resident, R/PM=Resident

with Partial movements, R/SM=Resident with summer influx, SM=Summer Migrant, as well as their conservation status following IUCN Red Data list of species (2018 version). Family Muscicapidae, the largest bird family of India as well as Himachal Pradesh (Manakadan & Pittie, 2001; Mahabal, 2005, Thakur, 2008; Thakur *et.al.* 2010 and Kumar, 2015) has been found to be represented by 12 species in this area, followed by families Accipitridae (7 species), Phylloscopidae (7 species), Corvidae (6 species) and Paridae (5 species). However families Columbidae, Cuculidae, Picidae, Leiothrichidae, Fringillidae represented by 3 species each & rest of the families are represented by either 2 species or 1 species each (as given in Table 1). In total the highest numbers of individuals of bird species are observed in summer (287 individuals) with passerine birds (241 number of individuals alone) representing the highest in numbers. In winter the numbers of individuals of birds are observed less (166 individuals of birds). In winter also the total count of individuals of passerine birds (135 individuals) is highest among all bird species as given in table 1.

TABLE 1: List of Birds of Kais WildLife Sanctuary

S.No.	Common name	Scientific name	In month of February		In month of April	
			Matikochar	Tandla	Matikochar	Tandla
1	Koklass pheasant	<i>Pucrasia macrolopha</i>	0	0	1	0
2	Kaleej pheasant	<i>Lophura leucomelanus</i>	1	0	2	0
3	Himalayan griffon	<i>Gyps himalayensis</i>	3	0	2	0
4	Egyptian vulture	<i>Neophron percnopterus</i>	0	0	20	0
5	Booted eagle	<i>Hieraetus pinnatus</i>	1	0	0	0
6	Tawny eagle	<i>Aquila rapax</i>	0	0	1	0
7	Shikra	<i>Accipiter badius</i>	0	1	0	0
8	Eurasian sparrow- hawk	<i>Accipiter nisus</i>	1	0	0	0
9	Black kite	<i>Milvus migrans</i>	0	1	0	0
10	Red wattled lapwing	<i>Vanellus indicus</i>	0	3	0	0
11	Rock pigeon	<i>Columba livia</i>	4	2	0	0
12	Eurasian collared-Dove	<i>Streptopelia decaocta</i>	0	0	2	1
13	Oriental turtle dove	<i>Streptopelia orientalis</i>	0	1	1	1
14	Eurasian cuckoo	<i>Cuculus canorus</i>	0	0	1	1
15	Asian koel	<i>Eudynamys scolopaceus</i>	0	0	3	1
16	Greater coucal	<i>Centropus sinensis</i>	0	0	1	1
17	Himalayan swiftlet	<i>Aerodramus brevirostris</i>	2	0	0	0
18	Oriental pied hornbill	<i>Anthracoceros albirostris</i>	1	0	0	1
19	Great barbet	<i>Megaliama virens</i>	0	0	0	3
20	Himalayan woodpecker	<i>Dendrocopus himalayensis</i>	0	0	2	0
21	Brown-fronted woodpecker	<i>Dendrocopus auriceps</i>	1	0	0	0
22	Scaly bellied woodpecker	<i>Picus squamatus</i>	0	1	0	1
23	Long tailed minivet	<i>Pericrocotus ethologus</i>	8	2	0	0
24	Slaty headed parakeet	<i>Psitacula himalayana</i>	0	4	0	0
25	Plum headed parakeet	<i>Psittacula cyanocephalus</i>	2	2	0	0
26	Red billed blue magpie	<i>Urocissa flavirostris</i>	3	5	3	5
27	Yellow billed blue magpie	<i>Urocissa flavirostris</i>	0	0	5	4
28	Rufous treepie	<i>Dendocitta vagabanda</i>	0	0	0	2
29	Spotted nutcracker	<i>Nucifraga caryocatactes</i>	0	0	0	1
30	Red billed cough	<i>Pyrhocorax pyrrhocorax</i>	1	0	1	1
31	Large billed crow	<i>Corvus macrorhynchos</i>	7	4	15	10
32	Grey-headed Canary-Flycatcher	<i>Culicicapa ceylonensis</i>	0	0	4	8
33	Spot winged tit	<i>Parus melanolophus</i>	0	3	7	4
34	Rufous-vented tit	<i>Periparus rubidiventris</i>	0	0	1	2
35	Grey crested tit	<i>Lophophanus dichrous</i>	2	1	6	5
36	Green backed tit	<i>Parus monticolus</i>	0	1	3	1
37	Great tit	<i>Parus major</i>	0	0	12	6
38	White tailed nuthatch	<i>Sitta himalayensis</i>	1	0	0	0
39	Black throated Tit	<i>Aegithalos concinnus</i>	0	0	1	0
40	Hodgsons treecreeper	<i>Certhia hodgsoni</i>	0	0	2	6
41	Bar tailed tree creeper	<i>Certhia himalayana</i>	1	0	9	4

42	Eurasian wren	<i>Troglodytes troglodytes</i>	0	1	0	0
43	Himalayan bulbul	<i>Pycnonotus leucogenys</i>	3	7	0	0
44	Himalayan black bulbul	<i>Hypsipetes leucocephalus</i>	0	0	4	2
45	Sulphur bellied warbler	<i>Phylloscopus griseolus</i>	0	0	2	1
46	Buff-barred Warbler	<i>Phylloscopus pulcher</i>	0	0	0	1
47	Lemon-rumped warbler	<i>Phylloscopus chloronotus</i>	0	0	1	1
48	Humes leaf warbler	<i>Phylloscopus humei</i>	0	0	1	0
49	Blyths leaf warbler	<i>Phylloscopus reguloides</i>	0	0	3	0
50	Whistlers warbler	<i>Seicercus whistleri</i>	0	0	2	4
51	Ashy prinia	<i>Prinia socialis</i>	0	5	0	0
52	Plain prinia	<i>Prinia inornata</i>	0	0	6	0
53	Oriental white-eye	<i>Zosterops palpebrosus</i>	3	1	3	1
54	Common babbler	<i>Turdoides caudata</i>	15	8	0	0
55	Jungle babbler	<i>Turdoides striata</i>	0	6	0	0
56	Streaked laughingthrush	<i>Trochalopteron lineatum</i>	1	0	1	0
57	Rufous-bellied Niltava	<i>Niltava sundara</i>	0	0	1	1
58	Verditer Flycatcher	<i>Eumyias thalassinus</i>	0	0	10	7
59	Indian robin	<i>Copsychus fulicatus</i>	1	1	0	0
60	Blue whistling thrush	<i>Myophonus caeruleus</i>	4	2	1	2
61	Spotted Forktail	<i>Enicurus maculatus</i>	0	0	1	0
62	Little Pied Flycatcher	<i>Ficedula westermanni</i>	0	0	5	1
63	Ultramine flycatcher	<i>Ficedula superciliaris</i>	0	0	0	1
64	Blue Fronted Redstart	<i>Phoenicurus erythronotus</i>	0	0	0	1
65	Plumbeous redstart	<i>Phoenicurus fuslignos</i>	0	1	0	1
66	White capped redstart	<i>Phoenicurus leucocephalus</i>	1	1	0	0
67	Indian chat	<i>Cercomela fusca</i>	1	0	0	0
68	Grey bushchat	<i>Saxicola ferreus</i>	0	0	7	4
69	White-Collared Blackbird	<i>Turdus albocinctus</i>	0	0	1	2
70	Grey winged blackbird	<i>Turdus boulboul</i>	0	4	1	0
71	Brown accentor	<i>Prunella fulvescens</i>	12	7	0	0
72	Rock bunting	<i>Emberiza cia</i>	6	0	15	8
73	Common chiffchaff	<i>Fringilla coelebs</i>	0	3	0	0
74	Grey wagtail	<i>Motacilla cinerea</i>	0	0	0	2
75	Black and yellow Grosbeak	<i>Mycerobas icterioides</i>	0	0	0	2
76	Collared Grosbeak	<i>Mycerobas affinis</i>	0	0	1	1
77	Russet Sparrow	<i>Passer rutilans</i>	0	0	2	0
78	House sparrow	<i>Passer domesticus</i>	2	0	0	0
			90	76	175	114
TOTAL NUMBER OF INDIVIDUALS OF BIRDS OBSERVED			166		287	

TABLE 2: Staus of bird species observed in Kais Wildlife Sanctuary

S.No	Order	Family	Common Name	Scientific Name	Migratory Status	IUCN Status
1	Galliformes	Phasianidae	Koklass pheasant	<i>Pucrasia macrolopha</i>	R	LC
2	Galliformes	Phasianidae	Kaleej pheasant	<i>Lophura leucomelanus</i>	R	LC
3	Accipitriformes	Accipitridae	Himalayan griffon	<i>Gyps himalayensis</i>	R	NT
4	Accipitriformes	Accipitridae	Egyptian vulture	<i>Neophron percnopterus</i>	R	EN
5	Accipitriformes	Accipitridae	Tawny eagle	<i>Aquila rapax</i>	R	LC
6	Accipitriformes	Accipitridae	Booted eagle	<i>Hieraetus pinnatus</i>	R/PM	LC
7	Accipitriformes	Accipitridae	shikra	<i>Accipiter badius</i>	R	LC
8	Accipitriformes	Accipitridae	Eurasian sparrow- hawk	<i>Accipiter nisus</i>	R	LC
9	Accipitriformes	Accipitridae	Black kite	<i>Milvus migrans</i>	R/PM	LC
10	Gruiformes	Charadriidae	Red wattled lapwing	<i>Vanellus indicus</i>	R	LC
11	Columbiformes	Columbidae	Rock pigeon	<i>Columba livia</i>	R	LC
12	Columbiformes	Columbidae	Eurasian collared-Dove	<i>Streptopelia decaocta</i>	R/SM	LC
13	Columbiformes	Columbidae	Oriental turtle dove	<i>Streptopelia orientalis</i>	R	LC
14	Cuculiformes	Cuculidae	Eurasian cuckoo	<i>Cuculus canorus</i>	SM	LC
15	Cuculiformes	Cuculidae	Asian koel	<i>Eudynamis scolopaceus</i>	SM	LC
16	Cuculiformes	Cuculidae	Greater coucal	<i>Centropus sinensus</i>	R	LC
17	Caprimulgiformes	Apodidae	Himalayan swiftlet	<i>Aerodramus brevirostris</i>	R	LC
18	Coraciiformes	Bucerotidae	Oriental pied hornbill	<i>Anthracoceros albirostris</i>	R	LC
19	Piciformes	Magalaimidae	Great barbet	<i>Megaliama virens</i>	R	LC
20	Piciformes	Picidae	Himalayan woodpecker	<i>Dendrocopus himalayensis</i>	R	LC
21	Piciformes	Picidae	Brown fronted woodpecker	<i>Dendrocopus auriceps</i>	R	LC
22	Piciformes	Picidae	Scaly bellied woodpecker	<i>Picus squamatus</i>	R	LC
23	Psittaciformes	Psittacidae	Slaty headed parakeet	<i>Psitacula himalayana</i>	R	LC
24	Psittaciformes	Psittacidae	Plum headed parakeet	<i>Psitacula cyanocephalus</i>	R	LC
25	Passeriformes	Campephagidae	Long tailed minivet	<i>Pericrocotus ethologus</i>	R/SM	LC

Diversity of avian species in kais wildlife sanctuary, Kullu

26	Passeriformes	Corvidae	Red billed blue magpie		<i>Urocissa flavirostris</i>	R	LC
27	Passeriformes	Corvidae	Yellow billed blue magpie		<i>Urocissa flavirostris</i>	R	LC
28	Passeriformes	Corvidae	Rufous treepie		<i>Dendocitta vagabanda</i>	R	LC
29	Passeriformes	Corvidae	Spotted nutcracker		<i>Nucifraga caryocatactes</i>	R	LC
30	Passeriformes	Corvidae	Red billed cough		<i>Pyrrhocorax pyrrhocorax</i>	R	LC
31	Passeriformes	Corvidae	Large billed crow		<i>Corvus macrorhynchos</i>	R	LC
32	Passeriformes	Stenostiridae	Grey-headed Flycatcher	Canary-	<i>Culicicapa ceylonensis</i>	SM	LC
33	Passeriformes	Paridae	Spot winged tit		<i>Parus melanolophus</i>	R	LC
34	Passeriformes	Paridae	Rufous-vented tit		<i>Periparus rubidiventris</i>	R	LC
35	Passeriformes	Paridae	Grey crested tit		<i>Lophophanus dichrous</i>	R	LC
36	Passeriformes	Paridae	Green backed tit		<i>Parus monticolus</i>	R	LC
37	Passeriformes	Paridae	Black throated Tit		<i>Aegithalos concinnus</i>	R	LC
38	Passeriformes	Sittidae	White tailed nuthatch		<i>Sitta himalayansis</i>	R	LC
39	Passeriformes	Certhiidae	Hodgsons treecreeper		<i>Certhia hodgsoni</i>	R	LC
40	Passeriformes	Certhiidae	Bar tailed tree creeper		<i>Certhia himalayana</i>	R	LC
41	Passeriformes	Troglodytidae	Eurasian wren		<i>Troglodytes troglodytes</i>	R	LC
42	Passeriformes	Pycnonotidae	Himalayan bulbul		<i>Pycnonotus leucogenys</i>	R	LC
43	Passeriformes	Pycnonotidae	Himalayan black bulbul		<i>Hypsipetes leucocephalus</i>	R	LC
44	Passeriformes	Phylloscopidae	Ashy throated warbler		<i>Phylloscopus maculipennis</i>	R	LC
45	Passeriformes	Phylloscopidae	Sulphur bellied warbler		<i>Phylloscopus griseolus</i>	SM	LC
46	Passeriformes	Phylloscopidae	Buff-barred Warbler		<i>Phylloscopus pulcher</i>	SM	LC
47	Passeriformes	Phylloscopidae	Lemon-rumped warbler		<i>Phylloscopus chloronotus</i>	SM	LC
48	Passeriformes	Phylloscopidae	Hume's leaf warbler		<i>Phylloscopus humei</i>	SM	LC
49	Passeriformes	Phylloscopidae	Blyth's leaf warbler		<i>Phylloscopus reguloides</i>	SM	LC
50	Passeriformes	Phylloscopidae	Whistler's warbler		<i>Seicercus whistleri</i>	SM	LC
51	Passeriformes	Cisticolidae	Ashy prinia		<i>Prinia socialis</i>	R	LC
52	Passeriformes	Cisticolidae	Plain prinia		<i>Prinia inornata</i>	R	LC
53	Passeriformes	Zosteropidae	Oriental white-eye		<i>Zosterops palpebrosus</i>	R	LC
54	Passeriformes	Leiothrichidae	Common babbler		<i>Turdoides caudata</i>	R	LC
55	Passeriformes	Leiothrichidae	Jungle babbler		<i>Turdoides striata</i>	R	LC
56	Passeriformes	Leiothrichidae	Streaked laughingthrush		<i>Trochalopteron lineatum</i>	R	LC
57	Passeriformes	Muscicapidae	Rufous-bellied Niltava		<i>Niltava sundara</i>	SM	LC
58	Passeriformes	Muscicapidae	Verditer Flycatcher		<i>Eumyias thalassinus</i>	SM	LC
59	Passeriformes	Muscicapidae	Indian robin		<i>Copsychus fulvicatus</i>	R	LC
60	Passeriformes	Muscicapidae	Blue whistling thrush		<i>Myophonus caeruleus</i>	R	LC
61	Passeriformes	Muscicapidae	Spotted Forktail		<i>Enicurus maculatus</i>	R	LC
62	Passeriformes	Muscicapidae	Little Pied Flycatcher		<i>Ficedula westermanni</i>	SM	LC
63	Passeriformes	Muscicapidae	Ultramine flycatcher		<i>Ficedula superciliaris</i>	SM	LC
64	Passeriformes	Muscicapidae	Blue Fronted Redstart		<i>Phoenicurus erythronotus</i>	SM	LC
65	Passeriformes	Muscicapidae	Plumbeous redstart		<i>Phoenicurus fusliginos</i>	R	LC
66	Passeriformes	Muscicapidae	White capped redstart		<i>Phoenicurus leucocephalus</i>	R/SM	LC
67	Passeriformes	Muscicapidae	Indian chat		<i>Cercomela fusca</i>	R	LC
68	Passeriformes	Muscicapidae	Grey bushchat		<i>Saxicola ferreus</i>	R	LC
69	Passeriformes	Turdidae	White-Collared Blackbird		<i>Turdus albocinctus</i>	R	LC
70	Passeriformes	Turdidae	Grey-winged Blackbird		<i>Turdus boulboul</i>	R	LC
71	Passeriformes	Prunellidae	Brown accentor		<i>Prunella fulvescens</i>	R	LC
72	Passeriformes	Motacillidae	Grey wagtail		<i>Motacilla cinerea</i>	SM	LC
73	Passeriformes	Emberizidae	Rock bunting		<i>Emberiza cia</i>	R/SM	LC
74	Passeriformes	Fringillidae	Common chiffchaff		<i>Fringilla coelebs</i>	WM	LC
75	Passeriformes	Fringillidae	Black and yellow Grosbeak		<i>Mycerobas icteroides</i>	R	LC
76	Passeriformes	Fringillidae	Collared Grosbeak		<i>Mycerobas affinis</i>	R	LC
77	Passeriformes	Passeridae	Russet Sparrow		<i>Passer rutilans</i>	R	LC
78	Passeriformes	Passeridae	House sparrow		<i>Passer domesticus</i>	R	LC

Analysis of data on residential status shows that of the 78 bird species 71.79% species of birds are resident, 2.56% are either residents or partial migrants, 1.28% showed winter migration, 5.12% are either residents or summer migrants and rest 19.28% are summer visitors to this area. Moreover the analysis of data also reveals that among all the bird species recorded, most of the birds are listed under the category of Least concern, except Egyptian vulture (*Nephron percnopterus*) under the category endangered & Himalayan griffon (*Gyps himalayensis*) under category

near threatened according to IUCN status (as given in Table 2). Review of literature reveals that present studies shows similar results and fall in the same line as with the earlier works of Gaston *et al.* (1993), Mahabal (2000), Thakur *et al.* (2002, 2003, 2006, 2010), Mattu & Thakur (2004, 2006, 2011) Singh and Banyal (2013) and Kumar (2015) who also reported the presence of different categories of birds like resident, summer visitors, winter visitors etc from different biogeographical regions of Himachal Pradesh.

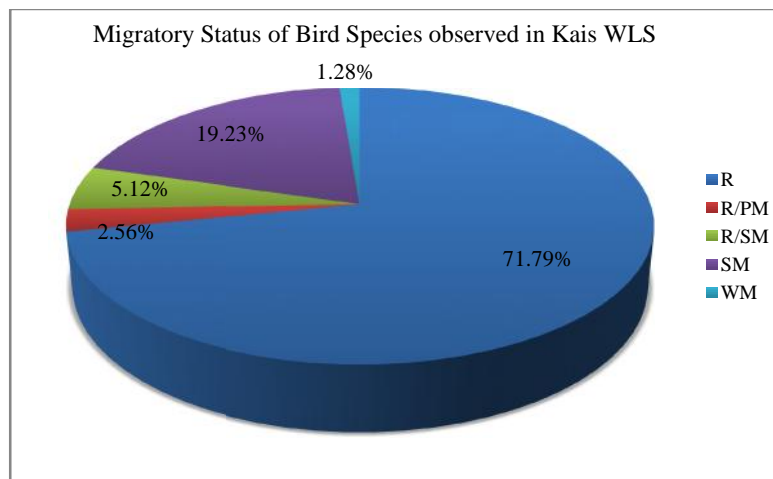


FIGURE 1: Migratory status of birds observed in Kais Wildlife Sanctuary

Abbreviations

R =Resident, R/PM=Resident with Partial movements, R/SM=Resident with summer influx, SM=Summer Migrant, LC=Least Concern; NT-Near Threatened; EN-Endangered

ACKNOWLEDGEMENTS

The authors are grateful to the Dr. Kailash Chandra (Director, Zoological Survey of India, for his guidance, support and inspiring suggestions. We would like to thank PCCF of Himachal Pradesh for giving permission to undertake surveys and all the members of Department of Wildlife Division (Hamirpur and Kullu) for their all possible help during surveys. We extend our deepest gratitude to Shri Krishan Kumar (Divisional Forest Officer, Hamirpur) & Shri Tilak Raj Sharma (Divisional Forest Officer, Kullu) for their support in every possible.

REFERENCES

Ali, S. & Ripley, S.D. (1983a) *Handbook of the birds of India and Pakistan together with those of Bangladesh, Nepal, Bhutan and Sri Lanka*. Compact ed. Delhi: Oxford University Press.

Ali, S. & Ripley, S.D. (1983b) *A pictorial guide to the birds of the Indian Subcontinent*. 1st ed. New Delhi: Oxford University Press.

Birdlife International (2015) <http://www.birdlife.org/datazone/sowb/introduction/state/pressure/responce>.

Gaston, A.J., Garson, P.J. and Hunter, M.L. Jr. (1981) Present distribution and status of pheasants in Himachal Pradesh, Western Himalayas. *Journal of World Pheasant Association* 6: 10-30.

Grimmett, R.C. Inskipp and Inskipp, T. (1998): *Birds of the Indian Subcontinent*. Oxford University Press: Delhi.
Kazmierczak, K. (2000): *A field guide to the birds of India, Sri Lanka, Pakistan, Nepal, Bhutan, Bangladesh and the Maldives*. New Delhi: Om Book Service.

Kumar, A. (2011) Pong Dam wetlands & Zoological Survey of India. *Current science* 85(10): 13-98.

Kumari, A., Kaushal, P., Dubey, J.K. & Sharma, D.K. (2012) Climate change - an impact study in Himachal Pradesh. *International Journal of Farm Sciences* 2(2): 95-101.

Kumar, A. (2014) Avifauna of Kalatop Khajjiar Wildlife Sanctuary and adjacent areas, Himachal Pradesh, India. *Bird Populations* 13: 36-48.

Kumar, A. (2015) Migratory Waterbirds of Himachal Pradesh: Status & Conservation. *Water birds of India*. 258-267.

Mahabal, A. & Mukherjee, R. (1991) Birds of Mandi District (Himachal Pradesh). *Newsletter for Birdwatchers* 31 (1&2): 8-9.

Mahabal, A. & Sharma, T.R. (1992) Distribution patterns of birds of Kangra Valley (Himachal Pradesh). *Himalayan Journal of Environment & Zoology* 6 (2): 85-96.

Mahabal, A. (1992) Avifauna of Chamba District (Himachal Pradesh) with emphasis on their altitudinal distribution. *Pavo* 30 (1&2): 17-25.

Mahabal, A. (1996) Bird survey in Shiwalik Himalaya of Himachal Pradesh. *Pavo* 34 (1&2): 7-16.

Mahabal, A. (2000a) Birds of Talra Wildlife Sanctuary in lower Western Himalaya, Himachal Pradesh, with notes on their status and altitudinal movements. *Zoos' Print Journal* 15 (10): 334-338.

Manakadan, R. & Pittie, A. (2001) Standardised common and scientific names of the birds of the Indian Subcontinent. *Buceros* 6 (1): 1-37.

Mahabal, A. (2005) Aves. In: *Fauna of Western Himalaya*. (Ed. The Director) Kolkata: Zoological Survey of India. Pp. 275-339.

- Mattu, V.K. & Thakur, M.L. (2006) Bird diversity and status in Summer Hill, Shimla (Himachal Pradesh). *Indian Forester* 132 (10): 1271–1281.
- Miller, J.R.B. (2010) Survey of Western Tragopan, Koklass Pheasant, and Himalayan Monal populations in the Great Himalayan National Park, Himachal Pradesh, India. *Indian Birds* 6 (3): 60–65.
- Narang, M.L. (1989) Birds of Sangla Valley. *Newsletter for Birdwatchers* 29 (5-6): 8.
- Narang, M.L. & Singh, A.P. (1995) Birds of Nauni campus of University of Horticulture and Forestry, Solan, Himachal Pradesh. *Newsletter for Birdwatchers* 35 (6): 106-108
- Pandey, S. (1989) The birds of Pong Dam Lake Sanctuary. *Tigerpaper* 16 (2): 20–26.
- Singh, J. S. (2006) Sustainable development of the Indian Himalayan region: Linking ecological and economic concerns. *Current Science* 90 (6).
- Sharma (2009) Avifauna. In Faunal Diversity of Simbalbara WLS. *Conservation Area Series* 41: 81-101.
- Singh, A.P. (2011) Birds of the upper catchment of Ravi River, Chamba district, Himachal Pradesh, India. *Indian BIRDS* 7 (4): 97–103.
- Singh, V. & Banyal, H.S. (2013) Avifauna of Khajjiar Lake, District Chamba, Himachal Pradesh, India. *Springer* 66(2): 130-136.
- Thakur, M.L., Paliwal, R., Tak, P.C., Mehta, H.S. & Mattu, V.K. (2002) Birds of Kalatop-Khajjiar Wildlife Sanctuary, Chamba (H.P.). *Cheetal* 41 (3 & 4): 29–36.
- 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.
- Thakur, M.L., Mattu, V.K. & Sharma, R.M. (2006) Bird diversity & status in Tara Devi, Shimla, Himachal Pradesh. In: *Biodiversity and Environment* (Eds.: Pandey B.N. and Kulkarni G.K.). A.P.H. Pub., New Delhi.
- Thakur, M.L., Mattu, V.K., Lal.H., Sharma, V.N., Raj,H., & Thakur, V. (2010) Avifauna of Arki Hills, Solan (Himachal Pradesh), India. *Indian Birds* 5 (6): 162–166.
- Thakur, M.L. & Mattu, V.K. (2011) Avifauna of Kaza area of spiti (Himachal Pradesh), India. *International Journal of Science & Nature* 2(3): 483-487.
- Thakur, D.R. & Mehta, A. (2015) First Record of *Anas querquedula* (Linnaeus, 1758) from Chandertal and Marshy Meadows of Spiti River Near Lossar, in Himachal Pradesh, India. *Asian Journal of Scientific Research* 8 (3): 436-441.
- Thakur & Narang. (2016) Population status and habitat-use pattern of Indian white-backed vulture (*Gyps bengalensis*) in Himachal Pradesh, India. *Journal of Ecology and the Natural Environment* 4(7): 173-180.
- Ramesh, K., Sathyakumar, S. & Rawat, G.S. (2005) Recent trends in the pheasant population in Great Himalayan National Park, western Himalaya. *Wildlife Conservation, Research and Management*: 40–43.
- Whistler, H. (1926b) A note on the birds of Kullu. *Journal of Bombay Natural History Society*. 31(2), 458-485.