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DIVERSITY, ABUNDANCE, STATUS AND ENDANGERED HABITATS OF AVIFAUNA IN SHEIKH BADIN NATIONAL PARK, DERA ISMAIL KHAN, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

Bird species richness and diversity are the key factors that determine the health and productivity of an ecosystem. They have occupied a marvelous place, i.e., they play a vital role in the contribution of public consideration towards natural habitats and considered as barometers of an ecosystem. This study was carried out to determine the bird species diversity of the Sheikh Badin National Park, located in District Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan. For this purpose, bird watching surveys following line transect method were conducted from June 2018 to July 2019 in the study area. A total 3408 individuals (1260 migrants and 2148 residents) representing the 41 bird species were recorded during the surveys. Among the total, 18 species were migrants and 23 residents, belong to 11 Orders and 25 Families. Passeriformes was the dominant encompass of 19 species (9 native and 10 migrants) and 13 families. This national park harbored species richness was r = 41, Shannon-Weiner diversity index (H′ = 3.546), evenness (J′ 0.955) and Simpson's Diversity (D = 0.966). The foraging guild results revealed that the granivore (2274) and insectivore (565) were the most abundant bird species. The major threats to the avifauna were illegal hunting, grazing and deforestation.

Key words: National Park, Avifauna, Biodiversity, Habitat, Human Footprints, Hunting.

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INTRODUCTION

The existence of a variety of organisms in a specific area shown their biological diversity. Biodiversity of a region indicates a total genes flow, species variation, and bio networks of that area. Species are the basic units of diversity which perform a vital role in a healthy ecosystem. Thus, investigation of the loss of species and destruction of the gene pool is a most critical challenge to the ecosystem (Trivedi, 1999). Bird fauna are so crucial for the balanced ecosystem as they play numerous roles as foragers, pollinators, insect pest predators, and also act as bioindicators in different kind of environment like suburbanization and industrialization (Sharma, 1982; Bhattacharjee and Hazarika, 1985) human pollution (Talukdar, 1997; Chakravarty, 1981) lighting (Sandhu and Dang, 1980). They are the first indicators of pollution problems and the purpose of given initial threatening (Gole, 1984; Becker, 2003).

In an ecosystem diversity of species acts as an essential factor to maintain it healthy. Birds have a marvelous place among other species as they are much appreciated by humans. Furthermore, birds also play a vital role in the contribution of public consideration towards natural habitats. Avian species are considered as barometers of an ecosystem. According to recent studies, numerous populations of avian species are claimed declining world widely, while, some of these gaining a status of locally extinct due to degradation of their habitats and fragmentation (Hewson *et al*., 2007).

It is world widely accepted that more than 1800 genera exist that give rise to roundabout 9702 avian species (Sibley and Monroe, 1990). Out of them, roughly 1300 bird species have been recorded from the Indian region (Manakadan and Pittie, 2001), while, Pakistan waterfronts cover a large chain of ecosystems that ultimately fascinates most diverse avifauna throughout the world to venture out their resources (Khan *et al*., 1996). According to a survey, 650 bird species founded in the country, and the presence also revealed a unique diversity in the world in three zoogeographical regions including Ethiopian, Palaearctic and Oriental, (Grimmett *et al*., 2001; Mirza and Wasiq, 2007). Additionally, in Pakistan, Indus flyway, is instantly being responsible for millions of resident and migratory birds shelter and food.

The leading causes of bird populations decline persisting over a long period may be due to unexpected

changes such as pollution, shortage of food supply, inter-specific interactions and global warming (Kushlan, 1993; Hetrick and Sieving, 2012). Status of bird species may be established by diagnosing threats and detecting further changes in the population of birds in the future are essential factors in minimizing the risk in their community (Amano *et al*., 2010b). However, incoming upcoming times, habitat loss, climate changes, (Yasué and Dearden, 2006), extinction and increasing numbers of species may cause a decline in bird population (Birdlife International, 2004). Similarly, bird extinctions occurred and 21st population reductions in the present century ultimately cause disturbance in ecosystems and their processes (Luck *et al*., 2003).

The study was conducted first time in this national park and the main objective of the present research about avifauna diversity, abundance, status, endangered habitat for species, decline in bird species and to identify causes of this decline and suggest necessary actions for protection and conservation of bird population at the Sheikh Badin National Park, Dera Ismail Khan, Pakistan.

MATERIALS AND METHODS

Study Area: The present research was conducted in the Sheikh Badin National Park also spelt Sheikh Buddin National Park (32.297534 °N and 70.805227 °E), which is located in the southern part of Khyber Pakhtunkhwa (KP), Pakistan (Figure 1). It is situated among the Sheikh Badin Hills, which is an eastern extension of the Sulaimon Mountains at an elevation of 4600ft. The park covers an area of 15,540 hectares. The park is situated with an altitude from 300 – 1350 meters. Due to very high there are no specific arrangements for water supply, that's why the residential peoples make their man-made ponds, which is the only for restoring the water after the rain and later this water is utilized by every community like human, animals and birds. The weather in winter is very cold but in summer its very pleasant and mostly raining in summer. The residential birds are Chukor – *Alectoris chukar*, see–see partridge – *Ammoperdix griseogularis,* black partridge – *Francolinus francolinus* and grey partridge – *Predix predix*, common myna – *Acridotheres tristis*, house crow – *Corvus splendens*, house sparrow – *Passer domesticus*, red-vented bulbul – *Pycnonotus cafer*, rock pigeon – *Columba livia*, eurasian collared doves – *Streptopelia decaocto* and baya weaver –*Ploceus philippinus*.

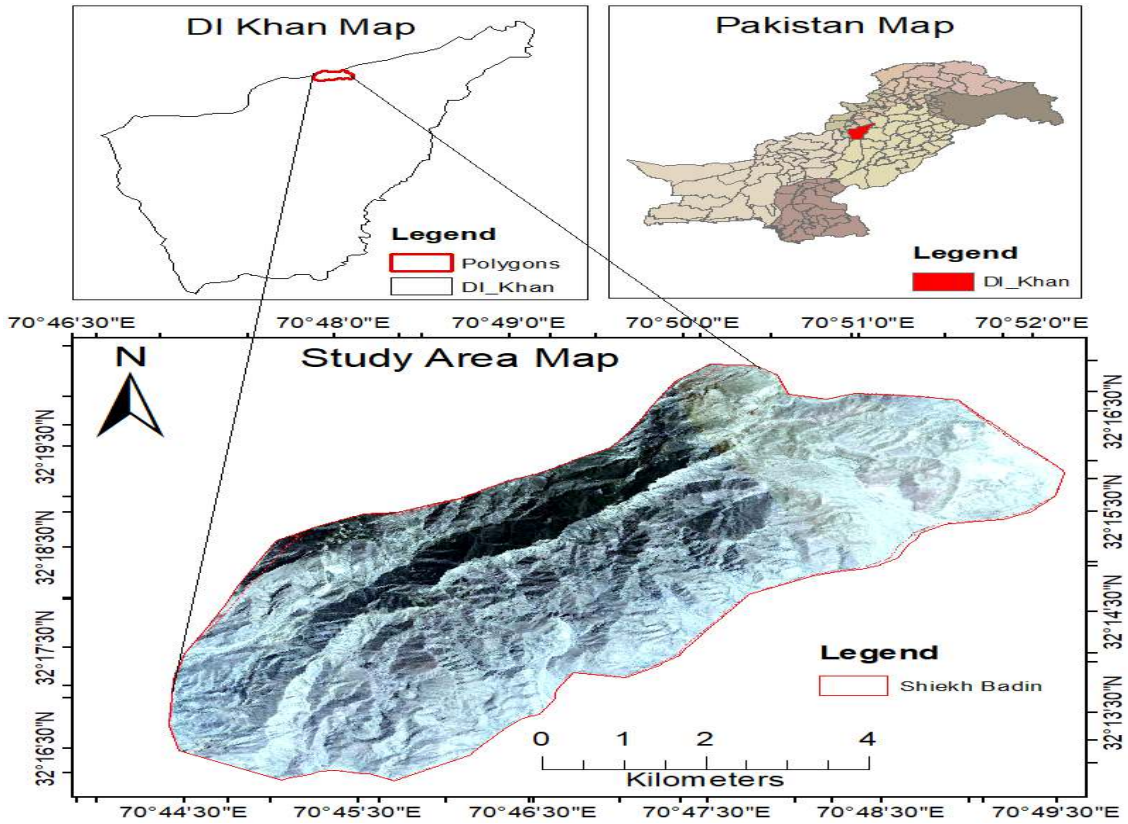

Fig.1. A GIS-based map showing the location of Conducted study sites at Sheikh Badin National Park, District Dera Ismail Khan, Pakistan.

Bird Survey: For field data, we used the "Line Transect Method" method to collect our data, for a fixed period, of the year. The bird count surveys were conducted at dusk (5 – 7pm) and dawn (6 – 8 am) assuming that the bird's activities are at the peak during these hours. The study site was visited once every month from June 2018 to July 2019. The birds were observed through binocular (42X) to confirm species identity and sometimes photographed with Nikon D7200 (Sigma 150-600 mm lens). The bird species were identified using the most authentic bird identification key for birds of Pakistan (Birds of Pakistan by Richard Grimmet, Tom Roberts and Tim Inskipp). The data was collected on a pre-designed field survey form.

Data Analysis: All the collected data were interned and stored in the Microsoft Excel Spreadsheet. We estimated the following parameters using that data:

I) We determined the relative abundance of bird species of the area using the following equation

$$1\text{---------- (R.A)} = \frac{N}{N}$$

Where

R.A: Relative Abundance

N = total number of individuals sighted of a bird species recorded during the surveys.

N = total number of individuals sighted of all bird species recorded during the surveys.

II) In studies related to avian fauna, it is always important to determine the diversity of bird species of an area. For this purpose Shannon-Weiner Index (H′) was calculated in order to know the species diversity based on species abundance using the following equation:

$$2\text{----------} \quad H' = -[\Sigma Pi^{*} LN(Pi)]$$

where

H′ = Diversity Index,

Pi = proportion of each bird species in the sample

LN (Pi) = natural logarithm of this proportion.

III) Evenness is another important aspect of bird studies which needed to be determined. Evenness is basically the comparison of the similarity of the different bird species population size in a whole sample (all bird species). We calculated the Evenness Index (J′) using the following formula.

$$3\text{---------- } J = \frac{H'}{H_{max}}$$

H′ = Diversity index

Hmax = natural log of the total number of all bird species.

IV) We calculated the Simpson Index (D) which is the probability of any two individuals drawn from noticeably large community belonging to different species (Simpson, 1949).

$$4\text{---------- D} = 1 - \frac{\Sigma n\,(n-1)}{N\,(N-1)}$$

N = total number of individuals of a bird species sighted during the surveys.

N = total number of individuals of all bird species sighted during the surveys.

RESULTS

Wild bird Species Records: Bird watching surveys were conducted to record the diversity of avian fauna of the Sheikh Badin National Park. The wild bird species recorded in the park during the period from June 2018 to July 2019 are shown in Table 1. During this study a total number of 3408 individuals belonging to different bird species were sighted in the Sheikh Badin National Park. The total number of wild bird species found was 41, with 18 seasonal and 23 residential, belonging to 11 Orders and 25 Families and. The order Passeriformes was the dominant order represented by 19 species from 13 families, including 9 species residential and 10 seasonal. Order Galliformes was in the second rank including five species from one family, one seasonal and 4 residential. Order Columbiformes represented by four species. While the lowest orders were Apodiformes, including one specie from Accipitridae family, Bucerotiformes, including one specie from Upupidae family, haradriiformes, including one specie from Charadriidae family and Passerine, including one specie from Muscicapidae family. In the Sheikh Buddin National Park species in descending order were recorded are House Sparrow (n: 252, R.A: 0.07), Blue-Checked Bee-Eater, Baya weaver, Alpine Swift, House Crow, Common Myna and Black-Breasted Weaver. 252, 219, 174,174, 147, 124. 0.07, 0.06, 0.05, 0.05, 0.04, 0.04 and 0.04. The lowest relative abundance (0.01) was recorded for Chukar with just 14 individuals sighted Also, the species richness was r = 41, Shannon-Weiner diversity index (H′ = 3.546), evenness (J′ 0.955) and Simpson's Diversity (D = 0.966).

Relative Abundance of Migrant Bird Species: Detail of migrant bird species observed at the Sheikh Badin National Park is presented in Table 3. The total of 1260 individuals of different migrant bird species was sighted in the Sheikh Badin National Park. The descending order of bird species found in our study area is Alpine Swift, Indian Robin, Common Quail, Spanish Sparrow, Bay-backed shrike and Purple sunbird. They are highest as follows: 174, 115, 113, 108, 75 and 71 individuals. The relative abundances among wild bird species were 0.14, 0.09, 0.09, 0.09, 0.06 and 0.06, respectively. The lowest number of birds was twenty-one individuals with a relative abundance of 0.02, for Common kestrel. Also, the species richness was r = 18, Shannon-Weiner diversity index (H′ = 2.768), evenness (J′ 0.957) and Simpson's Diversity (D = 0.930).

Relative Abundance of Residential Bird Species: The residential wild bird species recorded in the Sheikh Badin

National Park were presented in Table 4. Total 2148 number of resident bird species recorded in the Sheikh Badin National Park. The descending order of species was: House Sparrow 252, Blue-Checked Bee-Eater 219, Baya weaver 174, House crow 147, Common Myna 124 and Black-Breasted Weaver 122. Their relative abundances were 0.12, 0.1, 0.08, 0.07, 0.06and 0.06, respectively. Fourteen was the lowest number of individuals with relative abundance of 0.01, for Chukur. Also, the species richness was r = 23, Shannon-Weiner diversity index (H′ = 2.957), evenness (J′ 0.943) and Simpson's Diversity (D = 0.940).

Table 1. Wild birds species recorded from the Sheikh Badin National Park.

Order	Family	English Name	Scientific Name	Status	IUCN
Accipitriformes					
1	Accipitridae	Shikra	*Accipiter badius*	M	LC
2		Common Buzzard	*Buteo buteo*	M	LC
Apodiformes					
3	Apodiformes	Alpine Swift	*Tachymarptis melba*	M	LC
Bucerotiformes					
4	Upupidae	Common Hoopoe	*Upupa epops*	M	LC
Charadriiformes					
5	Charadriidae	Red-wattled lapwing	*Vanellus indicus*	R	LC
Columbiformes					
6	Columbidae	Eurasian collared dove	*Streptopelia decaocto*	R	LC
7		Red Collared Dove	*Streptopelia tranquebarica*	R	LC
8		Spotted Dove	*Spilopelia chinensis*	R	LC
9		Rock Pigeon	*Columba livia*	R	LC
Coraciiformes					
10	Coraciidae	Indian Roller	*Coracias benghalensis*	M	LC
11	Meropidae	Blue-Checked Bee-Eater	*Merops persicus*	R	LC
12		Green Bee-Eater	*Merops orientalis*		LC
Cuculiformes					
13	Cuculidae	Asian koel	*Eudynamys scolopacea*	R	LC
14		Pied Cuckoo	*Clamator jacobinus*	M	LC
15	Cuculiformes	Greater coucal	*Centropus sinensis*	R	LC
Falconiformes					
16	Falconidae	common kestrel	*Falco tinnunculus*	M	LC
Galliformes					
17	Phasianidae	Black Francolin	*Francolinus francolinus*	R	LC
18		Chukar	*Alectoris chukar*	R	LC
19		Common Quail	*Coturnix coturnix*	M	LC
20		Grey Francolin	*Francolinus pondicerianus*	R	LC
21		See-See Partridge	*Ammoperdix griseogularis*	R	LC
Passeriformes					
22	Laniidae	Bay-backed shrike	*Lanius vittatus*	M	LC
23		Red Backed Shrike	*Lanius collurio*	M	LC
24	Sturnidae	Common Myna	*Acridotheres tristis*	R	LC
25	Muscicapidae	Common Stone Chat	*Saxicola rubicola*	R	LC
26		Indian Robin	*Copsychus fulicatus*	M	LC
27		Isabelline Wheatear	*Oenanthe isabellina*	M	LC
28		Grey Bush Chat	*Saxicola ferreus*	R	LC
29	Ploceidae	Baya weaver	*Ploceus philippinus*	R	LC
30		Black-Breasted Weaver	*Ploceus benghalensis*	R	LC
31	Dicruridae	Black Drongo	*Dicrurus macrocercus*	R	LC
32	Passeridae	House Sparrow	*Passer domesticus*	R	LC
33		Spanish Sparrow	*Passer hispaniolensis*	M	LC
34	Oriolidae	Eurasian Golden Oriole	*Oriolus oriolus*	R	LC
35	Corvidae	house crow	*Orvus splendens*	R	LC
36	Nectariniidae	purple sunbird	*Cinnyris asiaticus*	M	LC

37	Pycnonotidae	Red-Vented bulbul	*Pycnonotus cafer*	R	LC
38	Hirundinidae	Rock Martin	*Ptyonoprogne fuligula*	M	LC
39	Cisticolidae	Rufous-Fronted Prinia	*Prinia buchanani*	M	LC
40	Sylviidae	Orphean Warbler order	*Sylvia hortensis*	M	LC
41	Muscicapidae	Rufous-Tailed Scrub Robin	*Cercotrichas galactotes*	R	LC

M = Migrant birds species, R= Resident Birds species
IUCN = International Union for Conservation of Nature and Natural Resources LC = Least Concern * The information is based on the IUCN Red List (IUCN 2011)

Table 2 Relative abundance of wild birds at Sheikh Badin National Park.

Species Name	Count	Pi	LN"Pi"	Pi*LN"Pi"
Shikra	39	0.01	-4.470	-0.0511
Common Buzzard	45	0.01	-4.327	-0.0571
Alpine Swift	174	0.05	-2.974	-0.1518
Common Hoopoe	68	0.02	-3.914	-0.0781
Red-wattled lapwing	88	0.03	-3.656	-0.0944
Eurasian collared dove	79	0.02	-3.764	-0.0872
Red Collared Dove	66	0.02	-3.944	-0.0763
Spotted Dove	72	0.02	-3.857	-0.0814
Rock Pigeon	58	0.02	-4.073	-0.0693
Indian Roller	63	0.02	-3.990	-0.0737
Blue-Checked Bee-Eater	219	0.06	-2.744	-0.1763
Green Bee-Eater	119	0.03	-3.354	-0.1171
Asian koel	58	0.02	-4.073	-0.0693
Pied Cuckoo	63	0.02	-3.990	-0.0737
Greater coucal	50	0.01	-4.221	-0.0619
common kestrel	21	0.01	-5.089	-0.0313
Black Francolin	35	0.01	-4.578	-0.0470
Chukar	14	0.01	-5.494	-0.0225
Common Quail	113	0.03	-3.406	-0.1129
Grey Francolin	84	0.02	-3.703	-0.0912
See-See Partridge	38	0.01	-4.496	-0.0501
Bay-backed shrike	75	0.02	-3.816	-0.0839
Red Backed Shrike	52	0.02	-4.182	-0.0638
Common Myna	124	0.04	-3.313	-0.1205
Common Stone Chat	41	0.01	-4.420	-0.0531
Indian Robin	115	0.03	-3.388	-0.1143
Isabelline Wheatear	40	0.01	-4.445	-0.0521
Grey Bush Chat	90	0.03	-3.634	-0.0959
Baya weaver	174	0.05	-2.974	-0.1518
Black-Breasted Weaver	122	0.04	-3.329	-0.1192
Black Drongo	61	0.02	-4.023	-0.0720
House Sparrow	252	0.07	-2.604	-0.1925
Spanish Sparrow	108	0.03	-3.451	-0.1093
Eurasian Golden Oriole	48	0.01	-4.262	-0.0600
House crow	147	0.04	-3.143	-0.1355
purple sunbird	71	0.02	-3.871	-0.0806
Red-Vented bulbul	111	0.03	-3.424	-0.1115
Rock Martin	52	0.02	-4.182	-0.0638
Rufous-Fronted Prinia	38	0.01	-4.496	-0.0501
Orphean Warbler order	39	0.01	-4.470	-0.0511
Rufous-Tailed Scrub Robin	82	0.02	-3.727	-0.0896
	3408	**1**	**-159.29**	**3.5465**

Table 3. Relative abundance of migrant wild birds in the Sheikh Badin National Park.

Species Name	Count	Pi	LN"Pi"	Pi*LN"Pi"
Shikra	39	0.03	-3.475	-0.108
Common Buzzard	45	0.04	-3.332	-0.119
Alpine Swift	174	0.14	-1.98	-0.273
Common Hoopoe	68	0.05	-2.919	-0.158
Indian Roller	63	0.05	-2.996	-0.15
Pied Cuckoo	63	0.05	-2.996	-0.15
Common kestrel	21	0.02	-4.094	-0.068
Common Quail	113	0.09	-2.411	-0.216
Bay-backed shrike	75	0.06	-2.821	-0.168
Red Backed Shrike	52	0.04	-3.188	-0.132
Common Stone Chat	41	0.03	-3.425	-0.111
Indian Robin	115	0.09	-2.394	-0.218
Isabelline Wheatear	40	0.03	-3.45	-0.11
Spanish Sparrow	108	0.09	-2.457	-0.211
purple sunbird	71	0.06	-2.876	-0.162
Rock Martin	52	0.04	-3.188	-0.132
Rufous-Fronted Prinia	38	0.03	-3.501	-0.106
Orphean Warbler order	82	0.07	-2.732	-0.178
	1260	1	54.24	2.768

Table 4. Relative abundance of resident wild birds in the Sheikh Badin National Park.

Species Name	Count	Pi	LN"Pi"	Pi*LN"Pi"
Red-wattled lapwing	88	0.04	-3.195	-0.131
Eurasian collared dove	79	0.04	-3.303	-0.121
Red Collared Dove	66	0.03	-3.483	-0.107
Spotted Dove	72	0.03	-3.396	-0.114
Rock Pigeon	58	0.03	-3.612	-0.098
Blue-Checked Bee-Eater	219	0.1	-2.283	-0.233
Green Bee-Eater	119	0.06	-2.893	-0.16
Asian koel	58	0.03	-3.612	-0.098
Greater coucal	50	0.02	-3.76	-0.088
Black Francolin	35	0.02	-4.117	-0.067
Chukar	14	0.01	-5.033	-0.033
Grey Francolin	84	0.04	-3.241	-0.127
See-See Partridge	38	0.02	-4.035	-0.071
Common Myna	124	0.06	-2.852	-0.165
Grey Bush Chat	90	0.04	-3.172	-0.133
Baya weaver	174	0.08	-2.513	-0.204
Black-Breasted Weaver	122	0.06	-2.868	-0.163
Black Drongo	61	0.03	-3.561	-0.101
House Sparrow	252	0.12	-2.143	-0.251
Eurasian Golden Oriole	48	0.02	-3.801	-0.085
House crow	147	0.07	-2.682	-0.184
Red-Vented bulbul	111	0.05	-2.963	-0.153
Rufous-Tailed Scrub Robin	39	0.02	-4.009	-0.073
	2148	1	-76.53	2.958

DISCUSSION

In this study bird species diversity of the Sheikh Badin National Park was determined using the line-transect method. Moreover, species richness, current status, number of endangered habitat for species following the decline in birds' and also to identify causes of abrupt decline along with references and engagements for conservation of the bird's population in the Sheikh

Badin National Park, Dera Ismail Khan, Pakistan were also evaluated. In our study the total number of wild bird species was 3408 including 41 wild bird species with 18 seasonal and 23 residential, belongs to 11 Orders and 25 Families respectively. The dominant order was Passeriformes with 19 species recorded from 13 families, including 9 residential and 10 seasonal species. Whereas order Galliformes with 5 belongs from one family, one seasonal and 4 residential while, order Columbiformes with 4 residential species belongs from one family. The lower orders in numbers were Apodiformes, including one species of Accipitridae family, Bucerotiformes, with one species from Upupidae family, Charadriiformes, with one species from Charadriidae family and Passerine, having one species from Muscicapidae family respectively. A comprehensive study conducted by (Raza *et al*. 2015) correlated with our study results with dominant one order as Passeriformes with species (n=29) belongs to 17 families following the second order with species (n=3) belongs to 2 families.

Moreover, their results also indicated the number of species (n=2) belongs from two separated families in order Coraciiformes. While the other orders, follow the sequence as; Gruiformes, Piciformes, Falconiformes, Ciconiiformes, Psittaciformes and Columbiformes, with 3, 3, 3, 2, 2, 2 species respectively belong to a single-family. Spatio-temporal conditions like shelter, less anthropogenic interventions, food, water are the factors have great influence on the relative abundance of bird species within a specific habitat.

Table 1 shows that all the 3408 species belong to 11 orders of birds were encountered in the Sheikh Badin National Park during the study period. Of these, according to the International Union for Conservation of Nature and Natural Resources (IUCN), all the species are "least concern" while study conduct in Jhunjhunu district (Deependra Singh Shekhawat and Chhaya Bhatnagar 2014) concluded that 2 species are classified as "critically endangered"; 1 species, "endangered"; two species, "near threatened"; and the remaining 96 species, "least concern". Our study results showed the species richness (r = 41), Shannon-Weiner diversity index (H′ = 3.546), evenness (J′ 0.955) and Simpson's Diversity (D = 0.966). Mengesha and Bekele (2008) mentioned that habitat heterogeneity and the importance of a specific area depends on a variety of individuals and species and avian diversity. Bibi and Ali (2013) also mentioned that the values of Shannon-Weiner Diversity Index usually falls between 1.5 and 3.5; however, in rare conditions, it surpasses 4.5. Variations in different factors like bird species diversity following species richness and species abundance are associated with vegetation of specific area. The vegetation composition alter nesting, food sources and protection, according to birds feeding and habitat preferences (Kiros *et al*., 2018). According to Lande *et al*., (2000), to limit the diversity for minor sample size Simpson Diversity index has swift convergence. Hence it is suitable for the evaluation of regions regarding species conservation. As Shannon Weiner diversity index was used to associate relative richness and species abundance amongst the species, also a source to specify the relative occurrence of many species (Whittaker, 1977; Barbour *et al*., 1998). Here in the present study the calculated values of the Shannon Weiner diversity index were 3.546, showed that the all species and individuals are uniformly distributed in the study area. These findings were also related to a study conducted by Ali (2006) which also shows the Shannon Weiner diversity index value as 3.99. Moreover, comprehensive field observations and findings of (Ali *et al*., 2011) at Taunsa Barrage Wildlife Sanctuary also showed that resident birds species and visitors species of winter and summer were evenly distributed in the study area. The majority of birds in the current study recorded were granivorous followed by insectivorous birds.

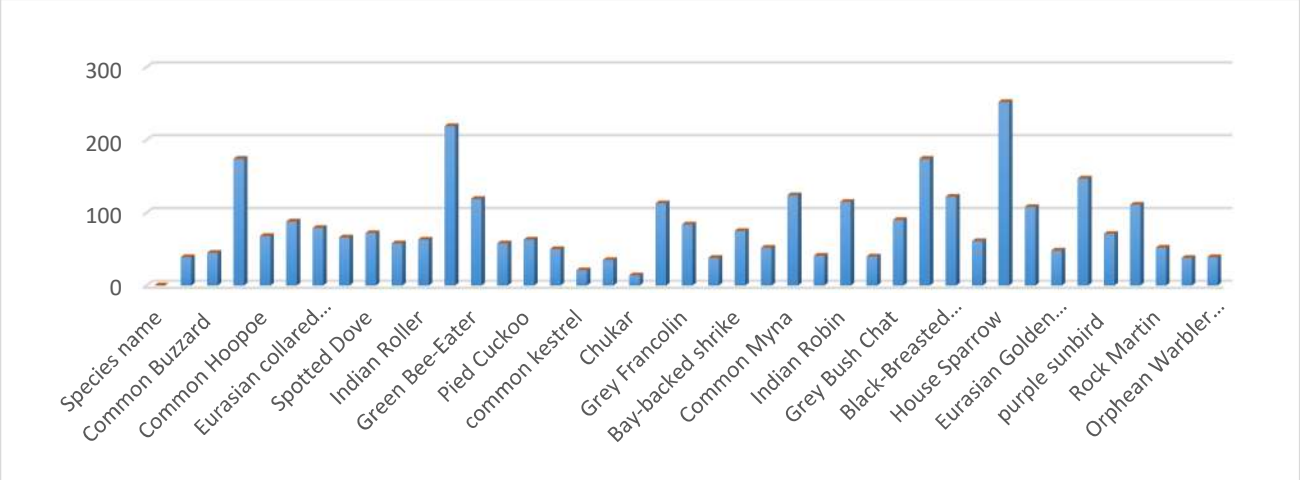

Figure 2. The number of bird species recorded at conducted study area.

Threats to Avifauna Observed at Study Site: Following major threats has been observed in the Sheikh Badin National Park for the avifauna

Hunting: Prohibited and illegal hunting of bids by local community leads towards an interruption in feeding and breeding of birds. In the current study observed that mostly in the summer season people doing unlawful hunting of the birds through guns and nets. Which is directly effecting on the bird's population and breeding also. Mostly they are doing the hunting of Galliformes order and now the francolins are near to threatened in this area. It is illustrated that the drowning of ducks in fishing nets has been a major problem presented by Scott (1989). Likewise, hunting is a major problem creates a drastic disturbance in wildfowl (ducks) and other bird species that is the reason birds generally shift their feeding and resting places or schedules (Khan, 1992). In the park, the wildlife department clearly displays, sign boards and poster, i.e., hunting is strictly prohibite in the park area. However, the local peoples hunts on chukors, partridges, pigeons and doves illegally due to that the gamebird species decreasing quickly.

Deforestation: The other threat which was observed in the conducted study area was the deforestation. For avifauna, a suitable habitat is required to obtain their food and also for nesting and breeding. Bit due to deforestation now they are migrating for breeding to other areas.

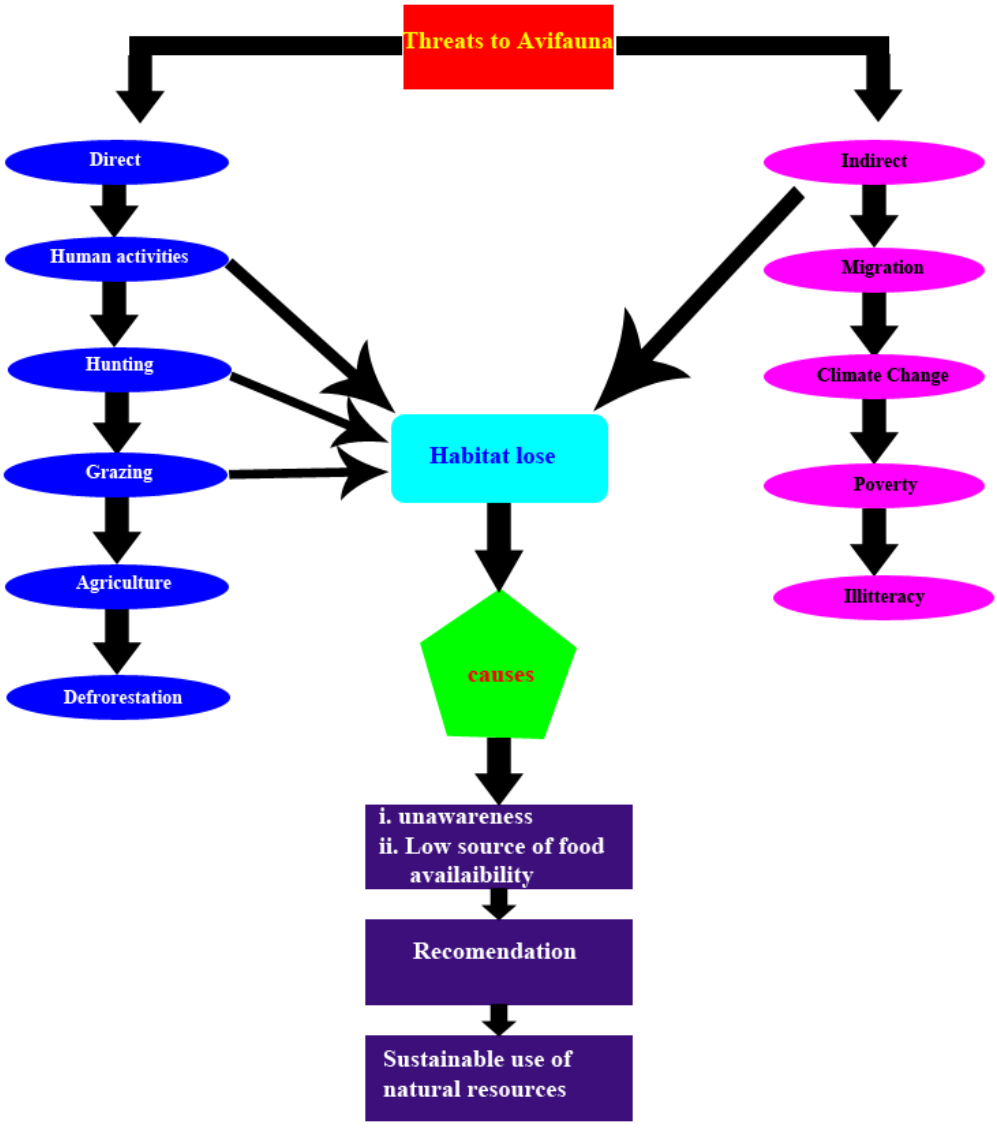

Fig 2. Showing the threats to avifauna at the conducted study area.

Influence of Grazing: Human activities affect include grazing of livestock results in flushing of nests of birds by rain when these are made due to availability of less hay material for nesting birds. Shortage of hay matter

assists predators of birds to approach the eggs or chicks of breeding birds (Khan, 1992), while, wandering of livestock in the current study area was a significant threat to species of bird's survivorship. In the park, the wildlife department clearly displays boards and poster that keep away the animals from grazing in the park area.

Conclusion: This study determined abundance, status and endangered habitat. In culmination of the present study revealed a significant decline in Galliformes in the Sheikh Badin National Park due to unchecked and uncontrolled habitat destruction, hunting and grazing. This area harbor the higher bird diversity, e.g., Shannon-Weiner index (H′ = 3.546). This might be due to stability and functions of the ecological interactions that attracted a wide array of avian species. Hence, there is an urgent need for the conservation of avian diversity by protecting the natural habitat. In addition, the concern departments should control the unlawful activities, i.e., illegal hunting, uncontrolled grazing, and deforestation in the study area through implementing the wildlife act 2014.

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