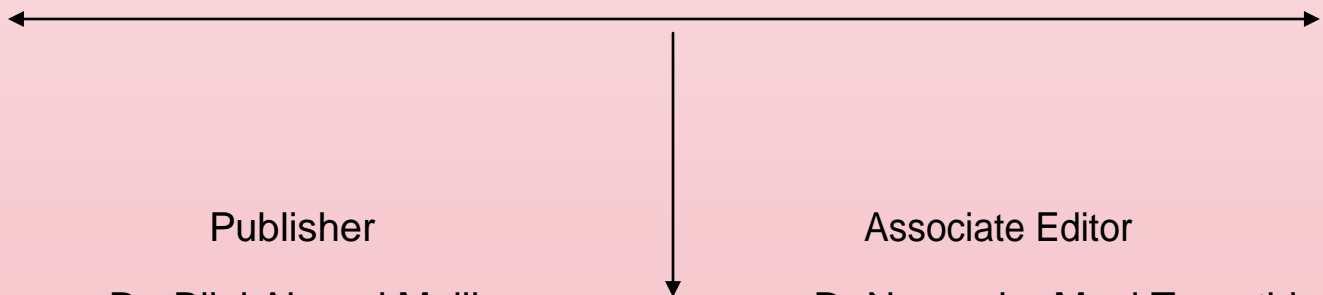


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THE STATUS OF THREATENED BIRDS OF KEOLADEO NATIONAL PARK BHARATPUR, RAJASTHAN

ALTAF AHMAD LONE*

*Teacher, Govt. Higher Secondary School Fatehgarh Baramulla, J&K-193101

ABSTRACT:

Birds are important for a number of reasons, most of which relate to their significance as dispersal agents, as predators at the top of the food chain. Over the last few past decades the bird species population is declining continuously. More than hundred birds are either endemic or endangered in India. Keoladeo National Park is India's most famous bird watching site. It is known to be a heaven for birdwatchers. Some 375 bird species have been recorded, a third being migrant and overwintering. Many among these are threatened. The categories included here are 'Critically Endangered', 'Endangered', 'Vulnerable' and 'Near Threatened'. India is ranked seventh with 78, threatened bird species includes migratory species (Bird Life International IUCN, 2008), Out of them 13 categorized as 'Critically Endangered' species for India, seven (7) have been recorded in this park. Of the 10 'Endangered' species of birds three (3) have been recorded here and among the 53 'Vulnerable' species of birds in India, nine (9) have been recorded in the Keoladeo National Park. Apart from the above categories out of 61 'Near threatened' seventeen (17) more species of birds have been recorded. Many species have become endangered because of habitat loss and fragmentation, small original range, habitat alteration, pollution, disturbance in specialised habitat and diseases. This present paper discusses the ecological attributes of 36 threatened bird species of Keoladeo National Park, Bharatpur and the current status as per Bird Life International IUCN, (2008) of these threatened species of birds has been summarised.

Keywords: Threatened bird species, Keoladeo National Park, IUCN Status, Conservation.

INTRODUCTION:

Keoladeo National Park, originally known as 'Ghana', which means 'thicket', is a shallow wetland of 2,873ha. It is situated 2km southeast of Bharatpur City and 180km south of Delhi. The park, a protected forest since its declaration in 1967, was later declared a Ramsar site in 1981 in recognition of its value as a unique man-



made freshwater wetland which serves as a staging ground for migratory waterfowl. It was included in the list of National Parks in 1982 and declared a World Heritage site in 1985.

Keoladeo National Park, which is arguably one of the finest and richest bird areas in the world (Naturetrek, 2005). It is known for nesting of its resident birds and visiting migratory birds including water birds. The park was among the first two sites listed as a Ramsar site in 1981..However, in view of the recent threats to the ecological characteristics of KNP it has been put on Montreux Record‘ – a Red List for wetlands in danger (State Empowered Committee, 2005).

Keoladeo supports more than 350 bird species (Vijayan, 1991). The Park qualifies as an IBA under A1 (Threatened Species), A4i (1% threshold population), and A4iii (20,000 water birds. During good monsoon years, it is common to see a hundred thousand birds. It is one of the major breeding centers of the Painted Stork (*Mycteria leucocephala*), Asian Openbill (*Anastomus oscitans*), Darter (*Anhinga melanogaster*) and various egrets, herons, ibises and other storks. Many ducks, coots and rails occur much above their 1% threshold numbers (Islam, M.Z. and Rahmani A.R., 2004).

METHODOLOGY

After having plenty amount of information available on Indian avifauna especially after Ali and Ripley (1968-1974) Handbook of Birds of India and Pakistan. It lists more than 1200 species and 827 sub-species that occur today in India, Sri Lanka, Pakistan, Nepal and Bangladesh and of these 1177 occur within Indian limits. The information from the Handbook on different attributes including food habits, resident behavior and occupation of different habitats has been extracted.

The checklist of threatened birds at the National Park was made both by self sighting the birds with binoculars and with the help of the records and observations of several ornithologists (Abdulali and Pandey, 1978; Grewal Bikram, *undated*,). Appropriate field guides (Ali, 1996; Sonobe and Usui, 1993) were used for the purpose. Based on regularly updated checklist the detailed census of birds was conducted by direct count method (Colin, *et al.* 1993). The study was conducted at monthly intervals both during summers and winters from Oct., 2009 to June, 2010 by scanning the National Park by walking and bicycle riding. The morning hours, 0630 to 1000 am and evening 0330 to 0700 pm, were utilized for the purpose. Further, the Threatened status of birds was taken according to the Birdlife International IUCN Red List, (2008). The work is an attempt to give an *actual*



number of threatened bird species sighted inside the park since its origin. Checklist of these 36 threatened bird species of KNP is given in (see appendix- A).

RESULTS AND DISCUSSION

A status of threatened bird families recorded from *Keoladeo National Park* is reported in Table-2. The study reveals the occurrence of 36 threatened species of birds (see appendix A) belonging to 13 families. Among the 13 families Accipitridae dominated the list with thirteen (13) threatened species followed by Anatidae with five (5) species, Ciconiidae with four (4), Scolopacidae with three (3), Pelecanidae and Gruidae with two (2) each and Anhingidae, Threskiornithidae, Phoenicopteridae, Otididae, Charadriidae, Laridae and Rynchopidae with one species each. Out of 36 Threatened species of the park 7 are Critically Endangered (CR), 3 are Endangered (EN), 9 are Vulnerable (VU) and 17 species are Near Threatened (NT). Further among these Threatened species 15 are resident, 13 migratory and 8 are resident migratory.

Feeding habits

About 42 percent threatened bird species recorded in the park are Piscivorous. Out of total 15 threatened species of Piscivorous, families Ciconiidae (Storks) and Accipitridae (Hawks, Eagles, Buzzards, Old World Vultures, Kites, Harriers) consists 4 species each. The remaining species come from families Pelecanidae (Pelicans), Gruidae (Cranes), Anhingidae (Darters), Threskiornithidae (Ibises and Spoonbills) and Laridae (Gulls, Terns and Noddies). A significant proportion of the Omnivorous, Scavengers and Vegetarian bird species are also threatened (Table-3). This group contains the bird which are highly conservation dependent, such as Long-billed Vulture (*Gyps indicus*), White-rumped Vulture (*Gyps bengalensis*) and Red-headed Vulture (*Sarcogyps calvus*), which are critically endangered species and some Vulnerable category species like Lesser White-fronted Goose (*Anser erythropus*), Marbled teal (*Marmaronetta angustirostris*), Lesser Florican (*Grus leucogeranus*), Sociable Lapwing (*Vanellus gregarius*) and Baikal teal (*Anas formosa*). Also some proportion of Carnivorous and Insectivorous e.g. Imperial eagle (*Aquila heliaca*), Greater Spotted Eagle (*Aquila clanga*), Spoonbill sandpiper (*Calidris pygmaea*) are under threatened categories of *Keoladeo National Park* species.

Other threatened species like Greater Adjutant (*Leptoptilos dubius*) has stopped visiting the park. Two pairs of Pallas's Fish Eagle (*Fam. Accipitridae*) used to breed till the late 1980s but now, this bird occurs only as an occasional winter visitor (IBA, undated).

Resident status

Of the 36 threatened bird species reported from *Keoladeo National Park* (see appendix-A), 13 are migrant (36.1%), another (22.3%) are resident migratory and a significant percent (41.6%) of species are resident to the park (Table-4). Though the percentage of migratory species is comparatively lesser than resident species, some of these species such as Baikal teal (*Anas Formosa*), Common Buzzard (*Buteo buteo*) stopped to visit the park for about 20 long years. The most unwanted disappearance of migratory species from the park is considered of Siberian crane (*Grus leucogeranus* for the 10th consecutive year. Usually, the Siberian cranes would start flying towards India in mid-October and stay here till March or April. Winter counts at KNP have indicated a steady decline from about 80 birds in the 1960s (UNEP/GEF SCWP, 2004-2007), upto 40 individuals in 1980s (UNESCO-IUCN, 2008), to just a single pair in winter 2001/02 (numbers of birds were higher in some reports: 200 in 1964-65 (Walkinshaw, 1973), and 100 in 1967-68 (Sauey, 1985). In the summer of 2002 a pair, presumably the same pair mentioned above, was observed for the last time on the breeding grounds in Russia (UNEP/GEF SCWP, 2004-2007).

Habitat Distribution

The habitat distribution of threatened bird species clearly shows that a significant proportion occupy only one habitat. Hence, most of the threatened birds are habitat specialists (Table-5). The habitat specialization is evident with respect to both aquatic and terrestrial species, with a significant proportion of them using a single habitat. The proportion of threatened species using more than one habitat is insignificant. Of the 36 species in the park (see appendix-A), a significant (66.7%), use aquatic, (19.4%) a terrestrial and (2.8%) an aerial habitat. Rest, an insignificant proportion (11.1%) species use more than one habitat.

The two way analysis was carried out *between* resident status and food habits, food habits and habitat and resident status and habitat to identify the proportion of threatened species in each of the categories. Two way analysis of resident status and food habits shows that a significant proportion of resident-piscivorous bird species (22.2%) are greatly threatened among all categories. Interestingly resident- flesh-fish carrion eaters and resident migratory piscivorous are also significantly threatened (Table- 6).

These include the species such as, Spotted billed pelican *Pelecanus philippensis*, Painted stork *Mycteria leucocephala* Blacknecked stork *Ephippiorhynchus asiaticus*, Grey headed fish eagle *Ichthyophaga ichthyaetus*,



Egyptian Vulture *Neophron percnopterus*, White-rumped Vulture *Gyps bengalensis* and Long-billed Vulture *Gyps indicus* etc.

The two way analysis of food and habitat category shows that Piscivorous are threatened in aquatic and both aquatic and terrestrial habitats. Significantly, Insectivorous and Omnivorous are threatened in aquatic habitat. Interestingly, in the Terrestrial habitat Flesh-fish carrion eaters and Carnivorous forms a significant proportion of threatened species (Table-7).

At the scale of the residence and habitat (Table-8), a large proportion of resident birds are significantly threatened in all habitats followed by migratory species which are threatened in aquatic and terrestrial habitats. Interestingly, resident migratory category is threatened in aquatic and both aquatic and residence habitat categories with a noteworthy proportion of (13.95%) and (5.5 %) respectively.

Appendix A: Attributes of 36 KNP bird species assigned to one of the Threatened categories.

S. No	Species	Common Name	Family	Resident status	Feeding habit	Habitat status	IUCN status*
1.	<i>Pelecanus philippensis</i>	Spot-billed Pelican	Pelecanidae	R ^{1,7}	P ^{1,2,7,8}	WI ^{1,2,4,5,8,9}	NT
2.	<i>Pelecanus crispus</i>	Dalmatian Pelican ⁺	Pelecanidae	M ^{1,7}	P ^{1,2,7,8}	WI ^{1,2,4,5,9}	VU
3.	<i>Anhinga melanogaster</i>	Datar or snake bird ⁺	Anhingidae	RM ^{1,6,8}	P ^{1,2,6}	WI ^{1,2,6,8,9}	NT
4.	<i>Mycteria leucocephala</i>	Painted Stork ⁺	Ciconiidae	R ^{6,8}	P ⁸	WI ^{5,6,9}	NT
5.	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork ⁺	Ciconiidae	R ^{1,6,8}	P ^{1,8}	WI ^{1,6,9}	NT
6.	<i>Leptoptilos javanicus</i>	Lesser Adjutant-Stork ⁺	Ciconiidae	RM ^{1,4,8}	P ⁸	WI ^{2,9}	VU

7.	<i>Leptoptilos dubius</i>	Greater adjutant stork	Ciconiidae	RM ^{1,4,8}	P ^{1,8}	WI ⁹ , Gr, Cs ^{1,6}	EN
8.	<i>Threskiornis melanocephalus</i>	Black-headed Ibis ⁺	Threskiornithidae	R ^{1,6,8}	P ^{1,8}	WI ⁹	NT
9.	<i>Phoenicopterus minor</i>	Lesser Flamingo ⁺	Phoenicopteridae	RM ^{1,4,8}	I ^{1,4}	WI ^{1,4,9}	NT
10.	<i>Anser erythropus</i>	Lesser White-fronted Goose	Anatidae	M ¹	V ¹	WI ^{1,4,9}	VU
11.	<i>Anas falcata</i>	Falcated Duck	Anatidae	M ¹	V ¹	WI ^{1,9}	NT
12.	<i>Marmaroneta angustirostris</i>	Marbled Teal	Anatidae	RM ¹	V ¹	WI ^{1,4,9}	VU
13.	<i>Anas formosa</i>	Baikal Teal [`]	Anatidae	RM ¹	V ¹	WI ^{1,4,9}	VU
14.	<i>Aythya nyroca</i>	Ferruginous Pochard ⁺	Anatidae	M ^{1,6}	Om ¹	WI ^{1,6,9}	NT
15.	<i>Haliaeetus leucoryphus</i>	Pallas's Fish-Eagle	Accipitridae	RM ^{1,8}	P ^{1,4,8}	WI ^{1,5,9}	VU
16.	<i>Haliaeetus albicilla</i>	White-tailed Eagle	Accipitridae	M ^{1,8}	P ^{4,8}	WI ^{1,5,9}	NT
17.	<i>Ichthyophaga humilis</i>	Lesser Fish Eagle	Accipitridae	R ^{1,8}	P ⁸	WI ^{1,5,9}	NT
18.	<i>Ichthyophaga ichthyaetus</i>	Grey headed fish eagle	Accipitridae	R ^{1,8}	P ⁸	WI ^{1,6,9}	NT
19.	<i>Neophron</i>	Egyptian	Accipitridae	R ^{1,6}	NV ^{1,4,6}	Cs ^{1,6}	EN



	<i>percnopterus</i>	Vulture ⁺					
20.	<i>Gyps bengalensis</i>	White-rumped Vulture	Accipitridae	R ^{1,6,8}	NV ^{1,4,8}	Ms, Cs ^{1,5,6}	CR
21.	<i>Gyps indicus</i>	Long-billed Vulture	Accipitridae	R ^{1,8}	NV ^{1,4,8}	Cs ^{1,6}	CR
22.	<i>Aegypius monachus</i>	Cinereous Vulture	Accipitridae	M ¹	NV ^{1,4,8}	Cs ³	NT
23.	<i>Sarcogyps calvus</i>	Red-headed Vulture	Accipitridae	R ^{1,6,8}	NV ^{1,4,8}	Tk, Ms, Cs ^{1,5,6}	CR
24.	<i>Circus macrourus</i>	Pallid Harrier	Accipitridae	M ^{1,6}	Cr ^{1,4,6}	Gr, Cs ¹	NT
25.	<i>Aquila clanga</i>	Greater Spotted Eagle ⁺	Accipitridae	RM ^{1,8}	Cr ¹	WI ⁹ , Tk, Ms, Os, Gr ^{1,5}	VU
26.	<i>Aquila heliaca</i>	Imperial Eagle	Accipitridae	RM ^{1,8}	Cr ⁵	WI ⁹ , Tk, Ms ¹	VU
27.	<i>Falco jugger</i>	Laggar Falcon (Laggar)	Falconidae	R ^{1,4}	Cr ¹	Gr, Cs ^{1,4}	NT
28.	<i>Grus leucogeranus</i>	Siberian Crane	Gruidae	M ⁶	P ⁷	WI ^{5,9}	CR
29.	<i>Grus antigone</i>	Sarus Crane ⁺	Gruidae	R ⁷	P ⁴	WI ⁹ , Gr, Cs ⁶	VU
30.	<i>Eupodotis indica</i>	Lesser Florican	Otididae	R ⁸	Om ⁸	A ⁸	EN
31.	<i>Vanellus</i>	Sociable	Charadriidae	M ⁷	Om ⁸	WI ⁹	CR



	<i>gregarious</i>	Lapwing					
32.	<i>Numenius arquata</i>	Eurasian Curlew	Scolopacidae	M	I	WI ⁹	NT
33.	<i>Limosa limosa</i>	Black-tailed Godwit	Scolopacidae	M ⁷	I ⁷	WI ⁹	NT
34.	<i>Calidris pygmaea</i>	Spoonbill sandpiper	Scolopacidae	M	I ⁵	WI ⁹	CR
35.	<i>Sterna acuticauda</i>	Black-bellied Tern	Laridae	R ^{5,8}	P ⁸	WI ^{5,9}	NT
36.	<i>Rynchoes albicollis</i>	Indian skimmer	Rynchopidae	R ⁸	Om ⁸	WI ⁹	CR
Total							36

Sources: * Birdlife International IUCN Red List (2008); + Self sighted birds.

¹Ali and Ripley, (1978) , ²Ali and Ripley , (1983), ³Ali and Ripley, (1987), ⁴Ali and Futehally, (1989), ⁵Listed in Barua and Sharma (2005), ⁶Listed in Pasha, *et al.* (2004), ⁷Listed in Reginald, *et al.* (2007), ⁸Listed in Subramanian, *et al.* (2004), ⁹ Listed in Manakadan and Pittie (2001).

Keys: CR- Critically endangered, EN- Endangered, VU- Vulnerable, NT- Near threatened and DD- Data deficient.

Synopsis numbers as followed by Ali and Ripley (1983) and Ali (1996); Common and scientific names by Manakadan and Pittie (2001).

Food habits: I= Insectivore, P= Piscivore, Cr= Carnivore, Om= Omnivore, A= Aerial, V=Vegetarian, and NV=Scavenger. **Status of the birds:** R= Resident, M= Migratory and RM=Resident migratory. **Habitat Status:** Tk=Teak forest, Ms=Miscellaneous forest (teak mixed, *Anogeissus-Boswellia* stand, hill forest, and *zizyphus* stand), Bm= Bamboo dominant forest, Cc=*Cleistanthus collinus* woodland, Gr= Grassland – Savanna, Os=Open

scrub jungle (dominated by *Lantana*), Cs=Countryside / Cultivation, WI=Wetlands (river, streams, ponds, and reservoir.

Table-1: Categories of Threat levels to Birds and number of Threatened Bird Species in Keoladeo National Park.

Category	Definition#	Number of species
Critically Endangered	A species is Critically Endangered when it is facing an extremely high risk in the wild in immediate future.	07
Endangered	High risk of extinction	03
Vulnerable	Risk of extinction	09
Near Threatened	Close to vulnerable	17
Least Concern	Does not qualify for any of the above	0
Data Deficient	No information available	0

[#] Birdlife International, 2001.

Table-2: The Status of Threatened bird families in Keoladeo National Park.

S. No	Family	CR	EN	VU	NT	Total
1	Pelecanidae	0	0	1	1	2
2	Anhingidae	0	0	0	1	1
3	Ciconiidae	0	1	1	2	4
4	Threskiornithidae	0	0	0	1	1
5	Phoenicopteridae	0	0	0	1	1
6	Anatidae	0	0	3	2	5
7	Accipitridae	3	1	3	6	13
8	Gruidae	1	0	1	0	2
9	Otididae	0	1	0	0	1
10	Charadriidae	1	0	0	0	1
11	Scolopacidae	1	0	0	2	3
12	Laridae	0	0	0	1	1
13	Rynchopidae	1	0	0	0	1
Total		7	3	9	17	36

Source: compiled from Appendix- A

Table-3: Distribution of Threatened bird species of KNP by feeding habits.

Threatened species		
Feeding Categories	Frequency	Percentage (%ge)
Piscivorous	15	41.7
Insectivorous	4	11.1
Omnivorous	5	13.9
Carnivorous	4	11.1
Scavengers	5	13.9
Vegetarian	3	8.3
Total	36	100

Source: compiled from Appendix- A



Table-4: Distribution of Threatened bird species of KNP by Resident Status.

Threatened species		
Resident Status	Frequency	Percentage (%)
Resident	15	41.6
Migratory	13	36.1
Resident Migratory	8	22.3
Total	36	100

Source: compiled from Appendix- A

Table-5: Distribution of Threatened and bird species of KNP by habitats.

Threatened Species		
Habitat Status	Frequency	Percentage (%)
Aquatic	24	66.7
Terrestrial	7	19.4
Areal	1	2.8
Both water & Terrestrial	4	11.1
Total	36	100

Source: compiled from Appendix- A

Table- 6: Proportion of Threatened birds of KNP in different Residence and Food Habits.

Residence x Food	Piscivorous (P)	Insectivorous (I)	Omnivorous (Om)	Carnivorous (Cr)	Flesh-fish carrion eaters (NV)	Vegetarian (V)
Resident (R)	22.2	2.8	2.8	2.8	11.1	—
Migratory (M)	8.3	8.3	8.3	2.8	2.8	5.6
Resident Migratory (RM)	11.1	2.8	—	5.5	—	2.8

Source: compiled from Appendix- A



Table- 7: Proportion of Threatened birds of KNP in different Food and Habitats.

Food x Habitat	Piscivorous (P)	Insectivorous (I)	Omnivorous (Om)	Carnivorous (Cr)	Flesh-fish carrion eaters (NV)	Vegetarian (V)
Aquatic (WI)	36.1	11.1	11.1	–	–	8.3
Terrestrial (Tk, Ms, Bm, Cs etc.)	–	–	–	5.6	13.9	–
Both aquatic & terrestrial	5.6	–	–	5.6	–	–
Areal (A)	–	–	2.7	–	–	–

Source: compiled from Appendix- A

Table- 8: Proportion of Threatened birds of KNP in different Residence and Habitats.

Residence x Habitat	Aquatic	Terrestrial	Both aquatic & residence	Areal
Resident (R)	22.2	16.7	5.5	2.8
Migratory (M)	30.6	2.8	–	–
Resident Migratory (RM)	13.9	–	5.5	–

Source: compiled from Appendix- A



CONCLUSION

Climate change is emerging as the greatest threat to natural communities in many, if not most, of the world's ecosystems in coming decades, with mid-range climate change scenarios expected to produce greater extinction rates than habitat loss, currently deemed the top threat to biodiversity" (Thomas, *et al.*, 2004; Malcolm, *et al.*, 2006).

Birds have been considered as consistent factors of environmental change for ages, but due to the adverse effects of global warming, which created numerous ill impacts in ecosystems worldwide. At global level the effects of climate change on birds behavior is growing evidently, which reduce their ability to reproduce and even to survive. The extinction rates of threatened bird species depends on the potential disturbance of ecosystems. Similarly, our study indicates the climate change in the study area resulted in the extinction of many species.

If the climate changes will continue to happen with the same pace, expectedly it will result in the shifting of important bird species out of this protected area. Therefore, to remove the climate threat for the conservation of birds, a change in approach at basic level need to be implemented for the conservation maintenance of species diversity.

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