

## First confirmed records of Rüppell's Vultures (*Gyps rueppelli*) in Malawi.

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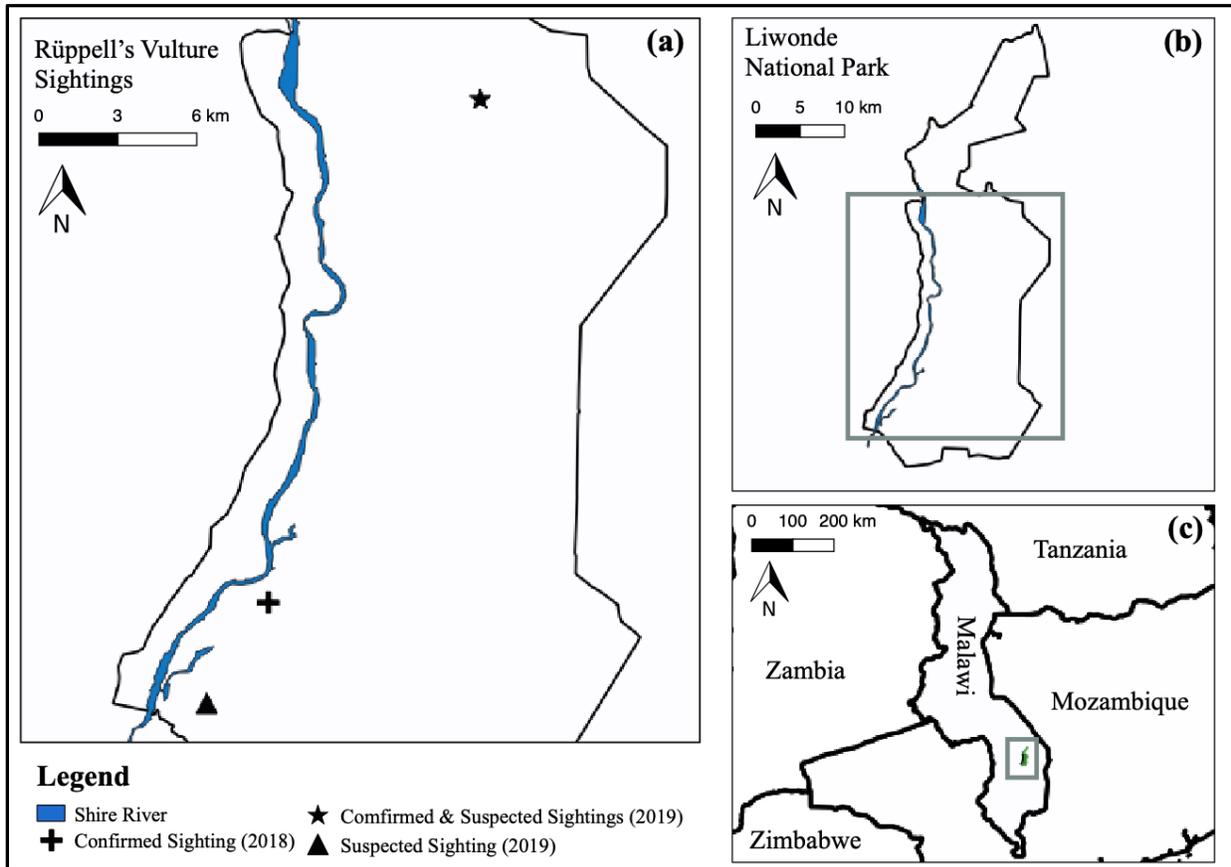
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There is little contemporary research or literature on the ecology and movements of vultures in Malawi (*see*, Roxburgh & McDougall 2012, Galanou 2016, Sievert *et al.* 2018). Consequentially, the Convention on the Conservation of Migratory Species' Vulture Multi-Species Action Plan, has identified Malawi as a considerable knowledge gap for eastern and southern African vulture populations (Botha *et al.* 2017). Historical information on the distribution of vultures in Malawi is also sparse. However, four species have been recorded as residents in Malawi, namely: African White-backed Vulture *Gyps africanus*, White-headed Vulture *Trigonoceps occipitalis*, Hooded Vulture *Necrosyrtes monachus* and Palm-nut Vulture *Gypohierax angolensis* (Botha *et al.* 2017). Additionally, two species have been identified as non-breeding visitors to Malawi, the Lappet-faced Vulture *Torgos tracheliotos* and the Cape Vulture *Gyps coprotheres* (Botha *et al.* 2017).

In the southern region of Malawi, vulture monitoring in the form of opportunistic road counts and camera trapping at carcasses, has been underway in Liwonde National Park (14°50'31.5"S 35°20'59.9"E; Figure 1) since 2017. On the 6<sup>th</sup> of November 2018 during monitoring, an adult Rüppell's Vulture *Gyps rueppelli* was spotted feeding on an impala *Aepyceros melampus* among

African White-backed Vultures and a Marabou Stork *Leptoptilos crumeniferus* (Figure 2). This was the sole report or record of Rüppell's Vultures in Liwonde National Park that year. However, in 2019, a large bull African elephant *Loxodonta africana* was found deceased through natural causes in the central section of the park. Camera trapping at this carcass took place for 52 days (5<sup>th</sup> of May – 11<sup>th</sup> of July) during which time Rüppell's Vultures were photographed. Over the course of 2019, a total of eight camera trap days yielded photos of suspected Rüppell's Vultures. An additional report in 2019 totalled the number of suspected Rüppell's Vulture sightings in 2019 to nine. Five of these sightings had high enough quality images to allow species confirmation (Figures 3,4,5,6,7), leaving four sightings inconclusive.

Plumage of the individuals photographed confirms a minimum of two separate Rüppell's Vultures, an adult and an immature, visiting the park in 2019. However, given the number of inconclusive sightings the authors cannot rule out the presence of additional individuals. Initial species identification was made based on plumage while referencing Rodriguez & Elorriaga (2016). Images were then sent to experts with extensive experience working with the species for final confirmation.



**Figure 1:** Map of (a) Rüppell's Vulture sightings in Liwonde National Park (2018-2019), (b) Liwonde National Park with indication to the area of sightings (c) the location of Liwonde National Park in Malawi.



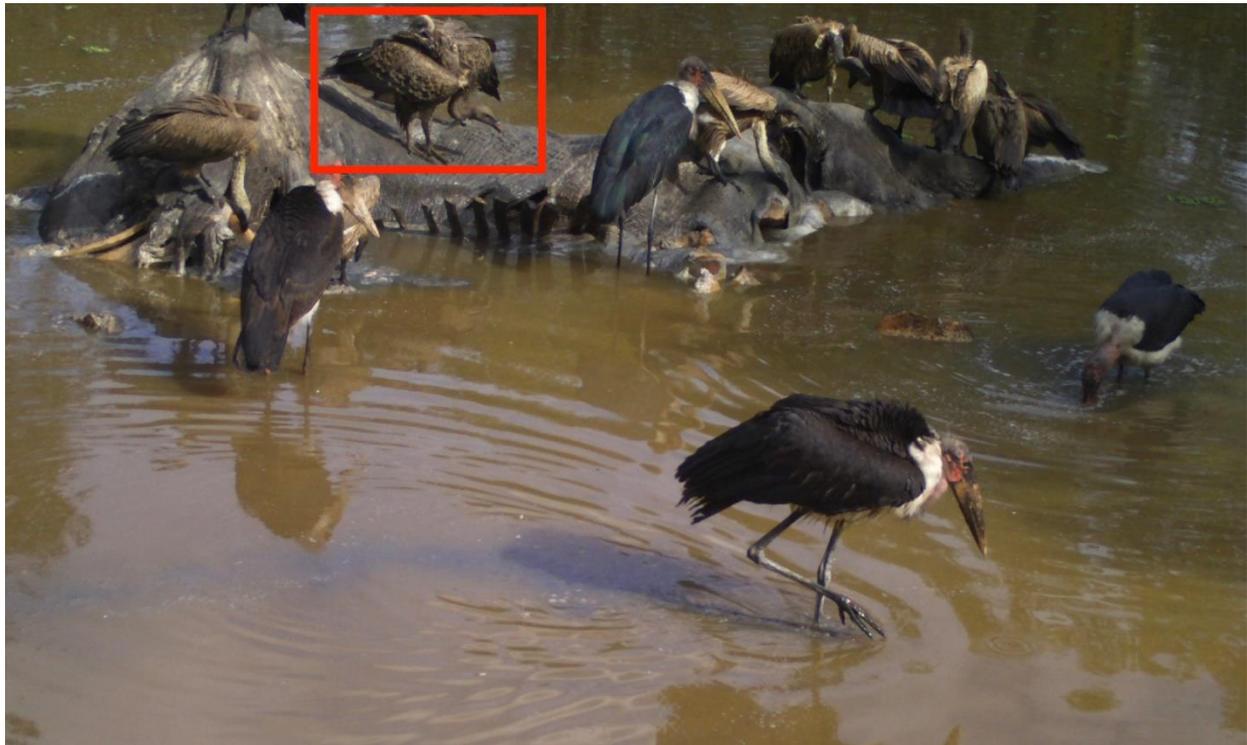
**Figure 2:** Adult Rüppell's Vulture photographed at an impala carcass with African White-backed Vultures and Marabou Storks, 6<sup>th</sup> November 2018.



**Figure 3:** A camera trap image of an immature Rüppell's Vulture (indicated by red box) feeding on an elephant carcass with African White-backed Vultures and Marabou Storks, 3<sup>rd</sup> June 2019.



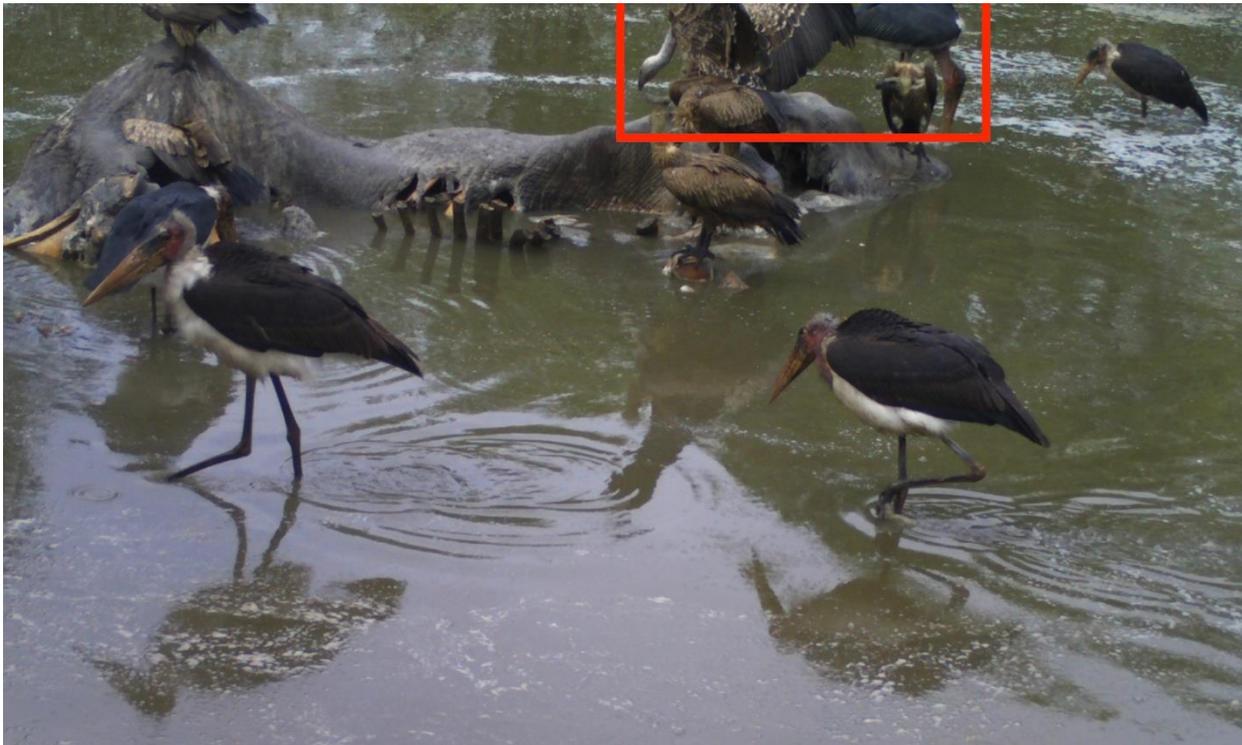
**Figure 4:** A camera trap image of an adult Rüppell's Vulture (indicated by red box) resting on an elephant carcass with African White-backed Vultures and Marabou Storks, 6<sup>th</sup> June 2019.



**Figure 5:** A camera trap image of an adult Rüppell's Vulture (indicated by red box) resting on an elephant carcass with African White-backed Vultures and Marabou Storks, 16<sup>th</sup> June 2019.



**Figure 6:** A camera trap image of an immature Rüppell's Vulture (indicated by red box) feeding on an elephant carcass with African White-backed Vultures and Marabou Storks, 19<sup>th</sup> June 2019.



**Figure 7:** A camera trap image of an adult Rüppell's Vulture (indicated by red box) feeding on an elephant carcass with African White-backed Vultures and Marabou Storks, 22<sup>nd</sup> June 2019.

To the authors' knowledge, these are the first records of Rüppell's Vultures in Malawi. Rüppell's Vultures occur throughout the Sahel region and the East African savanna regions. A recent study of a satellite tagged adult Rüppell's Vultures revealed a range size of 71,990 km<sup>2</sup> over ten months (Virani *et al.* 2012). Moreover, individuals have been recorded on several occasions outside of the species range in both the Iberian Peninsula and southern Africa (Rodriguez & Elorriaga 2016, Botha *et al.* 2017, Botha & Román 2018). However, prior to our report, there has been no definite evidence of the species in Malawi. The recent sightings in Liwonde National Park coupled with the recent record in central Mozambique (Botha & Román 2018), roughly 443 km southwest of Liwonde National Park, suggests this species may be an uncommon visitor to Malawi.

Considering the alarming decline in vulture populations across Africa and the large multi-country home ranges that many vulture species inhabit, the development of cross-country legislation is vital in the conservation of remaining populations (Botha *et al.* 2017, Buechley *et al.* 2018). However, the large knowledge gaps that remain must be addressed in order to create informed conservation initiatives. Since the initiation of Liwonde National Park's vulture monitoring in 2017, five species have been identified across 241 sightings, including the before mentioned Rüppell's Vultures. Although Rüppell's Vultures may have occurred sporadically in Malawi previously, no formal records could be located, thereby demonstrating the importance of long-term monitoring in expanding our knowledge of the ranging behaviour of Africa's vulture species.

## Acknowledgements

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## Ethical Standards

Vulture monitoring in Liwonde National Park is conducted by African Parks Liwonde. African Parks has the required authorizations and mandate to undertake vulture monitoring in Liwonde National Park.

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