

## AVIAN DIVERSITY OF LONAR METEORITIC CRATER, INDIA (MS)

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### ABSTRACT

Study on bird diversity in the Lonar meteoritic crater (Maharashtra) India. Geologically located on Latitude 19° 58'45''N, Altitude 1852 ft was done, over a period of 2 years 2009 -2011. A total number of 17 bird species belonging to 13 families were recorded during the study covering an crater area. In present study recorded 17 avian species of 9 Order such as, Anseriformes, Passeriformes, Coraciiformis, Charadriiformes, Psittaciformes, Galliformes, Cuculiformes, Strigiformes, Falconiformes were observed and 17 were identified. The 17 identified species such as *Accipter badius*, *Anas acuta*, *Anas poecilrhyncha*, *Anas quequedula*, *Athena brama*, *Copsychus saularis*, *Coracias benghalensis*, *Eudynamys scolopacea*, *Halcyon smyrnensis*, *Himantopus himantopus*, *Meropus orientalis*, *Pavo cristatus*, *psittacula krameri*, *saxicoloides fulicata*, *Tadorna ferruginea*, *Turdoides caudatus*, *vanellus indicus*. The lake region has wide variety of trees, which may be one of the major contributing factor for the richness of bird species.

**Keywords:** Lonar Meteoritic Crater, Bird Diversity

### INTRODUCTION

Lonar Crater is an impact crater situated in the Buldana District of the Indian state Maharashtra. Geologically located on Latitude 19° 58'45''N, Altitude 1852 ft, the lake is 1.83 km (600 feet) in diameter and 170 meter in depth and its age is estimated to be 52000 ± 6000 years ago in the late Pliocene (Fudali, *et al.*, 1980). Mythology associated the crater with the underground abode of demon Lonasura, who was killed by Lord Vishnu. The scientific studies were carried out in recent time attribute the probable origin of Lonar crater by the impact of large meteoritic body (Mahabal, 2008). It is the largest impact crater in basaltic rock and partially filled by saline water. Also once thought to be volcanic origin. The crater was firstly noticed by an Englishman, C J E. Alexander in 1823. Lonar crater is now recognized as an impact crater created by the hypervelocity impact comet or meteorite. The impact origin of this crater is clearly demonstrated by the presence of Plagioclase that has been either converted into maskelynite or contains planar deformation features. The Lonar impact crater in the Deccan the Indian peninsula provides unique opportunities to study physical and chemical process of impact crater on basaltic targets because terrestrial impact crater on basalts are extremely rare such studies are needed for determining provenance and other parameter of the excavated rocks and the creating phenomenon that may have implication for similar crater in Lunar Martian and other basaltic targets in solar system. Biodiversity is the degree of variation of life forms within a given species, ecosystem, biome, or an entire planet. Biodiversity is a measure of the health of ecosystems. Biodiversity is in part a function of climate. In terrestrial habitats, tropical regions are typically rich whereas Polar Regions support fewer species. Rapid environmental changes typically cause mass extinctions. One estimate is that less than 1% of the species that have existed on Earth are extant Raup (1994).

Birds are feathered, winged, bipedal, endothermic (warm-blooded), egg-laying, vertebrate animals. With around 10,000 living species, they are the most species class of tetrapod vertebrates. All present species belong to the subclass Neornithes, and inhabit ecosystems across the globe, from the Arctic to the Antarctic. Extant birds range in size from the 5 cm (2 in) Bee Hummingbird to the 2.75 m (9 ft) Ostrich. Modern birds are characterized by feathers, a beak with no teeth, the laying of hard-shelled eggs, a high metabolic rate, a four-chambered heart, and a lightweight but strong skeleton. Many species undertake long distance annual migrations, and many more perform shorter irregular

movements. Birds are social; they communicate using visual signals and through calls and songs, and participate in social behaviors, including cooperative breeding and hunting, flocking, and mobbing of predators. The highest bird diversity occurs in tropical regions. It was earlier thought that this high diversity was the result of higher speciation rates in the tropics, however recent studies found higher speciation rates in the high latitudes that were offset by greater extinction rates than in the tropics Weir, (2007). In the present study, we have observed avian diversity of Lonar Lake for two years from 2009-2011 such as,

## **MATERIAL AND METHODS**

The observation was carried out for 5 h a day from 6:30 to 10:00 am in the morning and from 4:30 to 6:00 pm in the afternoon, when the activities of birds were prominent. Species were recorded using direct observation. Photographs Binocular and videos were taken to justify the species type for those species which were difficult to identify Ali, (1981) Grimmett *et al.*, (1999). Some inconspicuous bird species were also identified based on their calls like, the song and calls records of Chappuis (2000) and Roche (1996).

## **RESULTS**

In present study recorded 17 avian species of 9 Order such as, Anseriformes, Passeriformes, Coraciiformis, Charadriiformes, Psittaciformes, Galliformes, Cuculiformes, Strigiformes, Falconiformes were observed and 17 were identified. The 17 identified species such as *Accipter badius*, *Anas acuta*, *Anas poecilrhyncha*, *Anas quequedula*, *Athena brama*, *Copsychus saularis*, *Coracias benghalensis*, *Eudynamis scolopacea*, *Halcyon smyrnensis*, *Himantopus himantopus*, *Meropus orientalis*, *Pavo cristatus*, *Psittacula krameri*, *Saxicoloides fulicata*, *Tadorna ferruginea*, *Turdoides caudatus*, *Vanellus indicus*. The residential status is given in Table-1.

## **DISCUSSION**

Birds are often common denizens of the ecosystems and they have been considered as an indicator species of inhabited areas. Population of bird is sensitive indicators of population in both terrestrial and aquatic ecosystem The estimation of local density of avian fauna helps to understand the abundance of various species of other organisms Gaston, (1975), Hardy, *et al.*, (1987), Blair, (1999), Turner, (2003). Shimelis and Afework (2008) studied on the species composition, relative abundance and distribution of bird fauna of riverine and wetland habitats of Infranz and Yiganda of Lake Tana, ethopia and observed that the 129 bird species consisting of three endemics, two globally threatened and 21 palaeartic migrants were identified. The species composition of birds during wet and dry season was not significant difference among the habitats. Patil, *et al.*, (2008) studied on the conservation and management of Salim Ali Lake Aurangabad and observed that the sanctuary was rich in bird fauna associated with some migratory species and ecologically important landmark. 64 bird species were observed as permanent residential, while 24 non-residential (migratory) bird species in the lake. Birds were visiting the lake as visitor in winter, summer and Monsoon. The population of overall birds was increases in December and decline from January as the water levels recedes. Roy, *et al.*, (2008) studied on the sustainable development of Kavar lake, Begusarai (North Bihar, India) and observed that the fluctuations in the values of species of wetland bird families (*Podicipiformes*, *Peiecaniformis*, *Anseriformes*, *Anatidae* and *Charadriidae*) and found very less Species diversity in the resident bird families (*Ciconiiformes*). The range of the species diversity of waterfowl (*Anatidae*) was recorded as (0.394 to 2.054), indicating higher productivity as well as spatial diversity in the lake. Bhatnagar *et al.*, (2008) studied on aquatic bird diversity of lake Bari (a component of Udaipur important bird area) with a special note on its habitat management and observed that the total 32 bird species belonging to 18 families. Among, these 20 species were resident, 2 species were summer migrant and 10 species were winter migrants. Kafle, *et al.*, (2008) studied on the status of and threats to water birds of Rupa lake, Pokhara, Nepal and observed that the 36 species of waterbirds in the lake which represents about 19% of the total 193 wetland-dependant birds found in Nepal. Mohan and Gaur (2008) studied on the avian diversity around Jajiwal pond- A natural wetland and observed that the 62 species of birds belonging to 26

**Table 1: Avian Diversity of Lonar Meteorite Crater (Total F-13; G-15; S-17)**

Order	Family	Genus	Species	Residential status
1) Anseriformes(F- 1; G- 2; S- 4)	1) Anatidae	1) <i>Anas</i> (3 sp.)	1) <i>acuta</i>	Winter visitor (WV)
			2) <i>poecilorhyncha</i>	Resident (R)
			3) <i>querquedula</i>	Winter visitor (WV)
		2) <i>Todorna</i> (1 sp.)	1) <i>ferruginea</i>	Winter visitor (WV)
2) Passeriformes(F- 2; G- 3; S- 3)	1) Timaliidae	1) <i>Turdoides</i>	1) <i>caudata</i>	Resident (R)
	2) Muscicapidae	1) <i>saxicoloides</i>	1) <i>fulicata</i>	Resident (R)
		2) <i>coptesychus</i>	1) <i>saularis</i>	Resident (R)
3) Coraciiformis(F- 3; G- 3; S- 3)	1) Meropidae	1) <i>Merops</i>	1) <i>orientalis</i>	R/Seasonal Migrant (SM)
	2) <i>Halcyonidae</i>	1) <i>Halcyon</i>	1) <i>smyrnensis</i>	Resident (R)
	3) Coraciidae	1) <i>Coracias</i>	1) <i>benghalensis</i>	R/Seasonal Migrant (SM)
4) Charadriiformes (F- 2; G- 2; S- 2)	1) Recurvirostridae	1) <i>Himantopus</i>	1) <i>himantopus</i>	R/Winter visitor (WV)
	2) Charadriiformes	1) <i>Vanellus</i>	1) <i>indicus</i>	Resident (R)
5) Psittaciformes (F- 1; G- 1; S- 1)	1) Psittaculidae	1) <i>Psittacula</i>	1) <i>krameri</i>	Resident (R)
6) Galliformes (F- 1; G- 1; S- 1)	1) Phasianidae	1) <i>pavo</i>	1) <i>crisatus</i>	Resident (R)
7) Cuculiformes (F- 1; G- 1; S- 1)	1) Cuculidae	1) <i>Eudynamys</i>	1) <i>scolopaceus</i>	Resident (R)
8) Strigiformes (F- 1; G- 1; S- 1)	1) strigidae	1) <i>Athene</i>	1) <i>brama</i>	Resident (R)
9) Falconiformes (F- 1; G- 1; S- 1)	1) Accipitridae	1) <i>Accipiter</i>	1) <i>badius</i>	Resident (R)

(F-Family; G-genus; S-species)

families and 15 orders out of these 62 species were water birds and 36 were terrestrial birds.



1 *Anas acuta*



2 *Anas poecilorhyncha*



3 *Anas querquedula*



4 *Tadorna ferruginea*



5 *Turdoides caudata*



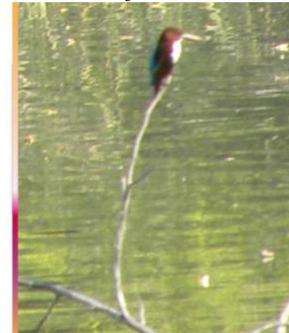
6 *Saxicoloides fulicata*



7 *Copsychus saularis*



8 *Merops orientalis*



9 *Halcyon smyrnensis*



10 *Coracias Benghalensis*



11 *Himantopus himantopus*



12 *Vanellus indicus*

**Figure 1-12: Birds species observed**

Among water birds 6 species of waterfowl. Bhat *et al.*, (2009) studied on the avifaunal diversity of anekere wetland, Kakala, Udupi district, Karnataka, India and observed that the 44 bird species attracted this habitat, which including migratory and local aquatic birds, waders and others. Highest population of tree ducks (lesser whistling teal) was recorded. Birasal *et al.*, (2010) studied on the water bird diversity at Heggeri lake, Haveri district and observed that the 30 bird species belonging to 10 families. Roy *et al.*, (2011) studied on the changes in densities of water birds species in Santragachi Lake, India: Potential effect on limnological variables and observed that the 22 species

of birds active in around the water body Lesser Whistling ducks followed by Northern Pintail (*Anas acuta*), Cotton Pigmy Goose (*Nettapus coromandelianus*) and Godwall (*Anas strepera*) were the most common duck species.



13 *Psittacula krameri*



14 *Pavo cristatus*



15 *Eudynamys scolopaceus*



16 *Athene brama*



17 *Accipiter badius*

**Figure 13-17: Birds species observed**

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