

# **Seasonal occurrence of waterbird species in Pyu Kan Wetland, Data U Township, Mandalay**

**Ni Ni Win\*, Thandar\*\*, San San Htay\*\*\*, Aung Thu\*\*\*\*, Yee Yee Htay\*\*\*\*\*, Khin May Nyo\*\*\*\*\***

## **Abstract**

A total of 34 waterbirds species confined to 28 genera and distributed among 12 families and seven orders were recorded in Pyu Kan Wetland. Waterbird fauna was represented with 15 species of residents and 19 species of migrants. Species belonging to order among seven orders, the highest species number of 11 and the highest species composition of (32.40%) was recorded in order Anseriformes and Ciconiiformes. The lowest number of species (only one species and 3.00% species composition each) was recorded in order Pelecaniformes and Suliformes in the present study. Among 12 families, the highest species number of eight and highest species composition of (32.40%) was recorded in family Anatidae. The lowest number of species (only one species and species composition of 3.00%) was recorded in each of family Threskiornithidae, Phalacrocoracidae, Anhingidae, Recurvirostridae, Charadriidae and Jacanidae during this study period. According to this seasonal occurrence, data 15 species of waterbirds were residents and 19 waterbirds were winter migrants.

**Key Words:** Waterbird, species composition, occurrence, Pyu Kan Wetland

## **Introduction**

Myanmar is one of the most diverse bird fauna per unit area of any country in the world. The wetland of Myanmar includes rivers and streams, shallow fresh water lakes and marshes, water storage reservoirs, fish ponds, seasonally flooded cultivated plains and estuarine with extensive mangrove swamps.

Pyu Kan is probably natural and is now mainly used for irrigation. It is located above 98 m sea level, beside the village of Pyu Kan in the south western part of the Tada U Township, Mandalay Region. The area of water body is approximately 1897 ha in the rainy season and 291 ha in the dry season. Fishing is important for the livelihood of the people who live in Pyu Kan village. They do not use boats for fishing because of traditional cultural and spiritual beliefs. The lake is one of the important wetlands in central Myanmar.

---

\* Lecturer, Dr, Zoology Department, Yadanabon University

\*\* Associate Professor, Dr, Zoology Department, Monwya University

\*\*\* Associate Professor, Dr, Zoology Department, Monwya University

\*\*\*\* Lecturer, Dr, Zoology Department, Yadanabon University

\*\*\*\*\* Assistant Lecturer, Dr, Zoology Department, Yadanabon University

\*\*\*\*\* Professor (Head), Dr, Zoology Department, Yadanabon University

It is an important ecosystem for both migratory and resident water bird species and as benefits to local people such as food and regular water supplies.

In Myanmar, the total area of wetland habitat is gradually reducing due to the extension of farmlands by local people. Furthermore, the use of chemical fertilizers and pesticides have contaminated many existing wetlands and threatens the existing biologically diverse plant and animal communities and add to the difficulty in conserving wetlands environments. Illegal fishing by mean of electric-shock further enhances the depletion and extinction of aquatic animals. The objectives of this project are;

- to record and identify the water bird species in Pyu Kan during survey period
- to determine of water bird species in Pyu Kan
- to examine the seasonal occurrence and status of water bird species in Pyu Kan

## **Materials And Methods**

### **Study area and sites**

Pyu Kan is situated in the Tada U Township, Mandalay Region which lies between latitude 21° 46' 14.98" N and longitude 95°53' 50.21" E. It is natural flood-plain and is used for irrigation. The area of water body is approximately 1897 ha in the rainy season and 291 ha in the dry season (Fig. 1).

### **Study period**

The study period lasted for about a year (from July 2016 to June 2017).

### **Bird watching and field data collection**

Data were collected using the direct observation method. Birds were observed with the aid of binoculars and photographed by digital camera. Most bird species were spotted with binoculars and photographs were taken. The species were noted during each survey trips. It was identified down to the species level and the size, colour and behaviour of the species were carefully noted.

### **Identification of species**

The identification of the collected bird species was made according to King and Dickinson (1975), Smythies, (2001), and Robson (2016).

## **Residential status**

Status of the birds has been worked out and different status categories like resident and winter migrant have been assigned strictly with reference to the study area on the basis of presence or absence method and also referred to relevant literatures.

WM = winter migrant

R = resident

(King *et al.*, 1995)

## **Results**

Throughout the study period from July 2016 to June 2017, a total of 34 water bird species belonging to 28 genera under 12 families and seven orders in the Phy Kan Wetland were recorded.

### **Species composition and seasonal occurrence of species**

In this study, a total of 34 species belonging to the 28 genera under 12 families and seven orders were recorded at the Pyu Kan Lake during July 2016 to June 2017 (Plate 1).

During three seasons 34 species of waterbirds were recorded, 15 species in the rainy season, 13 species in the hot season and 34 species in the cold season. Two species of Common Coot and Little-ringed Plover were found both in the rainy season and in the cold season.

The highest number of species were recorded in order Anseriformes and Ciconiiforme (11 each), followed by Charadriiformes (five), Gruiformes (three), and Podicipediformes (two each) during the study period. The lowest number of species was found in order Pelecaniformes and Suliformes (only one) during the study period.

In the case of species under family, the highest number was recorded in family Anatidae (11), followed by Ardeidae (eight), Rallidae (three), Podicipedidae, Ciconiidae and Scolopacidae (two each) and the lowest number of species was recorded in family Threskiornithidae, Phalacrocoracidae, Anhingidae, Recurvirostridae, Charadriidae and Jacanidae (one each) during the study period.

Species belonging to order Anseriformes and Ciconiiformes were most dominant (32.40% each), followed by Charadriiformes (14.70%), Gruiformes (8.80%), Podicipediformes (5.90%), Pelecaniformes and Suliformes (3.00% each) (Fig.2).

Species belonging to the family Anatidae was most dominant (32.40%), followed by Ardeidae (24.00%), Rallidae (8.80%), Podicipedidae and Ciconiidae, (5.90% each),

*Threskiornithidae*, *Phalacrocoracidae*, *Anhingidae*, *Recurvirostridae*, *Charadriidae* and *Jacanidae* (3.00% each) (Table 4 and Fig.3).

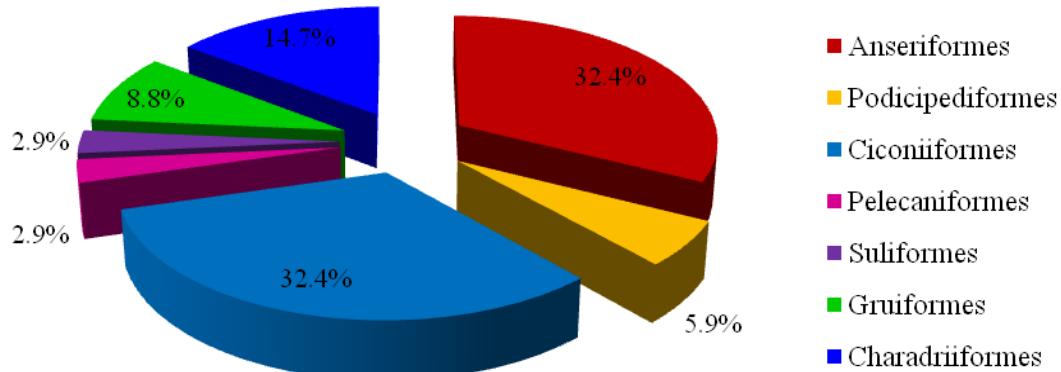


Fig.1 Composition of waterbird species in different orders at Pyu Kan Lake,  
Tada U Township

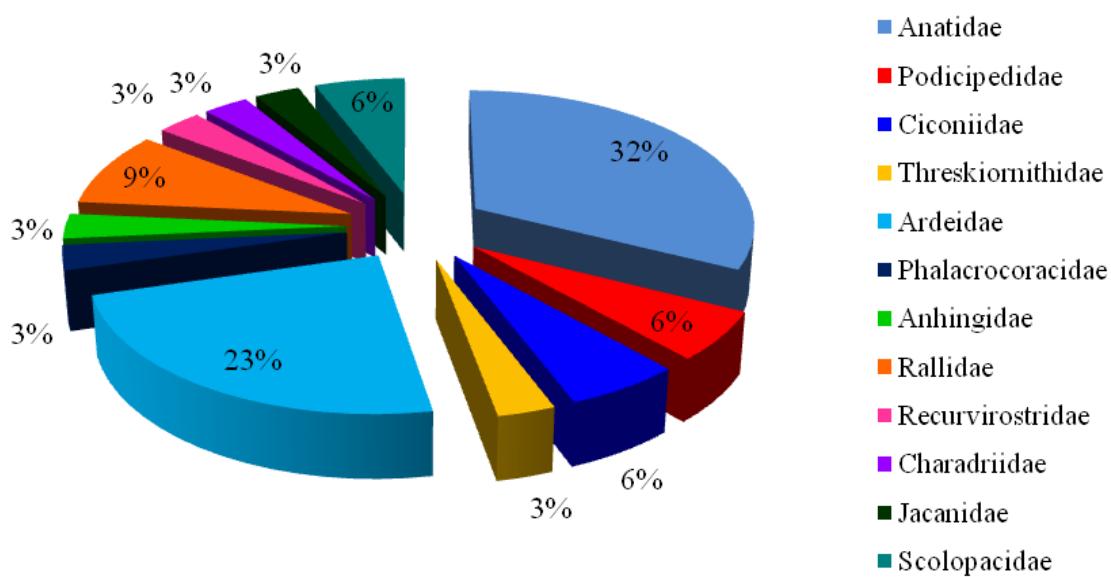


Fig.2 Composition of waterbird species in different families at Pyu Kan Lake,  
Tada U Township



A. *Tadorna ferruginea*



B. *Sarkidiornis melanotos*



C. *Sarkidiornis melanotos*



D. *Tadorna ferruginea*



E. *Anas clypeata*



G. *Anas clypeata*



H. *Anas acuta*



Plate 1. Recorded waterbird species in Pyu Kan Lake



*phalus*



Plate 1. Continued



Plate 1. Continued



AE. *Charadrius dubius*



AF. *Hydrophasianus chirurgus*



AS. *Gallinago gallinago*



AG. *Actitis hypoleucos*

Plate 1. Continued

### Discussion

During the three seasons of study period, 34 species of waterbirds that belong to 28 genera under 12 families and seven orders in the aquatic habitats of study area were recorded from July 2016 to June 2017.

The record of 34 species of waterbirds was observed during three seasons, 18 species were migrants and 16 species were residents in this wetland. A total of 34 species of waterbirds was recorded, 15 species in the rainy season, 34 species in the cold season and 13 species in the hot season during the study period.

Seasonality plays a major role in determining the abundance and distribution of birds. Seasonality affects food and covers availability of bird population, which in turn affects breeding success and ultimately survival of the bird species (Girma *et al.*, 2008) (Cited by Villiers, 2009).

Among seven orders, the highest species number of 11 and the highest species composition of (32.40%) was recorded in order Anseriformes and Ciconiiformes and next to this was order Charadriiformes with five species and (14.70%) species composition, Gruiformes with three species and (8.80%) species composition, and Podicipediformes with two species and (5.90%) species composition. The lowest number of species (only one species and 3.00% species composition each) was recorded in order Pelecaniformes and Suliformes in the present study.

Waterbirds comprise a large group of species including Anseriformes, Charadriiformes, Ciconiiformes, Gruiformes, Pelecaniformes, Suliformes and Podicipediformes. These species display a variety of adaptations for exploiting wetland habitats. In non-diving waterbirds, variation in morphological features, such as bill length and shape, bill lamellae, neck length, leg length, and body size allow forage at different depths and on different foods (Bolduc and Afton, 2008).

Among 12 families, the highest species number of eight and highest species composition of (32.40%) was recorded in family Anatidae and next to this was family Ardeidae with eight species and (24.00%) species composition, Rallidae with three species and (8.80%) species composition, Podicipedida, Ciconiidae and Scolopacidae with two species and (5.90%) composition each. The lowest number of species (only one species and species composition of 3.00%) was recorded in each of family Threskiornithidae, Phalacrocoracidae, Anhingidae, Recurvirostridae, Charadriidae and Jacanidae during this study period.

A large number of avian species depends on these wetland habitats to satisfy their needs and perform other activities. They select wetland habitats based on vegetation structure and composition, food resources and microclimatic conditions that provide optimal resources for their survival. Birds are bioindicators of wetland ecosystem, exhibit variety of techniques to utilize the wetland area and indicate ecological conditions and wetland productivity (Li and Mundfur, 2007; Seymour and Simmons, 2008) (Cited by Rajpar and Zakaria, 2013).

Anatidae family which was the most dominant family during winter period was represented by eleven species. This indicates that most of the wintering waterbirds belong to Anatidae family. Members of Anatidae family were found to be dominant among the winter migratory birds in this Pyu Kan Lake.

In addition, weather and climate conditions also play a significant role in avian population affecting their breeding and wintering grounds, availability of food resources directly and indirectly (Sillett *et al.*, 2000; Both and Visser, 2001). Furthermore, the arrival departure of migratory bird species also influences avian species abundance and food resources (Gaston *et al.*, 2000; Corcoran, 2005) (Cited by Rapjar and Zakaria, 2013).

In with regard to conservational status according to IUCN (2014), 30 species were least concerned, one species was not recognized and three species were nearly threatened. According to this seasonal occurrence data) 15 species of waterbirds were residents and 19 waterbirds were winter migrants.

In conclusion, from the results that variation in the number of waterbird species and individual among different study seasons may relate to factors such as habitat condition, availability of food sources, environmental conditions and habitat sensitivity of some waterbirds depend on heterogeneous vegetation that provides diversity of food resources, suitable foraging and adequate shelter in this wetland. In addition, the arrival and departure of migratory bird species also govern waterbird species abundance and density. Therefore, there is a need to conserve diversity of waterbirds by protecting natural habitat of wetland area.

### Acknowledgements

First and foremost we wish to express our sincere indebtedness to Dr Maung Maung Naing, Rector of Yadanabon University, for allowing us to pursue our present topic of research project in the Department. We are also greatly indebted to Dr Si Si Khin and Dr Tin Moe Thuzar, Pro-Rector of Yadanabon University, for allowing us to pursue the present topic of research in this project. We next extend our gratitude to Dr Khin May Nyo, Professor and Head of the Department of Zoology, Yadanabon University for her permission to conduct this research and invaluable suggestions given during the study period.

### References

- Bolduc, F. and Afton., A.D., 2008. Monitoring waterbird abundance in wetlands: the importance of controlling results for variation in water depth. *Ecological Modelling*, 216: 402–408.
- King, B.F. and Dickinson E.C., 1975. *A field guide to the birds of South East Asia*. Collin. London. 480 pp.
- Rajpar, M. N. and Zakaria., M., 2013. Avian diversity habitat types at Paya Indah natural wetland reserve, Peninsular Malaysia. *The Journal of Animal and Plant Sciences*, 23(4):1019–1033.
- Robson, C., 2016. *Newholland field guide to the birds of Southeast Asia*. New Holland Publishers (UK) Ltd. 544 pp.
- Smythies, B.E., 2001. *The bird of Burma*. Oliver Boyd Ltd. Fourth edition. Natural Publication. Borneo. 601 pp.
- Villiers, M.S. (ed.), 2009. Bird and Environmental Change: Bulding and early warning system in South Africa. SANBI, Private Bag x 101, Pretoria, South Africa.

