Table S5: Occupancy models by species from the 2010, 45 sites data set.

Model	N	-2 log likelihood	Δ AIC	AIC Weight	$\hat{\psi}(s.e)$	$\hat{p}(s.e)$
Slow-worm						
$\psi(.), p(\text{survey-specific})$	7	211.45	0.00	1.00	0.87 (0.051)	0.82 (0.053)
$\psi(.), p(\text{soil temp})$	3	238.11	18.66	0.00	0.87 (0.051)	0.82 (0.024)
$\psi(.), p(\text{refugia})$	3	238.34	18.89	0.00	0.87 (0.051)	0.83 (0.025)
$\psi(.), p(\text{experience})$	6	237.95	24.50	0.00	0.87 (0.051)	0.83 (0.041)
$\psi(.), p(.)$	2	248.22	26.77	0.00	0.87 (0.051)	0.83 (0.025)
$\psi(\text{area}), p(.)$	3	246.70	27.25	0.00	0.87 (0.050)	0.83 (0.025)
$\psi(\text{south facing}), (.)$	3	247.46	28.01	0.00	0.87 (0.049)	0.83 (0.025)
$\psi(\text{level}), (.)$	3	247.60	28.15	0.00	0.87 (0.050)	0.83 (0.025)
$\psi(.), p(\text{cloud cover})$	3	247.78	28.33	0.00	0.87 (0.051)	0.83 (0.025)
$\psi(.), p(\text{air temp})$[a]	3	248.08	28.63	0.00	0.87 (0.051)	0.83 (0.025)
$\psi(.), p(\text{duration})$[a]	3	248.19	28.74	0.00	0.87 (0.051)	0.83 (0.025)
ψ (level & south facing), $(.)$[a]	3	248.21	28.76	0.00	0.87 (0.051)	0.83 (0.025)
				Model averaged:	0.87 (0.051)	0.82 (0.053)
Common lizard						
$\psi(.), p(\text{duration})$	3	298.90	0.00	0.80	0.76 (0.065)	0.63 (0.034)
$\psi(.), p(\text{survey-specific})$	7	296.16	5.26	0.06	0.76 (0.064)	0.64 (0.081)
ψ (soil type), $(.)$	5	300.69	5.79	0.04	0.76 (0.097)	0.64 (0.035)
$\psi(.), p(.)$	2	308.22	7.32	0.02	0.76 (0.064)	0.64 (0.035)
$\psi(.), p(\text{refugia})$	3	307.02	8.12	0.01	0.76 (0.064)	0.64 (0.035)
$\psi(\text{area}), p(.)$	3	307.24	8.34	0.01	0.76 (0.064)	0.64 (0.035)
$\psi(.), p(\text{air temp})$	3	307.29	8.39	0.01	0.76 (0.064)	0.64 (0.035)
$\psi(.), p(\text{soil temp})$	3	307.69	8.79	0.01	0.76 (0.064)	0.64 (0.035)
$\psi(.), p(\text{cloud cover})$	3	307.71	8.81	0.01	0.76 (0.064)	0.64 (0.035)
$\psi(\text{level}), p(.)$[a]	3	307.78	8.88	0.01	0.76 (0.064)	0.64 (0.035)
$\psi(\text{south facing}), p(.)$[a]	3	308.08	9.18	0.01	0.76 (0.064)	0.64 (0.035)
				Model averaged:	0.76 (0.066)	0.63 (0.037)

Model	N	-2 log likelihood	Δ AIC	AIC Weight	$\hat{\psi}(s.e)$	$\hat{p}(s.e)$
Sand lizard						
ψ(soil type), p(.)	5	70.06	0.00	0.85	0.14 (0.046)	0.43 (0.089)
ψ(.), p(air temp)	3	78.94	4.88	0.07	0.15 (0.057)	0.35 (0.089)
ψ(.), p(soil temp)	3	81.84	7.78	0.02	0.14 (0.053)	0.44 (0.086)
ψ(.), p(.)	2	84.32	8.26	0.01	0.14 (0.053)	0.43 (0.089)
ψ(.), p(duration)	3	82.57	8.51	0.01	0.18 (0.086)	0.26 (0.118)
ψ(.), p(cloud cover)	3	83.79	9.73	0.01	0.14 (0.053)	0.44 (0.091)
ψ(level & south facing), p(.)[a]	3	83.90	9.84	0.01	0.14 (0.056)	0.43 (0.089)
ψ(level), p(.)[a]	3	84.24	10.18	0.01	0.14 (0.053)	0.43 (0.089)
ψ(south facing), p(.)[a]	3	84.27	10.21	0.01	0.14 (0.053)	0.43 (0.089)
ψ(area), p(.)[a]	3	84.29	10.23	0.01	0.14 (0.053)	0.43 (0.089)
ψ(.), p(refugia)[a]	3	84.32	10.26	0.01	0.14 (0.053)	0.43 (0.090)
ψ(connectivity), p(.)	6	80.37	12.31	0.00	0.14 (0.098)	0.43 (0.089)
ψ(.), p(survey-specific)	7	81.91	15.85	0.00	0.14 (0.053)	0.43 (0.195)
				Model averaged:	0.14 (0.048)	0.42 (0.093)
Adder						
ψ(level & south facing), p(.)	3	257.53	0.00	0.29	0.56 (0.072)	0.57 (0.042)
ψ(.), p(.)	2	261.51	1.98	0.11	0.56 (0.075)	0.57 (0.042)
ψ(.), p(survey-specific)	7	251.74	2.21	0.10	0.56 (0.075)	0.57 (0.097)
ψ(level), p(.)	3	259.82	2.29	0.09	0.56 (0.073)	0.57 (0.042)
ψ(.), p(soil temp)	3	260.36	2.83	0.07	0.56 (0.075)	0.57 (0.042)
ψ(.), p(cloud cover)	3	260.45	2.92	0.07	0.56 (0.075)	0.58 (0.042)
ψ(.), p(duration)	3	260.75	3.22	0.06	0.56 (0.075)	0.56 (0.043)
ψ(area), p(.)	3	260.80	3.27	0.06	0.56 (0.074)	0.57 (0.042)
ψ(.), p(refugia)	3	260.89	3.36	0.05	0.56 (0.075)	0.57 (0.042)
ψ(.), p(air temp)	3	260.92	3.39	0.05	0.56 (0.075)	0.58 (0.042)
ψ(south facing), p(.)[a]	3	261.50	3.97	0.04	0.56 (0.075)	0.57 (0.042)
ψ(connectivity), p(.)	6	257.74	6.21	0.01	0.56 (0.140)	0.57 (0.042)
ψ(human impact), p(.)	7	260.23	10.70	0.00	0.56 (0.075)	0.57 (0.042)
				Model averaged:	0.56 (0.075)	0.57 (0.048)

Model	N	-2 log likelihood	Δ AIC	AIC Weight	$\hat{\psi}(s.e)$	$\hat{p}(s.e)$
Grass snake						
$\psi(.), p(\text{soil temp})$	3	272.61	0.00	0.94	0.67 (0.075)	0.43 (0.039)
$\psi(.), p(\text{survey-specific})$	7	270.12	5.51	0.06	0.66 (0.074)	0.45 (0.087)
$\psi(.), p(\text{air temp})$	3	283.24	10.63	0.00	0.68 (0.076)	0.43 (0.040)
$\psi(.), p(.)$	2	291.38	16.77	0.00	0.67 (0.075)	0.45 (0.041)
$\psi(.), p(\text{cloud cover})$	3	290.21	17.60	0.00	0.67 (0.075)	0.44 (0.041)
$\psi(.), p(\text{duration})$[a]	3	291.23	18.62	0.00	0.67 (0.075)	0.50 (0.043)
$\psi(\text{level}), p(.)$[a]	3	291.34	18.73	0.00	0.67 (0.075)	0.45 (0.041)
$\psi(.), p(\text{refugia})$[a]	3	291.35	18.74	0.00	0.67 (0.075)	0.45 (0.041)
$\psi(\text{level \& south facing}), p(.)$[a]	3	291.36	18.75	0.00	0.67 (0.075)	0.45 (0.041)
$\psi(\text{area}), p(.)$[a]	3	291.37	18.76	0.00	0.67 (0.075)	0.45 (0.041)
$\psi(\text{south facing}), p(.)$[a]	3	291.37	18.76	0.00	0.67 (0.075)	0.45 (0.041)
$\psi(\text{soil type}), p(.)$	5	287.68	19.07	0.00	0.67 (0.123)	0.45 (0.041)
$\psi(.), p(\text{experience})$	6	288.43	21.82	0.00	0.68 (0.077)	0.44 (0.074)
$\psi(\text{connectivity}), p(.)$	6	289.01	22.40	0.00	0.67 (0.140)	0.45 (0.041)
				Model averaged:	0.67 (0.075)	0.43 (0.042)
Smooth snake						
$\psi(.), p(\text{soil temp})$	3	80.24	0.00	0.88	0.16 (0.054)	0.64 (0.059)
$\psi(.), p(\text{survey-specific})$	7	76.66	4.42	0.10	0.16 (0.054)	0.62 (0.133)
$\psi(\text{area}), p(.)$	3	90.11	9.87	0.01	0.16 (0.050)	0.62 (0.076)
$\psi(.), p(\text{refugia})$	3	90.94	10.70	0.00	0.16 (0.054)	0.67 (0.071)
$\psi(\text{level \& south facing}), p(.)$	3	91.90	11.66	0.00	0.16 (0.052)	0.62 (0.076)
$\psi(.), p(.)$	2	94.65	12.41	0.00	0.16 (0.075)	0.62 (0.076)
$\psi(), p(\text{air temp})$	3	93.44	13.20	0.00	0.16 (0.055)	0.59 (0.082)
$\psi(.), p(\text{duration})$	3	93.80	13.56	0.00	0.16 (0.054)	0.68 (0.092)
$\psi(\text{south facing}), p(.)$	3	94.08	13.84	0.00	0.16 (0.054)	0.62 (0.076)
$\psi(\text{level}), p(.)$[a]	3	94.26	14.02	0.00	0.16 (0.054)	0.63 (0.076)
$\psi(.), p(\text{cloud cover})$[a]	3	94.58	14.34	0.00	0.16 (0.054)	0.62 (0.076)
$\psi(\text{connectivity}), p(.)$	6	90.36	16.12	0.00	0.16 (0.100)	0.62 (0.076)
				Model averaged:	0.16 (0.054)	0.64 (0.067)

N = Number of parameters in the model, $\hat{\psi}$ = estimated occupancy probability, and $\hat{p}$ = estimated detection probability. Models that failed to converge were discarded. 15 models were therefore run for each species in this data set. Model notation used is:

(.)	The parameter was a constant	(air temp)	Mean air temperature during surveys
(survey-specific)	The parameter varied over time	(soil temp)	Mean soil temperature during surveys
(area)	The area of the site measured in hectares	(cloud cover)	Proportion of the sky covered by cloud
(connectivity)	The connectivity of the site with other areas of habitat	(duration)	Length of the survey in minutes
(human impact)	The amount of human activity at the site	(refugia)	The total number of refugia checked
(level)	The proportion of the site that was level	(experience)	The field experience of each surveyor
(south facing)	The proportion of the site that faced south		
(level & south facing)	The proportions of the previous two categories combined		
(soil type)	Classification of site soil types into acid, alkaline or neutral		

Further details of covariates are given in the text.

[a] note that in these models the covariate can be considered to be acting as a "pretending variable" [30]