

Supplementary material

Table S1. Description of environmental variables and Shannon diversity (mean ± SD per site) sampled at each site within 8 m radius (200 m²) of each trap (pitfall and window trap) along the fire gradient (unburnt, burnt margin, burnt center). Within a row, different letters indicate significant differences (p < 0.05) after ANOVA and Tukey post-hoc test with Holm corrections for multiple tests.

Environmental variables	Unburnt		Burnt margin		Burnt center	
% Trees	63.3 ± 5.98	a	0.00	b	0.00	b
% Shrubs	2.2 ± 1.08	a	0.5 ± 0.11	b	0.4 ± 0.11	b
% Grass	18.2 ± 5.62	a	78.4 ± 5.17	b	78.7 ± 3.70	b
% Litter	63.3 ± 5.79	a	8.3 ± 5.62	b	15.0 ± 6.45	b
% Standing dead trees	0.2 ± 0.11	a	5.4 ± 0.93	b	6.1 ± 2.61	b
% Laying dead wood	7.8 ± 1.34	a	2.2 ± 0.64	b	2.6 ± 0.75	b
Shannon environment diversity ¹	1.57 ± 0.03	a	1.07 ± 0.08	b	1.17 ± 0.04	b

¹ Shannon environment diversity based on percentage of cover of the vegetation layers in this table and that of other variables not shown here, i.e. percentage cover of stones, bare soil, height (in cm) of grass, trees, and shrubs sampled by Moser and Wohgemuth (2006).

Table S2. Analyses of variance of a) log-number of individuals, b) number of species, and c) Simpson species diversity (mean values per site ± SE) in the three categories of fire (unburnt, burnt margin, burnt center) at each altitude (1200, 1450, 1700 m). Different letters within a column (↓) or row (→) indicate significant differences (p < 0.05) after Tukey post-hoc test and Holm correction for multiple tests.

a)

Factors	Unburnt	↓	→	Burnt margin	↓	→	Burnt center	↓	→	Total altitude	↓
1200 m	4.18 ± 0.42	ab	a	7.13 ± 0.45	a	b	7.11 ± 0.32	a	b	6.14 ± 0.47	a
1450 m	5.08 ± 0.33	b	a	7.11 ± 0.41	a	b	6.99 ± 0.37	a	b	6.39 ± 0.34	a
1700 m	3.18 ± 0.52	a	a	6.08 ± 0.47	a	b	5.60 ± 0.56	a	b	4.96 ± 0.47	a
Total fire	4.15 ± 0.32	–	a	6.78 ± 0.28	–	b	6.57 ± 0.30	–	b	5.83 ± 0.26	–

b)

Factors	Unburnt	↓	→	Burnt margin	↓	→	Burnt center	↓	→	Total altitude	↓
1200 m	8.8 ± 1.65	a	a	27.0 ± 1.29	ab	b	26.3 ± 0.75	a	b	20.7 ± 2.63	a
1450 m	15.0 ± 1.29	b	a	24.0 ± 2.65	b	b	18.3 ± 1.03	b	a	19.1 ± 1.46	a
1700 m	5.3 ± 1.11	a	a	19.3 ± 0.95	a	b	12.3 ± 1.80	c	c	12.4 ± 1.86	b
Total fire	9.67 ± 1.41	–	a	23.42 ± 1.34	–	b	19.08 ± 1.80	–	b	17.39 ± 1.29	–

c)

Factors	Unburnt	↓	→	Burnt margin	↓	→	Burnt center	↓	→	Total altitude	↓
1200 m	0.792 ± 0.058	ab	a	0.940 ± 0.003	a	b	0.937 ± 0.003	a	b	0.890 ± 0.027	a
1450 m	0.894 ± 0.009	b	a	0.930 ± 0.012	a	b	0.906 ± 0.005	b	ab	0.910 ± 0.007	a
1700 m	0.701 ± 0.044	a	a	0.920 ± 0.004	a	b	0.863 ± 0.026	a	b	0.829 ± 0.032	a
Total fire	0.796 ± 0.032	–	a	0.930 ± 0.005	–	b	0.902 ± 0.012	–	b	0.876 ± 0.015	–

Table S3. Results of the fourth-corner analysis (see methods) showing significant functional relationship between environmental variables (Env.var.) and saproxylic community traits (see codes at Table 2). Environmental variables are fire (unburnt, burnt margin, burnt center) and altitude (1200, 1450, 1700 m a.s.l.), and time elapsed since fire (2, 3 yr). Only the significant traits are shown after Holm's correction for multiple testing (p-holm). See Table 1 for the definition of the trait names.

Env.var.	Traits		Statistic	p-holm
Unburnt	Thermo	F	54.4926	0.0168
Unburnt	Xero	F	95.4763	0.0168
Unburnt	Helio	F	41.1530	0.0168
Unburnt	Forest	F	23.7470	0.0168
Unburnt	Xyolodetrirical	F	51.8475	0.0168
Unburnt	WeaklyDecayed	F	21.4797	0.0168
Unburnt	Decayed	F	42.5752	0.0168
Unburnt	HabitatSp	ChiSq	18.2396	0.0320
Burnt center	Xero	F	18.0063	0.0484

Table S4. Mean number of individuals \pm SE per site of a) endangered species and b) pest species of cerambycids and buprestids sampled at different burnt sites; § indicator species (see Method); ° pyrophilous species according to Wikars (1997).

a)

Species	Red List ¹		Unburnt	Burnt margin	Burnt center
<i>Cortodera femorata</i>	D ₃	CH	0.42 \pm 0.26		
<i>Callidium coriaceum</i>	D ₃			0.17 \pm 0.11	
<i>Chrysobothris solieri</i>	D ₃	CH		0.17 \pm 0.17	
<i>Phytoecia nigripes</i>	D ₃	CH		0.17 \pm 0.11	
<i>Agrilus graminis</i>	D ₃	CH		0.08 \pm 0.08	
<i>Anthaxia salicis</i>	D ₃			0.08 \pm 0.08	
<i>Buprestis octoguttata</i>	D ₃ ,EU	CH		0.08 \pm 0.08	
<i>Pogonocherus decoratus</i>		CH		0.08 \pm 0.08	
<i>Agrilus pratensis</i>		CH			0.08 \pm 0.08
<i>Chlorophorus sartor</i> §	D ₃			4.25 \pm 3.09	3.33 \pm 1.66
<i>Anthaxia hungarica</i> §		CH*		1.08 \pm 0.38	0.75 \pm 0.31
<i>Pachyta lamed</i>	D ₂	CH*		0.50 \pm 0.29	1.33 \pm 1.08
<i>Chlorophorus varius</i>	D ₁			0.17 \pm 0.11	0.08 \pm 0.08
<i>Oxymirus cursor</i>	EU	CH	0.17 \pm 0.11	0.17 \pm 0.17	
<i>Semanotus undatus</i>	D ₃	CH	0.08 \pm 0.08	0.08 \pm 0.08	
<i>Acmaeops pratensis</i> §	D ₂	CH	0.17 \pm 0.17	221.83 \pm 96.7	199.75 \pm 61.8
<i>Anthaxia sepulchralis</i>	D ₂	CH	0.50 \pm 0.26	90.42 \pm 46.2	62.50 \pm 32.9
<i>Anthaxia similis</i> §	D ₃		0.42 \pm 0.23	5.75 \pm 1.67	1.92 \pm 0.47
<i>Acmaeops septentrionis</i> °	D ₂	CH	1.42 \pm 0.42	4.42 \pm 1.07	1.25 \pm 0.33
<i>Clytus lama</i>	D ₃		0.42 \pm 0.15	3.75 \pm 1.17	1.67 \pm 0.57
<i>Judolia sexmaculata</i>	D ₂		0.50 \pm 0.26	1.83 \pm 0.66	1.17 \pm 0.32
<i>Acmaeops marginatus</i> ° §	D ₂	CH	0.42 \pm 0.34	1.42 \pm 0.50	1.25 \pm 0.62
Total individuals			4.42 \pm 1.15 ^a	336.4 \pm 144.6 ^b	275.25 \pm 93.1 ^b

¹ Red list species in Germany (D₁ = critical, D₂ = endangered, D₃ = vulnerable); EU = species useful to identify forests of international importance to natural conservation; CH = species of potential national conservation concern (S. Barbalat pers. comm.); CH* = species protected by the Swiss law; § = indicator species (Fig. 1). For the literature see Moretti and Barbalat (2004).

b)

Species	Pest ²	Unburnt	Burnt margin	Burnt center
<i>Agrilus biguttatus</i>	2		0.08 \pm 0.08	
<i>Agrilus sulcicollis</i>	1		0.08 \pm 0.08	
<i>Phaenops cyanea</i>	3		0.08 \pm 0.08	
<i>Plagionotus arcuatus</i>	1		0.08 \pm 0.08	
<i>Arhopalus rusticus</i> §	1		0.08 \pm 0.08	1.00 \pm 0.75
<i>Phymatodes testaceus</i>	1		0.08 \pm 0.08	0.17 \pm 0.11
<i>Agrilus angustulus</i>	1			0.17 \pm 0.11
<i>Agrilus viridis</i>	1			0.08 \pm 0.08
<i>Molorchus minor</i>	1	1.00 \pm 0.42	3.58 \pm 1.05	1.58 \pm 0.23
<i>Tetropium castaneum</i>	2	0.33 \pm 0.19	0.83 \pm 0.47	1.25 \pm 0.75
<i>Clytus arietis</i> §	1	0.17 \pm 0.11	0.83 \pm 0.34	0.67 \pm 0.14
<i>Callidium violaceum</i>	1	0.08 \pm 0.08	0.33 \pm 0.14	0.08 \pm 0.08
<i>Tetropium gabrieli</i>	2	0.17 \pm 0.16	0.17 \pm 0.11	0.25 \pm 0.18
Total individuals		1.66 \pm 0.41 ^a	6.25 \pm 1.80 ^b	5.25 \pm 1.52 ^b

² Category of economic impact: 1 low; 2 moderate; 3 important (Schwenke 1974, Lieutier et al. 2004); § = indicator species in our analyses (Fig. 1).