

Supplementary Material

Shoot flammability patterns among plant species of the wildland–urban interface in the fire-prone Greater Blue Mountains World Heritage Area

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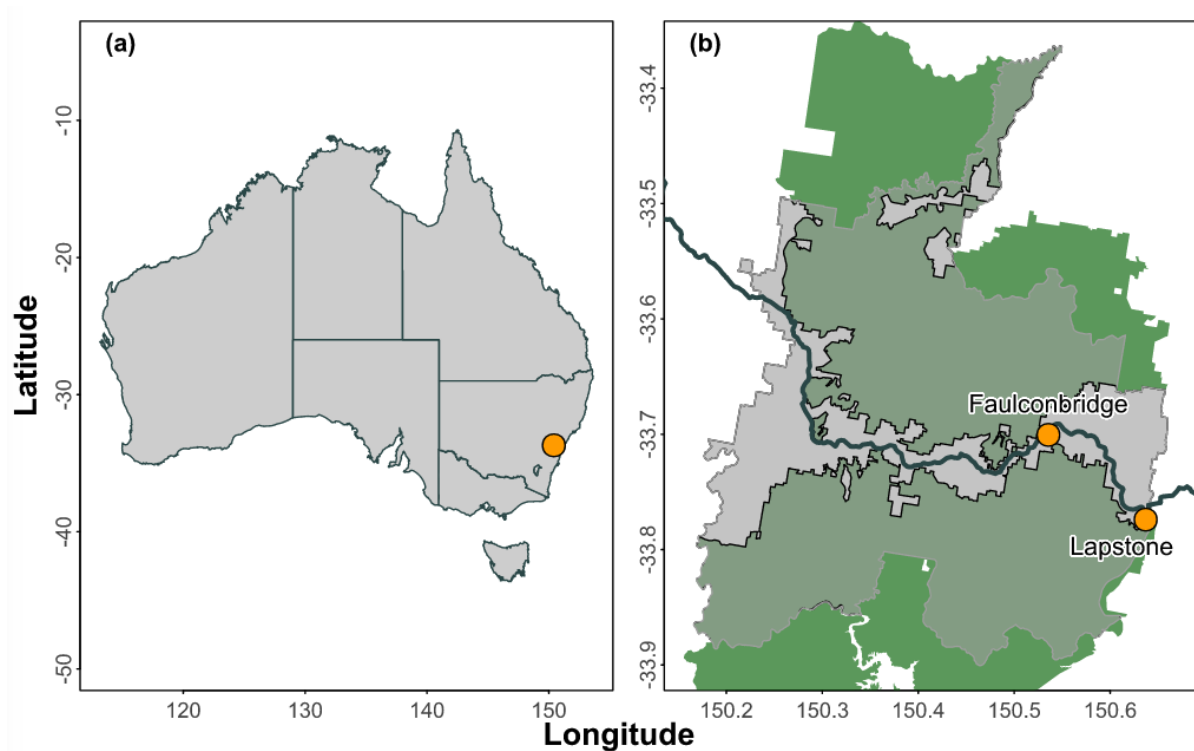
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Fig. S1. Map of the study region

The location of the study region in Australia shown in (a) by the orange circle and in more detail in (b) in the Greater Blue Mountains World Heritage Area. The Great Western Highway passes through the light grey section of the Local Government Area (LGA), the Blue Mountains National Park (BMNP) is marked in dark green at the outer edges of the map and the overlap between the LGA and the BMNP is in the intermediate-coloured olive green. All study sites were located between Lapstone and Falconbridge on either side of the black line at the wildland-urban interface separating the LGA from the LGA–BMNP areas.



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Table S1. Woody shrub and tree species assessed for their flammability at the WUI

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Species' means are provided for flammability attributes and shoot traits. TTF = time to flame, FD = flame duration, FT = flame temperature, BB

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= biomass burnt, FM = fuel moisture, SV = shoot volume, BD = bulk density, DR = degree of ramification

Species	Family	Status	TTF	FD	FT	BB	FM	SV	BD	DR
<i>Acacia linifolia</i>	Fabaceae	WN	1.818	13.727	308.818	13.182	60.178	0.012	1.068	6.015
<i>Acacia longifolia</i>	Fabaceae	WN	1.750	23.750	457.375	36.125	80.283	0.030	0.884	5.204
<i>Acacia parramattensis</i>	Fabaceae	WN	1.333	24.556	507.333	48.333	53.908	0.050	0.674	13.182
<i>Acacia podalyriifolia</i>	Fabaceae	WN	1.182	12.636	440.091	33.182	64.132	0.029	0.856	6.205
<i>Acacia ulicifolia</i>	Fabaceae	WN	1.000	7.500	298.500	10.167	47.605	0.028	0.534	16.023
<i>Acmena smithii</i>	Myrtaceae	UN	2.500	30.100	549.700	27.500	85.975	0.032	1.590	12.916
<i>Allocasuarina littoralis</i>	Casuarinaceae	WN	1.750	21.625	485.250	45.500	40.950	0.019	1.283	11.354
<i>Angophora costata</i>	Myrtaceae	WN	2.333	28.000	596.222	23.778	56.763	0.049	1.294	7.125
<i>Banksia ericifolia</i>	Proteaceae	WN	3.429	9.857	304.000	13.286	98.662	0.052	0.878	8.903
<i>Banksia integrifolia</i>	Proteaceae	UN	3.750	31.125	498.375	16.875	94.696	0.056	1.141	7.144
<i>Banksia spinulosa</i>	Proteaceae	WN	1.235	27.824	423.706	47.941	69.281	0.046	0.773	12.898

<i>Bossiaea obcordata</i>	Fabaceae	WN	1.000	15.000	335.857	34.429	23.710	0.030	0.655	32.777
<i>Buxus microphylla</i>	Buxaceae	UE	4.556	2.000	222.333	2.667	139.957	0.024	1.558	33.619
<i>Callistemon citrinus</i>	Myrtaceae	UN	1.000	35.800	596.200	72.700	20.198	0.031	1.840	12.986
<i>Callistemon viminalis</i>	Myrtaceae	UN	3.875	20.250	577.625	7.750	91.757	0.040	1.175	11.339
<i>Camelia sasanqua</i>	Theaceae	UE	3.556	7.889	389.444	3.000	115.751	0.038	1.254	20.789
<i>Ceratopetalum gummiferum</i>	Cunoniaceae	WN	3.667	27.500	434.167	13.667	108.545	0.049	0.562	11.200
<i>Citrus limon</i>	Rutaceae	UE	6.571	1.571	353.857	2.000	162.445	0.019	1.863	3.652
<i>Corymbia eximia</i>	Myrtaceae	WN	4.000	35.333	473.556	17.222	68.571	0.050	2.014	8.609
<i>Corymbia gummifera</i>	Myrtaceae	WN	2.467	64.133	716.333	62.333	57.355	0.061	1.489	9.109
<i>Dodonaea viscosa</i>	Sapindaceae	UN	1.300	6.700	311.500	15.200	47.708	0.025	1.087	10.531
<i>Elaeocarpus reticulatus</i>	Elaeocarpaceae	UN	1.500	32.200	507.300	40.200	79.479	0.049	2.032	7.219
<i>Grevillea banksii</i>	Proteaceae	UN	1.625	48.250	547.875	51.750	86.433	0.055	1.042	6.902
<i>Grevillea phylicoides</i>	Proteaceae	WN	2.000	6.333	348.167	23.333	53.605	0.034	0.692	13.778
<i>Hakea dactyloides</i>	Proteaceae	WN	2.889	30.667	425.222	23.556	44.556	0.048	0.800	7.326
<i>Hakea sericea</i>	Proteaceae	WN	1.556	24.556	426.000	17.444	66.407	0.040	0.757	12.849

<i>Isopogon anemonifolius</i>	Proteaceae	WN	3.333	51.333	530.778	40.000	73.507	0.016	2.689	6.153
<i>Jacaranda mimosifolia</i>	Bignoniaceae	UE	1.000	27.000	493.857	58.571	71.245	0.051	0.950	16.257
<i>Lambertia formosa</i>	Proteaceae	WN	2.056	35.056	470.667	30.222	51.820	0.022	1.741	8.710
<i>Leptospermum trinervium</i>	Myrtaceae	WN	1.375	26.125	401.000	52.500	12.921	0.031	1.046	22.435
<i>Lophostemon confertus</i>	Myrtaceae	UN	3.857	7.857	435.571	3.571	90.263	0.045	1.619	4.799
<i>Magnolia grandiflora</i>	Magnoliaceae	UE	6.000	1.167	204.500	2.000	213.186	0.016	2.354	8.464
<i>Melaleuca quinquenervia</i>	Myrtaceae	UN	3.250	6.625	335.625	2.375	119.603	0.050	1.072	11.562
<i>Murraya paniculata</i>	Rutaceae	UE	2.375	39.500	551.875	53.000	98.076	0.040	1.620	25.183
<i>Olea europaea</i>	Oleaceae	UE	2.429	6.143	255.143	2.000	56.445	0.043	1.743	13.538
<i>Persoonia linearis</i>	Proteaceae	WN	1.500	53.000	489.167	54.167	105.672	0.058	0.818	13.718
<i>Petrophile pulchella</i>	Proteaceae	WN	2.250	12.375	342.250	5.375	98.173	0.010	2.287	1.828
<i>Pittosporum tenuifolium</i>	Pittosporaceae	UE	2.800	2.200	198.000	2.600	141.336	0.014	1.184	39.518
<i>Pittosporum undulatum</i>	Pittosporaceae	WN	3.364	5.545	370.091	7.818	122.203	0.024	1.503	6.733
<i>Pultenaea scabra</i>	Fabaceae	WN	1.167	22.667	372.000	21.667	37.710	0.031	0.631	29.163
<i>Syncarpia glomulifera</i>	Myrtaceae	WN	2.000	19.889	334.000	14.444	40.072	0.048	0.895	13.337

<i>Trachelospermum jasminoides</i>	Apocynaceae	UE	3.250	2.750	298.250	4.000	93.241	0.023	1.065	9.727
<i>Viburnum odoratissimum</i>	Adoxaceae	UE	4.000	2.000	312.222	2.333	152.174	0.014	2.126	4.568
<i>Woollsia pungens</i>	Ericaceae	WN	1.000	18.222	388.667	34.667	36.659	0.017	0.880	16.478

Fig. S2. Phylogenetic tree of study species

Symbols to the left of each species name indicate plant group membership (squares for wildland natives, circles for urban natives and triangles for urban exotics)

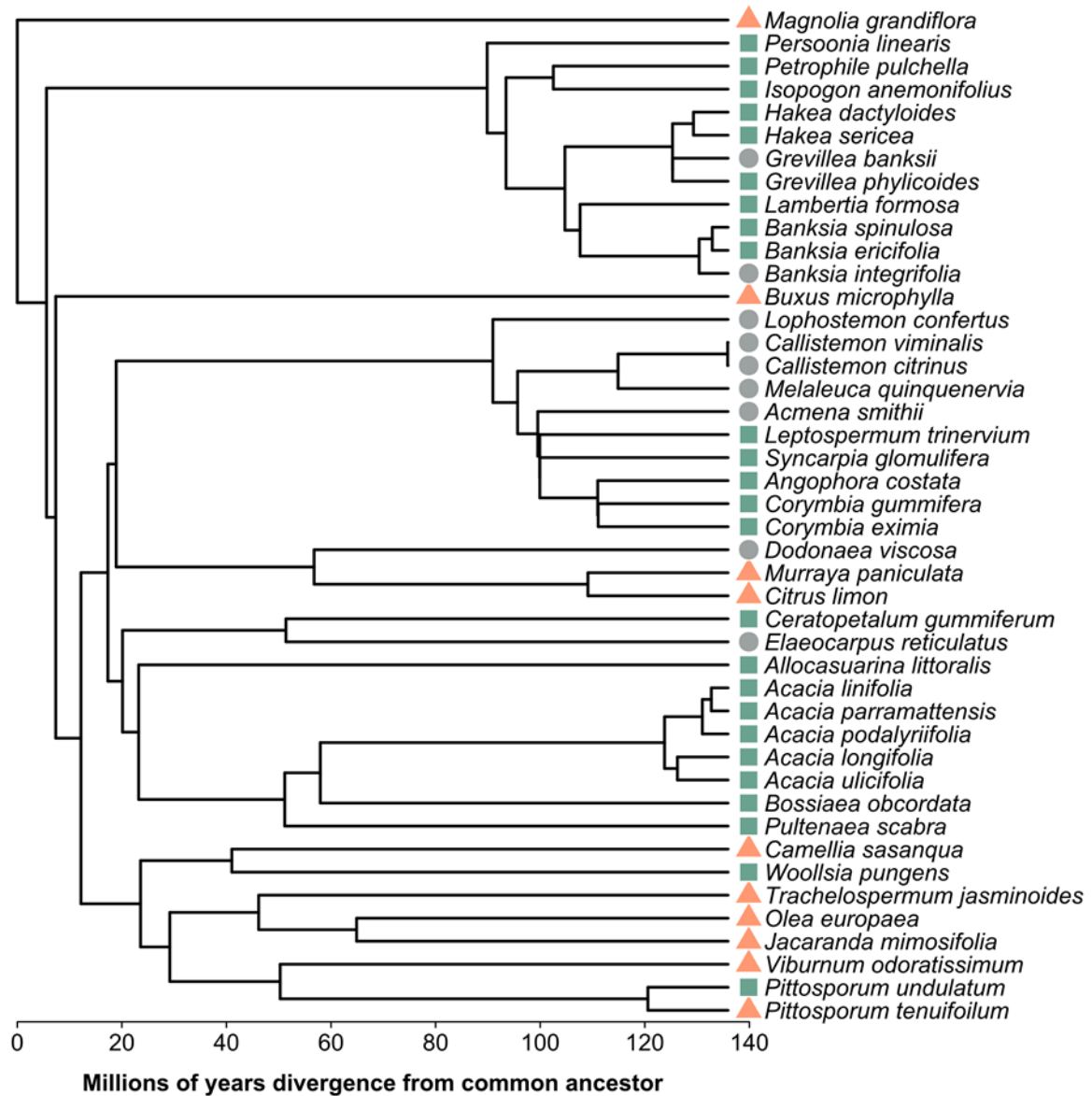


Table S2. Model AIC values under different branch length transformations

In all models, the lambda transformation provided the best fit (lowest AIC). The maximum likelihood estimated value for lambda used in the models is shown (ML est.). TTF = time to flame, FD = flame duration, FT = flame temperature, BB = biomass burnt, FM = fuel moisture, SV = shoot volume, BD = bulk density, DR = degree of ramification

Model	Brownian	Lambda	Kappa	Delta	Lambda value (ML est.)
TTF by plant group	250.794	62.582	80.458	226.271	0.099506
FD by plant group	266.425	167.344	185.638	243.660	0.000001
FT by plant group	243.127	210.106	224.755	225.842	0.000001
BB by plant group	333.216	146.485	175.746	308.676	0.000001
FM by plant group	599.668	433.612	438.603	575.407	0.458717
SV by plant group	-168.407	-248.323	-242.753	-190.530	0.000001
BD by plant group	156.171	43.077	47.464	132.843	0.099039
DR by plant group	115.890	84.759	99.566	100.832	0.000001
TTF by plant group and shoot traits	85.405	34.448	56.545	70.458	0.000001

FD by plant group and shoot traits	176.899	148.099	167.162	162.479	0.000001
FT by plant group and shoot traits	225.524	197.172	216.295	210.322	0.000001
BB by plant group and shoot traits	159.246	136.585	156.752	150.108	0.000001
Flammability score by plant group	149.984	-12.217	12.949	125.672	0.000001

Table S3. Model outputs of post-hoc tests comparing pairs of plant groups (with Tukey correction for multiple comparisons) for the four flammability attributes, the four shoot traits and the relative flammability scores

WN = wildland native, UN = urban native, UE = urban exotic, TTF = time to flame, FD = flame duration, FT = flame temperature, BB = biomass burnt, FM = fuel moisture, SV = shoot volume, BD = bulk density, DR = degree of ramification, FS = flammability score. For each test, the model estimate (Est.), standard error (SE), degrees of freedom (DF), *t*-ratio and significance (*P*) are provided

Response	Contrast	Est.	SE	DF	<i>t</i> ratio	<i>P</i>
TTF	WN-UN	-0.136	0.187	41	-0.730	0.47
	WN-UE	-0.570	0.189	41	-2.589	0.013
	UN-UE	-0.434	0.229	41	-1.694	0.10
FD	WN-UN	0.082	0.610	41	0.135	0.89
	WN-UE	2.257	0.587	41	3.472	0.001
	UN-UE	2.174	0.720	41	2.866	0.007
FT	WN-UN	-1.340	0.991	41	-1.352	0.18
	WN-UE	2.703	0.954	41	2.676	0.011
	UN-UE	4.042	1.171	41	3.057	0.004
BB	WN-UN	0.410	0.481	41	0.853	0.40
	WN-UE	1.834	0.463	41	3.593	< 0.001
	UN-UE	1.424	0.568	41	2.336	0.024

FM	WN-UN	-20.283	12.437	41	-1.631	0.11
	WN-UE	-63.320	15.131	41	-3.823	< 0.001
	UN-UE	-43.037	17.456	41	-2.295	0.027
BD	WN-UN	-0.007	0.005	41	-1.326	0.19
	WN-UE	0.007	0.005	41	1.326	0.19
	UN-UE	0.014	0.006	41	1.699	0.10
SV	WN-UN	-0.264	0.150	41	-1.554	0.13
	WN-UE	-0.408	0.152	41	-2.237	0.031
	UN-UE	-0.144	0.184	41	-0.786	0.44
DR	WN-UN	0.128	0.238	41	0.535	0.60
	WN-UE	-0.280	0.230	41	-0.957	0.34
	UN-UE	-0.408	0.282	41	-0.957	0.34
FS	WN-UN	0.025	0.079	41	0.311	0.76
	WN-UE	0.358	0.076	41	4.344	< 0.001
	UN-UE	0.333	0.094	41	3.418	0.001