

Table 2. Top-ranked models explaining the occupancy (or occurrence) ( $\Psi$ ) and detection probabilities ( $p$ ) for lions and leopards based on spoor data collected between August-November 2014 and April-May 2015. Models are ranked according to AICc. No. of sites: lion = 20; leopard = 34.

Model	AICc	$\Delta$ AICc	$\omega_i$	Model Likelihood	K	-2LL	$\hat{\Psi}$ (SE)	$\hat{p}$ (SE)	$\hat{c}$
<b>Lion</b>									
<b>Detection models (<math>p</math>) ~</b>									
$\Psi(\cdot), p(BI+Season)$	116.35	0.00	0.9503	1.0000	3	110.35	0.56(0.11)	0.60(0.06)	1.10
$\Psi(\cdot), p(\cdot)$	122.25	5.90	0.0497	0.0523	2	118.25	0.56(0.11)	0.46(0.06)	1.09
<b>Occupancy models (<math>\Psi</math>) ~</b>									
$\Psi(Dist\_water+Dist\_PA), p(\cdot)$	113.30	0.00	0.4556	1.0000	3	107.30	0.54(0.11)	0.45(0.06)	1.20
$\Psi(Dist\_PA), p(\cdot)$	114.64	1.34	0.2331	0.5117	2	110.64	0.55(0.08)	0.46(0.06)	0.99
$\Psi(\cdot), p(\cdot)$	122.25	8.95	0.0052	0.0114	2	118.25	0.56(0.11)	0.46(0.06)	1.20
<b>Averaged model</b>							<b>0.55(0.10)</b>	<b>0.49(0.06)</b>	
<b>Leopard</b>									
<b>Detection models (<math>p</math>) ~</b>									
$\Psi(\cdot), p(Bushl+Season)$	97.93	0.00	0.7386	1.0000	3	91.93	0.77(0.30)	0.17(0.06)	0.64
$\Psi(\cdot), p(\cdot)$	105.56	7.63	0.0163	0.0220	2	101.56	0.70(0.33)	0.09(0.05)	1.20
<b>Occupancy models (<math>\Psi</math>) ~</b>									
$\Psi(Gr), p(\cdot)$	104.03	0.00	0.1288	1.0000	2	100.03	0.72(0.18)	0.10(0.03)	1.10
$\Psi(Bushl+Gr), p(\cdot)$	104.60	0.57	0.0969	0.7520	3	98.60	0.55(0.21)	0.12(0.05)	0.92
$\Psi(Gr+Wdl), p(\cdot)$	105.06	1.03	0.0770	0.5975	3	99.06	0.70(0.33)	0.10(0.04)	1.01
$\Psi(Hpd+Bushl), p(\cdot)$	105.12	1.09	0.0747	0.5798	3	99.12	0.56(0.21)	0.12(0.05)	0.95
$\Psi(BI), p(\cdot)$	105.21	1.18	0.0714	0.5543	2	101.21	0.63(0.16)	0.11(0.04)	1.03
$\Psi(Hpd), p(\cdot)$	105.55	1.52	0.0602	0.4677	2	101.55	0.68(0.33)	0.10(0.05)	1.10
$\Psi(\cdot), p(\cdot)$	105.56	1.53	0.0599	0.4653	2	101.56	0.70(0.33)	0.10(0.05)	1.10
$\Psi(Slo), p(\cdot)$	105.69	1.66	0.0562	0.4360	2	101.69	0.68(0.34)	0.10(0.05)	1.00
$\Psi(Wdl), p(\cdot)$	105.70	1.67	0.0559	0.4339	2	101.70	0.47(0.03)	0.13(0.04)	0.95
$\Psi(Dist\_water), p(\cdot)$	105.73	1.70	0.0551	0.4274	2	101.73	0.50(0.10)	0.13(0.04)	0.76
$\Psi(Dist\_Vill), p(\cdot)$	105.98	1.95	0.0486	0.3772	2	101.98	0.51(0.12)	0.13(0.04)	0.93
<b>Averaged model</b>							<b>0.61(0.21)</b>	<b>0.11(0.04)</b>	

Notes: All models with  $\Delta$ AICc  $<$  2.0, plus the constant-only models, are reported. K is the number of estimated parameters;  $\Delta$ AICc is the difference between the AICc of the model and the lowest-AICc model;  $\omega_i$  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;  $\hat{c}$  is the estimated overdispersion parameter and  $\beta$  is the untransformed estimate of coefficient for covariates. Covariate abbreviations: Dist\_water = distance to permanent water; Dist\_vill = distance to nearest village; Dist\_PA = distance to park boundary; Slo = Slope; Hpd = Human population density; Gr = proportion of grassland; Bushl = proportion of bushland; BI = proportion of bareland; Wdl = proportion of woodland; season = wet versus dry seasons.