International Journal of Science, Environment and Technology, Vol. 8, No 5, 2019, 1232 – 1240
ISSN 2278-3687 (O)
2277-663X (P)

A CHECKLIST OF AVIFAUNAL DIVERSITY IN THE POWER GRID TRANSMISSION LINE AFFECTED AREA UNDER RAIGARH FOREST DIVISION, CHHATTISGARH, INDIA

Jeevan S. Toppo, Rajesh Toppo, Manas M. Ujjaini and Mudit K. Singh
State Forest Research and Training Institute,
Near Vidhan Sabha, Zero point, Baloda Bazar Road – 492005 Raipur, Chhattisgarh, India

Abstract: A study has been carried out to find the bird diversity of affected area of Raigarh forest division, where the Power Grid transmission lines were crossing through Kharsiya, Gharghoda and Tamnar Ranges. The felling of trees from dense forest creates habitat loss of bird diversity. This Study reveals the total of 55 bird species belonging to 36 families which were recorded during the study period. Total 93.1636 hectare forest land area is affected due to the transmission line towers. The Study also brought out endangered species among the identified species. Most of the species recorded in the study area were residents. The research highlights the significance of green space around forest density and the accessibility of bird diversity as preferred habitats for populations of birds in impacted regions.
Keywords: Avifaunal diversity, Checklist, Habitat, Raigarh, Chhattisgarh.

Introduction

The impact from the construction of a transmission line can be measured in several different ways. The effect of a new transmission line on an area may depend on the topography, land cover, and existing land uses. In present time, avifaunal diversity has been decreasing due to the destruction of natural habitats and human disturbances. Random destruction of natural habitats by cutting nesting trees and foraging habitats for commercial use of woods and lands are the main factors responsible for narrow down in avian foraging habitat and their nesting sites (Edison et al., 2016). In order to prioritize the future conservation of species, understanding the effect of habitat on bird community structure is important (Rajpar et al., 2011). In the long run, the relative value of different habitats and conservation importance of sites can be assessed by investigating the diversity of birds present in those areas (Bensizerara et al., 2013). This would be important for assessment of population status and conservation of avifaunal biodiversity in urban ecosystems.

This line is passing through the State of Chhattisgarh where the huge forest patches and having no other alternative from forest land. However the route alignment of above said transmission line is carried out keeping in view of involve of minimum forest area.

*Received Oct 1, 2019 * Published Dec 8, 2019 * www.ijset.net*

Raigarh is one of the major city of Chhattisgarh state known as Cultural capital. The district is surrounded by rural and urban areas with diverse variety of habitats represented by aquatic bodies, woodlots and gardens, which provide sheltering for numerous fauna. The present study was an attempt to explore and document the avian diversity associated with the affected forest areas of Power Grid transmission line present in Raigarh Forest Division.

Study Area

The study site is located in three Forest Range under Raigarh Forest Division i.e (i). Kharsiya Range near Kafermar and Kurru village, (ii). Gharghoda Range- Tenda Nawapara & Raikera village and (iii). Tamnar Range – Villages- Kurru, Sakta, Semijhor, Jaridih, Hardijhariya and Milupara.

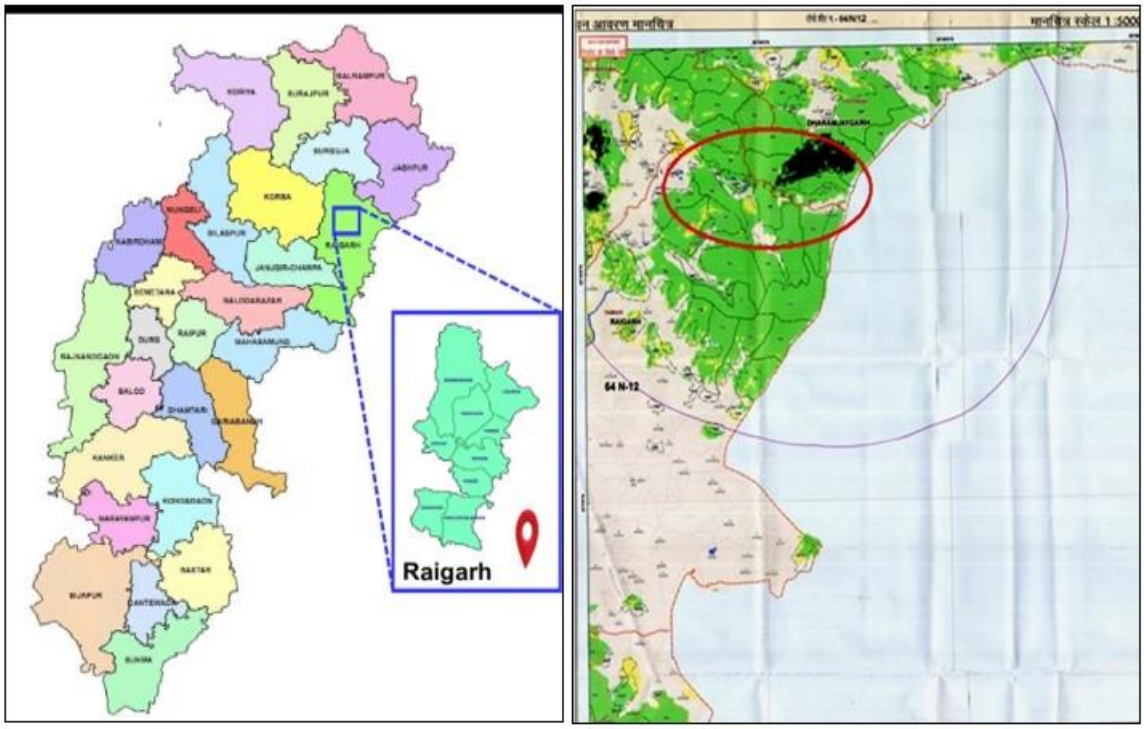


Fig.1-Location Map of study area, Raigarh, Chhattisgarh, India

Table.1: Affected areas of Raigarh Forest Division (Diverted forest lands).

Name of Forest Division	Types of forest land	Affected area (in Hactare)
Raigarh	Reserve forest land	56.4140
	Protected forest land	22.0430
	Orange forest land	8.5425
	Revenue forest land	6.1636
Total		93.1636

Materials and Methods

The study was carried out for the period from July 2018 to March 2019. The Seasonal surveys have been done in three different seasons namely; 1st seasonal survey conducted in the month of July-August 2018, 2nd season survey in December 2018 and 3rd season survey was conducted in March 2019. The bird species were recorded by applying 'Transect line method'. An observer moves along a transect line in a line - transect survey method and notes the location of all detected birds on the line (Bird census and survey techniques, Richard D. Gregory, David W. Gibbons, and Paul F. Donald, 2004). The birds were observed during the most active period of the day, i.e. early morning between 07:00 to 10:00 AM and in the evening from 03:00 to 06:00 PM (Cunningham et al., 2006; Simons et al., 2006). Field survey method used seasonally to observe the abundance of avifauna, habitat, nesting pattern & adjacent vegetation; to estimate the present status of diversity of avifauna species in the Power grid region was used to monitor bird observation. However, in three seasons, namely rainy, summer and winter seasons, the observations were taken and used to identify birds and prepare checklists. The habitat and habitat of bird species discovered were also noted during field research. Their event in the region and IUCN status were also researched at the moment of checklist preparation.

Results and Discussion

As a result of observation, a total number of 1354 individual avifauna species from 55 different species belonging to 36 families were identified and recorded from the study area (Table-2). According to three seasonal surveys, the avifauna populations have been recorded which are as; 1st season survey, total 133 individuals of 23 different avifauna species; 2nd season survey, total 317 individuals of 40 different avifauna species; and in 3rd season survey, 904 individuals of 50 different avifauna species were recorded. Among the bird species, Alexandrine Parakeet (*Psittacula eupatria)* was listed under 'Near Threatened' category and Turtle dove (*Streptopelia orientalis*) was listed under 'Vulnerable' in the red list (IUCN, 2016). Rests of the all species recorded in the area were listed in the Least Concern category (IUCN, 2016).

The maximum species richness of avian species was recorded from the family 'Columbidae' with five species, followed by family 'Muscicapidae'. Thus the study revealed the diversity of birds in different habitat types in the Power grid transmission line affected area of Raigarh Forest Division.

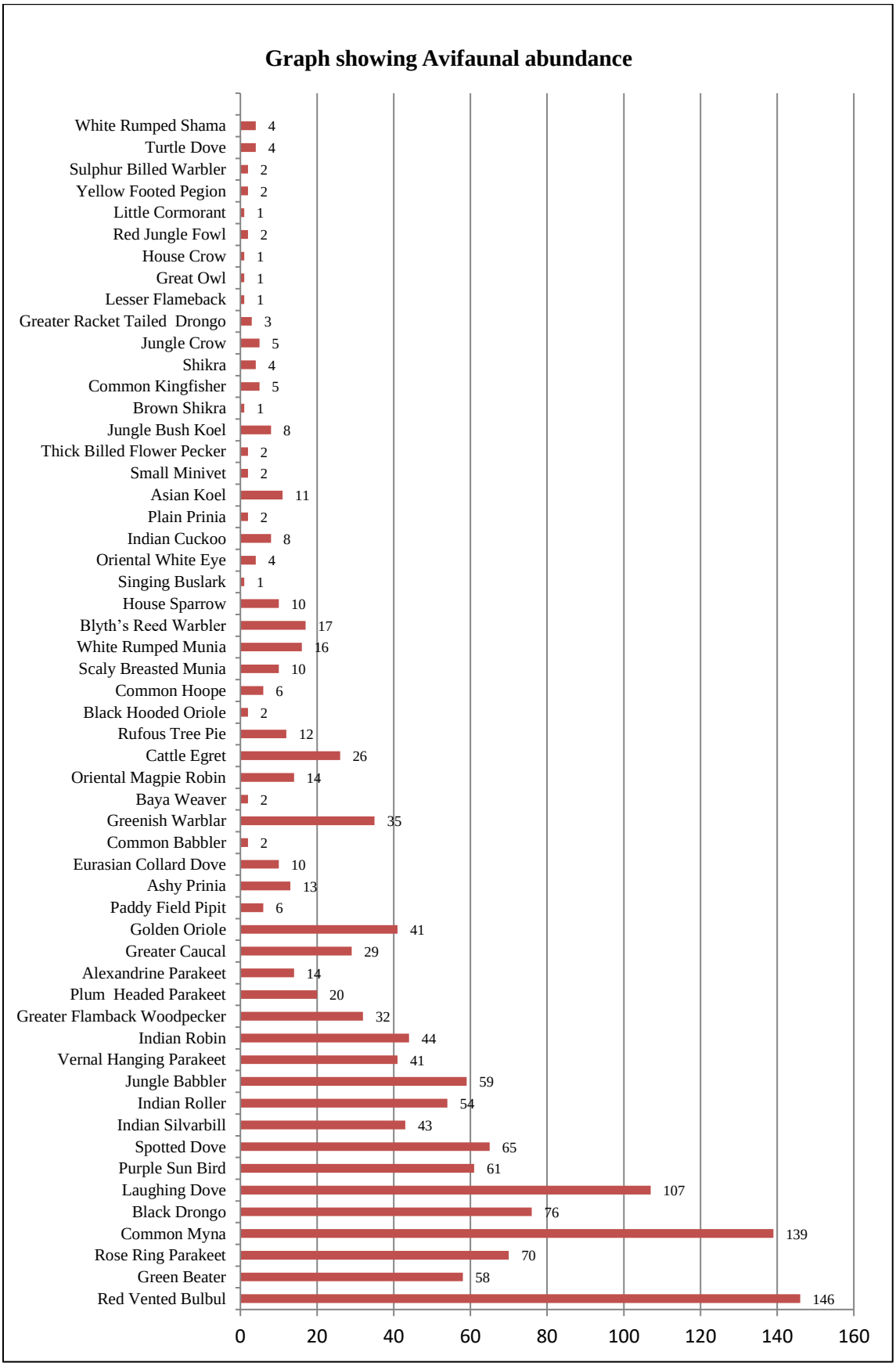
Table 2: Checklist of availability of avifauna in the Power grid affected area of Raigarh Forest Division

S. N	Avifauna Species	Zoological Name	Family	Habitat	IUCN Status	Ist Season	IInd Season	IIIrd Season	Total Avi-fauna
1	Red Vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	R	LC	13	33	100	**146**
2	Green Beater	*Green Bee Eater*	Meropidae	R	LC	-	07	51	**58**
3	Rose Ring Parakeet	*Psittacula krameri*	Psittaculidae	R	LC	04	12	54	**70**
4	Common Myna	*Acridotheres tristis*	Sturnidae	R	LC	23	43	73	**139**
5	Black Drongo	*Dicrurus macrocercus*	Dicruridae	R	LC	09	09	58	**76**
6	Laughing Dove	*Spilopelia senegalensis*	Columbidae	R	LC	14	25	68	**107**
7	Purple Sun Bird	*Nectarania asiatica*	Nectariniini	R	LC	02	11	48	**61**
8	Spotted Dove	*Streptopelia chinensis*	Columbidae	R	LC	06	12	47	**65**
9	Indian Silverbill	*Euodice malabarica*	Estrildidae	R	LC	01	10	32	**43**
10	Indian Roller	*Coracias benghalensis*	Coraciidae	R	LC	08	10	36	**54**
11	Jungle Babbler	*Turdoides striata*	Leiothrichidae	R	LC	07	20	32	**59**
12	Vernal Hanging Parakeet	*Loriculus vernalis*	Psittaculidae	R	LC	11	10	20	**41**
13	Indian Robin	*Saxicoloides fu licatus*	Muscicapidae	R	LC	05	05	34	**44**
14	Greater Flamback Woodpecker	*Dryocopus martius*	Picidae	R	LC	06	06	20	**32**
15	Plum Headed Parakeet	*Psittacula cyanocephala*	Psittacidae	R	LC	01	02	17	**20**
16	Alexandrine Parakeet	*Psittacula eupatria*	Psittacidae	R	**NT**	-	03	11	**14**
17	Greater Caucal	*Centropus sinensis*	Cuculidae	R	LC	02	07	20	**29**
18	Golden Oriole	*Oriolus kundoo*	Oriolidae	R	LC	05	08	28	**41**
19	Paddy Field Pipit	*Anthus rufulus*	Motacillidae	R	LC	-	-	06	**6**
20	Ashy Prinia	*Prinia socialis*	Cisticolidae	R	LC	-	03	10	**13**
21	Eurasian Collard Dove	*Streptopelia decaocto*	Columbidae	R	LC	-	02	08	**10**

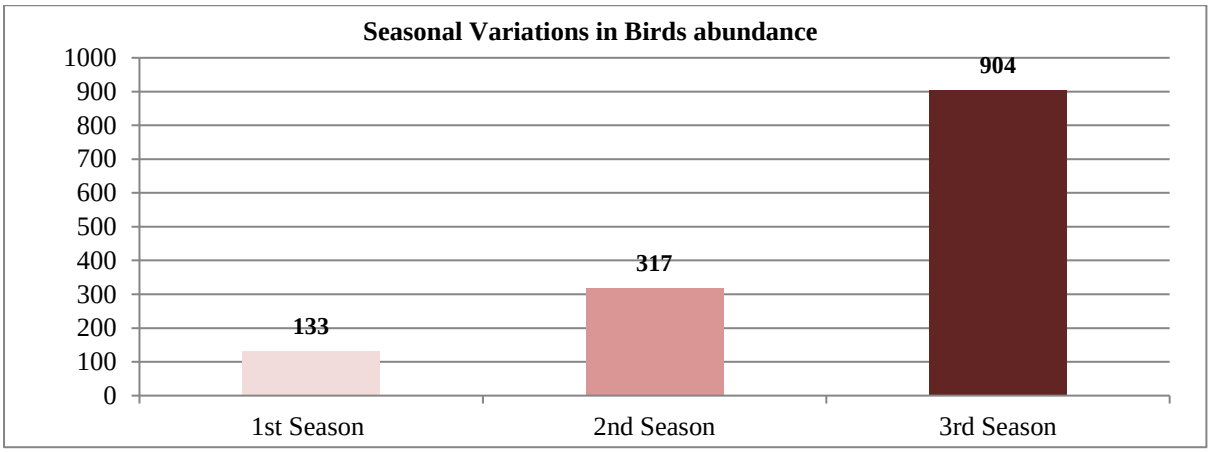
22	Common Babbler	*Turdoides caudate*	Lieothrichidae	R	LC	-	-	02	**02**
23	Greenish Warblar	*Phylloscopus trochiloides*	Phylloscopidae	R	LC	05	14	16	**35**
24	Baya Weaver	*Ploceus philippinus*	Ploceidae	R	LC	-	-	02	**02**
25	Oriental Magpie Robin	*Copsychus saularis*	Muscicapidae	R	LC	-	02	12	**14**
26	Cattle Egret	*Bubulcus ibis*	Ardeidae	R	LC	-	19	07	**26**
27	Rufous Tree Pie	*Dendrocitta vagabunda*	Corvini	R	LC	-	04	08	**12**
28	Black Hooded Oriole	*Oriolus xanthornus*	Oriolidae	R	LC	01	-	01	**02**
29	Common Hoope	*Upupa epops*	Upupidae	R	LC	-	06	-	**06**
30	Scaly Breasted Munia	*Lonchura punctulata*	Estrildidae	R	LC	-	02	08	**10**
31	White Rumped Munia	*Lonchura striata*	Estrildidae	R	LC	03	07	06	**16**
32	Blyth's Reed Warbler	*Acrocephalus dumetorum*	Acrocephalidae	R	LC	02	07	08	**17**
33	House Sparrow	*Passer domesticus*	Passeridae	R	LC	-	02	08	**10**
34	Singing Buslark	*Mirafra javanica*	Alaudidae	R	LC	-	-	01	**01**
35	Oriental White Eye	*Zosterops palpebrosus*	Zosteropidae	R	LC	-	01	03	**04**
36	Indian Cuckoo	*Cuculus micropterus*	cuculidae	R	LC	02	-	06	**08**
37	Plain Prinia	*Prinia inornata*	Cisticolidae	R	LC	-	01	01	**02**
38	Asian Koel	*Eudynamys scolopacea*	Cuculidae	R	LC	02	02	07	**11**
39	Small Minivet	*Ptericrocotus cinnamomeus*	Campephagidae	R	LC	-	-	02	**02**
40	Thick Billed Flower Pecker	*Dicaeum agile*	Muscicapidae	R	LC	-	-	02	**02**
41	Jungle Bush Koel	*Perdicula asiatica*	Phasianidae	R	LC	-	-	08	**08**
42	Brown Shikra	*Accipiter badius*	Laniidae	R	LC	-	-	01	**01**
43	Common Kingfisher	*Alcedo atthis*	Alcedinidae	R	LC	-	02	03	**05**
44	Shikra	*Accipiter badius*	Accipitridae	R	LC	-	-	04	**04**
45	Jungle Crow	*Corvus culminatus*	Corvidae	R	LC	-	03	02	**05**
46	Greater Racket	*Dicrurus*	Dicruridae	R	LC	-	-	03	**03**

	Tailed Drongo	*paradiseu*							
47	Lesser Flameback	*Dinopium benghalense*	Picidae	R	LC	-	-	01	**01**
48	Great Owl	*Bubo bubo*	Strigidae	R	LC	-	01	-	**01**
49	House Crow	*Corvus splendens*	Carvidae	R	LC	-	01	-	**01**
50	Red Jungle Fowl	*Gallus gallus*	Phasianidae	R	LC	-	-	02	**02**
51	Little Cormorant	*Microcarbo niger*	Phalacrocoracidae	R	LC	-	01	-	**01**
52	Yellow Footed Pegion	*Treron phoenicoptera*	Columbidae	R	LC	01	01	-	**02**
53	Sulphur Billed Warbler	*Phylloscopus griseolus*	Acrocephalidae	R	LC	-	01	01	**02**
54	Turtle Dove	*Streptopelia orientalis*	Columbidae	R	VU	-	02	02	**04**
55	White Rumped Shama	*Copsychus malabaricus*	Muscicapidae	R	LC	-	-	04	**04**
					Total	**133**	**317**	**904**	**1354**

Legends: LC = Least Concerned, VU = Vulnerable, NT = Near threatened, R = Residental



Graph 1: Avifaunal abundance of Study site.



Graph 2: Seasonal variation in bird abundance.

Among all the seasonal surveys, third season survey outputs highest populations of birds during the study. This study reveals that the most of the avifauna presence in the study site is in 3rd season. The seasonal variation of the avifauna abundance of this study shows the highest population found in 3rd season (Graph 2).

The aquatic avifauna species were observed and recorded during the winter season survey. The breeding and nesting season of avifauna species were started after rainy season in the month of September- October which is favourable for breeding and nesting. Mostly, the birds found in the study site were belongs to Columbidae and Muscicadidae family. The avifaunal diversity populations in the present study were found majorly the bird species of total 146 individuals of Red vented bulbul, 139 of Common Myna and 107 of Laughing dove. Most of the species recorded in the study site are residents of the area.

Conclusion

The study disclosed that the wealthy bird variety is attributable to the habitat structure and geographic location of the Raigarh Forest Division. The habitat composition and diversity in the Kharsiya, Tamnar and Gharghoda Forest Ranges need to be protected as it is essential to maintain the bird population's diversity and ecological balance. The transmission lines crossed from forest areas do not creates issues for avifauna diversity. The major affecting reasons occurred for avifauna and their habitat and diversity is due to felling of trees. The Study shows the checklist of avifauna population present in the study site and the data is obtained after the Power Grid Transmission line was started. Further study on suitable conservation mechanisms and management methods is inevitable with the ultimate conservation objectives of transforming rural and urban environments into species – rich ecosystems.

Acknowledgement

The Authors convey their gratitude to the Forest Department, Raigarh, Chhattisgarh for rendering services during the research and encouraging them. Authors also thanks to Shri Amit Kumar Baghel, Kamlesh Kumar Dadsena, Vijay kumar Bhagat and team of State forest Research and Training Institute, Raipur Chhattisgarh for contributing their untiring team work.

References

[1] Edison S, D.P., Abragam D, A. and Vijila S, 2016. Terrestrial avifauna of St. John's College campus, Tirunelveli District, Tamilnadu, India. International Journal of Advanced Research, 4(1): 390- 395.

[2] Rajpar, M.N. and Zakaria, M., 2011. Bird species abundance and their correlationship with microclimate and habitat variables at Natural Wetland Reserve, Peninsular Malaysia. International Journal of Zoology, 1-17.

[3] Bensizerara, D., Chenchouni, H., Bachir, A.S. and Houhamdi, M., 2013. Ecological status interactions for assessing bird diversity in relation to a heterogeneous landscape structure. Avian Biology Research, 6(1): 67–77.

[4] Richard D. Gregory, David W. Gibbons, and Paul F. Donald, 2004. Bird census and survey techniques.

[5] Cunningham, M.A., Johnson, D.H. and Svingen, D.N., 2006. Estimates of Breeding Bird Populations in the Sheyenne National Grassland, North Dakota. The Prairie Naturalist, 38(1): 50–67.

[6] IUCN, 2016. Red List Categories and Criteria, Version 3.1, Second edition. International Union for Conservation of Nature and Natural Resources. (www.iucnredlist.org).

[7] Chandrakar, A.K and Dhuria, S. S. 2019. A Checklist Of Bird Diversity In Guru Ghasidas University Campus, Bilaspur, Chhattisgarh, India. Eco Chronicle PP: 53 – 59.

[8] Grimmett, R., Inskipp, C. and Inskipp, T., 2011. Birds of the Indian Subcontinent. Oxford University Press, Delhi.

[9] Kazmierczak, K. and Perlo, B.V. 2015. A Field Guide to the Birds of the Indian Subcontinent. Bloomsbury Publication, New Delhi.

[10] Bibby, C.J., Burgess, N.D. & Hill, D.A. (1992) Bird Census Techniques Academic Press London Google Scholar.

[11] R. Grimmett, C. Inskipp, and T. Inskipp, Pocket Guide To the Birds of the Indian Sub-Continent, Oxford University Press, New Delhi, India, 2006.