

## **A second count of vultures at carcasses in Uganda, and a revised proposal for a standardised method**

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In a previous note (Pomeroy *et al.* 2004), we reported that 319 vultures of six species came to goat carcasses placed at seven sites across Uganda on the same day (15 January 2003). We adopted that method because there were no known breeding colonies of vultures in Uganda (Carswell *et al.* 2005), although there appear to be a number of potentially suitable sites, according to the preferences described by Bamford *et al.* (2009). At the same time, the alarming decline of vultures in southern Asia and West Africa, and several reports of vulture poisoning in Uganda, gave us cause for concern and a reason to develop a standard monitoring protocol. In our 2004 note, we expressed the hope that other countries might adopt a similar approach – so far that has not happened, but we have now made a repeat count, with some modifications, on 29<sup>th</sup> January 2009.

As in 2003, the counts in 2009 were in all four savanna parks, but with one site each (in 2003, Queen Elizabeth National

Park (QENP) and Murchison Falls National Park (MFNP) each had two sites) and no sites outside parks (there was one in 2003). The main features of each site are given in Table 1. In 2009, a cow in good condition was used as bait. Two of the sites were up to 20 km away from those in 2003, but that is not far as a vulture flies! Each site was in an open area, from which the carcass could easily be observed from a vehicle parked 100-200 m away. It was originally planned to have the carcasses in place by 08h00, but only at Lake Mburo (LMNP) and Kidepo Valley National (KVNP) Parks was this achieved (Table 2). In both QENP and MFNP, vultures appeared almost as soon as the carcasses, suggesting that earlier starts would have been better. Luckily the weather was good (except earlier at LMNP), although in QENP and MFNP there had been heavy and prolonged rain on the previous day. We opened the carcasses immediately after killing, and some internal organs were pulled out.

Table 1. Main features of the four sites used in 2009.

Area	Site	Latitude and Longitude	Altitude (m)	Annual rainfall (mm)
Lake Mburo NP	Eland track <sup>a</sup>	-0.54, 30.98	1250	800
Queen Elizabeth NP	Kasenyi <sup>b</sup>	-0.60, 30.11	900	800
Murchison Falls NP	E of Buligi <sup>c</sup>	2.35, 31.56	700	900
Kidepo Valley NP	Kakine east	3.75, 33.76	1200	900

Notes: a c.10 km W of 2003 site  
 b similar to 2003 site  
 c c.20 km E of Lake Albert site of 2003

Counts of birds at, or perched within 500 m of the carcass were made every 30 minutes throughout the day (or, in MFNP, until there was only the skeleton and some skin left). In 2003, each site had two goat carcasses, but the advice of Mark

Anderson (pers. comm.) that, at least in southern Africa, larger carcasses are more attractive to vultures than smaller ones, was the reason why we used one cow per site in 2009.

Table 2. Timing and weather conditions at the carcass sites

	Lake Mburo NP	Queen Elizabeth NP	Murchison Falls NP	Kidepo Valley NP
Start time	0800 <sup>a?</sup>	1000	1030	0800
First vultures seen -				
- Overhead	1030	1000	1035	0900
- On carcass	(1000 <sup>b</sup> )	1045	1125	0900
Time of peak vulture numbers	1200	1530	1430	1200
Carcass completely consumed	Not <sup>c</sup>	Not <sup>c</sup>	1430	Not <sup>d</sup>
Weather – morning	Cloudy, cool	Sunny, warm	Sunny, warm	Sunny, warm
– afternoon	Some sun, warm	Sunny, warm	Sunny, warm	Sunny, warm
Recorder	MM	AB	MO	BL

Notes: a On both 29<sup>th</sup> and 30<sup>th</sup> January – see text

b On 30<sup>th</sup>

c No vultures, and few other birds attacked the carcass

d Carcass was only partly consumed

## Results

Table 3 gives the highest recorded number of each vulture species, and of other scavengers seen on or near the carcass at each site. The comparable results for 2003 are shown too, although there were differences in methods. Despite those differences, there was a general similarity of results, with a total of 290 vultures in 2009, 29 (10%) less than in 2003. Such

a small reduction cannot be considered significant, after allowing for fewer sites and larger carcasses. What is notable for 2009 is the much larger number of Rüppell's Vultures, whilst numbers of the traditional 'can-openers' (Lappet-faced and White-headed) dropped from 37 to 12. Marabous showed a large increase, paralleling the national trend (Pomeroy *et al.* 2009).

Table 3. Summary of results of simultaneous counts of vultures and other scavenging birds at four sites in Uganda on 29 January 2009.

	RD status <sup>a</sup>	2003 total <sup>b</sup>	Lake		Queen Elizabeth	Murchison Falls	Kidepo Valley	2009 total
			Mburo	148				
African White-backed Vulture	R-NT	253	12	148	48	20	228	
Ruppell's Vulture	R-NT	6	2	3	24	5	34	
Lappet-faced Vulture	G-VU, R-NT	25	2	1	1	5	9	
White-headed Vulture	R-VU	12	0	0	0	3	3	
Hooded Vulture		8	0	12	2	2	16	
Egyptian Vulture	G-VU	1	0	0	0	0	0	
Vultures only in air		14	0	0	0	0	0	
<b>TOTAL VULTURES</b>		<b>319</b>	<b>16<sup>c</sup></b>	<b>164<sup>d</sup></b>	<b>75</b>	<b>35</b>	<b>290</b>	
Tawny Eagle		1	0	0	0	0	0	
Fish Eagle		11	3	1	0	0	4	
Palm-nut Vulture		6	0	4	1	0	5	
Marabout Stork		10	1	12	14	13	40	
Bearded Vulture	R-EN	1	0	0	0	0	0	
Black Kite		0	0	2	4	2	8	
Bateleur		0	3	0	0	2	5	
Fan-tailed Raven		0	0	0	0	2	2	
<b>TOTAL OTHER SPECIES</b>		<b>29</b>	<b>7</b>	<b>19</b>	<b>19</b>	<b>19</b>	<b>64</b>	

Notes: a - From Carswell *et al.* (2005); G-VU = globally vulnerable, R-EN, R-VU and R-NT are regionally endangered, vulnerable and near-threatened, respectively  
 b - From Pomeroy *et al.* (2004)  
 c - Perched on nearby trees, but did not reach carcass, even on the following day  
 d - Only a few actually on the carcass

Table 4. Numbers of vultures arriving in 30 minute periods at the MFNP site

	Number present at 12h00	Numbers seen to arrive in each period					Total arriving
		12h00-12h30	12h30-13h00	13h00-13h30	13h30-14h00	14h00-14h30	
African White-backed Vulture	11	13	3	1	5	4	26
Rüppell's Vulture	2	10	4	2	1	2	19
Lappet-faced Vulture	0	1	0	0	0	0	1
Hooded Vulture	1	0	1	0	0	0	1

Note: There were 14 vultures on the ground at 12h00, plus 28 soaring above, totaling 42; with the 53 arrivals seen in the table (which are all additional to the 42), we have a total of 95; yet, as Table 3 shows, the highest total at any one time was 75. The difference is explained by about 20 vultures leaving the area at various times between 12h00 and the time of the highest number at the site (which was at 14h30).

**Conclusions on the method**

Whilst our method has the merit of being simple, and hence of repeatability, we noted several factors that affected the results:

In LMNP and QENP, no vultures came to the carcasses, although in QENP, large numbers were attracted to the area (in both parks, the teams visited the carcasses on the following day, and found a similar situation).

Repeated counts (in our case, every 30 minutes) are easy to do, but almost certainly lead to an underestimate. As

Table 4 shows, an estimate based upon new arrivals yields higher figures but is harder to obtain, because it requires continual recording at both the carcass and any nearby perching sites. The latter can be in any direction, requiring vigilance around 360°.

In QENP, there was a lion kill near to our carcass site, probably explaining why, although 164 vultures came to the carcass site, they seemed uninterested in feeding on it. The same probably happened in LMNP.

Scavengers are likely to be more stressed towards the end of wet seasons; in Uganda, this could be May or June; but late January, typically a dry month, is logistically easier for us.

In MFNP, the carcass had been picked clean by 14h30, but vultures were still arriving during the previous half hour (Table 4). This suggests that, had there been a second carcass (or perhaps a larger cow), more vultures would have come. The ribcage will have been easily seen from the air, but we were unable to know if any more vultures saw it from afar but did not approach.

A lion approached the QENP carcass to within about 80 m at 10h45, and had to be gently chased away by driving towards it; this did not disturb the vultures.

### **Proposed new protocol**

*Sites.* These should be constant from year to year; in Uganda's case, the 2009 sites were all suitable; they form a minimum set.

*Timing.* The choice of January in Uganda allows cost savings as teams are in the field for waterbird counts; May or June might otherwise be better.

*Baits.* Cows proved suitable but MFNP, being a large area (some 4000 km<sup>2</sup> plus 1400 km<sup>2</sup> of Wildlife Reserves) would

be better served by having two sites. The increase in the sample size would be beneficial too.

*Procedure for count days.* An early start – certainly not later than 09h00 – seems desirable. Counting the numbers of birds as they arrive (and, if possible, departures too) would probably give a better (and higher) total but is harder to do. The present system of 30 minute intervals might be decreased to 20 or even 15 minutes. Such counts will best be referred to as estimates of relative abundance, which also allows for the fact that unknown numbers of birds in the area may never come close enough to be recorded.

*Large carnivores.* If lions or other large carnivores approach the carcass, and appear to be keeping the vultures away, we suggest, if considered safe and practicable, that they be gently headed-off by the observers' vehicle.

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