

Table S1. Results of ANOVA exploring the effects of treatment (control and wildfire plume exposure), leaf litter type (alder, oak and eucalypt) and their interaction, on total and microbial decomposition (%), aquatic hyphomycete sporulation rate (conidia d⁻¹ g⁻¹) and species richness (number of species), inorganic mass (g m⁻²), and macroinvertebrate, detritivore, grazer, predator, collector gatherer and filterer abundance (ind. g⁻¹) and taxon richness (number of taxa). df = degrees of freedom, F = F-statistic, p = p-value.

Variable	Factor	df	F	p
Total decomposition	Treatment	1, 80	5.23	0.025
	Leaf type	2, 80	126.98	<0.001
	Treatment×Leaf type	2, 80	7.60	0.001
Microbial decomposition	Treatment	1, 81	5.22	0.025
	Leaf type	2, 81	108.29	<0.001
	Treatment×Leaf type	2, 81	10.44	<0.001
AH sporulation rate	Treatment	1, 81	0.10	0.754
	Leaf type	2, 81	66.48	<0.001
	Treatment×Leaf type	2, 81	0.63	0.535
AH species richness	Treatment	1, 81	0.01	0.923
	Leaf type	2, 81	26.71	<0.001
	Treatment×Leaf type	2, 81	0.39	0.677
Macroinvertebrate abundance	Treatment	1, 79	0.03	0.855
	Leaf type	2, 79	66.37	<0.001
	Treatment×Leaf type	2, 79	7.13	0.001
Macroinvertebrate taxon richness	Treatment	1, 80	3.83	0.054
	Leaf type	2, 80	16.72	<0.001
	Treatment×Leaf type	2, 80	0.23	0.794
Detritivore abundance	Treatment	1, 79	0.15	0.704
	Leaf type	2, 79	29.86	<0.001
	Treatment×Leaf type	2, 79	6.39	0.003
Detritivore taxon richness	Treatment	1, 80	0.02	0.892
	Leaf type	2, 80	12.00	<0.001
	Treatment×Leaf type	2, 80	0.44	0.648
Grazer abundance	Treatment	1, 79	1.01	0.318
	Leaf type	2, 79	31.54	<0.001
	Treatment×Leaf type	2, 79	6.28	0.003
Grazer taxon richness	Treatment	1, 80	1.92	0.169
	Leaf type	2, 80	3.00	0.055
	Treatment×Leaf type	2, 80	2.46	0.091
Predator abundance	Treatment	1, 79	6.18	0.015
	Leaf type	2, 79	42.65	<0.001
	Treatment×Leaf type	2, 79	4.70	0.012
Predator taxon richness	Treatment	1, 80	4.00	0.049
	Leaf type	2, 80	9.69	<0.001
	Treatment×Leaf type	2, 80	0.23	0.794
Collector gatherer abundance	Treatment	1, 79	7.08	0.009
	Leaf type	2, 79	45.35	<0.001
	Treatment×Leaf type	2, 79	6.01	0.004
Collector gatherer taxon richness	Treatment	1, 80	7.37	0.008
	Leaf type	2, 80	30.44	<0.001
	Treatment×Leaf type	2, 80	0.05	0.954
Filterer abundance	Treatment	1, 79	4.91	0.030
	Leaf type	2, 79	3.61	0.032
	Treatment×Leaf type	2, 79	1.28	0.285
Filterer taxon richness	Treatment	1, 80	0.91	0.344
	Leaf type	2, 80	0.65	0.525
	Treatment×Leaf type	2, 80	0.43	0.653

Table S2. Aquatic hyphomycete species found in each treatment, leaf litter type and stream (conidia d⁻¹ g⁻¹; mean ± SE). Bold type represents characteristic species of a stream and ‡ represents characteristic species of a leaf type. There were no characteristic species of treatment.

Stream		Stream 1				
Leaf type		Alder		Oak		Eucalypt
Treatment	Control	Wildfire plume exposure	Control	Wildfire plume exposure	Control	Wildfire plume exposure
<i>Alatospora acuminata</i>	7642.34 ± 7404.63‡		206.28 ± 132.69	405.49 ± 405.49	126.29 ± 96.64	32.94 ± 32.94
<i>Alatospora pulchella</i>	8889.58 ± 3737.68‡	6580.54 ± 2151.96‡	1841.05 ± 931.78	3938.42 ± 2520.77	1097.27 ± 1032.33	151.03 ± 69.62
<i>Angillospora filiformis</i>	16668.44 ± 3003.62‡	20796.77 ± 7227.91‡	4967.69 ± 2167.28	5896.01 ± 4847.88	4056.85 ± 2554.20	2429.25 ± 1750.58
<i>Angillospora longissima</i>	201.70 ± 201.70‡					66.25 ± 66.25
<i>Clavariopsis aquatica</i>	11470.78 ± 7024.01‡	13897.77 ± 6392.83‡	1478.14 ± 778.60	3808.32 ± 1331.82	136.21 ± 136.21	3411.75 ± 3370.72
<i>Clavatospora longibranchiata</i>	2421.05 ± 1354.42‡	818.99 ± 441.18‡	519.55 ± 519.55	125.46 ± 125.46		
<i>Culicidospora aquatica</i>	296.37 ± 192.14‡	241.59 ± 241.59‡				
<i>Flagelospora curvula</i>	19155.66 ± 16050.45‡	7483.13 ± 3454.77‡	2114.38 ± 1305.33	713.64 ± 335.32	1301.37 ± 609.65	934.26 ± 484.26
<i>Geniculospora inflata</i>			132.90 ± 81.45		24.95 ± 24.95	
<i>Gm/Ma</i>						
<i>Heliscella stellata</i>						
<i>Heliscus tentaculus</i>						
<i>Hymenoscyphus tetraccladius</i>	81030.25 ± 66881.24‡	44050.00 ± 17857.99‡	5149.89 ± 1601.66	7146.31 ± 5907.99	1348.86 ± 769.96	1411.69 ± 491.43
<i>Lemmoniera aquatica</i>						
<i>Lemmoniera terrestris</i>						
<i>Lunulospora curvula</i>	4228.30 ± 1405.23‡	2837.44 ± 1268.47‡	1291.88 ± 571.20	1156.08 ± 721.65	1381.18 ± 905.37	1946.18 ± 1438.37
<i>Mycofalcella calcarata</i>		85.24 ± 85.24				
<i>Neonectria lugdunensis</i>	2189.20 ± 1707.24‡	7347.73 ± 3497.51‡	2726.61 ± 1558.68	1154.82 ± 506.96	6745.28 ± 5796.45‡	5676.62 ± 2363.96‡
<i>Taeniospora gracilis</i>						
<i>Tetrachaetum elegans</i>	15953.14 ± 10624.78‡	32500.20 ± 23832.20‡	3738.76 ± 991.22	5441.16 ± 2885.30	1132.34 ± 644.07	3947.73 ± 3263.27
<i>Tetraccladium marchalianum</i>	649.66 ± 304.90	722.96 ± 482.73	696.87 ± 511.13		52.26 ± 52.26	
<i>Tricladium angulatum</i>						
<i>Tricladium chaetocladium</i>	1101.41 ± 562.17‡	6764.47 ± 4917.42‡	3384.47 ± 1236.76	12098.41 ± 9006.57	2143.53 ± 1670.62	2857.62 ± 2600.75
<i>Tricladium patulum</i>						

Table S2. Cont.

Stream	Stream 2					
Leaf type	Alder		Oak		Eucalypt	
Treatment	Control	Wildfire plume exposure	Control	Wildfire plume exposure	Control	Wildfire plume exposure
<i>Alatospora acuminata</i>	18519.04 ± 6639.85†	10166.16 ± 5166.34†	3825.73 ± 3591.60	429.59 ± 205.00	144.77 ± 144.77	450.44 ± 450.44
<i>Alatospora pulchella</i>	11535.52 ± 4316.62†	5177.91 ± 1268.05†	1581.77 ± 1341.98	293.70 ± 135.34	141.29 ± 110.72	421.94 ± 183.40
<i>Angillospora filiformis</i>	41001.01 ± 13225.61†	16868.95 ± 4634.74†	3027.35 ± 2708.27	1369.47 ± 673.19	976.80 ± 382.18	533.70 ± 230.06
<i>Angillospora longissima</i>	1234.20 ± 561.39†	181.40 ± 181.40†				32.17 ± 32.17
<i>Clavariopsis aquatica</i>	9229.84 ± 4923.99†	20497.48 ± 11540.62†	4488.97 ± 4085.85	4714.83 ± 2141.20	53.89 ± 53.89	85.64 ± 35.59
<i>Clavatospora longibranchiata</i>						
<i>Culicidospora aquatica</i>	470.65 ± 470.65†					
<i>Flagelospora curvula</i>	32452.63 ± 9585.47†	15005.50 ± 3773.30†	3924.85 ± 2143.04	1357.22 ± 210.57	587.34 ± 265.91	1635.63 ± 718.78
<i>Geniculospora inflata</i>	26003.90 ± 10156.73†	32093.98 ± 7182.23†	5468.45 ± 3647.99	3779.91 ± 1674.41	1961.39 ± 190.50	3392.69 ± 976.02
<i>Gm/Ma</i>			78.15 ± 78.15		30.17 ± 30.17	107.74 ± 76.37
<i>Heliscella stellata</i>	86.70 ± 86.70†	377.88 ± 377.88†	66.53 ± 66.53	71.75 ± 71.75	57.91 ± 57.91	
<i>Heliscus tentaculus</i>						
<i>Hymenoscyphus tetraccladius</i>	104009.30 ± 30430.30†	92870.23 ± 17434.17†	13727.60 ± 7000.57	6436.32 ± 2954.62	2696.15 ± 649.70	4356.74 ± 1801.88
<i>Lemmoniera aquatica</i>						
<i>Lemmoniera terrestris</i>						
<i>Lunulospora curvula</i>	1720.31 ± 818.41†	6238.79 ± 3029.88†	938.44 ± 654.68	395.90 ± 395.90		386.44 ± 347.21
<i>Mycofalcella calcarata</i>						
<i>Neonectria lugdunensis</i>	4530.72 ± 2259.80†	4710.98 ± 1423.40†	2692.38 ± 1358.93	1369.94 ± 471.54	4791.07 ± 2438.40†	7998.46 ± 3926.04†
<i>Taeniospora gracilis</i>	235.32 ± 235.32	799.15 ± 363.16	239.71 ± 169.28	213.05 ± 213.05		
<i>Tetrachaetum elegans</i>	32278.84 ± 15294.49†	16084.73 ± 3923.93†	3281.81 ± 2862.08	4423.34 ± 2704.37	1078.88 ± 283.62	932.49 ± 438.10
<i>Tetraccladium marchalianum</i>						
<i>Tricladium angulatum</i>						
<i>Tricladium chaetocladium</i>	14873.84 ± 5442.68†	8268.19 ± 4276.24†	7885.78 ± 7123.77	5353.00 ± 2702.80	262.72 ± 222.62	257.39 ± 257.39
<i>Tricladium patulum</i>						

Table S2. Cont.

Stream	Stream 3					
Leaf type	Alder		Oak		Eucalypt	
Treatment	Control	Wildfire plume exposure	Control	Wildfire plume exposure	Control	Wildfire plume exposure
<i>Alatospora acuminata</i>	13598.57 ± 4501.40†	9760.85 ± 5674.16†	2202.47 ± 1767.98	560.38 ± 260.14	221.06 ± 104.09	592.13 ± 314.02
<i>Alatospora pulchella</i>	5722.24 ± 2137.03†	5839.05 ± 3264.86†	969.30 ± 444.28	237.57 ± 165.19	467.10 ± 238.78	672.23 ± 369.87
<i>Angillospora filiformis</i>	99784.96 ± 21602.20†	30558.31 ± 6961.42†	1848.00 ± 612.67	1570.07 ± 351.13	2881.82 ± 1323.07	3566.46 ± 2204.92
<i>Angillospora longissima</i>	5005.82 ± 1517.15†	3105.97 ± 507.30†	333.39 ± 147.27	169.37 ± 106.54	227.95 ± 93.61	486.14 ± 197.96
<i>Clavariopsis aquatica</i>	21003.10 ± 5808.97†	18270.04 ± 6860.77†	224.30 ± 224.30	1705.77 ± 888.79	55.35 ± 55.35	733.10 ± 467.74
<i>Clavatospora longibranchiata</i>					35.23 ± 35.23	
<i>Culicidospora aquatica</i>	1282.22 ± 844.97†	174.05 ± 174.05†		207.76 ± 84.82	55.35 ± 55.35	
<i>Flagelospora curvula</i>	59620.60 ± 37175.12†	13433.64 ± 5624.28†	1066.21 ± 350.60	238.55 ± 101.38	1278.79 ± 758.66	1298.51 ± 686.52
<i>Geniculospora inflata</i>	443.70 ± 443.70†					
<i>Gm/Ma</i>			230.58 ± 230.58	208.50 ± 208.50	85.63 ± 53.79	108.84 ± 80.25
<i>Heliscella stellata</i>		936.94 ± 717.01†				28.84 ± 28.84
<i>Heliscus tentaculus</i>						26.15 ± 26.15
<i>Hymenoscyphus tetraccladius</i>	91175.74 ± 24422.09†	91308.60 ± 46906.00†	4471.51 ± 1580.93	2456.02 ± 785.02	4517.84 ± 1182.32	4140.82 ± 2245.26
<i>Lemmoniera aquatica</i>	628.89 ± 628.89				74.46 ± 74.46	248.05 ± 248.05
<i>Lemmoniera terrestris</i>		278.81 ± 278.81			223.38 ± 223.38	300.36 ± 240.37
<i>Lunulospora curvula</i>	16409.82 ± 5683.04†	2709.43 ± 876.33†		68.97 ± 68.97	513.60 ± 286.64	565.88 ± 403.30
<i>Mycofalcella calcarata</i>						
<i>Neonectria lugdunensis</i>	1543.45 ± 675.81†	11471.46 ± 4391.29†	1891.48 ± 519.49	2635.53 ± 1375.72	14538.66 ± 4400.82†	11680.67 ± 5093.79†
<i>Taeniospora gracilis</i>			642.55 ± 521.79		50.40 ± 50.40	
<i>Tetrachaetum elegans</i>	22308.40 ± 6364.95†	11717.57 ± 4459.28†	256.16 ± 107.83	500.07 ± 258.29	590.99 ± 423.48	2328.62 ± 1842.00
<i>Tetraccladium marchalianum</i>		1851.08 ± 1851.08				
<i>Tricladium angulatum</i>	346.38 ± 346.38	544.27 ± 367.61	104.54 ± 104.54			
<i>Tricladium chaetocladium</i>	27492.68 ± 8118.83†	18107.89 ± 5276.93†	602.31 ± 436.33	2592.65 ± 1242.93	628.28 ± 267.38	1959.58 ± 1505.82
<i>Tricladium patulum</i>				84.14 ± 84.14		

Table S3. Macroinvertebrate taxa found in each treatment and stream (individual g⁻¹; mean ± SE). Bold type represents characteristic species of a stream, † represents characteristic species of a leaf type and * represents characteristic species of treatment. FFD = Functional feeding group. WPE = Wildfire plume exposure

Stream			Stream 1					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
sC. Acari		Predator	0.96 ± 0.52†	0.20 ± 0.20†	0.07 ± 0.07	0.31 ± 0.24	0.07 ± 0.07	0.24 ± 0.18
<i>Acentrella</i>	O. Ephemeroptera	Grazer	0.77 ± 0.77					0.30 ± 0.30
<i>Agraylea</i>	O. Trichoptera	Grazer				0.06 ± 0.06		
<i>Amphinemura</i>	O. Plecoptera	Shredder	0.17 ± 0.17					
<i>Atherix</i>	O. Diptera	Predator	1.74 ± 1.74†	1.37 ± 1.37†	0.40 ± 0.40	0.63 ± 0.63	0.19 ± 0.19	0.18 ± 0.18
<i>Baetis</i>	O. Ephemeroptera	Grazer-Gatherer	1.46 ± 1.46†	1.10 ± 1.10*†	0.40 ± 0.40†	0.70 ± 0.70*†		0.43 ± 0.43*
sF. Ceratopogoninae	O. Diptera	Predator-Gatherer	0.10 ± 0.10†	0.09 ± 0.09†	0.07 ± 0.07†	0.31 ± 0.31†		
sF. Chironominae	O. Diptera	Gatherer	3.14 ± 3.14†	5.12 ± 5.12†	5.22 ± 5.22†	4.67 ± 4.67†	0.39 ± 0.39	0.98 ± 0.98
<i>Chloroperla</i>	O. Plecoptera	Predator	0.15 ± 0.15*		0.13 ± 0.13*		0.22 ± 0.22*	0.06 ± 0.06
sF. Clinocerinae	O. Diptera	Predator	1.02 ± 1.02†	0.78 ± 0.78†	0.84 ± 0.84†	1.36 ± 1.36†	0.57 ± 0.57	0.25 ± 0.25
<i>Cordulegaster</i>	O. Odonata	Predator						
<i>Crunoecia</i>	O. Trichoptera	Shredder						
F. Curculionidae	O. Coleoptera	Shredder						
sF. Dasyheleinae	O. Diptera	Gatherer			0.14 ± 0.14	0.06 ± 0.06		
<i>Dixa</i>	O. Diptera	Filterer		0.10 ± 0.10†				
<i>Dixella</i>	O. Diptera	Gatherer-Filterer		0.20 ± 0.20	0.26 ± 0.26			
<i>Dryops</i>	O. Coleoptera	Grazer-Shredder						
<i>Dupophilus</i>	O. Coleoptera	Grazer						0.06 ± 0.06
<i>Ecdyonurus</i>	O. Ephemeroptera	Grazer-Gatherer				0.06 ± 0.06		
<i>Echinogammarus</i>	O. Amphipoda	Shredder	1.37 ± 1.37†	1.23 ± 1.23†	0.33 ± 0.33	1.00 ± 1.00	0.32 ± 0.32	0.54 ± 0.54
<i>Elmis</i>	O. Coleoptera	Grazer	0.26 ± 0.26			0.06 ± 0.06		0.06 ± 0.06
<i>Ephemerella</i>	O. Ephemeroptera	Grazer-Gatherer	0.54 ± 0.54†		0.07 ± 0.07	0.06 ± 0.06		
<i>Ephemerella</i>	O. Ephemeroptera	Filterer						
<i>Ephoron</i>	O. Ephemeroptera	Filterer				0.06 ± 0.06		

Table S3. Cont.

Stream			Stream 1					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
<i>Erpobdella</i>	Arhynchobdellida	Predator						
<i>Esolus</i>	Coleoptera	Grazer	0.32 ± 0.32				0.07 ± 0.07	0.12 ± 0.12
<i>Glossiphonia</i>	Rhynchobdellida	Predator						
<i>Habroleptoides</i>	Ephemeroptera	Gatherer			0.60 ± 0.60†	0.32 ± 0.32†	0.14 ± 0.14	
<i>Habrophlebia</i>	Ephemeroptera	Gatherer		0.09 ± 0.09		0.06 ± 0.06		
<i>Haliphus</i>	Coleoptera	Grazer		0.10 ± 0.10		0.06 ± 0.06		
<i>Heptagenia</i>	Ephemeroptera	Grazer-Shredder						
<i>Hydraena</i>	Coleoptera	Grazer	0.96 ± 0.96†		0.31 ± 0.31†	0.32 ± 0.32†	0.07 ± 0.07	0.24 ± 0.24
<i>Hydrocyphon</i>	Coleoptera	Gatherer	0.70 ± 0.70	0.28 ± 0.28	0.26 ± 0.26	0.19 ± 0.19		
<i>Hydroporus</i>	Coleoptera	Predator						
<i>Hydropsyche</i>	Trichoptera	Filterer	2.44 ± 2.44	0.38 ± 0.38	0.07 ± 0.07	0.32 ± 0.32		0.12 ± 0.12
<i>Hyporhyacophyla</i>	Trichoptera	Predator	0.15 ± 0.15	0.40 ± 0.40				0.06 ± 0.06
<i>Lepidostoma</i>	Trichoptera	Shredder			0.07 ± 0.07†			
<i>Leuctra</i>	Plecoptera	Shredder	0.78 ± 0.78	0.29 ± 0.29	1.07 ± 1.07†	2.23 ± 2.23†	0.46 ± 0.46	0.06 ± 0.06
<i>Limnephilinae</i>	Trichoptera	Shredder	0.10 ± 0.10†					
<i>Limnius</i>	Coleoptera	Grazer			0.06 ± 0.06			
F. Limoniidae	Diptera	Shredder			0.18 ± 0.18	0.24 ± 0.24		
<i>Nemoura</i>	Plecoptera	Shredder	1.54 ± 1.54		0.62 ± 0.62†	4.69 ± 4.69†		0.06 ± 0.06
<i>Odontocerum</i>	Trichoptera	Shredder-Predator		0.09 ± 0.09				
C. Oligochaeta		Gatherer		0.30 ± 0.30	0.26 ± 0.26	0.57 ± 0.57	0.13 ± 0.13	0.06 ± 0.06
sF. Orthocladiinae	Diptera	Grazer-Gatherer	39.02 ± 39.02†	20.84 ± 20.84†	19.76 ± 19.76	21.82 ± 21.82	6.66 ± 6.66	12.00 ± 12.00
Oulimnius	Coleoptera	Grazer				0.06 ± 0.06		
F. Perlodidae	Plecoptera	Predator		0.20 ± 0.20				0.12 ± 0.12
<i>Philopotamus</i>	Trichoptera	Filterer				0.06 ± 0.06	0.06 ± 0.06	
<i>Pisidium</i>	Sphaeriida	Filterer		0.19 ± 0.19				0.49 ± 0.49

Table S3. Cont.

Stream			Stream 1					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
<i>Plectrocnemia</i>	Trichoptera	Predator						
<i>Protonemura</i>	Plecoptera	Shredder	15.81 ± 15.81†	12.15 ± 12.15†	6.54 ± 6.54	3.17 ± 3.17	3.41 ± 3.41	5.33 ± 5.33
F. Rhagionidae	Diptera	Predator						
<i>Rhyacophila</i>	Trichoptera	Predator						
<i>Sericostoma</i>	Trichoptera	Shredder	0.54 ± 0.54†					0.06 ± 0.06
F. Simuliidae	Diptera	Filterer	22.35 ± 22.35	12.73 ± 12.73	2.24 ± 2.24	4.59 ± 4.59	2.77 ± 2.77	9.98 ± 9.98
<i>Somatochlora</i>	Odonata	Predator						
sF. Tanypodinae	Diptera	Predator	3.81 ± 3.81†	2.60 ± 2.60†	10.19 ± 10.19†	8.84 ± 8.84†	1.47 ± 1.47	1.41 ± 1.41
F. Tipulidae	Diptera	Shredder			0.14 ± 0.14	0.06 ± 0.06		
C. Turbellaria		Predator	0.11 ± 0.11	0.10 ± 0.10				
<i>Wormaldia</i>	Trichoptera	Filterer						0.06 ± 0.06
<i>Xanthoperla</i>	Plecoptera	Predator						

Table S3. Cont.

Stream			Stream 2					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
sC. Acari		Predator	0.37 ± 0.37†	0.73 ± 0.54†	0.15 ± 0.15	0.31 ± 0.24	0.20 ± 0.14	0.18 ± 0.18
<i>Acentrella</i>	Ephemeroptera	Grazer	1.55 ± 1.55				0.18 ± 0.18	1.16 ± 1.16
<i>Agraylea</i>	Trichoptera	Grazer						
<i>Amphinemura</i>	Plecoptera	Shredder						
<i>Atherix</i>	Diptera	Predator		0.48 ± 0.48†	0.33 ± 0.33	0.74 ± 0.74	0.26 ± 0.26	0.06 ± 0.06
<i>Baetis</i>	Ephemeroptera	Grazer-Gatherer	1.40 ± 1.40†	6.84 ± 6.84†*	0.27 ± 0.27†	3.58 ± 3.58†*	0.40 ± 0.40	0.30 ± 0.30*
sF. Ceratopogoninae	Diptera	Predator-Gatherer	0.29 ± 0.29†	0.11 ± 0.11†	0.27 ± 0.27†	0.86 ± 0.86†	0.06 ± 0.06	0.06 ± 0.06
sF. Chironominae	Diptera	Gatherer	1.73 ± 1.73†	1.01 ± 1.01†	5.12 ± 5.12†	4.87 ± 4.87†	0.52 ± 0.52	0.39 ± 0.39
<i>Chloroperla</i>	Plecoptera	Predator	3.90 ± 3.90*	0.69 ± 0.69	1.61 ± 1.61*	0.68 ± 0.68	0.13 ± 0.13*	0.20 ± 0.20
sF. Clinocerinae	Diptera	Predator	0.29 ± 0.29†	0.86 ± 0.86†	1.01 ± 1.01†	1.36 ± 1.36†	0.25 ± 0.25	0.13 ± 0.13
<i>Cordulegaster</i>	Odonata	Predator						
<i>Crunoecia</i>	Trichoptera	Shredder						
F. Curculionidae	Coleoptera	Shredder	0.37 ± 0.37					
sF. Dasyheleinae	Diptera	Gatherer	0.37 ± 0.37		0.06 ± 0.06			
<i>Dixa</i>	Diptera	Filterer	3.35 ± 3.35†	0.57 ± 0.57†			0.27 ± 0.27	0.18 ± 0.18
<i>Dixella</i>	Diptera	Gatherer-Filterer	5.58 ± 5.58		0.13 ± 0.13	0.25 ± 0.25		
<i>Dryops</i>	Coleoptera	Grazer-Shredder					0.07 ± 0.07	
<i>Dupophilus</i>	Coleoptera	Grazer						
<i>Ecdyonurus</i>	Ephemeroptera	Grazer-Gatherer						
<i>Echinogammarus</i>	Amphipoda	Shredder	21.53 ± 21.53†	5.44 ± 5.44†	0.94 ± 0.94	3.69 ± 3.69	3.34 ± 3.34	2.60 ± 2.60
<i>Elmis</i>	Coleoptera	Grazer		0.21 ± 0.21				
<i>Ephemerella</i>	Ephemeroptera	Grazer-Gatherer	2.50 ± 2.50†	0.60 ± 0.60†		0.24 ± 0.24		
<i>Ephemerella</i>	Ephemeroptera	Filterer						
<i>Ephoron</i>	Ephemeroptera	Filterer						
<i>Erpobdella</i>	Arhynchobdellida	Predator				0.06 ± 0.06		

Table S3. Cont.

Stream			Stream 2					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
<i>Esolus</i>	Coleoptera	Grazer	1.84 ± 1.84		0.27 ± 0.27	0.12 ± 0.12		
<i>Glossiphonia</i>	Rhynchobdellida	Predator		0.09 ± 0.09				
<i>Habroleptoides</i>	Ephemeroptera	Gatherer			0.21 ± 0.21†	0.25 ± 0.25†		0.07 ± 0.07
<i>Habrophlebia</i>	Ephemeroptera	Gatherer		0.09 ± 0.09	0.14 ± 0.14	0.06 ± 0.06		
<i>Haliphus</i>	Coleoptera	Grazer	0.74 ± 0.74	0.11 ± 0.11	0.13 ± 0.13			
<i>Heptagenia</i>	Ephemeroptera	Grazer-Shredder						
<i>Hydraena</i>	Coleoptera	Grazer	1.03 ± 1.03†	0.96 ± 0.96†	0.54 ± 0.54†	0.93 ± 0.93†	0.18 ± 0.18	0.12 ± 0.12
<i>Hydrocyphon</i>	Coleoptera	Gatherer	6.67 ± 6.67	0.41 ± 0.41	1.09 ± 1.09	0.49 ± 0.49	0.33 ± 0.33	0.13 ± 0.13
<i>Hydroporus</i>	Coleoptera	Predator	0.37 ± 0.37	0.11 ± 0.11				
<i>Hydropsyche</i>	Trichoptera	Filterer				0.12 ± 0.12		
<i>Hyporhyacophyla</i>	Trichoptera	Predator						
<i>Lepidostoma</i>	Trichoptera	Shredder			0.07 ± 0.07†	0.18 ± 0.18†		
<i>Leuctra</i>	Plecoptera	Shredder	0.57 ± 0.57	0.46 ± 0.46	0.49 ± 0.49†	0.87 ± 0.87†	0.26 ± 0.26	0.19 ± 0.19
<i>Limnephilinae</i>	Trichoptera	Shredder	2.13 ± 2.13†	0.34 ± 0.34†		0.12 ± 0.12	0.07 ± 0.07	
<i>Limnius</i>	Coleoptera	Grazer						
F. Limoniidae	Diptera	Shredder						
<i>Nemoura</i>	Plecoptera	Shredder	0.29 ± 0.29	0.59 ± 0.59	1.42 ± 1.42†	0.63 ± 0.63†		
<i>Odontocerum</i>	Trichoptera	Shredder-Predator						
C. Oligochaeta		Gatherer	0.86 ± 0.86	0.20 ± 0.20	0.13 ± 0.13	0.06 ± 0.06	0.20 ± 0.20	0.13 ± 0.13
sF. Orthocladiinae	Diptera	Grazer-Gatherer	73.65 ± 73.65†	33.71 ± 33.71†	18.21 ± 18.21	32.13 ± 32.13	9.55 ± 9.55	9.84 ± 9.84
Oulimnius	Coleoptera	Grazer						
F. Perlodidae	Plecoptera	Predator	0.57 ± 0.57	0.21 ± 0.21	0.06 ± 0.06	0.37 ± 0.37		
<i>Philopotamus</i>	Trichoptera	Filterer			0.22 ± 0.22	0.25 ± 0.25		0.13 ± 0.13
<i>Pisidium</i>	Sphaeriida	Filterer						
<i>Plectrocnemia</i>	Trichoptera	Predator						0.07 ± 0.07

Table S3. Cont.

Stream			Stream 2					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
<i>Protonemura</i>	Plecoptera	Shredder	15.99 ± 15.99†	11.51 ± 11.51†	2.15 ± 2.15	5.41 ± 5.41	0.77 ± 0.77	1.46 ± 1.46
F. Rhagionidae	Diptera	Predator			0.07 ± 0.07			
<i>Rhyacophila</i>	Trichoptera	Predator					0.06 ± 0.06	
<i>Sericostoma</i>	Trichoptera	Shredder		0.21 ± 0.21†	0.07 ± 0.07			
F. Simuliidae	Diptera	Filterer	7.80 ± 7.80	10.71 ± 10.71	4.26 ± 4.26	13.50 ± 13.50	1.92 ± 1.92	4.05 ± 4.05
<i>Somatochlora</i>	Odonata	Predator				0.06 ± 0.06		
sF. Tanypodinae	Diptera	Predator	12.57 ± 12.57†	3.64 ± 3.64†	4.73 ± 4.73†	8.31 ± 8.31†	0.98 ± 0.98	2.20 ± 2.20
F. Tipulidae	Diptera	Shredder	0.80 ± 0.80†	0.24 ± 0.24†	0.13 ± 0.13			0.06 ± 0.06
C. Turbellaria		Predator		0.44 ± 0.44	0.07 ± 0.07	0.75 ± 0.75	0.18 ± 0.18	
<i>Wormaldia</i>	Trichoptera	Filterer		0.11 ± 0.11				
<i>Xanthoperla</i>	Plecoptera	Predator						

Table S3. Cont.

Stream			Stream 3					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
sC. Acari		Predator	0.18 ± 0.18†	0.44 ± 0.20†	0.06 ± 0.06	0.06 ± 0.06		0.24 ± 0.15
<i>Acentrella</i>	Ephemeroptera	Grazer		0.35 ± 0.35	0.06 ± 0.06	0.06 ± 0.06	0.32 ± 0.32	0.19 ± 0.19
<i>Agraylea</i>	Trichoptera	Grazer						
<i>Amphinemura</i>	Plecoptera	Shredder						
<i>Atherix</i>	Diptera	Predator	1.20 ± 1.20†	2.57 ± 2.57†	0.59 ± 0.59	1.01 ± 1.01	0.37 ± 0.37	0.37 ± 0.37
<i>Baetis</i>	Ephemeroptera	Grazer-Gatherer	2.12 ± 2.12†	1.25 ± 1.25†*	0.06 ± 0.06†	3.47 ± 3.47†*		0.37 ± 0.37*
sF. Ceratopogoninae	Diptera	Predator-Gatherer	1.16 ± 1.16†	0.36 ± 0.36†	1.30 ± 1.30†	0.73 ± 0.73†	0.08 ± 0.08	0.25 ± 0.25
sF. Chironominae	Diptera	Gatherer	9.32 ± 9.32†	5.87 ± 5.87†	11.19 ± 11.19†	11.26 ± 11.26†	1.18 ± 1.18	2.30 ± 2.30
<i>Chloroperla</i>	Plecoptera	Predator	0.09 ± 0.09*	0.09 ± 0.09	0.32 ± 0.32*			
sF. Clinocerinae	Diptera	Predator	0.91 ± 0.91†	1.14 ± 1.14†	0.44 ± 0.44†	0.77 ± 0.77†	0.23 ± 0.23	0.18 ± 0.18
<i>Cordulegaster</i>	Odonata	Predator					0.08 ± 0.08	
<i>Crunoecia</i>	Trichoptera	Shredder						0.06 ± 0.06
F. Curculionidae	Coleoptera	Shredder						
sF. Dasyheleinae	Diptera	Gatherer	0.13 ± 0.13	0.10 ± 0.10	0.07 ± 0.07			
<i>Dixa</i>	Diptera	Filterer	0.09 ± 0.09†	0.36 ± 0.36†				0.06 ± 0.06
<i>Dixella</i>	Diptera	Gatherer-Filterer			0.63 ± 0.63	0.18 ± 0.18		
<i>Dryops</i>	Coleoptera	Grazer-Shredder	0.49 ± 0.49					
<i>Dupophilus</i>	Coleoptera	Grazer						
<i>Ecdyonurus</i>	Ephemeroptera	Grazer-Gatherer	0.13 ± 0.132	0.18 ± 0.18			0.08 ± 0.08	
<i>Echinogammarus</i>	Amphipoda	Shredder	11.37 ± 11.37†	0.57 ± 0.57†	2.11 ± 2.11	3.33 ± 3.33	2.35 ± 2.35	0.37 ± 0.37
<i>Elmis</i>	Coleoptera	Grazer						
<i>Ephemerella</i>	Ephemeroptera	Grazer-Gatherer	0.18 ± 0.18†	0.34 ± 0.34†	0.19 ± 0.19		0.23 ± 0.23	0.06 ± 0.06
<i>Ephemerella</i>	Ephemeroptera	Filterer			0.13 ± 0.13			
<i>Ephoron</i>	Ephemeroptera	Filterer						
<i>Erpobdella</i>	Arhynchobdellida	Predator						

Table S3. Cont.

Stream			Stream 3					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
<i>Esolus</i>	Coleoptera	Grazer		0.08 ± 0.08		0.35 ± 0.35		
<i>Glossiphonia</i>	Rhynchobdellida	Predator						
<i>Habroleptoides</i>	Ephemeroptera	Gatherer		0.10 ± 0.10	0.13 ± 0.13†	0.25 ± 0.25†	0.07 ± 0.07	
<i>Habrophlebia</i>	Ephemeroptera	Gatherer	0.58 ± 0.58	0.08 ± 0.08	0.72 ± 0.72	0.06 ± 0.06		
<i>Haliphus</i>	Coleoptera	Grazer			0.06 ± 0.06			
<i>Heptagenia</i>	Ephemeroptera	Grazer-Shredder			0.13 ± 0.13			0.06 ± 0.06
<i>Hydraena</i>	Coleoptera	Grazer		0.93 ± 0.93†	0.25 ± 0.25†	0.48 ± 0.48†		0.06 ± 0.06
<i>Hydrocyphon</i>	Coleoptera	Gatherer	0.49 ± 0.49	0.16 ± 0.16	0.06 ± 0.06		0.08 ± 0.08	0.06 ± 0.06
<i>Hydroporus</i>	Coleoptera	Predator						
<i>Hydropsyche</i>	Trichoptera	Filterer				0.06 ± 0.06		
<i>Hyporhyacophyla</i>	Trichoptera	Predator						
<i>Lepidostoma</i>	Trichoptera	Shredder	0.09 ± 0.09	0.08 ± 0.08	0.06 ± 0.06†	0.06 ± 0.06†		
<i>Leuctra</i>	Plecoptera	Shredder	1.12 ± 1.12	0.74 ± 0.74	0.90 ± 0.90†	1.50 ± 1.50†	0.23 ± 0.23	0.31 ± 0.31
<i>Limnephilinae</i>	Trichoptera	Shredder	0.49 ± 0.49†		0.06 ± 0.06	0.06 ± 0.06		
<i>Limnius</i>	Coleoptera	Grazer	0.15 ± 0.15			0.06 ± 0.06		0.06 ± 0.06
F. Limoniidae	Diptera	Shredder						0.06 ± 0.06
<i>Nemoura</i>	Plecoptera	Shredder	1.08 ± 1.08	0.08 ± 0.08	0.26 ± 0.26†	0.42 ± 0.42†		0.06 ± 0.06
<i>Odontocerum</i>	Trichoptera	Shredder-Predator	0.15 ± 0.15	0.10 ± 0.10	0.13 ± 0.13	0.06 ± 0.06		
C. Oligochaeta		Gatherer	0.71 ± 0.71	0.28 ± 0.28	0.64 ± 0.64	0.61 ± 0.61		0.25 ± 0.25
sF. Orthocladiinae	Diptera	Grazer-Gatherer	59.79 ± 59.79†	35.16 ± 35.16†	17.67 ± 17.67	33.28 ± 33.28	7.72 ± 7.72	15.63 ± 15.63
Oulimnius	Coleoptera	Grazer						
F. Perlodidae	Plecoptera	Predator				0.12 ± 0.12		0.19 ± 0.19
<i>Philopotamus</i>	Trichoptera	Filterer						
<i>Pisidium</i>	Sphaeriida	Filterer						
<i>Plectrocnemia</i>	Trichoptera	Predator						

Table S3. Cont.

Stream			Stream 3					
Leaf type			Alder		Oak		Eucalypt	
Treatment			Control	WPE	Control	WPE	Control	WPE
Taxon	Order	FFD						
<i>Protonemura</i>	Plecoptera	Shredder	6.66 ± 6.66†	6.28 ± 6.28†	0.97 ± 0.97	11.88 ± 11.88	1.01 ± 1.01	1.73 ± 1.73
F. Rhagionidae	Diptera	Predator						
<i>Rhyacophila</i>	Trichoptera	Predator	0.15 ± 0.15					
<i>Sericostoma</i>	Trichoptera	Shredder	0.34 ± 0.34†	0.27 ± 0.27†			0.08 ± 0.08	
F. Simuliidae	Diptera	Filterer	11.02 ± 11.02	21.47 ± 21.47	0.83 ± 0.83	14.83 ± 14.83	2.01 ± 2.01	16.72 ± 16.72
<i>Somatochlora</i>	Odonata	Predator						
sF. Tanypodinae	Diptera	Predator	11.69 ± 11.69†	5.59 ± 5.59†	8.03 ± 8.03†	9.51 ± 9.51†	3.25 ± 3.25	2.54 ± 2.54
F. Tipulidae	Diptera	Shredder	0.67 ± 0.67†	0.38 ± 0.38†	0.38 ± 0.38	0.23 ± 0.23		0.12 ± 0.12
C. Turbellaria		Predator	2.04 ± 2.04	0.45 ± 0.45	0.19 ± 0.19	0.85 ± 0.85	0.16 ± 0.16	0.31 ± 0.31
<i>Wormaldia</i>	Trichoptera	Filterer		0.08 ± 0.08				
<i>Xanthoperla</i>	Plecoptera	Predator				0.06 ± 0.06		

Fig. S1. Location of the three studied sites in Agüera stream headwaters, North Spain. Highlighted in different colours the leaf-litter collection areas.

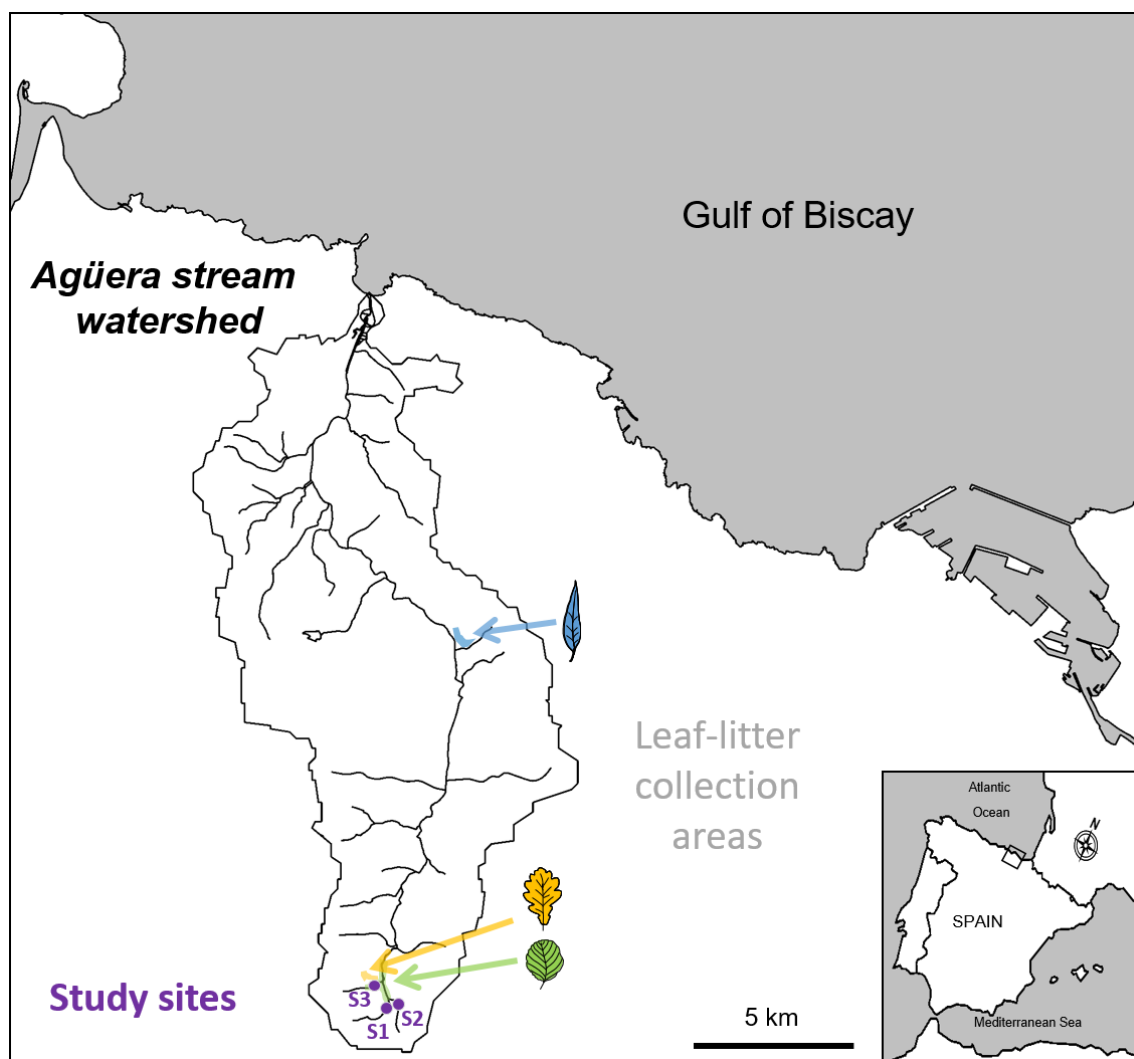


Fig. S2. Non-metric multidimensional scaling (NMDS) ordination of aquatic hyphomycete assemblage in the three leaf types (alder, oak and eucalypt), the two treatments (control and wildfire plume exposed) and the three streams. Symbol colour represents leaf type (green for alder, red for oak and blue for eucalypt), symbol filling represents treatment (full circles for control leaves and empty circles for wildfire plume exposed leaves) and symbol form represents stream (circles for stream 1, triangles for stream 2 and squares for stream 3). Stress = 0.1624.

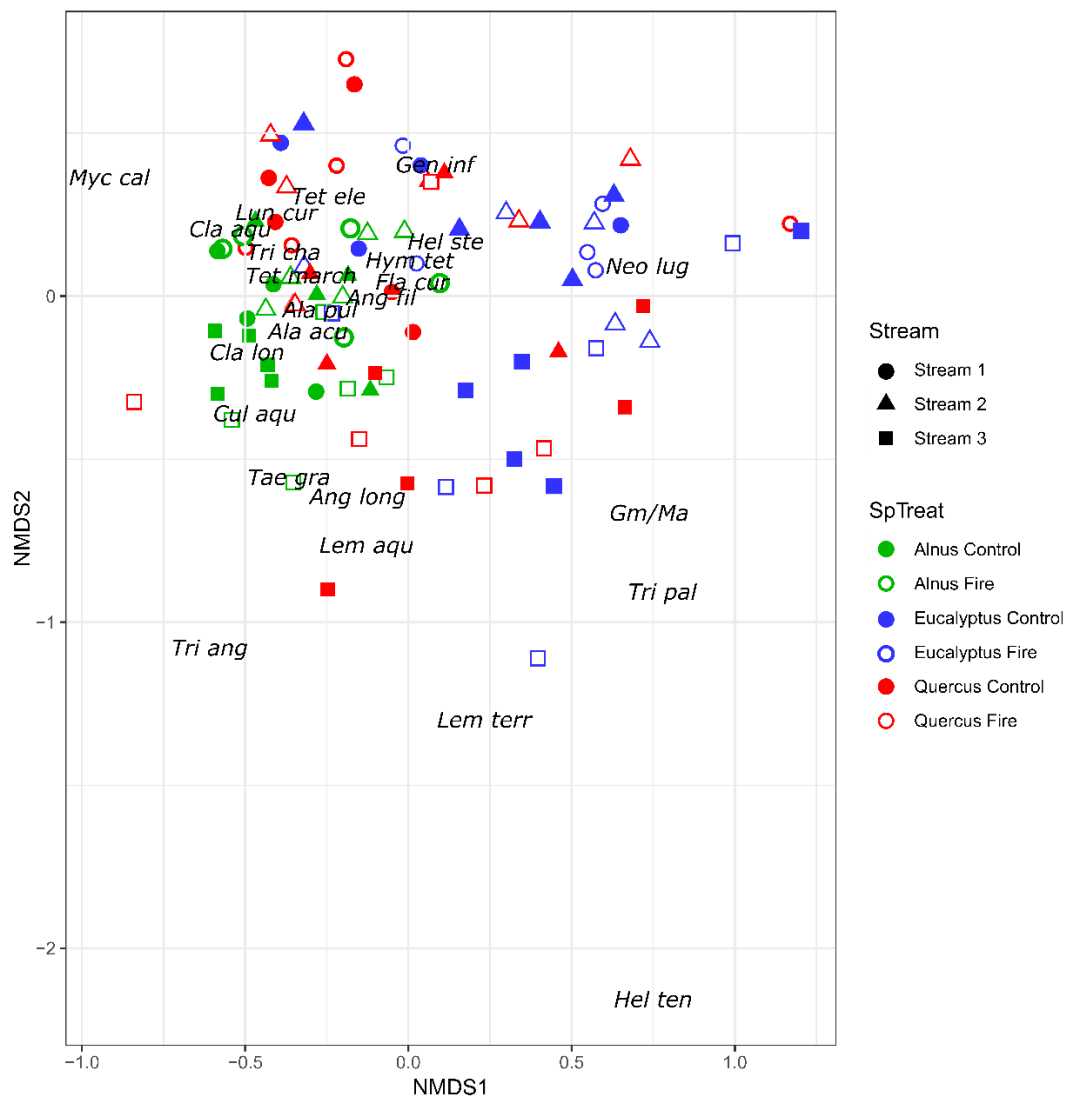


Fig. S3. Non-metric multidimensional scaling (NMDS) ordination of macroinvertebrate assemblage in the three leaf types (alder, oak and eucalypt), the two treatments (control and wildfire plume exposed) and the three streams. Symbol colour represents leaf type (green for alder, red for oak and blue for eucalypt), symbol filling represents treatment (full circles for control leaves and empty circles for wildfire plume exposed leaves) and symbol form represents stream (circles for stream 1, triangles for stream 2 and squares for stream 3). Stress = 0.1696.

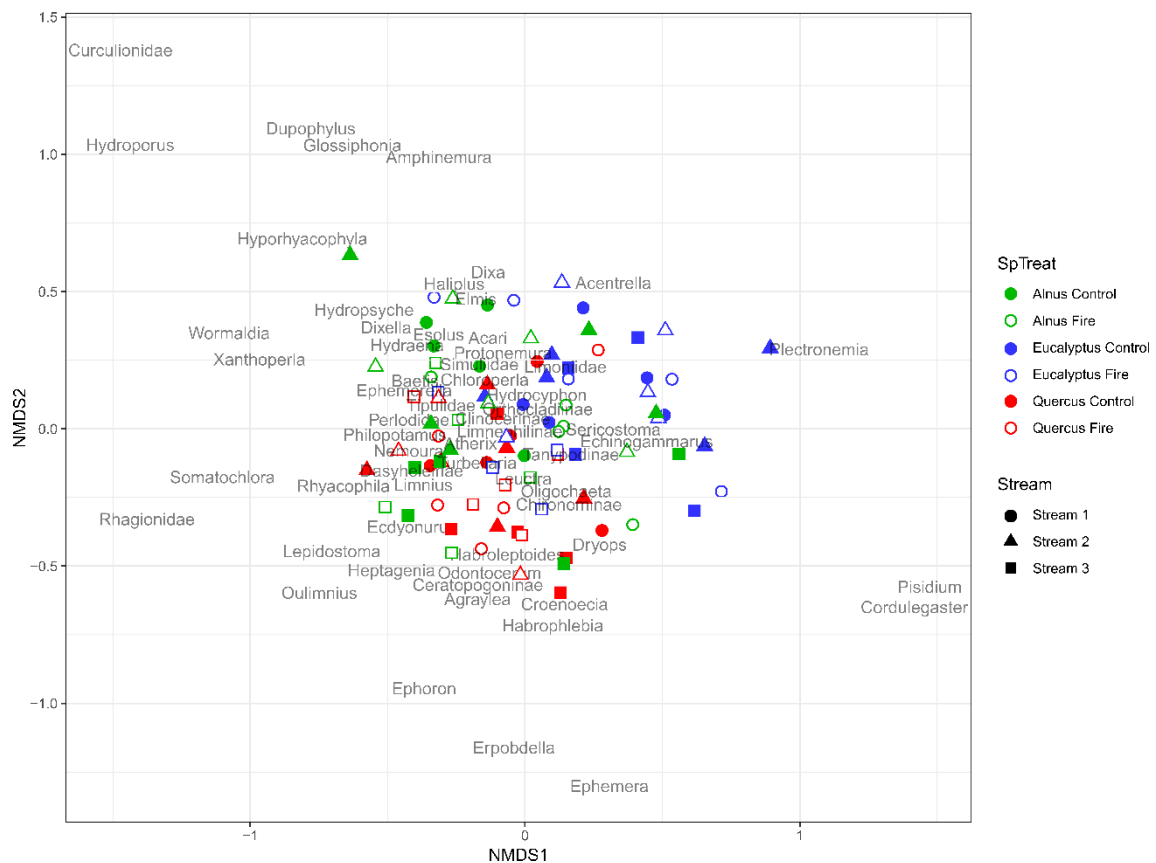


Fig. S4. Non-metric multidimensional scaling (NMDS) ordination of detritivore assemblage in the three leaf types (alder, oak and eucalypt), the two treatments (control and wildfire plume exposed) and the three streams. Symbol colour represents leaf type (green for alder, red for oak and blue for eucalypt), symbol filling represents treatment (full circles for control leaves and empty circles for wildfire plume exposed leaves) and symbol form represents stream (circles for stream 1, triangles for stream 2 and squares for stream 3). Stress = 0.1459.

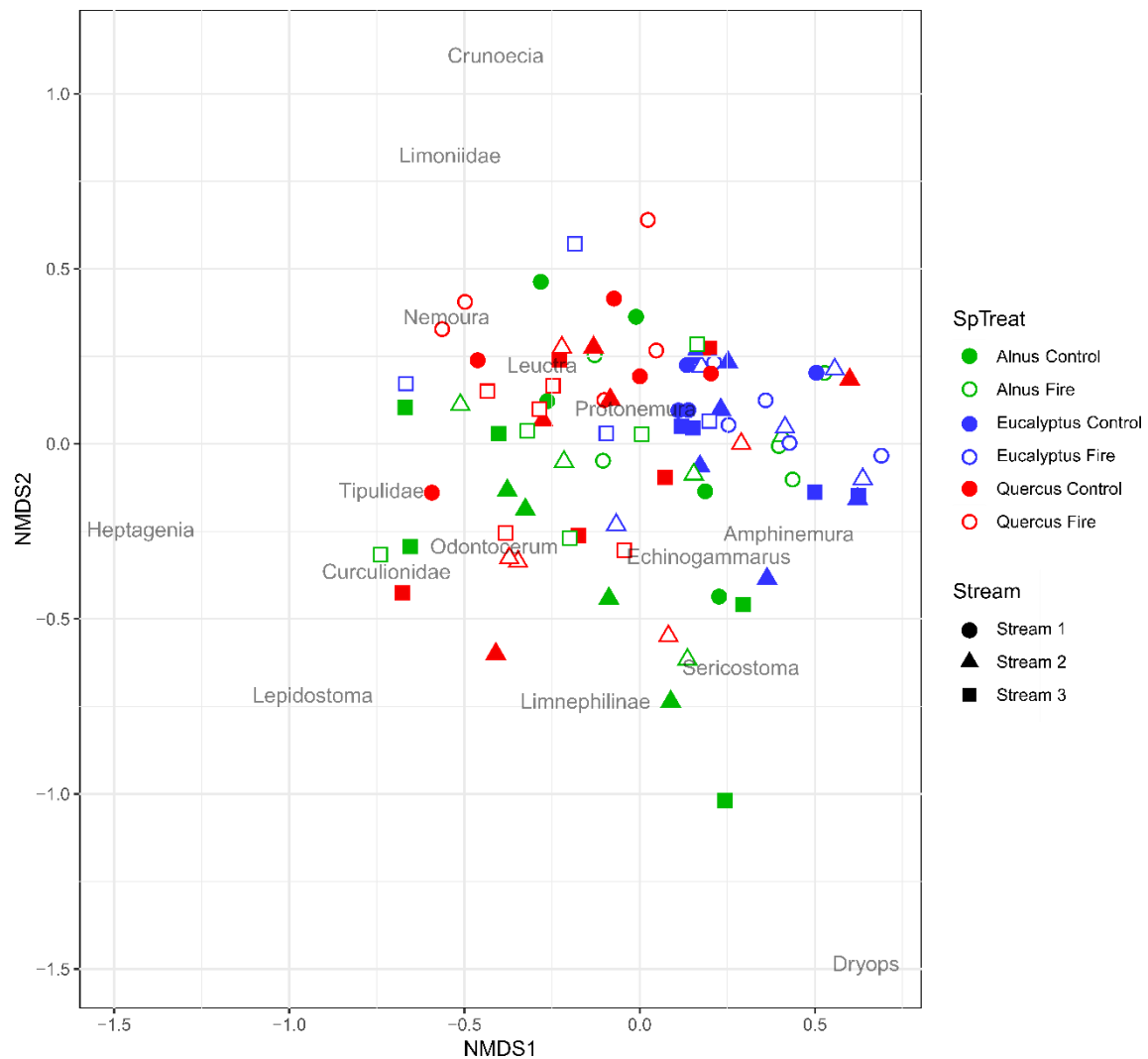


Fig. S5. Non-metric multidimensional scaling (NMDS) ordination of grazer assemblage in the three leaf types (alder, oak and eucalypt), the two treatments (control and wildfire plume exposed) and the three streams. Symbol colour represents leaf type (green for alder, red for oak and blue for eucalypt), symbol filling represents treatment (full circles for control leaves and empty circles for wildfire plume exposed leaves) and symbol form represents stream (circles for stream 1, triangles for stream 2 and squares for stream 3). Stress = 0.1286.

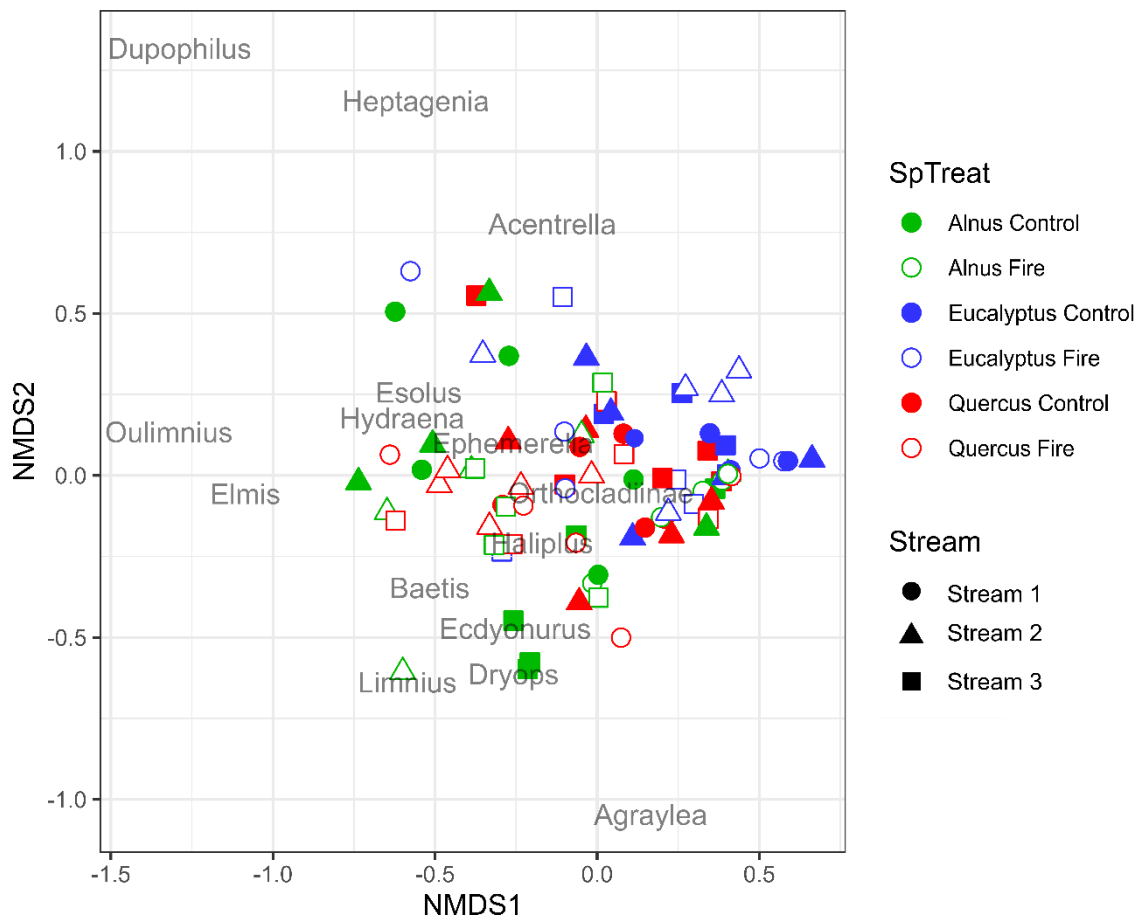


Fig. S7. Non-metric multidimensional scaling (NMDS) ordination of collector gatherer assemblage in the three leaf types (alder, oak and eucalypt), the two treatments (control and wildfire plume exposed) and the three streams. Symbol colour represents leaf type (green for alder, red for oak and blue for eucalypt), symbol filling represents treatment (full circles for control leaves and empty circles for wildfire plume exposed leaves) and symbol form represents stream (circles for stream 1, triangles for stream 2 and squares for stream 3). Stress = 0.1403.

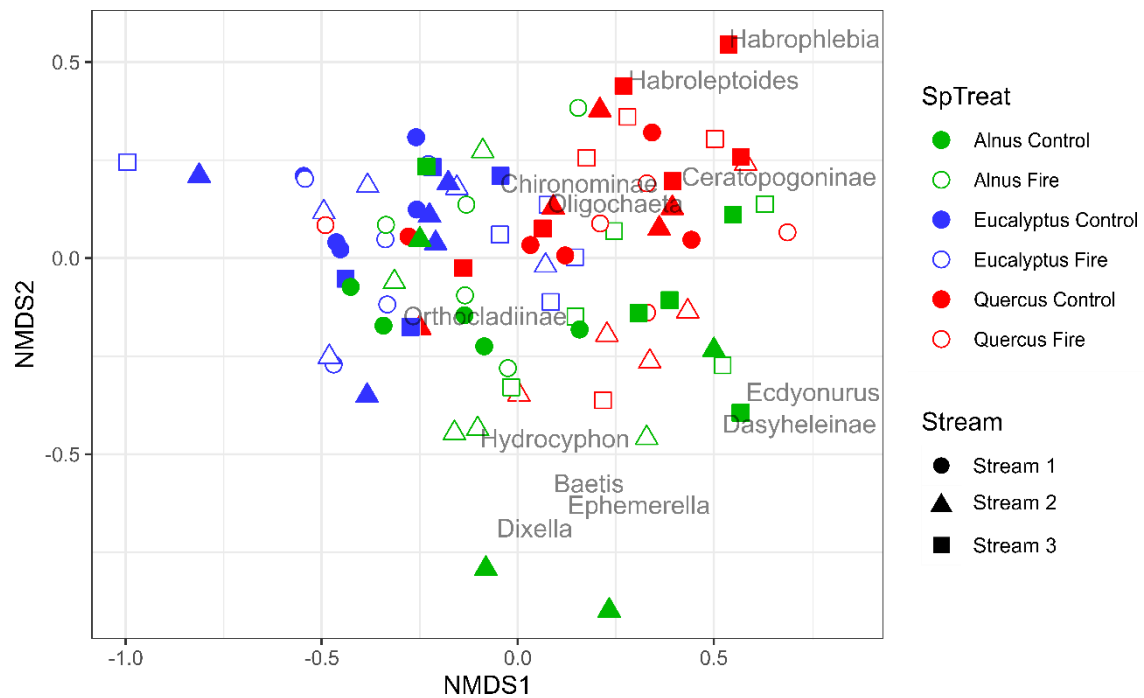


Fig. S8. Non-metric multidimensional scaling (NMDS) ordination of filterer assemblage in the three leaf types (alder, oak and eucalypt), the two treatments (control and wildfire plume exposed) and the three streams. Symbol colour represents leaf type (green for alder, red for oak and blue for eucalypt), symbol filling represents treatment (full circles for control leaves and empty circles for wildfire plume exposed leaves) and symbol form represents stream (circles for stream 1, triangles for stream 2 and squares for stream 3). Stress = 0.0888.

