Avifaunal Diversity of Bisalpur Dam and nearby Area of Tehsil Deoli, District Tonk (Rajasthan), India

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Abstract: Avifauna is the term used for the birds of a particular region, habitat, or geological period. Study area covers foothills of beautiful Aravali ranges. It is one of the world’s oldest mountain ranges. Bisalpur Dam is avifaunal diversity rich area situated in district Tonk, Rajasthan. Deoli is 165 Kms away from Jaipur, 85 Kms from Kota and 145 Kms from Ajmer. The dam was constructed between two mountains on Banas river for the purpose of drinking water and irrigation. This dam attracts human beings as well as birds also. Nesting spots are easy to find along the bank of Banas river. Visual encounter method and different methods were used for the study purpose. Identification was done with the help of field guide books. Total 176 species of birds belonging to different family were spotted in the study area.

Keyworss: Avifauna, bisalpur, diversity, terrestrial and water birds

I. INTRODUCTION

Birds are excellent indicators of water quality and measures of biodiversity. The present study was conducted to understand the diversity measures of avifauna in and nearby places of Bisalpura dam.

A. Study Area

Study area is Bisalpur Dam and nearby area. Bisalpur dam is constructed on Banas river near tehsil Deoli, district Tonk, Rajasthan, India (Figure 1-4). The coordinates are 25°55'20.56" N & 75°27'20.51" E with an elevation of 1081 feet. The height of dam is 130 feet and length is 1883 feet; gross storage capacity is 1.10 KM³. Reservoir area is 218.36 KM². Effective storage capacity is 1.04 KM³. This Dam was completed in 1999. It supplies irrigation and drinking water for many towns of Rajasthan. Bisalpur dam and nearby area is rich in Avifaunal Diversity.

Figure 1: Study area in map
II. MATERIALS & METHODOLOGY:

A. Materials
Different apparatus i.e. digital camera (Canon SX10, Canon 1200D), binoculars, field guide and observation sheets were used for the present study.

B. Survey
Regular surveys were made at different time interval between 05:00 to 22:00 Hrs. The study was based on the survey of the area. Quantitative avifauna data was collected in the point count survey and combined with distance estimation with the help of binocular and camera. Bisalpur Dam and nearby area was selected as site for observation of avifauna. These areas are rich in avifaunal diversity. Periodical studies were made to know about the status of birds. Direct count methods were adopted from Bibbey et al. [1] and Javad and Kaul [2] for recording and analysis. Birds were identified with the help of field guide [3,4,5,6,7,8]. Visual encounter method was also used. Most of the birds species were spotted during the winter season. Regular surveys were made near the breeding grounds. Representative cases were photographed from different angles in the nature. Morphometric observations were also made for the taxonomic identification and compared with the standard diagnostic keys. Birds were divided in three categories MC-most common, C-common, R-rare according to the number of individuals. We also described the IUCN status of the birds.
III. RESULT & DISCUSSION

Total 176 species of birds belonging to different family were present in the study area. Avifaunal diversity was divided into two categories one is water birds (Table 1) and another is terrestrial birds (Table 2) found near water bodies.

### Table 1: List of water birds spotted in study area

| S. No. | Scientific name | Common name | IUCN status | Migratory status | Population trend |
|--------|-----------------|-------------|-------------|------------------|------------------|
| 1      | Anser indicus, (Latham, 1790) | Bar-headed goose | Least Concern | Winter Visitor | Decreasing |
| 2      | Anas acuta, (Linnaeus, 1758) | Northern Pintail | Least Concern | Winter Visitor | Decreasing |
| 3      | Anas clypeata, (Linnaeus, 1758) | Northern shoveler | Least Concern | Winter Visitor | Decreasing |
| 4      | Anas crecca, (Linnaeus, 1758) | Eurasian teal/ Common Teal | Least Concern | Winter Visitor | Decreasing |
| 5      | Anas penelope, (Linnaeus, 1758) | Eurasian wigeon | Least Concern | Winter Visitor | Decreasing |
| 6      | Anas poecilorhyncha, (Forster, 1781) | Indian Spot-billed duck | Least Concern | Resident | Decreasing |
| 7      | Anas querquedula (Linnaeus, 1758) | Garganey | Least Concern | Winter Visitor | Decreasing |
| 8      | Anas strepera (Linnaeus, 1758) | Gadwall | Least Concern | Winter Visitor | Decreasing |
| 9      | Aythya ferina (Linnaeus, 1758) | Common Pochard | Vulnerable | Winter Visitor | Decreasing |
| 10     | Aythya fuligula, (Linnaeus, 1758) | Tufted duck | Least Concern | Winter Visitor | Stable |
| 11     | Aythya nyroca, (Güldenstädt, 1770) | Ferruginous pochard/ Ferruginous Duck | Near Threatened | Winter Visitor | Decreasing |
| 12     | Sarkidiornis melanotos, (Pennant, 1769) | Comb duck/ knob-billed duck | Least Concern | Resident | Decreasing |
| 13     | Tadorna ferruginea, (Pallas, 1764) | Ruddy shelduck | Least Concern | Winter Visitor | Stable |

### Ardeidae

| S. No. | Scientific name | Common name | IUCN status | Migratory status | Population trend |
|--------|-----------------|-------------|-------------|------------------|------------------|
| 14     | Ardea alba, (Linnaeus, 1758) | Great Egret/ Great white Egret | Least Concern | Resident | Stable |
| 15     | Ardea cinerea, (Linnaeus, 1758) | Grey heron | Least Concern | Resident | Stable |
| 16     | Ardea purpurea, (Linnaeus, 1766) | Purple heron | Least Concern | Resident | Decreasing |
| 17     | Ardeo a grayii, (Sykes, 1832) | Indian Pond Heron | Least Concern | Resident | Increasing |
| 18     | Bubulcus ibis (Linnaeus, 1758) | Cattle Egret | Least Concern | Resident | Increasing |
| 19     | Butorides Striatus (Linnaeus, 1758) | Striated Heron | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Winter Visitor | Unknown |
| 20     | Egretta garzetta, (Linnaeus, 1766) | Little Egret | Least Concern | Resident | Increasing |
|   | Scientific Name                          | Common Name                  | Conservation Status | Habitat          | Trend    |
|---|----------------------------------------|------------------------------|---------------------|------------------|----------|
| 21| Mesophoyx intermedia (Wagler, 1827)    | Intermediate Egret          | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Resident | Unknown |
| 22| Nycticorax nycticorax, (Linnaeus, 1758)| Black-crowned night heron   | Least Concern       | Resident         | Decreasing|
| 23| Ceryle rudis (Linnaeus 1758)           | Pied Kingfisher             | Least Concern       | Winter Visitor   | Decreasing|
| 24| Charadrius dubius (Scopoli, 1786)      | Little ringed plover        | Least Concern       | Resident         | Stable   |
| 25| Vanellus indicus (Boddaert, 1783)      | Red-wattled lapwing         | Least Concern       | Resident         | Increasing|
| 26| Vanellus malabaricus (Boddaert, 1783) | Yellow-wattled lapwing      | Least Concern       | Resident         | Stable   |
| 27| Anastomus oscitans (Boddaert, 1783)   | Asian Open bill             | Least Concern       | Winter Visitor   | Stable   |
| 28| Mycteria leucocephala (Pennant, 1769)  | Painted stork               | Near Threatened     | winter Visitor   | Decreasing|
| 29| Hydrophasianus chirurgus (Scopoli, 1786)| Pheasant-tailed jacana      | Least Concern       | Resident         | Decreasing|
| 30| Chroicocephalus brunniceps (Jerdon, 1840)| Brown Headed Gull          | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Winter Visitor | Unknown |
| 31| Chroicocephalus ridibundus (Linnaeus, 1766)| Black Headed gull          | Least Concern       | Winter Visitor   | Decreasing|
| 32| Pelecanus onocrotalus (Linnaeus, 1758)| Great white pelican/ Rosy pelican | Least Concern     | Winter Visitor   | Stable   |
| 33| Pelecanus crispus (Bruch, 1832)       | Dalmatian pelican           | Vulnerable          | Winter Visitor   | Decreasing|
| 34| Phalacrocorax carbo (Linnaeus, 1758)  | Great Cormorant             | Least Concern       | Resident         | Increasing|
| 35| Phalacrocorax fuscicolis (Stephens, 1826)| Indian Cormorant            | Least Concern       | Resident         | Stable   |
| 36| Phalacrocorax niger (Vieillot, 1817)  | Little Cormorant            | Least Concern       | Resident         | Stable   |
| 37| Phoenicopterus roseus (Linnaeus, 1758)| Greater Flamingo           | Least Concern       | Passage Visitor  | Decreasing|
| 38| Tachybaptus ruficollis (Pallas, 1764) | Little grebe                | Least Concern       | Resident         | Decreasing|

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|   | Scientific Name | Common Name | Threat Status | Life Cycle | Population Status |
|---|-----------------|-------------|---------------|------------|-------------------|
| 39 | Amaurornis phoenicurus (Pennant, 1769) | White-breasted waterhen | Least Concern | Resident | Stable |
| 40 | Fulica atra (Linnaeus, 1758) | Common Coot / Eurasian coot | Least Concern | Resident | Decreasing |
| 41 | Gallinula chloropus (Linnaeus, 1758) | Common moorhen | Least Concern | Resident | Stable |
| 42 | Porphyrio Porphyrio (Linnaeus, 1758) | Purple swamp hen | Least Concern | Resident | Increasing |
| 43 | Himantopus himantopus (Linnaeus, 1758) | Black-winged Stilt | Least Concern | Resident | Increasing |
| 44 | Recurvirostra avosetta (Linnaeus, 1758) | Pied avocet | Least Concern | Winter Visitor | Stable |
| 45 | Rostratula benghalensis (Linnaeus, 1758) | Greater Painted-snipe | Least Concern | Winter Visitor | Decreasing |
| 46 | Actitis hypoleucus (Linnaeus, 1758) | Common sandpiper | Least Concern | Winter Visitor | Decreasing |
| 47 | Calidris minuta (Leisler, 1812) | Little Stint | Least Concern | Winter Visitor | Decreasing |
| 48 | Calidris temminckii (Leisler, 1812) | Temminck’s Stint | Least Concern | Winter Visitor | Unknown |
| 49 | Limosa limosa (Linnaeus, 1758) | Black-tailed godwit | Near Threatened | Winter Visitor | Decreasing |
| 50 | Philomachus pugnax (Linnaeus, 1758) | Ruff | Least Concern | Winter Visitor | Decreasing |
| 51 | Tringa erythropus (Pallas, 1764) | Spotted redshank | Least Concern | Winter Visitor | Stable |
| 52 | Tringa glareola (Linnaeus, 1758) | Wood sandpiper | Least Concern | Winter Visitor | Stable |
| 53 | Tringa nebularia (Gunnerus, 1767) | Common greenshank | Least Concern | Winter Visitor | Stable |
| 54 | Tringa ochropus (Linnaeus, 1758) | Green sandpiper | Least Concern | Winter Visitor | Stable |
| 55 | Tringa tetanus (Linnaeus, 1758) | Common redshank | Least Concern | Winter Visitor | Stable |
| 56 | Chlidonias hybridus, (Pallas, 1811) | Whiskered tern | Least Concern | Winter Visitor | Stable |
| 57 | Sterna aurantia (Gray, JE, 1831) | Indian River tern / River tern | Near Threatened | Resident | Decreasing |
| 58 | Platalea leucorodia (Linnaeus, 1758) | Eurasian spoonbill / Common spoonbill | Least Concern | Winter Visitor | Stable |
| 59 | Pseudibis papillosa (Temminck, 1824) | Red-naped Ibis / Black Ibis | Least Concern | Winter Visitor | Decreasing |
| 60 | Threskiornis melanocephalus (Latham, 1790) | Black-headed ibis / Oriental white ibis | Near Threatened | Resident | Decreasing |
Table 2: List of terrestrial birds spotted in study area

| S. No. | Scientific name | Common name | IUCN status     | Migratory status | Population trend |
|-------|----------------|-------------|-----------------|------------------|------------------|
| 1     | Accipitridae   |             |                 |                  |                  |
| 2     | Accipiter badius (Gmelin, 1788) | Shikra | Least Concern | Resident | Decreasing |
| 3     | Aquila nipalensis (Hodgson, 1833) | Steppe Eagle | Endangered | Resident | Decreasing |
| 4     | Buteo Rufinus (Cretzschmar, 1829) | Long Legged Buzzard | Least Concern | Resident | Stable |
| 5     | Circaetus gallicus (Gmelin, 1788) | Short-toed Snake-Eagle | Least Concern | Resident | Stable |
| 6     | Circus aeruginosus (Linnaeus, 1758) | Eurasian Marsh Harrier | Least Concern | Winter visitor | Increasing |
| 7     | Circus pygargus (Linnaeus, 1758) | Montagu’s Harrier | Least Concern | Winter Visitor | Decreasing |
| 8     | Elanus caeruleus (Desfontaines, 1789) | Black-Winged Kite | Least Concern | Resident | Stable |
| 9     | Milvus migrans (Boddaert, 1763) | Black Kite | Least Concern | Resident | Stable |
| 10    | Neophron percnopterus (Linnaeus, 1758) | Egyptian Vulture | Endangered | Resident | Decreasing |
| 11    | Alaudidae      |             |                 |                  |                  |
| 12    | Eremopterix grisea (Scopoli, 1786) | Ashy-crowned Sparrow-Lark | Least concern | Resident | Stable |
| 13    | Galerida cristata (Linnaeus, 1758) | Crested Lark | Least concern | Resident | Stable |
| 14    | Mirafra cantillans (Blyth, 1845) | Singing Bush-Lark | Least concern | Resident | Decreasing |
| 15    | Mirafra erythrorostra (Blyth, 1845) | Indian Bush-Lark | Least concern | Resident | Stable |
| 16    | Alcedinidae    |             |                 |                  |                  |
| 17    | Alcedo atthis (Linnaeus, 1758) | Common Kingfisher | Least Concern | Resident | Decreasing |
| 18    | Apodidae       |             |                 |                  |                  |
| 19    | Burhinidae     |             |                 |                  |                  |
| 20    | Caprimulgidae  |             |                 |                  |                  |
| 21    | Cisticolidae   |             |                 |                  |                  |
| No. | Scientific Name                                      | Common Name                  | Conservation Status | Habitat       | Notes                      |
|-----|-----------------------------------------------------|------------------------------|---------------------|---------------|----------------------------|
| 22  | Orthotomus sutorius (Pennant, 1769)                | Common Tailorbird            | Least concern       | Resident      | Decreasing                 |
| 23  | Prinia Hodgsonii (Blyth, 1844)                     | Grey Breasted Prinia         | Least concern       | Resident      | Decreasing                 |
| 24  | Prinia inornata (Sykes, 1832)                      | Plain Prinia/ White browed Wren-warbler | Least Concern       | Resident      | Stable                      |
| 25  | Prinia socialis (Sykes, 1832)                      | Ashy Prinia / Ashy wren-warbler | Least concern       | Resident      | Decreasing                 |
|     | Columbidae                                          |                              |                     |               |                            |
| 26  | Columba livia (Gmelin, 1789)                       | Rock Pigeon                  | Least concern       | Resident      | Stable                      |
| 27  | Streptopelia decaocto (Frivaldszky, 1838)          | Eurasian Collared-Dove       | Least concern       | Resident      | Stable                      |
| 28  | Streptopelia senegalensis (Linnaeus, 1766)         | Laughing Dove                | Least concern       | Resident      | Stable                      |
| 29  | Streptopelia tranquebarica (Hermann, 1804)         | Red Collared-Dove            | Least concern       | Resident      | Stable                      |
| 30  | Treron phoenicoptera (Latham, 1790)                | Yellow-Footed Green-Pigeon   | Least concern       | Winter visitor| Decreasing                 |
|     | Coraciida                                           |                              |                     |               |                            |
| 31  | Coracias benghalensis (Linnaeus, 1758)             | Indian Roller                | Least concern       | Resident      | Stable                      |
| 32  | Coracias garrulus (Linnaeus, 1758)                 | European Roller              | Least Concern       | Passage Visitor| Decreases                  |
|     | Corvidae                                            |                              |                     |               |                            |
| 33  | Corvus macrorhynchos (Wagler, 1827)                | Jungle Crow                  | Least concern       | Resident      | Decreasing                 |
| 34  | Corvus splendens (Vieillot, 1817)                  | House Crow                   | Least concern       | Resident      | Increasing                 |
| 35  | Dendrocitta vagabunda (Latham, 1790)               | Rufous Treepie               | Least concern       | Resident      | Stable                      |
|     | Cuculidae                                           |                              |                     |               |                            |
| 36  | Centropus sinensis ( Stephens, 1815)               | Greater Coucal               | Least concern       | Resident      | Stable                      |
| 37  | Clamator jacobinus (Boddart, 1783)                 | Jacobin cuckoo/ Pied cuckoo/ Pied crested cuckoo | Least Concern       | Summer Visitor| Stable                      |
| 38  | Eudynamys scolopacea (Linnaeus, 1758)              | Asian Koel                   | Least concern       | Resident      | Stable                      |
| 39  | Hierococcyx varius (Vahl, 1797)                    | Common hawk-cuckoo/ Brainfever Bird | Least concern       | Resident      | Stable                      |
| 40  | Phaenicophaeus leschenaultia (Lesson, 1830)        | Sirkeer Malkoha              | Least concern       | Resident      | Stable                      |
|     | Dicrurida                                           |                              |                     |               |                            |
| 41  | Dicurus caerulescens (Linnaeus, 1758)              | White bellied drongo         | Least Concern       | Resident      | Unknown                     |
| 42  | Dicurus macrocercus (Vieillot, 1817)               | Black Drongo                 | Least concern       | Resident      | Increasing                 |
|     | Emberizida                                          |                              |                     |               |                            |
| 43  | Melophostathami (Gray, 1831)                       | Crested Bunting              | Least concern       | Resident      | Stable                      |
| 44  | Emberiza bruniceps (Brandt, 1841)                  | Red headed bunting           | Least Concern       | Winter Visitor| Stable                      |

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|   | Scientific Name                                      | Common Name                  | Conservation Status | Life Cycle | Population Status |
|---|-----------------------------------------------------|------------------------------|---------------------|------------|-------------------|
| 45 | Lonchura malabarica (Linnaeus, 1758)                | Indian Silver bill           | Least concern       | Resident   | stable            |
|   | **Falconidae**                                      |                              |                     |            |                   |
| 46 | Falco tinnunculus (Linnaeus, 1758)                  | Common Kestrel               | Least Concern       | Winter visitor | Decreasing       |
|   | **Glaerolidae**                                     |                              |                     |            |                   |
| 47 | Cursorius coronandus (Gmelin, 1789)                 | Indian Courser               | Least concern       | Resident   | Decreasing       |
|    | **Halcyonidae**                                    |                              |                     |            |                   |
| 48 | Glareola lacteal (Temminck, 1820)                  | Little Pratincole/Small Indian Pratincole | Least Concern | Winter Visitor | unknown          |
| 49 | Halcyon smyrnensis (Olitiari, 1758)                | white-throated kingfisher    | Least Concern       | Resident   | Decreasing       |
|   | **Hirudinidae**                                     |                              |                     |            |                   |
| 50 | Cecropis daurica (Laxmann, 1769)                   | Red Rumped swallow           | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Resident | Unknown          |
| 51 | Hirundo rustica (Linnaeus, 1758)                   | Barn Swallow                 | Least Concern       | Resident   | Decreasing       |
| 52 | Hirundo smithii (Leach, 1818)                     | Wire-tailed Swallow          | Least Concern       | Resident   | Increasing       |
| 53 | Petrochelidon fluvicola (Blyth, 1855)              | Streak-throated-swallow      | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Resident | Unknown          |
| 54 | Ptenonoprogne concolor (Sykes, 1832)               | Dusky crag martin            | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Resident | Unknown          |
|   | **Laniidae**                                        |                              |                     |            |                   |
| 55 | Lanius meridionalis (Temminch, 1820)               | Southern Grey Shrike         | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Resident | Stable           |
| 56 | Lanius schach (Linnaeus, 1758)                     | Long tailed shrike/Rufous-backed Shrike | Least concern  | Resident | Stable           |
| 57 | Lanius vittatus (Valenciennes, 1826)               | Bay-backed Shrike            | Least concern       | Resident   | stable            |
|   | **Leiothrichidae**                                 |                              |                     |            |                   |
| 58 | Turdoides caudatus (Dumont, 1823)                  | Common Babbler               | Least concern       | Resident   | Stable            |
| 59 | Turdoides malcolmii (Sykes, 1832)                  | Large Grey Babbler           | Least concern       | Resident   | Stable            |
| 60 | Turdoides striatus (Dumont, 1823)                  | Jungle Babbler               | Least concern       | Resident   | Stable            |
|   | **Megalaimidae**                                   |                              |                     |            |                   |
| 61 | Megalaima haemacephala (Philipp Ludwig Stattius)   | Coppersmith Barbet           | Least concern       | Resident   | Decreasing       |
|   | Family | Species Name | Common Name | Conservation Status | Location | Abundance |
|---|--------|--------------|-------------|---------------------|----------|-----------|
|   | Meropidae | Merops orientalis (Latham, 1801) | Green Bee-eater | Least concern | Resident | Increasing |
| 62 | Merops persicus (Pallas, 1773) | Blue-Cheeked Bee-eater | Least concern | Summer Visitor | Decreasing |
| 63 | Merops philippinus (Linnaeus, 1766) | Blue-Tailed-bee-eater | Least Concern | Resident | Stable |
|   | Monarchidae | Terpsiphone paradise (Linnaeus, 1758) | Indian Paradise flycatcher/Asian Paradise flycatcher | Least Concern | Summer Visitor | Stable |
| 65 | Motacillidae | Anthus rufulus (Vieillot, 1818) | Paddyfield pipit/Oriental pipit | Least Concern | Resident | Stable |
| 66 | Motacilla alba (Linnaeus, 1758) | White Wagtail | Least Concern | Resident | Stable |
| 67 | Motacilla cinerea (Turnall, 1771) | Grey wagtail | Least concern | Resident | Stable |
| 68 | Motacilla Citreola (Pallas, 1776) | Citrine wagtail | Least concern | Resident | Stable |
| 69 | Motacilla flava (Linnaeus, 1758) | Yellow wagtail | Least concern | Resident | Decreasing |
| 70 | Motacilla maderaspatensis (Gmelin, 1789) | White-browed wagtail | This taxon has not yet been assessed for the IUCN Red List, but is in the Catalogue of Life | Resident | Unknown |
| 71 | Muscicapidae | Cercomela fusca (Blyth, 1851) | Brown rock Chat | Least concern | Resident | Stable |
| 72 | Copsychus saularis (Linnaeus, 1758) | Oriental Magpie-Robin | Least concern | Resident | Stable |
| 73 | Ficedula parva (Bechstein, 1792) | Red-breasted flycatcher | Least Concern | Winter Visitor | Stable |
| 74 | Luscinia svecica (Linnaeus, 1758) | Blue throat | Least concern | Winter visitor | Stable |
| 75 | Monticola solitarius (Linnaeus, 1758) | Blue Rock-Thrush | Least concern | Winter visitor | Stable |
| 76 | Oenanthe deserti (Temminck, 1829) | Desert wheatear | Least Concern | Winter Visitor | Stable |
| 77 | Oenanthe picata (Blyth, 1847) | Variable Wheatear | Least concern | Winter visitor | Stable |
| 78 | Phoenicurus ochruros (S.G.Gmelin, 1774) | Black redstart | Least Concern | Winter Visitor | Increasing |
| 79 | Saxicola caprata (Linnaeus, 1766) | Pied Bushchat | Least concern | Winter visitor | Stable |
| 80 | Saxicola torquata (Linnaeus, 1766) | Common Stonechat | Least concern | Winter visitor | Stable |
| 81 | Saxicoloides fulicata (Linnaeus, 1776) | Indian Robin | Least concern | Resident | Stable |
| 82 | Nectarinia asiatica (Latham, 1790) | Purple Sunbird | Least concern | Resident | Stable |
| 83 | Oriolus oriolus (Linnaeus, 1758) | Eurasian Golden Oriole | Least concern | Summer Visitor | Stable |
| Order         | Scientific Name                          | Common Name          | Status            | Habitat          | Trend     |
|--------------|------------------------------------------|----------------------|-------------------|------------------|----------|
| Passeridae   | *Passer domesticus* (Linnaeus, 1758)     | House Sparrow        | Least concern     | Resident         | Increasing|
| Phasianidae  | *Francolinus pondicerianus* (Gmelin, 1789) | Grey Francolin       | Least Concern     | Resident         | Stable   |
|               | *Pavo cristatus* (Linnaeus, 1758)        | Indian Peafowl       | Least Concern     | Resident         | Decreasing|
| Phylloscopidae| *Phylloscopus collybita* (Vieillot, 1817) | Common Chiffchaff    | Least concern     | Winter visitor   | Decreasing|
| Picidae      | *Chrysocolaptes festivus* (Boddaert, 1783) | White-naped woodpecker | Least Concern     | Residential      | Stable   |
|               | *Dinopium benghalense* (Linnaeus, 1758)  | Black-rumped Woodpecker | Least concern     | Resident         | Stable   |
|               | *Jynx torquilla* (Linnaeus, 1758)        | Eurasian wryneck     | Least Concern     | Winter Visitor   | Decreasing|
|               | *Picoides nanus* (Vigors, 1832)          | Brown-capped Pygmy Woodpecker | Least concern    | Resident         | Stable   |
| Ploceidae    | *Ploceus philippinus* (Linnaeus, 1766)   | Baya Weaver          | Least concern     | Resident         | Stable   |
| Psittacidae  | *Psittacula cyanocephala* (Linnaeus, 1766) | Plum-headed Parakeet | Least concern     | Winter visitor   | Decreasing|
|               | *Psittacula eupatria* (Linnaeus, 1766)   | Alexandrine Parakeet | Near threatened   | Resident         | Decreasing|
|               | *Psittacula krameri* (Scopoli, 1769)     | Rose_ringed Parakeet | Least concern     | Resident         | Increasing|
| Pteroclidae  | *Pterocles indicus* (Gmelin, 1789)       | Painted sandgrouse   | Least concern     | Resident         | Stable   |
|               | *Pterocles exustus* (Temminck, 1825)     | Chestnut-bellied sandgrouse | Least concern    | Resident         | Stable   |
| Pycnonotidae | *Pycnonotus cafer* (Linnaeus, 1766)      | Red-vented Bulbul    | Least concern     | Resident         | Increasing|
|               | *Pycnonotus leucotis* (Gould, 1836)      | White-eared bulbul   | Least concern     | Resident         | Decreasing|
| Strigidae    | *Asio flammeus* (Pontoppidan, 1763)      | Short-eared Owl      | Least concern     | Winter visitor   | Decreasing|
|               | *Athene brama* (Temminck, 1821)          | Spotted Owlet        | Least concern     | Resident         | Stable   |
|               | *Bubo bubo* (Linnaeus, 1758)             | Eurasian Eagle-Owl   | Least concern     | Resident         | Decreasing|
| Sturnidae    | *Acridotheres gingesianus* (Latham, 1790) | Bank Myna            | Least concern     | Resident         | Increasing|
|               | *Acridotheres tristis* (Linnaeus, 1766)  | Common Myna          | Least concern     | Resident         | Increasing|
|               | *Sturnus contra* (Linnaeus, 1758)        | Asian Pied Starling  | Least concern     | Resident         | Stable   |
|               | *Sturnus pagodarum* (Gmelin, 1789)       | Brahminy Starling    | Least concern     | Resident         | Increasing|
|               | *Sturnus roseus* (Linnaeus, 1758)        | Rosy Starling        | Least concern     | Winter visitor   | Stable   |
|               | *Sturnus vulgaris* (Linnaeus, 1758)      | Common Starling      | Least concern     | Winter visitor   | Decreasing|
The category of water birds included 60 species of birds belonging to different families. Out of which 05 species Aythya nyroca, Mycteria leucocephala, Limosa limosa, Sterna aurantia and Threskiornis melanocephalus are Near Threatened, 02 species Aythya ferina and Pelecanus crispus are Vulnerable, 50 are Least Concern and 03 species “taxon has not yet been assessed for the IUCN Red List, but it is in Catalogue of Life” (Table 3).

Table 3: IUCN status of avian species

| S.No. | IUCN Status    | Water birds | Terrestrial birds | Number of species |
|-------|----------------|-------------|-------------------|------------------|
| 1     | Endangered     | -           | 02                | 02               |
| 2     | Vulnerable     | 02          | -                 | 02               |
| 3     | Near Threatened| 05          | 01                | 06               |
| 4     | Least Concern  | 50          | 108               | 158              |
| 5     | Not Evaluated  | 03          | 05                | 08               |
| Total |                | 60          | 116               | 176              |

According to IUCN Status, 34 species were Winter Visitor and 01 Passage Visitor and 25 were Resident (Table 4). Population trend of 29 species decreased, 20 were Stable and 07 species increased in the study area (Table 5). Population trend of 04 species were Unknown.

Table 4: Migratory status of avian species

| S. No. | Migratory status | Water birds | Terrestrial bird | Number of Species |
|--------|------------------|-------------|------------------|------------------|
| 1      | Resident         | 25          | 86               | 111              |
| 2      | Winter Visitor   | 34          | 25               | 059              |
| 3      | Summer Visitor   | -           | 04               | 04               |
| 4      | Passage Visitor  | 01          | 01               | 02               |
| Total  |                  | 60          | 116              | 176              |
Table 5: Population trend of avian species

| S. No. | Population trend | Water birds | Terrestrial bird | Number of Species |
|--------|------------------|-------------|------------------|------------------|
| 1      | Increases        | 07          | 12               | 019              |
| 2      | Stable           | 20          | 63               | 083              |
| 3      | Decreases        | 29          | 34               | 063              |
| 4      | Unknown          | 04          | 07               | 011              |
| Total  |                  | 60          | 116              | 176              |

In the category of terrestrial birds 116 species belonging to different families were observed in the study area. Out of which 02 species Aquila nipalensis and Neophron percnopterus are endangered and only one species Psittacula eupatria is near threatened. Five species were not yet been assessed for the IUCN Red List, but is in the Catalogue of Life. 108 species were least concern, 86 birds species are Resident. 25 species are Winter Visitor, 04 species Clamator jacobinus, Merops persicus, Terpsiphone paradise and Oriolus oriolus are Summer Visitor and only 01 species Coracias garrulus is Passage Visitor.

Population trend of 34 species decreases, 63 are stable and 12 species increases where as 7 species were unknown. Major threats and reason for decline in population are mining, anthropogenic activities, population growth, resource consumption, climate change and global warming, urbanisation, invasive alien species, over-exploitation of natural resources and environmental degradation.

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