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An electronic journal published by the Animal Demography Unit at the University of Cape Town

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OXPECKERS AND HOSTS IN NORTHERN KRUGER NATIONAL PARK: JANUARY–FEBRUARY 2016

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Recommended citation format:
Paton A 2016. Oxpeckers and hosts in northern Kruger National Park: January–February 2016. Biodiversity Observations 7.81: 1–6
URL: http://bo.adu.org.za/content.php?id=274

Published online: 17 November 2016

– ISSN 2219-0341 –

BEHAVIOUR

OXPECKERS AND HOSTS IN NORTHERN KRUGER NATIONAL PARK: JANUARY–FEBRUARY 2016

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While visiting northern Kruger National Park (KNP) in January 2016 it became apparent that Yellow-billed Oxpeckers *Buphagus africanus* were unexpectantly abundant. This inspired a study of this species in comparison with Red-billed Oxpeckers *Buphagus erythrorhyncus* with respect to their occurrence (fairly similar in the area) and host preference (clearly different) (Figures 1 and 2).

In line with SABAP2 protocol (Underhill & Brooks 2016), the numbers of birds were not counted, but the position of each species on the list was recorded (4th column) of an Excel spreadsheet (Appendix 1). Deviating from SABAP2 protocol, second and subsequent sightings within pentads were also recorded along with their position on list as a second sighting.

There were 29 separate oxpecker sightings, the first six of which did not include a record of the host species. The study of host species can thus be considered as being one week long from 1–7 February 2016. In this time period there were 24 oxpecker observations, six of which did not note any clear host species. Of the 18 recorded observations of oxpeckers associated with host species, two sightings involved both species on the same host (on 1 February, both species were observed on Buffalo and, on 7 February, both species were recorded on Giraffe) and two sightings involved oxpeckers moving between different host species (on 3 February, Yellow-billed Oxpecker moved from Impala to Buffalo and, on 7 February, Red-billed Oxpecker moved from Buffalo to Giraffe).

Figure 1: Red-billed Oxpecker on buffalo (pentad 2400_3140 Olifants camp area 003 on 7 February 2016)

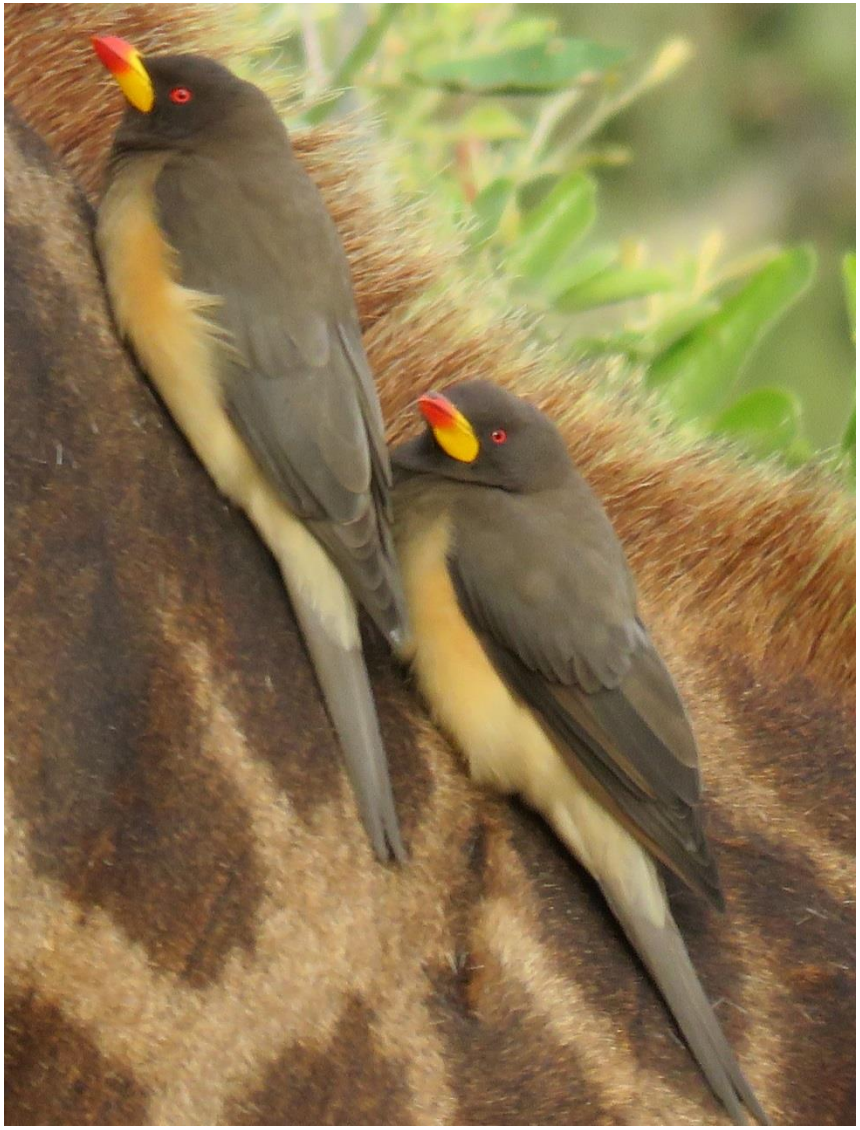

Figure 2: Yellow-billed Oxpecker on giraffe (pentad 2310_3115 Red Rocks Road 001 on 3 February 2016)

Both species thus occurred on 10 host species, which render an easy percentage of likelihood of encountering each species on each host species. Repeat surveys by other observers could refine the validity of this sample.

Red-billed Oxpeckers were observed on 10 hosts: four Giraffe (40%), four Buffalo (40%), one Hippo (10%) and one Kudu (10%). Yellow-billed Oxpeckers were also observed on 10 hosts: six Buffalo (60%), two Giraffe (20%), one Impala (10%) and one Kudu (10%).

A citizen scientist literature review on the subject may be inadequate, but I found a mid-1977–mid-1978 year-long study by Grobler & Charsley (1978) on Yellow-billed Oxpecker in Matopos National Park, Zimbabwe; they examined host preferences for this species (Table 1). Size and surface area, hair density and tick load were considered by Grobler & Charsley (1978) as the main factors in host selection. They suggested that large size, sparse hair and large tick load were more important for Yellow-billed Oxpecker than for Red-billed Oxpecker. Yellow-billed Oxpecker feeds primarily by picking out ticks and does not employ the scissor-like bill movement as readily and effectively as the Red-billed Oxpecker, particularly in species with long hair. The latter species this copes better with long hair and also benefit more from animal tissue especially around cuts and wounds.

Their descending sequence of host preference for Yellow-billed Oxpecker from Buffalo (favourite) to Giraffe (likely) to Impala (uncommon) (Table 1) is similar to mine. White Rhino and Sable Antelope are both very unlikely in the northern KNP and Eland is relatively sparse, but it is unclear why Plains Zebra and Blue Wildebeest did not show up equal to or ahead of Impala in my study. Kudu rated exceptionally low as a host in Grobler & Charsley (1978), last of 15 host species surveyed, of which only the first eight are shown in Table 1, so the observation of Yellow-billed Oxpecker on this host may either be a fluke, or rate significantly higher in northern KNP compared to south-eastern Zimbabwe.

Sample size (a one-week study by one observer compared to a one-year study by two observers) might be the cause of any differences, and a longer study may see Plains Zebra and Blue Wildebeest overtake Impala, unless there is some reason why they are less preferred in the northern KNP compared to south-eastern Zimbabwe almost thirty years earlier. Similarly, it would be interesting to see if Kudu retains a 10% utilization after extended recording.

Table 1. Top eight hosts preference for Yellow-billed Oxpecker in the Matopos National Park, Zimbabwe (based on Grobler & Charsley 1978). The preference index is calculated as "Host individuals" divided by "Oxpeckers seen", ie the number of mammals per bird

	Host sightings	Host individuals	Oxpecker sightings	Oxpeckers seen	Preference index	Hosts in population
Buffalo *Syncerus caffer*	96	2 601	57	556	4,67	150
White Rhino *Ceratotherium simum*	535	1 399	55	186	7,52	26
Plains Zebra *Equus burchelli*	261	1 303	19	87	14,98	26
Eland *Taurotragus oryx*	184	857	13	18	14,77	90
Giraffe *Giraffa camelopardalis*	95	588	9	31	18,97	9
Sable Antelope *Hippotraugus equinus*	196	2 160	12	57	37,89	150
Blue Wildebeest *Conochaetes taurinus*	509	5 778	15	63	91,71	140
Impala *Aepyceros melampus*	564	9 104	6	29	313,93	250

I have observed and photographed Plains Zebra as host to Red-billed Oxpecker *B. erythrorhyncus,* in Hluhluwe Game Reserve in October, 2014 on a shorter visit than that to northern Kruger Natonal Park, which reinforces the suggestion that the sample of this study is on the small side.

The area visited was from Olifants to Pafuri, but the sample is too small to make any observations of variation within the northern KNP. But it probably provides a fairly good overview, because it involved a single observer making the similar effort throughout the sampling area. This is because one of the main objectives of the trip was to accumulate full protocol checklists for SABAP2, and thus the level of effort per pentad was two hours for full protocol checklists (and less for the ad hoc protocol checklists). For this reason I have included the order in which the oxpecker was recorded in Appendix 1, and also the historical reporting rate in SABAP2 just prior to this trip. However, the absence of records of total numbers of host species inspected for oxpeckers, as done by Grobler & Charlsey (1978) might be a critical shortfall of the potential use of this information.

This shortfall makes in it impossible to convert my data to a preference index allowing direct comparison with Grobler & Charsley (1978). The small sample here is unlikely to be robust enough for it to have statistical validity, given that my data is probably about 1% of the size of that collected by Grobler & Charsley (1978).

With the addition of counts of host species inspected for oxpeckers, this study could be repeated by other SABAP2 observers. The combined data would then have statistical validity because a similar protocol would be in use. It may also be particularly interesting to do a studies in winter to find out if there is a seasonal shift in host preference.

References

Grobler WH, Charsley GW 1978. Host preference of the Yellow-billed Oxpecker *Buphagus africanus* in the Rhodes Matopos National Park, Rhodesia. South African Journal of Nature Research 8: 169–170.

Underhill LG 2016. The fundamentals of the SABAP2 protocol. Biodiversity Observations 7.42: 1–12. Available online at http://bo.adu.org.za/content.php?id=235

Appendix 1: Records of oxpeckers in northern Kruger National Parl, 29 January – 7 February 2016. For an explanation of terminology of the Second Southern African Bird Atlas Project (SABAP2), see Underhill & Brook (2016). Pentads are five minutes of latitude by five minutes of longitude. A full-protocol (FP) checklist for SABAP2 involves at least two hours of intensive fieldwork; an ad hoc protocol (AP) involves less fieldwork. The order refers to the number of species previously seen when the oxpecker was recorded (a plus sign indicates that it was recorded as an additional species after the two hours of inenstive fieldwork. The reporting rate is the percentage of full-protocol checklists for the pentad on which the oxpecker species was recorded; the reporting rate is based on the given number of full-protocol SABAP2 checklists.

Date	SABAP2 Pentad	SABAP2 Protocol	Oxpecker species	Mammal host	Order on checklist	SABAP2 Reporting Rate	SABAP2 Check-lists	Other oxpecker species present at the same time
2016-01-29	2310_3115	FP	Red-billed Oxpecker	N/A	34	23.0	13	
2016-01-29	2305_3125	FP	Red-billed Oxpecker	N/A	50	71.6	162	
2016-01-30	2305_3125	FP	Red-billed Oxpecker	N/A	64+	71.6	162	
2016-01-31	2235_3105	AP	Yellow-billed Oxpecker	N/A	13	37.1	35	
2016-01-31	2225_3110	FP	Red-billed Oxpecker	N/A	35	50.9	234	
2016-02-01	2235_3055	FP	Red-billed Oxpecker	N/A	25	55.1	29	
2016-02-01	2235_3055	FP	Yellow-billed Oxpecker	Kudu	47	24.1	29	
2016-02-01	2240_3055	FP	Red-billed Oxpecker	Buffalo	59	40.5	38	Yellow-billed Oxpecker
2016-02-01	2240_3055	FP	Yellow-billed Oxpecker	Buffalo	60	31.5	38	Red-billed Oxpecker
2016-02-02	2350_3130	FP	Red-billed Oxpecker	Giraffe	75+	53.7	164	
2016-02-02	2330_3120	AP	Red-billed Oxpecker	Kudu	22	55.6	124	
2016-02-02	2325_3120	AP	Yellow-billed Oxpecker	Buffalo	6	22.7	22	
2016-02-02	2320_3120	AP	Yellow-billed Oxpecker	Buffalo	1	0	5	
2016-02-02	2230_3110	AP	Yellow-billed Oxpecker	Buffalo	23	30.8	13	
2016-02-03	2355_3125	AP	Yellow-billed Oxpecker	Buffalo	1	0	5	

Date	SABAP2 Pentad	SABAP2 Protocol	Oxpecker species	Mammal host	Order on checklist	SABAP2 Reporting Rate	SABAP2 Check-lists	Other oxpecker species present at the same time
			Red-billed Oxpecker	Unknown, possible nesting site	6	40	5	
2016-02-03	2350_3130	FP	Red-billed Oxpecker	Hippo	67	53.7	164	
2016-02-03	2325_3120	FP	Yellow-billed Oxpecker	Impala departed towards buffalo	16+	22.7	22	
2016-02-04	2345_3135	FP	Red-billed Oxpecker	buffalo	32+	60.5	43	
2016-02-04	2355_3140	FP	Red-billed Oxpecker	giraffe	1	55.3	38	
2016-02-04	2345_3135	FP	Red-billed Oxpecker	Unknown, overflying	19	60.5	43	
2016-02-04	2345_3130	FP	Red-billed Oxpecker	Unknown, overflying	46	42.9	56	
2016-02-05	2400_3140	FP	Yellow-billed Oxpecker	Unknown, overflying	38	15.6	115	
2016-02-05	2355_3140	FP	Yellow-billed Oxpecker	Giraffe	33	5.3	38	
2016-02-06	2400_3140	FP	Red-billed Oxpecker	Unknown, overflying	46	55.6	115	
2016-02-07	2355_3125	AP	Red-billed Oxpecker	Buffalo to Giraffe	1	80.0	5	
2016-02-07	2400_3140	FP	Red-billed Oxpecker	Giraffe	88+	55.6	115	Yellow-billed Oxpecker
2016-02-07	2400_3140	FP	Yellow-billed Oxpecker	Giraffe	88+	15.7	115	Red-billed Oxpecker
2016-02-07	2355_3135	AP	Red-billed Oxpecker	Buffalo	10	30.0	10	