

Supplementary Material

Balancing act: evaluating non-target risks of feral cat management in conservation reserves

Mark Cowan^{A,E}, Michelle Drew^B, Brian Macmahon^C, and Lesley A. Gibson^{A,D,}*

^ABiodiversity and Conservation Science, Department of Biodiversity, Conservation and Attractions, 17 Dick Perry Avenue, Kensington, WA 6151, Australia.

^BParks and Wildlife Service, Department of Biodiversity, Conservation and Attractions, 17 Dick Perry Avenue, Kensington, WA 6151, Australia

^CParks and Wildlife Service, Department of Biodiversity, Conservation and Attractions, 5 Wald Street, Narrogin, WA 6312, Australia.

^DSchool of Biological Sciences, University of Western Australia, 35 Stirling Highway, Crawley, WA 6009, Australia.

^EPresent address: Curtin University, Kent Street, Bentley, WA 6151, Australia.

*Correspondence to: Lesley A. Gibson Biodiversity and Conservation Science, Department of Biodiversity, Conservation and Attractions, 17 Dick Perry Avenue, Kensington, WA 6151, Australia Email: lesley.gibson@dbca.wa.gov.au

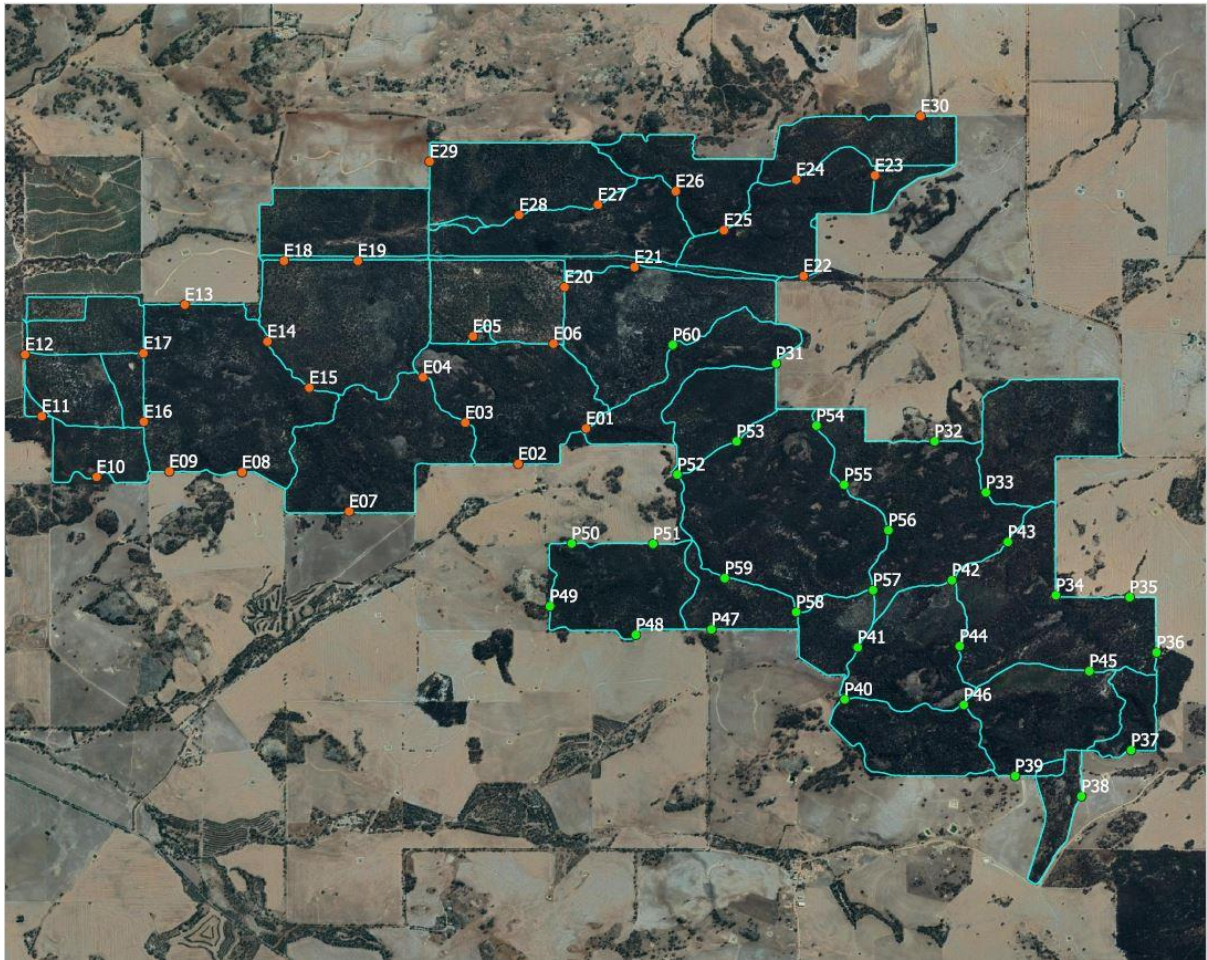


Figure S1. Location of tree-mounted camera traps at Tutanning Nature Reserve. Orange - Eradicat® treatment zone; Green – control zone.

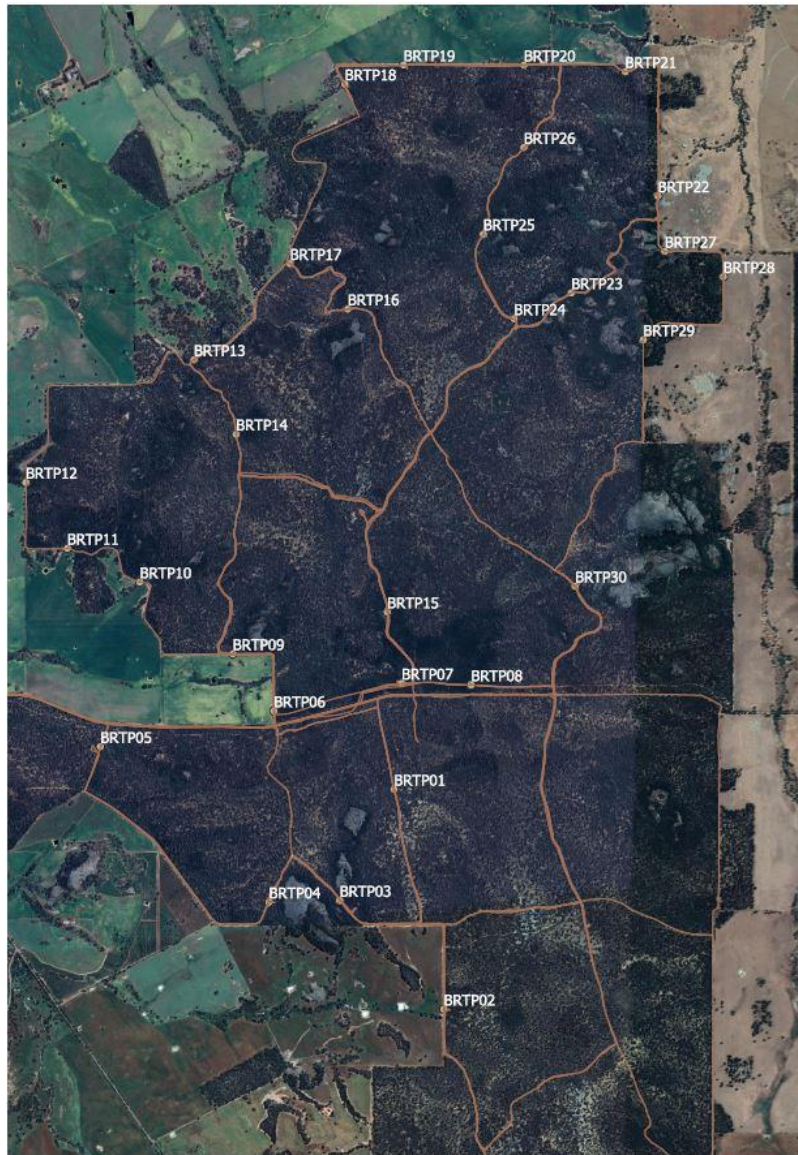


Figure S2. Location of tree-mounted camera traps at Boyagin Nature Reserve (control zone).

Table S1. Output from the generalised linear mixed model analyses for detections of red-tailed phascogales at Tutanning (Zone – treatment and control) and Boyagin (control), before and after Eradicat® baiting (Session) for each trial. Standard errors, lower and upper 95% confidence intervals are also shown. Both models included camera ID as a random intercept.

Reserve	Trial	Model term	Estimate	Standard Error	Lower 95% CI	Upper 95% CI	z value	P
Tutanning	1	(Intercept)	2.211	0.121	1.779	2.643	18.256	<0.001
		ZoneSession	-0.203	0.173	-0.848	0.441	-1.175	0.240
		Sessionpost_bait	0.225	0.076	-0.169	0.620	2.950	0.003
		ZoneSession:Sessionpost_bait	-0.344	0.117	-0.994	0.305	-2.932	0.003
	2	(Intercept)	-0.037	0.309	-0.469	0.395	-0.119	0.905
		ZoneSession	0.216	0.404	-0.428	0.860	0.535	0.593
		Sessionpost_bait	-0.127	0.179	-0.522	0.267	-0.712	0.476
		ZoneSession:Sessionpost_bait	-0.400	0.276	-1.050	0.249	-1.451	0.147
	3	(Intercept)	1.977	0.123	1.546	2.409	16.135	<0.001
		ZoneSession	-0.104	0.175	-0.748	0.540	-0.595	0.552
		Sessionpost_bait	-0.028	0.089	-0.422	0.367	-0.313	0.754
		ZoneSession:Sessionpost_bait	0.178	0.129	-0.471	0.828	1.383	0.167
4	(Intercept)	0.289	0.220	-0.143	0.720	1.309	0.190	
	ZoneSession	-0.613	0.329	-1.257	0.031	-1.865	0.062	
	Sessionpost_bait	-0.101	0.201	-0.496	0.293	-0.502	0.616	
	ZoneSession:Sessionpost_bait	0.239	0.331	-0.410	0.889	0.722	0.470	
Boyagin	1	(Intercept)	1.347	0.151	0.800	1.893	8.907	<0.001
		Sessionpost_bait	0.134	0.116	-0.310	0.577	1.154	0.249
	2	(Intercept)	0.617	0.234	0.071	1.164	2.635	<0.001
		Sessionpost_bait	-0.784	0.186	-1.227	-0.341	-4.211	<0.001
	3	(Intercept)	1.698	0.140	1.151	2.244	12.136	<0.001
		Sessionpost_bait	-0.424	0.116	-0.868	0.019	-3.658	<0.001
	4	(Intercept)	-0.285	0.279	-0.832	0.261	-1.022	0.307
		Sessionpost_bait	0.302	0.226	-0.141	0.746	1.337	0.181

Table S2. Post-hoc Tukey tests of the difference between before and post Eradicat® baiting camera detections of red-tailed phascogales at the Eradicat® treatment and control zones in each of the four trials of the study. Standard Error (SE) and 95% lower (LCL) and upper (UCL) confidence intervals are also shown.

Reserve	Trial	Zone	Session	Detection rate	SE	LCL	UCL	<i>P</i>
Tutanning	1	Treatment	before_bait	7.45	0.93	5.83	9.51	0.180
			post_bait	6.61	0.84	5.16	8.47	
	1	Control	before_bait	9.13	1.11	7.2	11.57	0.003
			post_bait	11.43	1.35	9.06	14.42	
	2	Treatment	before_bait	1.20	0.34	0.68	2.11	0.012
			post_bait	0.71	0.22	0.39	1.29	
	2	Control	before_bait	0.96	0.3	0.53	1.76	0.480
			post_bait	0.85	0.27	0.46	1.56	
	3	Treatment	before_bait	6.51	0.82	5.08	8.34	0.110
			post_bait	7.56	0.94	5.94	8.94	
	3	Control	before_bait	7.22	0.89	5.68	9.19	0.750
			post_bait	7.03	0.86	5.52	8.94	
	4	Treatment	before_bait	0.72	0.19	0.44	1.2	0.600
			post_bait	0.83	0.51	0.51	1.35	
	4	Control	before_bait	1.33	0.29	0.87	2.06	0.620
			post_bait	1.21	0.27	0.78	1.87	
Boyagin	1	Control	before_bait	3.85	0.58	2.86	5.17	0.250
			post_bait	4.39	0.65	3.29	5.88	
	2	Control	before_bait	1.85	0.43	1.17	2.93	<0.001
			post_bait	0.85	0.22	0.51	1.41	
	3	Control	before_bait	5.46	0.76	4.15	7.18	<0.001
			post_bait	3.57	0.54	2.67	4.79	
	4	Control	before_bait	0.75	0.21	0.44	1.3	0.180
			post_bait	1.02	0.27	0.61	1.71	

Table S3. Peak (7-day) occupancy and detection probabilities of red-tailed phascogales at Tutanning (Treatment and Control) and Boyagin (Control), before and after Eradicat® baiting (Session) for autumn trials (1 - 2021 and 3 - 2022). Standard errors, lower and upper 95% confidence intervals are also shown.

Reserve	Zone	Trial	Measure	Session	Probability	Standard Error	Upper 95% CI	Lower 95% CI
Tutanning	Control	1	Detection	before_bait	0.54	0.04	0.07	0.07
Tutanning	Control	1	Detection	post_bait	0.48	0.04	0.07	0.07
Tutanning	Control	1	Occupancy	before_bait	0.97	0.03	0.03	0.2
Tutanning	Control	1	Occupancy	post_bait	0.94	0.05	0.05	0.19
Tutanning	Control	3	Detection	before_bait	0.43	0.04	0.07	0.07
Tutanning	Control	3	Detection	post_bait	0.46	0.04	0.07	0.07
Tutanning	Control	3	Occupancy	before_bait	0.92	0.06	0.06	0.2
Tutanning	Control	3	Occupancy	post_bait	0.91	0.06	0.06	0.19
Tutanning	Treatment	1	Detection	before_bait	0.55	0.04	0.07	0.07
Tutanning	Treatment	1	Detection	post_bait	0.45	0.04	0.07	0.07
Tutanning	Treatment	1	Occupancy	before_bait	0.87	0.06	0.08	0.18
Tutanning	Treatment	1	Occupancy	post_bait	0.95	0.05	0.04	0.21
Tutanning	Treatment	3	Detection	before_bait	0.31	0.04	0.09	0.08
Tutanning	Treatment	3	Detection	post_bait	0.49	0.04	0.07	0.07
Tutanning	Treatment	3	Occupancy	before_bait	0.79	0.09	0.13	0.23
Tutanning	Treatment	3	Occupancy	post_bait	0.91	0.06	0.07	0.18
Boyagin	Control	1	Detection	before_bait	0.28	0.04	0.09	0.07
Boyagin	Control	1	Detection	post_bait	0.31	0.04	0.09	0.07
Boyagin	Control	1	Occupancy	before_bait	0.81	0.1	0.12	0.26
Boyagin	Control	1	Occupancy	post_bait	0.80	0.09	0.13	0.23
Boyagin	Control	3	Detection	before_bait	0.41	0.04	0.08	0.08
Boyagin	Control	3	Detection	post_bait	0.27	0.04	0.09	0.08
Boyagin	Control	3	Occupancy	before_bait	0.75	0.08	0.13	0.19
Boyagin	Control	3	Occupancy	post_bait	0.75	0.1	0.15	0.24

Table S4. Peak (7-day) occupancy and detection probabilities of red-tailed phascogales at Tutanning (Treatment and Control) and Boyagin (Control), before and after Eradicat® baiting (Session) for spring trials (2 - 2021 and 4 - 2022). Standard errors, lower and upper 95% confidence intervals are also shown.

Reserve	Zone	Trial	Measure	Session	Probability	Standard Error	Upper 95% CI	Lower 95% CI
Tutanning	Control	2	Detection	before_bait	0.30	0.06	0.13	0.10
Tutanning	Control	2	Detection	post_bait	0.21	0.06	0.13	0.09
Tutanning	Control	2	Occupancy	before_bait	0.40	0.10	0.20	0.17
Tutanning	Control	2	Occupancy	post_bait	0.45	0.12	0.23	0.21
Tutanning	Control	4	Detection	before_bait	0.15	0.05	0.13	0.08
Tutanning	Control	4	Detection	post_bait	0.22	0.06	0.14	0.10
Tutanning	Control	4	Occupancy	before_bait	0.54	0.17	0.28	0.30
Tutanning	Control	4	Occupancy	post_bait	0.36	0.11	0.23	0.18
Tutanning	Treatment	2	Detection	before_bait	0.11	0.05	0.13	0.06
Tutanning	Treatment	2	Detection	post_bait	0.07	0.04	0.16	0.05
Tutanning	Treatment	2	Occupancy	before_bait	0.68	0.27	0.28	0.51
Tutanning	Treatment	2	Occupancy	post_bait	0.77	0.46	0.23	0.75
Tutanning	Treatment	4	Detection	before_bait	0.14	0.05	0.11	0.07
Tutanning	Treatment	4	Detection	post_bait	0.10	0.05	0.15	0.06
Tutanning	Treatment	4	Occupancy	before_bait	0.72	0.20	0.23	0.45
Tutanning	Treatment	4	Occupancy	post_bait	0.58	0.27	0.34	0.45
Boyagin	Control	2	Detection	before_bait	0.18	0.05	0.12	0.08
Boyagin	Control	2	Detection	post_bait	0.21	0.06	0.13	0.09
Boyagin	Control	2	Occupancy	before_bait	0.57	0.14	0.24	0.27
Boyagin	Control	2	Occupancy	post_bait	0.45	0.12	0.23	0.21
Boyagin	Control	4	Detection	before_bait	0.16	0.07	0.17	0.09
Boyagin	Control	4	Detection	post_bait	0.20	0.05	0.12	0.08
Boyagin	Control	4	Occupancy	before_bait	0.34	0.14	0.29	0.20
Boyagin	Control	4	Occupancy	post_bait	0.51	0.13	0.24	0.24