

A Study on Diversity of Birds of Thandapani Tawi River-Manawar Tawi River Catchment of Sunderbani Forest Range, District Rajouri

¹Dr. Rakesh Verma
Range Forest Officer, J&K Forest Deptt.

²Neelima Shah IFS
Dy. Conservator of Forests, J&K Forest Deptt.

Abstract:- A survey to identify the birds diversity in the catchment area of Thandapani Tawi River-Manawar Tawi River was conducted between May 2022 to January 2023. The study reveals a rich avian diversity and a total of 160 species of birds belonging to 56 families. The catchment of Thandapani Tawi River-Manawar Tawi River is a biodiversity rich region. It harbors a variety of flora and fauna. The catchment is a house of number of migratory as well resident birds. Varieties of migratory birds visit the catchment during winter. Continuous monitoring of the avifaunal diversity is required to evaluate the ecological status of the birds and their habitats. Birds plays an important role in maintaining the ecological balance. Due to increase in urbanization and various anthropogenic activities, diversity and distribution of bird's species is on declining trend all over the globe. Out of 160 species of birds 08 species are migratory, 128 resident, 02 resident summer visitors, 03 resident winter visitors, 03 summer visitors, 16 winter visitors were recorded.

Keywords: Birds of Sunderbani, Sunderbani Forest Range, Thandapani Tawi River Catchment, Manawar Tawi River Catchment, E-birds, Merlin, Birds of India, migratory birds, resident birds.

I. INTRODUCTION

This paper puts together a checklist of the birds found within the catchment of Thandapani Tawi River-Manawar tawi River in Rajouri District. Geographically, the catchment represents heterogeneous landscape with a varied altitudinal range, characterized by enormous diversity in habitats. Birds are regarded as the important indicators of environmental health (Collar and Andrew, 1988) and their diversity is directly related with the environmental conditions of the area. The major factors determining the existence of birds with human settlements include the presence of remnant vegetation, competition among the species and structural and floral attributes of existing vegetation (Chace and Walsh, 2006). At spatial scales their distribution however is regulated by the quantity and quality of food available, perching, roosting and nesting sites.(Muzaffar Ahmed Kitchloo et.al,2019). Birds are found throughout the world, at approximately all altitudes and in nearly every climate. Understanding the diversity and structure of bird communities is essential to delineate the

importance of regional or local landscapes for avian conservation. Moreover, seasonal monitoring is very important to trace the dynamic movement of birds in various habitats. Water birds have attracted the attention of the public and researchers because of their beauty, abundance, visibility and social behavior, as well as for their recreational and economic importance. Recently, water birds have become of interest as indicators of water quality and as parameters of restoration success and regional bio diversity (Gurdeep Kumar and Rajan Sharma, 2021), Bird surveys provide useful information for basic and applied ecology, and are useful for identifying priority areas for conservation (Daniels et al., 1991; Peterson et al., 2000). Though a number of avian studies have been conducted in the urban landscapes across India including many on the campuses and allied establishments, the information on the avian diversity for different institutes from the state of Jammu and Kashmir is scanty. Thandapani Tawi River-Manawar tawi River catchment was identified as one of study sites under our avian survey programme. Then catchment provides a rich array of habitats conducive to avian biodiversity. The present investigations attempt to provide a checklist of the birds, their preferences and migratory status based on the seasonal surveys carried out during the period of one and half year.

➤ Study Area:

District Rajouri is one of the 10 districts in Jammu division of Jammu and Kashmir (UT) and is divided into thirteen Tehsils and Panchayats. The present study is conducted in catchments of Thandapani Tawi River-Manawar Tawi River which covers 34 Panchayats. The objective of the study was to prepare a checklist of avian fauna in Sunderbani Forest Range of Nowshera Forest Division. The Thandapani Tawi River enters in the territorial jurisdiction of Sunderbani Forest Range at Taryath, which is a Tehsil headquarter and leaves the jurisdiction at Machi Bhour at village Nah. The catchment is situated 33.151626, 74.558990 at Taryath and 32.968, 74.405 at Machi Bhour. The altitudinal drop from Taryath to Machi Bhour is 421 meters. The altitude at Taryath is 734 mts. msl and at Machi Bhour is 313 mtr msl. The river flows between variety of flora and fauna. The main fauna of the study area is *Pinus roxburghii*, *kamila*, *dahin*, *kehmal*, *Cassia fistula*, *Acacia catechu*, *Terminalia chebula*, *T. ballerica*, *Coolibrookia*, *celtis australis*, *Bombax ceiba*, *Dalbergia sissoo*, *Acacia nilotica*, *A. modesta*, etc. The River Thandapani recives a

number tributaries, nallah and khads, it catches Kalima Dharam Khad at Khabbar, Barnara nallah at Barnara, Kallar kas nallah at Patrara, Nila Dub nallah at Thandapani, Nihari Tawi at Khui di Dhari and Nowshera

Tawi at Talla Tanda , where its renamed as Manawar Tawi River. It is a home for variety of fishes and other aquatic animals.

➤ *Map of Study*



II. MATERIAL AND METHODS

The present study was conducted for a period of one and half year by using Nikon 30x60 binocular, Nikon D5600 DSLR camera. The study was divided into two parts: interviews with village elders who have seen the change in bird's habitat and quick spotting of birds in the study area by visiting the sites mainly during the morning hours besides some incidental sighting during day time and evening hours. The subjects were photo graphed and properly identified by using Merlin mobile app, using its photo ID feature. It is also cross checked with photo plates of Birds of India, Birds Nepal and other available literature. Where there is any confusion in identification of a particular bird, the expert help was also sought by using FB page JKbirdlife. The experts opinion was recorded, **Dr. Parmil Kumar, Sh. Parvaiz Shagoo, Dr. Sachin Bhagat** were the main experts who identified most of the birds of study area. Secondary data were collected from the published literature. In total, we reviewed more than 40 articles published in international and national journals, books, and reports focused on Avifauna of J&K. Articles were retrieved mainly from scientific databases, including Scopus, CAB Abstracts, and Web of Science (WoS). We also used Internet search engines such as Google Scholar. Keywords included "Avifauna", "Bird count" and

"bird diversity". Findings from secondary sources support the descriptions with habitat of birds in J&K specifically focused on Sunderbani Forest Range. The observations are then properly uploaded on e-Birds cloud space with location and time of birding for feature reference. Bird's identification is bit challenging process as they are very active/ energetic. Quick eye spotting is required in order to get a detail of the particular bird species. Recognition of birds is done by observing their movement, feeding habits, habitats, specific voice calls, shape, size, etc. In order to get the data from village elders, a target group of old age villagers, who are above 70 years of age were called for personnel interviews. These persons provided the data regarding the change in habitat of birds due to urbanization, climate change etc. Many of the target groups told that house sparrow, common myna, Parakeets, Francolins were very common when the houses were thatched roofed, with the urbanization these birds migrated towards villages where there still area Kacha Ghar. They were shown photo tiles of Birds of India, Birds of Nepal and Google images. Recognition of birds is done by observing their movement, feeding habits, habitats, specific voice calls, shape, size, etc (Gurdeep Kumar and Dr. Rajan Sharma 2021).

III. RESULTS AND CONCLUSION

Table 1 Shows the Checklist of Species Observed During Study

S.No.	Family	Scientific name	Local name	F G	MS	IUCN
1	Accipitridae	<i>Milvus migrans</i>	Black kite	C	R	LC
2	Accipitridae	<i>Accipiter badius</i>	Shikra	C	R	LC
3	Accipitridae	<i>Accipiter nisus</i>	EurAsian sparrow hawk	C	R,WV	LC
4	Accipitridae	<i>Butastur teesa</i>	White honey buzzard	C	WV	LC
5	Accipitridae	<i>Buteo buteo</i>	Common buzzard	C	WV	LC
6	Accipitridae	<i>Circaetus cinereus</i>	Brown snake eagle	C	M	LC
7	Accipitridae	<i>Elanus axillaris</i>	White shouldered kite	C	R	LC
8	Accipitridae	<i>Elanus caeruleus</i>	Black winged kite	C	R	LC
9	Accipitridae	<i>Gyps bengalensis</i>	White rumped vulture	C	R	NT
10	Accipitridae	<i>Gyps himalayensis</i>	Himalayan griffon	C	R	NT
11	Accipitridae	<i>Haliaeetus albicilla</i>	White-tailed eagle	C	WV	LC
12	Accipitridae	<i>Neophron percnopterus</i>	Egyptian vulture	C	R	EN
13	Accipitridae	<i>Pernis ptilorhynchus</i>	Oriental honey buzzard	C	M	LC
14	Acrocephalidae	<i>Iduna caligata</i>	Booted warbler	G	WV	LC
15	Alaudidae	<i>Galerida cristata</i>	Crested lark	O	R	LC
16	Alcedinidae	<i>Ceryle rudis</i>	Pied kingfisher	C	R	LC
17	Alcedinidae	<i>Halcyon smyrnensis</i>	White throated kingfisher	C	R	LC
18	Alcedinidae	<i>Megaceryle lugubris</i>	Crested kingfisher	C	R	LC
19	Apodidae	<i>Aerodramus brevirostris</i>	Himalayan Swiftlet	I	R	LC
20	Apodidae	<i>Apus apus</i>	Common swift	I	SV	LC
21	Apodidae	<i>Tachymarptis melba</i>	Alpine swift	I	R	LC
22	Ardeidae	<i>Ardea cinerea</i>	Grey heron	C	R	LC
23	Ardeidae	<i>Ardea herodias</i>	Great Blue Heron	C	M	LC
24	Ardeidae	<i>Ardea purpurea</i>	Purple heron	C	R,WV	LC
25	Ardeidae	<i>Ardeola grayii</i>	Indian pond heron	C	R	LC
26	Ardeidae	<i>Bubulcus ibis</i>	Cattle egret	O	R	LC
27	Ardeidae	<i>Egretta garzetta</i>	Little egret	C	R	LC
28	Bucerotidae	<i>Ocyrceros birostris</i>	Indian grey hornbill	F	R	LC
29	Campephagidae	<i>Pericrocotus cinnamomeus</i>	Small minivet	I	R	LC
30	Campephagidae	<i>Pericrocotus ethologus</i>	long-tailed minivet	I	R	LC
31	Campephagidae	<i>Pericrocotus roseus</i>	Rosy minivet	I	R	LC
32	Certhiidae	<i>Certhia himalayana</i>	Bar tailed tree creeper	C	R	LC
33	Cettidae	<i>Horornis fortipes</i>	Brown flanked bush wabler	C	R	LC
34	Charadriidae	<i>Vanellus albiceps</i>	White -tailed lapwing	I	WV	LC
35	Charadriidae	<i>Vanellus indicus</i>	Red wattled lap wing	O	R	LC
36	Charadriidae	<i>Vanellus malabaricus</i>	Yellow wattled lapwing	C	R	LC
37	Cisticolidae	<i>Orthotomus sutorius</i>	Common tailor bird	I	R	LC
38	Cisticolidae	<i>Prinia crinigera</i>	Himalayan prinia	I,H	M	LC
39	Cisticolidae	<i>Prinia hodgsonii</i>	Grey breasted prinia	I	R	LC
40	Cisticolidae	<i>Prinia inornata</i>	Plain prinia	I,H	R	LC
41	Cisticolidae	<i>Prinia socialis</i>	Ashy prinia	I,H	R	LC
42	Cisticolidae	<i>Prinia sylvatica</i>	Jungle Prinia	I	R	LC
43	Columbidae	<i>Columba livia</i>	Rock pigeon	G	R	LC
44	Columbidae	<i>Spilopelia chinensis</i>	Spotted dove	G	R	LC
45	Columbidae	<i>Streptopelia decaocto</i>	Eurasian collared dove	G	R	LC
46	Columbidae	<i>Streptopelia tranquebarica</i>	Red collared dove	G	R	LC
47	Coraciidae	<i>Coracias benghalensis</i>	Indian roller	C	R	LC
48	Corvidae	<i>Corvus corone</i>	Carrion crow	O	R	LC
49	Corvidae	<i>Corvus culminatus</i>	Jungle crow	G	R	LC
50	Corvidae	<i>Corvus macrorhynchos</i>	Large billed crow	O	R	LC
51	Corvidae	<i>Corvus splendens</i>	House crow	O	R	LC
52	Corvidae	<i>Dendrocitta formosae</i>	Grey treepie	O	R	LC
53	Corvidae	<i>Dendrocitta vagabunda</i>	Rufous tree pie	O	R	LC
54	Corvidae	<i>Garrulus lanceolatus</i>	Black headed jay	O	R	LC
55	Corvidae	<i>Urocissa flavirostris</i>	Yellow-billed blue-magpie	O	R	LC

56	Cuculidae	<i>Centropus sinensis</i>	Greater coucal	O	R	LC
57	Cuculidae	<i>Clamator jacobinus</i>	Pied cuckoo	O	R	LC
58	Cuculidae	<i>Cuculus canorus</i>	Common cuckoo	O	R	LC
59	Cuculidae	<i>Cuculus micropterus</i>	Indian cuckoo	O	R	LC
60	Cuculidae	<i>Eudynamis scolopaceus</i>	Asian koel	O	R	LC
61	Cuculidae	<i>Hierococcyx varius</i>	Common hawk cuckoo	I	R	LC
62	Cuculidae	<i>Taccocua leschenaultii</i>	Sirkeer malkoha	O	R	LC
63	Dicruridae	<i>Dicrurus hottentottus</i>	Hair crested drongo	I,N	R	LC
64	Dicruridae	<i>Dicrurus leucophaeus</i>	Ashy drongo	I,N	R	LC
65	Dicruridae	<i>Dicrurus macrocercus</i>	Black drongo	I,N	R	LC
66	Emberizidae	<i>Emberiza cia</i>	Rock bunting	O	R	LC
67	Emberizidae	<i>Emberiza lathamii</i>	Crested bunting	O	R	LC
68	Emberizidae	<i>Emberiza stewartii</i>	White capped bunting	O	R	LC
69	Estrildidae	<i>Euodice malabarica</i>	Indian silverbill	O	R	LC
70	Estrildidae	<i>Lonchura punctulata</i>	Scally breasted munia	G	R	LC
71	Falconidae	<i>Falco tinnunculus</i>	Asian kestrel	I	R	LC
72	Fringillidae	<i>Carpodacus erythrinus</i>	Common rose finch	F	M	LC
73	Fringillidae	<i>Chloris spinoides</i>	Yellow breasted greenfinch	F	M	LC
74	Hirundinidae	<i>Cecropis daurica</i>	Red rumped swallow	I	R	LC
75	Hirundinidae	<i>Hirundo rustica</i>	Barn swallow	I	R	LC
76	Hirundinidae	<i>Petrochelidon fluvicola</i>	Streak throated swallow	I	R	LC
77	Hirundinidae	<i>Riparia chinensis</i>	Grey throated martin	I	M	LC
78	Laniidae	<i>Lanius tephronotus</i>	Gray-backed shrike	I	M	LC
79	Laniidae	<i>Lanius schach</i>	Long tailed shrike	I	R	LC
80	Leiothrichidae	<i>Argya caudata</i>	Common babbler	O	R	LC
81	Leiothrichidae	<i>Leiothrix lutea</i>	Red billed leiothorix	O		LC
82	Leiothrichidae	<i>Trochalopteron lineatum</i>	Streaked laughingthrush	O	R	LC
83	Leiothrichidae	<i>Turdoides striata</i>	Jungle babbler	O	R	LC
84	Megalaimidae	<i>Psilopogon asiaticus</i>	Blue throated barbet	O	R	LC
85	Megalaimidae	<i>Psilopogon haemacephalus</i>	Coppersmith barbat	O	R	LC
86	Megalaimidae	<i>Psilopogon virens</i>	Great barbet	O	R,SV	LC
87	Meropidae	<i>Merops orientalis</i>	Green bee eater	C	WV	LC
88	Monarchidae	<i>Terpsiphone paradisi</i>	Indian paradise flycatcher	I	WV	LC
89	Motacillidae	<i>Motacilla cinerea</i>	Grey wagtail	A,I	WV	LC
90	Motacillidae	<i>Motacilla citreola</i>	Citrine wag tail	A,I	WV	LC
91	Motacillidae	<i>Motacilla maderaspatensis</i>	White browed wagtail	A,I	WV	LC
92	Muscicapidae	<i>Oenanthe picata</i>	Variable wheatear	I	WV	LC
93	Muscicapidae	<i>Calliope pectoralis</i>	Himalayan ruby throat	I	R	LC
94	Muscicapidae	<i>Chaimarrornis leucocephalus</i>	White capped redstart	I	R	LC
95	Muscicapidae	<i>Copsychus saularis</i>	Oriental magpie robin	I	R	LC
96	Muscicapidae	<i>Eumyias thalassinus</i>	Verditer flycatcher	O	SV	LC
97	Muscicapidae	<i>Ficedula tricolor</i>	Slaty blue flycatcher	C	SV	LC
98	Muscicapidae	<i>Monticola solitarius</i>	Blue rock thrush	I	R,WV	LC
99	Muscicapidae	<i>Myophonus caeruleus</i>	Blue whistling	O	R	LC
100	Muscicapidae	<i>Oenanthe fusca</i>	Brown rock chat	I	R	LC
101	Muscicapidae	<i>Phoenicurus ochruros</i>	Black redstart	O	R	LC
102	Muscicapidae	<i>Rhyacornis fuliginosa</i>	Plumbeous water redstart	O	R	LC
103	Muscicapidae	<i>Saxicola caprata</i>	Pied bushchat	C	R	LC
104	Muscicapidae	<i>Saxicola ferreus</i>	Gray bushchat	C	R	LC
105	Muscicapidae	<i>Saxicoloides fulicatus</i>	Indian robin	I	R	LC
106	Nectariniidae	<i>Aethopyga siparaja</i>	Crimson sun bird	N	R	LC
107	Nectariniidae	<i>Cinnyris asiaticus</i>	Purple sun bird	N	R	LC
108	Paradoxornithi dae	<i>Chrysomma sinense</i>	Yellow eyed babbler	I	R	LC
109	Paridae	<i>Parus cinereus</i>	Cinereous tit	I	R	LC
110	Paridae	<i>Parus monticolus</i>	Green-backed tit	I	R	LC
111	Passeridae	<i>Gymnoris xanthocollis</i>	Yellow throated sparrow	G	R	LC
112	Passeridae	<i>Passer cinnamomeus</i>	Russet sparrow	G	R	LC
113	Passeridae	<i>Passer domesticus</i>	House sparrow	G	R	LC
114	Passeridae	<i>Petronia petronia</i>	Rock sparrow	G	WV	LC

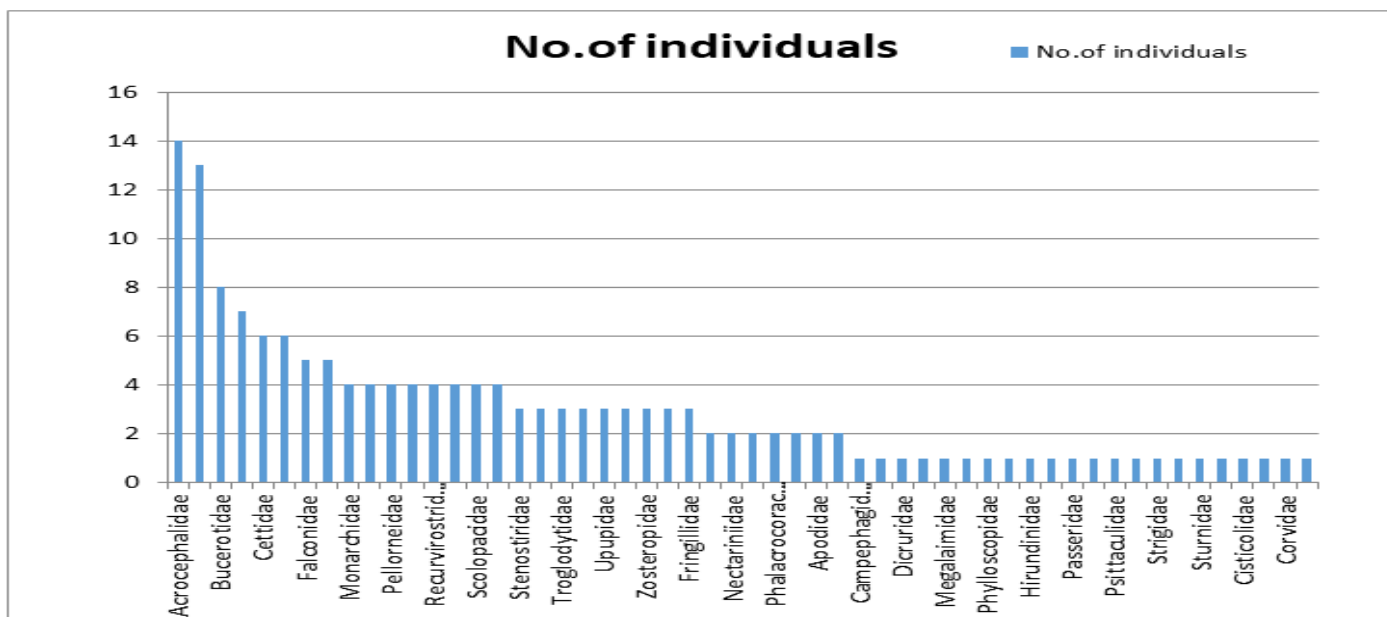
115	Pellorneidae	<i>Pellorneum ruficeps</i>	Puff throated babbler	I	R	LC
116	Phalacrocoracidae	<i>Microcarbo niger</i>	Little cormorant	AA	R	LC
117	Phalacrocoracidae	<i>Phalacrocorax fuscicollis</i>	Indian cormorant	AA	R	LC
118	Phasianidae	<i>Gallus gallus</i>	Red jungle fowl	O	R	LC
119	Phasianidae	<i>Lophura leucomelanos</i>	Kalij pheasant	O	R	LC
120	Phasianidae	<i>Ortygornis pondicerianus</i>	Grey francolin	O	R	LC
121	Phasianidae	<i>Pavo cristatus</i>	Indian peafowl	O	R	LC
122	Phasianidae	<i>Perdica asiatica</i>	Jungle Bush Quail	O	R	LC
123	Phylloscopidae	<i>Phylloscopus collybita</i>	Common chiffchaff	C	WV	LC
124	Phylloscopidae	<i>Phylloscopus humei</i>	Humes leaf wabler	I	R	LC
125	Phylloscopidae	<i>Phylloscopus xanthoschistos</i>	Grey hooded warbler	I	R	LC
126	Picidae	<i>Dendrocopos macei</i>	Fulvous brested woodpecker	O	R	LC
127	Picidae	<i>Dendrocopos nanus</i>	Brown capped pygmy woodpecker	O	R	LC
128	Picidae	<i>Dinopium benghalense</i>	Flameback wood pecker	O	R	LC
129	Picidae	<i>Leiopicus auriceps</i>	Brown fronted wood pecker	O	R	LC
130	Psittacidae	<i>Psittacula cyanocephala</i>	Plum headed parakeet	H	R	LC
131	Psittaculidae	<i>Psittacula himalayana</i>	Slaty-headed parakeet	H	R	LC
132	Psittaculidae	<i>Psittacula eupatria</i>	Alexandrine parakeet	H	R	LC
133	Psittaculidae	<i>Psittacula finschii</i>	Grey headed parakeet	H	R	LC
134	Psittaculidae	<i>Psittacula krameri</i>	Rose ringed parakeet	H	R	LC
135	Pycnonotidae	<i>Pycnonotus cafer</i>	Red vented bulbul	O	R	LC
136	Pycnonotidae	<i>Pycnonotus goiavier</i>	Yellow vented bulbul	O	R	LC
137	Pycnonotidae	<i>Pycnonotus leucogenys</i>	Himalayan bulbul	O	R	LC
138	Pycnonotidae	<i>Pycnonotus leucotis</i>	White eared bulbul	O	R	LC
139	Rallidae	<i>Amauornis phoenicurus</i>	White-breasted waterhen	AA	R	LC
140	Rallidae	<i>Zapornia akool</i>	Brown crane (jal kukdi)	O	R	LC
141	Recurvirostridae	<i>Himantopus himantopus</i>	Black winged stilt	I	R,SV	LC
142	Rhipiduridae	<i>Rhipidura albicollis</i>	White throated fantail	I	R	LC
143	Scolopacidae	<i>Tringa ochropus</i>	Green sandpiper	C	WV	LC
144	Sittidae	<i>Sitta cinnamoventriis</i>	Chestnut bellied nuthatch	O	R	LC
145	Stenostiridae	<i>Culicicapa ceylonensis</i>	Grey headed canary flycatcher	I	R	LC
146	Strigidae	<i>Athene brama</i>	Spotted owlet	C	R	LC
147	Strigidae	<i>Bubo bubo</i>	Eurasian eagle owl	C	R	LC
148	Strigidae	<i>Glaucidium cuculoides</i>	Asian barred owlet	C	R	LC
149	Strigidae	<i>Glaucidium radiatum</i>	Jungle owlet	C	R	LC
150	Sturnidae	<i>Acridotheres fuscus</i>	Jungle myna	O	R	LC
151	Sturnidae	<i>Acridotheres ginginianus</i>	Bank myna	O	R	LC
152	Sturnidae	<i>Acridotheres tristis</i>	Common myna	O	R	LC
153	Sturnidae	<i>Sturnia malabarica</i>	Chestnut tailed starling	O	R	LC
154	Sturnidae	<i>Sturnia pagodarum</i>	Brahminy starling	O	R	LC
155	Timaliidae	<i>Erythrogenys erythrogenys</i>	Rusty cheeked scimitar babbler	O	R	LC
156	Troglodytidae	<i>Troglodytes troglodytes</i>	Eurasian wren	I	R	LC
157	Turdidae	<i>Turdus atrogularis</i>	Black throated thrush	O	WV	LC
158	Upupidae	<i>Upupa epops</i>	Euracian hoopoe	O	WV	LC
159	Vangidae	<i>Tephrodornis pondicerianus</i>	Common woodshrike	C	R	LC
160	Zosteropidae	<i>Zosterops palpebrosus</i>	Oriental white eye	I	R	LC

- **Abbreviations:** FG-Forest guild: I-insectivorous, O-omnivorous, C- carnivorous, G-granivorous, H- herbivorous, F- frugivorous, N-nectarivorous, A-aquatic.
- **MS-Migratory status:** R-resident, M-migratory, WV-winter visitor, SV-summer visitor.
- **IUCN status:** LC-least concern, NT-not threatened, EN-endangered

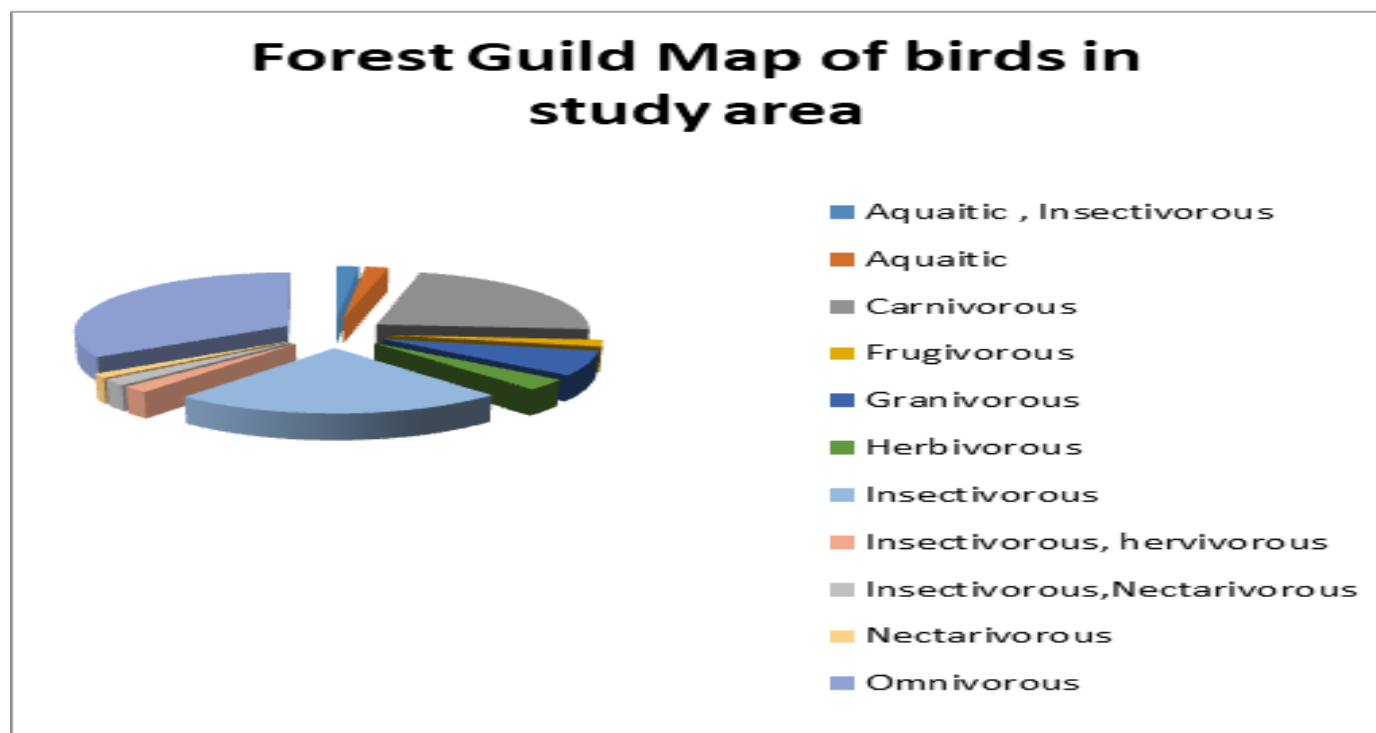
Table 2 Shows Family Wise Distribution of Species in the Study Area

Family	No. of individuals	Relative abundance
Acrocephalidae	14	8.75000
Alaudidae	13	8.12500
Bucerotidae	8	5.00000
Certhiidae	7	4.37500

Cettidae	6	3.75000
Coraciidae	6	3.75000
Falconidae	5	3.12500
Meropidae	5	3.12500
Monarchidae	4	2.50000
Paradoxornithi dae	4	2.50000
Pellorneidae	4	2.50000
Psittacidae	4	2.50000
Recurvirostridae	4	2.50000
Rhipiduridae	4	2.50000
Scolopacidae	4	2.50000
Sittidae	4	2.50000
Stenostiridae	3	1.87500
Timaliidae	3	1.87500
Troglodytidae	3	1.87500
Turdidae	3	1.87500
Upupidae	3	1.87500
Vangidae	3	1.87500
Zosteropidae	3	1.87500
Estrildidae	3	1.87500
Fringillidae	3	1.87500
Laniidae	2	1.25000
Nectariniidae	2	1.25000
Paridae	2	1.25000
Phalacrocoracidae	2	1.25000
Rallidae	2	1.25000
Apodidae	2	1.25000
Alcedinidae	2	1.25000
Campephagidae	1	0.62500
Charadriidae	1	0.62500
Dicruridae	1	0.62500
Emberizidae	1	0.62500
Megalaimidae	1	0.62500
Motacillidae	1	0.62500
Phylloscopidae	1	0.62500
Columbidae	1	0.62500
Hirundinidae	1	0.62500
Leiothrichidae	1	0.62500
Passeridae	1	0.62500
Picidae	1	0.62500
Psittaculidae	1	0.62500
Pycnonotidae	1	0.62500
Strigidae	1	0.62500
Phasianidae	1	0.62500
Sturnidae	1	0.62500
Ardeidae	1	0.62500
Cisticolidae	1	0.62500
Cuculidae	1	0.62500
Corvidae	1	0.62500
Accipitridae	1	0.62500
Muscicapidae	1	0.62500
Total	160	100



Graph 1 Graph shows the Family Wise Distribution Pattern of Birds in Study Area

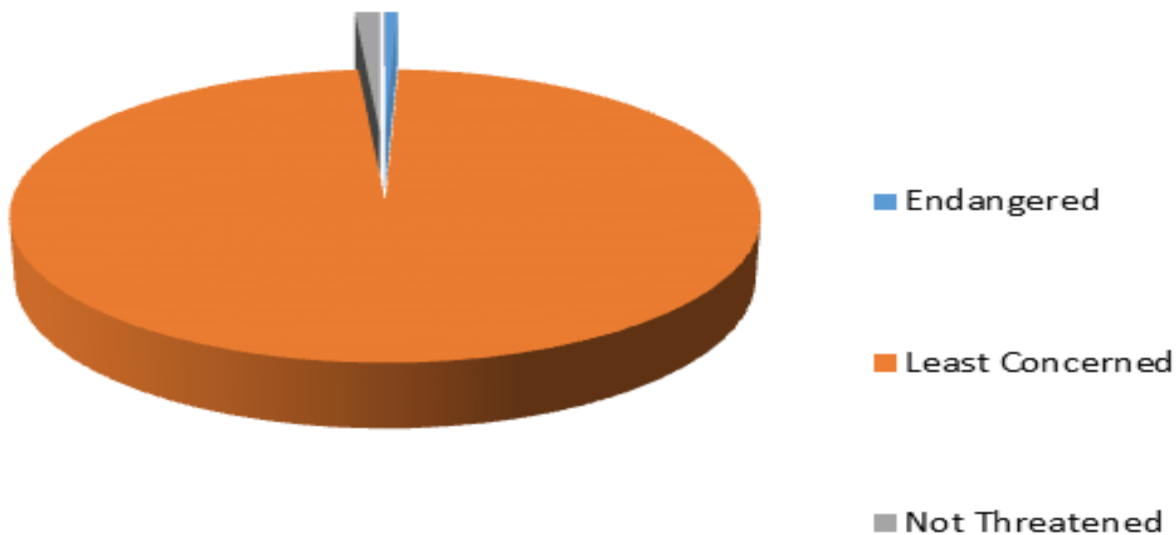


Graph 2 Graph showing Forest Guild of Birds in Study Area

Table 3 Table showing Forest Guild of Birds in Study Area

Aquatic , Insectivorous	3
Aquatic	3
Carnivorous	36
Frugivorous	3
Granivorous	11
Herbivorous	5
Insectivorous	37
Insectivorous, hervivorous	3
Insectivorous,Nectarivorous	3
Nectarivorous	2
Omnivorous	54

IUCN Status chart of birds in study area

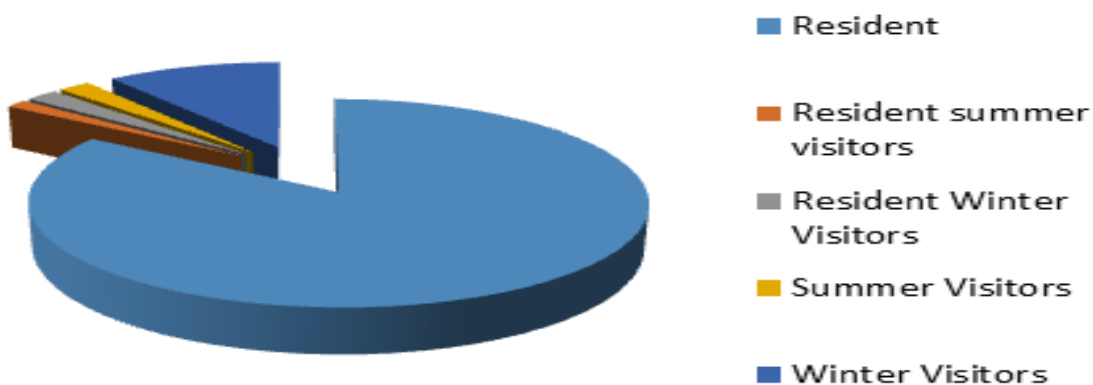


Graph 3 Graph showing IUCN Status of Birds in Study Area

Table 4 Showing IUCN Status of Birds in Study Area

Endangered	1
Least Concerned	157
Not Threatened	2

Migratory status chart of birds in study area



Graph 4 Graph showing Migratory Status of Birds in Study Area

Table 5 Table showing Migratory Status of Birds in Study Area

Migrant	8
Resident	128
Resident summer visitors	2
Resident Winter Visitors	3
Summer Visitors	3
Winter Visitors	16

During the observations of the study, it was observed that the catchment of Thandapani Tawi River-Manawar tawi River in District Rajouri has rich avifaunal diversity. We have listed 160 birds from 56 families which shows that the area is rich in biodiversity point of view. On the basis of frequency of sightings in different study sites, abundance of birds was categorized following (MacKinnon and Phillipps, 1993). Besides this, the relative abundance of the birds was also calculated using formula as number of individuals of one species / total number of individuals of all species x 100. Muscicapidae have highest relative abundance 8.64 % followed by Accipitridae 8.024 % and Corvidae 4.93 % The migratory status assigned to the birds was partly based on the visual observations which were then confirmed with the available literature (Grimmet et al., 2011). 128 birds of the study area belonged to the resident category as compared to resident summer visitors which represented only 02. Forest guild study revealed that 54 birds were omnivorous and only birds were nectarivorous. The IUCN status of birds have shown that 157 birds were under the category of least concerned and only one bird was from endangered category. There is also wide variety of plant and tree species which are present in the entire stretch of the study area may act as a suitable habitat for the avian diversity.

IV. CONCLUSION

Presently, this area is not much studied in view of avifaunal diversity and this study may highlight the scope of avifaunal studies and helpful in conserving and maintaining the ecological balance. Further, it will play a significant role in biodiversity documentation at the regional level.

ACKNOWLEDGEMENT

The authors are thankful to Dr. Parmil Kumar, Dr. Sachin Bhagat, Sh. Parvaiz Shagoo the renowned birders for helping in the identification of birds. The contribution of Sh. Suresh Manda IFS, Divisional Forest Officer in planning birding trips has resulted the documentation of birds of the catchment, the authors are highly thankful to Sh. Suresh Manda, IFS.

REFERENCES

- [1]. Aggarwal, S., D.N. Sahi and A. Wani (2008). Feeding guilds of avifauna of Nandni Wildlife Sanctuary, Jammu (Jammu and Kashmir). *The Ecoscan*, 2(2): 157-160
- [2]. Ahmed, A. and D.N. Sahi (2005). Diversity and status of birds of Tehsil Doda. *Journal of Nature and Conservation*, 17(1): 135-143.
- [3]. Ali, S. and S.D. Ripley (2001).
- [4]. Handbook of the birds of India and Pakistan - I. Oxford University Press, New Delhi.
- [5]. Anthal A., S. Koul and D.N. Sahi (2014). Species Diversity, Abundance and Status of Birds of Jammu University Campus, Jammu (Jammu and Kashmir). *Journal of Chemical, Biological and Physical Sciences*, 4(3): 2682-2690.
- [6]. Birdlife International (2017). Species Factsheet: Downloaded from <http://www.birdlife.org> on 12-11-2017.
- [7]. Chace, J.F. and J.J. Walsh (2006). Urban effects on native avifauna: A review. *Landscape Urban Plan.* 74:4669.
- [8]. Clements, J. F., T. S. Schulenberg, M. J. Iliff, D. Roberson, T. A. Fredericks, B. L. Sullivan, and C. L. Wood (2017).
- [9]. The eBird/Clements checklist of birds of the world: v 2016. Downloaded from <http://www.birds.cornell.edu/clementschecklist/download/>
- [10]. Collar, N. J. and Andrew, P (1988). Birds to watch: The ICBP Worlds Checklist of threatened birds. ICBP Technical Publication No. 8. p. 303.
- [11]. Collins, J.P., A. Kinzig, N.B. Grimm, W.F. Fagan, D. Hope, J.G. Wu, and E.T. Borer (2000). A new urban ecology. *Am. Sci.* 88:416425.
- [12]. Daniels, R.J.R., M. Hegde, N.V. Joshi and M. Gadgil (1991). Assigning conservation value ; a case study from India. *Conservation Biology*, 5 (4) : 464-475.
- [13]. Dey, A., D. Deb, S.D. Chaudhuri and P.S. Chaudhuri (2013). A Preliminary Study on Avifaunal Species Diversity of Maharaja Bir Bikram College Campus, Tripura, North East India.
- [14]. International Multidisciplinary Research Journal, 3(2):36-43. Diaz, I. A , J. Juan, R. Sharon, E. S. Kathryn and F.W. Mary (2005). Linking forest structure and composition: avian diversity in successional forests of Chiloe Island, Chile. *Biological Avian diversity at new Campus of University of Jammu, Jammu and Kashmir, India Science and Technology* (38) Conservation, 123: 91101.
- [15]. Grewal, B., S. Sen, S. Singh, N. Devasar and G. Bhatia (2016). A pictorial field guide to Birds of India, Pakistan, Nepal, Bhutan, Sri Lanka and Bangladesh. Om Books International. Pp. 1-791.

- [17]. Grimmett, R., C. Inskipp and T. Inskipp (2011). *Birds of the Indian Subcontinent*. 2nd ed. London: Oxford University Press and Christopher Helm. Pp. 1528.
- [18]. Grimmett, R., C. Inskipp and T. Inskipp (2013). *Birds of the Indian Subcontinent: India, Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh and the Maldives*. e-bookdownloaded https://play.google.com/store/books/details/Richard_Grimmett_Birds_of_the_Indian_Subcontinent.
- [19]. Hippargi, R.V., P.M. Bolde, S.V. Manthen and S.R. Aland (2012). Population and breeding status of avifauna in a highly fragmented grassland patch near Solapur, Maharashtra. *Avishkarsolapur University Research Journal*, 2:22-30. *International Union of Conservation of Nature* (2017). downloaded from <https://www.iucn.org/> on 25-11-2017.
- [20]. Kait, R., Manhas, R., Aggrwal, S. and Sahi, D.N. (2014). Birds of Srinagar City, Jammu and Kashmir, India. *International journal of biodiversity and conservation*, 6(3): 217-221.
- [21]. Kichloo, M. A. (2011). Inventorization of birds and mammals of Jammu University Campus, Jammu, JandK. M.Sc. Dissertation. University of Jammu, Jammu.
- [22]. Kichloo, M. A. (2014). Avian diversity and its association with the established forest stands in different elevational zones of Bhaderwah, JandK. M.Phil. Dissertation. University of Jammu, Jammu.
- [23]. Kumar, S. and D. N. Sahi (2006). Diversity and Status of avifauna of Jasrota Wildlife Sanctuary, Kathua (JandK state). *J. Himalayan. Ecol. Sustain. Dev.* (1): 95-104. Llanos F.A., M. Failla , G.J. García , P.M. Giovine , M. Carbajal , P.M. González , D.P. Barreto , P.
- [24]. Quillfeldt and J.F. Masello (2011). Birds from the endangered Monte, the Steppes and Coastal biomes of the province of Río Negro, northern Patagonia, Argentina. *Checklist* 7 (6) : 782-797
- [25]. MacKinnon, J., and K. Phillipps (1993). *A field guide to the birds of Borneo, Sumatra, Java and Bali*. Oxford: Oxford University Press.
- [26]. Manjunath, and B. Joshi (2012). Avifaunal diversity in Gulbarga region, north Karnataka Department of Zoology, Gulbarga University, Gulbarga, Karnataka, India. *Recent Research in Science and Technology*, 4(7): 27-34.
- [27]. Miller, J.R., and R.J. Hobbs (2002). Conservation where people live and work. *Conservation Biology*. 16:330-337.
- [28]. Motup, T. (2013). Studies on avian diversity of Trans-Himalayan region of Ladakh. Ph.D. Thesis. University of Jammu, Jammu.
- [29]. Pandotra, A. and Sahi, D.N. (2014). Avifaunal Assemblages in Suburban Habitat of Jammu, J&K,
- [30]. Muzaffar Ahmed Kichloo, Asha Sohil, Parmil Kumar & Neeraj Sharma (39) Researcher : A Multi-disciplinary Journal India. *International Research Journal of Environment Sciences*, 3(6): 17-24.
- [31]. Peterson, A.T., L.G. Ball and K.W. Brady (2000). Distribution of the birds of the Philippines : biogeography & conservation priorities. *Bird Conservation International*, 10(2): 149-167.
- [32]. Sharma, N. and Kichloo, M.A. (2015). Avian Habitat-Use and dietary guilds in different forest communities of Bhaderwah, Jammu And Kashmir, India. *International Journal of Recent Scientific Research*. 6(7): 5145-5149.
- [33]. Singh, R. D. Kour, N. Ahmad and D.N. Sahi (2013). Species diversity, relative abundance and habitat use of the bird communities of Tehsil Chenani, district Udhampur, Jammu and Kashmir, India. *Indian Journal of Life Science*, 2(2):81-90.
- [34]. Verner, J (1985). Assessment of counting techniques p. 247-302. In R. F. Johnston [ed.], *Current Ornithology*. Vol. 2. Plenum Press, New York.
- [35]. Wani, A.A., D.N. Sahi and S. Kumar (2008). Feeding ecology of avifauna of Doda, Jammu and Kashmir. *J. The Bioscan*, 3(4): 477-478. Xeno-canto (2017). Sharing birds sounds from around the world. Electronic database accessible at: <http://xeno-canto.org>. Downloaded on 12-11-2017.
- [36]. Ali, S. (1932). Flowers birds and birds flower in India, *Journal of Bombay Natural History Society*, 35:573-605.
- [37]. Ali, S. (2002). *The book of Indian birds*. Bombay Natural History Society, India.
- [38]. Davidar, P. (1985). Ecological interactions between the mistletoes and their avian pollinators in south India, *Journal of Bombay Natural History Society*, 82:45-60.
- [39]. Ghazi, H.K. (1962). Piscivorous birds of Madras, *Madras Journal of fisheries*, 1(1):106-107.
- [40]. Ghosal, D.N. (1995). Avifauna of conservation areas, No. 7, Fauna of Kanha Tiger Reserve. *Zoological survey of India (ZSI)*, pp 63-91.
- [41]. Green, A.J. (1996). Seasonal of globally threatened anatidae in relation to threats, distribution, migration patterns and habitat use. *Conservation Biology*, 10:1435-1445.
- [42]. Grewal, B., Sen, S., Singh, S., Devasar, N. and Bhatia, G. (2016). *A pictorial field guide to birds of India*. Om Publications, India.
- [43]. Grimmett, R., Inskipp, C. and Inskipp, T. (1999). *Pocket guide to the birds of the Indian subcontinent*. Oxford university press, Delhi.
- [44]. Karr J.R. (1976). Seasonality resource availability and community diversity in tropical bird communities, *American Naturalist*, 105:423-435.