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# A MAJOR WATERBIRD BREEDING COLONY AT LAKE UREMA, GORONGOSA NATIONAL PARK, MOÇAMBIQUE

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**S**talmans, M., Davies, G.B.P., Trollip, J. & Poole, G. 2014. A major waterbird breeding colony at Lake Urema, Gorongosa National Park, Moçambique. *Durban Natural Science Museum Novitates* 37: 54-57. A very large breeding colony of eight waterbird species, comprising 5003 nests and active over March and April 2014 in flooded (0.5-1 m deep), open *Faidherbia-Acacia* woodland, is described from Lake Urema, Gorongosa National Park, Moçambique. The colony contained breeding Yellow-billed Stork *Mycteria ibis* (983 nests), African Openbill *Anastomus lamelligerus* (531 nests), Reed Cormorant *Phalacrocorax africanus* (2276 nests), African Darter *Anhinga rufa* (547 nests), Great Egret *Egretta alba* (330 nests), White-breasted Cormorant (230 nests), Grey Heron *Ardea cinerea* (82 nests) and African Sacred Ibis *Threskiornis aethiopicus* (24 nests). The number of Yellow-billed Storks and African Darters present during the 2014 count exceeds the 1% criterion for listing as a Ramsar site of international importance.

KEYWORDS: Gorongosa, heronry, Moçambique, nests, waterbirds.

## INTRODUCTION

This note provides quantitative data on a large waterbird breeding colony ('heronry') on Lake Urema, Gorongosa National Park, Sofala Province, Moçambique. Although there have been tangential references to significant numbers of waterbirds breeding and feeding on Lake Urema in the past (e.g. Tinley 1971), there have been no published counts of the waterbirds, as far as we are aware, and Parker (2001: 635) observed that "the wetlands in the National Park have not been comprehensively surveyed [for birds]". The size of the breeding colony documented below indicates that Lake Urema is a significant nesting site for certain waterbirds.

Lake Urema is a shallow, permanent lake (ca 1.6 m deep) located within the Urema Graben, a continuation of the East African Rift System. The extent of the lake fluctuates widely between ca 10-25 km<sup>2</sup>, with extreme flooding events of up to ca 105 km<sup>2</sup>, dependent on seasonal rainfall, annual flooding by the Vunduzi and Nhandue rivers, and groundwater recharging (Tinley 1977: 31-33, plate 22; Böhme et al. 2006). The lake has a large, seasonally-inundated floodplain (*tando*) on its perimeter. Maximal flooding of the lake and adjoining floodplain occurs between January-March (Tinley 1977: 145).

On 7 April 2014 a detailed count was undertaken by the authors of a large waterbird colony discovered on the lake edge. The nesting

trees were counted from a boat within ca 20 - 100 m of the colony. All nests were individually counted per nesting tree and per species.

## RESULTS

The colony was located at the south-east corner of Lake Urema (Fig. 1) and extended across a distance of 1.6 km from 18° 54' 2.4" S; 34° 30' 1.7" E to 18° 54' 38.1" S; 34° 30' 44.3" E (covering approximately 15 ha). Nesting activity in the colony was initially detected in early March 2014 when the area was first accessed. The birds nested in open, flooded woodland dominated by ana trees *Faidherbia albida*, fever trees *Acacia xanthophloea* and paper-bark acacias *A. sieberana* (Figs 2 and 3). Only *F. albida* trees seemed to be used for nesting. During the April survey, these trees were standing in water that was 0.5 to 1.0 m deep (Figs 2 and 3). Ground observations of water and mud marks on the nesting trees during the 2014 dry season indicated that maximum flood levels (probably attained in February and March) had been approximately 2 m deep.

Eight species of medium- to large-bodied waterbirds were found nesting at the colony during the count of 7 April (e.g. Figs 4 and 5) with a total of 5003 active nests in 463 trees. Reed Cormorants *Phalacrocorax africanus* exceeded 2000 active nests and Yellow-billed Storks *Mycteria ibis* approached 1000 active nests (Table 1).



Fig. 1. Map of Gorongosa National Park, Mozambique, showing the location of Lake Urema and the waterbird breeding colony described in this paper.

Assuming that each nest represented a pair of birds, the Urema colony contained approximately 10,000 breeding waterbirds.

More than 30% of the nesting trees held three or more species of birds (Table 2). A maximum of five nesting species were recorded per breeding tree. The maximum number of nests recorded for a single breeding tree was 58, mostly Reed Cormorants. Some vertical stratification of the birds was observed, with Reed Cormorants occupying the higher, thinner branches and African Openbill *Anastomus lamelligerus* being found on the lowest branches.

Although the colony was active since at least early March, breeding was staggered for the respective species. African Sacred Ibis *Threskiornis aethiopicus* were only observed starting to nest a week before the survey, i.e. late March. On the other hand, by the time of the survey, the chicks of African Darter *Anhinga rufa* and Great Egret *Egretta alba* were well grown, whereas Yellow-billed Storks were only starting to hatch. The nesting birds were relaxed and allowed approach within 30 m or less of the nesting trees by the boat, except for some diving by African Darters at the northern end of the colony.

**DISCUSSION**

The above figures indicate that Lake Urema is a highly significant waterbird breeding locality. The attributes that make Urema attractive as a breeding locality are probably the large amounts of food (fish and aquatic invertebrates) provided by the lake and the receding flood waters of the adjacent floodplain, as well as the protection from disturbance provided by its location deep within the national park. There is very little past information on this Urema colony, but informal observations by the authors between 2009 and 2013 indicate that the site is an annually active colony and not an episodic occurrence. Currently, there are no direct threats to the breeding colony as the site is at least 20-25 km from any human settlements (e.g. Muanza town), except for the park headquarters (Chitengo), which lie approximately 17 km to the south-west. The general area is also patrolled by the park's game guards.



Fig. 2. Representative view of the Lake Urema waterbird breeding colony situated in leafless *Faidherbia* trees in flooded water. Waterbird species breeding in the area pictured include Yellow-billed Stork, African Sacred Ibis and Reed Cormorant (photo Piotr Naskrecki).

In Mozambique, aside from Gorongosa, significant numbers of waterbirds also nest in the 11,000 km<sup>2</sup> Marromeu Complex, Zambezi Delta (Dutton 1987; Beilfuss & Bento 1998; Bento 2000). Indications are that nesting waterbird numbers at Marromeu exceed those of Lake Urema (R. Beilfuss *in litt.*) as “three immense breeding colonies of storks and herons” have been observed in the central part of that massive wetland (Beilfuss & Bento 1998). When flooded, the ephemeral Banhine wetland (6588 ha) in Gaza Province (Stalmans & Wishart 2005) also attracts very large numbers of nesting waterbirds (Pietersen & Pietersen 2010; D.W. Pietersen pers. comm.) but detailed counts are not yet available from that wetland. It should also be borne in mind that many significant wetlands in Mozambique remain poorly surveyed or completely unknown for nesting waterbirds, e.g. large coastal wetlands in northern Mozambique. Nonetheless, even if comprehensive data were to become available from these other wetlands, it is still likely that Lake Urema would rank highly.

The breeding colony at Lake Urema is also large when compared against ‘heronries’ in Botswana (e.g. Tyler & Hancock 2006; Tyler 2011; Brown 2012; Muller & Flatt 2013), Zambia (e.g. Leonard 2001, 2005; Dowsett *et al.* 2008) and Tanzania (Baker & Baker 2001), with the caveat that many major wetlands in Zambia (e.g. Lukanga Swamps) and Tanzania (e.g. Wembere Steppe) are largely inaccessible when flooded and the full extent of regular waterbird breeding in such wetlands is inadequately known.



Fig. 3. General aspect of the Lake Urema waterbird breeding colony showing extensive flooding of open, largely leafless, woodland and including a view of the boat used to visit the colony (photo Bob Poole).

**Table 1.** Results of count of colonial waterbirds breeding at Lake Urema, Gorongosa National Park, on 7 April 2014.

Species	No. of nests	No. trees with nests	Average nests/tree	Max. nests per tree
African Darter <i>Anhinga rufa</i>	547	118	4.6	25
Reed Cormorant <i>Phalacrocorax africanus</i>	2276	219	10.4	53
White-breasted Cormorant <i>P.lucidus</i>	230	54	4.3	22
Great Egret <i>Egretta alba</i>	330	131	2.5	12
Grey Heron <i>Ardea cinerea</i>	82	66	1.2	3
African Sacred Ibis <i>Threskiornis aethiopicus</i>	24	4	6.0	12
African Openbill <i>Anastomus lamelligerus</i>	531	112	4.7	13
Yellow-billed Stork <i>Mycteria ibis</i>	983	259	3.8	23
Total (all species)	5003	463	10.8	58

**Table 2.** Number of bird species per nesting tree.

Number of bird species per tree	Frequency of trees (%)
1	35.2
2	31.7
3	23.8
4	8.4
5	0.9

With regard to individual species, the count of nesting Yellow-billed Storks is especially noteworthy. An indication of the relative size of this stork aggregation may be gauged by comparing the number of nests (893) against published data from Botswana, Moçambique, Zambia and Tanzania. The main nesting sites for Yellow-billed Stork in Botswana (e.g. in Moremi Game Reserve and Gadikwe Heronry) have varied between six and 108 nests or breeding pairs (Gaosafelwe *et al.* 1997; Tyler *et al.* 2002; Tyler & Hancock 2006: table 1; Brown 2012), although colonies of “a few hundred” have also been reported from unspecified localities in the Okavango Delta (Anderson 1997). A huge colony of “approximately 500-1000 pairs” of Yellow-billed Storks was observed at one colony in the Marromeu Complex, Zambezi Delta by Beilfuss & Bento (1998). In Zambia, Dowsett *et al.* (2008: 95) reported Yellow-billed Storks nesting in only three areas, with colonies in the Luangwa Valley of “up to 150 pairs”. In Tanzania, approximately 800 breeding pairs were recorded at Lake Manyara in May 2002 (N. Baker per T. Dodman *in litt.*). The large numbers of nesting Yellow-billed Storks at Urema exceeds the 1% Ramsar threshold for sub-Saharan Africa of 870 birds (Wetlands International 2012). The count of 547 African Darter nests (equating to 1094 birds) also just exceeds the 1% Ramsar threshold for this species in

**Fig. 4.** African Openbill nests and adults in the Lake Urema breeding colony (photo Piotr Naskrecki).**Fig. 5.** Yellow-billed and African Openbill stork nests and adults in the Lake Urema breeding colony; African Sacred Ibis also present (photo Piotr Naskrecki).

southern and eastern Africa (1000 birds; Wetlands International 2012). None of the other waterbird nest numbers meet the 1% Ramsar criterion.

To date, the importance of Lake Urema for nesting waterbirds has gone unreported in the ornithological and conservation literature, e.g. neither Clancey (1996) nor Parker (2005) in their synoptic Mozambican works mentioned ‘heronries’ at Lake Urema. The presence of this major waterbird breeding colony also heightens the importance of Gorongosa National Park as a conservation area. Potentially, this wildlife spectacle could also be an important ecotourism drawcard in future and augment the ongoing efforts to rehabilitate the National Park as a leading ecotourism destination and biodiversity sanctuary.

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