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SEASONAL VARIATION AND ABUNDANCE, RESIDENTIAL AND IUCN STATUS OF AVIAN DIVERSITY IN FOREST COMMUNITY IN JASHPUR DISTRICT (C.G.)

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ABSTRACT

Birds are one of the most important units in the food chain on this planet. They play significant role in the environment. They are good indicators for understanding climate changing in the ecosystems. Birds attract peoples due to their fascinating colors, courtship behavior, sound and their beauty. The present study was carried out in Forest Community in Jashpur District (C.G.) between January to December 2021 with the objectives to explore the bird diversity and seasonal variation along with the factors affecting bird diversity in the study area. Mackinnon's Listing Method and Point Count Method were used for bird survey during winter and summer seasons. In the present study, attempt has been made to collect the relevant information regarding the avian fauna of around the study site Jashpur (C.G.). The periodic survey of the study area, showed great deal of avian biodiversity. During the study period, a total of 102 bird species during the two year periods belonging to 15 orders and 39 families were reported were recorded. Various bird species recorded during the whole period of study in "Forest area near Sarudih tea garden area (Site A), nearly village Gamharia (Site B) and near Neemgoan dam (Site-C) Jashpur (C.G.)." were given the IUCN status (Table 5.9) so that the conservational measures could be suggested/adopted accordingly. A comparison of the recorded avian species was made with the recent Red Data List published by IUCN. Accordingly, these bird species were categorized into two IUCN categories, namely, Least Concern (LC) and Endangered (EN). According to Red Data Book of IUCN 102, "Globally threatened" species were also recorded from the study area. Out of 100 globally threatened species, and only 2 species was in endangered category.

Keywords: Seasonal Variation, Abundance, Residential and IUCN Status Avian Diversity

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1. INTRODUCTION

All the organisms on this earth have their own specific habitats where they persist. Among all the organisms, birds are one of the sensitive species which show the quick response towards different changes in the habitat. Birds prefer different habitats such as forest, bushes, grasslands, wetlands, grasslands, agricultural land, urban areas and desert as these habitats provide them protection, different arrays of foraging opportunities and nesting sites (Rahbek and Graves 2001). Birds that are encountered in various habitats types indicate their tolerance to a wide range of ecological conditions (Sekercioglu 2006). Resident and breeding bird species play an important role as a bio-indicator of habitat change (Sheta et al. 2011) as most of resident birds are gregarious, and show the pronounced effect on the habitat, especially when they are locally abundant (O'Connell et al. 2007).

Seasonality plays a major role in determining the abundance and distribution of birds. It affects food and cover availability of bird population, which in turn affects breeding success and ultimately survival of the bird species (Mengesha and Bekele 2008). The distinct seasonality of rainfall and seasonal variation in the availability of food resources (Schroth et al. 2004), presence of migratory species, reproductive activities, and seasonal changes in the composition and abundance of birds, who are dependent from particular seasonal resources, are the factors that cause seasonal differences in the bird assemblage (Almazan et al. 2015). The variation in the number of captures of birds are also influenced by the arrival and departure of seasonal altitudinal migrants (Werema and Howell 2016). The relative abundance of avian species during wet and dry seasons might be related to the availability of food, habitat condition, vegetation complexity and breeding season of the species (Belay and Yihune 2017). During the wet season, many flowering plants are seen flourished which provide the sufficient food supply to birds in almost all the habitats. However, during the dry season, the deciduous trees defoliate and in the absence of food, many species of birds can be restricted to specific habitat where sufficient resources are available (Husein and Sultan 2019).

IUCN Red List shows that there has been a steady and continuing deterioration in the status of the world's birds since the first comprehensive assessment in 1988. Highly threatened species continue to go extinct, while formerly common and widespread species are in sharp decline. The assessment of bird community is important tool in biodiversity conservation and identifications of conservation actions. Knowledge on diversity and composition of bird communities is important to determine the health status of the local ecosystem or regional landscapes (Sethy et al. 2015). However, no such study has been done in Jashpur (C.G.) forest Community about the diversity of birds and its seasonal variation. So, the study is most important for the exploration of avifauna in this area as well as for the management and conservation of bird species.

2. OBJECTIVES

1. Identification of Species
2. Seasonal variation & IUCN status of avian diversity

STUDY SITE-

The present investigations will be carried out in forest niche of Jashpur (C.G.). The district Jashpur lies North Eastern Part of C.G. and is rich with dense forest and Green Flora. Northern region of district has long series of hills and mountains. It has an average altitude from 2500 to 3500 meters above sea level, the district is geographically situated between 17^0 41 N to 24^0 5N latitude and 80^0 15 E to 84^0 26E longitude. The natural vegetation of this region in accordance with the climate of this area is of tropical deciduous forest type. The study in carried out in different forest area. The bird's diversity will be investigated for two year regularly. This information will be collected from 3 sites in Jashpur.

SITE A:-

Forest area near Sarudih tea garden area- It is an area with dense vegetation, where human interference is quite low. Various types of birds visit of this place.

SITE B:-

This seated site is nearly village Gamhariya – Which is moderate in habituated rural area; villager's regular visit the forest, because forest is very to the village.

SITE C-:

The forest area selected is near Neemgoan dam – Where aquatic birds are abundantly present. The forest is even though not very dense.

3. MATERIALS AND METHODS

Surveys were carried out within the months of January, (winter) and August, (summer) to assess seasonal variation. Birds were observed through Mackinnon's Listing Method (Mackinnon et. al., 1993) and Point Count Method as described by (Sutherland W.J., 2006). Location of each point was determined using Garmin Etrex. Altogether, 13 points count stations was established within study site representing forest, shrub land and open habitat according to birding route, keeping each point at the difference of 200 meters. Different disturbance variables which include the distance to nearest settlement, number of trails, livestock and fodder collection were also measured at each station. Bird observation was done early in the morning from 07:00 hrs to 11:00 hrs. With the help of binoculars for about 20 minutes at each point (Olympus 8X40). Ten days was spent in the field during each season. A bird was recorded by direct observation and calls aided by photographs (Nikon DSLR 5600 with , 75 mm-300 mm telelens) and Field guidebook "Birds of India". However, study of flying raptors and nocturnal birds was not done in the current research.

DATA ANALYSIS

After the collection of data, the avian diversity of each habitat was analyzed using Shannon-Wiener Diversity Index (H) (Shannon C.E., 1949) which was calculated from the software PAST version 3.25 (Hammer et.al., 2001). Paired T-test was performed to compare bird diversity in different habitats and seasons.

RESULTS

In the present study, attempt has been made to collect the relevant information regarding the avian fauna of around the study site Jashpur (C.G.). The periodic survey of the study area, showed great deal of avian biodiversity. During the study period, a total of 102 bird species during the two year periods belonging to 15 orders and 39 families were reported.

IUCN STATUS

Various bird species recorded during the whole period of study in "Forest area near Sarudih tea garden area (Site A), nearly village Gamharia (Site B) and near Neemgoan dam (Site-C) Jashpur (C.G.)." were given the IUCN status (Table 1) so that the conservational measures could be suggested/adopted accordingly. A comparison of the recorded avian species was made with the recent Red Data List published by IUCN. Accordingly, these bird species were categorized into two IUCN categories, namely, Least Concern (LC) and Endangered (EN). According to Red Data Book of IUCN 102, "*Globally threatened*" species were also recorded from the study area. Out of 100 globally threatened species, and only 2 species was in endangered category (Table no. 2).

ABUNDANCE STATUS

On the basis of the frequency of sighting, various bird species was categorized as Abundant (A), Common (C), Uncommon (UC) and Rare (RA). Analysis of data showed that out of total, 42 species (41.2%) were Abundant, 23 species (22.5%) were Common, 37 (36.3%) species were Uncommon (Graph 1 & 2).

RESIDENTIAL STATUS

In order to assess the residential status of avian fauna, the recorded bird species were categorized as Resident (R), Migratory (M) and Resident Migratory (RM). Analysis of data revealed that of the total 102 avian species encountered, 80 species were residential, 16 species were migratory and 6 species were resident migratory (Graph. 3).

Table 1. Abundance status, residential status and IUCN status of birds from Forest area near Sarudih tea garden area (Site A), nearly village Gamharia (Site B) and near Neemgoan dam (Site-C) Jashpur (C.G.).

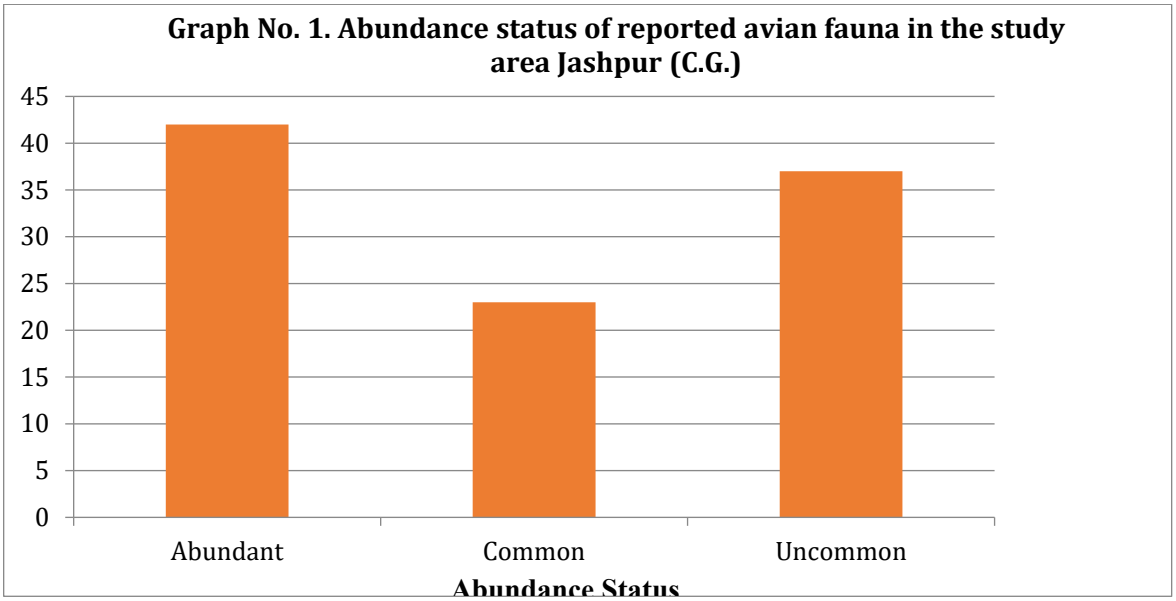
Sr. No.	Common Name	Abundance status	Residential status	IUCN status
1.	Ruddy Shelduck	A	WM	LC
2.	Bar-headed Goose	A	WM	LC
3.	Lesser Whistling-Duck	A	WM	LC
4.	Northern Pintail	A	WM	LC
5.	Plum-headed Parakeet	A	R	LC
6.	Rose-ringed Parakeet	A	R	LC
7.	Plain Parakeet	A	R	LC
8.	Jungle Owlet	C	R	LN
9.	Forest Owlet	UC	R	LC
10.	Barn Owlet	UC	R	LC
11.	Spotted Owlet	UC	R	LC
12.	Indian Eagle owl	UC	R	LC
13.	Black-winged Kite	UC	R	LC

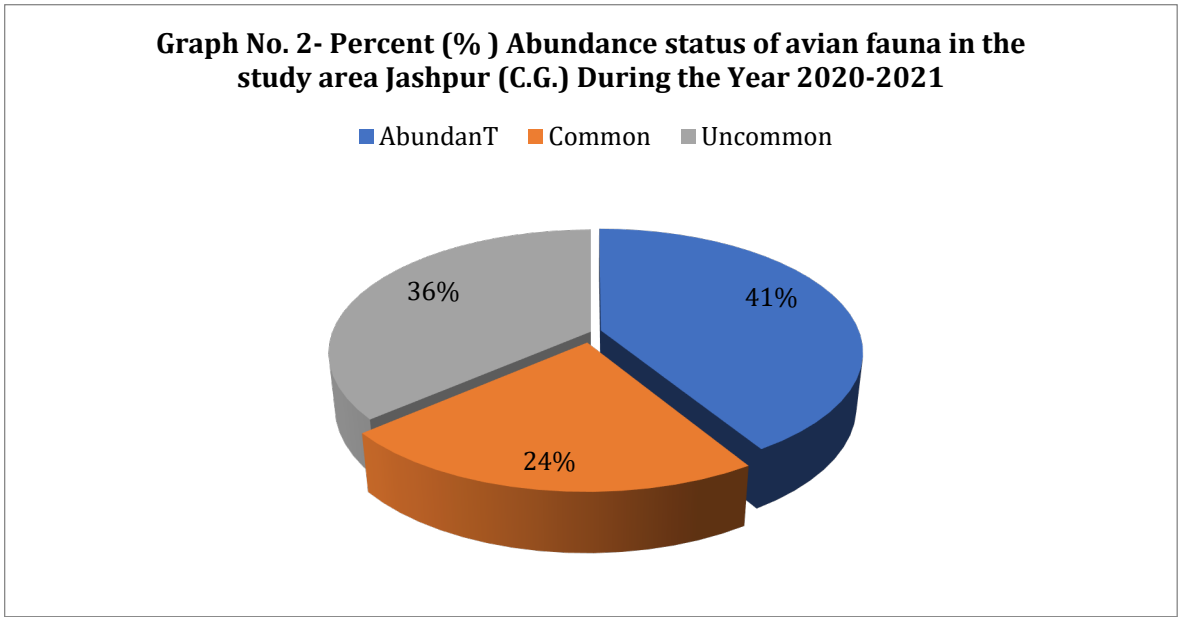
14.	White-eyed Buzzard	UC	R	LC
15.	Great egret	A	RM	LC
16.	Indian Pond-Heron	A	R	LC
17.	Little Egret	A	R	LC
18.	Red-naped Ibis	C	WM	LC
19.	Cattle Egret	A	R	LC
20.	Striated Heron	A	R	LC
21.	Black crowned night heron	UC	R	LC
22.	Little Cormorant	A	WM	LC
23.	Pheasant-tailedJacana	UC	WM	LC
24.	Common snipe	UC	R	LC
25.	Red-wattled Lapwing	A	R	LC
26.	Greter painted-snipe	UC	R	LC
27.	Green Sandpiper	UC	WM	LC
28.	Jacobin Cuckoo	UC	RM	LC
29.	Asian Koel	C	RM	LC
30.	Lesser Cuckooshrike	C	R	LC
31.	Common Hawk-Cuckoo	C	R	LC
32.	Indian Cuckoo	C	R	LC
33.	Common Cuckoo	C	R	LC
34.	Greater Coucal	A	R	LC
35.	Banded Bay Cuckoo	C	R	LC
36.	Himalayan Cuckoo	UC	WM	LC
37.	Eurasian Hoopoe	UC	RM	LC
38.	Long-tailed Shrike	C	R	LC
39.	Oriental White-eye	C	R	LC
40.	Ashy Woodswallow	A	R	LC
41.	Black Redstart	A	R	LC
42.	Pied Bushchat	A	R	LC
43.	Blue-Capped Red Start	A	R	LC
44.	Indian Robin	C	R	LC
45.	Indian black loret tit	C	R	LC
46.	Scarlet Minivet	C	R	LC
47.	Large Cuckooshrike	C	R	LC
48.	Small Minivet	C	R	LC
49.	Sunda Minivet	C	WM	LC
50.	White-bellied Cuckooshrike	UC	R	LC
51.	Orange Minivet	C	R	LC
52.	Rufous Treepie	C	R	LC
53.	Crow	C	R	LC
54.	Large-billed Crow	C	R	LC

55.	Indian Golden Oriole	C	R	LC
56.	Common Myna	A	R	LC
57.	Brahminy Starling	A	R	LC
58.	Asian Pied Starling	A	R	LC
59.	House Sparrow	A	R	LC
60.	Red-vented Bulbul	A	R	LC
61.	Oriental Magpie-Robin	C	R	LC
62.	Jungle Babbler	A	R	LC
63.	Common Woodshrike	C	R	LC
64.	Large Woodshrike	C	R	LC
65.	Western Yellow Wagtail	UC	WM	LC
66.	Richard's Pipit	UC	WM	LC
67.	Berthelot's Pipit	A	R	LC
68.	Tree Pipit	A	R	LC
69.	Paddy Field Pipit	A	R	LC
70.	Tawny Pipit	C	R	LC
71.	Black Drongo	A	R	LC
72.	Purple Sunbird	A	R	LC
73.	Ashy Prinia	A	R	LC
74.	Rufous-Fronted Prinia	A	R	LC
75.	White Spotted Fantail	UC	R	LC
76.	Little Pied Flycatcher	A	R	LC
77.	Ashy Drongo	C	R	LC
78.	Thick billed flowerpecker	C	R	LC
79	Chestnut-tailed Starling	C	WM	LC
80	Willow Warbler	C	WM	LC
81	Brown Shrike	UC	RM	LC
82	Sakhlin leaf warbler	C	R	LC
83	Scaly breasted munia	C	R	LC
84	Common tailorbird	C	R	LC
85	Chestnut Headed bee Eater	C	RM	LC
86	Green Bee-eater	C	R	LC
87	White-throated Kingfisher	C	R	LC
88	Indian Roller	C	R	LC
89	Rainbow Bee-eater	C	R	LC
90	Laughing Dove	A	R	LC
91	Spotted Dove	A	R	LC
92	Dove	A	R	LC
93	Common Wood pigeon	A	R	LC
94	Red Collared dove	A	R	LC
95	Coppersmith Barbet	A	R	LC
96	Yellow- Crowned Wood Pecker	UC	R	LC
97	Brown-headed Barbet	A	R	LC
98	Asian openbild stork	UC	WM	LC
99	common Moorhen	A	WM	LC
100	White –breasted waterhen	A	R	LC
101	Gray Francolin	UC	R	**EN**

102	Red Jungle fowl	UC	R	**EN**

(A)Abundant, C- Common, UC- Uncommon, R- Resident, RM- Resident Migrant, WM- Winter migrant, LC- Least concerned, EN- Endangered).





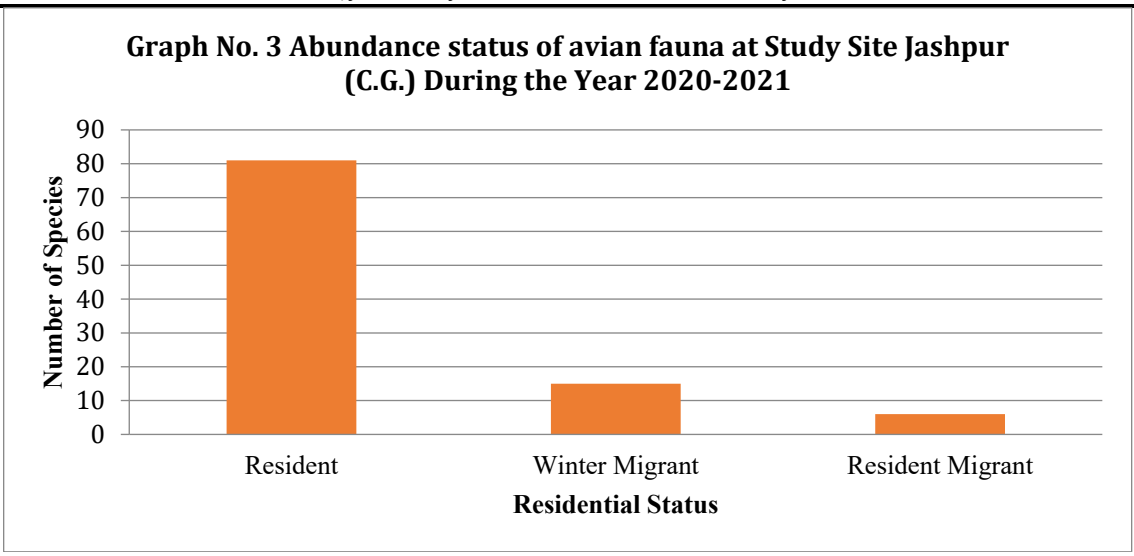
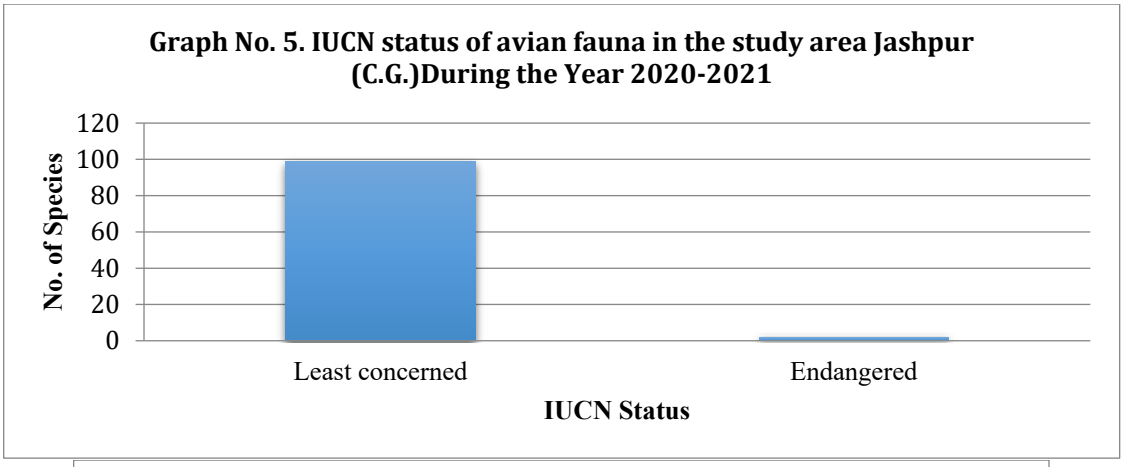
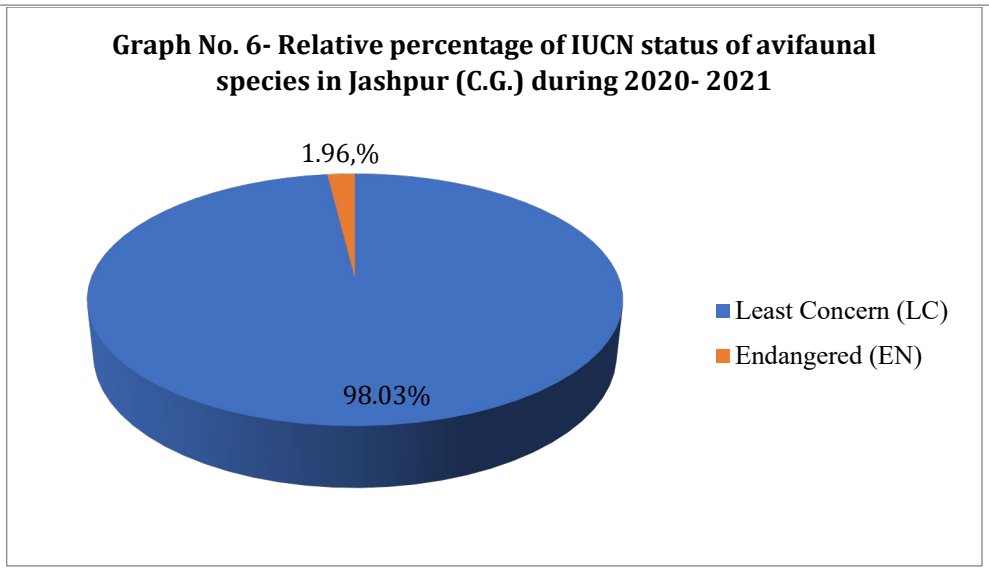


Table- 2 Relative percentage of IUCN status of avifaunal species in Jashpur (C.G.) during 2020- 2021

S.N.	IUCN status	No. of species	Percentage %
1.	Least Concern (LC)	100	98.03
2.	Endangered (EN)	2	1.96
	Total =	**102**	**100%**





4. DISCUSSION

The fundamental problems of bird life and functioning of ecosystem resolve themselves, upon analysis, into simple questions of avian diversity,. The proportions of birds of any species to its competitors, and of the population as a whole to the food resources at its disposal, have a vital bearing on the economy and social organization prevailing over a given area. The study conducted for the first time in the study area revealed that bird diversity and evenness was higher during winter season than summer season. Our study revealed that the high species of avian fauna in the study area attributed to different habitat types which provided different array of foraging opportunities and nesting sites (Girma Z et. al; 2016). Order Passeriformes was the dominant order (Chaudhari U.K. et.al.; 2009) which is similar with our study. Similarly, the present study found that the highest number of species was from Muscicapidae family followed by Corvidae and Cuculidae (Chaudhari UK et. al, 2009 & Thakuri J.J. et. al, 2018). The present study showed that the higher bird diversity was seen in winter season than in summer season. This might be due to increment in local movement of birds for searching food resources and defoliation of plants that helps them for easy detection of birds (Tirkey et al. 2022). Our research agreed with the study conducted by (Katuwal et . al., 2018 & Tzortzakaki et. al., 2018). Where the higher number of species was recorded in winter season than in summer season where there is defoliation of plants, some raptors and other species moved spatially to optimize their resources (Almazan et. al., 2015). Open habitats were favorable for foraging activity (Otieno NE et. al., 2011). Hailu stated that open areas were favorable for avian fauna to sight easily for identifying and classifying as well as counting (Hailu S.,2008). Birds were unable to tolerate the high temperature in summer season which might lead to recording low species in summer (Pokherel U., 2015) which is similar with our study.

5. LOCAL OCCURRENCE, MIGRATORY AND THREATENED STATUS-

Although the diversity of bird was higher in winter season, the higher abundance of the birds in summer season than winter season which might be due to the availability of enough food resources and breeding behavior of birds. Breeding activities lead to the increase in the number of the species which is similar with the finding of (Abie K, et.al.,2019). The reason behind this was the higher species abundance in summer season as wet season which created favorable environmental condition for food, cover, and another habitat requirement.

6. CONCLUSION

Birds are most beautiful, attractive, and diverse and they also help maintain ecological functions. As a part of food chain they play an important role by transferring matter and energy. The present study in Jashpur Community forest, despite its small size, observed high bird diversity. Bird diversity was higher during winter season than during summer season suggesting that the area is preferred by winter migrants for their breeding grounds. We conclude that the bird assemblage with seasonality is determined by the strong influence of habitat type and disturbance variables including distance to nearest settlements, livestock, fodder collection and number of human trails. The presence of globally vulnerable species revealed the importance of the area to conserve these species. The present study in Jashpur (C.G.) forest Community about the diversity of birds and its seasonal variation. So, the study is most important for the exploration of avifauna in this area as well as for the management and conservation of bird species.

CONFLICT OF INTERESTS

None.

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