



## Bird abundance of a flood plain wetland of Kashmir Himalayas

Masli Aijaz Ahmad, \* Dr. Imtiyaz Ahmad Bhat

Department of Zoology, Govt Degree College Boys Anantnag, Jammu and Kashmir, India

### Abstract

Wetlands are regarded as fragile ecosystems harbouring rich biodiversity of fauna and flora. Among fauna, birds are considered as most conspicuous group of vertebrates that are used as reliable indicators of ecological health of an ecosystem. The present study was carried out at Chandhara wetland located in South Kashmir of pIndia with an objective of assessing its bird fauna which can serve as first-hand baseline data for assigning conservation value to this important bird habitat. The study conducted during June, 2008 and November, 2008 recorded a total of twenty nine (29) species of birds belonging to fifteen (15) families as noticeable users of this wetland. Main contributors of avifauna belonged to Rallidae, Alcedinidae and Anatidae, each with three species of birds. Thirteen (13) species of birds were observed utilizing resources of wetland during summer of June 2008 whereas sixteen (16) species were noticed foraging in the wetland in November 2008. Based on abundance scale given by Komar and Herrera (1995), avifauna was categorized into Abundant, Locally abundant, Common, Uncommon and Rare species. Birds detected in June 2008 included Moorhen (*Gallinule chloropus*) as lone 'abundant' species. Five species of birds comprising of Whiskered Tern (*Chlidonias hybridus*), Great Reed Warbler (*Acrocephalus arundinaceus*), Rufous backed Shrike (*Lanius schach*), Little Bittern (*Ixobrychus minutus*) and Pond Heron (*Ardeola grayii*) were detected as 'Common locally abundant' species. Birds categorized as 'Common' species included Dabchick/Little Grebe (*Tachybaptus rufficollis*), Small Blue Kingfisher (*Alcedo atthis*), Water rail (*Rallus aquaticus*) and Rudy breasted crane (*Porzana fusca*). Three species of birds comprising of White breasted Kingfisher (*Halcyon smyrnensis*), Pheasant tailed Jacana (*Hydrophasianus chirugus*), and Yellow headed Wagtail (*Motacilla citreola calcarata*), detected in June 2008 were labelled as 'Uncommon'. The avifauna detected in November included Mallard (*Anas platyrhynchos*), Blue Throat (*Erithacus svecicus*), Pond Heron (*Ardeola grayii*) and Pipit (*Anthus novaeseelandiae*) sighted as 'common locally abundant' species. Birds like common Teal (*Anas crecca*), Common Snipe (*Capella gallinago gallinago*), Little Egret (*Egretta garzetta*), Grey Heron (*Ardea cinerea rectirostris*) and Pied Wagtail (*Motacilla alba*) were detected as 'common' species. Largest number of avifaunal species comprising of Gadwall (*Anas strepera*), Pied Kingfisher (*Ceryle rudis*), Small Blue Kingfisher (*Alcedo atthis*), Marsh Harrier (*Circus aeroginosus*), European Lapwing (*Vanellus vanellus*), Great Tit (*Parus major*) and Common Starling (*Sturnus vulgaris*) occurred as 'uncommon' species in November 2008.

**Keywords:** bird, flood plain, Kashmir Himalayas

### Introduction

Wetlands are regarded as highly productive ecosystems (Patole *et al*; 2009) [9] but most threatened habitats (Williams, 1993) [10]. They harbour a rich diversity of flora and fauna. A number of aquatic plants contained in them are used for food, fodder and other economic purposes. Besides these resources, wetlands provide a suitable habitat for a large number of animals including both invertebrates and vertebrates. Among vertebrates, a large number of birds use wetlands as feeding, breeding and overwintering grounds. Currently presence of avifauna have been used as reliable indicators of ecological health of an ecosystem (Bryce *et al*; 2002) [4], as indicators of pollution (Becker, 2003) [3] and as bio-indicators for studying environmental problems (Newton; 1995) [8]. The wetlands are presently experiencing significant bio-ecological alterations due to pollution, siltation, drainage, encroachment, fast urbanization, indiscriminate macrophyte harvesting, denudation of forests, eutrophication (Lehmann and Lachvanne, 1999) [7], erosion of catchment and watershed areas.

### Study area

The study on bird abundance was carried out in a permanent freshwater wetland called Chandhara wetland in June 2008 and November 2008. It is an emergent palustrine type of wetland

(33°, 45', 32 North latitude and 74°, 55', 35 East longitude) located adjacent to a village called Chandhara, at a distance of about thirteen (13) kilometers from Srinagar in Jammu & Kashmir (India). The wetland covers an area of about twenty eight (28) hectares and lies amidst two small karewas. The wetland is fed by a small spring called 'Goonjar Nag' located on its eastern border. It also receives run off from two adjacent karewas and seepage water from an irrigation channel situated at some distance towards its north western side. It is bordered by paddy fields on its northwest and southern sides. As far as history of its formation is concerned, no reliable information was available. However inquiries from elderly villagers revealed that this wetland was a cultivated crop land prior to 1940's, with maize being the principle crop grown over it. The wetland was found to contain five different vegetation zones designated as habitat categories and little open water patches together constituting sixth habitat category named as open water habitat. These habitats include (1) an outer peripheral zone of vegetation comprising of short emergents like *Cyperus difformis*, *Cyperus rotundus*, *Scirpus* species and *Eleocharis* species. It forms about 18% of total area of wetland. (2) Sparganium dominant area comprising about 49% of whole study area, with *Sparganium ramosa* constituting the major hydrophyte. (3) Floating patch covers about 23% of wetland and is formed by

tangled underground rhizomatous parts of *Carex species*. (4) Phragmites dominant zone constitutes about 4% of total wetland area with *Phragmites australis* as dominant emergent plant species. (5) Dry land strip, a narrow strip bisecting the wetland into two portions contributes about 2% of total area of wetland. It bears few isolated Salix trees.

### Methodology

Due to lack of previous information on study site, a preliminary survey of wetland was carried out to identify its avifauna. The birds were identified with the help of identification keys given by Bates and Lowther (1952) [2], S. Ali (1979) [1] and Fleming *et al* (1979) [5]. Relative abundance of birds was estimated on the basis of their frequency of detection at a series of fourteen (14) survey points located around the edge of study area. The survey points were spaced at a distance of about 200 meters from each other. At each survey point, census was carried for ten (10)

minutes duration between 6.00 a.m and 9 a.m on a day with good weather conditions. Birds were detected visually using field binoculars (12/50, super zenith) or aurally using bird vocalization. The data on species of birds identified were recorded in data sheets. The detection frequency percentage of each species of bird was determined from raw data by dividing the number of survey points where a particular species was detected by the total number of survey points established in the study area and then multiplying it by '100'. For defining various categories of abundance, terminology adopted by Komar and Herrera (1995) was followed. The species present at more than 50% of survey points was classified as 'Abundant' and the species found at 20% to 49% of survey points was categorized as 'Locally abundant'. The species detected at 10% to 19% of survey points was termed as 'Common'. The species sighted at 5% to 9% was considered as 'Uncommon'. Species not recorded at any survey/sampling point was classified as 'Rare'.

**Table 1:** List of Avifauna of Chandhara Wetland

| Serial No. | Name of Bird Species      | Scientific Name                     | Family        |
|------------|---------------------------|-------------------------------------|---------------|
| 1.         | Moorhen                   | <i>Gallinule chloropus</i>          | Rallidae      |
| 2.         | Whiskered Tern            | <i>Chlidonias hybridus</i>          | Laridae       |
| 3.         | Great Reed Warbler        | <i>Acrocephalus arundinaceus</i>    | Sylviidae     |
| 4.         | Little Grebe              | <i>Tachybaptus rufficollis</i>      | Podicipedidae |
| 5.         | Water rail                | <i>Rallus aquaticus</i>             | Rallidae      |
| 6.         | Rudy breasted Crake       | <i>Porzana fusca</i>                | Rallidae      |
| 7.         | Little Bittern            | <i>Ixobrychus minutus</i>           | Ardeidae      |
| 8.         | Pond Heron                | <i>Ardeola grayii</i>               | Ardeidae      |
| 9.         | Small blue Kingfisher     | <i>Alcedo atthis</i>                | Alcedinidae   |
| 10.        | White breasted Kingfisher | <i>Halcyon smyrnensis</i>           | Alcedinidae   |
| 11.        | Yellow headed Wagtail     | <i>Motacilla citreola calcarata</i> | Motacillidae  |
| 12.        | Pheasant tailed Jacana    | <i>Hydrophasianus chirugus</i>      | Jacaniidae    |
| 13.        | Rufous backed Shrike      | <i>Lanius schach</i>                | Laniidae      |
| 14.        | Mallard                   | <i>Anas platyrhynchos</i>           | Anatidae      |
| 15.        | Common Teal               | <i>Anas crecca</i>                  | Anatidae      |
| 16.        | Gadwall                   | <i>Anas strepera</i>                | Anatidae      |
| 17.        | Blue throat               | <i>Erithacus svecicus</i>           | Passeriformes |
| 18.        | Common Snipe              | <i>Capella gallinago gallinago</i>  | Charadriidae  |
| 19.        | Eurasian Lapwing          | <i>Vanellus vanellus</i>            | Charadriidae  |
| 20.        | Pipit                     | <i>Anthus novaeseelandiae</i>       | Passeriformes |
| 21.        | Grey Heron                | <i>Ardea cinerea</i>                | Ardeidae      |
| 22.        | Pond Heron                | <i>Ardeola grayii</i>               | Ardeidae      |
| 23.        | Little Egret              | <i>Egretta garzetta</i>             | Ardeidae      |
| 24.        | Small blue Kingfisher     | <i>Alcedo atthis</i>                | Alcedinidae   |
| 25.        | Pied Kingfisher           | <i>Ceryle rudis</i>                 | Alcedinidae   |
| 26.        | Marsh Harrier             | <i>Circus aeroginosus</i>           | Accipitrinae  |
| 27.        | Pied Wagtail              | <i>Motacilla alba</i>               | Motacillidae  |
| 28.        | Common Starling           | <i>Sturnus vulgaris</i>             | Sturnidae     |
| 29.        | Great Tit                 | <i>Parus major</i>                  | Paridae       |

**Table 2:** Avifauna of June 2008.

| Serial No. | Name of Bird Species | Detection Frequency percentage | Inference        |
|------------|----------------------|--------------------------------|------------------|
| 1.         | Moorhen              | 57.14                          | Abundant         |
| 2.         | Great Reed Warbler   | 28.57                          | Locally abundant |
| 3.         | Rufous backed Shrike | 28.57                          | Locally abundant |
| 4.         | Whiskered Tern       | 21.42                          | Locally abundant |
| 5.         | Little Bittern       | 21.42                          | Locally abundant |
| 6.         | Pond Heron           | 21.42                          | Locally abundant |
| 7.         | Little Grebe         | 14.28                          | Common           |

|     |                           |       |          |
|-----|---------------------------|-------|----------|
| 8.  | Water rail                | 14.28 | Common   |
| 9.  | Rudy breasted Crake       | 14.28 | Common   |
| 10. | Small blue Kingfisher     | 14.28 | Common   |
| 11. | Pheasant tailed Jacana    | 7.14  | Uncommon |
| 12. | White breasted Kingfisher | 7.14  | Uncommon |
| 13. | Yellow headed Wagtail     | 7.14  | Uncommon |

Table 3: Avifauna of October 2008.

| Serial No. | Name of Bird Species  | Detection Frequency percentage | Inference        |
|------------|-----------------------|--------------------------------|------------------|
| 1.         | Mallard               | 35.71                          | Locally abundant |
| 2.         | Blue Throat           | 21.42                          | Locally abundant |
| 3.         | Pond Heron            | 21.42                          | Locally abundant |
| 4.         | Pipit                 | 21.42                          | Locally abundant |
| 5.         | Common Teal           | 14.28                          | Common           |
| 6.         | Common Snipe          | 14.28                          | Common           |
| 7.         | Little Egret          | 14.28                          | Common           |
| 8.         | Grey Heron            | 14.28                          | Common           |
| 9.         | Pied Wagtail          | 14.28                          | Common           |
| 10.        | Pied Kingfisher       | 7.14                           | Uncommon         |
| 11.        | Small blue Kingfisher | 7.14                           | Uncommon         |
| 12.        | Marsh Harrier         | 7.14                           | Uncommon         |
| 13.        | Eurasian Lapwing      | 7.14                           | Uncommon         |
| 14.        | Starling              | 7.14                           | Uncommon         |
| 15.        | Gadwall               | 7.14                           | Uncommon         |
| 16.        | Great Tit             | 7.14                           | Uncommon         |

## Results and discussion

The survey conducted in June 2008 and November 2008 yielded twenty nine (29) species of birds belonging to fifteen (15) families of avifauna (Table 1). The avifauna recorded in June consisted of thirteen (13) species of birds belonging to nine (9) families (Table 2). Family Rallidae included highest number of three (3) species such as Moorhen (*Chloropus gallinule*), water rail (*Rallus aquaticus*) and Rudy breasted crake (*Porzana fusca*) followed by family Ardeidae and Alcedinidae each with two (2) species. Family Ardeidae included birds like Little Bittern (*Ixobrychus minutes*) and Pond Heron (*Ardeola grayii*) while as Alcedinidae comprised piscivorous birds such as Small Blue Kingfisher (*Alcedo atthis*) and White breasted Kingfisher (*Halcyon smyrnensis*). Families like Laridae, Sylviidae, Lanidae, Podicipedidae, Jacanidae, Motacillidae, each contributed one bird species to the summer avifauna of wetland. These families were represented by Whiskered Tern (*Chlidonias hybridus*), Great Reed Warbler (*Acrocephalus arundinaceus*), Rufous backed Shrike (*Lanius schach*), Little Grebe (*Tachybaptus rufficollis*), Pheasant tailed Jacana (*Hydrophasianus chirugus*) and Yellow headed Wagtail (*Motacilla citreola calcarata*) respectively. During June Moorhen (*Gallinule chloropus*) was recorded as single "Abundant" species while as Whiskered Tern (*Chlidonias hybridus*), Great Reed Warbler (*Acrocephalus arundinaceus*), Rufous backed Shrike (*Lanius schach*), Little Bittern (*Ixobrychus minutus*) and Pond Heron (*Ardeola grayii*) were detected as 'Common locally abundant' species. Birds sighted as 'Common' species included Dabchick / Little Grebe (*Tachybaptus rufficollis*), Small Blue Kingfisher (*Alcedo atthis*), Water rail (*Rallus aquaticus*) and Rudy breasted crake (*Porzana fusca*). While as birds like White breasted Kingfisher (*Halcyon smyrnensis*), Pheasant tailed Jacana (*Hydrophasianus chirugus*) and Yellow headed Wagtail (*Motacilla citreola calcarata*)

sighted in June were categorized as 'Uncommon' bird species. The avifauna recorded in November 2008 comprised of sixteen (16) species belonging to nine (9) families (Table 1). Maximum number of three (3) species were reported from either of the two (2) families such as Anatidae and Ardeidae followed by Passeriformes, Alcedinidae, Charadriidae each with two (2) species of birds. Each of the families like Motacillidae, Paridae, Sturnidae and Accipitridae contributed single bird species to the November avifauna of wetland. Birds like Mallard (*Anas platyrhynchos platyrhynchos*), Blue Throat (*Erithacus svecicus*), Pond Heron (*Ardeola grayii*) and Pipit (*Anthus novaeseelandiae*) were sighted as 'Locally abundant' species (Table 3). The 'Common' avifauna included common Teal (*Anas crecca*), Common Snipe (*Capella gallinago gallinago*), Little Egret (*Egretta garzetta*), Pied Wagtail (*Motacilla alba*) and Grey Heron (*Ardea cinerea rectirostris*). Seven (7) species of birds namely Gadwall (*Anas strepera*), Pied Kingfisher (*Ceryle rudis*), Small blue Kingfisher (*Alcedo atthis*), Marsh Harrier (*Circus aeruginosus*), Eurasian Lapwing (*Vanellus vanellus*), Great Tit (*Parus major*) and Common Starling (*Sturnus vulgaris*) were recorded as 'Uncommon' species in November 2008.

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