The Palm-nut Vulture: misconceptions and conservation concerns.

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Introduction

The common name of the Palm-nut Vulture *Gypohierax angolensis* reflects its apparent close association with, and reliance on palms and palm fruit (Mundy *et al.* 1992, Carneiro *et al.* 2017, Goodwin 2019). This species occurs (with clinal variation) from West Africa across to East and Central Africa, with a small but increasing population in Southern Africa (Donnelly & Irwin 1972, Steyn 1982, Mundy *et al.* 1992, Ferguson-Lees & Christie 2001, Goodwin 2019). While adults are largely sedentary, vagrants (most often immature birds) are known to range widely, appearing sporadically across the continent, sometimes in the most unexpected of localities, such as the dry Kalahari and Sahel, and even as far south as the Cape Province of South Africa (Steyn 1982, Mundy *et al.* 1992, Ferguson-Lees & Christie 2001, Goodwin 2019). In Guinea-Bissau this species shows important local distributional shifts along the tidal cycle, with some individuals also displaying seasonal movements between islands, linked to the temporary availability of seasonal food sources (Carneiro *et al.* 2017).

Despite its wide distribution, a number of gaps still remain in the current knowledge of the biology and ecology of this species (Goodwin 2019; Thompson *et al.* 2021). Occurrence of resident birds does seem to closely track the introduced and natural Afrotropical distribution of either the African Oil Palm *Elaeis guineensis* or raphia palms *Raphia* spp., on which they do feed and nest (Carneiro *et al.* 2017). However, an apparently under-appreciated fact is that this vulture is equally a predator and scavenger which relies on a relatively wide range of animal-based food items (Steyn 1982, Mundy *et al.* 1992, Harris *et al.* 1994, Ferguson-Lees & Christie 2001, Carneiro *et al.* 2017, Goodwin 2019). Indeed, it seems that many observers have been so misled by the current common name that this has largely detracted attention from the study of important aspects of the species (Mundy *et al.* 1992). While this name is not entirely a misnomer, it nevertheless tends to mask the true nature of this vulture, a fact that could well have negative connotations for its future conservation status (W. Goodwin in litt.). This subject is further explored below, with some relevant background information on the species also provided.

Nomenclature, uncertainty and misconceptions

There has been much uncertainty and conjecture regarding the taxonomy of this species, resulting in considerable revision (and reversion) of its scientific designation over time. The species was first named in 1773 by Thomas Pennant as ‘Angola Vulture’, then subsequently described (in 1788) by J.F. Gmelin as *Falco angolensis*, who lumped it in the same genus as the Secretarybird *Sagittarius serpentarius*, Bearded Vulture *Gypaetus barbatus* and some eagles. In 1790 John Latham re-classified

the species into the genus *Vultur*, however by 1800, F.M. Daudin had reassigned the species to its own genus and reassigned it as *Gypaetos angolensis*. Within 12 years this species had been renamed three times, and by 1821 John Latham had again lumped it, along with the Egyptian Vulture *Neophron percnopterus*, back under the genus *Vultur*. W.P.E.S Rüppell eventually introduced the current genus, *Gypohierax* in 1835 (Mundy *et al.*1992, Goodwin 2019). Of interest is that relatively recent molecular sequencing data confirms that the Palm-nut Vulture indeed sits as a sister taxon to both the Egyptian and Bearded Vulture (Lerner & Mindell 2005, Goodwin 2019).

The original common name 'Angola Vulture' was derived from the type locality, being Luanda, Angola. Due to its appearance and association with waterbodies, this vulture was subsequently referred to as the 'Vulturine Fish Eagle', however the current common name, coined in 1932 by James Chapin, seems to have endured (Mundy *et al.* 1992, Goodwin 2019). Perhaps misled by current nomenclature, it is sometimes incorrectly assumed that this vulture is in fact an obligate frugivore with a life cycle inextricably linked to both palm trees and palm fruit (W. Goodwin in litt.). Indeed, some recent authors have erroneously attempted to disassociate this species from current threats faced by other vultures by simply stating that it does not eat meat (see Duriez *et al.* 2022). This, despite ample empirical evidence to the contrary, freely available in the literature and other reliable sources.

Food sources and extent of association with palms

While fruit comprises a significant part of the diet of resident birds in most areas, they are largely opportunistic feeders that readily hunt or scavenge on animals, including mammals, birds, reptiles, amphibians, fish, crabs, snails, and insects, along with carrion (Steyn 1982, Mundy *et al.* 1992, Harris *et al.* 1994, Ferguson-Lees & Christie 2001, Carneiro *et al.* 2017, Goodwin 2019). In Uganda this species even appears to fill the niche of the Hooded Vulture *Necrosyrtes monachus* at large carcasses (A. Botha pers. comm.). Observations in South Africa have confirmed that the fruit of introduced Raphia Palms *Raphia australis* constitute an important part of the diet of resident birds (Harris *et al.* 1994), and even the fat rich elaiosomes of the introduced Australian Coastal Wattle *Acacia cyclops* have been recorded in the diet of vagrant birds in the Cape Province (Steyn 1982, Mundy *et al.* 1992, Goodwin 2019). Likewise, in West Africa, the fruit of oil and raphia palms, along with that of various other tree species make up around half of the diet (Mundy *et al.* 1992, Goodwin 2019, Fitzsimons & Leighton 2021).

Consumption of palm fruit has been found to be considerably higher in resident juvenile and immature birds, possibly reflecting difficulty in obtaining adequate animal-based food within the general vicinity (Mundy *et al.* 1992, Harris *et al.* 1994, Goodwin 2019). Interestingly, a similar situation was also noted in African Harrier-hawks *Polyboroides typus* in the Ivory Coast, where sampled stomach contents consisted almost entirely of palm fruit, possibly also reflecting a general dearth of available animal prey generally available to most raptors in the region (Mundy *et al.* 1992, Fitzsimons & Leighton 2021). Additionally, Hooded Vultures in The Gambia and Guinea-Bissau have also been recorded as feeding on the fruit of the oil palm (Barlow 2004, M. Henriques pers. comm). Although the major distribution of the Palm-nut Vulture almost matches the range of oil and raphia palms, which it does utilise for breeding, it more often prefers to nest in larger forest tree species, both native and introduced (Mundy *et al.* 1992, Carneiro *et al.* 2017, Goodwin 2019). In Angola this species appears to favour the baobab *Adansonia digitata* for this purpose (Steyn 1982, Mundy *et al.* 1992, Goodwin 2019). It should also

be noted that although their wider distribution also overlaps that of other palms such as the Fan Palm *Hyphaene petersiana*, Borassus palms *Borassus* spp. and wild date palms *Phoenix* spp., this is probably more coincidental as these tend to bear pithy fruits, largely inedible to this species (Mundy *et al.* 1992).

Conservation concerns

The Palm-nut Vulture was excluded from the current Multi-Species Action Plan to conserve African-Eurasian vultures compiled by Botha *et al.* (2017) and was last fully assessed (as Least Concern) for The IUCN Red List of Threatened Species back in 2016, with an errata version published in 2019 (IUCN 2019, BirdLife International 2023). The IUCN threat assessment references Ferguson-Lees & Christie (2001) and states that although this species is affected by habitat loss, particularly in West Africa, this threat may be partly offset by the expansion of oil palm plantations as a food source. It further states that this is possibly countered by the limitation of nesting opportunities as a result of disturbance, but that this bird is not directly persecuted (IUCN 2019, BirdLife International 2023). However, when taking into consideration the obvious importance of animal matter in the diet of the Palm-nut Vulture as discussed above, it is clear that this species may not be as impervious to incipient poisoning threats as seems to be commonly assumed (W. Goodwin in litt.). While the long-standing threat of deforestation alluded to by Mundy *et al.* (1992) and Ferguson-Lees & Christie (2001) remains valid, it is of additional concern that this vulture is becoming increasingly susceptible to additional anthropogenic threats. Indeed, research has found that this species is widely collected for traditional purposes in both Central and West Africa (Fa & García Yuste 2001, Nikolaus 2001, Fa *et al.* 2006, Willcox & Nambu 2007, Saidu & Buij 2013, Buij *et al*. 2016, Whytock *et al.* 2016).

The Hooded Vulture has historically been the most common vulture species recorded in Nigerian traditional markets (Nikolaus 2001, Buij *et al*. 2016), however asking prices for Palm-nut Vulture body parts are similar, and general price increases for all vulture parts now appear to reflect lower availability in relation to demand (Saidu & Buij 2013). With substantial depletion of target species across Africa, compounded by mass poisoning incidents, such as that recently reported from eastern Guinea-Bissau by Henriques *et al.* (2020), it is likely that Palm-nut Vultures will face increasing pressure as demand shifts. Additionally, this species was the most common raptor detected in bush meat surveys in the Ebo Forest, Cameroon by Whytock *et al.* (2016), also having been recorded in several previous studies carried out in Cameroon and elsewhere (Fa & García Yuste 2001, Fa *et al.* 2006, Willcox & Nambu 2007). These results suggest that populations of this species may well be experiencing unsustainable levels of hunting pressure (Whytock *et al.* 2016).

Conclusion

The conservation status of Palm-nut Vultures appears to have been largely overlooked in recent years, due at least in part to misleading nomenclature. Indeed, it also seems that the current IUCN Red List status is based upon some outdated information. In light of its susceptibility to habitat loss, reliance upon animal-based foods, and increasing usage for traditional purposes, it is likely that incipient threats to this species may well be underestimated. In order to ascertain if any of the reported unfavourable developments have indeed had a profound negative effect, more up-to-date information is required, particularly for West and Central Africa.

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