

Supplementary material

Appendix 1

Table A1. Summary of camera data recorded at Verreux's eagle nests in the Cederberg and the Sandveld.

Nest ID	Area	Year	Camera make	Set up	Frame interval	Installation date	End date	Photographs (n)	Reason for end	Prey deliveries (n)
1	Cederberg	2012	Scoutguard 560	Motion-sensing	NA	11-Jul	22-Jul	302	nest failed	3
2	Cederberg	2012	Scoutguard 560	Motion-sensing	NA	14-Jul	15-Jul	32	camera failed	1
1	Cederberg	2013	Ltl Acorn 6210MG/C	Time-lapse	3 minute	29-Jun	25-Sep	18576	fledged	57
2	Cederberg	2013	Ltl Acorn 6210MG/C	Time-lapse	3 minute	22-Jul	13-Aug	5610	chick died	15
5	Sandveld	2012	Scoutguard 560	Motion-sensing	NA	05-Jul	20-Jul	475	camera failed	0
4	Sandveld	2012	Scoutguard 560	Motion-sensing	NA	06-Jul	26-Jul	520	camera failed	10
3	Sandveld	2013	Ltl Acorn 6210MG/C	Time-lapse	3 minute	10-Jul	07-Sep	5268	camera failed	27
4	Sandveld	2013	Ltl Acorn 6210MG/C	Time-lapse	3 minute	05-Jul	11-Jul	1468	camera failed	7
5	Sandveld	2013	Ltl Acorn 6210MG/C	Time-lapse	3 minute	04-Jul	26-Aug	5287	camera failed	31
									Cederberg	76
									Sandveld	75
									TOTAL	151

Table A2. Summary of dietary data collected at Verreaux's eagle nests in the Sandveld ($n=9$) and the Cederberg ($n=5$) by means of prey remains collections (2011-2014), with adjusted percentage of each prey group corrected by correction factors devised from camera data. Diet and land use cover diversity were determined with the Shannon diversity Index (H).

Area		Sandveld									Cederberg						
Nest		1	2	3	4	5	6	7	8	9	Mean \pm SD	10	11	12	13	14	Mean \pm SD
Prey remains collection (MNI)	Hyrax	14	4	20	29	14	8	44	7	5	16.1 \pm13.2	22	11	73	19	26	30.2 \pm24.5
	Mole-rats	1	1	8	58	8	5	27	6	10	13.8 \pm18.3	0	0	0	0	0	0 \pm0
	Tortoise	5	59	29	65	12	20	33	5	47	30.6 \pm22.5	0	0	0	0	0	0 \pm0
	Birds	2	2	1	20	3	2	3	4	4	4.6 \pm5.9	0	0	0	0	0	0 \pm0
	Small Antelopes	1	0	5	5	0	0	2	0	0	1.4 \pm2.1	0	0	0	0	0	0 \pm0
	Lagomorphs	1	1	4	10	1	6	12	4	2	4.6 \pm4.1	2	0	1	0	0	0.6 \pm0.9
	Livestock	2	1	3	5	1	0	2	0	2	1.8 \pm1.6	0	0	0	0	0	0 \pm0
	Other	1	0	0	2	0	0	2	0	3	0.9 \pm1.2	0	0	1	0	0	0.2 \pm0.4
	TOTAL	27	68	70	194	39	41	125	26	73	73.7 \pm54.6	24	11	75	19	26	31 \pm25.3
Corrected prey in diet (%)	Hyrax	51.9	5.9	28.6	14.2	35.9	19.2	35.2	20.9	6.8	24.3 \pm15.1	91.7	100.0	94.9	100.0	100.0	97.3 \pm3.9
	Mole-rats	7.5	3.0	23.2	60.7	41.6	24.8	43.8	46.8	27.8	31.0 \pm18.8	0.0	0.0	0.0	0.0	0.0	0 \pm0
	Tortoise	4.8	22.6	10.8	8.7	8.0	12.7	6.9	5.0	16.7	10.6 \pm5.8	0.0	0.0	0.0	0.0	0.0	0 \pm0
	Birds	7.4	2.9	1.4	12.4	7.7	12.3	2.4	14.0	5.5	7.3 \pm4.6	0.0	0.0	0.0	0.0	0.0	0 \pm0
	Small Antelopes	3.7	0.0	7.1	2.7	0.0	0.0	1.6	0.0	0.0	1.6 \pm2.4	0.0	0.0	0.0	0.0	0.0	0 \pm0
	Lagomorphs	3.7	1.5	5.7	5.3	2.6	8.2	9.6	9.3	2.7	5.4 \pm3	8.3	0.0	2.9	0.0	0.0	2.2 \pm3.6
	Livestock	7.4	1.5	4.3	2.2	2.6	0.0	1.6	0.0	2.7	2.4 \pm2.2	0.0	0.0	0.0	0.0	0.0	0 \pm0
	Other	3.7	0.0	0.0	0.9	0.0	1.4	1.6	0.0	4.1	1.2 \pm1.6	0.0	0.0	0.7	0.0	0.0	0.1 \pm0.3
Diet diversity (H)		1.43	0.84	1.48	1.43	1.32	1.45	1.43	1.33	1.33	1.34 \pm0.20	0.29	0.00	0.19	0.00	0.00	0.10 \pm0.13
Habitat availability (%)	Natural	54.0	71.0	65.5	55.5	52.5	75.5	54.1	47.1	19.1	54.9 \pm16.4	97.3	97.3	99.8	100.0	99.1	98.7 \pm1.3
	Near Natural	4.1	2.6	2.6	3.6	2.3	1.1	2.3	4.1	5.1	3.1 \pm1.2	0.4	0.1	0.2	0.0	0.0	0.1 \pm0.2
	Degraded	6.4	21.8	6.8	7.3	15.5	9.8	2.5	14.3	53.4	15.3 \pm15.4	1.8	2.1	0.0	0.0	0.0	0.8 \pm1.0
	Agricultural (No Natural)	35.5	4.7	25.1	33.5	29.7	13.6	41.2	34.5	22.4	26.7 \pm11.6	0.5	0.5	0.0	0.0	0.8	0.4 \pm0.4
Land use cover diversity		1.01	0.81	0.90	1.00	1.08	0.76	0.88	1.13	1.14	0.96 \pm0.13	0.15	0.14	0.02	0.00	0.05	0.07 \pm0.06
Years monitored		3	3	2	4	3	2	3	3	NA	2.9 \pm0.6	4	4	4	3	4	3.8 \pm0.4
Mean breeding	Productivity	0.67	0.67	0.50	1.00	1.00	1.00	0.33	1.00	NA	0.77 \pm0.26	0.25	0.50	0.50	0.33	0.25	0.36 \pm0.12
	Success	1.00	0.67	1.00	1.00	1.00	1.00	0.50	1.00	NA	0.89 \pm0.19	0.50	0.67	0.50	0.50	1.00	0.63 \pm0.21
	Rate	0.67	1.00	0.50	1.00	1.00	1.00	0.67	1.00	NA	0.85 \pm0.2	0.50	0.75	1.00	0.67	0.25	0.63 \pm0.28

Table A3. Summary of data used in regional analysis of diet correlations with breeding parameters. MNI= Minimum Number of Individual Prey Items. H= Shannon's index for diet diversity. Breeding data: Rate, success and productivity are given as mean values with (SD) where possible.

Study	Diet data				Breeding data					
	MNI	H	Hyrax (%)	Source	Rate	Success	Productivity	Events	Years	Source
Cederberg	155	0.10	97.3	This study	0.48 (0.14)	0.57 (0.13)	0.28 (0.13)	64	4	Murgatroyd et al. 2016
Sandveld	663	1.34	24.3	This study	0.94 (0.07)	0.8 (0.05)	0.76 (0.05)	48	4	Murgatroyd et al. 2016
Karoo	3823	0.57	87.8	Davies 1994	0.62 (0.11)	0.76 (0.11)	0.47 (0.12)	84	4	Davies 1994
Matopos	1748	0.11	98.1	Gargett 1990	0.68 (0.17)	0.71 (0.14)	0.48 (0.12)	1101	26	Gargett 1990
Magaliesberg	158	1.35	34.7	Padayachee unpub.	0.70 (0.26)	0.73 (0.12)	0.52 (0.23)	28	3	Whittington-Jones et al. 2013 & unpub.
Transvaal	176	0.35	92.6	Tarboton & Allan 1984	0.65	0.79	0.51	111	5	Tarboton & Allan 1984
Walter Sisulu	336	1.17	22.3	Symes & Kruger 2012	1	0.9	0.9	21	21	Roodekrans Project 2015

Table A4. Results from GLMs comparing model fit for diet diversity of Verreaux's eagles described by land use cover diversity (luc div) and the percentage of agricultural land (no natural cover) within a 3 km of the nest and its quadratic term (^2). Other column abbreviations: df, degrees of freedom; LogLik, Logit link; ΔAIC_c , change in AICc relative to the highest ranked model; ω_i , AICc weight; ER, evidence ratio.

Response variable	Explanatory variables	df	logLik	AIC _c	ΔAIC_c	ω_i	ER
Diet diversity	luc div	3	2.47	3.5	0.00	0.50	-
	luc div + ^2	4	4.46	3.5	0.06	0.49	1.03
Diet diversity	% agriculture + ^2	4	5.17	2.10	0.00	1.00	-
	% agriculture	3	-2.66	13.70	11.62	0.00	332.33

Table S5. Results from GLMs comparing model fit for the proportion of main prey in Verreaux's eagles diet described by the percentage of agricultural land (no natural cover) within a 3 km buffer of the nest and its quadratic term (^2). Other column abbreviations: df, degrees of freedom; LogLik, Logit link; ΔAIC_c , change in AICc relative to the highest ranked model; ω_i , AICc weight; ER, evidence ratio.

Response variable	Explanatory variables	df	logLik	AIC _c	ΔAIC_c	ω_i	ER
% hyrax	% agriculture + ^2	4	-62.08	136.60	0.00	0.90	-
	% agriculture	3	-66.53	141.50	4.85	0.08	11.33
% mole-rat	% agriculture	3	-54.33	117.10	0.00	0.74	-
	% agriculture + ^2	4	-54.02	120.50	3.42	0.14	5.51
% tortoise	% agriculture + ^2	4	-43.07	98.60	0.00	0.42	-
	% agriculture	3	-46.80	98.70	0.10	0.40	1.05

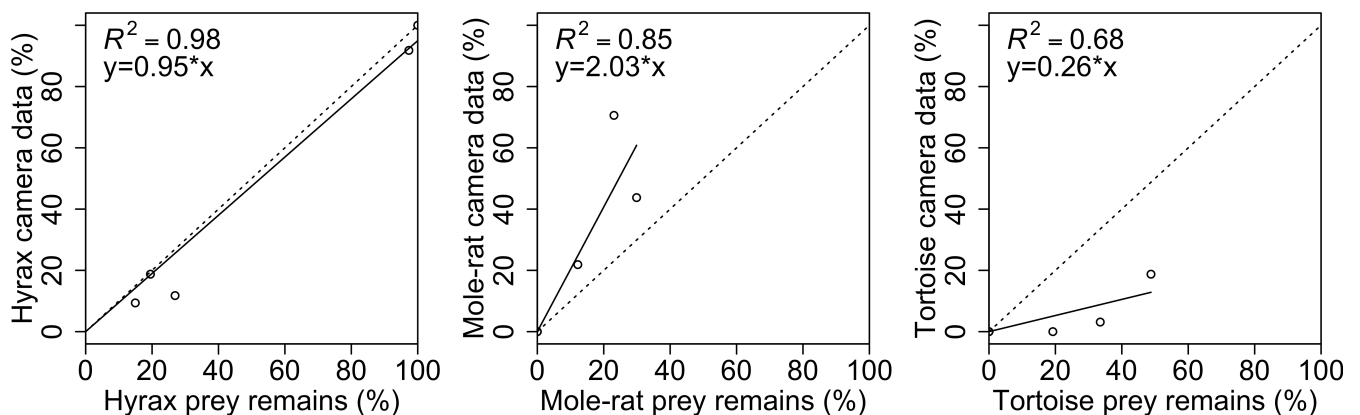


Figure A1. Comparative percentage contribution of rock hyrax, mole-rats and tortoise as assessed by prey remains collections and camera studies at five Verreaux's eagles nests from 2012-2013 in our study areas. Solid lines show linear relationships and dotted lines show 1:1 relationships. Points above the dotted line indicate under-representation in prey collections, points below the dotted line indicates over-representation in the prey collections.