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Wildlife Research

Supplementary Material

Wildfire in rainforest margins is associated with variation in mammal diversity and habitat use

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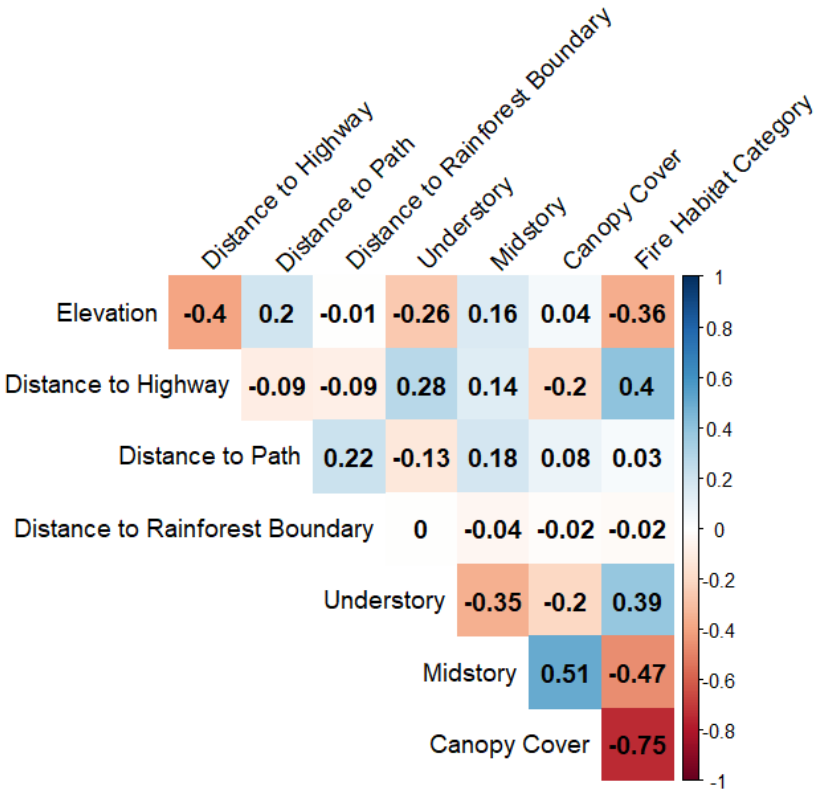

Figure S1. Pearson correlation coefficients between the main fire habitat category variable and environmental co-variates. We considered variables highly correlated if the correlation coefficient was ≥ |0.7|.

Table S1. Nine mammal species, identified to species level, detected across rainforest margins in South East Queensland, Australia.

Scientific name	Common name	Abbreviation	Individuals detected	EPBC Act classification	Native or introduced
Antechinus stuartii	Brown Antechinus	A.stu	34	Not listed	Native
Melomys cervinipes	Fawn-footed Melomys	M.cer	142	Not listed	Native
Perameles nasuta	Long Nosed Bandicoot	P.nas	11	Not listed	Native
Phascolarctos cinereus	Koala	P.cin	1	Endangered	Native
Rattus fuscipes	Bush Rat	R.fuscipes	354	Not listed	Native
Sus scrofa	Pig	S.scr	4	Not listed	Introduced
Thylogale stigmatica	Red Legged Pademelon	T.stigmatica	254	Not listed	Native
Thylogale thetis	Red Necked Pademelon	T.the	80	Not listed	Native
Trichosurus caninus	Short Eared Brushtailed Possum	T.can	40	Not listed	Native

Abbreviations refer to those used in Figure S1. Conservation status is from the *Environment Protection Biodiversity Conservation Act* 1999.

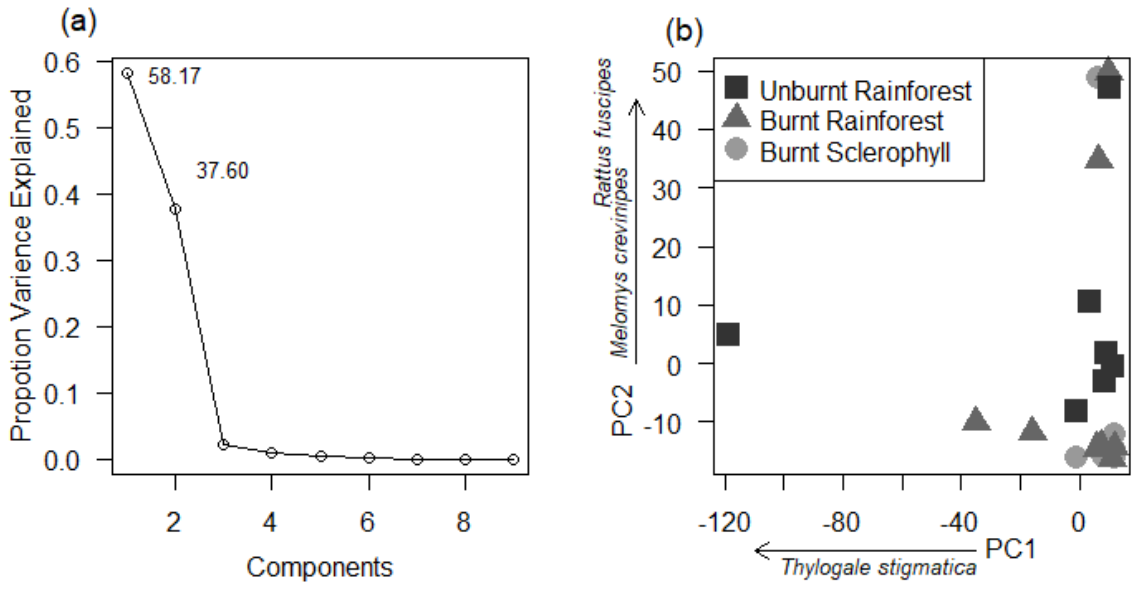

Figure S2. Principal Components Analysis (PCA) of mammal community composition in fire affected rainforest margins of South East Queensland, Australia. (a) The proportion of variance explained by each component; (b) Community dissimilarity among sites in three fire-habitat categories, represented by Component 1 (58.17% variance explained) and Component 2 (37.60% variance explained). A PCA bi-plot (Fig. S3) indicated that *Thylogale stigmatica* was associated with PC1 while *Melomys cervinipes* and *Rattus fuscipes* were associated with PC2.

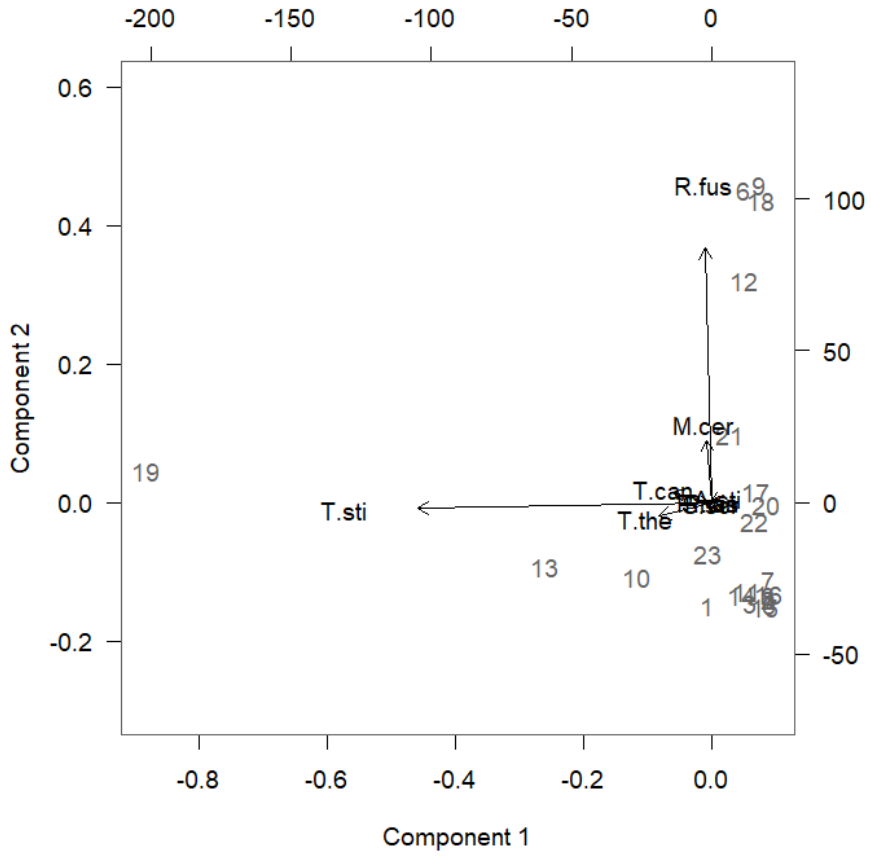

Figure S3. Bi-plot of Principal Components Analysis (PCA) from a community of small mammals across in rainforest margins in sSouth East Queensland, Australia. Component 1 was influenced by *Thylogale stigmatica* whereas Component 2 was influenced by *Rattus fuscipes* and *Melomys cervinipes* (see Table S1 for species name abbreviations).

Table S2. Models of mammal community composition represented by Principal Component 2 (PCA shown in Fig. S1), ranked by AICc.

Models	K	AICc	ΔAICc	AICcWt	Cum.Wt	Log L.
Null	2	212.18	0.00	0.57	0.57	-103.79
FHC * Midstorey	7	213.68	1.51	0.27	0.83	-96.11
FHC	4	216.11	3.93	0.08	0.91	-102.94
FHC + Understorey	5	218.69	6.51	0.02	0.94	-102.58
FHC + Distance to Path	5	219.25	7.07	0.02	0.95	-102.86
FHC + Elevation	5	219.30	7.12	0.02	0.97	-102.88
FHC + Distance to Rainforest Boundary	5	219.36	7.18	0.02	0.98	-102.91
FHC + Distance to Road	5	219.40	7.23	0.02	1.00	-102.94

The null model was the first-ranked model, while the second-ranked model (ΔAICc < 2) included an interaction between fire-habitat category and midstorey. For PC1, no models were ranked within ΔAICc < 2 relative to the null model. K, number of parameters; AICc, second order Akaike Information Criterion; ΔAICc, change in AICc; AICc Wt, AICc weight, Cum.Wt, Cumulative AICc weight, Log L., log likelihood of model given the data.

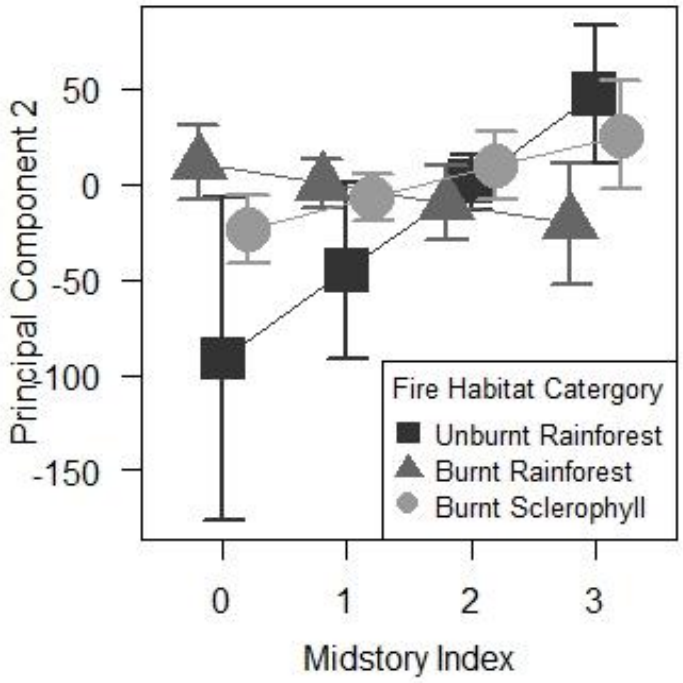

Figure S4. Estimated effect (±95% confidence interval) of fire-habitat category and midstorey vegetation on small mammal community composition (represented by Principal Component 2) from rainforest margins of South East Queensland, Australia. Results show estimates from the second-ranked model (ΔAIC< 2 relative to first-ranked null model) which included an interaction between fire-habitat category (unburnt rainforest, burnt rainforest and burnt sclerophyll) and midstorey vegetation. No notable effects were found for Principal Component 1.

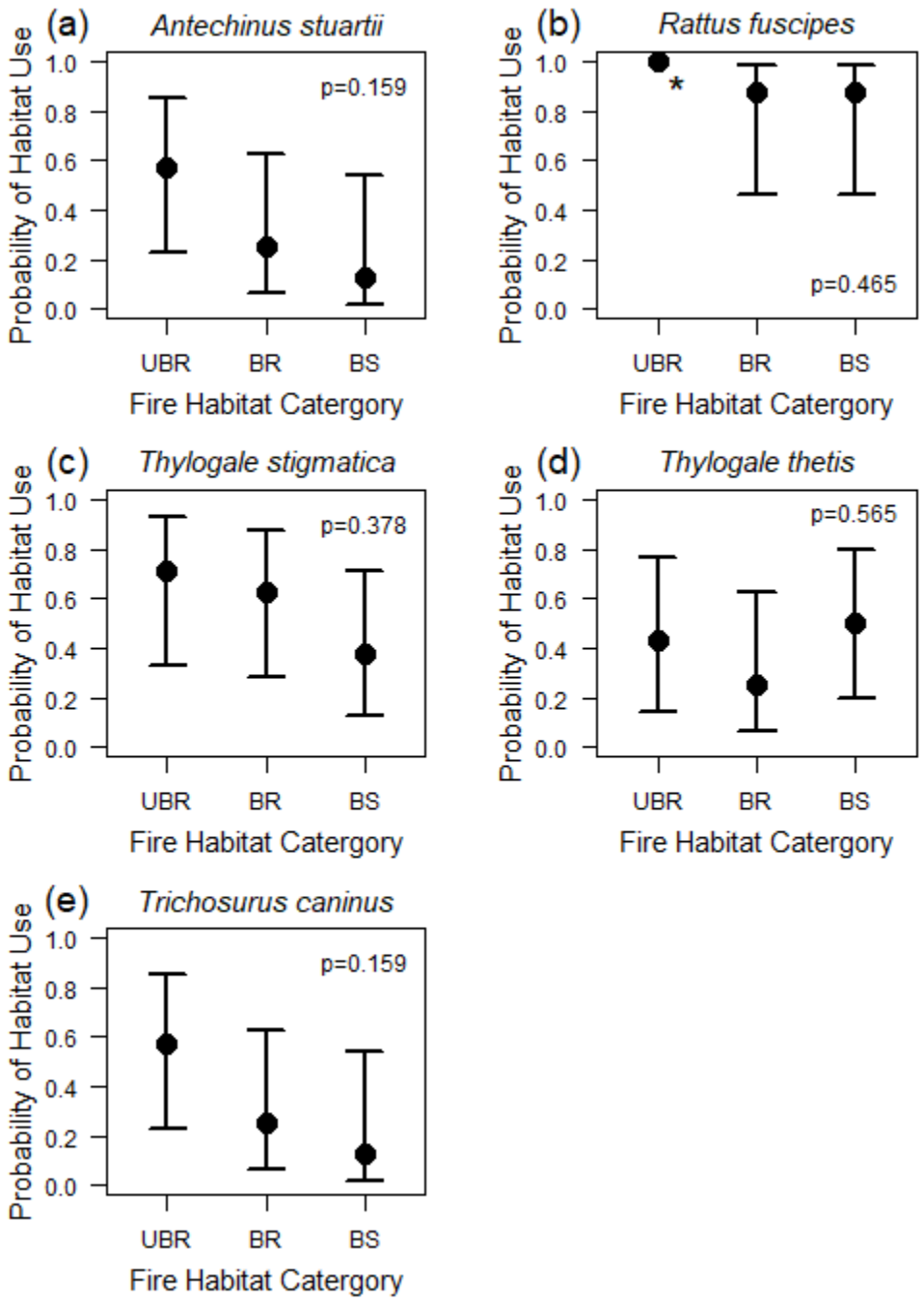

Figure S5. Estimated probability of habitat use (±95% confidence interval) of (a) *Antechinus stuartii*, (b) *Rattus fuscipes*, (c) *Thylogale stigmatica*, (d) *Thylogale thetis* and (e) *Trichosurus caninus* in fire affected rainforest margins of South East Queensland, Australia. Asterisks indicate inability to calculate confidence intervals as that species was present at all sites that fire-habitat category. UBR, unburnt rainforest; BR, burnt rainforest; BS, burnt sclerophyll.

Table S3. Models examining the probability of movement for *Melomys cervinipes*, *Thylogale stigmatica* and *Thylogale thetis* across rainforest margins in South East Queensland, Australia, ranked by AICc.

Species	Models	K	AICc	ΔAICc	AICcWt	Cum.Wt	Log L.
Melomys cervinipes	Null	2	199.38	0.00	0.52	0.52	-97.65
	FHC * Elevation	7	200.48	1.10	0.30	0.81	-92.82
	FHC	4	203.52	4.14	0.07	0.88	-97.61
	FHC + Midstorey	7	204.82	5.44	0.03	0.91	-94.99
	FHC + Distance to Path	5	205.38	6.00	0.03	0.94	-97.47
	FHC + Distance to Road	5	205.40	6.02	0.03	0.96	-97.48
	FHC * Distance to Rainforest Boundary	7	205.46	6.08	0.02	0.99	-95.31
	FHC + Understorey	6	207.04	7.66	0.01	1.00	-97.20
Thylogale stigmatica	Null	2	81.85	0.00	0.60	0.60	-38.90
	FHC	4	84.86	3.02	0.13	0.73	-38.35
	FHC + Distance to Path	5	86.00	4.15	0.08	0.81	-37.88
	FHC + Distance to Rainforest Boundary	5	86.81	4.77	0.06	0.86	-38.19
	FHC + Distance to Road	5	86.93	5.08	0.05	0.91	-38.34
	FHC + Elevation	5	86.94	5.10	0.05	0.96	-38.35
	FHC + Understorey	6	87.16	5.31	0.04	1.00	-37.41
Thylogale thetis	Null	2	29.12	0.00	0.67	0.67	-12.47
	FHC	4	32.29	3.18	0.14	0.81	-11.85
	FHC + Distance to Road	5	33.24	4.12	0.09	0.90	-11.16
	FHC + Distance to Rainforest Boundary	5	34.00	4.88	0.06	0.96	-11.54
	FHC + Path	5	34.60	5.49	0.04	1.00	-11.85

Each species was modelled as a function of fire-habitat category (FHC) and environmental co-variates. The null model was first ranked for all three species, while two species with models ranked higher than the null are shown in the main document (Table 2). For *Melomys cervinipes*, there was one model ranked within ΔAICc < 2 relative to the null model (Fig. S5). K, number of parameters; AICc, second order Akaike Information Criterion; ΔAICc, change in AICc; AICc Wt, AICc weight, Cum.Wt, Cumulative AICc weight, Log L., log likelihood of model given the data

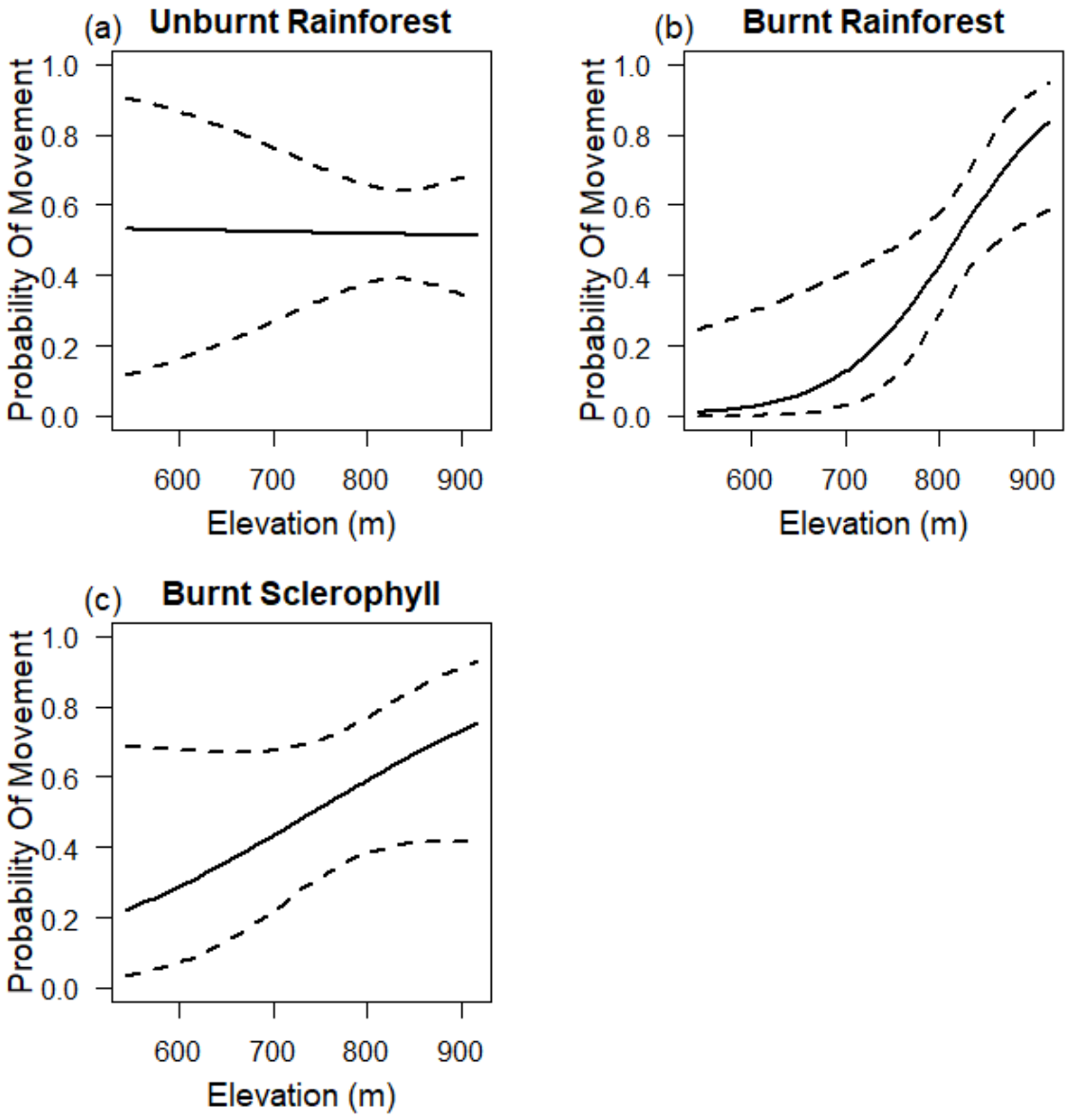

Figure S6. Estimated probability of movement (±95% confidence interval) of *Melomys cervinipes* in fire affected rainforest margins of South East Queensland, Australia. The top-ranked model was the null model (Table S3), while the second ranked model shown here (ΔAICc = 1.10, relative to the null model) included an interaction between fire-habitat category and elevation: (a) unburnt rainforest (b) burnt rainforest (c) burnt sclerophyll.