Екологія	Беркут	17	Вип. 1-2	2008	38 - 40

FACTORS AFFECTING NEST AND HATCHING SUCCESS OF MALLARD IN HOKERSAR WETLAND, KASHMIR

Fayaz Ahmad Ahangar, G. Mustafa Shah, Ulfat Jan, Javid A. Wani

Abstract. 41 Mallard nests containing 326 eggs were found during the two year study period (2004–2005) in Hokersar wetland. 17 nests failed completely to hatch. Overall nest success was 58.5%. The various factors responsible for nest failure were the abandonment of nest by the female (17.1% of the nests), flooding (9.8%) and predation (14.6%). 174 eggs hatched successfully. Overall hatching success was 53.4%. The various factors responsible for low hatching success were predation (15.7% of eggs), abandonment of nests by the female (14.1%), flooding (11.0%) and faulty incubation and infertility (5.8%).

Key words: Mallard, *Anas platyrhynchos*, breeding, nest, egg, predation, abandonment.

Address: F.A. Ahangar, Pandach Ganderbal P.O. Naseembagh Srinagar, Kashmir, 190006 India;
e-mail: fayaz_sultan@yahoo.co.in.

Факторы, влияющие на успешность размножения кряквы на озере Хокерсар (Кашмир). - Ф.А. Ахангар, Г.М. Шах, У. Джан, Дж.А. Вани. - Беркут. 17 (1-2). 2008. - Всего в 2004–2005 гг. обнаружено 41 гнездо с 326 яйцами. 17 гнезд погибли до вылупления птенцов. Общая успешность гнездования составила 58,5%. Причинами гибели гнезд были оставление гнезда самкой (17,1% гнезд), затопление (9,8%), хищничество (14,6%). Из 174 яиц вылупились птенцы. Общая успешность вылупления составила 53,4%. Основные причины гибели яиц: хищничество (15,7% яиц), оставление гнезда самкой (14,1%), затапливание (11,0%), нарушения инкубации и неоплодотворенность яиц (5,8%).

Introduction

Mallard (*Anas platyrhynchos*) is the only wild duck that presently breeds in Kashmir. It is the only territory within Indian limits where Mallard breeds (Bates, Lowther, 1952). Almost more than a century ago this bird used to breed in wetlands and lakes of Kashmir in large numbers (Bates, Lowther, 1952).

With destruction of wetland habitat in general and nesting sites of the bird in particular, illegal egg collection and unfriendly attitude of man, the bird altogether abandoned its breeding in Kashmir and restricted itself to the valley only for wintering.

However, in the recent years Mallard has started breeding in Kashmir once again although in limited numbers.

Studies on various aspects of breeding of Mallard were carried out in order to have an appraisal of its various breeding parameters so as to suggest conservational measures. The present paper discusses the observations made on nest success and hatching success and the factors affecting them.

Study area

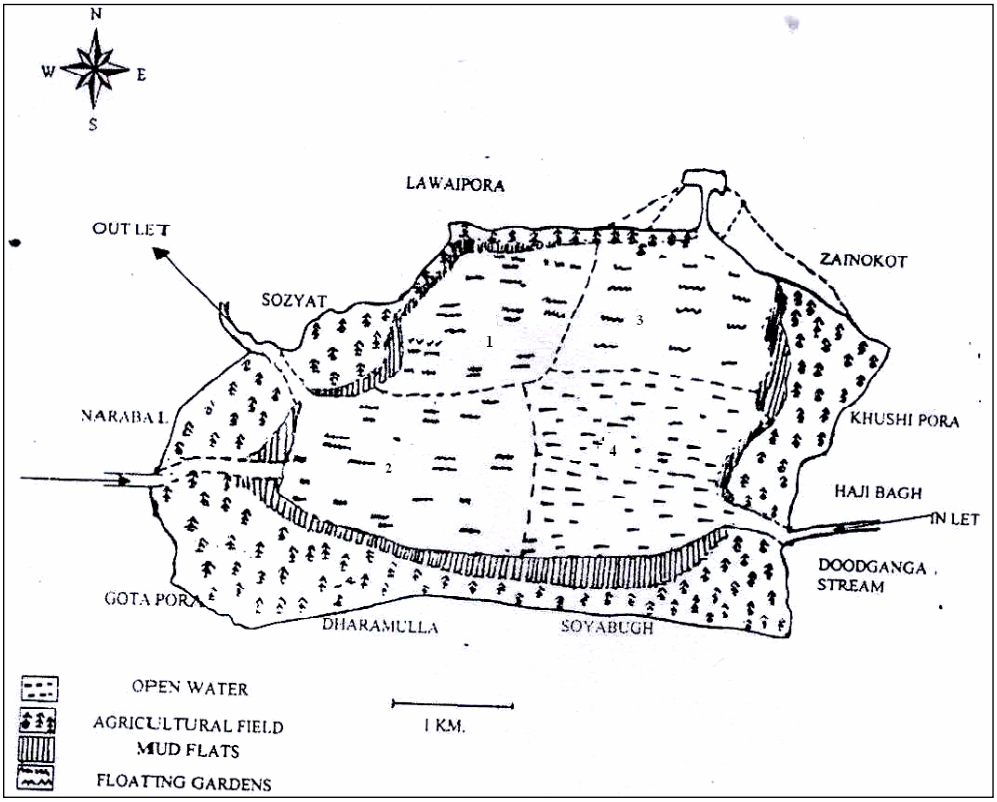
Hokersar is an important and well-protected reserve for ducks and geese managed by Jammu and Kashmir Wildlife Protection Department. The wetland is located about 10 km to the west of Srinagar on Srinagar – Baramullah highway. The wetland is more or less semicircular in outline with an area of about 5 km^2.

Methods

The present study was carried out for a period of two years (2004 and 2005).

Tall and dense macrophytic vegetation, willow (S*alix* sp.) bushes and hollows of old willows were thoroughly searched during breeding season to detect nests. Nests were also detected by flushing of ducks by gently disturbing the macrophytic vegetation and willow bushes (Klett et al., 1988).

A nest was defined as any depression in which the bird laid one or more eggs (Miller, Johnson, 1978).



Study area Район исследований

At each nest, type and height of vegetation cover, shape, size, structure and position of the nest and its concealing arrangement was recorded (Shah, 1984).

Slender willow stakes flagged with strips of cloth were used to mark nest locations so that the nests could be relocated (Klett et al., 1988). For the determination of nest success and hatching success, the nests were followed till the hatching or the period till nest was live.

Nest and hatching success was calculated as per Teal (1965):

$$\frac{NS}{NS + NU} 100$$

where NS – number of successful nests, NU – number of unsuccessful nests.

Hatching success was calculated as per Shah (1984):

(Eggs hatched x 100) / Eggs observed.

Table 1

Nest success of Mallard in Hokersar
Успешность гнездования кряквы на оз. Хокерсар

Year	N	Successful nests		Abandoned nests		Flooded nests		Predated nests	
		n	%	n	%	n	%	n	%
2004	19	9	47.4	4	21.1	3	15.8	3	15.8
2005	22	15	68.2	3	13.6	1	4.5	3	13.6
Total	41	24	58.5	7	17.1	4	9.8	6	14.6

Table 2

Hatching success of Mallard in Hokersar
Успешность вылупления кряквы на оз. Хокерсар

Year	N	Eggs hatched		Faulty incubation & infertility		Abandonment		Flooding		Predation	
		n	%	n	%	n	%	n	%	n	%
2004	154	70	45.5	4	2.6	28	18.2	28	18.2	24	15.6
2005	172	104	60.5	15	8.7	18	10.5	8	4.6	27	15.7
Total	326	174	53.5	19	5.8	46	14.1	36	11.0	51	15.7

Results and Discussion

Nest success

In total 41 nests were studied, 19 – in 2004 and 22 – in 2005. 17 nests failed completely to hatch. Nesting success for the year 2004 and 2005 was 47.4% and 68.2% respectively, the overall nest success was 58.5% (Table 1).

Hatching success

326 eggs from 41 nests were used for hatching success calculations: 154 eggs from 19 nests in 2004 and 172 from 22 nests in 2005. Hatching success was 45.5% for the year 2004 and 60.5% for the year 2005. The overall hatching success for the two years was 53.4% (Table 2).

Predation was one of the main causes of nest failure. Among the avian predators, Common Crow (*Corvus splendens*) and Black Kite (*Milvus migrans*) were the principal egg predators. Shah (1984) also found the Common Crow and Black Kite to be the main egg predators of Common Moorhen (*Gallinula chloropus*) in wetlands of Kashmir

The eggs were most vulnerable to predators during early part of the breeding season when the macrophytic vegetation surrounding the nests had not attained sufficient height to fully conceal the nests. Hill (1984) also reported that proportion of Mallard and Tufted Duck (*Aythya fuligula*) nests destroyed by predators generally decreased as the minimum vegetation height around the nest increased. Predation on nests has been found to be the main factor for decreased nest success in Mallards in North America (Greenwood et al., 1995; Beauchamp et al., 1996)

Abandonment (desertion of the nests or eggs) by the female was other major factor responsible for egg loss. Abandonment of eggs may have been caused by several reasons like the disturbance of nest, disturbance of the duck at the nest, poaching or predation of the duck etc. Greenwood et al (1987, 1995) found that 14% of Mallard nests were lost to abandonment.

REFERENCES

Bates R.S.P., Lowther E.H.N. (1952): Breeding birds of Kashmir. London: Oxford Univ. Press. 1-367.

Beauchamp W.D., Koford R.R., Nudds T.D., Clark R.G., Johnson H.D. (1996): Long term declines in nest success of prairie ducks. - J. Wildlife Manag. 60: 247-257.

Greenwood R.J., Sargeant A.B., Johnson D.H., Cowardin L.M., Shaffer T.L. (1987): Mallard nest success and recruitment in Praire Canada. - Trans. N. Am. Wildl. Nat. Resour. Conf. 52: 298-309.

Greenwood R.J., Sargeant A.B., Johnson D.H., Cowardin L.M., Shaffer T.L. (1995): Factors associated with duck nest success in Prairie pathole region of Canada. - Wildlife monographs. 128: 1-57.

Hill D.A. (1984): Clutch predation in relation to nest density in mallard and tufted duck. - Wildfowl. 35: 151-156.

Klett A.T., Terry L.S., Douglas H.J. (1988): Duck nest success in the Prairie Pathole region. - J. Wildlife Manag. 52 (3): 431-440.

Miller H.W., Johnson D.H. (1978): Interpreting the results of nesting studies. - J. Wildl. Manag. 42: 471-476.

Shah G.M. (1984): Birds of Hokersar: food, feeding and breeding biology of resident and non-resident birds. PhD thesis, P. G. Department of Zoology, University of Kashmir.

Teal M.J. (1965): Nesting success of egrets and herons in Georgia. - The Wilson Bulletin. 77 (3): 257-263.