

Supplementary material

Variable reptile responses to introduced predator control in southern Australia

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Table S1. Monitoring site details and covariates used in analyses to investigate abundance of the lace monitor in East Gippsland

Definitions for site and survey specific covariates are provided in Table S3

<i>Varanus</i> site	Location	VegClass	Fox	Elev	Survey effort (days)
1	55 H 652430 5816138	Banksia woodland	Baited	42	29
2	55 H 652411 5817077	Eucalypt forest	Baited	61	29
3	55 H 652258 5818411	Eucalypt forest	Baited	59	29
4	55 H 666471 5824404	Heath	Control	125	29
5	55 H 665683 5824706	Heath	Control	123	29
6	55 H 664682 5824851	Eucalypt forest	Control	120	29
7	55 H 663768 5825365	Eucalypt forest	Control	98	29
8	55 H 662787 5825602	Eucalypt forest	Control	113	29
9	55 H 661879 5825536	Eucalypt forest	Control	124	29
10	55 H 660966 5826014	Banksia woodland	Control	146	29
11	55 H 660279 5826812	Heath	Control	149	29
12	55 H 659441 5827339	Banksia woodland	Control	160	29
13	55 H 665039 5821545	Banksia woodland	Control	75	29
14	55 H 664166 5821492	Banksia woodland	Control	76	29
15	55 H 663134 5821192	Banksia woodland	Control	73	29
16	55 H 662286 5820972	Heath	Control	86	29
17	55 H 661243 5820656	Eucalypt forest	Control	76	29
18	55 H 660265 5820321	Eucalypt forest	Control	85	29
19	55 H 659092 5820288	ecotone	Control	67	29
20	55 H 658396 5820228	ecotone	Baited	57	29
21	55 H 657408 5820582	ecotone	Baited	87	29
22	55 H 656610 5820396	ecotone	Baited	84	29
23	55 H 655926 5819864	Banksia woodland	Baited	41	29
24	55 H 655436 5819746	Banksia woodland	Baited	64	29
25	55 H 654398 5819933	Banksia woodland	Baited	83	29
26	55 H 653368 5819947	Banksia woodland	Baited	97	29
27	55 H 652199 5820206	Banksia woodland	Baited	101	29
28	55 H 651518 5820577	Banksia woodland	Baited	107	29
29	55 H 651203 5821725	Banksia woodland	Baited	111	29
30	55 H 651730 5822458	Banksia woodland	Baited	100	29
31	55 H 652239 5823192	Banksia woodland	Baited	118	29
32	55 H 652622 5823780	Banksia woodland	Baited	118	29
33	55 H 652713 5824894	Banksia woodland	Baited	119	29
34	55 H 652992 5825533	Heath	Baited	138	29
35	55 H 653554 5826365	Banksia woodland	Baited	141	29
36	55 H 652282 5819400	Heath	Baited	88	29
37	55 H 658530 5831137	Eucalypt forest	Baited	285	29
38	55 H 657819 5831209	Heath	Baited	255	29
39	55 H 656953 5830933	Banksia woodland	Baited	236	29
40	55 H 656056 5831142	Banksia woodland	Baited	222	29

41	55 H 655483 5831809	Banksia woodland	Baited	150	29
42	55 H 656178 5832399	Eucalypt forest	Baited	203	29
43	55 H 656026 5833249	Eucalypt forest	Baited	194	29
44	55 H 655352 5833622	Eucalypt forest	Baited	248	29
45	55 H 654412 5833693	Eucalypt forest	Baited	315	29
46	55 H 653499 5833843	Eucalypt forest	Baited	356	29
47	55 H 653122 5833066	Eucalypt forest	Control	297	29
48	55 H 652713 5832480	Banksia woodland	Control	250	29
49	55 H 651756 5832612	Banksia woodland	Control	199	29
50	55 H 651474 5832022	Eucalypt forest	Control	266	29
51	55 H 650617 5831787	Eucalypt forest	Control	173	29
52	55 H 650247 5831182	Eucalypt forest	Control	191	29
53	55 H 649294 5831434	Eucalypt forest	Control	138	29
54	55 H 648479 5831959	Eucalypt forest	Control	219	29
55	55 H 647860 5832423	Eucalypt forest	Control	220	29
56	55 H 647436 5831996	Eucalypt forest	Control	217	29
57	55 H 647601 5830982	Eucalypt forest	Control	179	29
58	55 H 647644 5830111	Eucalypt forest	Control	149	29
59	55 H 647952 5829258	Eucalypt forest	Control	157	29
60	55 H 648607 5828423	Eucalypt forest	Control	139	29

Table S2. Monitoring site details and covariates used to determine patterns of abundance and richness in small reptiles in East Gippsland

Definitions for site and survey specific covariates are provided in Table S3

Sites	Long	Lat	Fox	varanus	firey	ba tree	litt	sub	hc05	can cov	log vol	Survey effort (days)
PY10	148.778	-37.740	Baited	4.84	0.33	-0.71	0.48	-0.73	-0.49	0.020	3.74	37
PY12	148.780	-37.748	Baited	4.84	0.33	-0.23	0.10	-0.50	-0.96	-0.28	-0.69	37
PY14	148.839	-37.744	Control	2.55	0.49	-1.19	-0.20	0.20	-0.12	0.94	-0.04	26
PY16	148.845	-37.744	Control	2.55	-1.18	-1.60	-1.30	1.61	0.81	-0.14	-0.73	26
PY162	148.910	-37.762	Control	2.55	0.33	-0.24	0.54	-0.73	-0.92	0.79	0.69	24
PY163	148.903	-37.763	Control	2.55	0.33	-0.30	0.56	-0.27	-0.80	1.40	-0.66	24
PY164	148.897	-37.765	Control	2.55	0.33	3.51	0.77	-0.96	0.77	0.53	0.23	23
PY17	148.846	-37.744	Control	2.55	0.49	-0.90	0.51	-0.73	-0.53	0.49	-0.20	27
PY18	148.847	-37.743	Control	2.55	-1.18	-1.02	-0.96	1.61	1.07	-2.60	-0.22	26
PY19	148.848	-37.742	Control	2.55	0.49	-0.97	0.30	-0.73	0.72	0.67	1.03	25
PY20	148.852	-37.742	Control	2.55	0.49	-1.20	0.54	-0.96	-0.35	0.88	2.71	25
PY21	148.854	-37.742	Control	2.55	-0.96	-0.48	0.54	-0.96	-0.26	0.94	1.12	25
PY22	148.856	-37.740	Control	2.55	0.49	0.21	1.22	-0.96	-0.60	1.13	-0.71	25
PY26	148.842	-37.776	Control	2.55	1.51	0.79	0.42	-0.03	0.04	0.52	0.08	24
PY27	148.840	-37.778	Control	2.55	1.51	0.00	0.83	0.43	0.08	0.45	-0.47	24
PY28	148.826	-37.779	Control	2.55	3.07	0.77	-1.00	0.43	0.06	0.93	-0.16	24
PY30	148.779	-37.768	Baited	4.84	-1.18	0.80	-1.44	1.12	-0.37	-1.20	-0.67	26
PY49	148.783	-37.784	Baited	4.84	0.76	-0.40	1.07	-0.73	1.00	-0.400	-0.31	23
PY49A	148.788	-37.783	Baited	4.84	0.76	-0.18	0.52	-0.73	-0.53	-1.09	-0.77	23
PY50	148.776	-37.785	Baited	4.84	0.76	0.18	-0.28	-0.73	1.07	0.59	-0.62	23
PY51	148.793	-37.751	Baited	4.84	0.33	2.16	0.55	-0.96	1.00	-0.06	-0.09	34
PY52	148.788	-37.748	Baited	4.84	-0.48	1.37	1.87	-0.27	-0.03	1.04	-0.49	37
PY70	148.817	-37.782	Control	2.55	-1.18	-0.08	-1.23	0.89	0.93	0.62	-0.46	24
PY71	148.841	-37.775	Control	2.55	-1.18	-0.18	-1.22	-0.73	-0.03	1.22	-0.78	25
PY72	148.913	-37.762	Control	2.55	0.33	0.05	0.40	-0.73	-1.15	0.83	-0.03	24
PY73	148.916	-37.761	Control	2.55	-1.23	1.37	-0.78	0.66	0.93	-0.42	0.04	25
PY74	148.913	-37.761	Control	2.55	-1.23	0.32	-1.22	0.89	-3.06	-2.45	-0.79	24
PY75	148.916	-37.763	Control	2.55	0.33	-0.09	0.82	-0.96	-1.26	0.56	-0.63	24
PY77	148.786	-37.780	Baited	4.84	-1.18	-0.6	-1.88	2.51	0.50	-0.38	0.26	24
PY78	148.780	-37.775	Baited	4.84	-1.18	-0.25	-1.34	1.82	0.34	-0.94	-0.77	26
PY79	148.787	-37.783	Baited	4.84	-1.18	0.39	-1.04	1.61	1.00	-1.41	-0.75	23
PY80	148.895	-37.765	Control	2.55	-1.23	0.81	-1.46	1.36	-2.49	-1.32	-0.55	23
PY81	148.880	-37.781	Control	2.55	-0.05	-0.75	0.52	-0.50	0.59	-0.07	-0.36	24
PY90	148.726	-37.752	Baited	4.84	0.33	-0.82	1.05	-0.73	1.00	-0.81	-0.14	34
PY91	148.730	-37.752	Baited	4.84	0.33	0.07	-0.11	0.20	1.07	-0.21	0.49	34
PYF50	148.796	-37.751	Baited	4.84	0.49	-0.63	1.84	-0.73	1.00	-0.82	1.74	37

Table S3. Description of site and survey specific covariates used to evaluate patterns of reptile abundance or richness in this study

#	Covariate	Abbreviation	Covariate type	Description
1	Fox control	fox	Site	Site baited with '1080' poison baits or non-lethal control baits
2	Mesopredator release	varanus	Site	Mean abundance of lace monitors in fox baited or control sites.
3	Age since fire	firey	Site	Number of years since most recent fire
4	Total basal area	batree	Site	Total basal area of trees (m ²) per 1256 m ²
5	Litter depth	litd	Site	Average leaf litter depth (cm)
6	Substrate cover	sub	Site	Percentage of ground covered by bare substrate
7	Horizontal cover	hc05	Site	Horizontal vegetation density at 0.5 m above ground
8	Canopy cover	cancov	Site	Percent canopy cover
9	Log volume	logvol	Site	Total volume of logs and coarse woody debris (m ³) per 1256 m ²
10	Vegetation type	veg	Site	Coarse-scale ecological vegetation class (EVC) of the site, including (1) banksia woodland, (2) eucalypt forest, (3) heathland and (4) ecotone
11	Elevation	elev	Site	Site-specific elevation above sea level (m)
12	Temperature (max)	tempH	Sampling	Average of the maximum temperature of the day of sampling and preceding day (i.e. recorded in the preceding 24 hours)
13	Temperature (min)	tempL	Sampling	Average of the minimum temperature of the day of sampling and preceding day
14	Rainfall	rain	Sampling	Total amount of precipitation (mm) recorded from the closest weather station to the study site in the preceding 24 h for each survey
15	Insolation	solar	Sampling	Total amount of solar radiation (MJ per m ²) that reaches the earth's surface in the preceding 24 h for each survey

Table S4. Reptile species captured via pitfall trapping across all study sites ($n = 36$) in East Gippsland

Species	Scientific name	Family	Total number of captures
Yellow bellied water skink	<i>Eulamprus heatwolei</i>	Scincidae	381
Garden skink	<i>Lampropholis guichenoti</i>	Scincidae	329
Weasel skink	<i>Saproscincus mustelinus</i>	Scincidae	106
Delicate skink	<i>Lampropholis delicata</i>	Scincidae	89
Black rock skink	<i>Egernia saxatilis</i>	Scincidae	32
Spencer's skink	<i>Pseudemoia spenceri</i>	Scincidae	11
White lipped snake	<i>Drysdalia coronoides</i>	Elapidae	9
Rawlinson's skink	<i>Pseudemoia rawlinsoni</i>	Scincidae	7
McCoy's skink	<i>Anepischtos maccoyi</i>	Scincidae	3
Eastern three-lined skink	<i>Acritoscincus dupperei</i>	Scincidae	1
Highland copperhead	<i>Austrelaps ramsayi</i>	Elapidae	1
Coventry's skink	<i>Niveoscincus coventryi</i>	Scincidae	1

Table S5. Model selection results for estimating site abundance (u) and probability of detection (r) of small reptiles, estimated using repeated count Royle N-mixture models

Table abbreviations include AIC, Akaike Information Criterion; Δ AIC, difference in value between AIC of this model and the most parsimonious model; ω , model weight; K , number of estimated parameters; and LogLik, the model $2 \times \log$ likelihood. See Table S3 for definitions of covariates

Model
u(logvol),a(.),r(survey)
u(sub + hc05),a(.),r(survey)
u(hc05 + logvol),a(.),r(survey)
u(sub),a(.),r(survey)
u(.),a(.),r(survey)
u(cancov + logvol),a(.),r(survey)
u(cancov),a(.),r(survey)
u(sub + logvol),a(.),r(survey)
u(batree + logvol),a(.),r(survey)
u(litd),a(.),r(survey)
u(litd + logvol),a(.),r(survey)
u(batree + cancov),a(.),r(survey)
u(fox + logvol),a(.),r(survey)
u(hc05 + cancov),a(.),r(survey)
u(litd + hc05),a(.),r(survey)
u(firey + sub),a(.),r(survey)
u(firey + logvol),a(.),r(survey)
u(batree + litd),a(.),r(survey)
u(sub + cancov),a(.),r(survey)
u(firey + cancov),a(.),r(survey)
u(varanus),a(.),r(survey)
u(litd + cancov),a(.),r(survey)
u(fox + sub),a(.),r(survey)
u(litd + sub),a(.),r(survey)
u(varanus + batree),a(.),r(survey)
u(firey + litd),a(.),r(survey)
u(fox + cancov),a(.),r(survey)
u(fox + litd),a(.),r(survey)
u(varanus + logvol),a(.),r(survey)
u(batree + sub),a(.),r(survey)
u(hc05),a(.),r(survey)
u(batree + hc05),a(.),r(survey)
u(fox + hc05),a(.),r(survey)
u(varanus + hc05),a(.),r(survey)
u(batree),a(.),r(survey)
u(varanus + sub),a(.),r(survey)
u(varanus + cancov),a(.),r(survey)
u(fox + batree),a(.),r(survey)
u(firey + hc05),a(.),r(survey)
u(varanus + litd),a(.),r(survey)

u(fox),a(.),r(survey)
u(firey + batree),a(.),r(survey)
u(firey),a(.),r(survey)
u(fox + firey),a(.),r(survey)
u(varanus + firey),a(.),r(survey)
u(varanus + fox),a(.),r(survey)
u(.),a(.),r(solar)
u(.),a(.),r(rain)
u(.),a(.),r(tempH)
u(.),a(.),r(tempL)
u(.),a(.),r(.)Null
u(fox + varanus + firey + batree + litd + sub + hc05 + cancov + logvol),a(.),r(survey + tempH + tempL + rain + solar)Global

Table S6. Model selection results for estimating site level richness (u) and probability of detection (r) of small reptiles, estimated using repeated count Royle N-mixture models

Table abbreviations include AIC, Akaike Information Criterion; Δ AIC, difference in value between AIC of this model and the most parsimonious model; ω , model weight; K , number of estimated parameters; and LogLik, the model $2 \times \log$ likelihood. See Table S3 for definitions of covariates

Model	AIC	Δ AIC	ω	Model likelihood	K	$-\text{LogLik}$
u(.),a(.),r(survey)	2059.85	0.00	0.1045	1.0000	48	1963.85
u(varanus),a(.),r(survey)	2060.98	1.13	0.0594	0.5684	49	1962.98
u(fox),a(.),r(survey)	2060.99	1.14	0.0591	0.5655	49	1962.99
u(varanus + logvol),a(.),r(survey)	2061.58	1.73	0.0440	0.4211	50	1961.58
u(hc05),a(.),r(survey)	2061.84	1.99	0.0386	0.3697	49	1963.84
u(batree),a(.),r(survey)	2061.94	2.09	0.0368	0.3517	49	1963.94
u(cancov),a(.),r(survey)	2062.29	2.44	0.0309	0.2952	49	1964.29
u(varanus + batree),a(.),r(survey)	2062.36	2.51	0.0298	0.2851	50	1962.36
u(sub),a(.),r(survey)	2062.39	2.54	0.0294	0.2808	49	1964.39
u(fox + logvol),a(.),r(survey)	2062.44	2.59	0.0286	0.2739	50	1962.44
u(litd),a(.),r(survey)	2062.52	2.67	0.0275	0.2632	49	1964.52
u(varanus + hc05),a(.),r(survey)	2062.64	2.79	0.0259	0.2478	50	1962.64
u(fox + hc05),a(.),r(survey)	2062.64	2.79	0.0259	0.2478	50	1962.64
u(hc05 + logvol),a(.),r(survey)	2062.67	2.82	0.0255	0.2441	50	1962.67
u(varanus + cancov),a(.),r(survey)	2062.79	2.94	0.0240	0.2299	50	1962.79
u(varanus + sub),a(.),r(survey)	2062.85	3.00	0.0233	0.2231	50	1962.85
u(varanus + firey),a(.),r(survey)	2062.88	3.03	0.0230	0.2198	50	1962.88
u(fox + sub),a(.),r(survey)	2062.92	3.07	0.0225	0.2155	50	1962.92
u(varanus + litd),a(.),r(survey)	2062.92	3.07	0.0225	0.2155	50	1962.92
u(firey + cancov),a(.),r(survey)	2062.92	3.07	0.0225	0.2155	50	1962.92
u(varanus + fox),a(.),r(survey)	2062.98	3.13	0.0219	0.2091	50	1962.98
u(fox + cancov),a(.),r(survey)	2063.13	3.28	0.0203	0.1940	50	1963.13
u(sub + logvol),a(.),r(survey)	2063.40	3.55	0.0177	0.1695	50	1963.40
u(fox + batree),a(.),r(survey)	2063.41	3.56	0.0176	0.1686	50	1963.41
u(hc05 + cancov),a(.),r(survey)	2063.51	3.66	0.0168	0.1604	50	1963.51
u(sub + hc05),a(.),r(survey)	2063.53	3.68	0.0166	0.1588	50	1963.53
u(sub + cancov),a(.),r(survey)	2063.54	3.69	0.0165	0.1580	50	1963.54
u(firey + logvol),a(.),r(survey)	2063.67	3.82	0.0155	0.1481	50	1963.67
u(firey + hc05),a(.),r(survey)	2063.71	3.86	0.0152	0.1451	50	1963.71
u(fox + litd),a(.),r(survey)	2063.79	3.94	0.0146	0.1395	50	1963.79
u(firey + sub),a(.),r(survey)	2063.80	3.95	0.0145	0.1388	50	1963.80
u(litd + hc05),a(.),r(survey)	2063.85	4.00	0.0141	0.1353	50	1963.85
u(batree + hc05),a(.),r(survey)	2063.95	4.10	0.0135	0.1287	50	1963.95
u(batree + litd),a(.),r(survey)	2064.19	4.34	0.0119	0.1142	50	1964.19
u(batree + sub),a(.),r(survey)	2064.26	4.41	0.0115	0.1103	50	1964.26
u(firey + batree),a(.),r(survey)	2064.41	4.56	0.0107	0.1023	50	1964.41
u(litd + sub),a(.),r(survey)	2064.47	4.62	0.0104	0.0993	50	1964.47
u(fox + firey),a(.),r(survey)	2064.72	4.87	0.0092	0.0876	50	1964.72
u(.),a(firey),r(survey)	2065.36	5.51	0.0066	0.0636	49	1967.36

u(batree + logvol),a(.),r(survey)	2065.42	5.57	0.0065	0.0617	50	1965.42
u(firey + litd),a(.),r(survey)	2065.85	6.00	0.0052	0.0498	50	1965.85
u(litd + cancov),a(.),r(survey)	2066.06	6.21	0.0047	0.0448	50	1966.06
u(batree + cancov),a(.),r(survey)	2067.10	7.25	0.0028	0.0266	50	1967.10
u(litd + logvol),a(.),r(survey)	2067.67	7.82	0.0021	0.0200	50	1967.67
u(fox + varanus + firey + batree + litd + sub + hc05 + cancov + logvol),a(.),r(survey + tempH + tempL + rain + solar)Global	2082.46	22.61	0.0000	0.0000	61	1960.46
u(logvol),a(.),r(survey)	2193.84	133.99	0.0000	0.0000	49	2095.84
u(cancov + logvol),a(.),r(survey)	2195.64	135.79	0.0000	0.0000	50	2095.64
u(.),a(.),r(tempH)	2203.06	143.21	0.0000	0.0000	4	2195.06
u(.),a(.),r(solar)	2210.77	150.92	0.0000	0.0000	4	2202.77
u(.),a(.),r(rain)	2250.73	190.88	0.0000	0.0000	4	2242.73
u(.),a(.),r(tempL)	2301.10	241.25	0.0000	0.0000	4	2293.10
u(.),a(.),r(.)Null	2318.26	258.41	0.0000	0.0000	3	2312.26

Table S7. Model selection results for estimating site abundance (u) and probability of detection (r) of *Eulamprus heatwolei*, estimated using repeated count Royle N-mixture models

Table abbreviations include AIC, Akaike Information Criterion; Δ AIC, difference in value between AIC of this model and the most parsimonious model; ω , model weight; K , number of estimated parameters; and LogLik, the model 2*log likelihood. See Table S3 for definitions of covariates

Model	AIC	Δ AIC	ω	Model likelihood	K	-LogLik
u(.),a(.),r(survey)	1493.67	0.00	0.0901	1.0000	48	1397.67
u(sub),a(.),r(survey)	1494.43	0.76	0.0616	0.6839	49	1396.43
u(firey),a(.),r(survey)	1494.56	0.89	0.0578	0.6408	49	1396.56
u(litd),a(.),r(survey)	1494.67	1.00	0.0547	0.6065	49	1396.67
u(logvol),a(.),r(survey)	1494.98	1.31	0.0468	0.5194	49	1396.98
u(batree),a(.),r(survey)	1495.05	1.38	0.0452	0.5016	49	1397.05
u(fox),a(.),r(survey)	1495.05	1.38	0.0452	0.5016	49	1397.05
u(varanus),a(.),r(survey)	1495.05	1.38	0.0452	0.5016	49	1397.05
u(cancov),a(.),r(survey)	1495.66	1.99	0.0333	0.3697	49	1397.66
u(litd + logvol),a(.),r(survey)	1495.80	2.13	0.0311	0.3447	50	1395.80
u(varanus + firey),a(.),r(survey)	1495.83	2.16	0.0306	0.3396	50	1395.83
u(fox + sub),a(.),r(survey)	1495.89	2.22	0.0297	0.3296	50	1395.89
u(varanus + sub),a(.),r(survey)	1495.89	2.22	0.0297	0.3296	50	1395.89
u(fox + logvol),a(.),r(survey)	1496.02	2.35	0.0278	0.3088	50	1396.02
u(varanus + logvol),a(.),r(survey)	1496.03	2.36	0.0277	0.3073	50	1396.03
u(sub + cancov),a(.),r(survey)	1496.06	2.39	0.0273	0.3027	50	1396.06
u(sub + logvol),a(.),r(survey)	1496.17	2.50	0.0258	0.2865	50	1396.17
u(batree + sub),a(.),r(survey)	1496.34	2.67	0.0237	0.2632	50	1396.34
u(batree + logvol),a(.),r(survey)	1496.37	2.70	0.0234	0.2592	50	1396.37
u(fox + litd),a(.),r(survey)	1496.39	2.72	0.0231	0.2567	50	1396.39
u(varanus + litd),a(.),r(survey)	1496.39	2.72	0.0231	0.2567	50	1396.39
u(varanus + hc05),a(.),r(survey)	1496.40	2.73	0.0230	0.2554	50	1396.40
u(firey + logvol),a(.),r(survey)	1496.49	2.82	0.0220	0.2441	50	1396.49
u(batree + litd),a(.),r(survey)	1496.52	2.85	0.0217	0.2405	50	1396.52
u(litd + cancov),a(.),r(survey)	1496.62	2.95	0.0206	0.2288	50	1396.62
u(batree + cancov),a(.),r(survey)	1496.67	3.00	0.0201	0.2231	50	1396.67
u(varanus + batree),a(.),r(survey)	1496.68	3.01	0.0200	0.2220	50	1396.68
u(cancov + logvol),a(.),r(survey)	1496.88	3.21	0.0181	0.2009	50	1396.88

u(fox + cancov),a(.),r(survey)	1496.96	3.29	0.0174	0.1930	50	1396.96
u(varanus + cancov),a(.),r(survey)	1496.96	3.29	0.0174	0.1930	50	1396.96
u(varanus + fox),a(.),r(survey)	1497.05	3.38	0.0166	0.1845	50	1397.05
u(fox + varanus + firey + batree + litd + sub + hc05 + cancov + logvol),a(.),r(survey + tempH + tempL + rain + solar)Global	1510.57	16.90	0.0000	0.0002	61	1388.57
u(firey + litd),a(.),r(survey)	1527.00	33.33	0.0000	0.0000	50	1427.00
u(firey + sub),a(.),r(survey)	1527.32	33.65	0.0000	0.0000	50	1427.32
u(firey + hc05),a(.),r(survey)	1527.36	33.69	0.0000	0.0000	50	1427.36
u(hc05),a(.),r(survey)	1528.07	34.40	0.0000	0.0000	49	1430.07
u(firey + cancov),a(.),r(survey)	1528.62	34.95	0.0000	0.0000	50	1428.62
u(hc05 + logvol),a(.),r(survey)	1529.89	36.22	0.0000	0.0000	50	1429.89
u(firey + batree),a(.),r(survey)	1529.91	36.24	0.0000	0.0000	50	1429.91
u(fox + firey),a(.),r(survey)	1530.53	36.86	0.0000	0.0000	50	1430.53
u(hc05 + cancov),a(.),r(survey)	1531.77	38.10	0.0000	0.0000	50	1431.77
u(fox + batree),a(.),r(survey)	1531.90	38.23	0.0000	0.0000	50	1431.90
u(fox + hc05),a(.),r(survey)	1532.07	38.40	0.0000	0.0000	50	1432.07
u(batree + hc05),a(.),r(survey)	1532.24	38.57	0.0000	0.0000	50	1432.24
u(litd + hc05),a(.),r(survey)	1532.27	38.60	0.0000	0.0000	50	1432.27
u(litd + sub),a(.),r(survey)	1532.71	0	0.0000	0.0000	50	1432.71
u(sub + hc05),a(.),r(survey)	1533.74	0	0.0000	0.0000	50	1433.74
u(.),a(.),r(solar)	1672.45	8	0.0000	0.0000	4	1664.45
u(.),a(.),r(tempL)	1699.76	9	0.0000	0.0000	4	1691.76
u(.),a(.),r(rain)	1703.03	6	0.0000	0.0000	4	1695.03
u(.),a(.),r(Null)	1722.07	0	0.0000	0.0000	3	1716.07
u(.),a(.),r(tempH)	1723.90	3	0.0000	0.0000	4	1715.90

Table S8. Model selection results for estimating site abundance (u) and probability of detection (r) of *Lampropholis guichenoti*, estimated using repeated count Royle N-mixture models

Table abbreviations include AIC, Akaike Information Criterion; Δ AIC, difference in value between AIC of this model and the most parsimonious model; ω , model weight; K , number of estimated parameters; and LogLik, the model $2 \times \log$ likelihood. See Table S3 for definitions of covariates

Model	AIC	Δ AIC	ω	Model likelihood	K	$-\text{LogLik}$
u(litd + logvol),a(.),r(survey)	1467.05	0.00	0.3871	1.0000	50	1367.05
u(cancov + logvol),a(.),r(survey)	1469.49	2.44	0.1143	0.2952	50	1369.49
u(litd + sub),a(.),r(survey)	1469.70	2.65	0.1029	0.2658	50	1369.70
u(litd + cancov),a(.),r(survey)	1470.33	3.28	0.0751	0.1940	50	1370.33
u(litd),a(.),r(survey)	1470.36	3.31	0.0740	0.1911	49	1372.36
u(batree + litd),a(.),r(survey)	1472.02	4.97	0.0323	0.0833	50	1372.02
u(litd + hc05),a(.),r(survey)	1472.30	5.25	0.0280	0.0724	50	1372.30
u(fox + litd),a(.),r(survey)	1472.31	5.26	0.0279	0.0721	50	1372.31
u(firey + litd),a(.),r(survey)	1472.31	5.26	0.0279	0.0721	50	1372.31
u(varanus + litd),a(.),r(survey)	1472.31	5.26	0.0279	0.0721	50	1372.31
u(logvol),a(.),r(survey)	1473.58	6.53	0.0148	0.0382	49	1375.58
u(cancov),a(.),r(survey)	1473.96	6.91	0.0122	0.0316	49	1375.96
u(fox + logvol),a(.),r(survey)	1474.99	7.94	0.0073	0.0189	50	1374.99
u(varanus + logvol),a(.),r(survey)	1474.99	7.94	0.0073	0.0189	50	1374.99
u(batree + logvol),a(.),r(survey)	1475.29	8.24	0.0063	0.0162	50	1375.29
u(hc05 + logvol),a(.),r(survey)	1475.57	8.52	0.0055	0.0141	50	1375.57
u(hc05 + cancov),a(.),r(survey)	1475.65	8.60	0.0053	0.0136	50	1375.65
u(sub + logvol),a(.),r(survey)	1475.68	8.63	0.0052	0.0134	50	1375.68
u(varanus + cancov),a(.),r(survey)	1475.70	8.65	0.0051	0.0132	50	1375.70
u(fox + cancov),a(.),r(survey)	1475.70	8.65	0.0051	0.0132	50	1375.70
u(sub + cancov),a(.),r(survey)	1475.73	8.68	0.0050	0.0130	50	1375.73
u(batree + cancov),a(.),r(survey)	1475.89	8.84	0.0047	0.0120	50	1375.89
u(firey + cancov),a(.),r(survey)	1475.90	8.85	0.0046	0.0120	50	1375.90
u(firey + logvol),a(.),r(survey)	1475.94	8.89	0.0045	0.0117	50	1375.94
u(fox + varanus + firey + batree + litd + sub + hc05 + cancov + logvol),a(.),r(survey + tempH + tempL + rain + solar)Global	1477.52	10.47	0.0021	0.0053	61	1355.52
u(.),a(.),r(survey)	1478.66	11.61	0.0012	0.0030	48	1382.66
u(sub),a(.),r(survey)	1479.22	12.17	0.0009	0.0023	49	1381.22
u(firey),a(.),r(survey)	1480.27	13.22	0.0005	0.0013	49	1382.27
u(hc05),a(.),r(survey)	1480.47	13.42	0.0005	0.0012	49	1382.47
u(fox),a(.),r(survey)	1480.52	13.47	0.0005	0.0012	49	1382.52
u(varanus),a(.),r(survey)	1480.52	13.47	0.0005	0.0012	49	1382.52
u(batree),a(.),r(survey)	1480.66	13.61	0.0004	0.0011	49	1382.66
u(firey + sub),a(.),r(survey)	1480.74	13.69	0.0004	0.0011	50	1380.74
u(sub + hc05),a(.),r(survey)	1480.89	13.84	0.0004	0.0010	50	1380.89
u(batree + sub),a(.),r(survey)	1481.09	14.04	0.0003	0.0009	50	1381.09
u(varanus + hc05),a(.),r(survey)	1482.12	15.07	0.0002	0.0005	50	1382.12

u(fox + hc05),a(.),r(survey)	1482.12	15.07	0.0002	0.0005	50	1382.12
u(varanus + firey),a(.),r(survey)	1482.26	15.21	0.0002	0.0005	50	1382.26
u(fox + firey),a(.),r(survey)	1482.26	15.21	0.0002	0.0005	50	1382.26
u(firey + batree),a(.),r(survey)	1482.26	15.21	0.0002	0.0005	50	1382.26
u(batree + hc05),a(.),r(survey)	1482.47	15.42	0.0002	0.0004	50	1382.47
u(varanus + batree),a(.),r(survey)	1482.52	15.47	0.0002	0.0004	50	1382.52
u(varanus + fox),a(.),r(survey)	1482.52	15.47	0.0002	0.0004	50	1382.52
u(fox + batree),a(.),r(survey)	1482.52	15.47	0.0002	0.0004	50	1382.52
u(fox + sub),a(.),r(survey)	1482.96	15.91	0.0001	0.0004	50	1382.96
u(varanus + sub),a(.),r(survey)	1482.96	15.91	0.0001	0.0004	50	1382.96
u(firey + hc05),a(.),r(survey)	1483.54	16.49	0.0001	0.0003	50	1383.54
u(.),a(.),r(solar)	1544.93	77.88	0.0000	0.0000	4	1536.93
u(.),a(.),r(rain)	1554.65	87.60	0.0000	0.0000	4	1546.65
u(.),a(.),r(tempH)	1592.58	125.53	0.0000	0.0000	4	1584.58
u(.),a(.),r(.)Null	1597.30	130.25	0.0000	0.0000	3	1591.30
u(.),a(.),r(tempL)	1597.99	130.94	0.0000	0.0000	4	1589.99

Table S9. Model selection results for estimating site abundance (u) and probability of detection (r) of *Saproscincus mustelinus*, estimated using repeated count Royle N-mixture models

Table abbreviations include AIC, Akaike Information Criterion; Δ AIC, difference in value between AIC of this model and the most parsimonious model; ω , model weight; K , number of estimated parameters; and LogLik, the model $2 \times \log$ likelihood. See Table S3 for definitions of covariates

Model	AIC	Δ AIC	ω	Model likelihood	K	LogLik
u(batree + litd),a(.),r(survey)	832.72	0.00	0.2581	1.0000	50	732.72
u(litd),a(.),r(survey)	833.89	1.17	0.1438	0.5571	49	735.89
u(litd + cancov),a(.),r(survey)	834.46	1.74	0.1081	0.4190	50	734.46
u(litd + hc05),a(.),r(survey)	834.89	2.17	0.0872	0.3379	50	734.89
u(litd + logvol),a(.),r(survey)	834.92	2.20	0.0859	0.3329	50	734.92
u(fox + litd),a(.),r(survey)	835.51	2.79	0.0640	0.2478	50	735.51
u(firey + litd),a(.),r(survey)	835.57	2.85	0.0621	0.2405	50	735.57
u(litd + sub),a(.),r(survey)	835.61	2.89	0.0608	0.2357	50	735.61
u(fox + cancov),a(.),r(survey)	837.38	4.66	0.0251	0.0973	50	737.38
u(batree + cancov),a(.),r(survey)	839.10	6.38	0.0106	0.0412	50	739.10
u(batree + sub),a(.),r(survey)	839.13	6.41	0.0105	0.0406	50	739.13
u(sub + hc05),a(.),r(survey)	839.99	7.27	0.0068	0.0264	50	739.99
u(sub),a(.),r(survey)	840.00	7.28	0.0068	0.0263	49	742.00
u(firey + batree),a(.),r(survey)	840.13	7.41	0.0063	0.0246	50	740.13
u(cancov),a(.),r(survey)	840.25	7.53	0.0060	0.0232	49	742.25
u(hc05 + cancov),a(.),r(survey)	840.43	7.71	0.0055	0.0212	50	740.43
u(fox + sub),a(.),r(survey)	840.53	7.81	0.0052	0.0201	50	740.53
u(firey),a(.),r(survey)	840.87	8.15	0.0044	0.0170	49	742.87
u(sub + cancov),a(.),r(survey)	840.93	8.21	0.0043	0.0165	50	740.93
u(firey + sub),a(.),r(survey)	841.00	8.28	0.0041	0.0159	50	741.00
u(firey + cancov),a(.),r(survey)	841.08	8.36	0.0039	0.0153	50	741.08
u(fox + firey),a(.),r(survey)	841.49	8.77	0.0032	0.0125	50	741.49
u(firey + hc05),a(.),r(survey)	841.49	8.77	0.0032	0.0125	50	741.49
u(batree),a(.),r(survey)	841.60	8.88	0.0030	0.0118	49	743.60
u(sub + logvol),a(.),r(survey)	841.67	8.95	0.0029	0.0114	50	741.67
u(batree + hc05),a(.),r(survey)	841.99	9.27	0.0025	0.0097	50	741.99
u(.),a(.),r(survey)	842.00	9.28	0.0025	0.0097	48	746.00
u(cancov + logvol),a(.),r(survey)	842.17	9.45	0.0023	0.0089	50	742.17
u(hc05),a(.),r(survey)	842.52	9.80	0.0019	0.0074	49	744.52
u(firey + logvol),a(.),r(survey)	842.82	10.10	0.0017	0.0064	50	742.82
u(fox),a(.),r(survey)	842.84	10.12	0.0016	0.0063	49	744.84
u(batree + logvol),a(.),r(survey)	843.34	10.62	0.0013	0.0049	50	743.34
u(fox + batree),a(.),r(survey)	843.35	10.63	0.0013	0.0049	50	743.35
u(logvol),a(.),r(survey)	843.99	11.27	0.0009	0.0036	49	745.99
u(fox + hc05),a(.),r(survey)	844.03	11.31	0.0009	0.0035	50	744.03
u(hc05 + logvol),a(.),r(survey)	844.52	11.80	0.0007	0.0027	50	744.52
u(fox + logvol),a(.),r(survey)	844.84	12.12	0.0006	0.0023	50	744.84

u(fox + varanus + firey + batree + litd + sub + hc05 + cancov + logvol),a(.),r(survey + tempH + tempL + rain + solar)Global	850.13	17.41	0.0000	0.0002	61	728.13
u(varanus + hc05),a(.),r(survey)	856.12	23.40	0.0000	0.0000	50	756.12
u(.),a(.),r(rain)	873.70	40.98	0.0000	0.0000	4	865.70
u(.),a(.),r(tempH)	882.96	50.24	0.0000	0.0000	4	874.96
u(varanus),a(.),r(survey)	1079.18	246.46	0.0000	0.0000	49	981.18
u(varanus + fox),a(.),r(survey)	1081.18	248.46	0.0000	0.0000	50	981.18
u(varanus + litd),a(.),r(survey)	1081.18	248.46	0.0000	0.0000	50	981.18
u(varanus + sub),a(.),r(survey)	1081.18	248.46	0.0000	0.0000	50	981.18
u(varanus + firey),a(.),r(survey)	1081.18	248.46	0.0000	0.0000	50	981.18
u(varanus + cancov),a(.),r(survey)	1081.18	248.46	0.0000	0.0000	50	981.18
u(varanus + logvol),a(.),r(survey)	1081.18	248.46	0.0000	0.0000	50	981.18
u(varanus + batree),a(.),r(survey)	1081.18	248.46	0.0000	0.0000	50	981.18
						1089.8
u(.),a(.),r(.)Null	1095.82	263.10	0.0000	0.0000	3	2
						1227.0
u(.),a(.),r(tempL)	1235.08	402.36	0.0000	0.0000	4	8
						1420.1
u(.),a(.),r(solar)	1428.18	595.46	0.0000	0.0000	4	8