Waterbird colony count at Lake Urema,

Gorongosa Nacional Park, Mozambique,

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Summary

The waterbird breeding colony at Lake Urema, Gorongosa National Park, was surveyed on the 14th of April 2025. Overall, 1040 active nests were counted across nine species, African darter (*Anhinga rufa*), Reed cormorant (*Microcarbo africanus*), White-breasted cormorant (*Phalacrocorax lucidus*), Great egret (*Ardea alba*), Black-headed heron (*A. melanocephala*), Grey heron (*A. cinerea*), African sacred ibis (*Threskiornis aethiopicus*), Yellow-billed stork (*Mycteria ibisI*) and African spoonbill (*Platalea alba*).

This count, part of an ongoing monitoring effort since 2014, revealed a substantial decrease (70.3%) in overall nest numbers compared to 2023, likely due to late rains and low lake water levels. Notably, Reed cormorants, Great egrets, Yellow-billed storks, and African openbills experienced the most significant declines, with African openbills not recorded in 2025. Conversely, African spoonbill numbers reached a record high, and Sacred ibis counts returned to 2014 levels, suggesting potentially different breeding phenologies for these species. These findings underscore the sensitivity of the waterbird colony to environmental conditions and highlight the importance of continued monitoring to assess the long-term trends and conservation needs of this important breeding site.

Methodology

The water bird colony is located at the lake Urema, at the approximate location of -18.89975, 34.49866 (Figure 1). Since 2014, when the water levels are sufficiently high to allow for boat access, the Science department team in collaboration with the Turismo da Gorongosa, counts active nests of the waterbird colony between March and April.

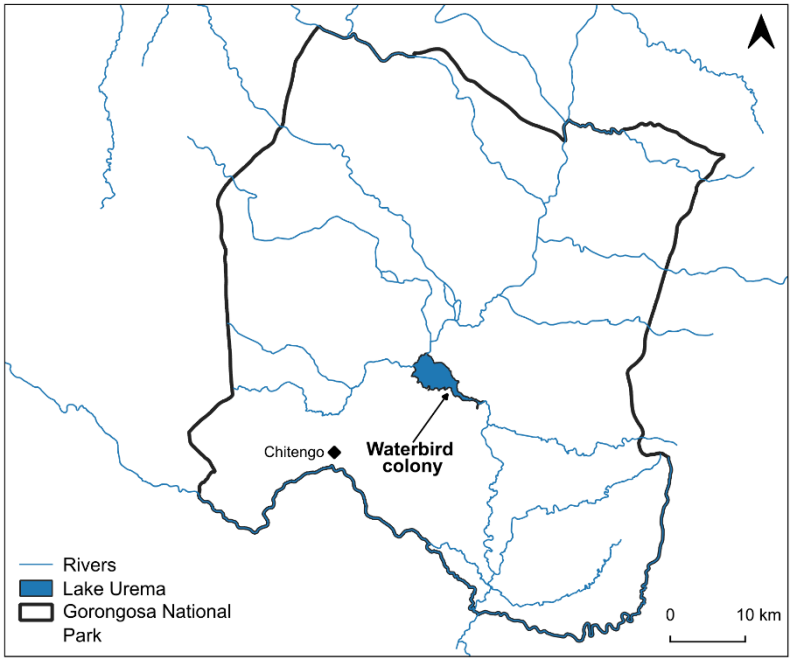

Figure 1 – Map of Gorongosa National Park (Mozambique) showing the location of the waterbird breeding colony, the Urema Lake and the river system.

In 2025 due to the late rains in the region, the lake only sustained enough water to allow boating and hence the count, in April. As such, on the 14th of April 2025, a team of six people (1 skipper, 1 assistant and 4 counters) set up the boat and navigated to the colony during the morning (Figure 2 and 3).

Figure 2 – Boat launch.

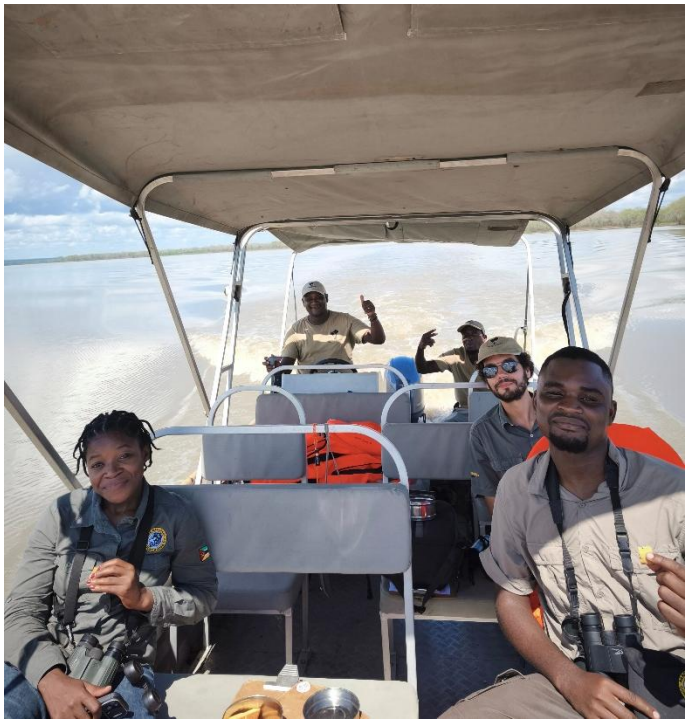

Figure 3 - The team.

Upon arriving to the colony, all the active nests were individually counted per nesting tree and per species to the extent possible. Nests are considered active when there is visible activity on them, when birds are standing or sitting on the nest or if there are chicks present.

Nests were counted from a boat within 20 to 100 m of the colony, always guaranteeing the minimal disturbance of the colony. In some cases, trees were grouped together, in clusters, when difficult to discern the differences between nests on branches within close proximity to each other. The counting methodology is similar to the ones applied in the previous counts in 2014, 2019, 2021 and 2023 (Stalmans et al. 2024, Denlinger et al. 2019, Delinger 2021).

Results

A total of 1040 active nests were recorded from nine different water bird species (Table 1), with the most common species being the African darter and the Yellow-billed stork (Figure 4 and 5). The active nests spread across 127 trees, in 75 recorded clusters. The maximum number of nests per tree was calculated taking into account the tree clusters instead of the individual trees to guarantee accuracy in the numbers.

Table 1 – Results of the count of the waterbird colony breeding at Lake Urema, Gorongosa National Park, on the 14th of April 2025. Nests/tree represents the average number of nests counted per individual tree, considering the number of trees per cluster. *max. nests/bird calculated for the clusters of trees, rather than the total number of trees/cluster.

Species	No. of nests	No. of trees	nests/tree	max. nests/tree *
African darter *Anhinga rufa*	349	64	7.96	63
Reed cormorant *Microcarbo africanus*	4	15	0.59	2
White-breasted cormorant *Phalacrocorax lucidus*	70	13	5.67	18
Great egret *Ardea alba*	20	11	2.84	9
Black-headed heron *A. melanocephala*	5	18	0.50	2
Grey heron *A. cinerea*	6	7	0.93	2
African sacred ibis *Threskiornis aethiopicus*	18	8	2.00	15
African openbill *Anastomus lamelligerus*	0	0	0	0
Yellow-billed stork *Mycteria ibis*	535	80	8.89	52
African spoonbill *Platalea alba*	33	22	1.56	16
Total (all species)	**1040**	**127**	**8.32**	**52**

Figure 4 - African darter (*Anhinga rufa*). Credit: Nuno Cardoso

Figure 5 – Yellow-billed stork (*Mycteria ibis*). Credit: Rita Ramos

The team counted a maximum of four different species per tree, most of them with pairs of African darters, African spoonbills and White-breasted cormorants, and with Black-headed herons or Reed cormorants in fewer numbers. Yellow-billed stork nests occurred usually in trees with this single species present.

There seems to be some a spatial segregation within the colony, with most African darters breeding the in the west of the colony, while the Yellow-billed stork nest is located in the centre of the colony (Figure 6). The same is true for Sacred ibis, which were clustered together is a small number of trees (Figure 6).

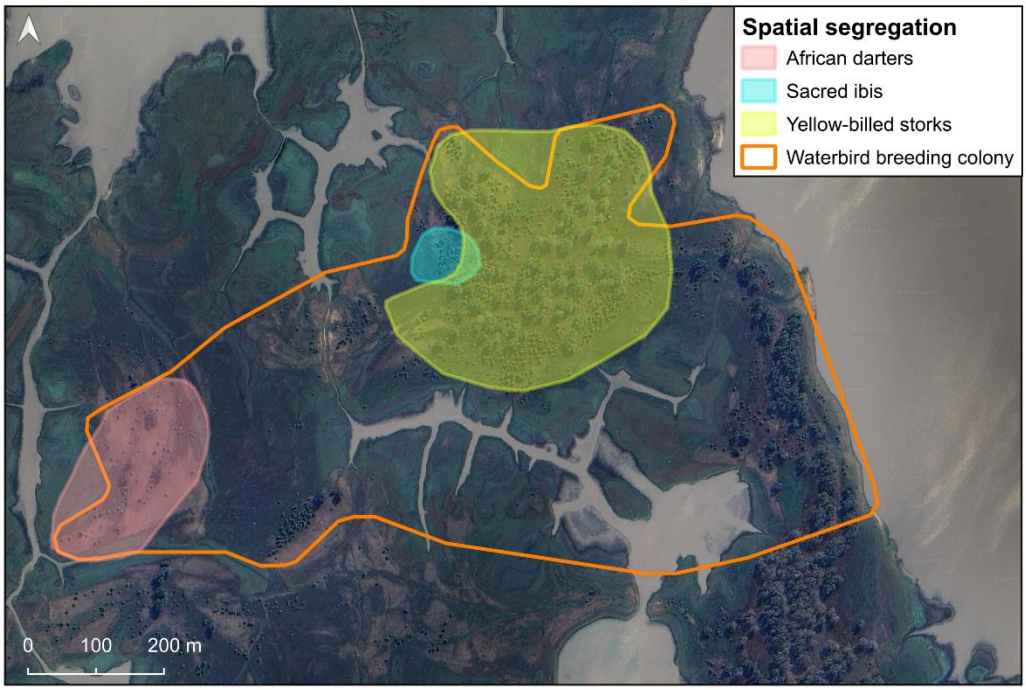

Figure 6 – Map showing the waterbird breeding colony in 2025 and the areas of segregation of some species: African darters in light pink, on the west side; Sacred ibis in blue in a small number of trees, in the centre and, Yellow-billed storks in yellow mostly in the middle of the colony.

Across years species-by-species observations

As mentioned before, the counts were done in 2014, 2019, 2021, 2023 and 2025 (Table 2). Most of the counts occurred in mid to late March however, there were years with two counts and years where the count was only possible in April. In 2019 the first count was done prior to Cyclone Idai. Subsequently, the team decided to do a second count in the days after the cyclone, as water level in the lake changed drastically. As a result, the number reported below are the maximum number of nests counted per species in the two counts. In 2023, the count was also performed twice at end of March and mid-April. The second count was targeted only to Yellow-billed storks due to the low numbers reported in the first count (190 active nests) (Table 2).

In general, the total number of nests was similar between the years, except the count of 2025, which had a third of the nests reported in previous years, especially for Reed cormorants, Great egrets, Grey heron and Yellow-billed storks (Table 2). Moreover, there was no records of Openbill stork in 2025, compared to the high numbers of previous years (Table 2). Contrastingly, 2025 was the year with the highest number of African spoonbills since the counts are done (Table 2).

Table 2 – Summary of the counts in the waterbird breeding colony since 2014

Year	Month	Total	African darter	Reed cormorant	White-breasted cormorant	Great egret	Grey heron	Black-headed heron	Yellow-billed stork	Openbill stork	Sacred ibis	African spoonbill
2014	Start April	5003	547	2276	230	330	82	0	983	531	24	0
2019	End March & mid-April	3864	722	741	308	112	42	9	896	1034	0	0
2021	End March	4382	412	150	153	801	65	0	1281	1502	10	8
2023	End March*	3502	701	428	143	704	58	3	950	515	0	0
2025	Mid April	1040	349	4	70	20	6	5	535	0	18	33

Below we present a more detailed comparison of the 2025 with the previous years of the count, considering the late rains and low water level of the lake.

In 2025, the numbers of African darters were similar with the counts of previous years, although it is lower than any other count. In contrast, Reed cormorant number were very low in 2025, compared with the previous counts, which may be a reflection of the late date of the count, the late rains of the season and the low water level of the lake. The same is true for White-breasted cormorant, although with higher number than Reed cormorants, they are very low (more than half) the numbers of previous years (Figure 7).

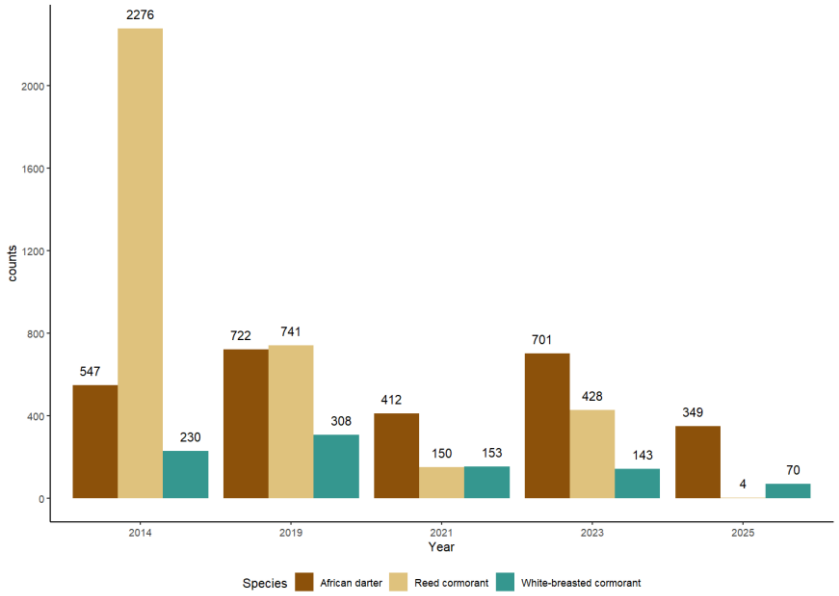

Figure 7 – Number of active nests across the years for African darter, Reed cormorants and White-breasted cormorant.

The number of Great egrets detected in 2025 was almost residual when compared to previous years. Moreover, the majority of the nests had grown chicks and almost no adult present near the nests or in the colonies (Figure 8). Grey herons add low numbers in 2025 although with smaller differences with previous counts. As for Black-headed herons, the numbers were low but similar with other years (2019 and 2023) (Figure 8).

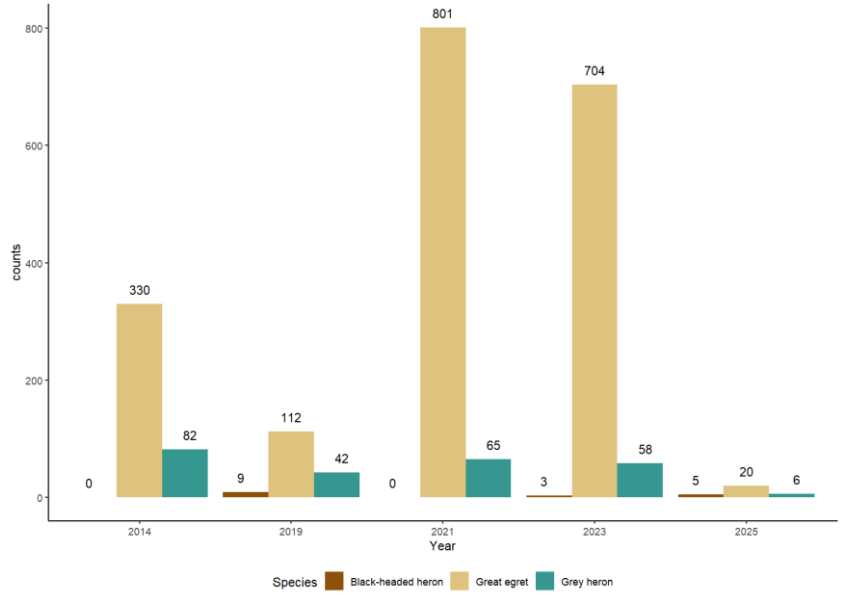

Figure 8 - Number of active nests across the years for Black-headed heron, Grey heron and Great egret.

The two most common species in the colony alongside Great egrets are Yellow-billed storks and African spoonbill (Table 2). However, in 2025, there was no record of breeding African openbill and there were

no individuals observed in the colony or its vicinity. As for Yellow-billed storks, the numbers were lower than the ones reported in all the previous counts (Figure 9).

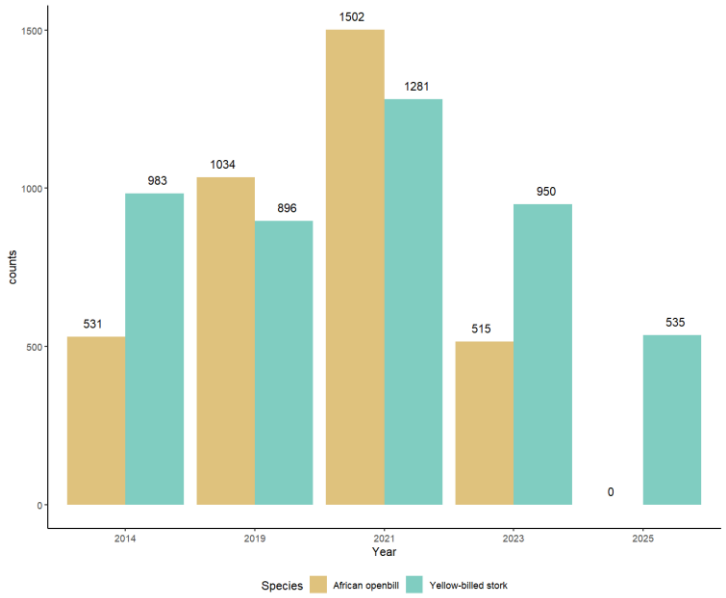

Figure 9 - Number of active nests across the years for African openbill and Yellow-billed stork.

Sacred ibis breeding fluctuated greatly across the years. However, numbers in 2025, were similar to those recorded in the first count, in 2014. This record is particularly relevant considering the late precipitation and differences from other years, as well as the low water level at the lake (Figure 10). Additionally, the number of African spoonbill nests recorded in 2025 was the maximum ever record in all the 4 previous counts (Figure 10), especially considering that most of the counts were done in two distinct periods (March and April), which should capture early and late breeding species. The team recorded a lot of activity of the African Spoonbill breeding pairs (Figure 11).

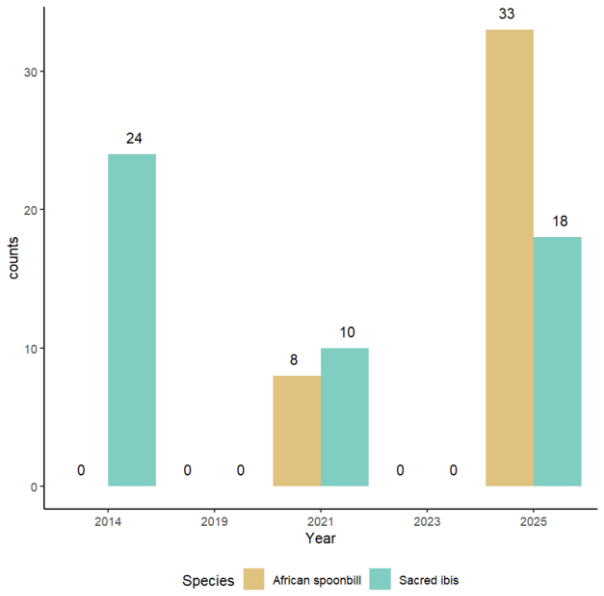

Figure 10 - Number of active nests across the years for African spoonbill and Sacred ibis.

Figure 11 - African spoonbill (*Platalea alba*). Credit: Rita Ramos

Additional observations

During the count and in the colony, it was possible to confirm the presence of one adult Palm-nut vulture (*Gypohierax angolensis*). Similarly, an African harrier-hawk (*Polyboroides typus*) was seen on multiple occasions perching near active nests. Additionally, a Pink-backed pelican (*Pelecanus rufescens*) was seen flying over the colony.

In any of the cases, the team saw no signs of potential breeding of these species in the waterbird colony.

Discussion

From all the five waterbird breeding counts done so far in Gorongosa National Park, 2025 was the year with fewer nests recorded, with a decrease of 70.3% from the counts of 2023. The decrease may be related to the precipitation patterns. During the rainy season of 2024-2025, the majority of the rain was registered during the month of March, with 259.4mm, when compared to the previous three months of December, January and February, with 22.8, 19.2 and 21.0mm, respectively (data from the weather station of Chitengo). The late precipitation also affected the water level of Lake Urema, confirmed by the impossibility of launching the boat before April. Additionally, 2024 was an extremely dry year in Gorongosa National Park.

From all the species that decreased in number the most relevant ones were Reed cormorant, Great egret, Yellow-billed stork and African openbill. This can be related with the breeding season of the species, which tend to occur during the rainy summer season, but also with the lack of precipitation in the 2024-2025 rainy season, which influences the water level near the colony. Although some more research is needed to understand the factor, we hypothesis that, if the trees are not sufficiently flooded the birds are less likely to breed in those trees, due to increased risk of nest predation.

Despite the decrease of the overall number of birds, two species increase greatly their numbers from the previous count, Sacred ibis and African spoonbills. Both species were absent on the 2023 count, however, the Sacred ibis increase in 80% from the number of nests reported in 2021 and decrease 25% from the numbers of 2014 (the higher count). As for the African spoonbills, the 33 nests counted represent an

increase of more than 3 times from the count of 2021 (the only that reported the species nests). The number of nests reported, although small when compared to other species in the colony, is relevant as it may indicate that both Sacred ibis and African spoonbills tend to breed later in the year and may be increasing their numbers in the colony. It also highlights the need for visits to the colony later in the year, by car, to evaluate the presence other species.

As an overall view, there is an extreme variability in nest numbers across the years, which is likely related to the flooding conditions of the lake, which affects the team capacity to count nests at the exact same time every year, resulting in a high variability in the number of nests recorded. It also affects the species breeding season, as late rains will probably delay nest constructions and egg laying, as well as influence which species are found in the colony during a later count.

Nonetheless, it is important to note that each of the counts represents a small, but important snapshot in time, which highlights the need and importance of regular counts to evaluate the status of this waterbird breeding colony and the significance of Gorongosa National Park as a conservation area.

References

Stalmans, 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.

Denlinger, J., Stalmans, M. & Massad, T. 2019. Waterbird colony count at Lake Urema, Parque Nacional da Gorongosa Mozambique, March and April 2019. Report. https://gorongosa.org/research/

Denlinger, J. 2021. Waterbird colony count at Lake Urema, Gorongosa National Park 25 March 2021. Report. https://gorongosa.org/research/

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To all the people that contributed to the other counts, reports and advice.