BIRD POPULATIONS

A journal of global avian biogeography

Volume 13 2014

Bird Populations 13:1-5

TEMPORAL VARIATION OF COLONIAL NESTING WATERBIRDS IN EASTERN UGANDA[1]

SARAH NACHUHA[2] AND IMRAN EJOTRE

Islamic University in Uganda
Department of Environmental Science
P.O. Box, 2555, Mbale, Uganda

Abstract. The aim of this study was to investigate temporal variations in the populations of tree nesting colonial waterbirds in eastern Uganda. Counts of breeding pairs were made during a six year period: 2005 and 2008 to 2012. Eight waterbird species namely, Cattle Egret *Bubulcus ibis*, Pink-backed Pelican *Pelecanus carbo*, Sacred Ibis *Threskiornis aethiopica*, Yellow-billed Stork *Mycteria ibis*, African Spoonbill *Platalea alba*, Long-tailed Cormorant *Phalacrocorax africanus*, Little Egret *Egretta garzetta* and the Black-headed Heron *Ardea melanocephala*, were recorded breeding. There was a decline in the number of nesting sites and breeding pairs over time. The possible cause of this decline is the cutting down of nesting trees by man, particularly because most waterbirds chose to nest on the Mvule tree *Milicia excelsa* that is also a very good source of timber for the local communities. Except *Pelicanus carbo*, all the other waterbird species recorded breeding seem to have adapted to this habitat loss by nesting on other tree species like Cassia *Cassia spectabilis* and Mango *Mangifera indica* L. It is therefore desirable to find out how *Pelicanus carbo* is coping with this habitat loss.

Key words: breeding, colonial birds, Uganda, temporal, waterbirds, *Milicia excelsa*

VARIACIÓN TEMPORAL EN AVES ACUÁTICAS NIDIFICANTES DEL ESTE DE UGANDA

Resumen. El objetivo de este estudio fue investigar la variación temporal en las poblaciones de tres aves acuáticas coloniales en el este de Uganda. Se llevaron a cabo conteos de parejas reproductoras durante un periodo de seis años, 2005 y de 2008 a 2012. Las ocho especies reproductoras fueron la garcilla bueyera *Bubulcus ibis*, Pelícano rosado *Pelecanus carbo*, ibis sagrado *Threskiornis aethiopicus*, tántalo africano *Mycteria ibis*, espátula africana *Platalea alba*, cormorán africano *Phalacrocorax africanus*, garceta común *Egretta garzetta* y garza cabecinegra *Ardea melanocephala*. Hubo un declive en el número de lugares de anidación y parejas

[1]Received 24 Oct 2013; accepted 23 Dec 2013

[2]Corresponding author, email: snachuha@yahoo.com

reproductoras. La causa probable de este declive es la tala de árboles de anidación por parte del hombre, ya que la mayoría de las aves eligen para anidar el árbol Mvule *Milicia excelsa* utilizado para leña en las comunidades locales. Exceptuando *Pelecanus carbo*, las demás especies parecen haberse adaptado a esta pérdida de hábitat anidando en otras especies, como *Cassia spectabilis* o *Mangifera indica*. Sería conveniente determinar si *Pelecanus carbo* es capaz de lidiar con esta pérdida de hábitat.

Palabras clave: reproducción, aves coloniales, Uganda, temporal, aves acuáticas, *Milicia excelsa*

INTRODUCTION

Many factors including the activities of humans transform habitats and this may change the patterns of resource availability thus influencing the way in which organisms use such habitats. The distribution and size of waterbird colonies are commonly governed by the availability of suitable nesting sites (Kelly et al. 1993) and habitat composition around nesting sites (Beaver et al. 1980, Gibbs et al. 1987, Fasola and Alieri 1992). Fluctuations and trends in the population of colonial nesting waterbirds has been found to be caused by both natural and human induced events (Schogolev 1996). Earlier studies in eastern Uganda have showed that the size and location of waterbird breeding colonies is determined mainly by the number of trees available (Nachuha 2006, Nachuha and Ejotre 2011, Nachuha and Quinn 2012). The objective of this study was therefore to investigate temporal variations in the abundance of tree nesting colonial waterbirds in eastern Uganda.

MATERIALS AND METHODS

DATA COLLECTION

Tree-by-tree direct nest counts were made from the ground with the aid of a telescope. Visibility was good because most colonies were in well-spaced trees, most of which had lost some or all of their leaves. Nest counts were made in the morning when many birds were active and visible (usually between 07:00-09:00h) and all nests were recorded. Data were collected between February and August in all six years of survey. Nesting trees at the colonies were identified to species level and counted.

DATA ANALYSIS

Tree and nest abundance were calculated for each year and the results were tabulated. Considering that waterbird species are affected differently by changing environmental conditions, we also calculated the number of nests per individual species to establish the interspecies variations across the years.

RESULTS

Results indicate that the number of breeding sites reduced from 18 in 2005 to eight in 2008-2012 resulting in the reduction in the number of total nests from 2152 nests to 1648 (Table 1). A total of eight waterbird species, namely, Yellow-billed Stork *Mycteria ibis*, Sacred Ibis *Threskiornis aethiopica*, Pink-backed Pelican *Pelicanus carbo*, Long-tailed Cormorant *Phalacrocorax africanus*,

TABLE 1. Variation in the overall abundance of nests across the six years.

Year	No. of colonies	No. of bird species	Total nests
2005	18	6	2152
2008	8	8	1235
2009	8	8	1388
2010	8	8	1245
2011	8	8	1087
2012	8	8	1648

Little Egret *Egretta garzetta*, Cattle Egret *Bubulcus ibis*, Black-headed Heron *Ardea melanocephala* and the African Spoonbill *Platalea alba*, were recorded breeding over the six year period. However, the Little Egret and Long-tailed Cormorant were not recorded in 2005 (Figure 1). These waterbirds bred on six different tree species across the colonies, namely, Cassia *Cassia spectabilis*, Jambula *Syzygium guineense*, Mango *Mangifera indica L*, Musambya *Markhamia lutea*, Mvule *Milicia excelsea* and Fig *Ficus sycomoru*. Results indicate that there was a decline in the usage of Mvule trees and an increase in that of other tree species over time (Table 2). The abundance of each species varied across the years, with highest numbers being recorded in 2005. Waterbirds such as the Pink-backed Pelican showed a consistent decline during the study period, the Yellow-billed Stork and the Sacred Ibis showed stable populations while the African Spoonbill, Black-headed Heron and Cattle Egret showed a minimal fluctuating pattern. Having been first recorded in 2008, the Little Egret also showed a stable population while the abundance of the Long-tailed Cormorant increased over time (See also Figure 2).

DISCUSSION

The number of breeding colonies and nests reduced over time. This decline is attributed to human disturbance (personal observation, also see Nachuha 2006; Nachuha and Ejotre 2011, Nachuha and Quinn 2012). Considering that

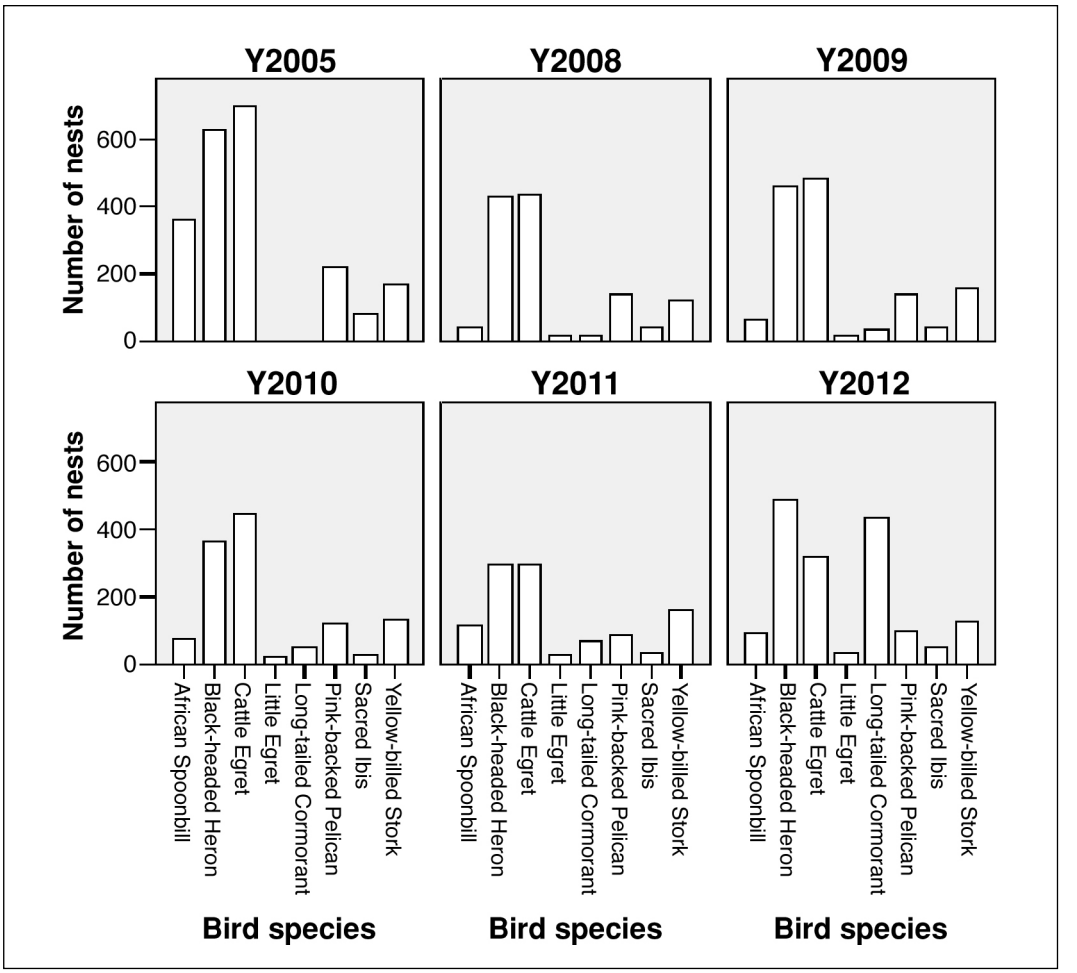

FIGURE 1. Temporal variation in species composition. Y =Year

Table 2. Variation in the number of nests and tree stands across the years

Tree type (common name)	Number of nests and tree stands					
	2005	2008	2009	2010	2011	2012
Cassia	305 (2)	101 (1)	111 (2)	105 (4)	123 (4)	86 (4)
Jambula	38 (1)	56 (0)	77 (2)	80 (3)	127 (3)	327 (3)
Mango	82 (1)	69 (1)	61 (2)	120 (4)	219 (4)	307 (3)
Musambya	0 (0)	0 (1)	11 (1)	11 (1)	8 (1)	00 (1)
Fig	103 (2)	38 (1)	38 (1)	33 (2)	36 (2)	31 (2)
Mvule	1624 (16)	964 (10)	1090 (10)	896 (8)	574 (8)	897 (8)

Note: Numbers in bracket indicate the tree stands per species on which waterbird nests were recorded

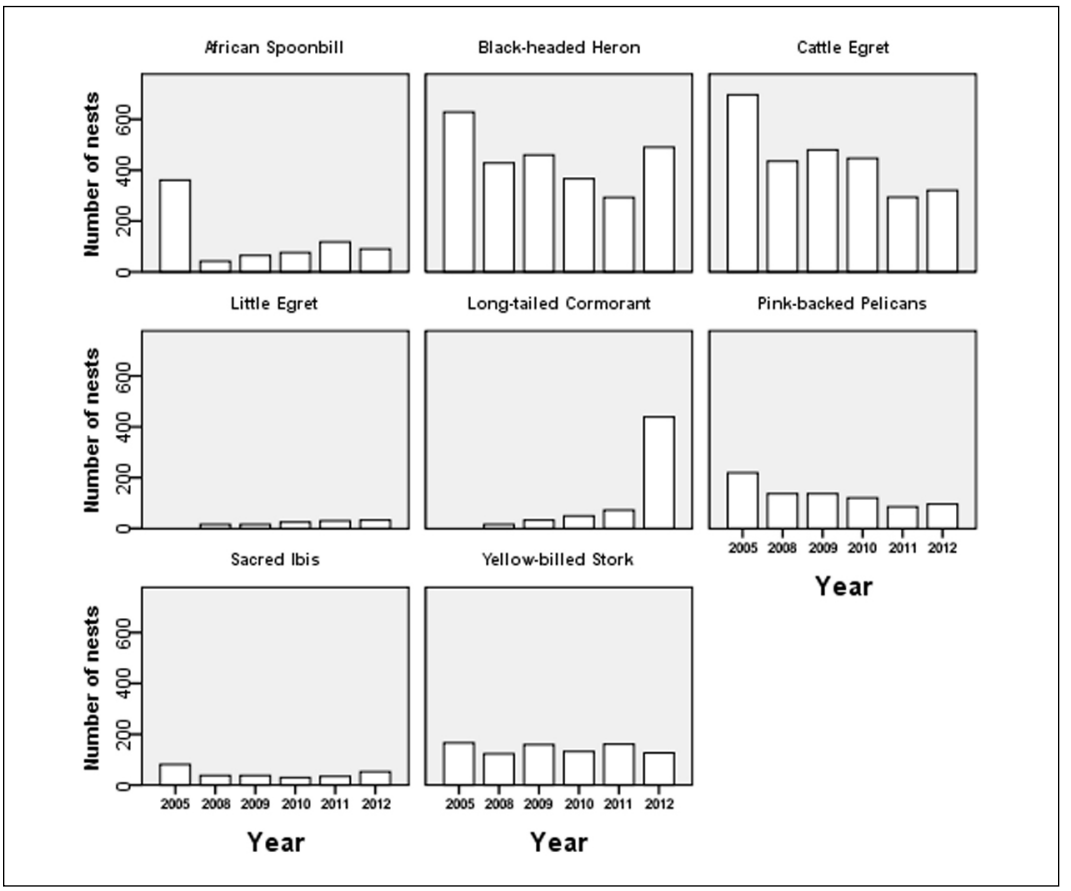

FIGURE 2. Temporal variation in nest abundance of each species.

Milicia excelsa is a hardwood tree species, it provides one of the best timbers and therefore the local community in this area cut them down for this purpose. In addition, most of the breeding sites were located within a few meters of human settlements, including towns, similar to what has been observed in India (Subramanya 1996) and Pakistan (Roberts 1991). This distribution makes these trees very vulnerable as the towns and the human populations in these

towns expand. This is likely to be a general problem in Africa as evidenced from another study by Skinner et al. (1987) in the Niger Delta, where the population of breeding Ciconiiformes and Pelicaniformes declined when the woodlands they were nesting in were cleared to provide land for rice cultivation.

The Pink-backed Pelican nested exclusively on the Mvule trees; therefore the decline in their breeding population was as a result of loss of the nesting trees. The minor population fluctuations of the Cattle Egrets and Black-headed Herons is presumably because they are generalists and can adapt to changing environments (Fasola 1994). For example, they have opted to place their nests on other tree species present at the colony. The increase in the population size of the Long-tailed Cormorant could be attributed to the seasonal floods that are becoming common whenever the rains start. These floods come along with aquatic organisms such as fish, frogs and insects that serve as food for the cormorant. It is clear from these results that the waterbird breeding population in eastern Uganda is highly threatened mainly due to habitat loss. If this trend continues, then the Pink-backed Pelican would be challenged to find an alternative site considering that there are hardly any Mvule trees left in the eastern Uganda landscape, and if there are any, they may not be located in strategic places that will enable quick and easy access to food. The other bird species seem to be coping by nesting on alternative tree species although there is no guarantee that these will not be the next to be logged. We have, however, engaged the local authorities to prevent further loss of these trees.

ACKNOWLEDGEMENTS

The study is part of the monitoring efforts by *Nature*Uganda, the Birdlife International partner in Uganda. We thank the local authorities of Mbale and Butaleja districts for providing protection to the remaining nesting trees especially the Mvule. Comments from Derek Pomeroy greatly improved the manuscript.

REFERENCES

BEAVER, D. L., R G. OSBORN, AND T. W. CUSTER. 1980. Nest-Site and Colony Characteristics of Wading Birds in Selected Atlantic Coast Colonies. Wilson Bulletin 92:200-220.

FASOLA, M. 1994. Opportunistic use of foraging resources by heron communities in Southern Europe. Ecography 17:113-123.

FASOLA, M., AND R. ALIERI. 1992. Conservation of heronry sites in North Italian agricultural landscapes. Biological Conservation 62:219-228.

KELLY J. P., H. M. PRATT, AND P. L. GREENE. 1993. The distribution, reproductive success, and habitat characteristics of heron and Egret breeding colonies in the San Francisco Bay area. Colonial Waterbirds 16:18-27.

NACHUHA, S. 2006. Explaining distribution patterns of waterbirds on rice paddies and other wetlands in eastern Uganda. Ph.D. thesis, Oxford University, Oxford, U.K.

NACHUHA, S., AND J. QUINN. 2012. The Distribution of Colonial Waterbirds in relation to a Ugandan rice scheme. Waterbirds 35:590-598.

NACHUHA, S., AND I. EJOTRE. 2011. The Conservation potential of the Mvule tree as a breeding habitat for waterbirds in Eastern Uganda. P. 10-13 *In*: Skeen, R., D. Pomeroy, M. Opige, and A. Byaruhanga (eds), Proceedings of the 1st *Nature*-Uganda Conservation Conference, 2009, Vol. 1, Series no. 8. Kampala, Uganda.

ROBERTS, T. J. 1991. The birds of Pakistan. Vol. 1. Oxford University Press, Oxford, U.K.

SKINNER, J., J.P. WALLACE, A. WIBE, AND B. FOFANA. 1987. The status of heron colonies in the Inner Niger Delta Mali. Malimbus 9:65-83.

SUBRAMANYA, S. 1996. Distribution, status and conservation of Indian herons. Journal of Bombay Natural History Society 93:459-486.

SCHOGOLEV, I.V. 1996. Fluctuations and trends in breeding populations of colonial waterbirds in the Dnester Delta, Ukraine, Black Sea. Colonial Waterbirds 19 (Special publications 1):91-97.