

## Original Research Article

### **Avian Diversity of Nature Park, Kolkata (West Bengal, India)**

#### **ABSTRACT**

This study is a preliminary inventory of the avifauna diversity in Nature Park, situated in the south western periphery of Kolkata within the state of West Bengal, India. A rigorous study of avifauna was carried out from March 2022 to February 2024. Basic line transects and point count methods were used in this study. A total of 108 bird species taxonomically belonging to 79 genera, 41 families and 12 orders were recorded from the study site. Passeriformes was the most predominant order with 48 species belonging to 21 families. Ardeidae with 11 species was the most dominant family. Maximum numbers of species were noted in genus *Ardea*. One vulnerable and one near threatened bird species was recorded from the study site regarding IUCN status.

*Keywords: Avifauna diversity; ecological indicators; IUCN status; line transects; point count.*

#### **1. INTRODUCTION**

Avifauna and their diversity constitute a central part of the natural environment. Birds are important ecological indicators assessing the quality of habitats [1]. Birds play various roles in ecosystem as pollinators, agents of seed dispersals, predators and scavengers [2]. Biodiversity is under threat worldwide and avian diversity is not an exception. Avifauna diversity has been reducing due to natural phenomenon as well as anthropogenic activities.

Urbanization coupled with climate change aggravates the problem [3]. Destruction of natural habitats is one of the important reasons for decreasing bird diversity [4]. The Indian subcontinent is rich in avifauna diversity due to huge habitats variability, prevalent climatic conditions and a wide range of altitudes from the peak of Himalaya to the sea level. As a result more than 13% of the world's avifauna is found here [5].

Present study aims to prepare a baseline survey report on avifauna diversity in Nature Park. Nature Park is considered as wetland ecosystem which contains a wide variety of habitats. According to WWF-India, wetlands are one of the most threatened of all ecosystems in India. Wetlands are one of the important, diverse and highly productive ecosystems. Wetlands are recognized for their essential biological, hydrological and ecological functions. Not only these, they also have socio-economic functions.

## **2. MATERIALS AND METHODS**

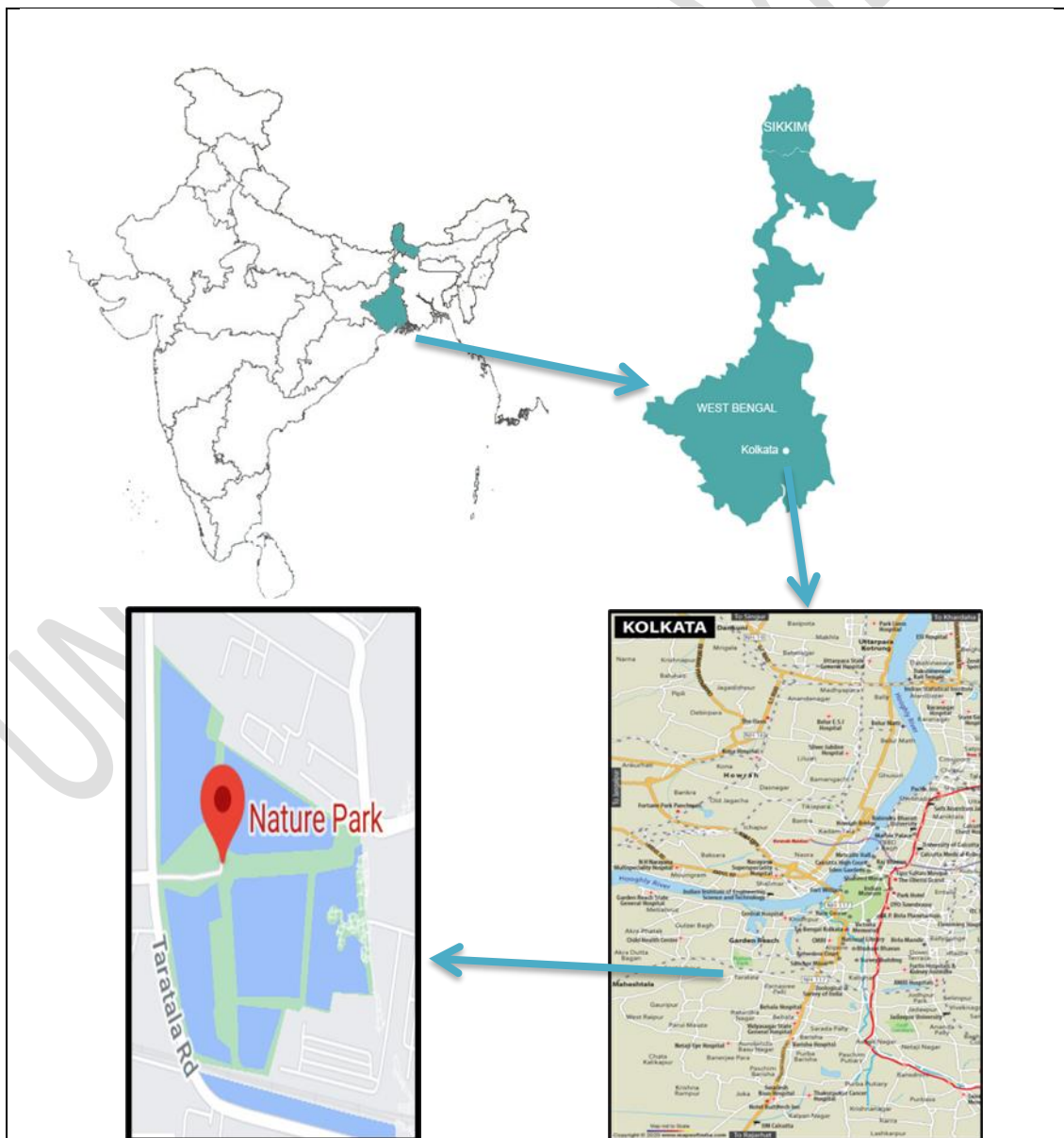
### **2.1 Study Site**

The present study was conducted in Nature Park of Kolkata, West Bengal, India (Fig. 1). The study area is situated within the geographic range of 22° 31' 23"-22° 33' 00" N and 88° 17' 15"- 88° 18' 26" E. The whole area is habitat of more than 120 plant species including herbs, shrubs, grasses and trees. In addition the Nature Park occupies thousands of hectares of wetlands. The water body, greenery, plenty of flowers and fruits, availability of foraging, breeding and nesting sites attracts a wide variety of avifauna (Fig. 2).

### **2.2 Avifauna Survey**

An extensive study of avifauna was carried out for two consecutive years at regular intervals of fifteen days from March 2022 to February 2024. Bird survey was conducted both in the early morning and evening hours. Basic line transects and point count methods were used in

this study [6]. Activity of birds like calling, perching, mobbing, overflying, walking, nest building and feeding during the study period was also noted. Birds were identified by using field guides [7, 8] and by searching internet resources. Observations were carried out with the help of binocular (Olympus 8x40) and data was recorded from different habitat during each survey. Photography was also done with digital camera (Canon power shot SX50 HS) for documentation of avifauna. For Scientific nomenclature and authorship of Bird species, Howard and Moore 4th Edition was followed [9, 10].



**Fig. 1.** Maps showing location of Nature Park, Kolkata, West Bengal, India (Source: Google Earth).



**Fig. 2.** Nature Park, Kolkata, West Bengal, India

### 3. RESULTS AND DISCUSSION

A total of 108 bird species taxonomically belonging to 79 genera, 41 families and 12 orders were recorded from the study site (Table 1). Different species of birds were photographically documented during survey from Nature Park (Fig. 3 and Fig. 4). Bird calls recording was done for identification of some bird species. The habitats with nests of some bird species were also noted (Fig. 5).

**Table 1.** Avifauna recorded from Nature Park, Kolkata, West Bengal, India during survey.

Common Name	Scientific Name	Family	Order	Current status (IUCN 3.1)
1. Black kite	<i>Milvus migrans</i> (Boddaert,1783)	Accipitridae	Accipitriformes	Least concern
2. Lesser Whistling Duck	<i>Dendrocygna javanica</i> (Horsfield,1821)	Anatidae	Anseriformes	Least concern

3. Bronze winged Jacana	<i>Metopidius indicus</i> (Latham, 1790)	Jacanidae	Charadriiformes	Least concern
4. Pheasant tailed Jacana	<i>Hydrophasianus chirurgus</i> (Scopoli, 1786)	Jacanidae	Charadriiformes	Least concern
5. Red wattled Lapwing	<i>Vanellus indicus</i> (Boddaert,1783)	Charadriidae	Charadriiformes	Least concern
6. Little Ringed Plover	<i>Charadrius dubius</i> Scopoli, 1786	Charadriidae	Charadriiformes	Least concern
7. Common Sandpiper	<i>Actitis hypoleucos</i> ( Linnaeus,1758)	Scolopacidae	Charadriiformes	Least concern
8. Green Sandpiper	<i>Tringa ochropus</i> Linnaeus,1758	Scolopacidae	Charadriiformes	Least concern
9. Wood Sandpiper	<i>Tringa glareola</i> Linnaeus,1758	Scolopacidae	Charadriiformes	Least concern
10. Common Snipe	<i>Gallinago gallinago</i> ( Linnaeus, 1758)	Scolopacidae	Charadriiformes	Least concern
11. Pintail Snipe	<i>Gallinago stenura</i> (Bonaparte, 1831)	Scolopacidae	Charadriiformes	Least concern
12. River Tern	<i>Sterna aurantia</i> J.E. Gray, 1831	Laridae	Charadriiformes	Vulnerable
13. Gull billed Tern	<i>Gelochelidon nilotica</i> (J.F. Gmelin, 1789)	Laridae	Charadriiformes	Least concern
14. Black winged Stilt	<i>Himantopus himantopus</i> ( Linnaeus, 1758)	Recurvirostridae	Charadriiformes	Least concern
15. Rock Pigeon	<i>Columba livia</i> J.F. Gmelin, 1789	Columbidae	Columbiformes	Least concern
16. Yellow footed Green Pigeon	<i>Treron phoenicopterus</i> (Latham, 1790)	Columbidae	Columbiformes	Least concern
17. Spotted Dove	<i>Streptopelia chinensis</i> (Scopoli, 1786)	Columbidae	Columbiformes	Least concern
18. Eurasian Collared Dove	<i>Streptopelia decaocto</i> ( Frivaldsky, 1838)	Columbidae	Columbiformes	Least concern
19. Green Bee eater	<i>Merops orientalis</i> Latham, 1801	Meropidae	Coraciiformes	Least concern
20. White throated Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus, 1758)	Alcedinidae	Coraciiformes	Least concern
21. Black Capped Kingfisher	<i>Halcyon pileata</i> (Boddaert,1783 )	Alcedinidae	Coraciiformes	Least concern
22. Pied Kingfisher	<i>Ceryle rudis</i> (Linnaeus,1758)	Alcedinidae	Coraciiformes	Least concern
23. Stork billed Kingfisher	<i>Pelargopsis capensis</i> (Linnaeus, 1766)	Alcedinidae	Coraciiformes	Least concern
24. Common King fisher	<i>Alcedo atthis</i> ( Linnaeus,1758)	Alcedinidae	Coraciiformes	Least concern
25. Common Hawk Cuckoo	<i>Hierococcyx varius</i> (Vahl,1797)	Cuculidae	Cuculiformes	Least concern
26. Pied Cuckoo	<i>Clamator jacobinus</i> (Boddaert, 1783)	Cuculidae	Cuculiformes	Least concern
27. Asian Koel	<i>Eudynamys scolopaceus</i>	Cuculidae	Cuculiformess	Least

	(Linnaeus,1758)			concern
28. Greater Coucal	<i>Centropus sinensis</i> (Stephens, 1815)	Cuculidae	Cuculiformes	Least concern
29. Plaintive Cuckoo	<i>Cacomantis merulinus</i> (Scopoli, 1786)	Cuculidae	Cuculiformes	Least concern
30. White breasted Water hen	<i>Amaurornis phoenicurus</i> (Pennant, 1769)	Rallidae	Gruiformes	Least concern
31. Watercock	<i>Gallicrex cinerea</i> (J.F. Gmelin, 1789)	Rallidae	Gruiformes	Least concern
32. Common Moorhen	<i>Gallinula chloropus</i> (Linnaeus, 1758)	Rallidae	Gruiformes	Least concern
33. Green Leaf Warbler	<i>Seicercus nitidus</i> (Blyth, 1843)	Phylloscopidae	Passeriformes	Least concern
34. House Crow	<i>Corvus splendens</i> Vieillot, 1817	Corvidae	Passeriformes	Least concern
35. Rufous Treepie	<i>Dendrocitta vagabunda</i> (Latham, 1790)	Corvidae	Passeriformes	Least concern
36. Large billed crow	<i>Corvus macrorhynchos</i> Wagler,1827	Corvidae	Passeriformes	Least concern
37. Black-headed Cuckoo shrike	<i>Lalage melanoptera</i> (Rüppell, 1839)	Campephagidae	Passeriformes	Least concern
38. Small Minivet	<i>Pericrocotus cinnamomeus</i> (Linnaeus, 1766)	Campephagidae	Passeriformes	Least concern
39. House Sparrow	<i>Passer domesticus</i> (Linnaeus, 1758)	Passeridae	Passeriformes	Least concern
40. Black headed Munia	<i>Lonchura malacca</i> (Linnaeus, 1766)	Estrildidae	Passeriformes	Least concern
41. Scaly breasted Munia	<i>Lonchura punctulata</i> (Linnaeus, 1758)	Estrildidae	Passeriformes	Least concern
42. Black naped Oriole	<i>Oriolus chinensis</i> Linnaeus, 1766	Oriolidae	Passeriformes	Least concern
43. Eurasian golden Oriole	<i>Oriolus oriolus</i> (Linnaeus, 1758)	Oriolidae	Passeriformes	Least concern
44. Black hooded Oriole	<i>Oriolus xanthornus</i> (Linnaeus, 1758)	Oriolidae	Passeriformes	Least concern
45. Ashy Wood swallow	<i>Artamus fuscus</i> Vieillot, 1817	Artamidae	Passeriformes	Least concern
46. Grey backed Shrike	<i>Lanius tephronotus</i> (Vigors, 1831)	Laniidae	Passeriformes	Least concern
47. Brown Shrike	<i>Lanius cristatus</i> Linnaeus, 1758	Laniidae	Passeriformes	Least concern
48. Long tailed Shrike	<i>Lanius schach</i> Linnaeus, 1758	Laniidae	Passeriformes	Least concern
49. Purple Sunbird	<i>Cinnyris asiaticus</i> (Latham, 1790)	Nectariniidae	Passeriformes	Least concern
50. Purple rumped Sunbird	<i>Leptocoma zeylonica</i> (Linnaeus, 1766)	Nectariniidae	Passeriformes	Least concern
51. Jungle Babbler	<i>Turdoides striata</i> (Dumont,1823)	Leiothrichidae	Passeriformes	Least concern

52. Yellow billed Babbler	<i>Turdoides affinis</i> (Jerdon, 1845)	Leiothrichidae	Passeriformes	Least concern
53. Pale billed flowerpecker	<i>Dicaeum erythrorhynchos</i> (Latham, 1790)	Dicaeidae	Passeriformes	Least concern
54. Red vented Bulbul	<i>Pycnonotus cafer</i> (Linnaeus, 1766)	Pycnonotidae	Passeriformes	Least concern
55. Red rumped Swallow	<i>Cecropis daurica</i> (Laxmann, 1769)	Hirundinidae	Passeriformes	Least concern
56. Common Tailorbird	<i>Orthotomus sutorius</i> (Pennant, 1769)	Cisticolidae	Passeriformes	Least concern
57. White Wagtail	<i>Motacilla alba</i> Linnaeus, 1758	Motacillidae	Passeriformes	Least concern
58. Yellow Wagtail	<i>Motacilla flava</i> Linnaeus, 1758	Motacillidae	Passeriformes	Least concern
59. Grey Wagtail	<i>Motacilla cinerea</i> Tunstall, 1771	Motacillidae	Passeriformes	Least concern
60. Forest Wagtail	<i>Dendronanthus indicus</i> (J.F. Gmelin, 1789)	Motacillidae	Passeriformes	Least concern
61. Olive backed Pipit	<i>Anthus hodgsoni</i> (Richmond, 1907)	Motacillidae	Passeriformes	Least concern
62. Tree Pipit	<i>Anthus trivialis</i> (Linnaeus, 1758)	Motacillidae	Passeriformes	Least concern
63. Paddyfield Pipit	<i>Anthus rufulus</i> Vieillot, 1818	Motacillidae	Passeriformes	Least concern
64. Streaked weaver	<i>Ploceus manyar</i> (Horsfield, 1821)	Ploceidae	Passeriformes	Least concern
65. Ashy Drongo	<i>Dicrurus leucophaeus</i> Vieillot, 1817	Dicruridae	Passeriformes	Least concern
66. Black Drongo	<i>Dicrurus macrocercus</i> Vieillot, 1817	Dicruridae	Passeriformes	Least concern
67. Bronzed Drongo	<i>Dicrurus aeneus</i> Vieillot, 1817	Dicruridae	Passeriformes	Least concern
68. Bank Myna	<i>Acridotheres ginginianus</i> (Latham, 1790)	Sturnidae	Passeriformes	Least concern
69. Common Myna	<i>Acridotheres tristis</i> (Linnaeus, 1766)	Sturnidae	Passeriformes	Least concern
70. Jungle Myna	<i>Acridotheres fuscus</i> (Wagler, 1827)	Sturnidae	Passeriformes	Least concern
71. Chestnut Tailed Starling	<i>Sturnia malabarica</i> (J.F. Gmelin, 1789)	Sturnidae	Passeriformes	Least concern
72. Asian Pied Starling	<i>Gracupica contra</i> (Linnaeus, 1758)	Sturnidae	Passeriformes	Least concern
73. Indian Robin	<i>Saxicolodius fulicatus</i> (Linnaeus, 1766)	Muscicapidae	Passeriformes	Least concern
74. Oriental Magpie Robin	<i>Copsychus saularis</i> (Linnaeus, 1758)	Muscicapidae	Passeriformes	Least concern
75. Verditer Flycatcher	<i>Eumyias thalassinus</i> (Swainson, 1838)	Muscicapidae	Passeriformes	Least concern
76. Asian Brown	<i>Muscicapa dauurica</i> Pallas, 1811	Muscicapidae	Passeriformes	Least

Flycatcher				concern
77. Dark sided Flycatcher	<i>Muscicapa sibirica</i> J.F. Gmelin, 1789	Muscicapidae	Passeriformes	Least concern
78. Red throated Flycatcher	<i>Ficedula albicilla</i> (Pallas, 1811)	Muscicapidae	Passeriformes	Least concern
79. Orange headed thrush	<i>Geokichla citrina</i> (Latham, 1790)	Turdidae	Passeriformes	Least concern
80. Great tit	<i>Parus cinereus</i> Vieillot, 1818	Paridae	Passeriformes	Least concern
81. Open billed Stork	<i>Anastomus oscitans</i> ( Boddaert, 1783)	Ciconiidae	Pelecaniformes	Least concern
82. Little Cormorant	<i>Microcarbo niger</i> (Vieillot, 1817)	Phalacrocoraci dae	Pelecaniformes	Least concern
83. Indian Cormorant	<i>Phalacrocorax fuscicollis</i> Stephens, 1826	Phalacrocoraci dae	Pelecaniformes	Least concern
84. Great Cormorant	<i>Phalacrocorax carbo</i> (Linnaeus, 1758)	Phalacrocoraci dae	Pelecaniformes	Least concern
85. Indian Pond Heron	<i>Ardeola grayii</i> (Sykes,1832)	Ardeidae	Pelecaniformes	Least concern
86. Black crowned Night Heron	<i>Nycticorax nycticorax</i> (Linnaeus, 1758)	Ardeidae	Pelecaniformes	Least concern
87. Grey Heron	<i>Ardea cinerea</i> Linnaeus, 1758	Ardeidae	Pelecaniformes	Least concern
88. Little Egret	<i>Egretta garzetta</i> (Linnaeus, 1766)	Ardeidae	Pelecaniformes	Least concern
89. Purple Heron	<i>Ardea purpurea</i> Linnaeus, 1766	Ardeidae	Pelecaniformes	Least concern
90. Cattle Egret	<i>Bubulcus ibis</i> (Linnaeus,1758)	Ardeidae	Pelecaniformes	Least concern
91. Great Egret	<i>Ardea alba</i> Linnaeus, 1758	Ardeidae	Pelecaniformes	Least concern
92. Intermediate Egret	<i>Ardea intermedia</i> Wagler,1829	Ardeidae	Pelecaniformes	Least concern
93. Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i> (J.F. Gmelin, 1789)	Ardeidae	Pelecaniformes	Least concern
94. Yellow Bittern	<i>Ixobrychus sinensis</i> (J.F. Gmelin, 1789)	Ardeidae	Pelecaniformes	Least concern
95. Black Bittern	<i>Ixobrychus flavicollis</i> (Latham, 1790)	Ardeidae	Pelecaniformes	Least concern
96. Greater Flameback	<i>Chrysocolaptes guttacristatus</i> (Tickell,1833)	Picidae	Piciformes	Least concern
97. Black rumped Flameback	<i>Dinopium benghalense</i> ( Linnaeus, 1758)	Picidae	Piciformes	Least concern
98. Rufous Woodpecker	<i>Micropternus brachyurus</i> (Vieillot, 1818)	Picidae	Piciformes	Least concern
99. Streak throated Woodpecker	<i>Picus xanthopygaeus</i> (J.E. & G.R. Gray, 1846)	Picidae	Piciformes	Least concern
100. Fulvous breasted	<i>Dendrocopos macei</i> (Vieillot,1818)	Picidae	Piciformes	Least concern

woodpecker				
<b>101.</b> Eurasian Wryneck	<i>Jynx torquilla</i> Linnaeus, 1758	Picidae	Piciformes	Least concern
<b>102.</b> Coppersmith Barbet	<i>Psilopogon haemacephalus</i> (Statius Muller, 1776)	Ramphastidae	Piciformes	Least concern
<b>103.</b> Blue throated Barbet	<i>Psilopogon asiaticus</i> (Latham, 1790)	Ramphastidae	Piciformes	Least concern
<b>104.</b> Lineated Barbet	<i>Psilopogon lineatus</i> (Vieillot, 1816)	Ramphastidae	Piciformes	Least concern
<b>105.</b> Rose-ringed Parakeet	<i>Psittacula krameri</i> (Scopoli, 1769)	Psittaculidae	Psittaciformes	Least concern
<b>106.</b> Alexandrine Parakeet	<i>Psittacula eupatria</i> (Linnaeus, 1766)	Psittaculidae	Psittaciformes	Near Threatened
<b>107.</b> Barn Owl	<i>Tyto alba</i> (Scopoli, 1769)	Tytonidae	Strigiformes	Least concern
<b>108.</b> Spotted Owlet	<i>Athene brama</i> (Temminck, 1821)	Strigidae	Strigiformes	Least concern

The family richness of orders was estimated (Fig. 6). Order Passeriformes represented the highest richness with 21 families (51.21%) followed by Charadriiformes with 5 families (12.19%) and Pelecaniformes with 3 families (7.31%). Avian orders Strigiformes, Coraciiformes, Piciformes consisted 2 families each (4.87% each) of the total bird family. Orders Accipitriformes, Anseriformes, Columbiformes, Cuculiformes, Gruiformes and Psittaciformes consisted 1 family each (2.43% each) of the total family surveyed. The contribution of percentage of species in different orders of avifauna (Fig. 7) showed that Passeriformes was the most dominant order comprising 44.44% of total species followed by Pelecaniformes (13.88%), Charadriiformes (11.11%), Piciformes (8.33%), Coraciiformes (5.55%), Cuculiformes (4.62%), Columbiformes (3.70%), Gruiformes (2.77%), Strigiformes, Psittaciformes, (1.85% each) , Anseriformes and Accipitriformes (0.92% each). The percentage of species in different families of avifauna was also analysed (Fig. 8). The result showed that out of 41 families, Ardeidae family (11 species) dominated the avifauna followed by Motacillidae (7 species), Muscicapidae, Picidae (6species each), Scolopacidae,



*Dendrocitta vagabunda*

*Dicrurus leucophaeus*

*Ardeola grayii*

*Picus xanthopygaeus*

*Turdoides striata*



*Streptopelia decaocto*

*Centropus sinensis*

*Treron phoenicopterus*

*Phalacrocorax fuscicollis*

*Oriolus xanthornus*



*Egretta garzetta*

*Milvus migrans*

*Merops orientalis*

*Eudynamys scolopaceus*

*Streptopelia chinensis*

**Fig. 3.** Different species of birds documented during survey from Nature Park, Kolkata, West Bengal, India.



*Leptocoma zeylonica*

*Bubulcus ibis*

*Dicrurus leucophaeus*

*Halcyon smyrnensis*

*Pelargopsis capensis,*



*Alcedo atthis*

*Gracupica cphntra*

*Orthotomus sutorius*

*Turdoides affinis*

*Copsychus saulari*



*Chrysocolaptes guttaeristatus*

*Pycnonotus cafer*

*Geokichla citrina*

*Amaurornis phoenicurus*

*Dendrocopos macei.*

**Fig. 4.** Different species of birds documented during survey from Nature Park, Kolkata, West Bengal, India.



*Anastomus oscitans* in nest

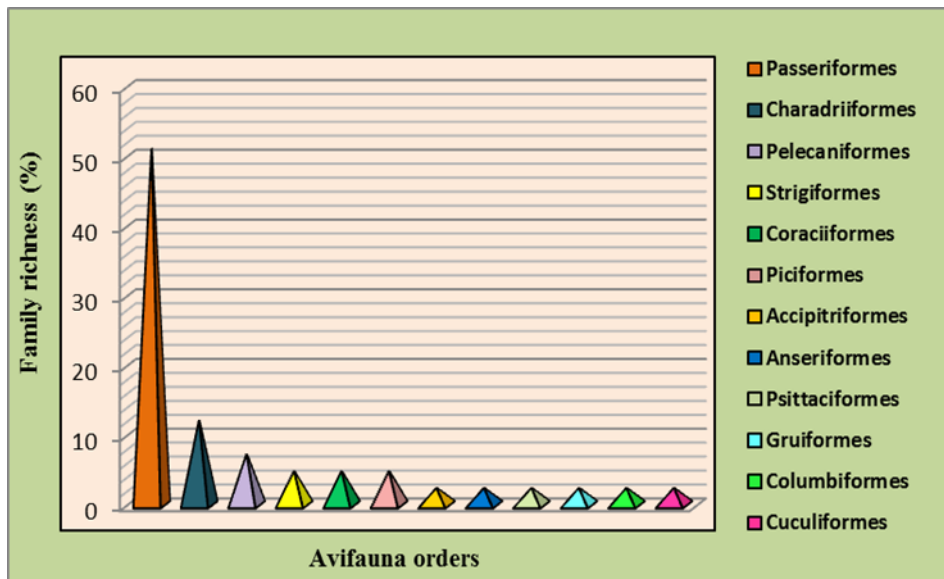


Cormorant habitat

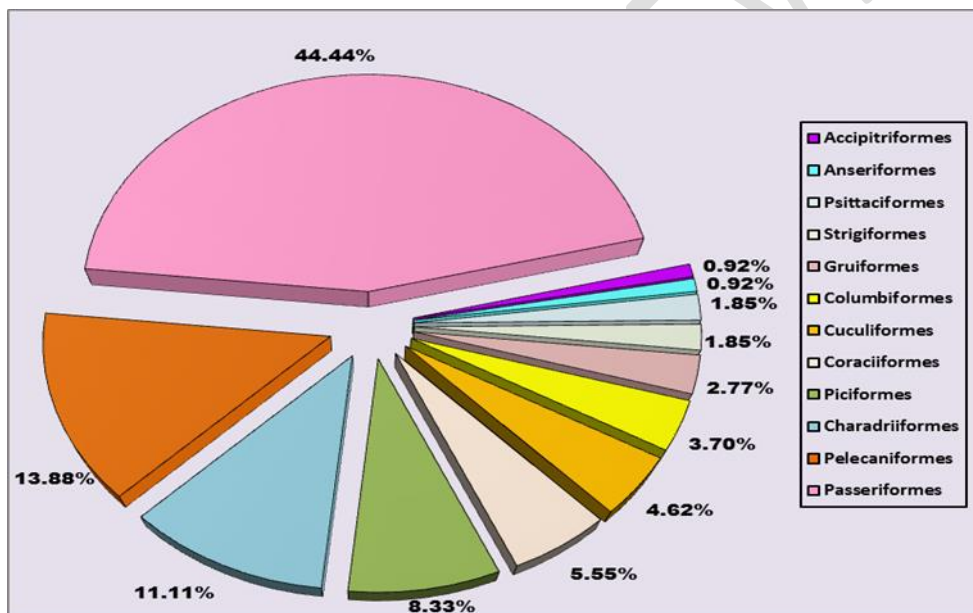


Bird nests on trees

**Fig. 5.** Habitats with nests of some bird species



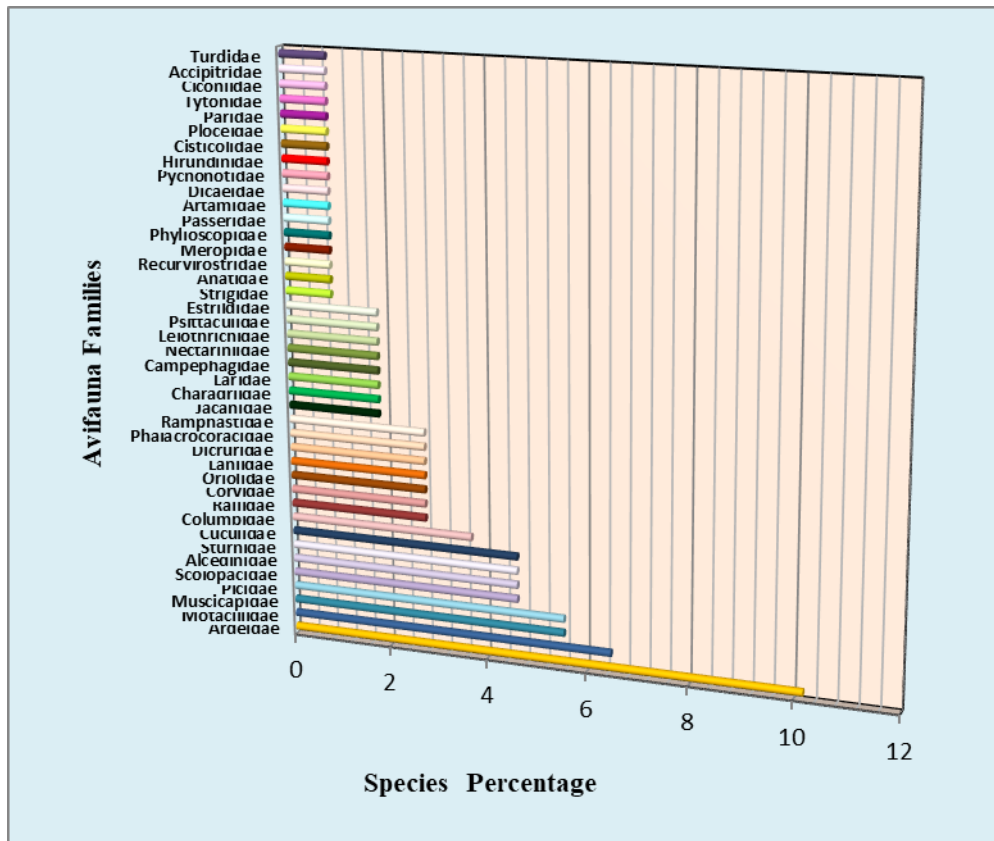
**Fig. 6.** Family richness of avifauna orders in Nature Park



**Fig. 7.** Percentage of species composition under different avian orders in Nature Park

Alcedinidae, Sturnidae, Cuculidae (5 species each), Columbidae (4 species), Rallidae, Corvidae, Oriolidae, Laniidae, Dicruridae, Phalacrocoracidae, Ramphastidae (3 species each), Jacanidae, Charadriidae, Laridae, Campephagidae, Nectariniidae, Estrildidae, Leiothrichidae, Psittaculidae (2 species each), Strigidae, Anatidae, Recurvirostridae, Meropidae, Phylloscopidae, Passeridae, Artamidae, Dicaeidae, Pycnonotidae, Hirundinidae, Cisticolidae, Ploceidae, Paridae, Tytonidae, Ciconiidae, Accipitridae, Turdidae (1 species each). The

maximum numbers of bird species were seen in the genus *Ardea*. Of the total bird species recorded, River Tern (*Sterna aurantia*) was Vulnerable and Alexandrine Parakeet (*Psittacula eupatria*) was near threatened according to IUCN status. Rest of the bird species were least concern.



**Fig. 8.** Percentage of species in different avifauna families in Nature Park

#### 4. CONCLUSION

Ornithological surveys provide necessary information for basic and applied ecology. It is also important for identifying priority areas for conservation. The present study was an attempt to reveal preliminary record of avifauna in Nature Park that has not been explored previously. Nature Park supports significant number of avifauna being a part of urban Kolkata. The diversity of passerine (Order Passeriformes) was higher in Nature Park with 48 species as compared to non -passerine (60 species). Ecologically suitable and healthy environment of

Nature Park made it possible. Of the total bird species recorded in this study, 1 species was vulnerable and 1 species was near threatened indicating their conservation significance. So there is a need to protect the ecosystem and conserve the diversity of the study area. Further, in order to attract more avifauna, plantation of all seasonal variety of flowering and fruiting plants along with regular monitoring is very important.

## **RERERENCES**

1. Fimbel RA, Robinson J, Grajal A, editors. The cutting edge: conserving wildlife in logged tropical forests. Columbia University Press; 2001 Dec 31.
2. Nason I. Discovering birds. Pisces publication. 1992:67-9.
3. Pragasan LA, Madesh M. Species diversity and abundance of birds on Bharathiar University Campus, Tamil Nadu, India. *Journal of Threatened Taxa*. 2018 May 26; 10(6):11725-31. DOI: 10.11609/jott.2965.10.6.11725-11731.
4. Grewal B, Monga S, Wright G. Birds of the Indian subcontinent. Guidebook Company; 1995.
5. Grimmett R, Inskipp T. Birds of northern India. Bloomsbury Publishing; 2018 Sep 20.
6. Bibby CJ. Bird census techniques. Elsevier; 2000 Aug 15.
7. Grimmett R, Inskipp C, Inskipp T. Birds of the Indian Subcontinent: India, Pakistan, Sri Lanka, Nepal, Bhutan, Bangladesh and the Maldives. Bloomsbury Publishing; 2016 Oct 20.
8. Ali S. The book of Indian birds. (No Title). 1996.
9. Howard R, Moore A, Dickinson EC. The Howard and Moore complete checklist of the birds of the world. 2003.
10. Dickinson EC, Christidis L. The Howard and Moore complete checklist of the birds of the World. Vol. 2. Passerines. Eastbourne: 1-752.