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### STUDY OF LOCAL AND MIGRATED BIRDS AROUND A PROTECTED RESERVOIR (KERWA) BHOPAL WITH REFERENCE TO CONSERVATION OF AVIAN FAUNA

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**Abstract:** Beautiful landscape and lush greenery all around makes the city of Bhopal & its nearby number of lakes and water reservoirs generates a very favorable home land for avian fauna and at the same time an ideal location for bird watchers. Among these Kerwa reservoir a massive and environmentally protected water body and preferred option for wide varieties of birds who gather here, some of them travel thousands of miles across the Northern countries Nearly 900 different species are from different parts of India and they remain within India throughout the year. We term these birds as Migratory and Local birds. Duck (Red Wattled Lapwing) is commonly known migratory bird. In India alone, 130 species of bird marked for serious conservation concern. About 20% of those species are reportedly threatened due to degradation of wetland. In this consideration Kerwa reservoir is a very suitable destination for birds considering wetland and all other favorable conditions prevailing all around the reservoir. Birds can be distinguished by their food diets (Frank gill, 2007). Birds to Classify or identify each individual species of birds with their food diet. This reveals whether they are *Omnivores*, *Frugivores*, *Insectivores*, *Carnivores*, *Piscivores*, *Nectarivores*, *Scavengers* birds which prey on mammals or large animals are called as carnivores.

**Keywords:** Water Foul, Eco-Tourism, Avian fauna. Frugivores



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## INTRODUCTION

The Indian sub-continent is an important non-breeding (wintering) ground for many migratory water fowl in the central Asian flyway (Alfred & Nandi 2000). Because of its latitudinal and climatic extent, the subcontinent provides a diversity of wetland habitats for migratory birds (Ali & Ripley 1978). Bhopal is a city of lakes & natural environment surrounded by forest & natural & manmade lakes e.g. Kerwa dam. Bhopal is situated at the central part of India at an elevation of 527 m (1,729 ft) at 262 meter from mean sea level.

Kerwa is a gift of nature and located at very convenient and easy to approach from various part of the city. Beautiful lush greenery and vast reservoir with a large variety of trees makes it a suitable place for birding activities. It is surrounded by agricultural fields with rural habitation & forest also. The water reservoir and the vegetation planted around the farm house land & forest have created a very good habitat and source of attraction for many faunal species like insects, reptiles, birds and mammals. In all 204 species of birds have been authentically identified at Bhopal. Birding area includes road sides from the dam to the different areas, and flowing water of river Kerwa and other small streams of water. The area is also rich in Avian-fauna (birds close to 30-40 species) with so many varieties of birds. The place is full of birds in the Mornings hours and it is really a spectacular sight at outskirts of Bhopal.

## MATERIAL & METHOD

Kerwa Dam Location of Longitude 77° 22'25", Latitude 23°9'55" and catchment area of reservoir is 64.5sq km. Total 16 important species of avian fauna were found during the period of study.

For avian fauna study, we had to start very early morning with a team of forest guide and local resident who are very well-versed with the surroundings area. We had to carry a kit of essentials like, Birds Hand book containing good nos. of photographs, Some research material of other area, Camera with lenses combinations, 7X42 Binoculars. Direct visual method (Bibby1992) was used and for vocal individuality method (Saunders 1988) in the existing forest trails which was covered by foot for the purpose defined above. Because a good binocular enables to see birds on the other side of the dam or flying above, specially Saras Cranes, Kite Terns can be seen covering a large over the dam. The observation period for this task was from January 2011 to December 2013. At times we had to walk a long distance along the Kerwa river for observations. Birds were sighted using a binocular from zoom lens. Only confirmed species are included in the checklist.

Some researcher has worked and reported such as Saxsena 1975 has studied the flora and fauna of Bharatpur bird santaury which support the bird life. Hussain Ali, 1984 has studied the profile of Chilka lake in Orissa. In 1990, he studied the ecology of birds at Kavar lake in Bihar. In 2001 studied the ornitho-ecological aspects on Gudavi bird sanctuary, Simoga, inac. Et. Al (2008)

Shola forest & Udpi district, Avian fauna distribution in the Shoal forest of Baba Buta Hills in Chickkangalure, Karnataka, (Kadabagere R Shrinivas\*, Vijaya Kumara, 2011).

To identify each individual species of birds with their food diet whether they are omnivores frugivores or insectivores or carnivores or piscivores or nectarivores or scavengers birds which prey on mammals or large animals are called as carnivores e.g. Black shouldered kite. Birds which predominantly feed on insects are called as insectivores e.g. bubbler. Birds which feed on almost on all palatable food are called as omnivores.eg birds which exclusively feed on the nectars of the flowers are called as nectarivore e.g. purple sun bird. Birds which feed on cereals, grains and seeds are called as granivores Sliver billed munia (*Lonchura Malabarica*). The scavengers are also present in the bird species where they feed on the dead animals or the garbage (Egyptian Vulture).

The scavengers are also present in the bird species where they feed on the dead animals or the garbage. Finally

Piscivores are those birds which exclusively prey upon e.g. Great Egreat fishes. Birds with their feeding habits are further taken down and classified upon their diets, the book of Indian birds by Salim Ali to know the exact hense predominatl taken food is written first and occasionally taken food later. This behavior is because of the lack of availability of its predominant food or for adaptation purpose .the birds that employ many strategies to obtain food or on verity of food called generalists. While birds which concentrate on specific food items or have a single strategy are called as Specialists.

**BIRDS STATUS IN KERWA DAM (BHOPAL)**

S.No.	Common Name	Scientific Name	Family	Status	Diet	
					Generalist(g)	Specialist(s)
1.	Jungle Babbler	<i>Turdoides Striata</i>	Leiothrichidae	Local	Insectivores	Omnivores
2.	Great Tit	<i>Parus Major</i>	Paridae	Local	Omnivores	Granivore
3.	Black Drongo	<i>Dicrurus Macrocerus</i>	Dicruridae	Local	Insectivores	Nectarivores
4.	Purple Sunbird	<i>Cinnyris Asiaticus</i>	Nectariniidae	Local	Insectivores	Nectarivores
5.	Black Shouldered Kite	<i>Elanus Caeruleve</i>	Accipitridae	Local	Carnivores	Scavenger

6.	Rose Ringed Parakeet	<i>Psittacula Krameri</i>	Psittaculidae	Local	Frugivores	Insectivores
7.	Asian Koel	<i>Eudynamys Scolopaceus</i>	Cuculidae	Local	Insectivores	Frugivores
8.	Hoopoe	<i>Upupa Epops</i>	Upupidae	Local	Omnivores	Insectivores
9.	Sarus Crane	<i>Grus Antigone</i>	Gruidae	Migrate	Piscivores	Omnivores
10.	Red- Wattled Lapwing	<i>Vanellus Indicus</i>	Charadriidae	Local	Omnivores	Insectivores
11.	Great Egret	<i>Ardea Alba</i>	Ardeidae	Migrate	Piscivores	Insectivores
12.	Common Kingfisher	<i>Alcedo atthis</i>	Alcedinidae	Local	Insectivores	Omnivores
13.	Black Winged Stilt	<i>Himantopus Himantopus</i>	Recurvirostridae	Local	Piscivores	Insectivores
14.	Common Snipe	<i>Gallinago Gallinago</i>	Scolopacidae	Migrate	Insectivores	Omnivores
15.	Egyptian vulture	<i>Neophron percnopterus</i>	Accipitridae	Local	Carnivores	Scavenger
16.	Oriental Darter Or Indian Darter	<i>Anhinga Melanogaster</i>	Anhingidae	Migrated	Snake	Insectivores

## OBSERVATION & DISCUSSION

Towards the end of winter, some of the birds move to neighboring agriculture land where farming activity is on, this forms their feeding ground. Also some of the birds gets involved in preparing their breeding ground during this period. They start returning to the water bodies during September. Birds like red walled lapwing and common sand piper occupied the dams only on and after winter months. The arrival coincides with the reduction in water level where they can avail the food easily by probing in to the mud. Similar observation was made earlier on water birds of Sundarban, W.B. (Mukherjee, 1972) & (P.Ishwara bhat Avifunal of Anekere wetland Karkala, Udapi district, Karnataka, 2009). Kerwa is a ideal place where home of local species bird recorded thought the study period. Because availability of abundant food and plenty of vegetation in this area. Where we observed birds from a distance of 15 meters with

the naked eye and at about 30 m with 7x 42 binoculars. Bird watching in Kerwa demands patience and it is time taking. Study area is divided in main three sites. It was not long before we had a flock of about 4-5 bubbler parrots in our binoculars. Although the flock consisted of adult birds but we observed some chicks also in tree's cavity nest. Good close sighting and photo opportunities we had by all. Degradation of wetland habitats, poaching, nest destruction, changes in agricultural practices and conflict with farmers in the catchment of the wetlands have been the main factors behind this decline, which seems likely to continue unless appropriate protection measures are taken (Gole 1989, Meine & Archibald 1996, Kaur & Choudhury 2003). Status of migratory shorebirds at Bhitarkanika and Chilika wetlands on the east coast of India (Nayak, A.K.2003). Water birds around the Kerwa river is flowing in zigzag way along with boundary wall of ETC (this place is around 2 k.m.) \_\_\_\_\_Kerwa reservoir is surrounded by hilly dense forest having huge trees. These area occupied by various types of vegetation viz; *Cassia siamea*, *Acacia spp.*, *Diospyros melanoxylon* *Anacardium occidentale.*, the area has got well-protected greenery of the following medical plant viz (emblica officianalis) and eucalyptus. Eco tourism centre has plantation area for shrubs & herbs vegetation, medicinal and garden area. "Bird life international", a U.K. in partnership with the Royal Society for the Protection Of Birds (RSPB) and the Bombay Natural History Society (BNHS), Red Data Book contains list of species whose existence is in danger. This list contains 17 Indian species and 57 others those seasonally migrate within India. Migratory species face severe threats from hunting and loss of habitat. Most of the birds move to agricultural land nearby. Black drongo during survey, agriculture lands of Sarodipura village, they observed congregate in fields that are being ploughed, picking up exposed caterpillars (s). They feed mainly on insects such as grasshoppers, termites, wasps, bees, ants and dragonflies (g). These birds were observed a noisy, Plum headed parakeet, gregarious species, they are extremely intelligent, individualistic birds and non-aggressive birds. Rose Ring Parakeets make charming pets. They are great talkers, are very curious birds and they thoroughly enjoy human interaction. only, a Lebbek and acacia provided the parakeet nests. Most of the parakeet nests were observed in to the cavity provided in their limbs and trunks of trees e.g., *Delonix regia* & *Mangifera indica* and a lebbek. Reported earlier larger number of cavities and parakeets nests (Ali and Ripley, 1969; Sarwar et al., 1989; Roberts, 1991). Parakeets nests habit. The most important of these for most true parrots in the diet of parrots consists of seeds, fruit, nectar, pollen, buds (g) the evolution of the large and powerful bill can be explained and sometime arthropods and other animal prey (s). Jungle babbler is a very common feral bird around. These birds were observed generally in group. Babbler eats insect bubbler always found anywhere in a group with fighting and makes loud sounds these birds were observed generally in group. Babbler eats insects. Because they have short broad wings. They feed on insects flying in the air and must be fast and agile enough to catch them. Breeding season of jungle babblers (*t. Striatus*); seem to differ slightly in different parts of India (Ali, 1993; Whistler, 1949; Andrews, 1968). Babblers observed

play behavior in keas (*Nestor Notabilis*) in zoos and diamond & bond (1999) described their play in the wild. Gaston (1977) described play behavior in jungle Babblers (*Turdoides striatus*) as well as in large gray Babblers (*Turdoides malcolmi*) Babblers (Orit Pozis-francois 1, Amotz Zahavi 2 and Avishag Zahavi 3-2004). We observed 2-3 Black-shouldered kites were sitting in forest area near Ganesh Ghati on eucalyptus. Usually large eucalyptus tree provides resting place to kites black shoulders kite can be seen over with its hovering flight. Earlier reported the relationship between communal roosting of black shouldered kites and ephemeral food resources has been pointed out in Africa and use a variety of tree and shrub species as winter roosts throughout their range (see review in Mendelsohn 1988, Clark and Wheeler 1989). We succeeded to get a photograph. Myna and Hoopee clutters can be heard any time( near Eco tourism centre ) During the day mostly in winter when we were walking near main wall the Kerwa dam ,we saw many water birds roaming around the water, like, black-winged stilts & great egret. Fork-tailed drongo. They are only rarely known to take larger arthropods such as scorpions and centipedes.(g) -they feed mainly on insects(s). Shrike "shrike" were the resident species recorded through the study period. Availability of abundant food and more vegetation.- - this bird has a characteristic upright "shrike" attitude when perched on a bush, from which it glides down at an angle to take lizards, large insects (g), small birds and rodents. It finds its every spot suddenly. Finally we succeed to caught in a camera. During monsoon peacock & cuckoo call is frequently heard around main dam place, they feed on hairy caterpillars and other insects but sometimes take fruits too. They usually feed on the upper canopy, gleaning insects, sometimes making aerial sallies for flying termites or rarely observed even by hovering lower near the ground. Purple sun bird Nectariniidae c. Asiaticus they are seen in pairs or small groups and aggregations may be found in gardens with suitable flowers. They feed mainly on nectar (s) but also sometimes take fruits and insect (g).

The sarus crane (*Grus antigone*) is the world's tallest flying bird (archibald et al. 2003), they observed near shallow water of the Kerwa Reservoir is the only resident breeding crane in India and southeast Asia, has suffered a rapid population decline within a few decades (Choudhury et al. 1999). Indian Sarus cranes have adapted to the dense human population, and interact closely with people in areas where traditions of tolerance prevail the current range of the Indian Sarus crane includes the plains of in northern India, north-western, and western India and the western half of Nepal's Tarai lowlands. Gole (1989). Sarus cranes in its entire distribution range in India. Degradation of wetland habitats, poaching, nest destruction, which seems likely to continue unless appropriate protection measures are taken. Sarus cranes are mostly non-migratory in India, but often make short seasonal movements between dry and wet season habitats.

Common kingfishers (*alcedo atthis*) "are found throught the year, they are more heard than seen because they dissapper quickly on sighting the danger". The predominant wood plant

species found in the study area are, mangifera indica, tamarindus indicus, ficus benghalensis, and azadirachta indica. Are also found in the study area. Last nineteen century reported that wetlands in northern Iberia play a significant role as stopover and/or wintering areas for several waterbird species (e.g. Galarza & Domínguez 1989). Many of the birds were displaced during this season and spread in the neighboring areas of agricultural activities, where in which forms their feeding ground, e.g. black drongo they congregate in fields that are being ploughed, picking up exposed caterpillars. They feed mainly on insects such as grasshoppers, termites,(s) wasps, bees, ants and dragonflies(g). Black-winged stilts, birds plunge their head below the surface to catch sub-aquatic prey small Molluscs (s) and crustaceans (g).it was preferring instead to wade in shallow water (where dam's wall shape is just "U" shape) and seize prey on the surface. The great egret during some surveyed it was found slowly stalk its victim. . It was often waited motionless quietly for prey on small fish (s) or frogs (g). Degradation of wetland habitats, poaching, nest destruction, changes in agricultural practices and conflict with farmers in the catchment of the wetlands have been the main factors behind this decline, which seems likely to Sarus cranes in its entire distribution range in India.

Relatively little is known, however, about how water birds use these areas and how long they remain at a particular site.

Relatively little is known, however, about how water birds use these areas and how long they remain at a particular site kites usually hunted in the paddocks around the house.

Birds like red walled lapwing , Black winged stilts and common sand piper occupied the dam only on and after winter months. The arrival coincides with the reduction in water level ,where they can avail the food easily by probing in to the mud. Similar observation was made earlier on water birds of Sundarban (Mukherjee, 1972) were the resident species recorded through at forest area & main dam during the study period. Indian Darter birds very Rare recorded only once during Surveyed.

## CONCLUSION

Local fishermen are threat to these birds. There have been reports that they use poison to kill these birds.

The birds are classified on the basis of the book of Indian birds (Ali 1996) Earlier report (Fowler, 1999). Klein (1995) observed effects on water bird communities in the Ding Darling National Park. There was a marked difference between the behavior of water birds that used the reserve as a feeding and breeding ground to those species that used it as an over-wintering site.

Cattle grazing are another threat to this Kerwa's grassland complex, though which can be stopped until it is still a state forest .It is required to store the original ecological features of Kerwa's Reservoir by the Government, NGO and Forest Department.

The hoopoe is a small bird found in forest area near village Ganesh ghati. They are on the red list of endangered species in Switzerland (Keller et al. 2001). Ring-necked parakeets are currently listed under schedule IV of the wildlife (protection) act 1972 which makes it illegal to own parakeets in India.

Limited information suggests that populations of several species of migratory ducks are declining due to encroachment of wetland habitats largely by agriculture and industry. The development of conservation strategies is stymied by a lack of ecological information on these species.

### **Suggestions**

In order to save these beautiful birds the following initiatives may be taken.

- In Kerwa reservoir shallow part of the area near Kerwa river may be declare as a protected area.
- Public awareness programme for conservation of avian fauna should be organized.
- The migratory birds were clearly unaccustomed to the humans and fled away. Vehicular traffic and sound pollution should be controlled.
- Creation of birds groups: under the guidance of wild life experts, students may be encouraged to form voluntary groups who will monitor Birds like Sarus crane & other water birds. Monitor their population throughout the year and help villagers understand the need to protect & save these birds particular in winter.
- Encourage commercial companies under corporate social responsibility (CSR) to help protect vulnerable species and their habitat by infrastructure development under the water body conservation plan.
- Ring- Rose parakeets are currently listed under schedule iv of the wildlife (protection) act 1972 which makes it illegal to own parakeets in India, this is not known to public in general.
- Forest department should take an active participation in conservation of forest and social forestry.

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