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Wildlife Research

Supplementary Material

Rocky escarpment versus savanna woodlands: comparing diet and body condition as indicators of habitat quality for the endangered northern quoll (*Dasyurus hallucatus*)

Hannah Thomas[A,D], *Skye F. Cameron*[B], *Hamish A. Campbell*[C], *Mariana A. Micheli-Campbell*[C], *Ellie C. Kirke*[A], *Rebecca Wheatley*[D] *and Robbie S. Wilson*[A]

[A]School of Biological Sciences, The University of Queensland, St Lucia, Qld 4072, Australia.

[B] Australian Wildlife Conservancy, PO Box 8070, Subiaco East, WA, 6008, Australia.

[C]Research Institute for the Environment and Livelihoods, College of Engineering, IT and Environment, Charles Darwin University, Darwin, NT 0909, Australia.

[C]School of Natural Sciences, University of Tasmania, Sandy Bay, Tas, 7001, Australia.

[D]Corresponding author. Email: hannah.thomas2@uq.net.au

Appendix S1. Habitat surveys

Habitat surveys were conducted at each of the twelve sites (rocky escarpment $n = 6$; savanna woodland $n = 6$), to confirm that each site was an accurate representation of rocky escarpment or savanna woodland habitat. Surveys were conducted during May 2018, concurrently with quoll trapping. Survey design and variables chosen were based on the methods of McIntyre *et al.* (2015). Habitat surveys were conducted along one of the four line transects from the trapping grid at each site. At every 100 m interval, we measured a 10 m by 10 m quadrat (n = 5 quadrats per site) and quantified:

1. Tree density: total count of the number of trees greater than 2 m tall.
2. Basal area: calculation of the area at breast height, by measurement of tree circumference for all trees greater than 2 m tall (McIntyre *et al.* 2015).
3. Ground cover: estimation of the percentage of the quadrat covered by ground cover, grasses and shrubs.
4. Foliage cover: estimation of the percentage of the quadrat covered by canopy foliage.

To confirm that each site was representative of either rocky escarpment or savanna woodland habitat, a principal component analysis (PCA) was conducted on standardised values for basal area, tree density, proportion of ground cover and proportion of canopy cover (Table S1). The first two principal components explained 62.9% and 19.8% of the total variation in the data respectively (Fig. S1). The first principal component describes a gradient from rocky escarpment to savanna woodland habitat. The first principal component scores were significantly different between rocky escarpment and savanna woodland habitat (two-sample t test, $t_{10} = -3.62$, $P = 0.005$, $n = 12$).

Table S1. Principal component analysis scores for habitat surveys on Groote Eylandt

Principal components analysis (PCA) matrix showing the factor loadings of the four variables measured to confirm each site represented either rocky escarpment (n = 6) or savanna woodland (n = 6) habitat. PC1 scores describe a gradient from rocky escarpment to savanna woodland habitats with the more negative scores associated with rocky escarpment habitat that have less trees, lower basal area, lower ground cover and lower canopy cover, while the more positive scores are associated with savanna woodland habitat that have more trees, greater basal area, higher ground cover and higher canopy cover

Principal component	**PC_1**	**PC_2**	**PC_3**	**PC_4**
% of overall variance	*62.9*	*19.8*	*10.1*	*7.2*
Basal area	0.556	–0.174	0.270	0.767
Tree density	0.370	0.894	0.211	–0.140
Ground cover	0.531	–0.036	–0.841	–0.097
Canopy cover	0.521	–0.412	0.419	–0.618

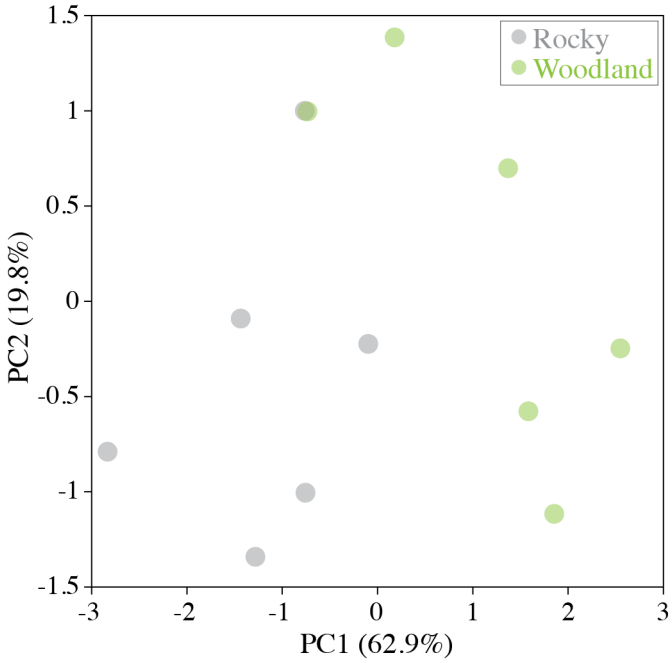

Figure S1. First (PC1) and second (PC2) principal components for habitat type of the 12 (rocky escarpment, grey circles, *n* = 6; savanna woodland, green circles, *n* = 6) trapping sites on Groote Eylandt. PC1 scores describe a gradient from rocky escarpment to savanna woodland habitats with the more negative scores associated with rocky escarpment habitat that have less trees, lower basal area, lower ground cover and lower canopy cover, while the more positive scores are associated with savanna woodland habitat that have more trees, greater basal area, higher ground cover and higher canopy cover. All rocky escarpment sites had a negative PC1 score and all savanna woodland sites, except for P24, had a positive PC1 score (note that P24 had the same score as a rocky escarpment site, HW9, and so are overlapping on the graph). The first two principle components explained 82.7% of the total variation.

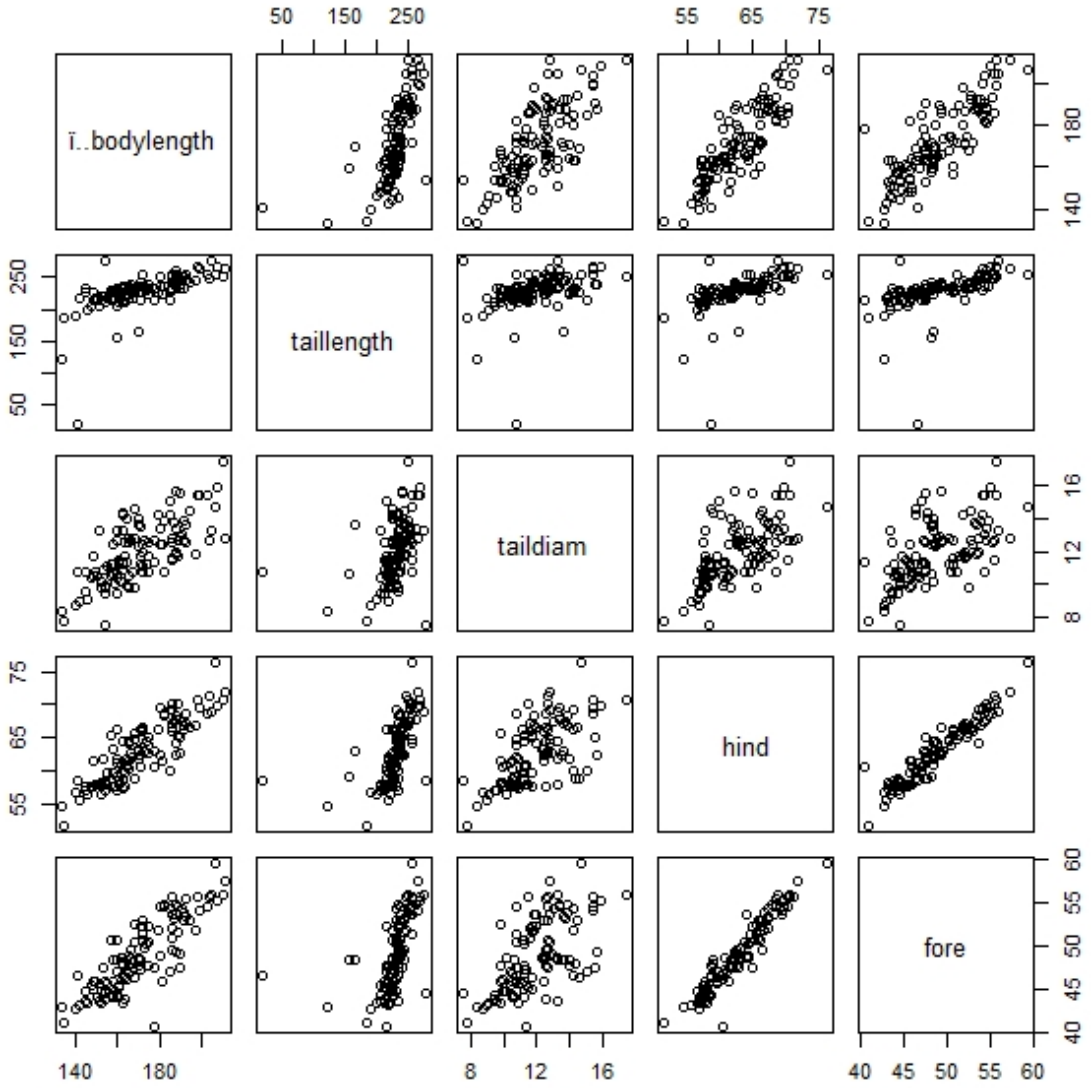

Figure S2. Body size and body length correlation. Positive correlation between body length and tail length, tail diameter, hindlimb length and forelimb length for northern quolls (*Dasyurus hallucatus*; *n* = 111) on Groote Eylandt, NT, Australia. Due to positive correlation, body length was used as a proxy for body size during further analysis.

Table S2. SIMPER pairwise comparison between dietary items in northern quoll *(Dasyurus hallucatus)* scats from rocky escarpment and savanna woodland on Groote Eylandt, NT, Australia

The relative volume that dietary items contributed to scats was different between rocky escarpment and savanna woodland habitats (P = 0.036, n = 107). SIMPER indicates which scats contributed the most to the dissimilarity between habitat types. This table lists the top ten scats which contributed the most, in order, and the quolls associated with those scats

Order	Sex	Mass (g)	Habitat	Cumulative contribution (%)
1	Female	330	Rocky escarpment	1.196
2	Female	186	Rocky escarpment	2.391
3	Female	214	Rocky escarpment	3.587
4	Female	301	Savanna woodland	4.782
5	Female	481	Savanna woodland	5.978
6	Male	471	Savanna woodland	7.173
7	Male	416	Savanna woodland	8.367
8	Male	671	Savanna woodland	9.564
9	Male	394	Rocky escarpment	10.760
10	Male	360	Rocky escarpment	11.956