

Research

Seasonal Variations of Avifauna of Shallabug Wetland, Kashmir

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Abstract

The main thrust in this research work has been given on the evaluation of current status of Avifauna associated with Shallabug wetland. The main objectives were to evaluate the bird population fluctuation, to determine various threats to waterbirds and their habitats, and to present the remedial measures based on the key issues identified. For the purpose of present investigation, the study area was divided systematically into three study units of 700 m² each. Visual census method was used for the estimation of bird population. Visual counting was made with the help of high power field binocular (SG- 9.2) from respective vantage points. The birds were observed on the monthly basis in 2008 and the fluctuation in bird population was determined in different seasons: summer, autumn and winter. The observations were made from 5:00 am to 7:00 am (when they come out from their resting place) and 6:00 pm to 7:00 pm (when they approach towards their resting place). The analysis of the results showed that the Shallabug Wetland is particularly important for migratory bird species and marsh land breeding species. The wetland was also found important for long distance migrants as a stopper site for feeding and resting. The bird population showed fluctuation with site differences as well as with changing seasons.

Key words: Wetland, Shallabug, Avifauna, Fluctuation, Wetland management

Introduction

Wetlands are defined as 'lands transitional between terrestrial and aquatic eco-systems where the water table is usually at or near the surface or the land is covered by shallow water (Mitsch & Gosselink 1986). The values of the world's wetlands are increasingly receiving due attention as they contribute to a healthy environment in many ways. Wetlands are one of the most productive of all ecosystems, and carry out critical regulatory functions of hydrological processes within watersheds (Banner et al. 1988). Regulating water quality, water levels, flooding regimes, and nutrient and sedimentation levels are a few of these processes (Gregory et al. 1991). In addition, wetlands are important feeding and breeding areas for wildlife and provide a stopping place and refuge for waterfowl. As with any natural habitat, wetlands are important in supporting species diversity and have a complex of wetland values. Even small wetlands are extremely important to the conservation of biodiversity because they provide critical breeding habitat where dispersed populations can exchange genetic material, reducing the risks of extinction (Semlitsch and Brodie 1998). Further, wetlands are dynamic, characterized by fluctuating water, nutrient, and vegetation levels.

Strategically located at the western extremity of the Himalayan range in India and south of the Pamirs, the wetlands of Kashmir serve as important staging grounds for medium and long distance migratory geese, ducks, shorebirds, cranes and other species that breed in the northern latitudes of Central Asia and Siberia. Many of these wetlands are of international and national importance, due to the large population and diversity of waterbirds and other wetland associated birds that they support. Of these, Wular Lake and Hokersar have already been included in Ramsar List considering their importance based on biodiversity and socio-economic aspects. More recently Wular Lake and associated marshes viz., Haigam, Hokersar, Mirgund and Shallabugh have been included in the network of Important Bird Areas (Islam and Rahmani 2004), based on their international importance for birds and all of which are not formally protected.

Out of more than 9,000 bird species of the world, the Indian subcontinent contains 1,300 species or over 13% of the world's bird species (Grimmett et al. 2004). The subcontinent rich in avifauna also boasts 48 bird families out of total 75 families in the world. Kashmir valley has always been considered wealthy in floral and faunal diversity- 250 species of macrophytes, 150-200 species of phytoplankton, and 300 taxa of periphytic algae and over 50 species of periphytic rotifers (Zutshi and Gopal 2000). About 187 species of breeding birds belonging to 46 families under 16 orders have been reported from Kashmir valley. A total of 76 mammalian species belonging to 20 orders have been reported from Kashmir Valley (Dar et al. 2002). The amphibians and reptiles are mainly represented by frogs, toads, lizards and snakes. Majority of migratory birds are winter migrants in Kashmir. Over half a million migratory birds visit Kashmir wetlands (Central Asia News Net, 2 Dec, 2007). In Kashmir wetlands these birds get the temperature that suits their metabolism. The waterfowl migrate to the valleys wetlands and lakes from their breeding grounds in the Palaearctic region, extending from North Europe to Central Asia. Winter migrants from Central Asia and Siberia are thought to use two main flyways: one in the west along the Indus valley and the other in the north along the River Brahmaputra. Wetlands are relatively safe areas which provide the birds with abundance of food and safe place for roosting, nesting and moulting.

Unfortunately all these wetlands including the Shallabugh wetland are experiencing significant bio-ecological changes that include loss of habitat through continued human impact, denudation of forest lands, intense agricultural activities, pollution, and erosion in catchment & watershed areas. Further, the impact of fast urbanization, encroachment, siltation and indiscriminate macrophyte removal has seriously affected the use of wetlands by the water fowl. The concern about the habitat destruction and overall deterioration of the wetland stimulated the need to carry out the study on current status of Avifauna associated with Shallabugh wetland. The main objectives of this research were: to evaluate the bird population fluctuation; to determine various threats to waterbirds and their habitats, and to present the remedial measures based on the key issues identified.

Methodology

Study Area

Shallabug (34°10'00"N, 74°42'00"E) is a shallow fresh water lake covering an area of 700 hectares with depth of 0.3 m to 2.0 m. The study area is located at a distance of about 19 km in the northwest of Srinagar city, at an altitude of about 1580 meters amsl with mean temperature ranging from 25°C to 30°C. Average rainfall in this region is between 900 mm and 1000 mm. The wetland is fed by Anchar Lake and a number of tributaries of the River Sindh and Jehlum and local snow belt. It is a temporary and deep wetland (Pandit and Fotedar 1982). The water level fluctuation in the wetland is mainly due to varying amounts of water brought in by the tributaries of Sindh and Anchar Lake and considerably according to rainfall (Qadri 1989). The major source of nutrients in this wetland are input from the drainage basin through feeding channel, mineralization of dead organic matter and the returns from sediments through exchange at mud water interface. The shallow open water and the marshy areas support a variety of aquatic and semi-aquatic vegetation that provides an adequate food spectrum for the avifauna. The important ones include *Potamogeton* spp., *Sparganium ramosum*, *Typha angustata*, *Phragmites australis*, *Myriophyllum verticellatum*, *Nymphaea* spp. etc. Associated with these macrophytes are a rich population of insects, mollusks, fishes, zooplanktons, and other members of aquatic communities that supplement the food for avifauna. The study area is an important staging and wintering ground for migratory Anatidae, and a breeding area for a variety of waterfowl. Over 1, 50,000 ducks and geese have been recorded at one time (R. Naqash. Comm. 2003).

Like other wetlands of Kashmir valley, Shallabug is also suffered from overfishing, siltation, agriculture intensification, use of fertilizers and pesticides, illegal grazing, encroachment, infestation by weeds and pollution. Besides the usual anthropogenic threats, biomedical wastes from the Sheri-Kashmir Institute of Medical Sciences disposed off in Anchar ends up in Shallabug.

Site 1 (Kreishibal): This site lies towards the southwest of the wetland with an average depth is 0.3 m. It has a rich growth of macrophytes like *Azolla* spp., *Lemna minor*, *Typha angustata*, etc. The site is covered by Willow and populus towards the littoral sides. Site 2 (Noorgah): This site lies towards the southeast side of the wetland with an average depth of 0.75 m. A number of macrophytes were observed at this site. Some of them are *Phragmites australis*, *Typha angustata*, *Lemna* spp., *Azolla* spp., *Nelumbo nucifera*, *Nymphaea* spp., *Trapa natans* etc. Site 3 (Shallabug): This site lies towards the northwest of the wetland. It has an average depth of 1.5 m. It is open water zone rich in *Sparganium ramosum*, *Hydricharis dubia*, *Myriophyllum verticellatum*, *Nymphaea* spp., *Trapa natans*, *Potamogeton*, *Azolla* spp., etc.

Methods

Transect Method: For the purpose of present investigation, the study area was divided systematically into three study units of 700 m² each. Visual census method was used for the estimation of bird population. Visual counting was made with the help of high power field binocular (20x 50x; SG- 9.2) from respective vantage points. Observations were made from 5:00 am to 7:00 am (when they come out from their resting place) and 6:00 pm to 7:00 pm (when they approach towards their resting place). The birds were observed on the monthly basis and the fluctuation in bird population was determined in different seasons like summer, autumn and winter.

For the winter months where the flock is no more than a few hundred birds, all were counted from suitable vantage points through binoculars. With large number of birds or with mobile flocks counts in twenties were done rather than counting individual birds.

Identification of birds was done with the help of identification keys evolved by Bates and Lowther (1952) and with the help of Department of Wildlife of Haigam. Data was collected regarding composition of flock and population of individual species at three different study sites.

Results and Discussion

Fluctuation in Bird Population

Out of 32 species of birds recorded from wetland, 13 species were found to represent the residents, 9 species were found to represent the summer migrants while as 10 species represented the winter migrant community (Table 1).

At site 1, the birds which were dominant during summer season are Slaty headed parakeet (15), Central Asian Kingfisher (15), Indian Moorhen (13) and Kashmir House Sparrow (11). The birds which were found in low numbers are Pheasant Tailed Jacana (1) and Gold Fronted Finch (1). The birds which were dominant during autumn season on the same site were House Crow (11) and Common Pariah Kite (11). The birds which were found in low numbers are Himalayan Griffin Vulture (1) and European Hoopoe (1) (Table 2).

At Site 2, the birds which were dominant during summer season are Kashmir House Sparrow (22), Indian Moorhen (18) and House Crow (17). The birds which were found in low numbers are Himalayan Griffin Vulture (1) and Gold Fronted Finch (2). The birds which were dominant during autumn season are House Crow (30) and Common Pariah Kite (20). The birds which were found in low numbers are White Cheeked Bulbul (1) and Rufous backed shrike (2) (Table 3).

At Site 3, the dominant birds during summer season were Common Myna (21), White Cheeked Bulbul (18) and Kashmir House Sparrow (17). Birds found in low numbers are Common Sand Piper (1), Gold Fronted Finch (2) and Slaty Headed Parakeet (2). While as during autumn season the dominant birds were Kashmir House Sparrow (55), House Crow (35) and Common Myna (28). Birds found in low numbers were Eastern Grey Heron (1) and Common Sand Piper (2) (Table 4).

Results of the annual monitoring programme were analyzed to assess the trends in population changes and change in species composition. The bird population shows fluctuation with site differences as well as with changing seasons. Bird population fluctuation in Shallabug wetland during the study period (July to November) is depicted graphically (Fig 1).

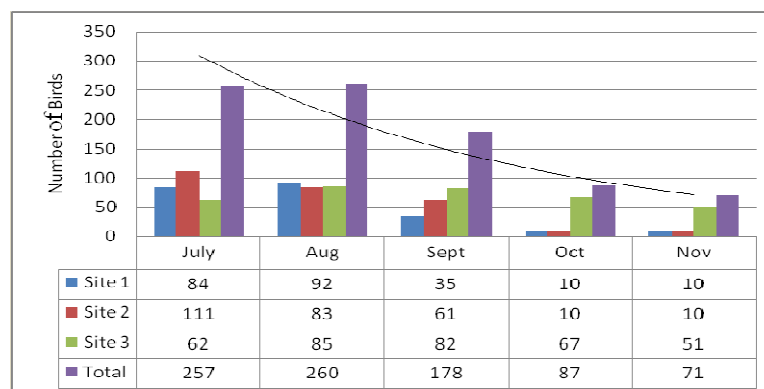


Figure 1: Bird population fluctuation in Shallabug wetland, Kashmir during the study Period (July to November, 2008)

During the five months study (July to November), a total of 853 birds were recorded from the study area. Among them, 682 (79.95%) were residents and 181 (21.21%) were summer migrants (Fig 2).

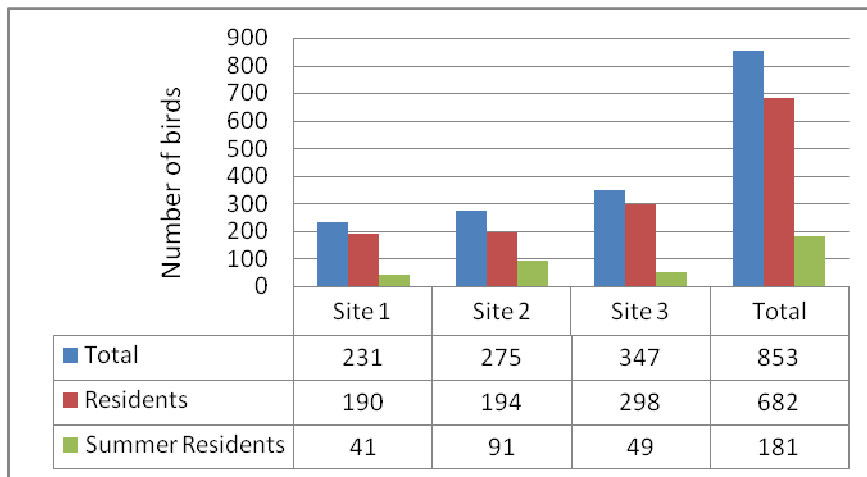


Figure 2: Residents and summer migrants in Shallabug Wetland during the study period (July to November)

At Site 1, a total of 231 birds (27.08%) were observed among which 190 (22.27%) were Residents and 41 (4.80%) were Summer Migrants. At Site 2, a total of 275 birds (32.23%) were observed among which 194 (22.74%) were Residents and 91 (9.49%) were Summer Migrants. At Site 3, a total of 347 (40.67%) birds were observed among which 298 (34.93%) were Residents and 49 (5.74%) were Summer Migrants. The Composition of bird population at three sites is presented in Figs. 3, 4 and 5.

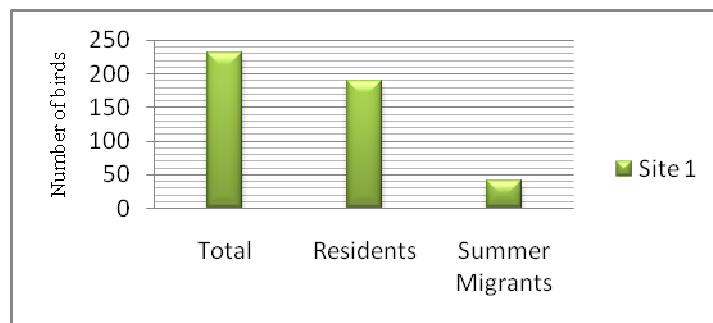


Figure 3: Bird population composition at Site 1

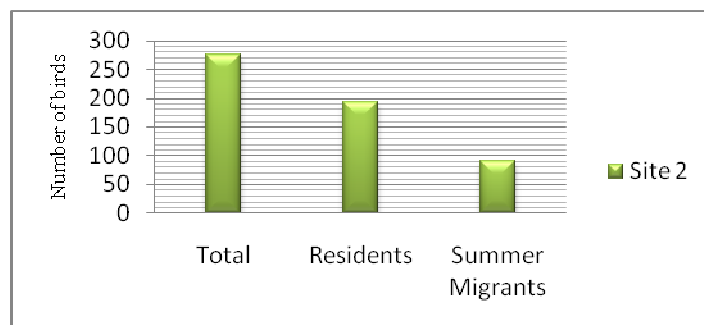


Figure 4: Bird population composition at Site 2

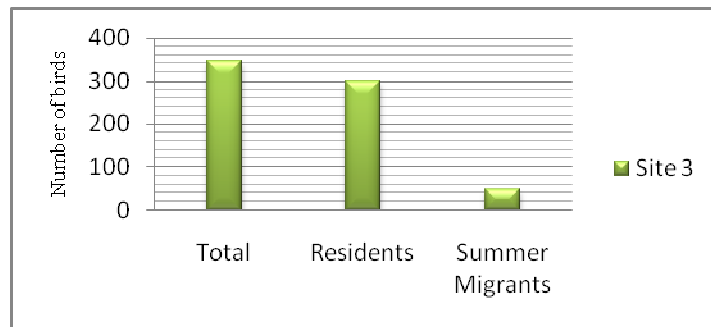


Figure 5: Bird population composition at Site 3

Site 1 is an open site with scattered trees and hence less number of birds was recorded at this site. Site 2 is covered by dense emergent vegetation and *Salix* trees providing space for nesting, breeding and resting place to birds. This site hence shows maximum number of birds in the summer season (residents and summer migrants). Site 3 is located towards the residential side of the wetland and hence shows large number of resident birds in the autumn season.

Autumn season shows decrease in the number of birds - both residents and summer migrants. This is due to the fact that summer migrants go for migration and residential birds move towards residential areas and nearby paddy fields. Fire in the emergent vegetation like *Typha* species in October and November makes grounds for the winter migrants but hampers the nesting and breeding of summer migrants.

Till November/December, Shallabug wetland was almost completely dry with water being diverted and used for irrigation and other purposes resulting in the complete non use by any waterfowl till then they start coming to the wetland when the wetland was filled with water. In the month of January, there was influx of winter migrants into the wetland and a total approximate of 1, 32,000 birds were observed belonging to 7 species. In the total number of birds, Mallard, Common Teal, Pintail and Coot altogether represent up to 75 to 78%. Areas having dense vegetation of emergent macrophytes were preferred by mallards. Where as pochards, coot, gadwall and geese preferred open waters. *Trapa* species was found providing the best food for various bird species. While as *Typha* spp, *Phragmite* spp and some other emergent macrophytes were found providing the food and best places for resting and breeding purposes.

It has been observed that the wetland was mostly visited by the winter migratory fauna. It is because of the severe cold and non-availability of food for their survival in Siberia and other cold areas in Europe. 37 species of waterfowl were reported to breed in the western Siberia. Fig. 6 depicts some birds recorded at various sites of the study area.

Threats to Waterbirds and Their Habitats

A recent risk to waterbirds and mass deaths of different migratory species to a highly pathogenic avian influenza virus (strain H5N1) from domestic poultry or other sources in east, southeast and north-central Asia, has highlighted the need for greater attention to understanding the impact of the virus on waterbirds and of the potential role of waterbirds in its spread. As the state of Jammu and Kashmir shares international borders with Pakistan and China - countries in which the virus has been recorded, there is a high risk of incursion of the virus to the waterbirds of the Valley.

The specific threats to waterbirds identified in this study are:

- ✓ Siltation, eutrophication, excessive weed infestation and degradation of water quality
- ✓ Lack of formal conservation status (such as protected areas) for most sites leading to poaching. Thousands of geese and ducks are hunted by the poachers in the unprotected areas leading to their movement to protected areas such as Haigam during day and their reverse movement during night.
- ✓ Collection of eggs and chicks of nesting waterbirds that constitutes a loss to breeding success.
- ✓ Spread of aquatic vegetation over open water areas leading to habitat loss of birds that prefer open water.
- ✓ Encroachment by agriculture and urbanisation, resulting in the decrease in the size and functions of many wetland areas affecting waterbirds.
- ✓ Heavy grazing leading to destruction of breeding and feeding grounds of birds.
- ✓ Unregulated and over fishing in some area resulting in loss of fish and invertebrate prey and disturbance to migrants, seasonal migrants and resident waterbirds.

The key issues identified based on observations and assessments in study sites are:

- ✓ Absence of comprehensive baseline information on waterbirds necessary for trend analysis and planning.
- ✓ Intense poaching in unprotected areas leading in decline in waterbird populations.
- ✓ Habitat modifications due to changes in natural water regimes and human activities.

Remedial Measures to Restore the Shallabug Wetland

✓ Rehabilitation of threatened / rare species

Maximizing the carrying capacity of the wetlands and associated marshes for waterbirds that use a range of preferred habitats for feeding, resting/roosting and nesting requires considerable planning and location specific knowledge. Adaptive management should be applied based on available knowledge of the management of the marsh vegetation and water depths. Through experimentation within sample plots, different vegetation management regimes can be tested during which time continuous monitoring of waterbird diversity, abundance and habitat use as well floral species diversity, abundance and cover, aquatic faunal diversity and abundance should be undertaken. Actions to manage the aquatic vegetation (species, quality and abundance/densities) should be undertaken with a complete understanding of their importance for waterbirds, fishes and other aquatic fauna.

✓ Habitat restoration

Regulation of water levels is critical to the maintenance of species diversity and abundance. Areas of open water need to be created to cater to the requirements of some bird species, particularly diving ducks for feeding and many other species for resting. The food and feeding habits of different species need to be investigated to advice on their precise needs. Thereafter, a detailed survey of the wetland is required to ensure that there is a proper proportion of open water area and surrounding vegetation belts.

✓ **Control of poaching**

Control of poaching requires an understanding of the modus operandi, impact on species and socio-economic impacts to enable appropriate responses to be undertaken.

Main locations of poaching, seasonality, main species taken and numbers per season are quantified.

For the resident species, an analysis of poaching of eggs, chicks and adults at nests and disturbance through cattle grazing, reed harvesting, lotus/other plant collection should be undertaken.

Conclusion and Recommendations

Autumn season shows decrease in the number of birds (both residents and summer migrants). This is due to the fact that summer migrants go for migration and residential birds move towards residential areas and nearby paddy fields. The bird population shows fluctuation with site differences as well as with changing seasons. Overall decreasing trends in the bird population were observed in autumn season. Less number of birds was recorded at site 1 because this site is an open site with scattered trees. Population density of birds shows direct relationship with density of emergent vegetation plus density of trees. Mathematically,

$$p_x = K\{p_y + p_z\} \dots\dots\dots \text{(Formula } \textcircled{c} \text{ to Imran Ahmad)}$$

Where “ p_x ” is the Avifaunal Density (in Wetland), “ p_y ” denotes the Emergent Vegetation Density (in Wetland), “ p_z represents” the Tree Density (in Wetland) and “ K ” is the Proportionality Constant (depending mainly upon the environmental conditions). As Site 2 is covered by dense emergent vegetation and Salix trees providing space for nesting, breeding and resting place to birds, this site shows maximum number of birds in the summer season (residents and summer migrants). Site 3 is located towards the residential side of the wetland and hence shows an increase number of resident birds in the autumn season.

In the present research, it has been observed that the wetland is mostly visited by the winter migratory fauna. It is because of the severe cold and non-availability of food for their survival in Siberia and other cold areas in Europe. 37 species of water fowl are reported to breed in the western Siberia. Out of these, 15 species were reported from Hokersar wetland and 9 species were observed in Shallabug wetland.

In order to protect the Shallabug Wetland from the major threats (mentioned above), the remedial measures suggested in this research work should be given due consideration.

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Annexes

Table 1: Resident birds, Summer Migrants & Winter Migrants (July to Nov. 2007) in Shallabug wetland, Kashmir

RESIDENT BIRDS		
S. No.	Scientific Name ¹	Common Name ²
01	<i>Passer domestics griseigularis</i>	Kashmir House Sparrow
02	<i>Holpestes leucogenys</i>	White Cheeked Bulbul
03	<i>Acridotheres tristis</i>	Common Myna
04	<i>Corvus splendns zugmkayeri</i>	House Crow
05	<i>Milvus migrans govinda</i>	Common Pariah Kite
06	<i>Podiceps ruficollis capensis</i>	Dab Chick
07	<i>Actitis hypoleucos</i>	Common Sand Piper
08	<i>Ardea cinerea</i>	Eastern Grey Heron
09	<i>Ardeola grayii</i>	Indian Pond Heron
10	<i>Alcedo atthis pallasii</i>	Central Asian Kingfisher
11	<i>Nycticorax nycticorax</i>	Night Heron
12	<i>Gyps himalayansis</i>	Himalayan Griffon Vulture
13	<i>Gallinula chloropus</i>	Indian Moorhen
SUMMER MIGRANTS		
01	<i>Ixobrychus minutus</i>	Little Bittern
02	<i>Hirundo rustica</i>	Common Swallow
03	<i>Upupa epops</i>	European Hoopoe
04	<i>Oriolus oriolus kundoo</i>	Indian Oriole
05	<i>Lanius schach erythronotus</i>	Rufous Backed Shrike
06	<i>Hydrophasianus chirurgus</i>	Pheasant Tailed Jacana
07	<i>Metoponia pusilia</i>	Gold Franted Finch
08	<i>Psittacula himalayana</i>	Slaty Headed Parakeet

09	<i>Streptopelia decaota decaota</i>	Indian Ring Dove
WINTER MIGRANTS		
01	<i>Anas platyrhynchos</i>	Mallard
02	<i>Anas crecca</i>	Common Teal
03	<i>Anas acuta</i>	Pin Tail
04	<i>Fulica atra</i>	Coot
05	<i>Anas strepera</i>	Gadwall
06	<i>Anas clypeata</i>	Showller
07	<i>Ansar ansar</i>	Grey Leg Goose
08	<i>Aythya rufina</i>	Pochard
09	<i>Anas penelope</i>	Wigeon
10	<i>Anas querquedula</i>	Garganey

¹Common and Scientific names follow the BirdLife International (2006).

²Common and Scientific names follow the BirdLife International (2006).

Table 2: Site 1- Approximate No. of birds observed in July, August (Summer Season) and September, October (Autumn Season) at Shallabug Wetland, Kashmir

S. No	Scientific Name	Common Name	Summer Season			Autumn Season			
			July	Aug	Total	Sept.	Oct.	Nov.	Total
01	<i>Passer domesticus griseigularis</i>	Kashmir House Sparrow	07	04	11	01	02	01	04
02	<i>Holpestes leucogenys</i>	White Cheeked Bulbul	06	05	11	00	01	00	01
03	<i>Acridotheres tristis</i>	Common Myna	03	05	08	00	02	02	04
04	<i>Corvus splendens zugmkayeri</i>	House Crow	04	06	10	04	03	04	11
05	<i>Milvus migrans govinda</i>	Common Pariah Kite	07	05	12	06	02	03	11
06	<i>Podiceps ruficollis capensis</i>	Dab Chick	05	03	08	02	00	00	02

07	<i>Actitis hypoleucos</i>	Common Sand Piper	02	05	07	02	00	00	02
08	<i>Ardea cinerea</i>	Eastern Grey Heron	03	02	05	00	00	00	00
09	<i>Ardeola grayii</i>	Indian Pond Heron	05	06	11	00	00	00	00
10	<i>Alcedo atthis pallasii</i>	Central Asian Kingfisher	07	08	15	04	00	00	04
11	<i>Nycticorax nycticorax</i>	Night Heron	02	00	02	00	00	00	00
12	<i>Gyps himalayensis</i>	Himalaya Griffon Vulture	00	00	00	01	00	00	01
13	<i>Gallinula chloropus</i>	Indian Moorhen	06	07	13	09	00	00	09
14	<i>Ixobrychus minutus</i>	Little Bittern	02	00	02	00	00	00	00
15	<i>Hirundo rustica</i>	Common Swallow	02	05	07	00	00	00	00
16	<i>Upupa epops</i>	European Hoopoe	02	04	06	01	00	00	01
17	<i>Oriolus oriolus kundoo</i>	Indian Oriole	04	06	10	01	00	00	01
18	<i>Lainius schach erythronotus</i>	Rufous Backed Shrike	07	06	13	01	00	00	01
19	<i>Hydrophasianus Chirurgus</i>	Pheasant Tailed Jacana	00	01	01	00	00	00	00
20	<i>Metoponia pusilia</i>	Gold Fronted Finch	02	01	03	00	00	00	00
21	<i>Psittacula himalayana</i>	Slaty Headed Parakeet	05	10	15	02	00	00	02
22	<i>Streptopelia decaota decaota</i>	Indian Ring Dove	03	03	06	01	00	00	01
Total			84	92	176	35	10	10	55

S. No	Scientific Name	Common Name	Summer Season			Autumn Season			
			July	Aug	Total	Sept.	Oct.	Nov.	Total
01	<i>Passer domestics griseigulars</i>	Kashmir House Sparrow	10	12	22	00	00	02	02
02	<i>Holpestes leucogenys</i>	White Cheeked Bulbul	03	03	06	01	00	00	01
03	<i>Acridotheres tristis</i>	Common Myna	10	02	12	00	00	00	00
04	<i>Corvus splendns zugmkayeri</i>	House Crow	10	07	17	20	06	04	30
05	<i>Milvus migrans govinda</i>	Common Pariah Kite	07	04	11	12	04	04	20
06	<i>Podiceps ruficollis capensis</i>	Dab Chick	02	02	04	00	00	00	00
07	<i>Actitis hypoleucos</i>	Common Sand Piper	02	03	05	00	00	00	00
08	<i>Ardea cinerea</i>	Eastern Grey Heron	03	02	05	04	00	00	04
09	<i>Ardeola grayii</i>	Indian Pond Heron	10	07	17	00	00	00	00
10	<i>Alcedo atthis pallasii</i>	Central Asian Kingfisher	08	08	16	06	00	00	06
11	<i>Nycticorax nycticorax</i>	Night Heron	02	01	03	00	00	00	00
12	<i>Gyps himalayansis</i>	Himalaya Griffon Vulture	00	01	01	03	00	00	03
13	<i>Gallinula chloropus</i>	Indian Moorhen	08	11	18	09	00	00	09
14	<i>Ixobrychus minutes</i>	Little Bittern	05	02	07	00	00	00	00
15	<i>Hirundo rustica</i>	Common Swallow	00	00	00	00	00	00	00
16	<i>Upupa epops</i>	European Hoopoe	07	04	11	00	00	00	00
17	<i>Oriolus oriolus kundoo</i>	Indian Oriole	05	01	06	00	00	00	00

18	<i>Lainius schach erythonotus</i>	Rufous Backed Shrike	03	02	05	02	00	00	02
19	<i>Hydrophasianus Chirurgus</i>	Pheasant Tailed Jacana	02	01	03	00	00	00	00
20	<i>Metoponia pusilia</i>	Gold Fronted Finch	02	00	02	00	00	00	00
21	<i>Psittacula himalayana</i>	Slaty Headed Parakeet	04	03	07	02	00	00	02
22	<i>Streptopelia decaota decaota</i>	Indian Ring Dove	08	07	15	02	00	00	02
Total			111	83	194	61	10	10	81

Table 4: Site 3- Approximate No. of birds observed in July, August (Summer Season) and September, October (Autumn Season) at Shallabug Wetland, Kashmir

			Summer Season			Autumn Season			
S. No	Scientific Name	Common Name	July	Aug	Total	Sept.	Oct.	Nov.	Total
01	<i>Passer domestics griseigulars</i>	Kashmir House Sparrow	05	12	17	15	20	20	55
02	<i>Holpestes leucogenys</i>	White Cheeked Bulbul	06	12	18	05	02	04	11
03	<i>Acridotheres tristis</i>	Common Myna	09	12	21	10	11	07	28
04	<i>Corvus splendns zugmkayeri</i>	House Crow	06	04	10	10	10	15	35
05	<i>Milvus migrans govinda</i>	Common Pariah Kite	05	10	15	10	14	05	29
06	<i>Podiceps ruficollis capensis</i>	Dab Chick	04	02	06	02	08	00	10
07	<i>Actitis hypoleucos</i>	Common Sand Piper	00	01	01	02	00	00	02
08	<i>Ardea cinerea</i>	Eastern Grey Heron	04	03	07	01	00	00	01
09	<i>Ardeola grayii</i>	Indian Pond Heron	00	02	02	00	00	00	00
10	<i>Alcedo athis pallasi</i>	Central Asian	07	02	09	10	00	00	10

		Kingfisher							
11	<i>Nycticorax nycticorax</i>	Night Heron	00	00	00	00	00	00	00
12	<i>Gyps himalayensis</i>	Himalaya Griffon Vulture	00	00	00	00	00	00	00
13	<i>Gallinula chloropus</i>	Indian Moorhen	04	06	10	06	02	00	08
14	<i>Ixobrychus minutus</i>	Little Bittern	00	00	00	00	00	00	00
15	<i>Hirundo rustica</i>	Common Swallow	02	10	12	00	00	00	00
16	<i>Upupa epops</i>	European Hoopoe	02	00	02	00	00	00	00
17	<i>Oriolus oriolus kundoo</i>	Indian Oriole	00	00	00	00	00	00	00
18	<i>Lanius schach erythonotus</i>	Rufous Backed Shrike	03	02	05	04	00	00	04
19	<i>Hydrophasianus Chirurgus</i>	Pheasant Tailed Jacana	00	00	00	00	00	00	00
20	<i>Metoponia pusilia</i>	Gold Fronted Finch	02	00	02	00	00	00	00
21	<i>Psittacula himalayana</i>	Slaty Headed Parakeet	00	02	02	00	00	00	00
22	<i>Streptopelia decaota decaota</i>	Indian Ring Dove	03	05	08	07	00	00	07
Total			62	85	127	82	67	51	200