

Table 1. Top-ranked models explaining the occupancy (or occurrence) (Ψ) and detection probabilities (p) for hyenas and cheetah in the Tarangire-Simanjiro ecosystem, northern Tanzania based on spoor data collected between August-November 2014 and April-May 2015. Models are ranked according to AICc. No. of sites: hyena = 34, cheetah = 10.

Model	AICc	Δ AICc	ω_i	Model Likelihood	K	-2LL	$\hat{\Psi}$ (SE)	\hat{p} (SE)	\hat{c}
Hyena									
Detection models (p) ~									
$\Psi(\cdot), p(\cdot)$	258.92	0.00	0.5853	1.0000	2	254.92	0.85(0.06)	0.64(0.04)	1.09
$\Psi(\cdot), p(Bl)$	260.77	1.85	0.2321	0.3965	2	256.77	0.86(0.06)	0.60(0.03)	1.10
Occupancy models (Ψ) ~									
$\Psi(Hpd+Bushl), p(\cdot)$	251.85	0.00	0.5480	1.0000	3	245.85	0.85(0.07)	0.64(0.04)	1.10
$\Psi(\cdot), p(\cdot)$	258.92	7.07	0.0160	0.0292	2	254.92	0.85(0.06)	0.64(0.04)	0.99
Averaged model							0.85(0.06)	0.63(0.04)	
Cheetah									
Detection models (p) ~									
$\Psi(\cdot), p(Season)$	73.38	0.00	0.8894	1.0000	2	69.38	0.85(0.13)	0.37(0.04)	1.20
$\Psi(\cdot), p(\cdot)$	77.55	4.17	0.1106	0.1243	2	73.55	0.85(0.14)	0.37(0.08)	0.93
Occupancy models (Ψ) ~									
$\Psi(Gr), p(\cdot)$	77.34	0.00	0.1470	1.000	2	73.34	0.84(0.13)	0.37(0.08)	0.94
$\Psi(Hpd), p(\cdot)$	77.52	0.18	0.1344	0.9139	2	73.52	0.85(0.14)	0.37(0.08)	0.94
$\Psi(\cdot), p(\cdot)$	77.55	0.21	0.1324	0.9003	2	73.55	0.85(0.14)	0.37(0.08)	0.94
$\Psi(Wdl), p(\cdot)$	77.97	0.63	0.1073	0.7298	2	73.97	0.78(0.12)	0.38(0.07)	1.00
$\Psi(Bushl), p(\cdot)$	78.10	0.76	0.1006	0.6839	2	74.10	0.82(0.14)	0.37(0.08)	0.97
$\Psi(Dist_Vill+Hpd), p(\cdot)$	78.50	1.16	0.0823	0.5599	3	72.50	0.83(0.13)	0.38(0.07)	0.92
$\Psi(Slo+Gr), p(\cdot)$	78.61	1.27	0.0779	0.5299	3	72.61	0.80(0.17)	0.38(0.07)	0.94
$\Psi(Dist_water+Gr), p(\cdot)$	78.62	1.28	0.0775	0.5273	3	72.62	0.82(0.15)	0.38(0.07)	0.94
$\Psi(Hpd+Agr), p(\cdot)$	78.70	1.36	0.0745	0.5066	3	72.70	0.83(0.17)	0.38(0.07)	0.91
$\Psi(Gr+Agr), p(\cdot)$	78.94	1.60	0.0661	0.4493	3	72.94	0.82(0.17)	0.38(0.07)	0.93
Averaged model							0.82(0.15)	0.38(0.07)	

Notes: All models with Δ AICc $<$ 2.0, plus the constant-only models, are reported. K is the number of estimated parameters; Δ AICc is the difference between the AICc of the model and the lowest-AICc model; ω_i is the Akaike's model weight; ($\hat{\Psi}$) is the estimated overall occurrence probability; (\hat{p}) is the estimated overall detection probability; (SE) is the associated standard error for the estimate; $-2LL$ is the negative value of twice the log likelihood and \hat{c} is the estimated overdispersion parameter. Covariate abbreviations: Dist_water = distance to permanent water; Dist_vill = distance to nearest village; Slo = slope; Hpd = Human population density; Gr = proportion of grassland; Bushl = proportion of bushland; Agr = proportion of agriculture; Bl = proportion of bareland; Wdl = proportion of woodland; season = wet versus dry seasons.