

# Post-Natal Developmental Stages Of Lesser Whistling Duck At Paleik In (Lake), Sinkaing Township, Mandalay Division, Myanmar

Nwe Nwe Khaing<sup>\*</sup>, Khin Mya Mya<sup>\*\*</sup>

<sup>\*</sup>(Department of Biology, Sagaing University of Education, Sagaing Division, Myanmar)

<sup>\*\*</sup>(Department of Zoology, Mandalay University, Myanmar)

DOI: 10.29322/IJSRP.9.06.2019.p9050

<http://dx.doi.org/10.29322/IJSRP.9.06.2019.p9050>

**Abstract-**Hatching success and post-natal stages of *Dendrocygna javanica* (Lesser Whistling Duck) were recorded from January 2007 to December 2007 at Paleik In in SinKaing Township, Mandalay division. Nests of *D. javanica* were observed among a variety of sites. All nests are nearly cup-shaped with a slight depression at the center. During the study period it was observed that 12 nests were constructed of twigs and broken dry leaves of Myet Mont Nyin grass (*Carex pandanophylla*), among the broken dry leaves of Myar grass (*Cyperus* spp.) and on the bending branches of Kyee tree (*Barringtonia acutangula*) at Paleik In. During the year 2007, 12 nests, 87 eggs and 49 hatchlings were observed in Paleik In. Among these nests 50% were recorded as successful, 25% as lost by predator, 16.67% were lost by flooding and 8.33% as abandoned. Of the 87 eggs observed, 49 eggs (56.32%) survived until hatching.

Keywords- Hatchlings, Hatching success, Nest sites, Water birds, Wetland.

## I. INTRODUCTION

Reproduction in birds requires the nurturing of eggs and young outside the body. Nests, which provides a receptacle for egg during incubation and for baby birds until they fledge, vary in construction from simple accumulations of sticks or scrapes in the earth to major architectural achievements (Gill, 2001).

Differential resource selection is one of the principal factors which permit species coexistence (Schoener, 1974 cited by Parejo, Sanchez and Aviles, 1999). In studies of niche partitioning nest location has received much less attention than food or habitat, perhaps because suitable nest sites are presumed to be readily available for most species. However, when a species has specific nesting locations it may be difficult to obtain (Wiens, 1989 cited by Parejo, *et al.*, 1999). To breed successfully waterbirds require suitable places in which to build their nest. Nesting sites vary from species to species. Many species of waterbirds such as cormorants, herons and egrets build stick nests in tree next to lake or wetland. Often these nests are built in branches that overhang open water (Scott, 1997).

Nest-building techniques and construction materials vary widely. Materials used are commonly twigs, grass or mud. A dove build a nest with twigs, the Robin with mud and grass, a duck used special down materials all readily available to the builder (Wallace, 1963). Having selected a nest site, the breeding bird must built a nest, lay a clutch of eggs and incubate them. The number of young hatched will depend on the size of clutch. Incubating birds must divide their time between the eggs and the need to spend some time feeding, the balance depending on the fat reserves which can be lost over the incubation period (Patterson, 1982). As soon as a clutch is completed, or in some cases before it is complete, one of the parent birds sit on the eggs with varying degrees of attentiveness until they hatch. The incubation period, or time interval required for hatching an egg, varies with different species and is not necessarily uniform within a species (Wallace, 1963).

At the end of the period of incubation fertile eggs with live embryo hatch, or give birth to young; unhatched eggs may be infertile embryos that died at some stage of development. Young birds are equipped with an "egg tooth", or caruncle a horny protuberance on the tip of the upper mandible which used to open the shell but which disappears soon after birth (Wallace, 1963).

A highly significant difference occurs between precocial and altricial birds. The precocial bird, hatches out covered with down, legs well developed, eyes open and alert, and is soon able to feed itself. Because it is usually able to leave the nest and to run after its parents shortly after hatching, it is also called a nidifuge or nest fugitive. Nidifuges are often ground-nesting species as adults, are good runners or good swimmers and feed either on the ground or in the water (Welty, 1982).

Parental behavior normally involves a number of different activities; feeding the young, providing them with shelter and protecting them from predators and other dangers. Shelducks, like other parents of precocial young, do not feed their broods but merely accompany them while they feed themselves. The parents do, however actively provide shelter and protection (Patterson, 1982). Being mobile while still very small, precocial young birds are very vulnerable to a number of hazards, the principal ones being the risk of predation and the danger of chilling when not being brooded by a parent. As a result, most suffer a high mortality in their first week or ten days of life (Patterson, 1982).

Many lesser whistling duck are found at Paleik In. Which is a moderately large natural wetland. Birds can get enough food supply. A total of 12 nests, 87 eggs and 49 hatchlings were observed during breeding season (2007). Since there is no information available on the reproduction of these species the present study has been undertaken at the Paleik In where these species are observed to be present throughout the year. The main objective is to study and record the post- natal developmental stages.

## II. MATERIALS AND METHODS

### **Study Area and Study Period**

Study area was carried out at Paleik In (21° 50'N 96° 03'E). This In is situated at Sinkaing Township, Mandalay Division. It lies near Mywe Pagoda. The water body of Paleik In is largest in the rainy season about 323.76 hectares while 40.47 hectares in hot season. The length of the Paleik In is 2.3 km and the width about 2.1 km (Fig 1). It is connected with Myintnge River, a tributary of Ayeyarwady River and other agricultural fields. There are rich habitats and microhabitats for water birds. Land birds are also observed at the vicinity. This In also supports a large variety of different flora and fauna. Myet Mont Nyin and Myar grass are the dominant emergent plants in this In. The study period is from January to December 2007.

### **Hatching Site Characteristic**

After hatching is completed ten hatchlings of lesser whistling duck from one clutch was reared in captivity at Paleik In.

### **Hatchling Metric**

After hatching, the young were measured until 5 days old. The following measurement were taken, the wing length from the carpal joint to the end of the longest primary feather, tarsus-length from the tarsal joint to the base of the foot; culmen-length, from the unfeathered base of the beak to its tip; total length, from the tip of beak to the tip of the tail.

### **Nest, Egg and Hatching Success**

Among the recorded nests, successful nest numbers and number of hatchlings were recorded. If one egg of the clutch hatched then the nest was considered successful. Clutch that fail included those that were abandoned or that were destroyed or unknown reason. Cold eggs were assumed abandoned. Evidence of predation includes partially eaten eggs in or below the nest and dead chicks with wound were also attributed to predator.

### **Hatching Time and Hatchling Characteristics**

Hatching time and hatching characteristics were recorded.

### **Hatching Success of Individual Eggs**

Among the successful nests, hatching success of the individual eggs were observed during the year 2007. Hatching date of successful nests were recorded during the breeding season.

### **Survival of Hatchling**

After hatching, the survival rate of hatchling were recorded.



Fig.1.Location Map of Paleik In, Sinkaing Township

Source: From Google Earth

### III. OBSERVATION AND RESULTS

#### **Hatchling Characteristics**

After hatching, the young was observed with pale black down feathers; a white eyebrow and a conspicuous white patch on the back of the head; a white patch on the wings and two other white patches on either side of the lower back and rump.

#### **Hatchling**

Measurements of total length, wing, tarsus and culmen of five days old hatchling were recorded (Table 1). Hatching date for 49 young ranged from 18<sup>th</sup> June to 24<sup>th</sup> July during breeding season (2007). After two days of hatching, hatchling of lesser whistling ducks were found as good runners and good swimmers and feed mainly on weeds in the water without the help of parents (Fig A, B).

#### **Nest, Egg and Hatchling Success**

A total of 12 nests and 87 eggs were found during the breeding season (2007). Among these nests, six nests (50%) survived giving rise to 49 hatchlings. Of these nests that failed three nests (25%) were lost to predator, two nests (16.67%) were flooded and only one nest (8.33%) were abandoned and six nests (50%) were observed as successful (Table 2). Number of nests, young and the percentage of total young were recorded (Table 3).

#### **Hatching Time and Feeding of Hatchlings**

During the hatching period, eggs of each clutch hatch out by striking with egg-tooth or caruncle within a period of about 3 hours (Table 4).

After hatching, newly hatched young whistling ducks were observed to stay in the nest for at least 22 hours. The hatchlings feed themselves mainly on water weeds (*Chana* spp.) near the nests.

#### **Hatching Success of Individual Egg**

Among the successful nests, the eggs were observed to hatch successfully. In the present study the breeding success at Paleik In showed that 83.14% of the eggs hatched in 2007 (Table 5).

#### **Survival of Hatchling**

After 10 days of age, 3 hatchlings disappeared and 4 died. The number of surviving hatchlings decreased in the second week of life were observed. The survival rate of hatchlings was observed as 30 percent (n=10) in the present study.

**Table 1. Measurements of total, wing, tarsus and culmen length of *Dendrocygna javanica***

Age	Mean of total length (cm)	Mean of wing length (cm)	Mean of tarsus length (cm)	Mean of culmen length (cm)
1 <sup>st</sup> day old	10.05	2.34	1.47	1.10
2 <sup>nd</sup> day ol	10.39	2.50	1.67	1.34
3 <sup>rd</sup> day old	10.83	2.81	1.95	1.51
4 <sup>th</sup> day old	11.42	3.09	2.33	1.83
5 <sup>th</sup> day old	12.01	3.46	2.65	2.05

**Table 2. Nest success and nest lost of *Dendrocygna javanica* at Paleik In (2007)**

Nest numbers	Nest outcome	Nest (2007)
2, 3, 5, 6, 8, 9	Successful	50%
1, 4, 12	lost of predator	25%
7, 11	lost by weather (flooded)	16.67%
10	Abandoned	8.33%
Total, 12		100.00

**Table 3. Number of nests and young of *Dendrocygna javanica* at Paleik In (2007)**

Number of young	Numbers of nests	Total young	% of total young
6	1	6	12.25
7	1	7	14.29
8	1	8	16.33
9	2	18	36.74
10	1	10	20.41
	6	49	100.00

**Table 4. Hatching time duration of *Dendrocygna javanica* at Paleik In (2007)**

Nest No.	Numbers of egg	Hatching time duration
1	8	3 hours
2	10	2 hours 45 minutes
3	11	3 hours
4	12	3 hours 25 minutes
5	9	3 hours 15 minutes
6	9	3 hours 25 minutes
Mean ± SD	9.83 ± 1.34	3.02 ± 0.27

**Table 5. Percentage of the hatching success of *Dendrocygna javanica* at Paleik In**

Nest No.	Numbers of egg	Number of hatchlings	Chicks hatched/eggs laid (%)
1	8	6	75%
2	10	9	90%
3	11	8	72.73%
4	12	10	83.33%
5	9	7	77.78%
6	9	9	100.00%
Mean ± SD	9.83 ± 1.34	8.17 ± 1.34	83.14 ± 9.44



Fig A. Two days old Ducklings



Fig B. Seven Days old Ducklings

#### IV. DISCUSSION

In Myanmar, *Dendrocygna javanica* is widely distributed (Smythies, 1953) and are present the whole year round at Paleik In. The breeding season of *D. javanica* starts from May to August. The date on which the first egg of the clutch is laid can only rarely be determined by direct observation during the egg-laying period, due to the inaccessibility to the nests and bird's intolerance of disturbance. Instead, a number of indirect methods must be used. In a few nests, observed before laying is complete, the laying date of the first egg can be back-dated since normally one egg is laid per day. If the hatching date and clutch size are known, the laying date can be estimated using the incubation period of 29-31 days, plus one day for each egg in the clutch (Patterson, 1982).

At Paleik In, some nests were observed before laying is completed, the laying date of the first egg were calculated by using back-dated system according to Patterson (1982). Incubation period ranged from 25-26 days. Among the successful nests, incubation period of two nests were recorded 25 days and four nests were observed 26 days at Paleik In during breeding season. After 28 days of incubation, the dozen or so eggs of the mallard, *Anas platyrhynchos*, generally all hatched out within a period of about two hours (Welty, 1982).

At Paleik In, after 25-26 days of incubation all eggs hatched out within a period of about 3 hours. The eggs of lesser whistling duck are much larger than eggs of bittern or eggs of grebe and other eggs of small size water birds that were observed at Paleik In during breeding season. The egg length and width were compared with other waterbirds it was observed that *D. javanica* length and width were (60.00 – 71.50 and 34.00 – 37.5 mm) whereas *Ixobrychus cinnamomeus* egg length and width were (39.35 – 44.28 and 25.46 - 26. 75 mm). From the above result it was obvious that *D. javanica* are much larger than other waterbirds.

Wallace (1963) stated that the eggs of precocial birds which contain more yolk and albumen hatch out more fully developed young than the eggs of altricial birds. The chief role in hatching is played by the chick itself. In preparation for liberation from its limestone prison, the maturing chick develops two tools. One is a short, pointed, horny “egg-tooth” at the tip of its upper mandible. The other is a set of prominent hatching muscles located largely on the upper side of its neck and head (Welty, 11982). At Paleik In, during the study period “egg-tooth” or caruncle of the maturing chicks were observed in the hatching period. There is highly significant difference between precocial and altricial birds (Portmann, 1950 cited by Welty, 1982). The precocial bird; hatches out

covered with down, legs well developed, eyes open and alert, and is soon able to feed itself. The altricial bird is born naked, blind and too weak to support itself on its legs (Nice, 1962 cited by Wetly, 1982).

At Paleik In, hatchling were observed as covered with down, legs well developed, eyes open and alert. Thus they are regarded as precocial. Precocial birds such as ducks, pheasants and grouse leave the nest upon hatching. Among the ducks, gallinaceous birds, plovers, and sandpipers lead their young from the nest soon after hatching (Wallace, 1963). Patterson (1982) also pointed out that in precocial species such as the domestic fowl and many ducks, the female takes complete charge of the brood from the time of hatching leading the young to food, but not feeding them directly.

In the present study the female of lesser whistling duck do not feed their broods and hatchlings were observed to feed themselves. In lesser whistling duck eggs were observed to hatch successfully. In the present study the breeding success at Paleik In were observed that 83.14% of the egg hatched. Most of the ducklings disappeared while they are still young. The number of survived ducklings decreased most rapidly in the first week of life and survival rate after three weeks of age was high. This pattern of increasing good survival with age is fairly general among Anatidae (Patterson, 1982).

During the year 2007, some of the hatchlings disappeared and some died. The number of surviving hatchling decreased in the second week of life were also recorded in the present study. Reproductive success of *D. javanica* at Paleik In has been estimated by observation data of nests in 2007. Predation and flooding were the major cause of nest, egg and hatchling destruction of lesser whistling duck at Paleik In. A total of 12 nests, 87 eggs and 49 hatchlings were found in the study period of 2007. Among these six nests (50%) and 49 hatchlings (56.32%) were observed as successful.

## V. CONCLUSION

Paleik In is a moderately large natural wetland. Many different kinds of waterbirds were found in this In . They can get enough food supply. In Myanmar, information on the breeding ecology of waterbirds at Paleik In is little known. With a little knowledge on the breeding ecology of waterbirds their conservation is not possible and problematic and thus to study the ecology of waterbirds needed.

## ACKNOWLEDGMENT

I am indebted to Dr. Mie Mie Sein, Professor and Head of the Department of Zoology, Mandalay University for accepting the research topic and providing facilities of the department. Thanks are also due to Dr. Si Si Hla Bu, Professor of the Department of Zoology, Mandalay University for her constant encouragement. I am also gratefully indebted to Dr. Khin Mya Mya, Professor and Head (Rtd.) of the Department of Zoology, Mandalay University for her close supervision and critical reading of the manuscript.

## REFERENCES

- [1] Gill, F. B. (2001). *Ornithology*. 2nd ed. W. H. Freeman and company. New York 766 pp.
- [2] Parejo, D., J.M. Sanchez and J.M. Aviles (1999). Factors affecting the nest height of three heron species in heronries in the south west of Spain. *Journal of Ardeola*. **46(2)**:227-230.
- [3] Patterson, I.J. (1982). *The shelduck. A study in behavior ecology*. Cambridge University press. pp. 106-210.
- [4] Scott, A. (1997). Relationships between waterbirds ecology and river flows in the Murray Darling Basin. CSIRO Land and Water; Australia. 486 pp.
- [5] Smythies, B.E. (1940-1986). *The Birds of Burma* Oliver and Boyd Ltd. Edinburgh, London. pp. 19-30.
- [6] Wallace, G.J. (1963). *An introduction to ornithology*. the Macmillian Company. New York pp. 190-230.
- [7] Wetly, J.C. (1982). *The life of birds 3<sup>rd</sup> ed.* CBS College. WB Saunder Company, New York. pp. 315-367.

## AUTHOR

First Author- Nwe Nwe Khaing, Associate Professor, Department Of Biology, Sagaing University Of Education, Sagaing Division, Myanmar

Second Author- Khin Mya Mya, Professor and Head (Rtd.), Department of Zoology, Mandalay University, Myanmar

Corresponding Author- Nwe Nwe Khaing\*

email: [drnwekhaing@gmail.com](mailto:drnwekhaing@gmail.com)

