

Captive large predators killing vultures: exposing captive facilities as an additional source of mortality to highly threatened birds

Authors

Lindy J. Thompson^{1,2} 
 John P. Davies² 
 Gareth Tate^{2,3} 
 Colleen T. Downs¹ 

Affiliations

¹ Centre for Functional Biodiversity,
 School of Life Sciences,
 University of KwaZulu-Natal,
 Private Bag X01, Scottsville,
 3201, South Africa.

² Birds of Prey Programme,
 Endangered Wildlife Trust,
 Private Bag X11, Modderfontein,
 3209, Johannesburg, South
 Africa.

³ FitzPatrick Institute of African
 Ornithology, DST-NRF Centre of
 Excellence, University of Cape
 Town, 7701, Rondebosch, South
 Africa.

Corresponding Author

Lindy Thompson,
 lindyt@ewt.org.za.

Dates

Submitted: 5 March 2019
 Accepted: 21 May 2019
 Published: 16 July 2020

How to cite this article:

Thompson, L.J., Davies, J.P., Tate, G. & Downs, C.T., 2020, 'Captive large predators killing vultures: exposing captive facilities as an additional source of mortality to highly threatened birds', *Bothalia* 50(1), a6. <http://dx.doi.org/10.38201/btha.abc.v50.i1.6>

Background and objective: African vultures are under pressure from various, well-known anthropogenic threats. Here we describe and aim to highlight a little-known source of mortality to two Critically Endangered vulture species (*Gyps africanus* and *Necrosyrtes monachus*), as well as the Endangered Cape Vulture (*Gyps coprotheres*) in southern Africa – that of captive big cats killing vultures that land in their enclosures to feed on food scraps or faeces or to bathe in drinking water.

Methods: Personal observations, reports from public, interviews with current and former staff from predator parks and lion hunting ranches.

Discussion: While the spatial and numerical extent of this mortality has not yet been quantified, if it is found to be widespread then failure to address it may present a risk to the regions' vulture populations.

Conclusion: We encourage captive breeding facilities and regulatory authorities to take appropriate action to prevent free-roaming vultures from coming into contact with captive big cats, and we highlight the need for further research to determine the spatial extent and magnitude of this threat to African vultures.

Keywords: captive big cats, *Gyps africanus*, Hooded Vulture, *Necrosyrtes monachus*, *Panthera*, threat, vulture, White-backed Vulture.

Introduction

Africa's vultures are facing an extinction crisis (Ogada et al. 2016a) similar to that experienced by Asia's vultures (Oaks et al. 2004), and both result from anthropogenic factors. The main anthropogenic threats to African vultures are deliberate poisoning by poachers, secondary poisoning, the illegal trade in vulture body parts for belief-based use, and mortalities caused by energy infrastructure (Ogada et al. 2016a,b). One of the least known anthropogenic threats to African vultures is mortality caused by captive big cats, *Panthera* spp. (Mundy et al. 1992). Here we describe a case of captive big cats (lions, *Panthera leo*, and leopards, *P. pardus*) killing Critically Endangered vultures when they land in enclosures at a predator breeding tourist facility in South Africa close to protected areas where vultures occur. In light of rapid population declines (Thiollay 2006; Virani et al. 2011; Buechley & Şekercioğlu 2016), and the dire conservation status of most African vulture species (IUCN 2018), we aim to highlight this source of mortality in Critically Endangered vultures. We hope that this record will serve as motivation for further investigation into the spatial extent and magnitude of this source of mortality and, if necessary, mitigation of this potential threat.

Observations

On 13 October 2016, Lindy Thompson observed a dead Cape Vulture (*Gyps coprotheres*) in a supplementary feeding site at an endangered species centre in South Africa's Limpopo Province (Figure 1). Since Thompson did not know how the bird came to be there, she emailed an enquiry to the centre, asking them to remove the bird to reduce the spread of possible pathogens or poison to other scavengers. The same day, Thompson received a reply from one of the centre's staff members, saying that the vulture had been killed by one of their predators and the carcass disposed of at the feeding site.

On 4 January 2018, John Davies received a report from a member of the public who had visited the same facility on the previous day that said that two of the centre's captive leopards were killing free-ranging vultures that landed in their enclosure. Note that we wish to highlight a source of mortality to vultures, rather than condemn a particular facility, and so we do not mention the property by name nor its exact geographical location. Thompson immediately arranged to meet a staff member at this facility, who stated that the centre's big cats were killing vultures at a rate of approximately one per month. A few days later, at a second meeting,

the facility's manager told Thompson that the big cats in two enclosures (each 1 hectare) were exhibiting this behaviour: the first enclosure housed two lions, and the second housed two leopards. These particular big cats were repeatedly catching and killing (but not eating) vultures that landed in their enclosures to bathe in the cats' drinking water and to feed on food scraps (and possibly also faeces, in the case of Hooded Vultures (*Necrosyrtes monachus*) (Mundy et al. 1992; Reading et al. 2017)). A former staff member of the centre later told Thompson that lions at this facility used to kill two to three vultures (Hooded and White-backed) a month, and, while those lions were now deceased, the lions currently at the facility also display this behaviour. The two aforementioned vulture species are classified both globally and regionally as Critically Endangered (Taylor et al. 2015; IUCN 2018).

In an attempt to determine how widespread this phenomenon is, we interviewed staff at 11 predator parks and lion hunting ranches in South Africa, and obtained responses from seven facilities. The people we interviewed had worked at these seven facilities for an average 17.3 ± 18.7 years (mean \pm standard deviation, $n = 6$), with a combined work experience of at least 104 years. Three of these seven individuals had never encountered their captive predators chasing or killing birds (at predator parks in Gauteng, the Eastern Cape



Figure 1. A Cape Vulture killed by a captive predator at a facility in Limpopo Province, South Africa, and placed at the centre's supplementary feeding site. Photographed on 13 October 2016, by L.J. Thompson.

and Limpopo). The remaining four people we spoke to had observed the following: leopards and cheetahs (*Acinonyx jubatus*) rarely killing Yellow-billed Kites (*Milvus aegyptius*) and Helmeted Guineafowl (*Numida meleagris*) (at a tourist facility in Limpopo); a lion catching (but not killing) a juvenile Verreaux's Eagle (*Aquila verreauxii*) (at a tourist facility in KwaZulu-Natal), lions killing White-backed Vultures and crows (*Corvus sp.*) (at an unrecorded frequency at a lion hunting ranch in North West Province); and lions killing one vulture (species unknown) and one crow (at a lion hunting ranch in North West Province). These observations suggest that captive predators may kill wild vultures and other birds at other facilities, and this behavior may be widespread across various provinces, but that it is also rare.

Discussion

Large mammalian scavengers and predators such as lion, leopard, cheetah and African wild dog (*Lycaon pictus*) do not tolerate vultures approaching too closely (or feeding) when they are feeding (Attwell 1963). Wild lions and African wild dogs frequently chase vultures (including Hooded and White-backed vultures) off carcasses, but it seems that vultures are rarely caught and killed (Attwell 1963; Mundy 1997). Hooded Vultures may be drawn to the lions' enclosure for food scraps (including moist lion droppings), and White-backed Vultures have previously been observed visiting the enclosures of captive lions to scavenge on food remains (Mundy et al. 1992). We could find little evidence of an association between wild leopards and vultures in the scientific literature (Kendall et al. 2012), other than leopards killing and preying on Lappet-faced and White-backed vulture nestlings (Pennycuik 1976; Mundy et al. 1992; Pringle 2016; Grobler 2018). Leopards usually consume small prey animals immediately after killing them, and cache larger prey in dense trees where they cannot be found by vultures and mammalian scavengers (Kruuk & Turner 1967). Therefore, the captive leopards at this facility seem to be displaying an unusual behaviour when they kill vultures.

The reported current loss of at least one individual vulture per month at this facility equates to a conservative estimate of 12 White-backed and/or Hooded vultures killed at this centre per year. In South Africa, there are an estimated 100–200 mature Hooded Vultures and 3 435 breeding pairs of White-backed Vultures (Taylor et al. 2015). The annual loss of vultures at this facility is therefore significant, and represents an additional and ongoing threat to the region's vulture populations. This facility is 30 km from a core Hooded Vulture breeding area (Thompson et al. 2017), 2.9 km from the nearest known Hooded Vulture nest (Davies, pers. obs.), and 13 km from the Kruger National Park, which holds an internationally significant population of White-backed

Vultures (Murn et al. 2013). These distances of source vulture areas to the facility are well within the daily distances travelled by Hooded and White-backed vultures (Phipps et al. 2013; Reading et al. 2019), the two vulture species commonly being killed at this centre.

Thompson's suggestion of installing roofs over the big cats' enclosures to prevent vultures from landing, was dismissed by the centre's management for being too expensive, and because roofs would make the enclosures 'look too much like cages', which would be unsightly for paying guests. Our repeated requests to spend a day observing the big cats in question, aiming to better understand the problem, were denied by the facility. The centre's policy of discarding leftover meat and bones at two sites on the property, for free-roaming vultures to consume, may be compounding this problem. One of these sites is a dump, and the other is a supplementary feeding site that is open for public viewing. The daily congregation of hundreds of Endangered and Critically Endangered vultures at this property's feeding sites (Thompson pers. obs.) may be a 'source', facilitating an ongoing supply of highly threatened birds to the 'sinks' that are the big cat enclosures.

Conservation recommendations

It is imperative that owners and staff of centres such as this, where captive big cats are killing highly threatened vultures, recognise the conservation implications of this phenomenon. Such cases should be reported to the relevant local wildlife authorities by anyone (including researchers, staff members, managers, owners, veterinarians, volunteers, tradesmen and members of the public) who becomes aware of it, so that it can be swiftly and effectively dealt with. The simplest solution may be for facility staff to make use of the smaller feeding enclosures within the big cat enclosures. These smaller feeding enclosures have doors and roofs, which prevent vultures from entering these designated feeding areas. While the big cats feed in the small, contained feeding enclosures, staff could remove all food scraps and faeces from the rest of the enclosures, minimising the attraction for vultures and preventing the problem. At the facility in question, staff do not make use of the feeding enclosures, instead they allow the big cats to drag their food out into the larger, uncovered enclosures, where it attracts vultures. Other management tools could include a variety of environmental enrichment techniques for captive big cats (Powell 1995; Bashaw et al. 2003; Clark & King 2008; Sutherland et al. 2018), coupled with exclusion techniques and/or visual deterrents, such as human disturbance, to prevent vultures from landing in big cats' enclosures (Bishop et al. 2003). We further recommend that centres place supplementary feeding sites for vultures as far as possible from uncovered big cat enclosures, to reduce the possibility of attracting vultures to these enclosures. As a

last resort, we suggest the relocation of the problem big cats to another facility outside of vulture foraging range.

We suggest that regulatory authorities who are responsible for issuing permits to allow such facilities to operate (provincial conservation agencies in the case of South Africa) should impose permit conditions to minimise the risk of vulture mortality at predator facilities. This could include measures such as requiring the covering of enclosures if other effective management options cannot be implemented. It may also include prohibition of additional facilities within the foraging range of Critically Endangered and Endangered vulture species, unless clear measures are taken to reduce such anthropogenically induced mortality.

Finally, we encourage researchers to assess the spatial extent of this problem and the frequency with which it occurs, to determine the potential population-level impact of this poorly documented threat to African vultures.

Acknowledgements

We are grateful to the staff of the facility mentioned here, and to Lyle Wiggins (Limpopo Department of Economic Development, Environment & Tourism), for meeting with Lindy Thompson to discuss the problem and possible mitigation measures. We are also grateful to various anonymous staff members from predator parks and lion hunting ranches throughout South Africa for answering our questions over the telephone. We thank Darcy Ogada, Richard Reading, Colleen Seymour and two anonymous reviewers for constructive comments which significantly improved the manuscript. Lindy Thompson is grateful for an Innovation Postdoctoral Fellowship from the National Research Foundation (NRF) of South Africa (Grant no. 99494). Opinions expressed and conclusions arrived at are those of the authors and are not necessarily attributable to funding bodies or the authors' affiliate institutions.

References

- Attwell, R.I.G., 1963, 'Some observations on feeding habits, behaviour and inter-relationships of northern Rhodesian vultures', *Ostrich* 34, 235–247, <https://doi.org/10.1080/0306525.1963.9633479>.
- Bashaw, M.J., Bloomsmith, M.A., Marr, M.J. & Maple, T.L., 2003, 'To hunt or not to hunt? A feeding enrichment experiment with captive large felids', *Zoo Biology* 22, 189–198, <https://doi.org/10.1002/zoo.10065>.
- Bishop, J., McKay, H., Parrott, D. & Allan, J., 2003, 'Review of international research literature regarding the effectiveness of auditory bird scaring techniques and potential alternatives', Central Science Laboratories for the Department for Environmental Food and Rural Affairs, London, UK.
- Buechley, E.B. & Şekercioğlu, C., 2016, 'The avian scavenger crisis: Looming extinctions, trophic cascades, and loss of critical ecosystem functions', *Biological Conservation* 198, 220–228, DOI: 10.1016/j.biocon.2016.04.001.
- Clark, F. & King, A.J., 2008, 'A critical review of zoo-based olfactory enrichment', in 'Chemical signals in vertebrates 11'. Eds J.L. Hurst, R.J. Beynon, S.C. Roberts, and T.D. Wyatt. Springer: New York, NY.
- Grobler, R., 2018, 'Curiosity killed the ... vulture?' viewed 13 April 2019, from <https://www.lionsands.com/2018/09/curiosity-killed-vulture-leopard/#>.
- IUCN, 2018, 'The IUCN Red List of Threatened Species', version 2018-1. www.iucnredlist.org. Downloaded on 10 August 2018.
- Kendall, C., Virani, M.Z., Kirui, P., Thomsett, S. & Githiru, M., 2012, 'Mechanisms of coexistence in vultures: understanding the patterns of vulture abundance at carcasses in Masai Mara National Reserve, Kenya', *Condor* 114, 523–531, DOI: 10.1525/cond.2012.100196.
- Kruuk, H. & Turner, M., 1967, 'Comparative notes on predation by lion, leopard, cheetah and wild dog in the Serengeti area, East Africa', *Mammalia* 31, 1–27.
- Mundy, P.J., 1997, 'Hooded Vulture *Necrosyrtes monachus*', in 'The atlas of southern African birds'. Eds J.A. Harrison, D.G. Allan, L.G. Underhill, M. Herremans, A.J. Tree, V. Parker, and C.J. Brown. pp. 156–157. BirdLife South Africa: Johannesburg.
- Mundy, P.J., Butchart, D., Ledger, J. & Piper, S., 1992, 'The vultures of Africa', Academic Press: London, UK.
- Murn, C., Combrink, L., Ronaldson, G.S., Thompson, C. & Botha, A., 2013, 'Population estimates of three vulture species in Kruger National Park, South Africa', *Ostrich* 84, 1–9, <https://doi.org/10.2989/00306525.2012.757253>.
- Oaks, J.L., Gilbert, M., Virani, M.Z., Watson, R.T., Meteyer, C.U., Rideout, B.A., Shivaprasad, H.L., Ahmed, S., Chaudry, M.J.I., Arshad, M., Mahmood, S., Ali, A. & Khan, A.A. 2004, 'Diclofenac residues as the cause of vulture population decline in Pakistan', *Nature* 427, 630–633, <https://doi.org/10.1038/nature02317>.
- Ogada, D., Botha, A. & Shaw, P., 2016a, 'Ivory poachers and poison: drivers of Africa's declining vulture populations', *Oryx* 50, 593–596, <https://doi.org/10.1017/S0030605315001209>.
- Ogada, D., Shaw, P., Beyers, R.L., Buij, R., Murn, C., Thioilay, J.M., Beale, C.M., Holdo, R.M., Pomeroy, D., Baker, N., Kruger, S.C., Botha, A., Virani, M.Z., Monadjem, A. & Sinclair, A.R.E., 2016b, 'Another continental vulture crisis: Africa's vultures collapsing toward extinction', *Conservation Letters* 9, 89–97.
- Pennycuik, C.J., 1976, 'Breeding of the Lappet-faced and White-headed vultures (*Torgos tracheliotus* Forster and *Trigonoceps occipitalis* Burchell) on the Serengeti Plains, Tanzania', *African Journal of Ecology* 14, 67–84.
- Phipps, W.L., Willis, S.G., Wolter, K. & Naidoo, V., 2013, 'Foraging ranges of immature African White-backed Vultures (*Gyps africanus*) and their use of protected areas in southern Africa', *PLoS ONE* 8, e52813, <https://doi.org/10.1371/journal.pone.0052813>.

- Powell, D.M., 1995, 'Preliminary evaluation of environmental enrichment techniques for African lions (*Panthera leo*)', *Animal Welfare* 4, 31–370.
- Pringle, G., 2016, 'Kruger leopard with a head for heights', viewed 13 April 2019, from <https://www.wildcard.co.za/kruger-leopard-head-heights/>.
- Reading, R., Tshimologo, B. & Maude, G., 2017, 'Coprophagy of African Wild Dog faeces by Hooded Vultures in Botswana', *Vulture News* 72, 34–37.
- Reading, R., Bradley, J., Hancock, P., Garbett, R., Selebatso, M. & Maude, G., 2019, 'Home range size and movement patterns of Hooded Vultures *Necrosyrtes monachus* in southern Africa', *Ostrich* 90, 73–77, DOI: 10.2989/00306525.2018.1537314.
- Sutherland, W.J., Dicks, L.V., Ockendon, N., Petrovan, S.O. & Smith, R.K. (Eds.), 2018, 'What works in conservation'. OpenBook Publishers.
- Taylor, M.R., Peacock, F. & Wanless, R.M., 2015, 'The 2015 Eskom Red Data Book of birds of South Africa, Lesotha and Swaziland'. BirdLife South Africa: Johannesburg.
- Thiollay, J.-M., 2006, 'Severe decline of large birds in the Northern Sahel of West Africa: A long-term assessment', *Bird Conservation International* 16, 353–365.
- Thompson, L.J., Davies, J.P., Gudehus, M., Botha, A.J., Bildstein, K.L., Murn, C. & Downs, C.T., 2017, 'Visitors to nests of Hooded Vultures *Necrosyrtes monachus* in north-eastern South Africa', *Ostrich* 88, 155–162, <http://dx.doi.org/10.2989/00306525.2017.1321049>.
- Virani, M.Z., Kendall, C., Njoroge, P. & Thomsett, S., 2011, 'Major declines in the abundance of vultures and other scavenging raptors in and around the Masai Mara ecosystem, Kenya', *Biological Conservation* 144, 746–752, <https://doi.org/10.1016/j.biocon.2010.10.024>.