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Wildlife Research

Supplementary Material

Assessing target and non-target species interactions with buried non-toxic meat baits across fire mosaics

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Table S1. Number of independent detections and bait interactions of all species identified on cameras deployed at buried liver bait sites in the Big Desert-Wyperfeld complex. Asterisks indicate records where animal could not be identified to species level due to photo quality/shutter speed issues.

Category	Species	Total Detections	Total Bait Interactions
Mammal	Dingo (*Canis dingo*)	1	1
	European hare (*Lepus europaeus*)	18	5
	European rabbit (*Oryctolagus cuniculus*)	67	5
	Fox (*Vulpes vulpes*)	32	17
	House mouse (*Mus musculus*)	29	8
	Mitchell's hopping-mouse (*Notomys mitchellii*)	146	43
	Short-beaked echidna (*Tachyglossus aculeatus*)	6	3
	Silky mouse (*Pseudomys apodemoides*)	116	54
	Western grey kangaroo (*Macropus fuliginosus*)	59	9
	Cat (*Felis catus)*	7	-
	Common dunnart (*Sminthopsis murina*)	4	-
	Swamp wallaby (*Wallabia bicolor*)	1	-
	Mammal spp.*	72	1
	Total Mammals	**558**	**146**
Bird	Australian owlet-nightjar *(Aegotheles cristatus)*	2	-
	Australian raven (*Corvus coronoides*)	6	-
	Chestnut quail-thrush (*Cinclosoma castanotum*)	29	-
	Common bronzewing (*Phaps chalcoptera*)	7	-
	Grey butcherbird (*Cracticus torquatus*)	10	-
	Grey shrike-thrush (*Colluricincla harmonica*)	18	-
	Malleefowl (*Leipoa ocellata*)	3	-
	Painted buttonquail (*Turnix varius*)	1	-
	Pied currawong (*Strepera graculina*)	11	-
	Rufous fieldwren (*Calamanthus campestris*)	1	-
	Shy heathwren (*Hylacola cauta*)	2	-
	Southern scrub-robin (*Drymodes brunneopygia*)	7	-
	Splendid fairywren (*Malurus splendens*)	6	-
	Spotted nightjar (*Eurostopodus argus*)	2	-
	White-browed babbler (*Pomatostomus superciliosus*)	1	-
	White-fronted honeyeater (*Purnella albifrons*)	2	-
	White-winged chough (*Corcorax melanorhamphos*)	1	-
	Willie wagtail (*Rhipidura leucophrys*)	3	-
	Bird spp.*	15	-
	Total Birds	**127**	**0**
Reptile	Central bearded dragon (*Pogona vitticeps*)	1	-
	Painted dragon (*Ctenophorus pictus*)	9	-
	Lizard spp.*	15	-
	Total Reptiles	**25**	**0**
Other	Unidentifiable species*	6	0
Grand Total		**716**	**146**

Table S2. Model selection table of the environmental variables influencing bait interactions for all species. Values represent the degree of freedom (df), the log-likelihood (logLik), the Akaike Information Criterion (corrected for small sample sizes; AIC_c), the relative difference in AIC values (Δ AIC), the AIC weights (AIC ω) and the variation explained by each model (R^2). The model response variable was the time taken for a species to record the first bait interaction at a site (Dig_Time). Predictor variables included park boundary distance (edge_dist), vegetation cover (veg), *mid to late successional* PC scores (fireyear_PC1), *recently burned* PC scores (fireyear_PC2), fire mosaic (fire_m) and species (target:non-target) status (target_non). We also included the interaction terms for species (target:non-target) status with each environmental variable as predictors. All models included a random effect of camera site (1|site). Models that returned $\Delta AIC < 2$, and the highest ranked model with $\Delta AIC \geq 2$, are reported here, with the null model highlighted in bold.

Model	**df**	**logLik**	**AIC_c**	**ΔAIC**	**AIC_ω**	**R^2**
Dig_Time ~ fire_m + fireyear_PC1 + target_non + (1|site)	5	-73.223	157.0	0.00	0.044	0.125
Dig_Time ~ target_non + (1|site)	3	-75.553	157.3	0.33	0.037	0.090
Dig_Time ~ fire_m + target_non + (1|site)	4	-74.561	157.5	0.49	0.034	0.105
Dig_Time ~ fireyear_PC1 + target_non + (1|site)	4	-74.572	157.9	0.87	0.028	0.102
Dig_Time ~ fire_m + fireyear_PC1 + target_non + (fireyear_PC1 * target_non) + (1|site)	6	-72.633	158.0	1.04	0.026	0.134
Dig_Time ~ fire_m + fireyear_PC1 + target_non + (fire_m * target_non) + (1|site)	6	-72.921	158.6	1.62	0.019	0.130
Dig_Time ~ fireyear_PC2 + target_non + (1|site)	4	-75.191	158.7	1.75	0.018	0.095
Dig_Time ~ fireyear_PC1 + (fireyear_PC1 * target_non) + (1|site)	5	-74.106	158.8	1.77	0.018	0.112
Dig_Time ~ edge_dist + fire_m + fireyear_PC1 + (1|site)	6	-73.056	158.9	1.89	0.017	0.128
Dig_Time ~ fire_m + (fire_m * target_non) + (1|site)	5	-74.226	159.0	2.01	0.016	0.110
Dig_Time ~ 1 + (1|site)	**2**	**-81.043**	**166.2**	**9.21**	**0.000**	**0.000**

Table S3. Model selection table of the environmental variables influencing bait interactions for models of individual species. Values represent the degree of freedom (df), the log-likelihood (logLik), the Akaike Information Criterion (corrected for small sample sizes; AIC_c), the relative difference in AIC values (Δ AIC), the AIC weights (AIC ω) and the variation explained by each model (R^2). The model response variable was the time taken for an individual of a species to record the first bait interaction at a site (Dig_Time). Predictor variables included park boundary distance (edge_dist), vegetation cover (veg), *mid to late successional* PC scores (fireyear_PC1), *recently burned* PC scores (fireyear_PC2) and fire mosaic (fire_m). Models that returned $\Delta AIC < 2$, and the highest ranked model with $\Delta AIC \geq 2$, are reported here, with the null model highlighted in bold.

Individual Species Model	Model Structure	df	logLik	AIC_c	ΔAIC	AIC_ω	R^2
Fox (*Vulpes vulpes*)	Dig_Time ~ edge_dist + veg	3	-5.785	17.6	0.00	0.085	0.222
	Dig_Time ~ edge_dist	2	-6.804	17.6	0.04	0.083	0.123
	Dig_Time ~ 1	**1**	**-7.922**	**17.8**	**0.27**	**0.074**	**0.000**
	Dig_Time ~ fireyear_PC1	2	-7.007	18.0	0.44	0.068	0.102
	Dig_Time ~ veg	2	-7.017	18.0	0.46	0.067	0.101
	Dig_Time ~ edge_dist + fireyear_PC1	3	- 6.203	18.4	0.84	0.056	0.183
	Dig_Time ~ fireyear_PC1 + veg	3	-6.451	18.9	1.33	0.043	0.159
	Dig_Time ~ edge_dist + fire_m + veg	4	-5.555	19.1	1.54	0.039	0.243
	Dig_Time ~ edge_dist + fireyear_PC2 + veg	4	-5.609	19.2	1.65	0.037	0.238
	Dig_Time ~ fireyear_PC1 + veg	3	-6.640	19.3	1.71	0.036	0.140
	Dig_Time ~ edge_dist + fireyear_PC1 + veg	4	-5.748	19.5	1.93	0.032	0.226
	Dig_Time ~ edge_dist + fireyear_PC2	3	-6.762	19.5	1.95	0.032	0.128
	Dig_Time ~ edge_dist + fire_m	3	-6.782	19.6	1.99	0.031	0.126
	Dig_Time ~ fire_m	2	-7.869	19.7	2.17	0.029	0.006

Western Grey Kangaroo (*Macropus fuliginosus*) – outlier retained	**Dig_Time ~ 1**	**1**	**-12.217**	**26.7**	**0.00**	**0.214**	**0.000**
	Dig_Time ~ fireyear_PC2	2	-11.596	27.9	1.24	0.115	0.006
	Dig_Time ~ veg	2	-11.960	28.6	1.97	0.080	0.003
	Dig_Time ~ edge_dist	2	-11.999	28.7	2.05	0.077	0.002
Western Grey Kangaroo (*Macropus fuliginosus*) – outlier removed	Dig_Time ~ edge_dist + fireyear_PC2	3	-8.631	24.9	0.00	0.217	0.287
	Dig_Time ~ 1	**1**	**-11.849**	**25.9**	**1.07**	**0.127**	**0.000**
	Dig_Time ~ edge_dist	2	- 10.881	26.5	1.65	0.095	0.097
	Dig_Time ~ fireyear_PC2	2	- 11.305	27.4	2.50	0.062	0.056
Mitchell's hopping-mouse (*Notomys mitchellii)*	Dig_Time ~ fire_m	2	-16.145	36.8	0.00	0.132	0.087
	Dig_Time ~ 1	**1**	**-17.323**	**36.8**	**0.00**	**0.132**	**0.000**
	Dig_Time ~ fireyear_PC2	2	-16.506	37.5	0.72	0.092	0.061
	Dig_Time ~ edge_dist	2	-16.629	37.8	0.97	0.081	0.052
	Dig_Time ~ edge_dist + fire_m	3	-15.768	38.6	1.82	0.053	0.113
	Dig_Time ~ fireyear_PC1	2	-17.137	38.8	1.98	0.049	0.014
	Dig_Time ~ fire_m + fireyear_PC2	3	-15.862	38.8	2.00	0.048	0.106
Silky Mouse (*Pseudomys apodemoides*)	Dig_Time ~ fire_m + fireyear_PC1	3	-10.092	27.4	0.00	0.229	0.307
	Dig_Time ~ fire_m + fireyear_PC1 + veg	4	-9.257	28.6	1.24	0.123	0.353
	Dig_Time ~ fire_m + fireyear_PC1 + edge_dist	4	-9.398	28.9	1.52	0.107	0.346
	Dig_Time ~ fire_m	2	-12.433	29.4	2.05	0.082	0.157
	Dig_Time ~ 1	**1**	**-14.487**	**31.2**	**3.77**	**0.035**	**0.000**

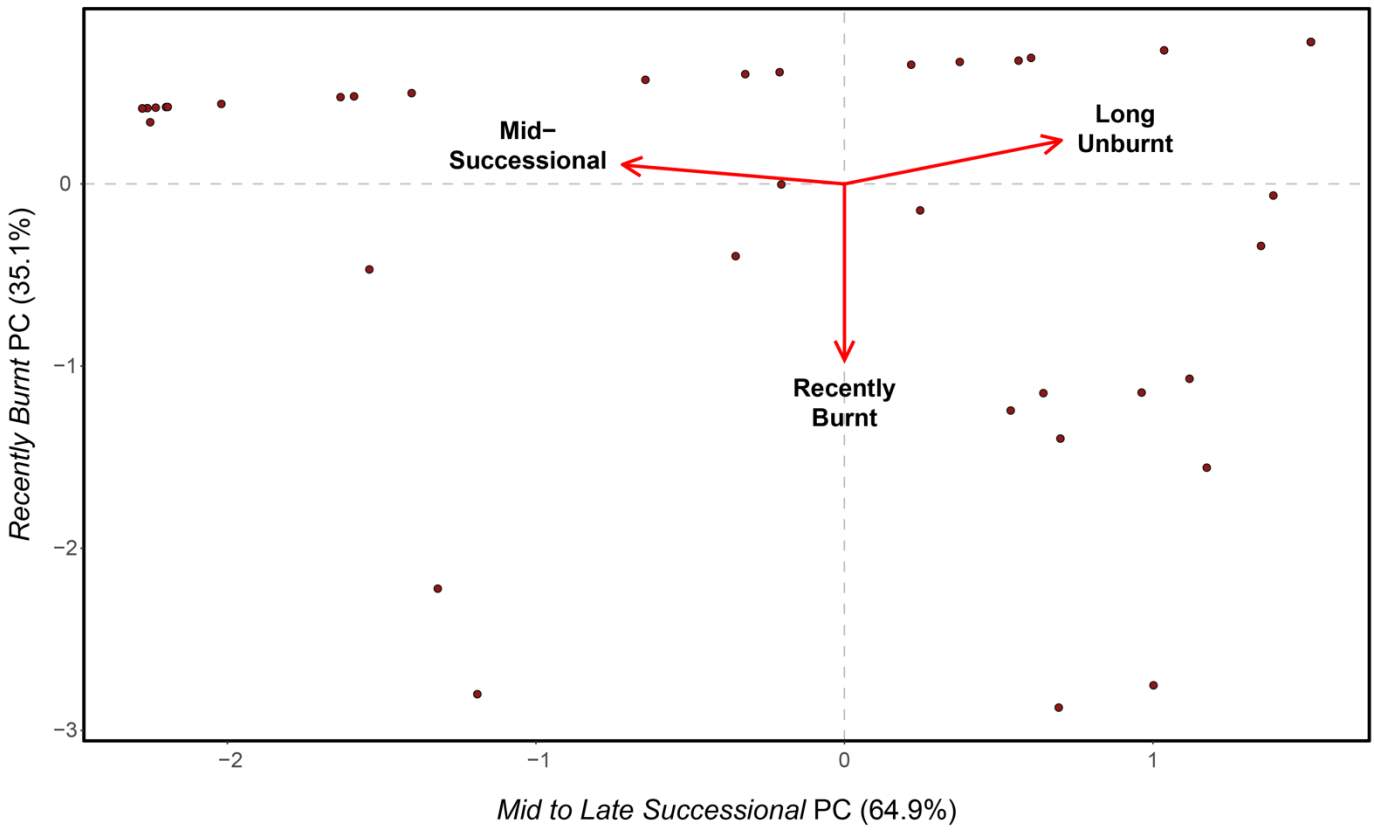

Figure S1. Principal component analysis (PCA) of proportional time since fire category values calculated within 750 m radius buffer zones around each bait site (red circles, n = 48) in the Big Desert-Wyperfeld complex. The first axis (*Mid to Late Successional* PC) explained 64.9% of variance, and the second axis (*Recently Burnt* PC) explained 35.1% variance (cumulative variance explained by both axes was 100%). PC scores were approximately equally weighted across the three time since fire categories: recently burnt (fire < 11 years ago), mid-successional (fire 12-35 years ago), and long-unburnt (fire > 35 years ago).

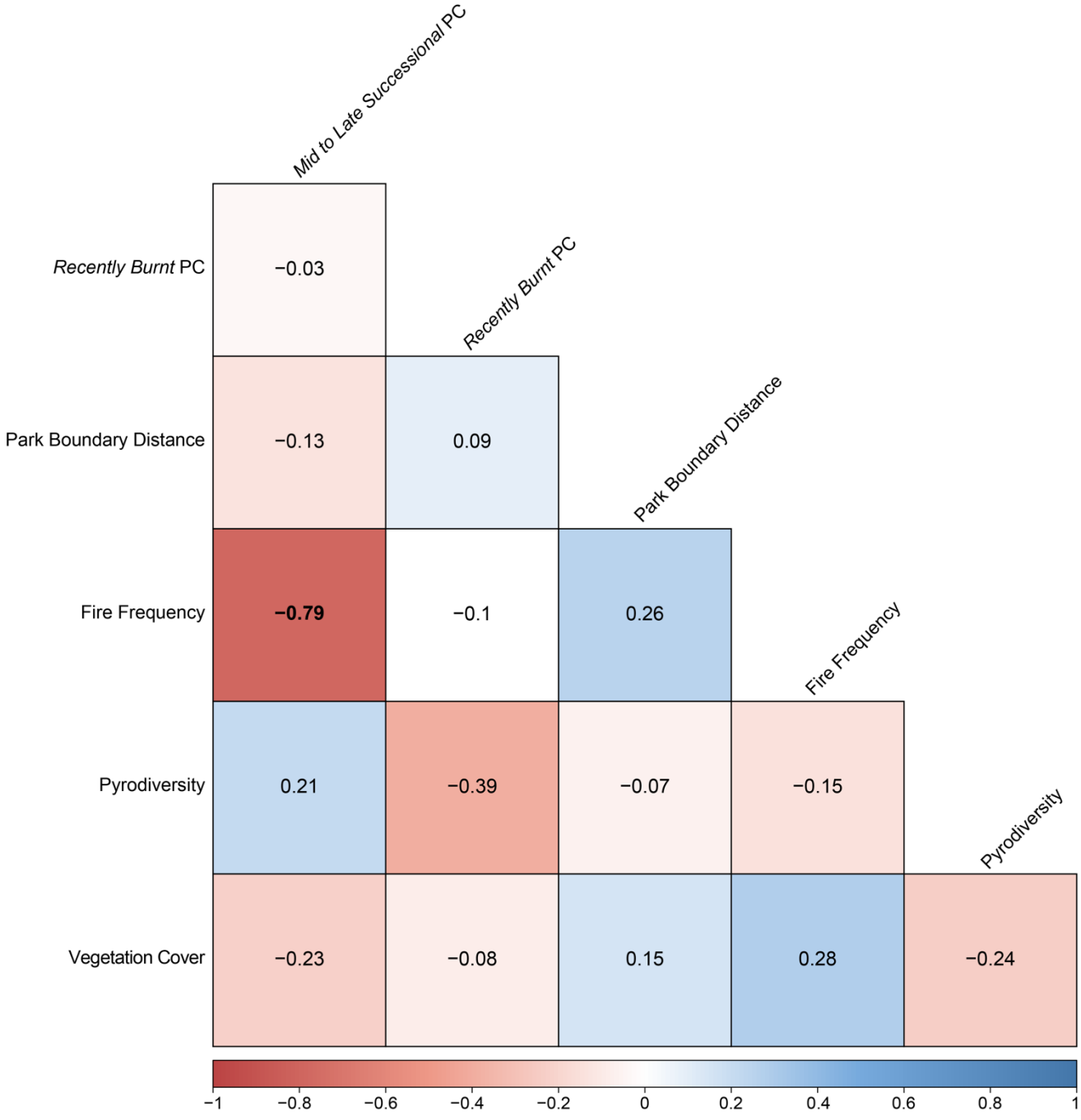

Figure S2. Correlation matrix showing the correlation between predictor variables. Coefficients strongly correlated (absolute value > 0.7; dark coloured boxes; bold values) were inspected, and one coefficient was removed from subsequent modelling.