Integrating feral cat (*Felis catus*) control into landscape-scale introduced predator management to improve conservation prospects for threatened fauna: a case study from the south coast of Western Australia

S. Comer[A,G,H], *L. Clausen*[A,B], *S. Cowen*[A,C], *J. Pinder*[A,D], *A. Thomas*[A], *Allan H. Burbidge*[C,E], *C. Tiller*[A,F], *D. Algar*[C] *and P. Speldewinde*

[A]Department of Biodiversity, Conservation and Attractions, Parks and Wildlife Service, South Coast Region, 120 Albany Highway, Albany, WA 6330, Australia.

[B]Department of Biodiversity, Conservation and Attractions, Parks and Wildlife Service, Exmouth District, 20 Nimitz Street, Exmouth, WA 6707, Australia.

[C]Department of Biodiversity, Conservation and Attractions, Biodiversity and Conservation Science, Locked Bag 104, Bentley, WA 6983, Australia.

[D]Bush Heritage Australia, PO Box 7103, Lower King, WA 6330, Australia.

[E]School of Science, Edith Cowan University, 270 Joondalup Drive, Joondalup, WA 6027, Australia.

[F]Ethos NRM Pty Ltd, PO Box 204, Bairnsdale, Vic. 3875, Australia.

[G]School of Agriculture and Environment, University of Western Australia, Stirling Highway, Nedlands, WA 6009, Australia.

[H]Corresponding author. Email: sarah.comer@dbca.wa.gov.au

Table S1.   **Mean weight and home range (MCP95) for feral cats caught during radio telemetry and post-bait capture work in south coast sites between 2010 and 2018**

Reserve	Sex	Mean weight (kg) ± s.d. (*n*)	Mean MCP95 (ha) ± s.d. (*n*)
CANP	M	4.598 ± 0.790 (79)	1764 ± 1140 (13)
CANP	F	3.008 ± 1.249 (40)	580.25 ± 418.94 (4)
FRNP	M	4.826 ± 1.005(48)	2399.62 ± 1831.87 (13)
FRNP	F	2.520 ± 0.761 (14)	734.25 ± 412.50 (4)
TPB–MP	M	4.224 ± 0.752 (9)	1229.33 ± 277.57 (3)
TPB–MP	F	3.162 ± 1.226 (6)	774.47 ± 334.39 (3)

Table S2.   Trap success by reserve for all cats trapped between 2010 and 2018 (* indicates trapping prior to *Eradicat®* baiting commencing in the reserve)

Reserve	Year	Month	Total trap nights	Trap success (%)
CANP	2011	Feb	838	2.51*
	2012	Jan	868	2.65
	2013	Jan	686	0.44
	2014	Jan	1197	0.67
	2014	Dec	863	1.51
	2015	Nov	446	1.57
	2016	Feb	513	1.95
	2016	Nov	836	1.08
	2017	May	589	1.02
	2018	May	721	1.11
	2018	Oct	373	1.61
FRNP	2010	Feb	811	1.48*
	2015	Jan	1185	1.60
	2016	Nov	480	5.00
	2017	May	526	1.14
TPB–MP	2014	Feb	650	0.77*
	2015	Feb	565	0.53
	2016	Jun	244	1.23
	2017	Oct	392	0.51
	2018	Feb	342	0.58
	2018	Nov	342	0.58

Table S3.   Weight class distribution by sex for all feral cats caught between 2010 and 2018

Sex and Age	Weight (g)	2010	2011	2012	2013	2014	2015	2016	2017	2018
Female										
Subadult	1000–2000	1		4			5	1		1
Adult	>2000	3	9	5	4	8	4	3	5	2
Total females		**4**	**9**	**9**	**4**	**8**	**9**	**4**	**5**	**3**
Male										
Subadult	1000–2500					1		1		
Adult	>2500	8	11	14	2	20	20	42	16	6
Total males		**8**	**11**	**14**	**2**	**21**	**20**	**43**	**16**	**6**

Table S4. Summary of measures of the feral cat population before and after baiting, from control and treatments sites, between 2013 and 2015

The measures of the cat population are based on occupancy modelling and detection rates at camera traps for treatment (*Eradicat®*) and control (*Probait®*) using spatial models, and following feral cat trapping and removal (t-values, degrees of freedom and *P*-values). Significant values are indicated with *P*-values and unless indicated otherwise a decline in occupancy (i.e. asterisk indicates a positive change). Post-trapping data are shaded grey. This table also includes raw camera detection rates and percentage of cameras that detected feral cats pre- and post-baiting

Site	Year	Season	Treatment	No cameras	Track	Spacing (km)	Pre-bait	SD	Post-bait	s.d.	t	d.f.	t^{crit}	P	Events per trapnight pre-bait	% Cameras with cats	Events per trapnight post-bait	% Cameras with cats
CANP	2013	Autumn	Eradicat	48	N	3	**0.560**	0.075	**0.439**	0.076	7.903	94	1.9	<0.001	0.007	23	0.004	8
CANP	2014	Autumn	Eradicat	48	N	3	**0.546**	0.080	**0.536**	0.079	0.636	94	1.9		0.010	40	0.024	33
CANP	2015	Autumn	Eradicat	48	N	3	**0.464**	0.078	**0.477**	0.076	0.846	94	1.9		0.014	13	0.013	15
CANP	2018	Autumn	Eradicat	34	Y	2	**0.861**	0.052	**0.711**	0.102	7.699	66	2	<0.001	0.115	74	0.072	71
FRNP	2015	Spring	Eradicat	45	Y	1	**0.840**	0.083	**0.960**	0.033	9.019	88	1.9	<0.001*	0.106	64	0.137	95
FRNP	2015	Spring	Control	21	Y	1	**0.846**	0.097	**0.708**	0.141	3.695	40	2	<0.001	0.050	62	0.048	48
FRNP	2016	Autumn	Eradicat	44/21	Y	1	**0.977**	0.024	**0.941**	0.049	3.241	64	2	<0.01	0.109	84	0.111	90
FRNP	2016	Autumn	Control	20	Y	1	**0.686**	0.160	**0.793**	0.120	2.386	38	2	<0.05*	0.044	43	0.035	70
FRNP	2016	Spring	Eradicat	26	Y	2	**0.866**	0.074	**0.902**	0.029	2.325	50	2	<0.05*	0.092	88	0.195	77
FRNP	2016	Spring	Post-trap Eradicat	26	Y	2	**0.694**	0.106			9.650	50	3	<0.001	0.202	69		
FRNP	2016	Spring	Control	25	Y	2	**0.979**	0.020	**0.917**	0.048	5.889	48	2	<0.001	0.162	100	0.229	84
FRNP	2016	Spring	Post-trap Control	25	Y	2	**0.941**	0.028			2.147	48	2	<0.05*	0.269	92		
FRNP	2017	Autumn	Eradicat	31	Y	2	**0.953**	0.024	**0.837**	0.058	10.301	60	2	<0.001	0.149	89	0.075	67
FRNP	2017	Autumn	Post-trap Eradicat	31	Y	2	**0.758**	0.091			4.063	60	3	<0.001	0.119	77		
FRNP	2017	Autumn	Control	31/30	Y	2	**0.837**	0.067	**0.867**	0.066	1.721	59	2		0.150	88	0.135	76
FRNP	2017	Autumn	Post-trap Control	30	Y	2	**0.813**	0.082			2.823	59	3		0.112	60		
FRNP	2018	Autumn	Eradicat	30	Y	2	**0.910**	0.053	**0.954**	0.036	3.762	58	2	<0.001*	0.112	80	0.090	83
FRNP	2018	Autumn	Control	17	Y	2	**0.917**	0.042	**0.858**	0.045	3.984	32	2	<0.001	0.159	88	0.128	82
TPB–MP	2014	Autumn	Eradicat	54	N	1	**0.297**	0.143	**0.361**	0.264	1.578	106	1.9		0.001	3	0.002	5
TPB–MP	2014	Autumn	Control	26	N	1	**0.074**	0.059	**0.081**	0.081	0.348	50	2		0.002	5	0.002	5
TPB–MP	2015	Autumn	Eradicat	55	N	1	**0.044**	0.076	**0.061**	0.033	1.521	108	1.9		0.001	2	0.002	4
TPB–MP	2015	Autumn	Control	26	N	1	**0.174**	0.149	**0.229**	0.204	1.095	50	2		0.003	8	0.002	8

Category	Activity	Site	2009 Autumn	2009 Spring	2010 Autumn	2010 Spring	2011 Autumn	2011 Spring	2012 Autumn	2012 Spring	2013 Autumn	2013 Spring	2014 Autumn	2014 Spring	2015 Autumn	2015 Spring	2016 Autumn	2016 Spring	2017 Autumn	2017 Spring	2018 Autumn	2018 Spring
Feral Cat Control	Baiting (aerial *Eradicat* ®)	Fitz			▨		▨		▨		▨				▨		▨		▨		▨	
		CANP					▨		▨		▨				▨		▨		▨		▨	
		TPB-MP											▨				▨				▨	
	Trapping & euthanasia feral cats (post-bait)	FRNP													▨							
		CANP											▨		▨		▨		▨	▨	▨	▨
		TPB-MP											▨		▨		▨		▨		▨	
Monitoring	Baiting Efficacy: Collared feral cats	FRNP			▨						▨		▨									
		CANP					▨		▨		▨		▨									
		TPB-MP																				
	Baiting Efficacy: Sandpads	FRNP			▨		▨															
		CANP																				
	Baiting Efficacy: Camera traps/occupancy	FRNP														▨	▨	▨	▨	▨	▨	
		CANP							Camera Trials		▨		▨		▨						▨	
		TPB-MP																				
	Native fauna: Trapping	CANP			▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨
		FRNP	▨		▨	▨	▨	▨	▨	▨	▨		▨	▨	▨		▨		▨		▨	
	Native fauna: Western ground parrot	CANP	▨		▨		▨		▨		ARUs		ARUs		ARUs		ARUs		ARUs		ARUs	
		FRNP	▨		▨		▨		▨		ARUs		ARUs		ARUs		ARUs		ARUs		ARUs	
	Native fauna: Chuditch	FRNP			Trapping & collaring		Trapping						Trapping		Trapping & collaring							

Fig. S1. Timeline of autumn and spring feral cat control and monitoring activities implemented through the Integrated Fauna Recovery Project (IFRP) project between 2009 and 2018.