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Species Diversity, Feeding Habits and Conservation Status of Birds in Qurumbar National Park, Gilgit-Baltistan, Pakistan

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Abstract: In the current study (2010-2012) an overall 83 avian species belonging to 13 orders and 30 families were recorded. Out of the total species (N=83), Passeriformes were dominated with 60% (n=50) of the total species. Residential status revealed that out of the total (N=83) birds species, 48 species are residents as they live year round, 19 were winter visitors and 15 were summer visitor, and 1 species visits the area both in summer and winter. Investigation on the feeding habit of birds revealed that 43.4% (n=36) were omnivorous, 21.7% (n=18) were carnivorous, 22.9% (n=19) insectivorous, 8.4% (n=07) granivorous, 2.4% (n=02) herbivorous and 1.2% (n=01) was found to be frugivorous. The main threats to the birds observed in the study area were habitat degradation, illegal shooting of migratory and game birds, excessive use of pesticides in the agricultural field and fruit orchards. This effort recommends that the government should declare the key bird areas like the Qurumbar Lake, Qurumbar river and its tributaries as no-hunting zones or bird refugia for migratory species; reduce bag limit and time duration of shooting license; revise the laws and impose ban on shooting of rare and threatened species and regulate use of pesticides.

Keywords: Avian diversity; Birds refugia; Threatened species; Qurumbar National Park

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Introduction

Avian biodiversity is essential component of our planet for providing various services to ecosystem like seed dispersal, aesthetic beauty, biological control and environmental

cleaners. Their bright colors, distinct songs and calls, and showy displays add enjoyment to our lives and offer easy opportunities to observe their diverse plumage and behaviors (Khan *et al*., 2012).

Birds belong to Class Aves of Phylum Chordata, the only chordates that have feather, wing with more than 10,000 species spread all over the globe from Artic to Antarctic regions (Bird Life International, 2012). The estimated avian diversity of Pakistan is 666 according to Robert (1991). According to IUCN Red List status (IUCN, 2013; Bird Life International, 2013), 5 species are critically endangered, 6 are endangered, 18 are vulnerable and 19 species are near threatened. Gilgit-Baltistan (GB) being the one of the most rugged and remote area of Pakistan is still unexplored in terms of its biological diversity. The numbers related to avian diversity, 230 species stated by Roberts (1991) are just estimations.

According to Abbas *et al*. (2014), the geographic location of GB positioned between the world's two geographic realms, i.e. the Palearctic and Oriental realms makes it an ideal habitat for biodiversity. Presence of wetlands like high and low altitude seasonal and permanent lakes, migratory route, The Indus Flyway makes it ideal for bird species, especially the migratory species. Migratory species include, the passage migrants, vagrants, residents, breeding and irregular visitors (Robert, 1991). GB is also home to game birds like the Himalayan monal pheasant, Snow partridge, Himalayan Snow cock, Chakur and quails (Virk *et al*., 2003). Threatened species like the Sociable lapwing, Lesser kestrel, Ferruginous duck, Kashmir flycatcher, Long belled bush warbler, Tytlers warbler and India skimmer also visits the area.

WWF-Pakistan conducted various studies on diversity and abundance of birds in high altitude wetlands of GB and Khyber Pakhtunkhwa (KPK) under the framework of "Saving Wetland Sky High Programme (SWSH) and Pakistan Wetlands Programme. Overall, 146 species belonging to 47 families were recorded from 15 high altitude lakes of GB. Habib (2007) recorded 25 birds species belonging to 15 families from Qurumbar lake, Shandur Lake, Handrap Lake, Rama Lake and Sheosar Lake areas of GB. Sheikh (2001) has listed 110 species and has studied the ecology of birds from Naltar valley. Biddulph (1981) also contributed to the ornithology of Gilgit, especially from Darel valley, Ghizer and Astore. The most recent contribution in the field of ornithology is by Abbas *et al*. (2014), in which 108 species were observed from the Central Karakoram National Park, which is the largest National Park of Pakistan. In the neighboring areas of Chinese province Xinjiang the birds are studied by Ma Ming *et al.* (1991, 2010).

GB spans over 72,971 km^2 area is considered to be one of most diverse in terms of habitats ranging from areas as low as 1500m a.s.l upto the series of peaks in the Central Karakorum, which are over 8000m a.s.l and houses the largest glacial mass outside the polar region. Prior to the present study only few contributions, most of which have been mentioned above are made related to ornithology and these small-scale contributions are unable to portray broader picture of the ornithology in GB.

The present study is, therefore, an effort to document the diversity, feeding habits, and

conservation status of birds in and around Qurumber National Park (QNP), which will also contribute for wise management of avian diversity in QNP, being the essential part of QNP management plan, which is under consideration. Some specific objectives of the present study are as under:

- Identify avian species diversity in the study area;
- Study bird feeding habits and identify threats to the species;
- Study the conservation status of the species found in the study area; and
- Identify Important Bird Areas (IBAs).

This study will provide researchers, policy makers and conservationists with scientific information about the diversity, feeding habits and conservation status of birds in and around QNP.

Materials and Methods

The Qurumbar valley (Fig. 1) is situated in the extreme north-western reaches of Gilgit-Baltistan falls in the western Tibetan Plateau, Alpine Steppe Eco region of Pakistan. It spearheads its boundaries with Hindukush Mountain range as it meets the Qurumbar range along the Bar Valley catchments in the west. Stretching over 150 Km length downstream, the valley begins at Barjungle where Qurumbar and Baru Rivers meet and ascend up to Qurumbar pass along the boundary of Wakhan Corridor in the west. The Valley falls under the mountain desert ecosystem where the average rainfall rarely exceeds 150 mm. The climate is primarily dry. Rain falls mainly during the months of March and May, and the snow falls between December and February. Wildlife biodiversity on the mountain is as diverse as human ethnicity down in the valley. The natural forests are limited to a few isolated patches of Juniper (*Juniperus excellsa*), Blue pine (*Pinus wallichiana*), Birch (*Betula utilis*), and Willow (*Salix* spp.). The shrub cover is dominant Artemisia species, Ephedra, Wild rose and Barbaris species. The common herb grass of the area includes *Poa bulbosa*, *Tanacetum* l*ongifolia*, *Stipa*, *Thymus sarphylum*, *Polygonum* and *Potentilla*. Unfortunately, the patches of juniper are affected badly as the local communities of the valley are solely dependent on these forests to meet fuel wood and timber requirements that cause rapid deforestation. The valley harbors an array of rare and unique wildlife species variety which includes Himalayan ibex, Asiatic wolf, Snow leopard, Snow cock, Chakor, House Sparrow, Wild pigeon and White Capped River Chat.

For observation, identification and documenting about feeding habits, Spotting scope (20 x 60) mounted on tripod and binocular (10x50) were used. GPS points were also recorded at each of the observation point. Data sheets were used to record observations. For identification of the species field guides of Gimmet *et al.* (2008) and Roberts (1991, 1992) were used. Focus Group Discussions (FGDs) were conducted to document the threats and population dynamics and local conservation status of the avian species in addition to direct observations. Nomenclature consulted was by Gill and Donskr (2003). For categorizing the residential status, categories like WV (winter visitor), R (resident), SV (summer visitor) were used based on their detection season earlier used by Abbas *et al*. (2012) and McCullough and Heiser (2008).

This study was conducted from January 2010 to December 2012 to assess bird's

diversity, feeding habits and local conservation status in and around Qurumbar National Park. Stratified random sampling technique was used to document the birds of the study area, earlier used by Thakur and Mattu (2011) and Snedecore and Cochran (1993). Efforts were made to record passerine and non-passerine avifauna in the valleys of Qurumbar National Park while for migratory water fowls field visits were conducted during the migratory season (September to November when birds start arriving the study area and in March-April when migratory birds start departure to their home areas). Observations were made during early morning and dusk time and wherever possible took the pictures.

Results

Avian Diversity: During the three efforts between January 2010 and December 2012, a total of 83 species have been recorded in and around Qurumbar National Park, belonging to 13 orders of 30 families. It is recorded that amongst bird's diversity the order Passeriformes dominated with 50 species in the area. Family-wise investigation revealed that the family Muscicapidae with 15 species is dominated group followed by Anatidae with 9 species, Corvidae and Accipitridae with 5 species each, Motacilidae species, Fringillidae, Prunellidae and Alaudidae with 4 species each, while Ardeidae, Falconidae, Columbaidae and Emberizidae have 3 species each, Phasianidae, Rallidae, Apodidae and Hirundindae have 2 species in each family, Ciconiidae, Meropidae, Upupidae, Picidae, Cinlidae, Trogloditidae, Phylloscipidae, Cuculidae, Oriolidae, Laniidae, Paridae, Passeridae, Tichodromadidae contain 1 species each family (Table 1).

Feeding Habit: Investigation on the feeding habits of birds of Qurumbar National Park revealed that out of 83 species, 43.4% (n=36) are omnivorous, 21.7% (n=18) carnivorous, 22.9% (n=19) insectivorous, (n=07) granivorous, 2.4% (n=02) herbivorous and 1.2% (n=01) are frugivorous (Table 1).

Residential Status: Investigation on residential status shows that out of the total birds species (N=83), 48 species are resident, 19 are winter visitors and 15 are summer visitors, and 1 species was recorded in both summer as well as winter (Table 1).

Discussion

The Gilgit Baltistan Government declared the Qurumbar Valley including the Qurumbar lake as Qurumbar National Park" on August 02, 2011 under section 5 of Gilgit-Baltistan Wildlife Preservation Act 1975 (PWP, 2011). The ecological significance of the National Park is presence of wildlife biodiversity including snow leopard, lynx, wolf, fox, brown bear, Himalayan ibex and productive range lands, wetlands and glaciers. Moreover Qurumbar National park serve as a significant migratory bird visiting area as a large number of diverse migratory birds, including water fowls, cranes, teals, pintail, mallard and gadwall used to visit the area. Furthermore the area is also home to a great variety of passerine and none passerine birds (Abbas *et al*., 2011).

Due to variety of wetland ecosystems including lake, rivers, marshy areas, peatlands and streams the area is considered to be a hotspot for migratory water fowl and these wetlands offer winter staging ground and refugia to migratory waterfowl. The migratory

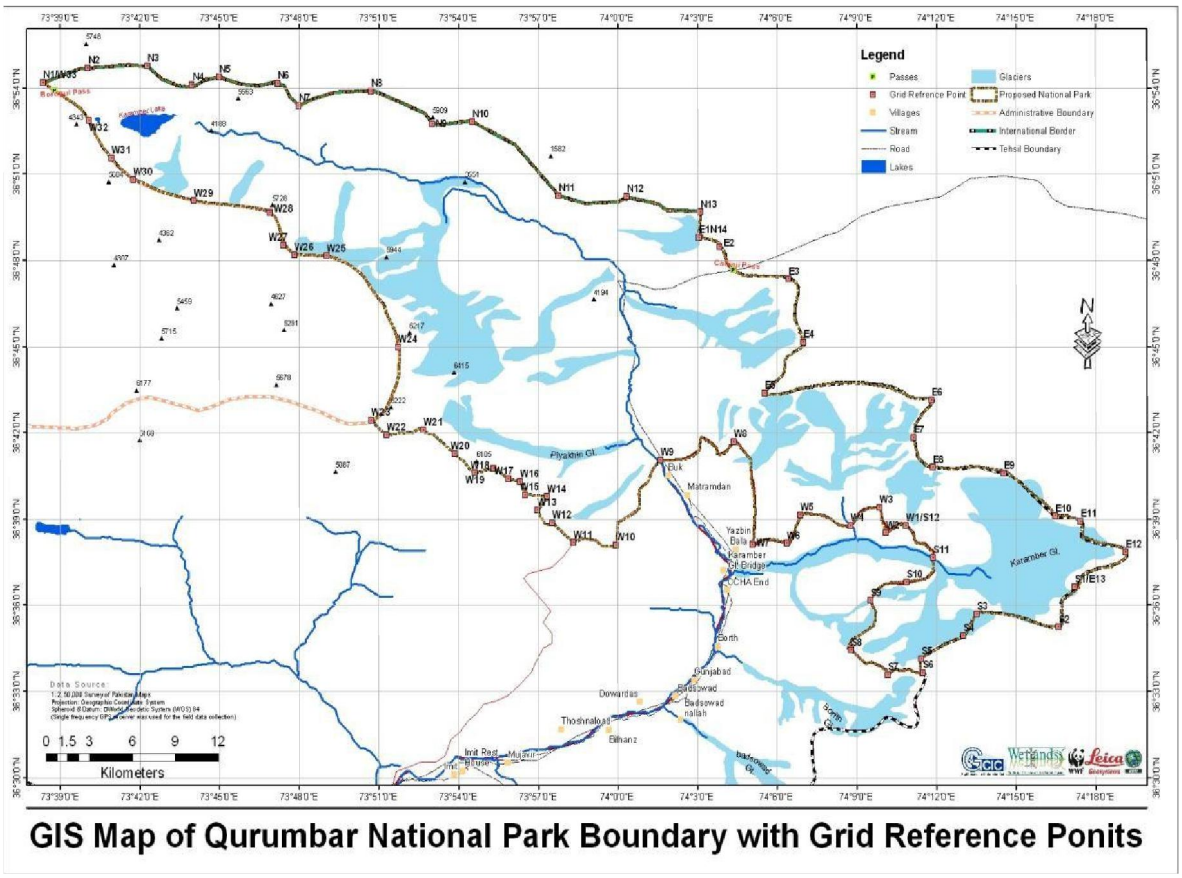

Fig. 1: GIS Map of Qurumbar National Park

bird start arriving in the area in October and return to their breeding destination in April. Qurumbar valley is not being sufficiently protected and is therefore under threat. Hunting and shooting of migratory birds reach at maximum as the arrivals and departure starts in the area ultimately effect migratory bird's population (Ali, 2005).

The major threats, emerging in the recent years, are thought to account for the accelerating migratory bird's population decline. Some major threats include the habitat loss, illegal and excessive shooting, use of pesticide etc. Habitat loss can be attributed primarily to the ever increasing pressure on wetlands. Unregulated human activities such as farming, livestock grazing, and settlements have led both to the reduction in overall wetland size and the fragmentation of wetlands, resulting in less suitable habitat (Harris and Mirande., 2013).

Table 1: Taxonomic List of Birds of Qurumbar National Park

Order	Family	Species	Common Name	Feeding habit	Status
Anseriformes	Anatidae	*Anascrecca*	common teal	Omnivorous	WV
		Anasstrepera	Gadwall	Herbivorous	WV
		Anasacuta	Northern Pint tail	Omnivorous	WV
		Anasclypleata	NothernShoveler	Omnivorous	WV
		Anasplatyrhynchos	Mallard	Herbivorous	WV
		Anasquerquedula	Gargany	Omnivorous	WV
		Anas Penelope	Eurasian Wigeon	Omnivorous	WV
		Aythyaferina	Common pochard	Omnivorous	WV
		Aythyamyroca	Ferruginous pochard	omnivorous	WV
Ciconiiformes	Ciconiidae	*Ciconianigra*	Black Stork	carnivorous	WV
Pelecaniformes	Ardeidae	*Ardeacinerea*	Grey heron	carnivorous	WV
		Ardeolagrayii	Indian pond heron	carnivorous	WV
		Grus virgo	Demoiselle crane	Omnivorous	WV
Accipitriformes	Accipitridae	*Hieraaetus pennatus*	Booted Eagle	Carnivorous	R
		Accipiter nisus	Eurasian Sparrow Hawk	Carnivorous	SV
		Aquila chrysaetos	Golden eagle	Carnivorous	R
		Gyps himalayensis	Himalayan Griffon vulture	Carnivorous	R
		Gypaetus barbatus	Bearded Vulture	Carnivorous	R
Falconiformes	Falconidae	*Falco tinnunculus*	Common Kestrel	Carnivorous	R
		Falco subbuteo	Northern Hobby	Carnivorous	R
		Falco peregrinus	Peregrine falcon	Carnivorous	R
Galliformes	Phasianidae	*AlectorisChakur*	Chukar partridge	Omnivorous	R
		Tetraogallus himalayensis	Snow cock	Omnivorous	R
Gruiformes	Rallidae	*Fulicaatra*	Common coot	Omnivorous	R
		Gallinulachloropus	common Morhen	Omnivorous	R
Coraciiformes	Meropidae	*Meropsapiaster*	Golden Bee eater	Insectivorous	SV
Columbiformes	Columbidae	*Streptopelia orientalis*	Oriental Turtle Dove	Granivorous	SV
		Columba livia	Rock Pigeon	Granivorous	R
		Columba rupestris	Turkistan Hill Pigeon	Granivorous	WV
Apodiformes	Apodidae	*Apus apus*	Common swift	Insectivorous	SV
		Apus affinis	Indian House	Insectivorous	R

			Swift		
Upupuiformes	Upupidae	*Upupaepops*	Hoopoe	Omnivorous	SV
Piciformes	Picidae	*Picussquamatus*	Scaly-bellied Woodpecker	Omnivorous	R
Passeriformes	Motacilidae	*Motacillacitreola*	Yellow Wagtail	Insectivorous	WV
		Motacilla alba	White Wagtail	Insectivorous	WV
		Anthusroseatus	Rosi pipit	Insectivorous	WV
		Motacillacinerera	Grey wagtail	Insectivorous	WV
	Cinlidae	*Cincluscinclus*	Brown Dipper	Carnivorous	R
	Trogloditidae	*Troglodytes troglodytes*	Winter wren	insectivorous	R
	Alaudidae	*Alaudaarvensis*	Eurasian Skylark	Omnivorous	R
		eremophilaalpestris	Horned Lark	Omnivorous	SV
		Alaudagulgula	Oriental skylark	Omnivorous	SV
		Calandrella brachydactyla	Greater Short toed Lark	Omnivorous	SV
	Phylloscipidae	*Phylloscopus sindianus*	Mountain chiffchaff	Omnivorous	R
	Prunellidae	*Prunellastrophiata*	Rufous-breasted Accentor	Omnivorous	R
		Prunellafulvescens	Brown Accentor	Omnivorous	R
		Prunella rubeculoides	Robin Accentor	Omnivorous	R
		Prunellacollaris	Alpine accentor	Omnivorous	R
	Muscicapidae	*Phoenicurus ochruros*	Black Redstart	Insectivorous	R
		Phoenicurus erythrogaster	white wing Redstart	Frugivorous	R
		Luscinia pectoralis	Himalayan Ruby throat	Insectivorous	R
		Lusciniasvecica	Blue Throat	Insectivorous	R
		Tarsigercyanurus	Orange-flanked Bush Robin	Insectivorous	W/S V
		Phoenicurus caeruleocephla	Blue capped Redstart	Insectivorous	R
		Myophonus solitarius	Blue rock thrush	Insectivorous	R
		Garrulax lineatus lineatus	Streacked laughing thrush	Omnivorous	R
		Myiophoneus caeruleus	Blue whisling thrush	Omnivorous	R
		Turdusruficollis	Dark throated	Omnivorous	R

			thrush		
		Saxicolatorquata	Stone chat	Insectivorous	R
		Saxicolacarprata	Pied bush chat	Insectivorous	R
		Oenathepleschanka	Pied wheatear	carnivorous	R
		Oenanthepicata	Variable Wheatear	Insectivorous	R
		Phylloscopus trochiloides	Greenish warbler	Carnivorous	R
	Emberizidae	*Emberizia lecucephalus*	Pine bunting	Granivorous	R
		Emberiziacia	Rock bunting	Granivorous	R
		Emberiziastewarti	White capped bunting	Granivorous	R
	Cuculidae	*Cuculuscanorus*	Eurasian Cuckoo	Insectivorous	SV
	Hirundindae	*Delichon dasypus cashmeriensis*	Asian House Martin	Carnivorous	SV
		Ptyonoprogne rupestris	Eurasian Crag Martin	Carnivorous	SV
	Oriolidae	*Oriolusoriolus*	Golden oriol	Insectivorous	SV
	Laniidae	*Laniusschach*	Long tail shrike	Carnivorous	SV
	Paridae	*Parus major*	Great tit	Omnivorous	R
	Passeridae	*Passer domastiucs*	House sparrow	Omnivorous	SV
	Fringillidae	*Carpodacusgrandis*	Red mantled rose finch	Omnivorous	R
		Carpodacusrubicilla	Great Rose finch	Omnivorous	R
		Carduelisflavirostris	Twite	Omnivorous	WV
		serinusrubicilla	Red fronted siren	Omnivorous	SV
	Corvidae	*Pyrrhocorax pyrrhocorax*	Red billed chough	Omnivorous	R
		Pyrrhocorax graculus	Alpine/Yellow billed chough	Omnivorous	R
		Pica pica	Blue billed magpie	Omnivorous	R
		Corvuscorax	Common Raven	Omnivorous	R
		Corvusculminatus	Jungle crow	Omnivorous	R
	Tichodro-madidae	*Tichodroma muraria*	wall creeper	Carnivorous	R

Key: Res. St. = Residential status R=Resident, R/SV=Resident with summer visit, WV=winter visitors, SV=summer visitors, (Abbas *et al*., 2014)

In past, the river beds along Ghizer River were less populated and thick Tamarix vegetation was found around water bodies but now the areas have been converted to agriculture or other purpose. According to the residents, a large number of birds used to visit the study area two decade back and flocks of migratory waterfowl were seen in the water bodies along the Ghizer river and Qurumbar river and other wetlands but now they hardly

observe a few of these waterfowls around water bodies.

Conclusion

It is concluded, that the avian diversity of the area will be more than what has been listed during the current effort as only a fraction of the areas was scanned for documenting the avian diversity. Therefore, it is recommended that more rigorous efforts should be made involving government, conservation organization and academia to document the avian diversity, distribution, behaviour and conservation needs in the real sense. It is also recommended that government should declare the key birds areas like the Qurumbar lake and river as no-hunting zones or bird refugia; reduce bag limit and time duration of shooting license; revise the laws and impose ban on shooting of rare and threatened species and regulate use of pesticides.

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